



# HL11 Lathe Instruction Manual



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## **NOTE**

The information contained in this handbook is intended as a guide to the operation of these machines and does not form part of any contract. The data it contains has been obtained from the machine manufacturer and from other sources. Whilst every effort has been made to ensure the accuracy of these transcriptions it would be impracticable to verify each and every item. Furthermore, development of the machine may mean that the equipment supplied may differ in detail from the descriptions herein. The responsibility therefore lies with the user to satisfy himself that the equipment or process described is suitable for the purpose intended.

## **LIMITED WARRANTY**

Every effort to assure that its products meet high quality and durability standards and warrants to the original retail consumer/purchaser of our products that each product be free from defects in materials and workmanship as follow: **ONE YEAR LIMITED WARRANTY ON ALL PRODUCTS UNLESS SPECIFIED OTHERWISE.** This Warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence or accidents, normal wear-and tear, repair or alterations outside our facilities, or to a lack of maintenance.

We shall in no event be liable for death, injuries to persons or property or for incidental, contingent, special, or consequential damages arising from the use of our products.

To take advantage of this warranty, the product or part must be returned to us for examination, postage prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection discloses a defect, we will either repair or replace the product, or refund the purchases price if we cannot readily and quickly provide a repair or replacement, if you are willing to accept a refund. We will return repaired product or replacement at expense, but if it is determined there in no defect, or that the defect resulted from causes not within the scope of warranty, then the user must bear the cost of storing and returning the product.

The manufacturers reserve the right to change specifications at any time as they continually strive to achieve better quality equipment.

## **WARNING!**

**Read and understand the entire instruction manual before attempting set-up or operation of this machine!**

1. This machine is designed and intended for use by properly trained and experienced personnel only. If you are not familiar with the proper safe use of lathes, do not use this machine until proper training and knowledge has been obtained.
2. Keep guards in place. Safety guards must be kept in place and in working order.
3. Remove adjusting keys and wrenches. Before turning on machine, check to see that any adjusting wrenches are removed from the tool.
4. Reduce the risk of unintentional starting. Make sure switch is in the OFF position before plugging in the tool.
5. Do not force tool. Always use a tool at the rate for which it was designed.
6. Use the right tool. Do not force a tool or attachment to do a job for which it was not designed.
7. Maintain tools with care. Keep tools sharp and clean for best and safest performance. Follow instructions for lubrication and changing accessories.
8. Always disconnect the machine from the power source before adjusting or servicing.
9. Check for damaged parts. Check for alignment of moving parts, breakage of parts, mounting, and any other condition that may affect the tools operation. A guard or any part that is damaged should be repaired or replaced.
10. Turn power off. Never leave a machine unattended. Do not leave a machine until it comes to a complete stop.
11. Keep work area clean, Cluttered areas and bench invite accidents.
12. Do not use in a dangerous environment. Do not use power tools in damp or wet locations, or expose them to rain. Keep work area well
13. Keep children and visitors away. All visitors should be kept a safe distance from the work area.
14. Make the workshop childproof. Use padlocks, master switches, and remove starter keys.
15. Wear proper apparel. Loose clothing, gloves, neckties, rings, bracelets, or other jewelry may get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair. Do not wear any type of glove.
16. Always use safety glasses. Every day glasses only have impact resistant lenses; they are not safety glasses.
17. Do not overreach. Keep proper footing and balance at all times.
18. Don not put hands near the cutter while the machine is operating.
19. Do not perform any set-up work while machine is operating.
20. Read and understand all warnings posted on the machine.
21. This manual is intended to familiarize you with the technical aspects of this lathe. It is not, nor was it intended to be a training manual.
22. Failure to comply with all of these warnings may result in serious injury.
23. Some dust created by power sanding, sawing, grinding, drilling and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are lead from lead based paint; crystalline silica from bricks and cement and other masonry products.
24. Your risk from those exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specifically designed to filter our microscopic particles.

## SPECIFICATIONS:

<b>Capacities:</b>	<b>HL11 Lathe</b>
Swing Over Bed	280mm
Swing Over Cross Slide	165mm
Distance Between Centers	650mm
Width of Bed	160mm
<b>Headstock:</b>	
Hole Through Spindle	26mm
Taper in Spindle Nose	MT4
Number of Spindle Speeds	12
Range of Spindle Speeds	70-2000 rpm
<b>Feeding and Threading:</b>	
Number of Metric Threads	18
Range of Metric Threads	0.25 ~ 5mm
Number of Imperial Threads	13
Range of Imperial Threads	6~96 T.P.I.
Range of Corss Feed	0.019~0.188 mm/r
Range of Longitudinal Feed	0.036~0.364 mm/r
<b>Compound and Carriage:</b>	
Tool Post Type	4-Way (Quick change tool posts)
Maximum Compound Slide Travel	80mm
Maximum Cross Slide Trave	155mm
Maximum Carriage Travel	650mm
<b>Tailstock:</b>	
Tailstock Spindle Travel	80mm
Taper in Tailstock Spindle	MT3
<b>Miscellaneous:</b>	
Main Motor	0.75 KW
Dimension:	
Length	1350mm
Width	750mm
Height	700mm
Net/gross weight (kg)	250/280Kg

## TABLE OF CONTENTS

LIMITED WARRANTY _____	1
SAFETY WARNINGS _____	2
SPECIFICATIONS _____	3
TABLE OF CONTENT _____	4
CONTENTS OF SHIPPING CONTAINER _____	5
UNCRATING AND CLEAN-UP _____	6
FOUNDATION DRAWING _____	6
GENERAL DESCRIPTION _____	7
CONTROLS _____	9
OPERATION _____	11
LATHE ACCESSORIES _____	16
ADJUSTMENT _____	18
LUBRICATION _____	19
ELECTRICAL CONNECTION _____	20
MAINTENANCE _____	21
TRUBLE SOLUTION _____	23

## **WARNING!**

**Read and understand the entire contents of this Manual before attempting set-up or operation! Failure to comply may cause serious injure!**

### **CONTENTS OF SHIPPING CONTAINER**

- 1 HL11 Lathe
- 2 Test Flow Chart
- 1 Toolbox & Tools

### **TOOLBOX CONTENTS (Fig. 01 )**

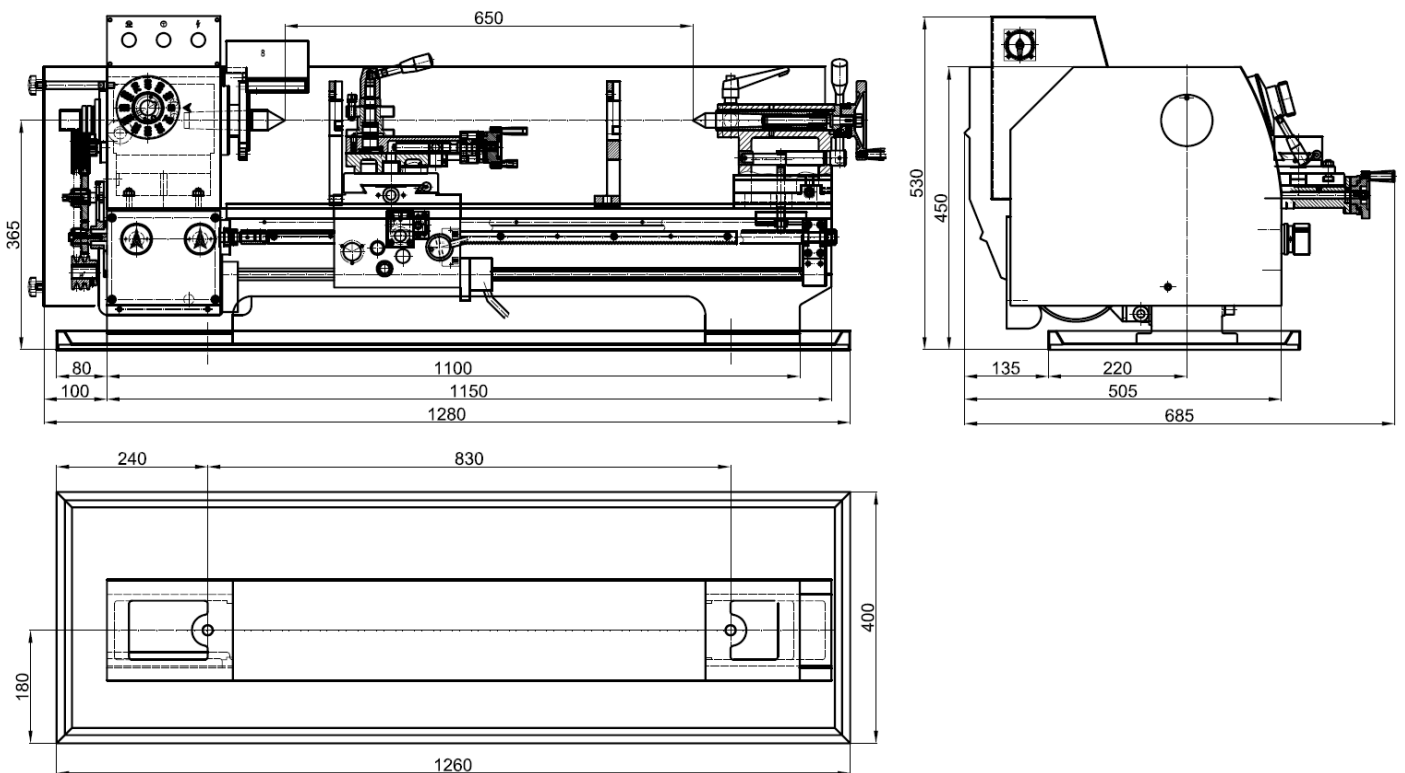
- 1 Dead Center MT4
- 1 Dead Center MT3
- 3 External Jaw
- 1 Oil Gun
- 1 Cross Screwdriver
- 1 Flat Screwdriver
- 1 Key for 3-Jaw Chuck
- 5 Hex Socket Wrench 2.5,4,5,6, mm
- 3 Double End Head Wrench 8-10mm, 12-14mm, 17-19mm
- 1 One piece of Change Gears T64

**Fig. 01**

## UNCRATING AND CLEAN-UP

1. Finish removing the wooden crate from around the lathe
2. Check all the accessories of the machine tool according to the packing list.
3. Unbolt the lathe from the shipping crate bottom.
4. Choose a location for the lathe that is dry, has good lighting and has enough room to be able to service the lathe on all four sides.
5. With adequate lifting equipment, slowly raise the lathe off the shipping crate bottom. **Do not lift by spindle.** Make sure lathe is balanced before moving to sturdy bench or stand.
6. To avoid twisting the bed, the lathe's location must be absolutely flat and level. Bolt the lathe to the stand (if used). If using a bench, through bolt for best performance.
7. Clean all rust protected surfaces using a mild commercial solvent, kerosene or diesel fuel. Do not use paint thinner, gasoline or lacquer thinner. These will damage painted surfaces. Cover all cleaned surfaces with a light film of 20W machine oil.
8. Remove the end gear cover. Clean all components of the end gear assembly and coat all gears with a heavy, non-slinging grease.

## FOUNDATION DRAWING



## GENERAL DESCRIPTION

### Lathe Bed (Fig. 03)

The lathe bed is made of high-grade iron. By combining high cheeks with strong cross ribs, a bed of low vibration and rigidity is produced. It integrates the headstock and drive unit, for attaching the carriage and leadscrew. The two precision-ground V - sideways, re-enforced by heat hardening and grinding, are the accurate guide for the carriage and tailstock. The main motor is mounted to the rear of the left side of the bed.

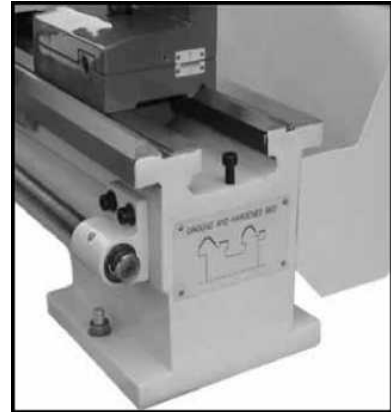


Fig. 03

### Headstock (Fig. 04)

The headstock is cast from high grade, low vibration cast iron. It is bolted to the bed with four screws. The headstock houses the main spindle with two precision taper roller bearings and the drive unit.

The main spindle transmits the torque during the turning process. It also holds the workpieces and clamping devices, (e.g. 3-jaw chuck).



Fig. 04

### Gear Box (Fig. 05)

The gear box is made from high quality cast iron and is mounted on the left side of the machine bed. It is used to select the feeds for straight turning as well as for thread cutting. In order to achieve certain thread pitches, it is necessary to replace the change gears.

The torque of the work spindle is transmitted to the feed gear and thus to the leadscrew.



Fig. 05

### Carriage (Fig. 06)

The carriage is made from high quality cast iron. The slide parts are smoothly ground. They fit the V on the bed without play. The lower sliding parts can be easily and simply adjusted. The cross slide is mounted on the carriage and moves on a dove tailed slide. Play in the cross slide may be adjusted with the gibs.

Move the cross slide with its conveniently positioned handwheel. There is a graduated collar on the handwheel.

The top slide, mounted on the cross slide, can be rotated 360°. The top slide and the cross slide travel in dove tailed slides and have gibs, adjustable nuts, and graduated collars.

A four way tool post is fitted on the top slide and allows four tools to be clamped. Loosen the center clamp handle to rotate any of the four tools into position.

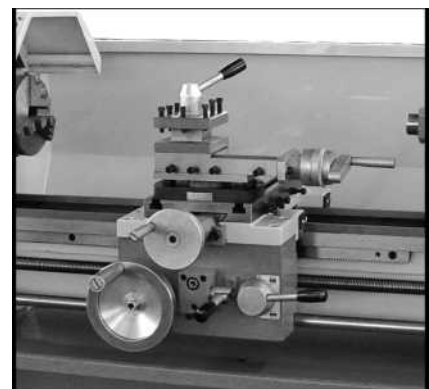


Fig.06

### Apron (Fig. 07)

The apron is mounted on the bed. It houses the half nut with an engaging lever for activating the automatic feed. The half nut gibs can be adjusted from the outside.

A rack, mounted on the bed, and a pinion operated by handwheel on the carriage allow for quick travel of the apron.

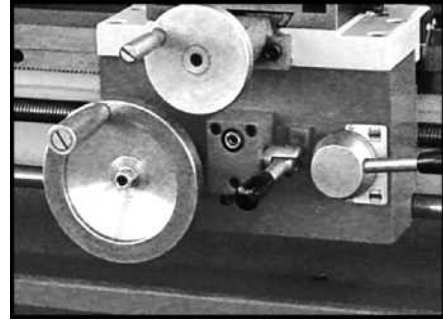


Fig.07

### Leadscrew(Fig. 08)

The leadscrew is mounted on the front of the machine bed. It is connected to the gear box at the left for automatic feed and is supported by bearing on both ends. The two groove nuts (A, Fig. 10) on the right end are designed to take up play on the leadscrew.

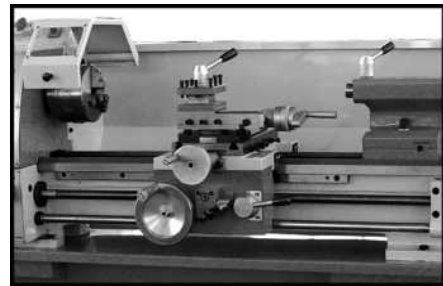


Fig. 08

### Tailstock (Fig. 09)

The tailstock slides on a V way and can be clamped at any location. The tailstock has a heavy-duty spindle with a Morse taper No. 3 socket and a graduated scale. The spindle can be clamped at any location with a clamping lever. The spindle is moved with a handwheel at the end of the tailstock.

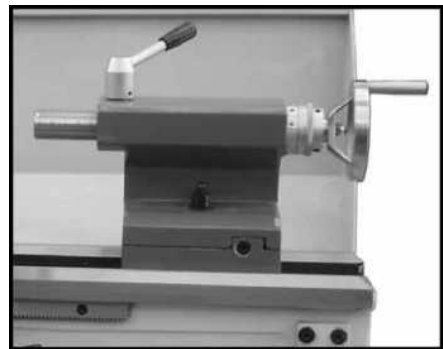


Fig. 09

### NOTE:

Fit the securing screw (B, Fig. 10) at the end of the lathe bed in order to prevent the tailstock from falling off the lathe bed.

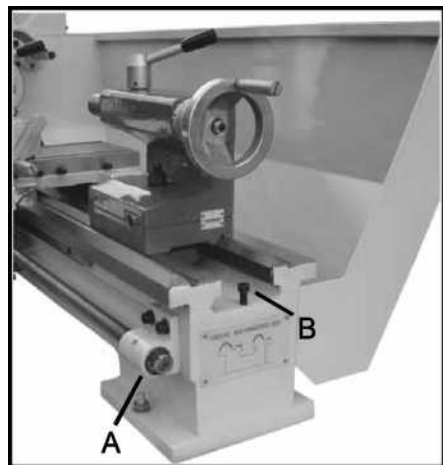


Fig. 10

## CONTROLS

### 1. Change-over Switch (A, Fig. 11)

After the machine is switched on, turn the switch to “F” position for counter-clockwise spindle rotation (forward). Turn the switch to “R” position for clockwise spindle rotation (reverse). “0” position is OFF and the spindle remains idle.

### 2. Emergency Button ON/OFF Switch (B, Fig. 11)

The machine is switched on and off with ON/OFF button. Depress to stop all machine functions. To restart, lift the cover and press ON button.

### 3. Variable speed control (Figure 11)

Toggle the speed change plate on the front of the headstock, you can select the corresponding speed according to the value on the plate. Stop the spindle before changing the speed!

### 4. Feed Direction Selector (D, Fig. 12)

Select carriage travel direction when the chuck is rotating in the forward direction or counter-clockwise as viewed from the front of the chuck.

### 5. Feed Rate Selector (E, Fig. 12)

Set the desired feed or thread rates.

### 6. Feed/Thread Selector (F, Fig. 12)

Select the handle for shift left to thread.  
Select the handle for shift right to feed.

### 7. Compound Rest Lock

Turn two hex nuts (G, Fig. 13) clockwise to lock and counter-clockwise to unlock.

### 8. Compound Slide Lock

Turn hex socket cap screws (H, Fig. 13) clockwise, and tighten to lock. Turn counter-clockwise to loosen.

### 9. Cross Slide Lock

Turn hex socket cap screw ( I, Fig. 13) clockwise and tighten to lock. Turn counter-clockwise and loosen to unlock.

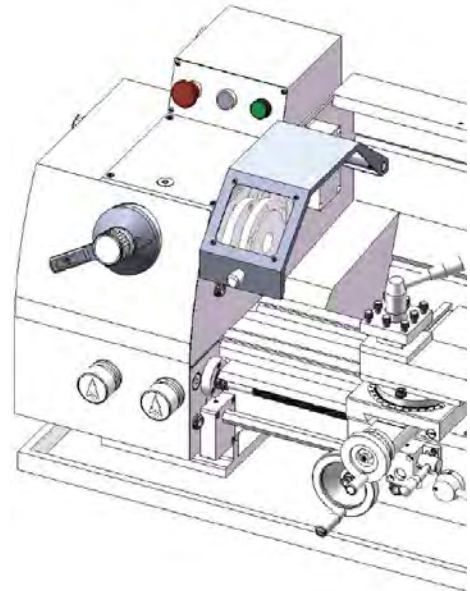


Fig. 11



Fig. 12

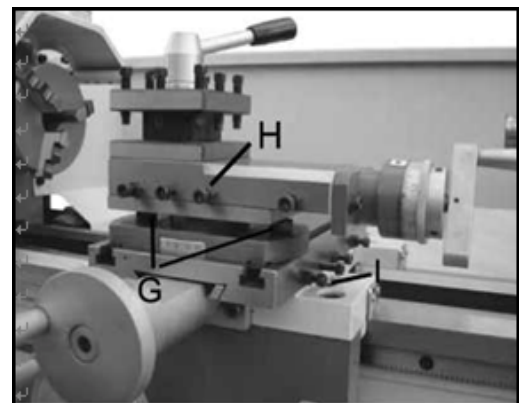


Fig. 13

## 9. Carriage Lock

Turn hex socket cap screw (A, Fig.14) clockwise and tighten to lock. Turn counter-clockwise and loosen to unlock.

Caution: carriage lock screw must be unlocked before engaging automatic feeds or damage to lathe may occur.

## 10. Longitudinal Traverse (B, Fig. 15)

Rotate hand wheel clockwise to move the apron assembly toward the tailstock (right). Rotate the hand wheel counter-clockwise to move the apron assembly toward the headstock (left).

## 11. Cross Traverse Handwheel(C, Fig. 15)

Clockwise rotation moves the cross slide toward the rear of the machine.

## 12. Half Nut Engage Lever (D, Fig. 15)

Move the lever down to engage. Move the lever up to disengage.

## 13. Compound Rest Traverse Lever (E, Fig. 15)

Rotate clockwise or counter-clockwise to move or position.

## 14. Tool Post Clamping Lever (F, Fig. 15)

Rotate counter-clockwise to loosen and clockwise to tighten. Rotate the tool post when the lever is unlocked.

## 15. Feed axis Selector (G, Fig. 15)

Push lever (G, Fig.15) to the left and down to engage cross feed Pull lever to the right and up to engage longitudinal feed.

## 16. Tailstock Clamping Screw (H, Fig. 16)

Turn hex nut clockwise to lock and counter-clockwise to unlock.

## 17. Tailstock Quill Clamping Lever ( I, Fig. 16)

Rotate the lever clockwise to lock the spindle and counter-clockwise to unlock.

## 18. Tailstock Quill Traverse Handwheel(J, Fig. 16)

Rotate clockwise to advance the quill. Rotate counter-clockwise to retract the quill

## 19. Tailstock Off-set Adjustment (K, Fig. 16)

Three sets screws located on the tailstock base are used to off-set the tailstock for cutting tapers. Loosen lock screw on tailstock end. Loosen one side set screw while tightening the other until the amount of off-set is indicated on scale. Tighten lock screw.

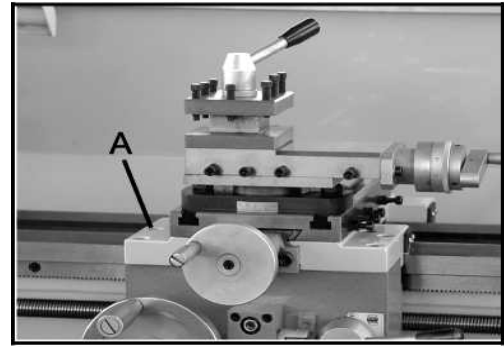


Fig. 14

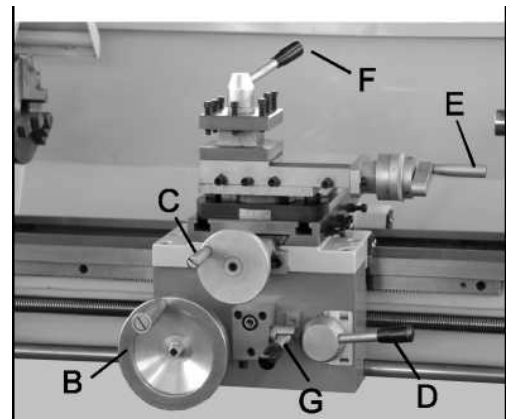


Fig. 15

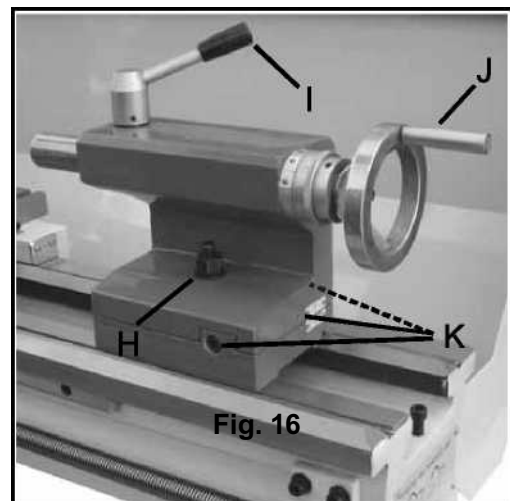


Fig. 16

## OPERATION

### Replacement of Chuck

The head spindle holding fixture is cylindrical. Loosen three set screws and nuts (A, Fig.17, only two are shown) on the lathe chuck flange to remove the chuck. Position the new chuck and fix it using the same set screws and nuts.

### Tool Set-Up

Clamp the turning tool into the toolholder.

The tool must be clamped firmly. When turning, the tool has a tendency to bend under the cutting force generated during the chip formation. For best results, tool overhang should be kept to a minimum of 3/8" or less.

The cutting angle is correct when the cutting edge is in line with the center axis of the work piece. The correct height of the tool can be achieved by comparing the tool point with the point of the center mounted in the tailstock. If necessary, use steel spacer shims under the tool to get the required height. (Fig. 18)

### Change H/L Speed

1. Unscrew the two fastening screws (B, Fig. 19) and remove the protective cover.
2. To selection A or B according to your requirement, A is low speed, B is high speed. ( Fig. 20)

**Caution: we suggestion our customers to select low speed position to work, it is could provides stronger torque for working!**

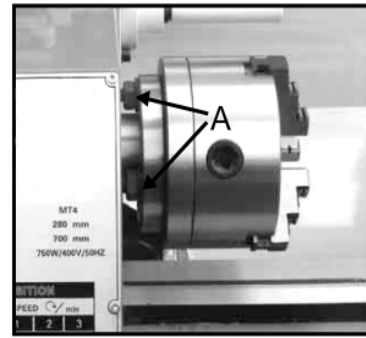


Fig. 17



Fig. 18

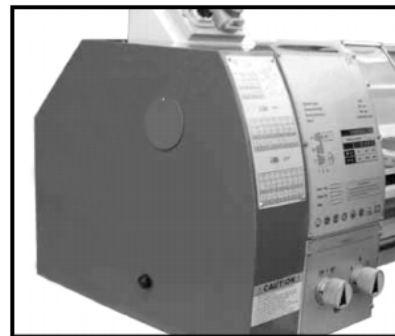


Fig. 19

## Manual Turning

Apron travel, cross travel, and top slide handwheel can be operated for longitudinal or cross feeding. (Fig.21)

### Longitudinal Turning with Auto-Feed

1. Set the selector knob (A, Fig.22) to select the feed direction and feed speed.
2. Use the table (B, Fig.22) on the lathe for selecting the feed speed or the thread pitch. Adjust the change gear if the required feed or thread pitch cannot be obtained with the installed gear set.

### Change Gears Replacement

1. Disconnect the machine from the power source.
2. Unscrew the two fastening screws and remove the protective cover.
3. Loosen the locking screw (C, Fig.23) on the quadrant.
4. Swing the quadrant (D, Fig.23) to the right.
5. Unscrew the bolt (E, Fig.23) from the leadscrew or the square bolts (F, Fig.23) from the quadrant bolts in order to remove the change gears from the front.
6. Install the gear couples according to the thread and feed table (Fig.24) and screw the gearwheels onto the quadrant again.
7. Swing the quadrant to the left until the gearwheels have engaged again.
8. Readjust gear backlash by inserting a normal sheet of paper as an adjusting or distance aid between the gearwheels.
9. Immobilize the quadrant with the locking screw.
10. Install the protective cover of the headstock and reconnect the machine to the power supply.

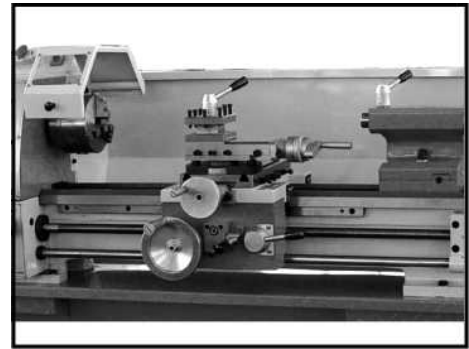


Fig. 21



Fig. 22

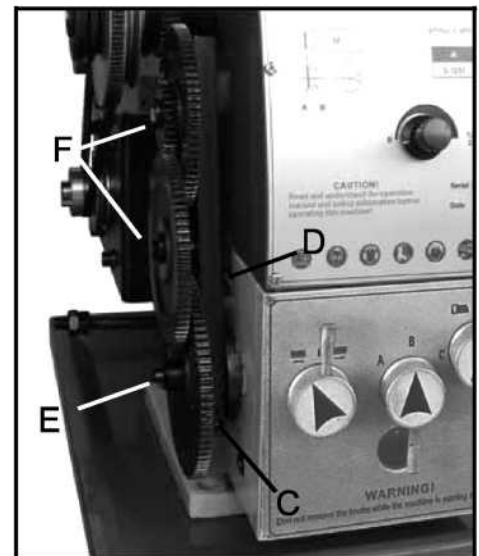


Fig. 23

### THREADING AND FEEDING TABLE FOR METRIC LATHE

a	32					
b	120					
c						
d	40					
		1	2	3	4	5
	A	0.036	0.044	0.051	0.058	0.073
	B	0.072	0.087	0.102	0.116	0.146
	C	0.182	0.218	0.255	0.291	0.364
	A	0.019	0.023	0.026	0.030	0.038
	B	0.038	0.045	0.052	0.060	0.075
	C	0.094	0.113	0.131	0.150	0.188

a	b	c	d		A	B	C
32	120		40	1	0.25	0.50	1.25
				2	0.30	0.60	1.50
				3	0.35	0.70	1.75
				4	0.40	0.80	2.00
				5	0.50	1.00	2.50
64	120		40	1	0.50	1.00	2.50
				2	0.60		3.00
				3	0.70		3.50
				4	0.80		4.00
				5	1.00	2.00	5.00

a	b	c	d		A	B	C
32	120	127	40	1	96	48	
				2	80	40	16
				3			
				4	60	30	12
				5	48	24	
64	120	127	40	1	48	24	
				2	40	20	8
				3			
				4	30	15	6
				5	24	12	

### Straight Turning (Fig. 25)

In the straight turning operation, the tool feeds parallel to the axis of rotation of the workpiece. The feed can be either manual by turning the handwheel on the lathe saddle or the top slide, or by activating the automatic feed. The crossfeed for the depth of cut is achieved using the cross slide.

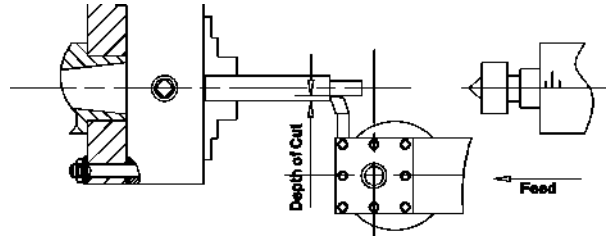


Fig. 25

### Facing and Recesses (Fig. 26)

In the facing operation, the tool feeds perpendicular to the axis of rotation of the workpiece. The feed is made manually with the cross slide handwheel. The crossfeed for cut depth is made with the top slide or lathe saddle.

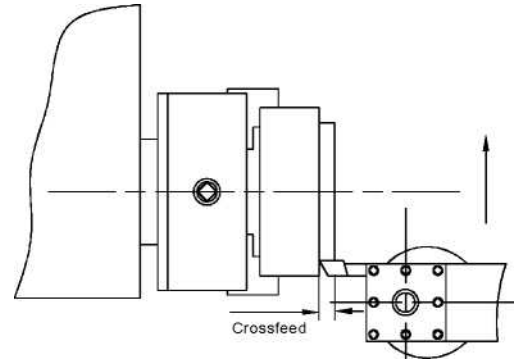


Fig. 26

### Turning Between Centers (Fig. 27)

For turning between centers, it is necessary to remove the chuck from the spindle. Fit the M.T.3 center into the spindle nose and the M.T.2 center into the tailstock. Mount the workpiece fitted with the driver dog between the centers. The driver is driven by a catch or face plate.

Note: Always use a small amount of grease on the tailstock center to prevent center tip form overheating.

### Taper Turning Using Tailstock Off-Set

Work to a side angle of 5 can be turned by off-setting the tailstock. The angle depends on the length of the workpiece.

To off-set the tailstock, loosen locking screw (A, Fig.28) Unscrew the set screw (B, Fig.28) on right end of the tailstock. Loosen the front adjusting screw (C, Fig.28) and take up the same amount by tightening the rear adjusting screw (D, Fig.28) until the desired taper has been reached. The desired cross-adjustment can be read off the scale. (E, Fig.28). First retighten the set screw (B, Fig.28) and then the two (front and rear) adjusting screw to lock the tailstock in position. Retighten the locking screw (A, Fig.28) of the tailstock. The workpiece must be held between to centers and driven by a face plate and driver dog.

After taper turning, the tailstock should be returned to its original position according to the zero position on the scale of tailstock. (E, Fig.28)

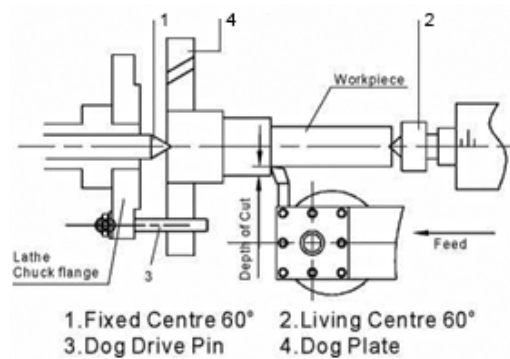


Fig. 27

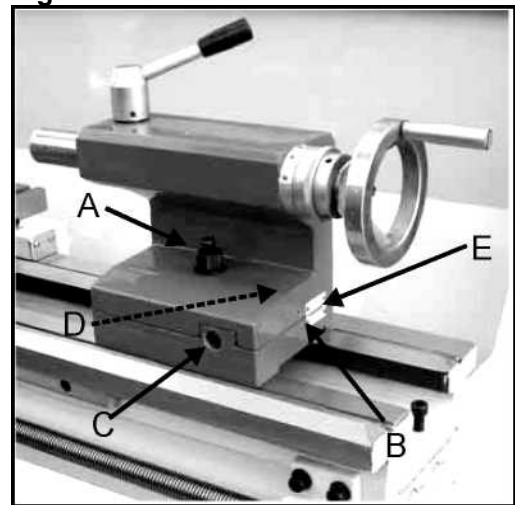
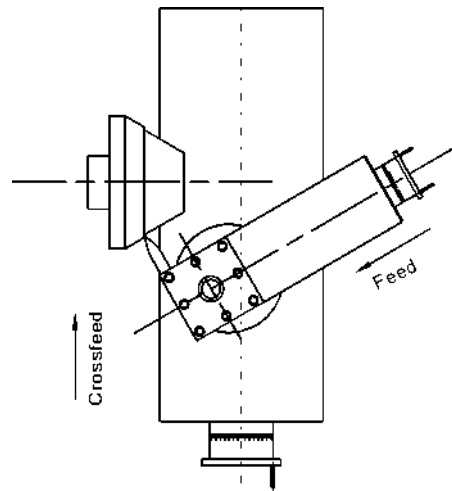


Fig. 28

## Taper Turning by Setting the Top Slide

By angling the top slide, tapers may be turned manually with the top slide. (Fig. 29)

Rotate the top slide to the required angle. A graduated scale permits accurate adjustment of the top slide. The crossfeed is performed with the cross slide. This method can only be used for short tapers.



**Fig. 29**

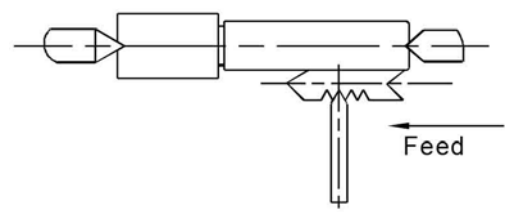
## Thread Cutting

Set the machine up to the desired thread pitch (according to the threading chart, Fig.24). Start the machine and engage the half nut. When the tool reaches the part, it will cut the initial threading pass. When the tool reaches the end of the cut, stop the machine by turning the motor off and at the same time back the tool out of the part so that it clears the thread. Do not disengage the half nut lever. Reverse the motor direction to allow the cutting tool to traverse back to the starting point. Repeat these steps until you have obtained the desired results.

### NOTES

#### Example: Male Thread

- The workpiece diameter must have been turned to the diameter of the desired thread.
- The workpiece requires a chamfer at the beginning of the thread and an undercut at the thread runout.
- The speed must be as low as possible.
- The change gears must have been installed according to the required pitch.
- The thread cutting tool must be exactly the same shape as the thread, must be absolutely rectangular and clamped so that it coincides exactly with the turning center.
- The thread is produced in various cutting steps so that the cutting tool has to be turned out of the thread completely (with the cross slide) at the end of each cutting step.
- The tool is withdrawn with the leadscrew nut engaged by inverting the change-over switch.
- Stop the machine and feed the thread cutting tool in low cut depths using the cross slide.
- Before each passage, place the top slide approximately 0.2 to 0.3mm to the left and right alternately in order to cut the thread free. This way, the thread cutting tool cuts only on one thread flank with each passage. Keep cutting the thread free until you have almost reached the full depth of thread.



**Fig. 30**

## LATHE ACCESSORIES

### Three Jaw Universal Lathe Chuck

Using this universal chuck, round, triangular, square, hexagonal octagonal, and twelve-cornered stock may be clamped. (Fig.31)

Note: new lathes have very tight fitting jaws. This is necessary to ensure accurate clamping and long service life. With repeated opening and closing, the jaw adjust automatically and their operation becomes progressively smoother.

#### Note:

For the original 3-jaw chuck that mounted on the lathe, the factory has mounted the chuck in the best way to guarantee the holding accuracy with two "0" mark (A, Fig.) showed on the chuck and chuck flange.

There are two types of jaws: Internal and external jaws. Please note that the number of jaws fit with the number inside the chuck's groove. Do not mix them together. When you are going to mount them, please mount them in ascending order 1-2-3, when you are going to take them out, be sure to take them out in descending order 3-2-1, one by one. After you finished this procedure, rotate the jaws to the smallest diameter and check that the three jaws are well fitted.

### Four Jaw Independent Lathe Chuck

This special chuck has four independently adjustable chuck jaws. These permit the holding of asymmetrical pieces and enable the accurate set-up of cylindrical pieces. (Fig.32)

### Drill Chuck (Optional)

Use the drill chuck to hold centering drills and twist drills in the tailstock. (A, Fig.33)

### Morse Taper Arbor (Optional)

An arbor is necessary for mounting the drill chuck in the tailstock. It has a No. 2 Morse taper. (B, Fig.33)

### Live Center (Optional)

The live center is mounted in ball bearings. Its use is highly recommended for turning at speeds in excess of 600 RPM. ( Fig. 34)

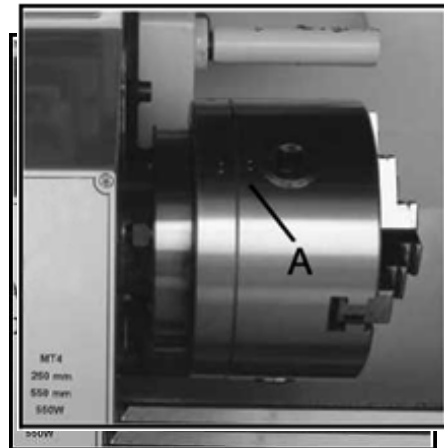


Fig. 31

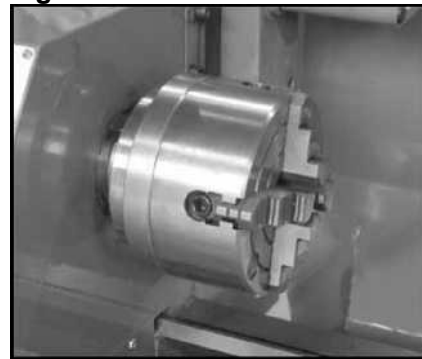


Fig. 32

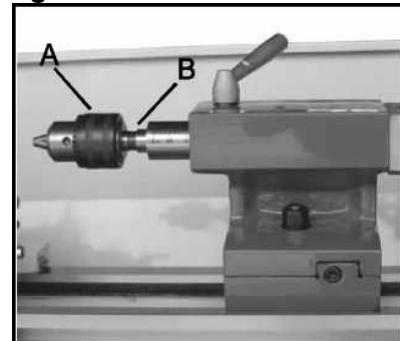


Fig. 33

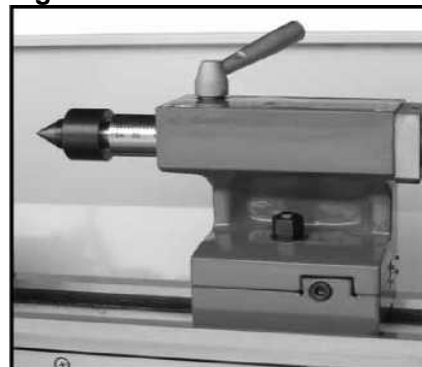


Fig. 34

## Steady Rest

The steady rest serves as a support for shafts on the free tailstock end. For many operations the tailstock can not be used as it obstructs the turning tool or drilling tool, and therefore, must be removed from the machine. The steady rest, which function as an end support, ensures chatter-free operation. The steady rest is mounted on the bedways and is secured from below with a locking plate. The sliding fingers require continuous lubrication at the contact points to prevent premature wear. (Fig.35)

### Setting the Steady Rest

1. Loosen three hex nuts. (A, Fig.36)
1. Loosen knurled screw (B, Fig.36) and open the sliding fingers. (C, Fig.36) until the steady rest can be moved with its finger around the workpiece. Secure the steady rest in position.
2. Tighten knurled screws so that fingers are snug but not tight against the workpiece. Tighten three nuts (A, Fig.36). Lubricate the sliding points with machine oil.
3. When, after prolonged operation, the jaw show wear, the tips of the fingers may be filed or remilled.

### Follow Rest

The follow rest is mounted on the saddle and follow the movement of the turning tool. Only two sliding fingers are required. The place of the third finger is taken by the turning tool. The follow rest is used for turning operations on long, slender workpieces. It prevents flexing of the workpiece under pressure from the turning tool. ( Fig.37 )

Set the fingers snug to the workpiece but not overly tight. Lubricate the fingers during operation to prevent premature wear.

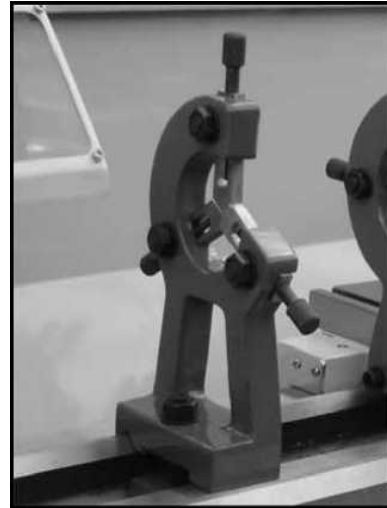


Fig. 35

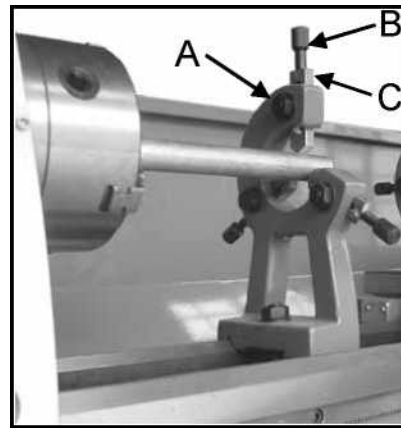


Fig. 36



Fig. 37

## ADJUSTMENT

After a period time, wear in some of the moving components may need to be adjust

### Main Spindle Bearings

The main spindle bearings are adjusted at the factory. If end play becomes evident after considerable use, the bearings may be adjusted.

Loosen two hex socket cap screws (A, Fig.38) in the slotted nut (B, Fig.38) on the back of the spindle. Tighten slotted nut until all end play is taken up. The spindle should still revolve freely. Tighten two hex socket cap screws (A, Fig.38).

Caution: excessive tightening or preloading will damage the bearings.

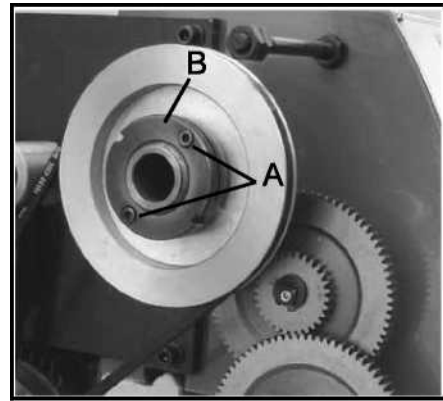


Fig. 38

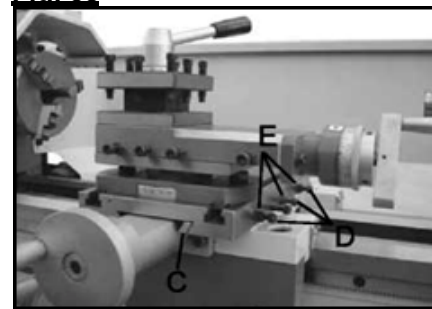


Fig. 39

### Adjustment of Cross Slide

The cross slide is fitted with a gib strip(C, Fig.39) and can be adjusted with screws (D, Fig.39) fitted with lock nuts. (E, Fig.39) Loosen the lock nuts and tighten the set screws until slide moves freely without play. Tighten lock nuts to retain adjustment.

### Adjustment of Top Slide

The top slide is fitted with a gib strip(F, Fig.40) and can be adjusted with screws (G, Fig. 40) fitted with lock nuts. (H, Fig. 40) Loosen the lock nuts and tighten the set screws until slide moves freely without play. Tighten lock nuts to retain adjustment.

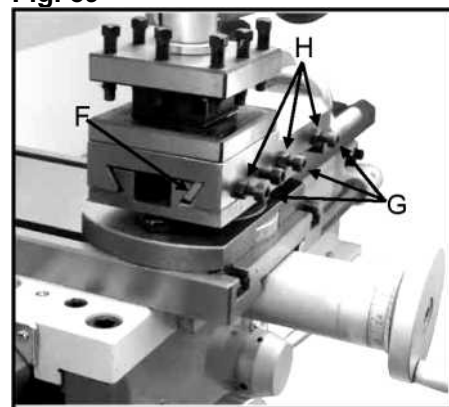


Fig. 40

### Adjustment of Half Nut Guide

Loosen the nut (I, Fig.41) on the right side bottom of the apron and adjust the control screws (J, Fig.41) until both half nuts move freely without play. Tighten the nut.

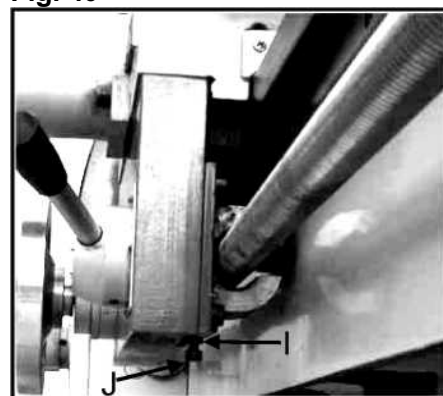


Fig. 41

## LUBRICATION

### CAUTION!

Lathe must be serviced at all lubrication points and all reservoirs filled to operating level before the lathe is placed into service!  
Failure to comply may cause serious damage!

#### NOTES:

Lubricate all slideways lightly before every use. Lubricate the change gears and the leadscrew slightly with a lithium-based grease.

#### 1. Gearbox

Oil Must be up to indicator mark in oil sight glass(A, Fig.42). Top off with Mobilgear 627 or equivalent. Fill by pulling plug (B, Fig. 42). To drain, remove drain plug on the right side of headstock(C, Fig.43). Drain oil completely and refill after the first three months of operation. Then, change oil in the headstock annually.

#### 2. Change Gear

Lubricate two oil ports (D, Fig.43) on the gear shafts with 20W machine oil once daily.

#### 3. Carriage

Lubricate Four oil ports (E, Fig. 44) with 20W machine oil once daily.

#### 4. Cross Slide

Lubricate two oil ports (F, Fig. 44) with 20W machine oil once daily.

#### 5. Apron

Lubricate two oil ports (G, Fig. 45) with 20W machine oil once daily.

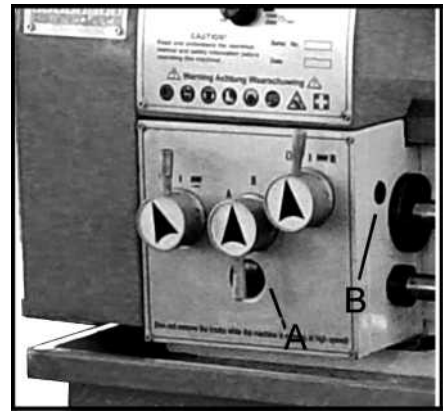


Fig. 42

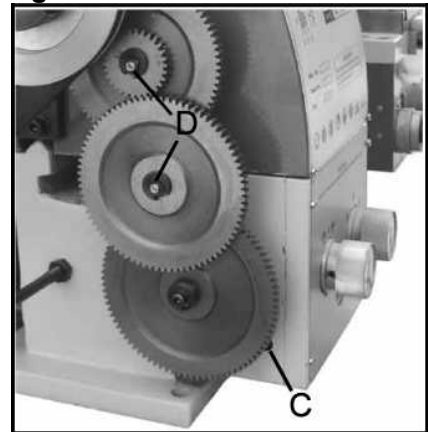


Fig. 43

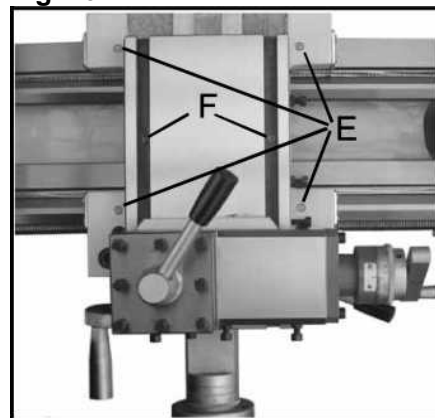


Fig. 44

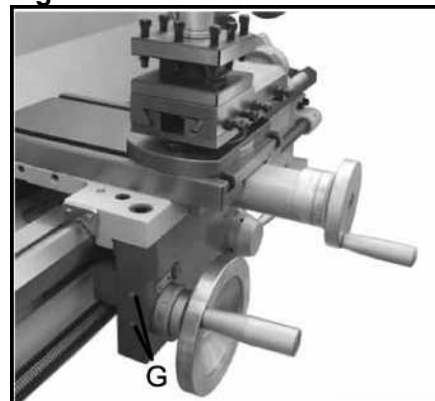


Fig. 45

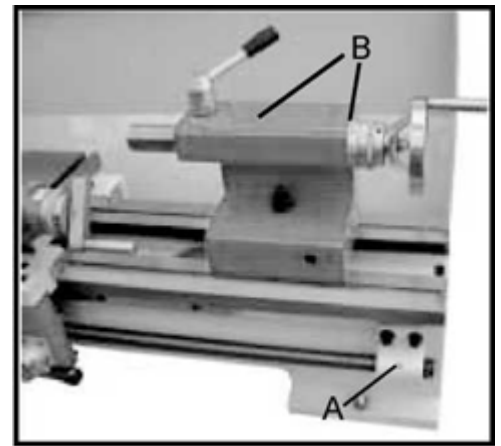
oil port (A,

**6. Leadscrew**

Lubricate the oil port (A. FIG.46) with 20W machine oil once daily.

**7. Tailstock**

Lubricate two oil ports (B. Fig.46) with 20W machine oil once daily.



**Fig. 46**

## ELECTRICAL CONNECTIONS

**A WARNING!**

Connection of the lathe and all other electrical work may only be carried out by an authorized electrician!

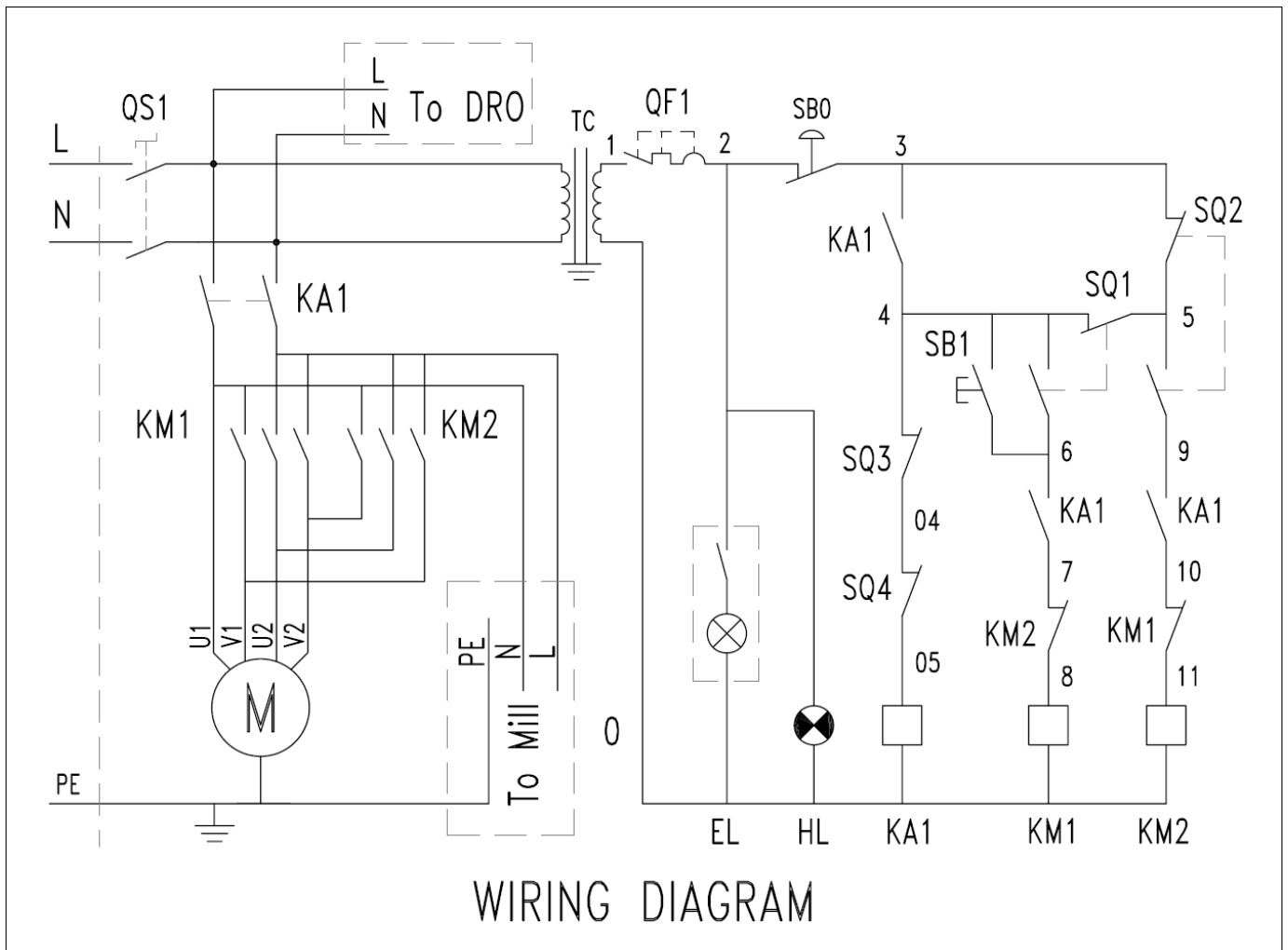
Failure to comply may cause serious injury and damage to the machinery and property!

**Fig.47**

The HL11 Lathe is rated at 70W, 1PH, 230V only. Confirm power available at the lathe's location is the same rating as the lathe. Using the wiring diagram (Fig.47) for connecting the lathe to the mains supply.

Make sure the lathe is properly grounded.

The following is wiring diagram of the lathe:



## **MAINTENANCE**

Keep the maintenance of the machine tool during the operation to guarantee the accuracy and service life of the machine tool.

1. In order to retain the machine's precision and functionality, it is essential to treat it with care, keep it clean and grease and lubricate it regularly. Only through good care, you can be sure that the working quality of the machine will remain constant.

### **NOTES:**

**Disconnect the machine plug from the mains supply whenever you carry out cleaning, maintenance or repair work!**

**Oil, grease and cleaning agents are pollutants and must not be disposed of through the drains or in normal refuse. Dispose of those agents in accordance with current legal requirements on the environment. Cleaning rags impregnated with oil, grease and cleaning agents are easily inflammable. Collect cleaning rags or cleaning wool in a suitable closed vessel and dispose of them in an environmentally sound way - do not put them with normal refuse!**

2. Lubrication all slideways lightly before every use. The change gears and the leadscrew must also be lightly lubricated with lithium base grease.
3. During the operation, the chips which falls onto the sliding surface should be cleaned timely, and the inspection should be often made to prevent chips falling into the position between the machine tool saddle and lathe bed guide way. Asphalt felt should be cleaned at certain time.

### **NOTES:**

**Do not remove the chips with your bare hands. There is a risk of cuts due to sharp-edged chips. Never use flammable solvents or cleaning agents or agents that generate noxious fumes! Protect electrical components such as motors, switches, switch boxes, etc., against humidity when cleaning.**

4. After the operation every day, eliminate all the chips and clean different part of the machine tool and apply machine tool oil to prevent rusting.
5. In order to maintain the machining accuracy, take care of the center, the surface of the machine tool for the chuck and the guide way and avoid mechanical damage and the wear due to improper guide.
6. If the damage is found, the maintenance should be done immediately.

### **NOTES:**

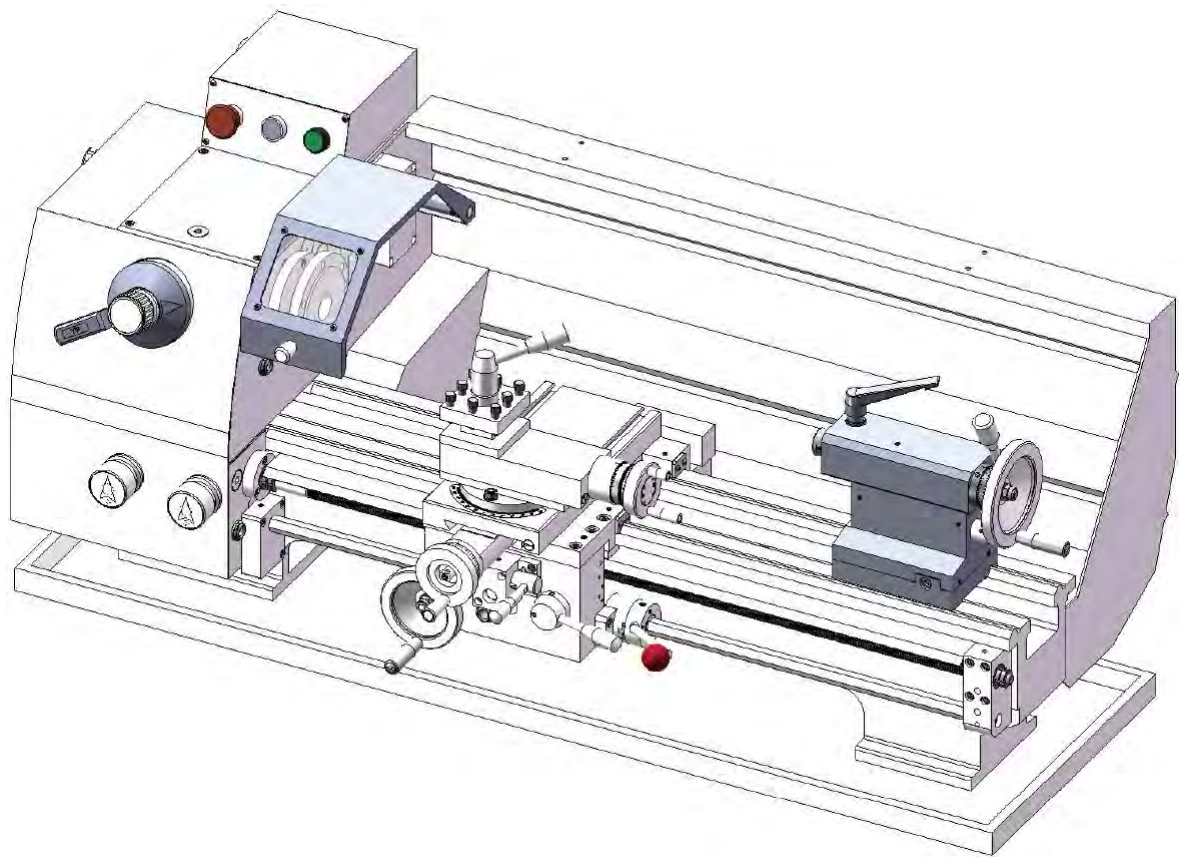
**Repair work may only be carried out by qualified personnel with the corresponding mechanical and electrical knowledge.**

## TROUBLESHOOTING

Problem	Possible Reason	Elimination
Surface of workpiece too rough	Tool blunt Tool springs Feed too high Radius at the tool tip too small	Resharpen tool Clamp tool with less overhang Reduce feed Increase radius
Workpiece becomes coned	Centers are not aligned (tailstock has offset) Top slide not aligned well (cutting with the top slide)	Adjust tailstock to the center Align top slide well
Lathe is chattering	Feed too high Slack in main bearing	Reduce feed Adjust the main bearing
Center runs hot	Workpiece has expanded	Loosen tailstock center
Tool has a short edge life	Cutting speed too high Crossfeed too high Insufficient cooling	Reduce cutting speed Lower crossfeed (finishing allowance should not exceed 0.5mm) More coolant
Flank wear too high	Clearance angle too small Tool tip not adjusted to center high	Increase clearance angle Correct height adjustment of the tool
Cutting edge breaks off	Wedge angle too small (heat build-up) Grinding crack due to wrong cooling Excessive slack in the spindle bearing Arrangement (vibrations)	Increase wedge angle Cool uniformly Adjust the slack in the spindle bearing arrangement
Cut thread is wrong	Tool is clamped incorrectly or has been started grinding the wrong way Wrong pitch Wrong diameter	Adjust too to the center Grind angle correctly Adjust the right pitch Turn the workpiece to the correct diameter
Spindle does not activate	Emergency stop switch activated	Unlock emergency stop switch

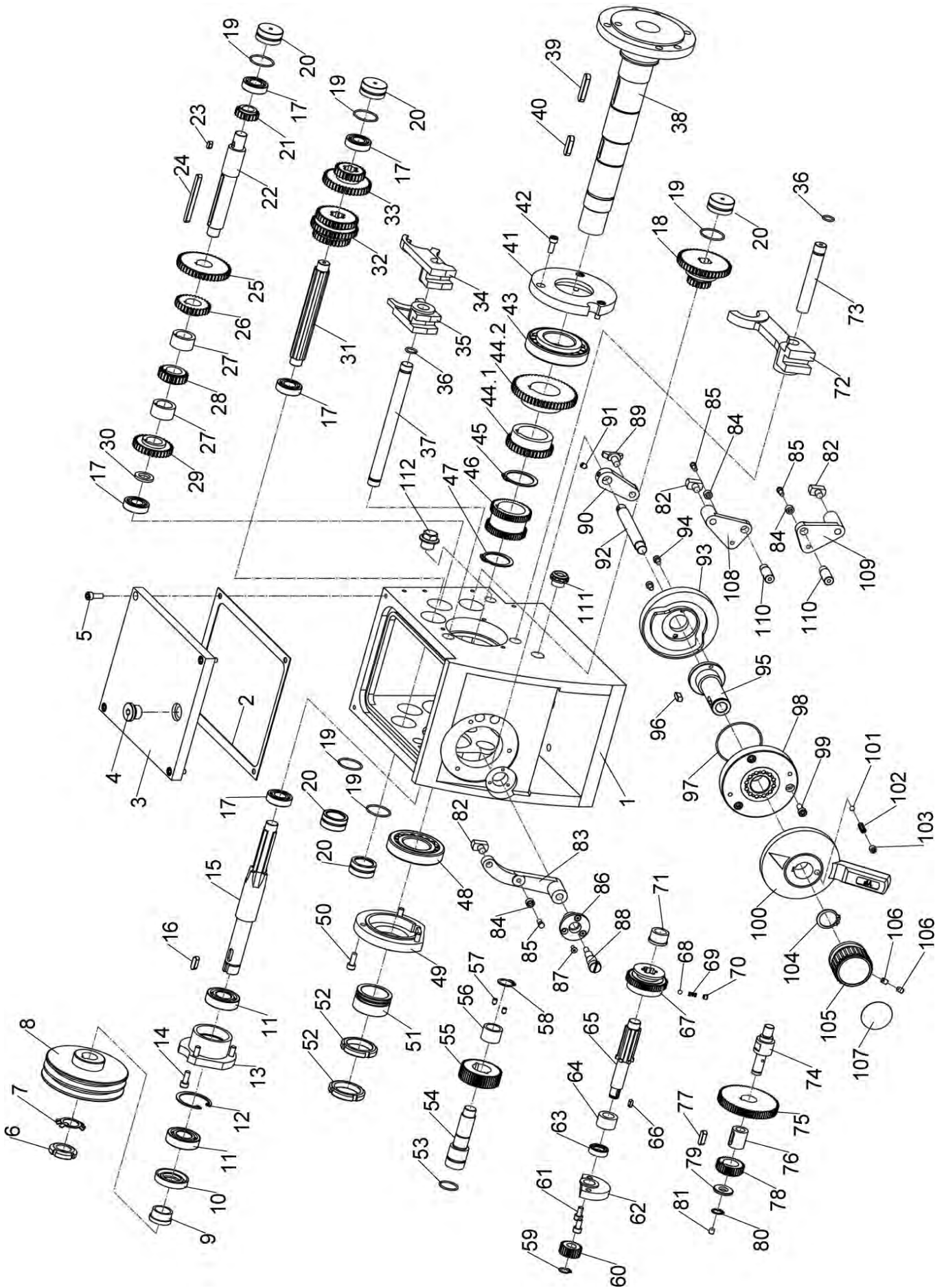
# BENCH LATHE

## Parts list for HL11



**Keep Read and Understand the Operation Manual and Safety Information  
Before Operated!**

# Headstock and Driving Assembly



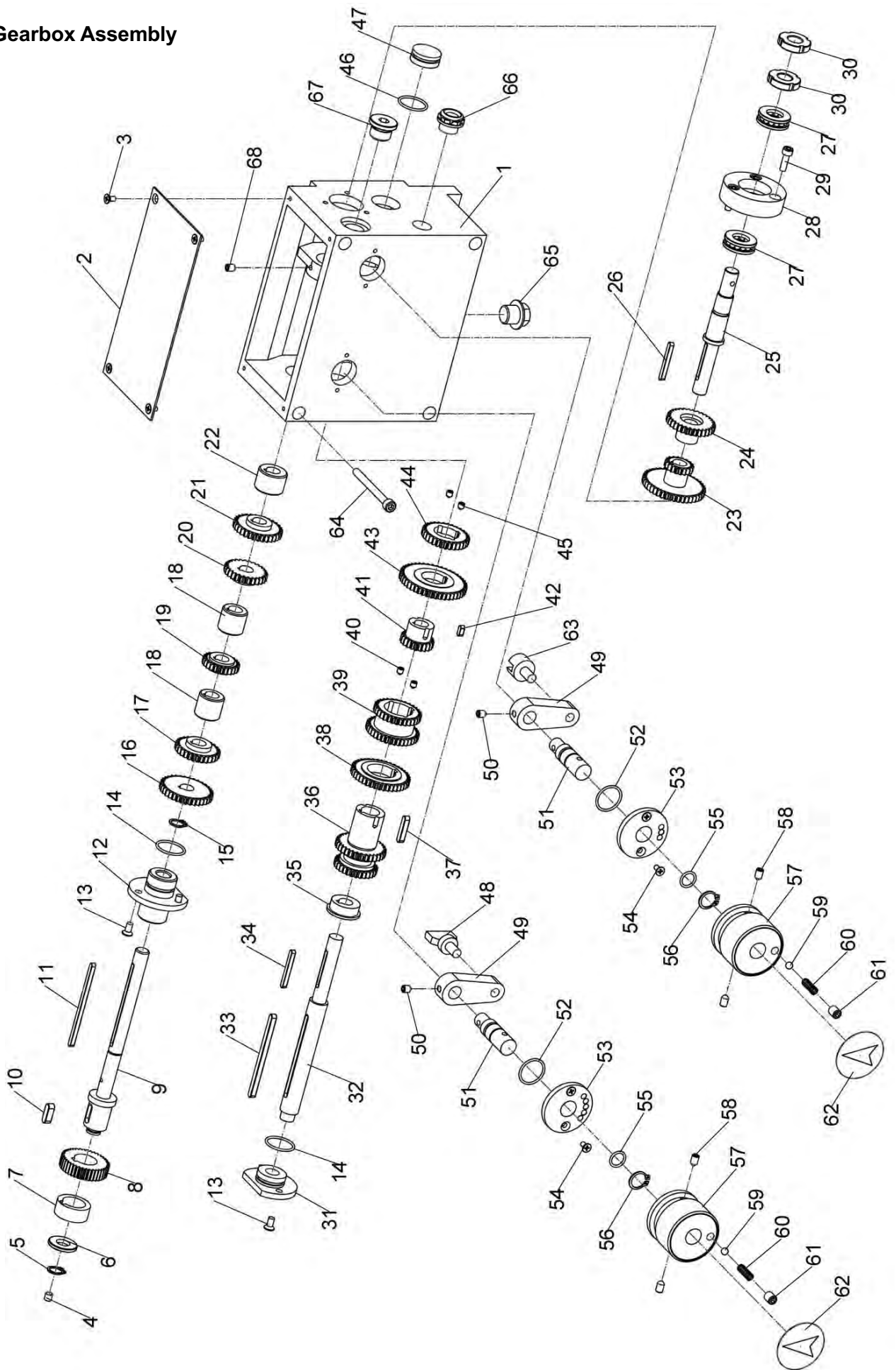
## Headstock and Driving Assembly(I)

Parts No.	Description	Specification	Qty
1	spindle box	CQC280-04-01B	1
2	Gasket	CQC280-04-02B.1	1
3	Gearbox cover	CQC280-04-02B	1
4	Oil plug	G38-4 M18x1.5	1
5	Hex Socket Cap Screw	M6x16	4
6	Round nut	M20x1.5	1
7	Spanner nut toothed washer	20 mm	1
8	V-Belt pulley	CQC280-04B-31	1
9	Bushing	CQC280-04-32	1
10	Oil seal	FB25x42x8	1
11	Ball Bearing	6004	2
12	Int retaining ring	42 mm	1
13	End cover	CQC280-04-33	1
14	Hex Socket Cap Screw	M6x16	3
15	Shaft	CQC280-04B-34	1
16	key	6x18	1
17	Ball Bearing	6002	5
18	Gear	CQC280-04B-11	1
19	O-ring	GB/T3452.1 29x1.8	5
20	Plug	CQC280-04-35	5
21	Gear	CQC280-04B-16	1
22	Shaft II	CQC280-04B-36	1
23	key	5x10	1
24	key	6x75	1
25	Gear	CQC280-04B-15	1
26	Gear	CQC280-04B-14	1
27	Bushing	CQC280-04-42	2
28	Gear	CQC280-04B-13	1
29	Gear	CQC280-04B-12	1
30	Spacer	CQC280-04-53	1
31	Shaft III	CQC280-04-37	1
32	Gear	CQC280-04B-17	1
33	Gear	CQC280-04B-18	1
34	Shifting fork	CQC280-04-69	1
35	Shifting fork	CQC280-04B-73	1
36	O-ring	GB/T3452.1 11.8x1.8	3
37	Shaft	CQC280-04-72	1
38	Spindle	CQC280-04-04	1
39	Thin flat key	10x40	1
40	Thin flat key	10x30	1

Parts No.	Description	Specification	Qty
41	End cover	CQC280-04-41	1
42	Hex Socket Cap Screw	M6x18	4
43	Tapered roller bearing	30208	1
44	Gear	CQC280-04B-19.1	1
44	Gear	CQC280-04B-19.2	1
45	Ext retaining ring	38 mm	1
46	Gear	CQC280-04-20	1
47	Ext retaining ring	35 mm	1
48	Tapered roller bearing	30207	1
49	End cover	CQC280-04-40	1
50	Hex Socket Cap Screw	M6x18	3
51	Bushing	CQC280-04-39	1
52	Round nut M35x1.5	CQC280-04-38	2
53	O-ring	GB/T3452.1 21.2x1.8	1
54	Shaft	CQC280-04-43	2
55	Gear	CQC280-04-21	1
56	Bushing	CQC280-04-44	1
57	Set screw	M4x6	2
58	Ext retaining ring	18 mm	1
59	Ext retaining ring	12 mm	1
60	Gear	CQC280-04-23B	1
61	Hex Socket Cap Screw	M6x16	2
62	End cover	CQC280-04-49	1
63	Oil seal	FB15x24x7	1
64	Bushing	CQC280-04-46	1
65	Shaft	CQC280-04-45	1
66	key	4x10	1
67	Gear	CQC280-04-22	1
68	Steel ball	5 mm	1
69	Compression spring	0.8x4x9	1
70	Set screw	M6x4	1
71	Bushing	CQC280-04-47	1
72	Shifting fork	CQC280-04-63	4
73	Shaft	CQC280-04-48	1
74	Shaft	CQC280-04-50	1
75	Gear	CQC280-04-24	1
76	Bushing	CQC280-04-51	1
77	key	6x20	1
78	Gear	CQC280-04-25B.1	1
79	Washer	CQ290V-05- 07B	1

<b>Parts No.</b>	<b>Description</b>	<b>Specification</b>	<b>Qty</b>
80	Ext retaining ring	12 mm	1
81	Ball oiler	6 mm	1
82	Speed shift fork	CQC280-04-65	3
83	Rocker arm	CQC280-04-74	1
84	Small axis	CQC280-04-62	3
85	Rolling sleeve	CQC280-04-61	3
86	Swing arm support	CQC280-04-75	1
87	Countersunk screw	M5x10	3
88	Swing arm shaft	CQC280-04-76	1
89	Speed shift fork	CQC280-04-66	1
90	Rocker arm	CQC280-04-67	1
91	Set screw	M6x8	1
92	Swing arm shaft	CQC280-04-68	1
93	Variable speed cam	CQC280-04-57	1
94	Hex Socket Cap Screw	M5x8	2
95	Variable speed camshaft	CQC280-04-56	1
96	key	6x18	1
97	O-ring	GB/T1235 60.5x2	1
98	Variable speed positioning seat	CQC280-04-58	1
99	Hex Socket Cap Screw	M6x16	3
100	Speed selection dial	CQC280-04-59C	1
101	Steel ball	6 mm	1
102	Compression spring	0.8x5.5x18	1
103	Set screw	M8x8	1
104	Ext retaining ring	24mm	1
105	Reversing knob	CQC280-04-60B	1
106	Set screw	M6x8	2
107	Feed direction sign	CQC280-04-79	1
108	Rocker arm	CQC280-04-70	1
109	Rocker arm	CQC280-04-64	1
110	Swing arm shaft	CQC280-04-71	2
111	Oil sight glass	Jyg-12 M18x1.5	1
112	Oil plug	G38-4 M16x1.5	1
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# Gearbox Assembly



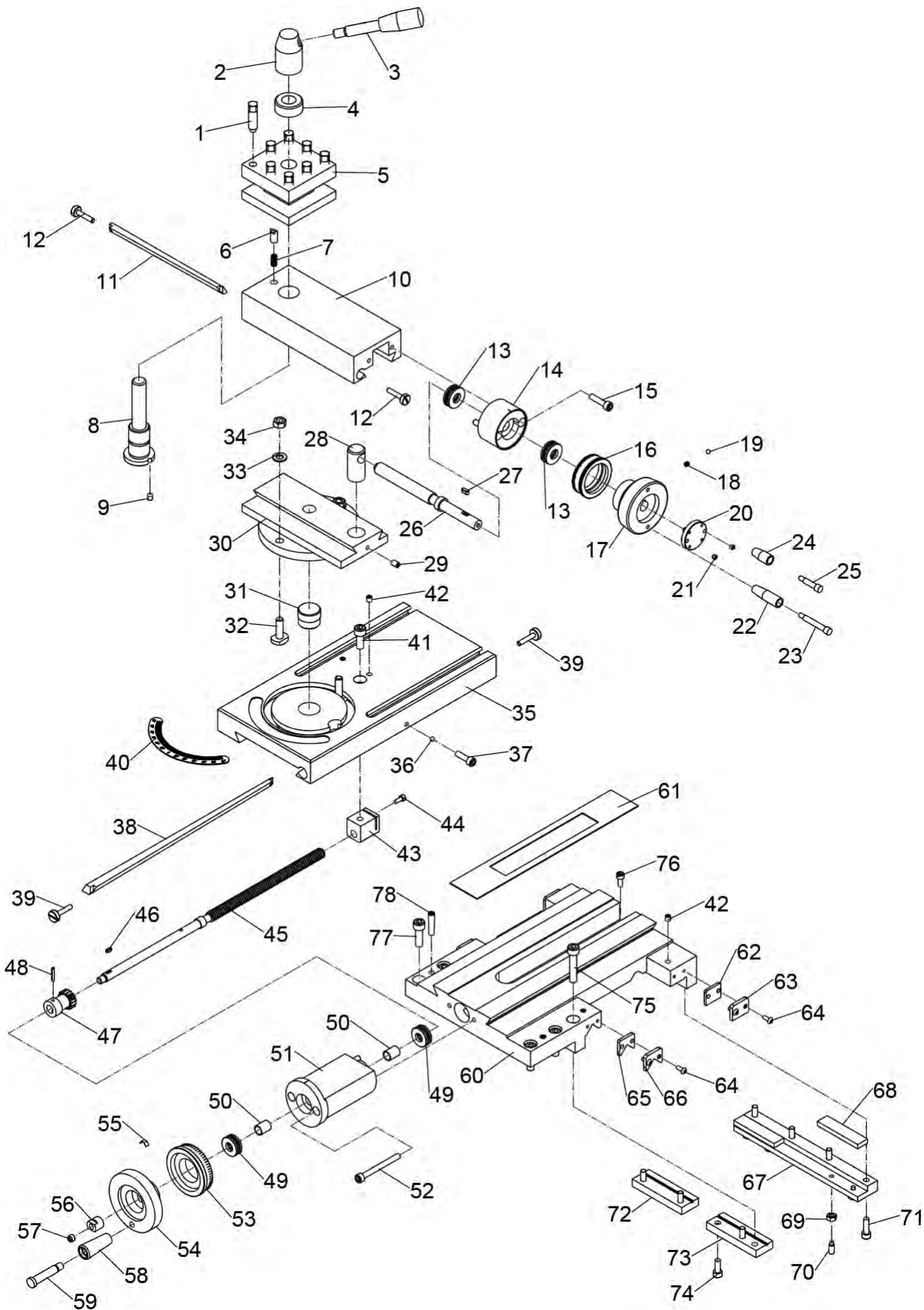
## Gearbox Assembly (I)

Parts No.	Description	Specification	Qty
1	Gearbox	CQC280-05-01	1
2	Gearbox Cover	CQC280-05-33	1
3	Countersunk screw	M4x6	4
4	Ball oiler	6 mm	1
5	Ext retaining ring	12 mm	1
6	Washer	CQ290V-05- 07B	1
7	Spacer sleeve	CQC280-04-52	1
8	Gear	CQC280-05-03B	1
9	Shaft	CQC280-05-04	1
10	Key	6x18	1
11	Key	4x80	1
12	Left flange	CQC280-05-05	1
13	Countersunk screw	M5x10	5
14	O-Ring	GB/T3452.1 22.4x1.8	2
15	Ext retaining ring	12 mm	1
16	Gear	CQC280-05-06	1
17	Gear	CQC280-05-07	1
18	Spacer sleeve	CQC280-05-13	2
19	Gear	CQC280-05-08	1
20	Gear	CQC280-05-09	1
21	Gear	CQC280-05-10	1
22	bushing	CQC280-05-14	1
23	Gear	CQC280-05-11	1
24	Gear	CQC280-05-12	1
25	Output shaft	CQC280-05-15	1
26	Key	4x36	1
27	Thrust bearing	51102	2
28	Right flange	CQC280-05-16	1
29	Hex Socket Cap Screw	M5x16	3
30	Round nut	GB/T810 M14x1.5	2
31	Left cover	CQC280-05-17	2
32	Shaft	CQC280-05-18	1
33	Key	5x80	1
34	Key	4x36	1
35	bushing	CQC280-05-25	1
36	Gear	CQC280-05-19	1
37	Key	5x25	1
38	Gear	CQC280-05-20	1
39	Gear	CQC280-05-21	1
40	Set Screw	M5x6	2

## Gearbox Assembly (II)

Parts No.	Description	Specification	Qty
41	Gear	CQC280-05-22	1
42	Key	4x10	1
43	Gear	CQC280-05-23	1
44	Gear	CQC280-05-24	1
45	Set Screw	M5x6	2
46	O-Ring	GB/T3452.1 22.4x1.8	1
47	Plug	CQC280-05-16	1
48	Speed shift fork	CQC280-05-27	1
49	Rocker arm	CQC280-05-28	2
50	Set Screw	M6x8	2
51	Shaft	CQC280-05-29	1
52	O-Ring	GB/T3452.1 21.2x1.8	2
53	Flange	CQC280-05-30	2
54	Countersunk screw	M4x10	4
55	O-Ring	GB/T3452.1 11.8x1.8	2
56	Ext retaining ring	15 mm	2
57	Shift hub	CQC280-05-31	2
58	Set Screw	M6x10	4
59	Ball	Φ6	2
60	Spring	1x5x30	2
61	Set Screw	M8x10	2
62	Pointer disk	ZX6350-308	2
63	Shift fork	CQC280-05-32	1
64	Hex Socket Cap Screw	M6x75	4
65	Oil plug	G38-4 M16x1.5	1
66	Oil Sight Glass	Jyg-12 M18x1.5	1
67	Oil plug	G38-4 M18x1.5	1
68	Set Screw	M5x6	1
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# Top slide Cross slide , Carriage Assembly



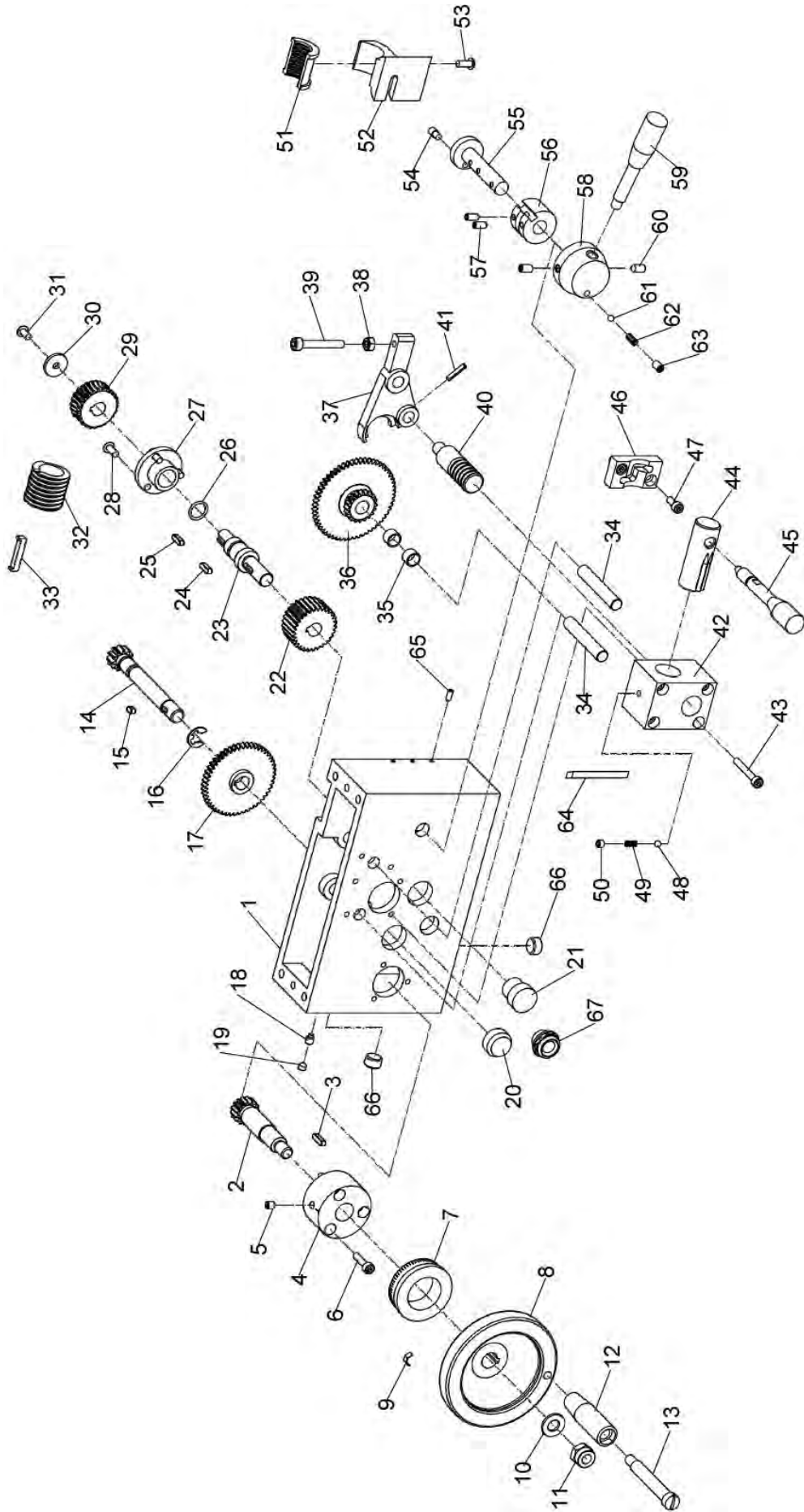
### Top slide Cross slide , Carriage Assembly (I)

Parts No.	Description	Specification	Qty
1	Screw	M8x30	8
2	Handle base	CQ6230-07-20	1
3	Handle lever	CQ6230-07-21	1
4	washer	CQ6230-07-19	1
5	Tool slide	CQ6230-WM290V-23	1
6	Plunger	CQ6230-07-16	1
7	Spring	CQ6230-07-48.1	1
8	Tool post stud	CQ6230-WM290V-18	1
9	Set screw	M6x8	1
10	Compound slide	CQ6230-07-24 (b)	1
11	Gib	CQ6230-07-38	1
12	Gib adjustment screw	M5x35	1
13	Thrust bearing	51101	2
14	Bracket	CQ6230-07-28c	1
15	Hex Socket Cap Screw	M6x20	2
16	Graduated dial	CQ6230C-07-29E	1
17	Handwheel	CQ6230-07-43C	1
18	Spring		1
19	Steel ball	4	1
20	Set screw	CQ6230-07-43C-1	1
21	Set screw	M5x6	2
22	Handle sleeve	CL66132-07-50	1
23	Shoulder screw	CL6132-07-43a	1
24	Handle sleeve	CQ6230-07-51	1
25	Shoulder screw	CQ6230-07-44a	1
26	Compound slide leadscrew	CQ6230-07-25E	1
27	Key	4x10	1
28	Leadscrew nut	CQ6230-07-26E	1
29	Set screw	M6x8	1
30	Rotary sliding seat	CQ6230-WM290V-14	1
31	Rotary shaft	CQ290V-07-35.1	1
32	T-bolt	CQ290V-07-35C.4	2
33	Flat washer	8	2
34	Hex nut	M8	2
35	Cross slide	CQC280-07-11	1
36	Steel ball	5mm	1
37	Hex Socket Cap Screw	M6x20	1
38	Gib	CQ290V-07-35.2	1
39	Gib adjustment screw	CQ290V-07-54	2
40	Angle ruler	CQ290V-07-35.3	1

**Top slide Cross slide , Carriage Assembly (II)**

<b>Parts No.</b>	<b>Description</b>	<b>Specification</b>	<b>Qty</b>
41	Hex Socket Cap Screw	M8x20	1
42	Oil ball	6	6
43	Cross slide leadscrew nut	CQC280-07-15	1
44	Hex Socket Cap Screw	M4x10	1
45	Cross slide leadscrew	CQC280-07-14	1
46	Key	3x8	1
47	Gear	CQC280-07-13	1
48	Roll Pin	3x18	1
49	Thrust bearing	51100	2
50	Bushing	SF-1-1015	2
51	Cross slide leadscrew bracket	CQC280-07-12	1
52	Hex Socket Cap Screw	M6x60	2
53	Graduated dial	CQC280-07-16	1
54	Handlewheel	CQ6123-07-38	1
55	Spring plate	CQ6123-07-37	1
56	Handwheel retaining nut	CQ6123-07-22	1
57	Set screw	M8x6	1
58	Handwheel handle	CQ6123-07-40	1
59	Handle step screw	CQ6123-07-39	1
60	Saddle	CQC280-07-01	1
61	Chip guard	CQC280-07-10	1
62	Straight way wiper	CQC280-07-06	1
63	Straight wiper clamp	CQC280-07-08	1
64	Hexagon socket pan head screws	M4x10	8
65	Notched way wiper	CQC280-07-07	2
66	Notched wiper clamp	CQC280-07-09	2
67	Back clamp plate	CQC280-07-02	1
68	saddle gib	CQC280-07-03	2
69	Hex nut	M6	4
70	Set screw	M6x16	4
71	Hex Socket Cap Screw	M6x20	4
72	Front left clamp plate	CQC280-07-04	1
73	Front right clamp plate	CQC280-07-05	1
74	Hex Socket Cap Screw	M6x16	4
75	Hex Socket Cap Screw	M8x40	1
76	Hex Socket Cap Screw	M5x12	1
77	Hex Socket Cap Screw	M8x25	4
78	Dowel pin	6x30	2
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# Apron Assembly



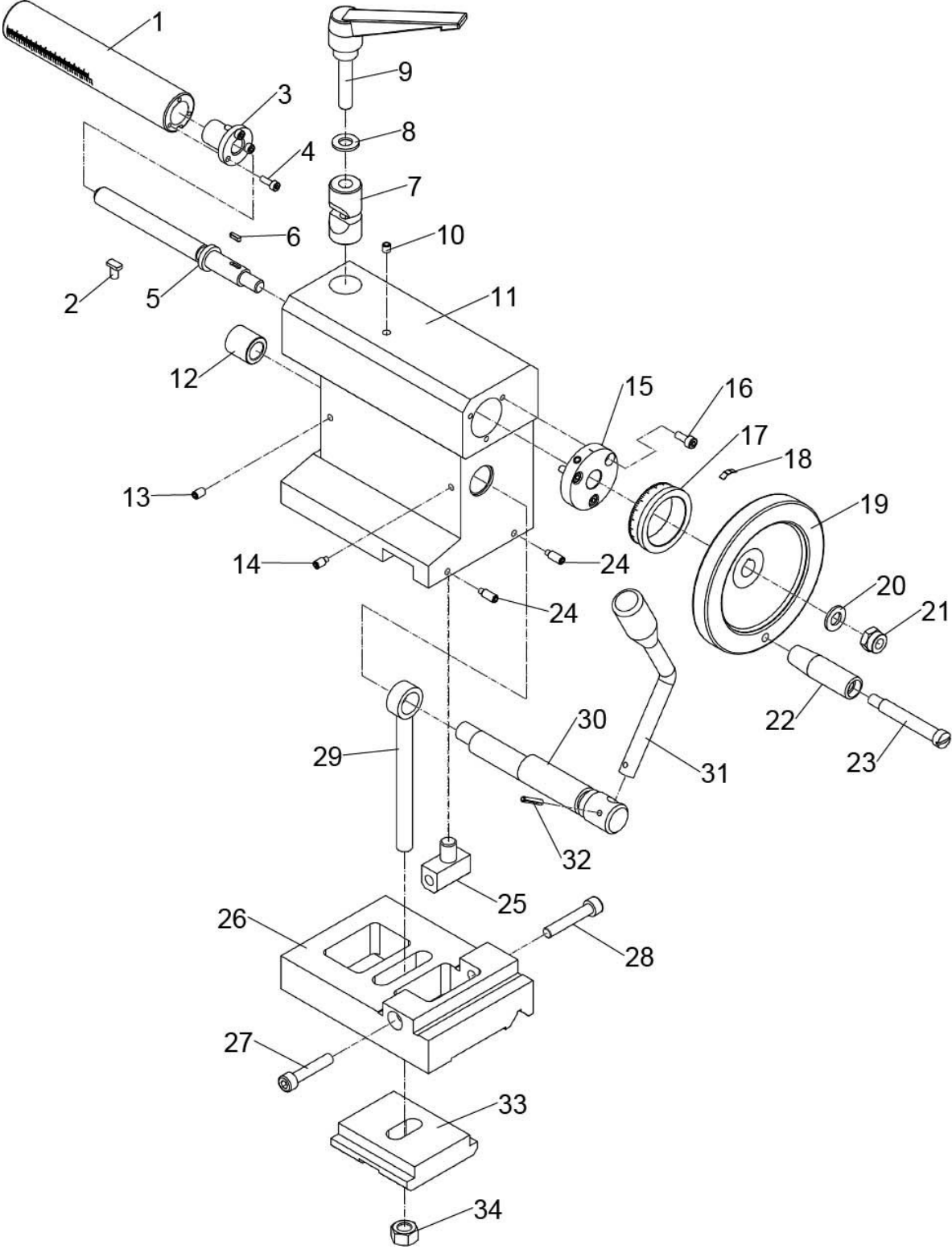
## Apron Assembly (I)

Parts No.	Description	Specification	Qty
1	Apron casting	CQC280-06-01	1
2	Gear Shaft	CQC280-06-05	1
3	Key	4x14	1
4	Bracket	CQC280-06-04	1
5	Oil ball	6mm	1
6	Hex Socket Cap Screw	M5x20	3
7	Graduated dial	CQC280-06-03	1
8	Handwheel	CQC280-06-02	1
9	Spring plate	CQ6123-07-37	1
10	washer	10mm	1
11	Hex nut	M10	1
12	Handwheel handle	ZX30-01-10	1
13	Handle step screw	ZX30-01-09	1
14	Gear Shaft	CQC280-06-07	1
15	Key	4x8	1
16	Snap Ring	GB896 9mm	1
17	Gear	CQC280-06-06	1
18	Set screws with cylindrical end	M6x6	1
19	Set Screw	M6x6	1
20	Plug	CQC280-06-08	1
21	Plug	CQC280-06-11	1
22	Gear	CQC280-06-12	2
23	Shaft	CQC280-06-13	1
24	Key	4x14	1
25	Key	4x14	1
26	O-Ring	GB/T3452.1 13.2x1.8	1
27	flange	CQC280-06-14	1
28	Hexagon socket pan head screws	M5x12	3
29	Worm gear	CQC280-06-15	1
30	Washer	CQC280-06-30	1
31	Hexagon socket pan head screws	M5x8	1
32	Worm	CQC280-06-16	1
33	Worm key	CQC280-06-17	1
34	Shaft	CQC280-06-10	2
35	Bushing	SF-1-1008	2
36	Gear	CQC280-06-09	1
37	Shifting fork	CQC280-06-22	1
38	Hex nut	M6	1
39	Hex Socket Cap Screw	M6x40	1
40	Gear shaft	CQC280-06-20	1

## Apron Assembly (II)

Parts No.	Description	Specification	Qty
41	Pin	Φ4x18	1
42	Feed control seat	CQC280-06-18	1
43	Hex Socket Cap Screw	M5x35	4
44	Gear shaft	CQC280-06-19	1
45	Handle	CQC280-06-23	1
46	Guide block	CQC280-06-21	1
47	Hex Socket Cap Screw	M5x12	2
48	Ball	Φ5	1
49	Spring	0.7x4x10	1
50	Set Screw	M6x5	1
51	Half Nut	CQC280-06-29	1
52	Opening and closing nut seat	CQC280-06-28	1
53	Hexagon socket pan head screws	M5x12	1
54	Pin	CQC280-06-26	1
55	Cam Shaft	CQC280-06-25	1
56	Interlocking sheaves	CQC280-06-27	1
57	Set Screw	M5x12	2
58	Handle Base	CQC280-06-24	1
59	Handle	CQC280-04-77	1
60	Set Screw	M6x10	2
61	Ball	Φ5	1
62	Spring	0.7x4x16	1
63	Set Screw	M6x8	1
64	Opening and closing nut seat gib	CQC280-06-31	1
65	Set Screw	M4x10	3
66	Oil Drain Plug	ZG1/4"	2
67	Oil Sight Glass	M18x1.5	1
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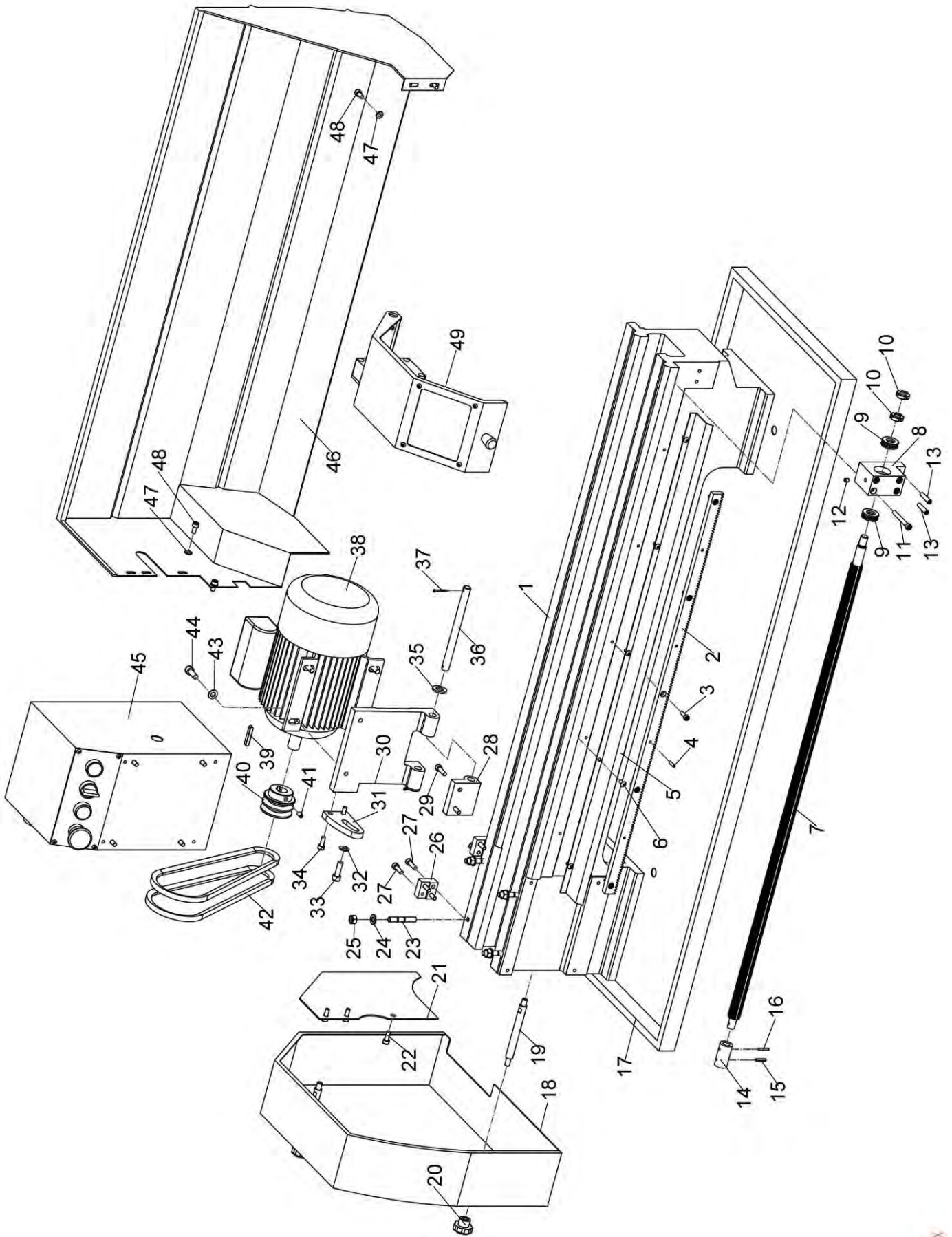
Tailstock Assembly



## Tailstock Assembly

Parts No.	Description	Specification	Qty
1	Tailstock quill	CQ290V-08-14	1
2	Key	CQ290V-08-12	1
3	Nut	CQ290V-08-15	1
4	Hex Socket Cap Screw	M4x12	3
5	Lead Screw	CQ6132-08-16	1
6	Key	3x10	1
7	Pivot Block	CQ6132V-08-09	1
8	Washer	Φ10	1
9	Adjustment handle	M10-95x50	1
10	Oil Ball	Φ6	2
11	Tailstock body	CQC280-08-01	1
12	Collar	CQ6132V-08-06	1
13	Set Screw	M6x10	1
14	Limit Screw	M6x10	1
15	Flange Cover	CQ290V-08-17	1
16	Hex Socket Cap Screw	M5x12	3
17	Graduated Dial	CQ290V-08-19	1
18	Spring	CQ6123-07-37	1
19	Handwheel	CQ290V-08-18	1
20	Washer	Φ8	1
21	Nut	M8	1
22	Knob	ZX30-01-10	1
23	Screw	ZX30-01-09	1
24	Set Screw	M6x16	2
25	Adjust the block	CQ6132V-08-03	1
26	Base	CQC280-08-02	1
27	Hex Socket Cap Screw	M8x40	2
28	Hex Socket Cap Screw	M8x45	1
29	Lock screw	CQC280-08-07	1
30	Lock shaft	CQ6132V-08-04	1
31	Handle	CQ6132V-08-05	1
32	Pin	Φ4x24	1
33	Clamping Plate	CQ290V-08-08	1
34	Hex nut	M12	1
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# Bed Assembly

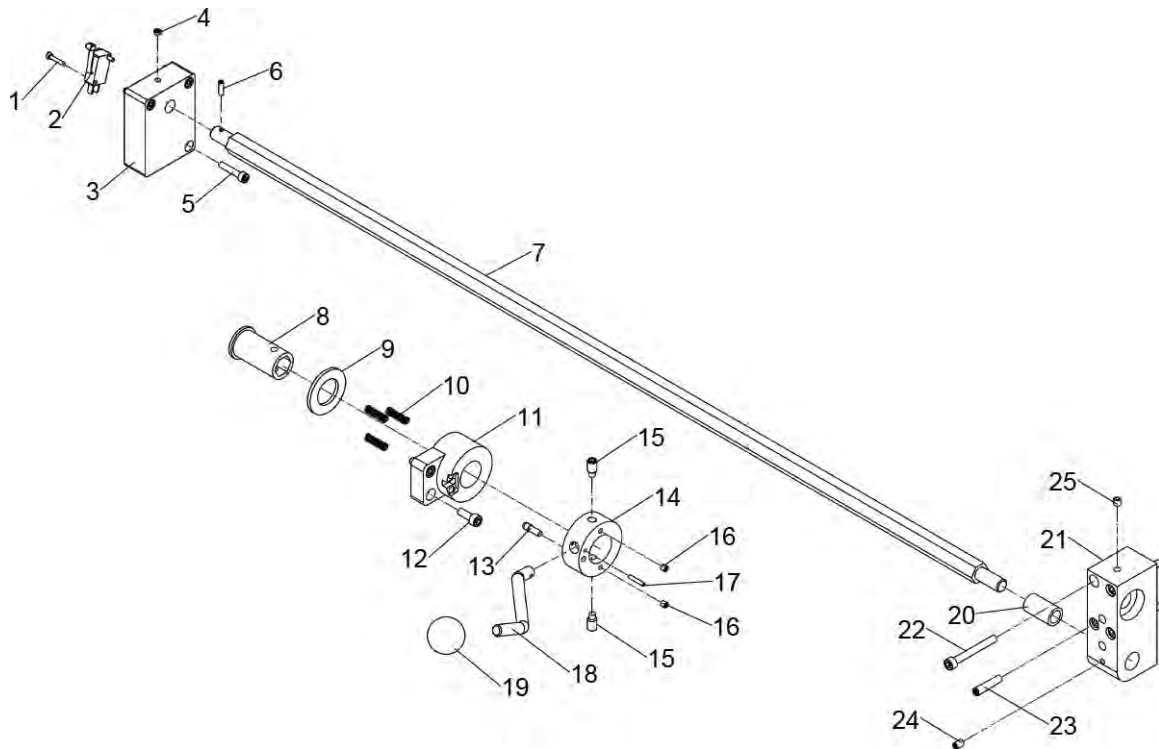


## Bed Assembly

Parts No.	Description	Specification	Qty
1	Lathe bed	CQC280-01-01	1
2	Rack gear	CQC280-01-03	1
3	Hex Socket Cap Screw	M5x16	5
4	Spring pin	Φ4x16	4
5	Lead screw guard	CQC280-13-10	1
6	Cross recessed head screws	M5x10	5
7	Lead screw	CQC280-01-02	1
8	Bracket	CQC280-01-04	1
9	Bearing	51102	2
10	Round nut	M12x1.25	2
11	Hex Socket Cap Screw	M6x50	4
12	Oil Ball	Φ6	1
13	Taper pin	Φ6x30	2
14	Lead screw collar	CQC280-01-05	1
15	Spring pin	Φ4x20	1
16	Brass shear pin	Φ3x20	1
17	Chip pan	CQC280-13-22	1
18	Change gear cover	CQC280-13-02	1
19	Bolt	CQC280-13-04	2
20	Star handle	BM8x32	2
21	Protective cover bottom plate	CQC280-13-03	1
22	Hex Socket Cap Screw	M6x12	3
23	Bolt	M8x45	4
24	Washer	Φ8	4
25	Hex nut	M8	4
26	Limit block	CQC280-01-10	2
27	Hex Socket Cap Screw	M6x20	8
28	Motor base support	CQC280-01-08	1
29	Hex Socket Cap Screw	M6x20	2
30	motor mount	CQC280-01-06	1
31	Fixed motor mount	CQC280-01-07	1
32	Washer	Φ8	1
33	Hex Socket Cap Screw	M8x30	1
34	Hex Socket Cap Screw	M6x20	2
35	Washer	Φ12	2
36	Cylindrical pin	CQC280-01-09	1
37	Split pin	2.5x25	2
38	Motor		1
39	Key	6x36	1
40	Motor pulley	CQ320GV-04-28	1

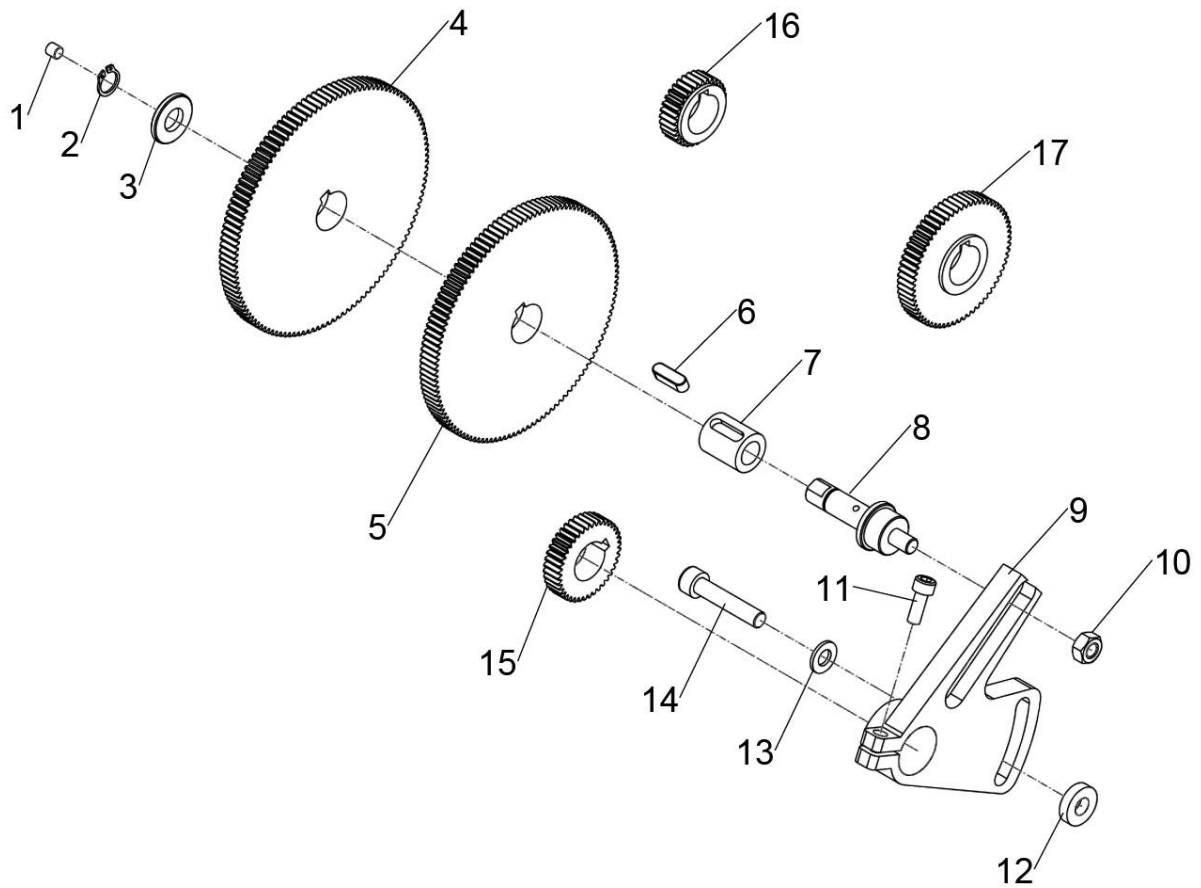
<b>Parts No.</b>	<b>Description</b>	<b>Specification</b>	<b>Qty</b>
41	Set screw	M6x12	1
42	V-Belt	Gates-XPZ710	2
43	Washer	Φ12	4
44	Hex Socket Cap Screw	M8x25	4
45	Electrical cabinet	CQC280-13-05	1
46	Splash guard	CQC280-13-01	1
47	Washer	Φ6	6
48	Hex Socket Cap Screw	M6x12	6
49	Chuck cover	CQC280-13-11	1
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## Reversing Maneuver



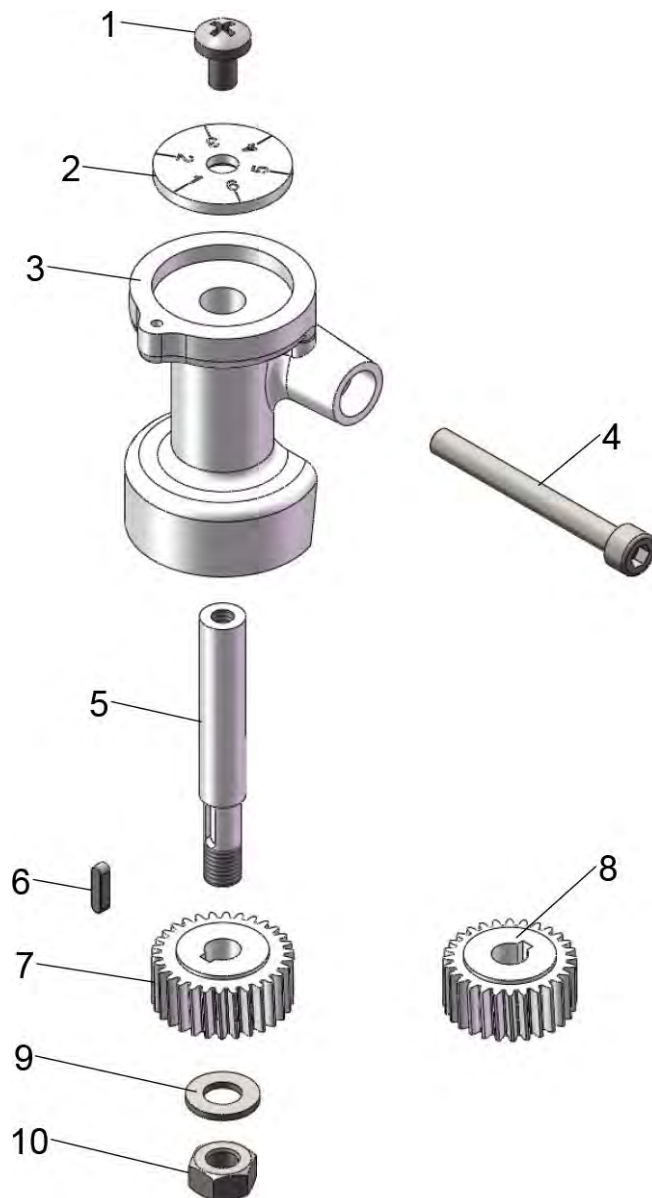
Parts No.	Description	Specification	Qty
1	Hex Socket Cap Screw	M3x16	4
2	Micro Switch	0V-156-1C25	2
3	Switch box	CQC280-01-17	1
4	Set Screw	M6x5	3
5	Hex Socket Cap Screw	M5x25	3
6	Threaded cylindrical pin	4x14	1
7	Hexagon joystick	CQC280-01-15	1
8	Shaft sleeve	CQC280-01-21	1
9	Washer	CQC280-01-20	1
10	Spring	CQC280-01-19	3
11	Switch bracket	CQC280-01-18	1
12	Hex Socket Cap Screw	M6x16	2
13	Pin	CQC280-01-23	1
14	Bracket	CQC280-01-22	1
15	Set Screw	M8x16	2
16	Set Screw	M5x6	2
17	Spring Pin	3x18	1
18	Lever	CQC280-01-24	1
19	Handle ball	AM10x32	1
20	Bushing	CQC280-01-16	1
21	Bracket	CQC280-01-04B	1
22	Hex Socket Cap Screw	M6x50	4
23	Taper pin	Φ6x30	2
24	Set Screw	M6x10	1
25	Oil Ball	Φ6	1

## Change Gear Assembly



Parts No.	Description	Specification	Qty
1	Oil ball	6mm	1
2	Ext retaining ring	12mm	1
3	Washer	CQ290V-05- 07B	1
4	Gear	CQC280-04-27B	1
5	Gear	CQC280-04-26B	1
6	Key	6x20	1
7	Bushing	CQC280-04-51	1
8	Shaft	CQC280-05-34	1
9	Swing frame	CQC280-05-35	1
10	Hex nut	M8	1
11	Hex Socket Cap Screw	M6x16	1
12	Spacer sleeve	CQC280-05-36	1
13	Washer	8mm	1
14	Hex Socket Cap Screw	M8x30	1
15	Gear	CQC280-05-03B	1
16	Gear	CQC280-04-25B.1	1
17	Gear	CQC280-04-25B.2	1
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## Thread Chasing Dial



Parts No.	Description	Specification	Qty
1	Screw	GB818-85 M6x10	1
2	Thread chasing dial	CQ6125-06-06	1
3	Clasp seat	CQ6123-06-14	1
4	Hex Socket Cap Screw	GB70-85 M8x45	1
5	Shaft	CQ6123-06-12	1
6	Key	GB1096-79 3x12	1
7	Gear	CQC280-06-49	1
8	Gear	CQ290V-06-49B	1
9	Washer	GB97.1-85 8	1
10	Nut	GB6170-86 M8	1
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# HL11 Lathe

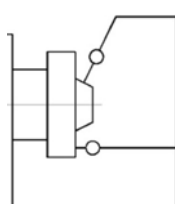
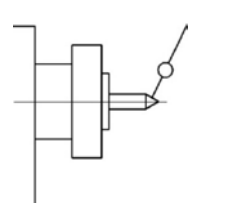
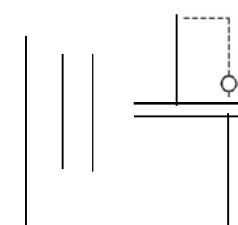
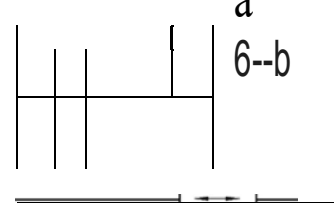
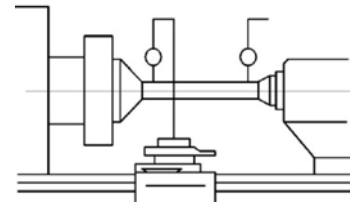
<b>I. Visual Inspection</b>   <b>OK</b>	<b>IV. Electrical Inspection</b>   <b>OK</b>
1. Correct label <input type="checkbox"/> 2. Painting damage <input type="checkbox"/> 3. Corrosion damage <input type="checkbox"/> 4. Screw tightened <input type="checkbox"/>	1. Connection tightened <input type="checkbox"/> 2. Correct electrical elements <input type="checkbox"/> 3. Earth resistance <input type="checkbox"/> 4. Insulation resistance <input type="checkbox"/>
<b>II. Mechanical Inspection</b>   <b>OK</b>	5. Tolerance voltage test <input type="checkbox"/> 6. Function of F/R switch <input type="checkbox"/> 7. Emergency stop switch <input type="checkbox"/> 8. Spindle safety cover <input type="checkbox"/> 9. Function of motor <input type="checkbox"/>
1. Function of top slide <input type="checkbox"/> 2. Function of cross slide <input type="checkbox"/> 3. Function of carriage <input type="checkbox"/> 4. Function of tailstock <input type="checkbox"/> 5. Lubrication for sliding parts <input type="checkbox"/> 6. Parallelism of pulleys <input type="checkbox"/> 7. Spindle adjustment <input type="checkbox"/>	<b>V. Final Inspection</b>   <b>OK</b>
<b>III. Active Inspection</b>   <b>OK</b>	1. Correct accessories <input type="checkbox"/> 2. Correct documents <input type="checkbox"/> 3. Machine cleanness <input type="checkbox"/> 4. Credibility antirust <input type="checkbox"/> 5. Correct mark <input type="checkbox"/>
<b>Remark:</b>	

# Test Record

## HL11 Lathe

Serial No.	<input type="text"/>
Date	<input type="text"/>
Inspector	<input type="text"/>

# HL11 Lathe

NO.	INSPECTION ITEM	DIAGRAM	TOLERANCE mm	
			PERMISSIBL E	ACTUAL
1	Runout of spindle a radial plane b face plane	 a 6-b	a 0.015 b 0.015	a b
2	Runout of center		0.03	
3	Runout of spindle taper hole a spindle nose b 250 distance		a 0.015 b 0.04	a b
4	Parallelism of center line of spindle to carriage movement a in horizontal plane b in vertical plane	 a 6--b	a 0.04/250 b 0.04/250	a b
5	Difference between two centers (higher at tailstock)		0.03-0.06	

# HL11 Lathe

NO.	INSPECTION ITEM	DIAGRAM	TOLERANCE mm	
			PERMISSIBL E	ACTUAL
6	Parallelism of tailstock quill to carriage movement a in horizontal plane b in vertical plane		a 0.025/50 b 0.025/50	a b
7	Parallelism of tailstock quill taper hole to carriage movement a in horizontal plane b in vertical plane		a 0.03/50 b 0.03/50	a b
8	Parallelism of center line of spindle to top slide movement		0.04/50	
9	Radial runout of chuck		0.05	
10	Radial runout of $\phi 20$ test bar		0.08/50	