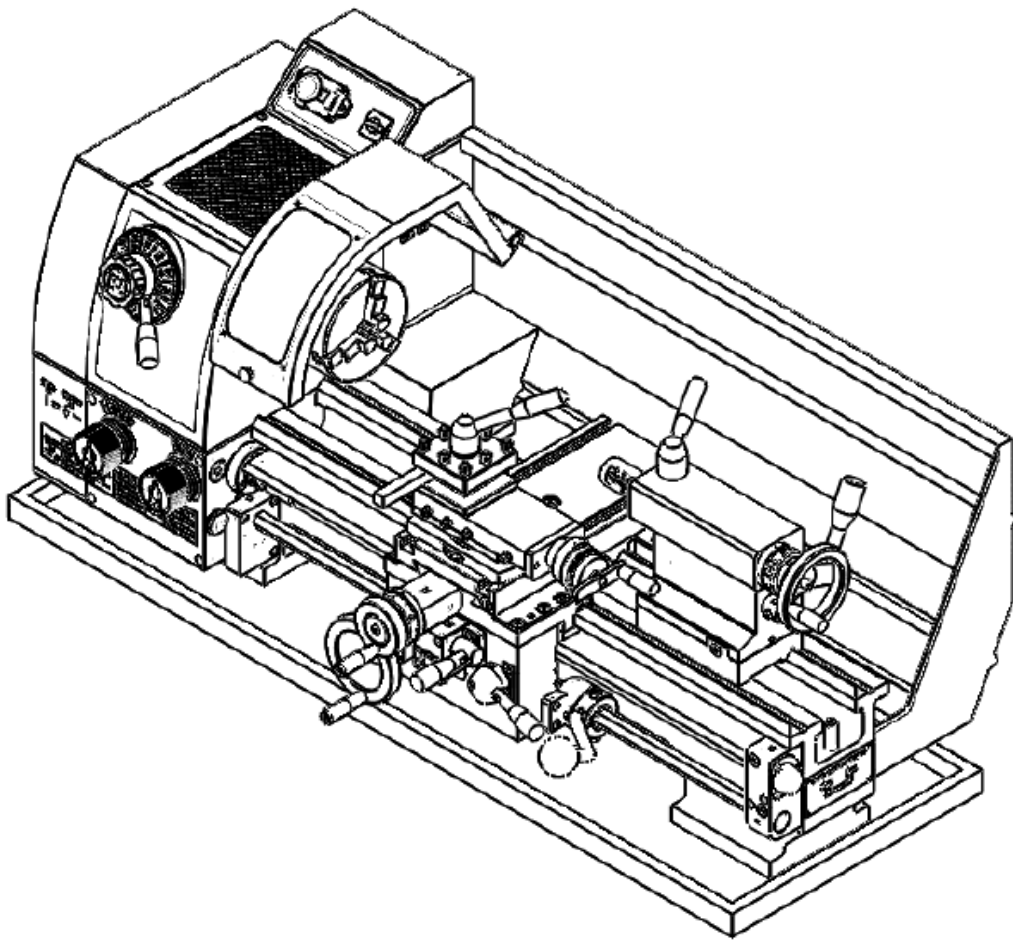


Operating manual



Foreword

Thank you for your purchasing the product manufactured in this company.

This machine tool meets the requirements specified in the standards GB15760-1995 General Technical Specifications for Metal Cutting Machine Tool Safety and Protection and Specifications for Equipment Used in Special-purpose Classrooms of General Techniques in Ordinary High Schools.

This Operation Instructions contains the information and tips necessary for proper and safe operation of the machine tool.

There may be differences in some details between the lathe that you have purchased and the photos contained in this Operation Instructions, which, however, does not affect the operation of the machine tool. We reserve the right to make further technical improvement and development of the machine tool design and its accessories.

For any consequences resulted from your misunderstanding in reading the Operation Instructions, this company shall not assume any responsibility.

Name	Content of Item
Ambient temperature for machine tool working	5°C~+40°C (During Running) -25°C~+55°C (During storage or transportation)
Optimal ambient temperature for machine tool service	20°C
Ambient humidity for machine tool	≤75%RH (No condensed water) Not higher than 50%RH at +40°C
Storage temperature	-20°C~70°C (-4°F~158°F)
Air source requirement	0.5~0.7Mpa
Height above sea level	≤1000 m

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Machine Tool Specifications and Parameters

Operating Parameters

Max swing of workpiece over bed[mm]	280
Max swing of workpiece over slide [mm]	160
Spindle center height [mm]	140
Central distance between two centres [mm]	600
Width of bed[mm]	150
Max lateral travel of medium carriage[mm]	130
Max longitudinal travel of small carriage[mm]	65

Spindle Parameters

Spindle through-hole diameter [mm]	26
Taper of spindle bore	MT4
Spindle speed range [rpm]	Low speed 45
	High speed 2000
Chuck Specifications	125

Tailstock Parameters

Tailstock stroke [mm]	60
Taper of tailstock bore	MT2
Outside diameter of tailstock sleeve [mm]	30

Electric

Switch	Forward turning/Reverse turning
Switching voltage [V]	240V
Power cord length [m]	1.2
Motor power [w]	850
Motor voltage [V]	240V

Product Size

Net/gross weight [kg]	225/255
Packing case length / width / height[cm]	1350*614*647
Motor type	Ordinary brush motor

Safety

2.1 Safe Operation Guide

This machine tool is a high speed and powerful cutting machine tool, which, if used improperly, will lead to danger occurred.

Operators are requested to read the Safe Operation Guide described below before operating the machine tool and care should be taken to observe and maintain the lathe in a normal use environment in the subsequent use, so as to avoid any danger from occurring.

Important -- Only those professional persons who have been subject to the operating manual and the machine tool safe operation training can operate the machine tool.


Be sure to read the Safe Operation Guide carefully described below before operating the machine tool:

1. Keep the machine tool and the working area clean and orderly.
2. All the protective devices and the cover plates shall be in place and the side covers shall be closed.
3. Do be careful not to place any objects within the machining area, as there may be collisions occurred of them with the rotating parts or moving parts of the machine tool.
4. Do not touch or step across the moving or rotating parts of the machine tool.
5. Before starting up the machine tool, it must be known how to shutdown the machine tool.
6. Do not operate the machine under the overload.
7. In case of any unforeseen circumstances occurred, the operation of the machine tool should be stopped immediately.
8. Before installing a chuck or other accessories on the spindle, the power of the machine tool should be cut off, so as to prevent the spindle from rotation.
9. In the absence of checks and assertions of whether your fixtures are compatible with the machine tool or not, your fixtures shall not be installed.
10. Check the load capacity of the centers used to find out whether they can meet the requirements.
11. When leaving the machine, be sure to switch off the power of the machine tool.
12. The maximum weight of the workpiece on the machine tool shall be 40kg.
13. The chuck shall be correctly and securely mounted on the spindle of the machine tool.
14. Care should be taken to ensure that the workpiece shall be clamped firmly and the spindle speed should not exceed the safe speed of the chuck.



15. As there may be contact with the human body, especially when using materials of small diameters, under no circumstances the bar materials extending beyond the end of the spindle of the headstock that has no special protection or corresponding support shall be used.
16. There is a marking of speed limit for the chuck and no shift of speed during running posted on the lower right corner of the headstock, an electric warning sign posted on the electrical cabinet and a warning sign of no touch on the workpiece (or chuck) with hand is allowed when the workpiece is rotating posted on the protective cover of the chuck in this machine tool, so as to remind you take care during your operation.
17. The Emergency Stop button is a red button on the control panel and, when it is presses down, the motor will stop its rotation immediately, which shall be used in an emergency situation to prevent the machine tool from collision.
18. Do not process toxic or flammable materials, which will emit deadly fumes. Before processing, consult your material suppliers, so as to obtain safe materials.
19. Do not carry out be the maintenance on the machine tool when it is charged. Check the control components and the operating elements of the machine tool regularly, so as to ensure that the machine tool works normally. When carrying out an overhaul of the machine tool, qualified parts & components shall be used for replacement.
20. Do not carry out any modifications or change of the equipment presumptuously, which, if necessary, shall be treated by this company. Any personal injury or mechanical damage to the machine tool caused by any modification or change shall not be within the scope of the responsibility of this company.
21. Keep children far away from the machine tool.

2.2 Safety Warnings and Description of Notes and Markings

This manual contains safety and prevention measures to protect the users and prevent the machine tool from being damaged, which, according to their nature of safety, is classified into warning, notice and additional information as notes or description. Please read the warning, notice and notes carefully before operating the machine tool.

Warning		There may be injury to the customers or damage to the equipment, if the operation methods or procedures designated are not observed.
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Notice		There may be damage to the equipment, if the operation methods or procedures designated are not observed.
Note		Notes are used to point out the additional information besides the warnings and notices.

Directed at specific hazard, these are replaced by the symbols as follows.



General Danger



With Warning



Possible hand injury



Dangerous Voltage

或



or Rotating Part

Other symbols:



No Touch



Prohibit to Wear Gloves



Pay Attention to Safety



Beware of Injury by Machinery



Beware of Hand Injury.



Beware of Foot Injury by Nails.



Must Wear Helmet.



Protect the environment.

2.3 Danger in Operation



2.3.1 Safe Operation of Lathe Chuck

- There must be an obvious marking of the highest safe rotation speed posted on all the workpiece clamping devices and the spindle rotation speed shall never exceed this rotation speed. It must be pointed that the highest safe rotation speed marked is generally assumed to be a speed under the ideal working conditions. In the following cases, lower spindle rotation speeds shall be selected for use.
 - a. Use the chuck to clamp the workpiece under noisy working conditions.
 - b. If there is an exact damage in the chuck, it is dangerous to rotate under the high rotation speed, especially when a chuck of grey cast iron matrix is used, there may be a crack caused in the damaged point.
 - c. The clamping force required is not known before clamping.
 - d. All of these factors, such as the strength of the workpiece to be clamped, the clamping surface and the balance of the workpiece shall have a larger impact on the highest safe rotation speed that can be used.

- When the workpiece is rotating, it can not be clamped tightly possibly because of the impact of the centrifugal force, which contains the following elements:



- a. The rotation speed used is too high.
 - b. The weight and type of the jaws used are not standard ones.
 - c. The working radius of the jaws is not right.
 - d. The lubrication conditions of the jaws are poor.
 - e. Poor balance status.
 - f. The clamping force used has not taken the dynamic factor into consideration.
 - g. The cutting force is too large
 - h. Whether the workpiece is clamped internally or externally.
- These factors must be carefully noted. As these factors have different effects due to their different uses, therefore, the manufacturer is impossible to provide specific parameters for general use, because these factors are beyond the range of the control of a machine tool manufacturer.



2.3.2 General Rules of Safety for Lathe Operators

1. When clamping the workpiece, the workpiece shall be free of oil or grease. Each component should be securely fastened. Do not attempt to clamp any workpiece that is extremely unfit or very difficult for clamping. Do not clamp the workpiece, which exceeds the weight allowed for the machine tool. When lifting the workpiece, Proper method of hanging and



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holding should be grasped.

2. Ensure that the oil or grease on the hand tools or operating handles shall be cleared off.

Ensure that the structure of the hand tools and operating handles used shall be suitable for safe holding by the hands.

3. When operating, the hand tools and operating handles should be gripped firmly and their appropriate gripping positions should be selected properly. Do not grab improper gripping positions of the hand tools and operating handles for operation. Do not use too much force in operation.

4. The gripping positions recommended for use shall be used to grip the hand tools and operating handles.

5. It is not allowed to leave other hand tools and operating handles behind on the chuck.

6. It is not allowed to use any broken, damaged or defective tools.

7. Ensure that the workpiece shall be clamped securely on the chuck or other gripping fixtures.

8. Special attention shall be paid to the irregular workpieces.



9. Care shall be taken to the large flashes and burrs on the workpieces.

10. Always pay attention to the correct selection of tools at work.

11. It is not allowed to have any other hand tools and operating handles that have not been fixed on the chuck.

12. It is not allowed to use tools without handles.

13. When necessary, always use the chuck, the follower rest and the centres to support the workpiece.

14. The positions of the tools in the hexagonal hole and the screwdriver slot should be correct.

15. Care should be taken to ensure that the locking screw must be tightened.

16. When the preparatory work has not been finished, do not hurry up for operation.

17. Without the right tools, or not equipped with the right tools in the workshop, do not use alternative tools.

18. When the lathe is in its energized state, it is not allowed to remove the protective plate or to open the door.

19. There shall be no hands or bodies moving within the working area of the moving parts. Attention should be paid that there may be machine parts dropping. Pay attention that, when moving the hands and bodies, keep a relative position of them with the lathe. Pay attention to the tool gripped in your hand or the other part that has been inserted into the chuck or the workpiece. Pay attention that do not place your hand or the other

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part of your body on a position, where your hand or the other part of your body may get hurt by the chuck or the workpiece.

20. Care should be taken not to cause an accident due to toggle the handle, to manipulate the clutch or to switch on the power. #

21. Master each function and various methods of operation. #

22. Never put your hand on the chuck or the workpiece to stop the rotation of the spindle. #

23. For the lathe driven through the clutch, when the clutch is in the disengaged state, the spindle should stop its rotation, or otherwise the clutch or the brake device should be adjusted. #

24. When the machine tool is not used, ensure that the power of the machine tool should be switched off. #

25. Before changing a new workpiece, it is necessary to stop the rotation of the chuck. #

26. Attention should be always paid to check the transmission of such transmission parts as the chuck and the belt pulley to find out whether it is loose. #

27. When the chuck wrench is in the chuck, do not start the spindle. #

28. When not able to focus on your work, do not operate the machine tool, so as to prevent from any accident. #

29. When making preparations to carry out other aspects of the operation of the machine tool, such as the tailstock, be careful that there shall be no such dangers as collision or falling off occurred.

30. Care should be taken that the chuck shield and other protective covers of the machine tool should be tight without looseness

31. Those keeping long hair should put on a helmet, when operating the machine tool, so as to prevent the danger of the hair from being rolled into the rotating part of the machine tool.

32. When carrying out other operations close to the rotating part of the machine tool, special attention should be paid to safety.

33. Attention should be always paid to the operations of filing it smooth and deburring. Special attention should be paid, when the file and the deburring tool get close to the chuck, as the file and the deburring tool may collide with the chuck.

34. For the machine tool, in which the clutch is used for driving, when carrying out the measuring work, pay attention that the clutch should be in the shutdown position.

35. When putting your hand on the clutch handle, attention should be paid to the rotation and the shutdown positions of the spindle.

36. When measuring the workpiece clamped in the chuck, ensure that the spindle of the machine tool should be in its shutdown position.

37. When using a measuring meter on the machine tool, ensure that the motor of the

machine tool should be in its shutdown position.

38. Before carrying out the operation of the machine tool, the operator should put on the protective articles that meet the requirements specified in the safety standards and during the operation of the machine tool, the protective articles are not allowed to be put off for even a short lapse of time. The protective articles should be worn properly.

39. Care should be taken to the cutting chips flying out from the machine tool.

40. An appropriate protective plate should be selected for the operation position.

41. When the chuck or the workpiece is in motion, be sure not to step across or bypass the chuck or the workpiece to carry out the adjustment. Be sure not to step across or bypass the chuck or the workpiece to take things. While adjusting the machine tool or the workpiece, pay attention to the position where the workpiece is placed. Be sure not to step across or bypass the chuck or the workpiece to move the tool/lathe to another location. Be sure not to step across or bypass the chuck or the workpiece to tighten up the parts on the lathe. Be sure not to step across or bypass the chuck or the workpiece to remove the iron chips.

42. Be sure to master an appropriate method of loading and not to apply force from an inappropriate position.

43. Be sure not to install a workpiece that is too big or too heavy for the machine tool.

44. Be sure not to install a workpiece that is too big or too heavy for the operator.

45. Use the necessary tools to process the workpieces.

46. Be sure not to use excessive force on the accessory or the joystick.

47. Pay attention to clamp the workpiece securely.

48. Tighten all the jaws, nuts, screws and fasteners.

49. Always pay attention to use the correct equipment.

50. Be sure not to carry out any cutting that exceeds the capacity of the machine tool.

51. When polishing and deburring, do not be too hard.

52. Always pay attention to use the proper tools for deburring, do not be in a hurry, when deburring and pay attention to the burrs on the chuck and the workpiece.

53. Before changing and replacing the gear, the power must be cut off, so that all the motion in the machine tool is stopped.

54. Pay attention to find out whether there is any part of the chuck/machine tool in operation possible to fall off.

2.3.3 Chuck Protection

The machine tool is equipped with the chuck protection, suitable for the conventional standard chuck of the machine tool.

For the machine tool equipped with the chuck protection, before the spindle of the machine tool is put into running, the chuck protection must be in an enclosed state.



1. If the machine tool is equipped with a larger chuck, a chuck protection suitable for the chuck diameter shall be used instead. ◦

It is recommended that the jaws should not be extended beyond the outside diameter of the chuck, so as to prevent the jaws from collision with the chuck. For the sake of safe operation, always be careful not to let the jaws extended beyond the outside diameter of the chuck.

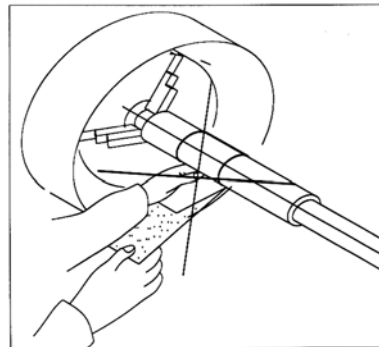
2. When a plane chuck is used in the machine tool, the chuck protection must be removed. If the user requires the plane chuck indeed, a chuck protection for the special circumstances shall be provided. For this case, it shall be determined specifically only on the premise that a plane chuck is used and the user shall be responsible for each condition.

2.3.4 Danger of Accident Resulted from Using Emery Cloth in Metal

Processing

In all the incidents occurred in the lathe, a great part of them results from using emery cloth and leading to fingers broken and even amputation in rare cases.

When various shapes of the workpieces are rotating in the lathe, if emery cloth is used for deburring, polishing or machining to size, when both ends of emery cloth are taken in the hands respectively and wrapped around the pieces to be polished, such an accident is possible to occur. If the emery cloth strip is wrapped around the finger or when carrying out coarse polishing, once bitten firmly, it is prone to an serious injury.



Preventive Measures

The users should have a certain understanding and knowledge of the necessity to use emery cloth for processing the parts in the machine tool.

In the following cases, it is necessary to use emery cloth for operation:

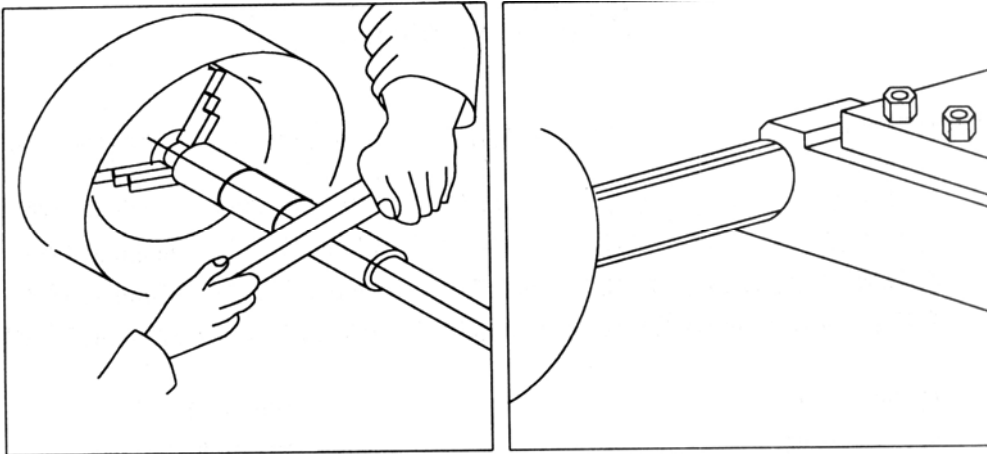
- 1) When the surface roughness required is not very high;
- 2) By means of the turning or a special-purpose polishing machine or a grinding machine for further processing, it is possible to process the parts perfectly to their sizes and the surface roughness.

If it is specified in the technological procedures that emery cloth must be used to polish the

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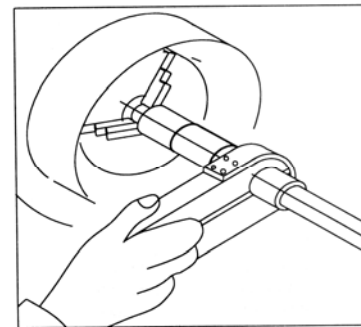
rotating workpiece, then emery cloth shall be used in the following situations:

a. Nail a piece of emery cloth on a block of fine quality wood for polishing;



b. Fix emery cloth on the toolholder and clamp it on the tool post for polishing.

c. Use two wooden plates connected together with emery cloth to form into a special-purpose "Strong Polisher" for polishing and its holes may let the workpiece pass through the surface to be polished.



d. Use a sturdy wire brush stuck with abrasive material for polishing.

Use force to pull both ends of emery cloth upward and be sure not to pull emery cloth loosely or to wrap emery cloth around the operator's fingers or around the workpiece.

When required to polish the ends of the workpiece, use only a very short emery cloth strip or a sheet of emery cloth, as a very short emery cloth strip or a sheet of emery cloth will not cause such problem as winding or wrapping.

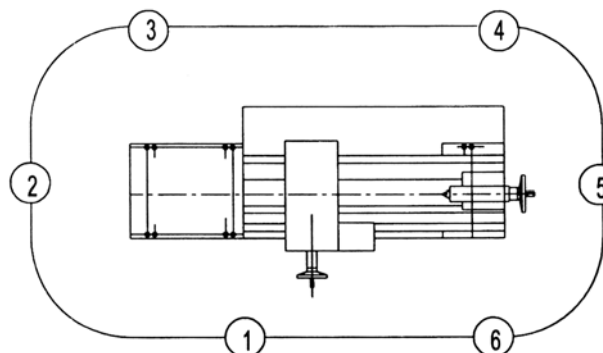
When carrying out polishing with emery cloth, be sure not to wear gloves.

2.3.5 Noise Level

According to GB/T16769-1997 "Metal Cutting Machine Tool Noise Level Measurement Methods", in the 6 positions at a distance of 1 meter from the machine tool, the maximum noise level

(A).

Note: The condition is that the workpiece is held with a standard chuck at its highest rotation



is less than 78dB

measurement condition is that the spindle equipped is running at its speed.

2.3.6 Electric Requirements

If there are no special instructions, the power adopted in this machine tool shall be 220V,50Hz AC power supply and its line voltage fluctuations shall not exceed $\pm 10\%$.

If the unstable state of the input voltage exceeds the allowable limits, it is impossible then for the machine tool to achieve the rated horsepower of the machine tool. The machine tool can be running normally, but it is in no way to transfer the power as indicated.

The reliable ground is a guarantee for the personal safety and the safe operation of the machine. When the user introduces the power line for the machine tool, the protective grounding wires shall be first connected and the grounding wire specifications shall not be less than the power line specifications. The ground wires shall not be connected to the cooling water pipe or the ground rod close to the machine tool.

The power inputted into the machine tool shall be grounded.

The user shall check the ground wires to find out whether they are reliable.

Installation

Safe Installation

Read the Operation Instructions, so as to master the operation of the machine!

Warning! Throughout the overall installation process, protective glasses shall be worn !

This is a heavy machine tool. When unpacking or moving the machine, there shall be a helper.

3.1 Tools Required for Installation



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Here are the tools needed to complete the installation, but they are not included in your machine packaging.

Name	Q'ty	Name	Q'ty
Protective glasses (for each operator)	1	12 mm flat washers (required for fixation on countertop)	4
Towel	1	Electric drill (required for fixation on countertop)	1
Cleaner	1	Drill bit (13.5mm) (required for fixation on countertop)	1
Level meter (required for fixation on countertop)	1	No. 3 flat head screwdriver	1
M12 hexagon bolt (used for fixation, length determined according to the thickness of the countertop) (required for fixation on countertop)	2	Flathead screwdriver	1
		Unpacking wrench (14mm)	1

3.2 Unpacking

Please be careful to unpack the case and check and estimate that there is no part damaged or injured. If parts found lost and damaged obviously, please contact this company timely.

Note: Due to the fact that CQ6128 series has a variety of configurations, if there is discrepancy between the text and the actual product, the manufacturer and this company reserves the right of final interpretation.

Ser.No.	Name	Q'ty	Ser.No.	Name	Q'ty
1	Operation Instructions (no Shown in Figures)	1	6	Allen wrench	1 set
2	Chuck key	1	7	Plastic oiler	1
3	Chuck anti-jaw 3 pcs/pair	1 pair	8	Morse No.3 fixed centre	1
4	Double-end Spanner: 8-10、14-17	1 each	9	Morse No.4 fixed centre	1
5	Hook spanner		1	Others	

If there is any non-professional component missing (such as nut or washer), we will be happy to provide you with it or, for sake of convenience, you can purchase at your local hardware store.

3.3 Cleaning

The unpainted surfaces are coated with anti-rust oil, which plays a protective role in transportation, but will not corrode. The cleaning agent that has a dissolving capacity shall be used to clean the surfaces. For the purpose of thorough cleaning, some parts may be required for prior removal. For the machine to achieve the best performance, be sure to clean the coatings of all the moving parts or the sliding contact surfaces. As the paint on the machine is readily soluble, such chlorinated solvents as acetone shall be avoided to be used. When using any type of cleaning product, always follow the requirements of the manufacturer.



Warning! As the burning point of gasoline is comparatively low, if gasoline is used to clean the machine, it may cause an explosion or fire. Therefore, when cleaning the machine, it is not recommend to use gasoline for cleaning..

After thoroughly cleaning the machine, the bearing surfaces, the screw and the guideway surfaces of the machine tool should be coated with a thin layer of oil. Note that, in the cleaning process, no anti-rust oil or cleaning agents shall be allowed to enter into the bearing surfaces under the guideway oil scraper plate.

Be careful! When cleaning machines, if the cleaning solvent inhaled or swallowed, poisoning will be resulted. In the workplaces, where the ventilation is inadequate, the use of these solvents may affect human health or cause a fire. Therefore, when using these cleaning solvents, it is necessary to choose a well-ventilated place, so as to prevent any injury.

3.4 Operating Sites

CQ6128 is a bench lathe. Refer to the data sheet for the weight and dimensions of the machine tool. Having considered the existing and the expected requirements, it is required to provide a reasonable space for your machine.

The lathe should be installed on a heavier and high-strength workbench, which has an enough height, so as for the operators not to lean forward to carry out the operation. When required for moving, the weight of the lathe and the auxiliary equipment and their handling requirements shall be taken into consideration. There must be plenty of bright light, so that the operator will not have to work in the dark place.



Considering to improve the safety of the machine tool, we wholeheartedly recommend that the screws of the machine tool should be firmly installed on the sturdy workbench and that the size of machine tool shall be ensured, so as to improve the rigidity of the machine tool as well. Get the four screws with their four rubber shock pads in alignment with the holes in the base respectively. Four holes shall be drilled on the work bench according to the machine chassis, then get 2 M12 screws and washers (prepared by the user himself) ready, align the machine tool with the chassis and then tighten up the screws.



The machine tool shall be forbidden to be placed in the following locations:

- △ There is strong vibration source externally;
- △ The humidity is too high around;
- △ Close to a heating source;
- △ There is direct sunshine.

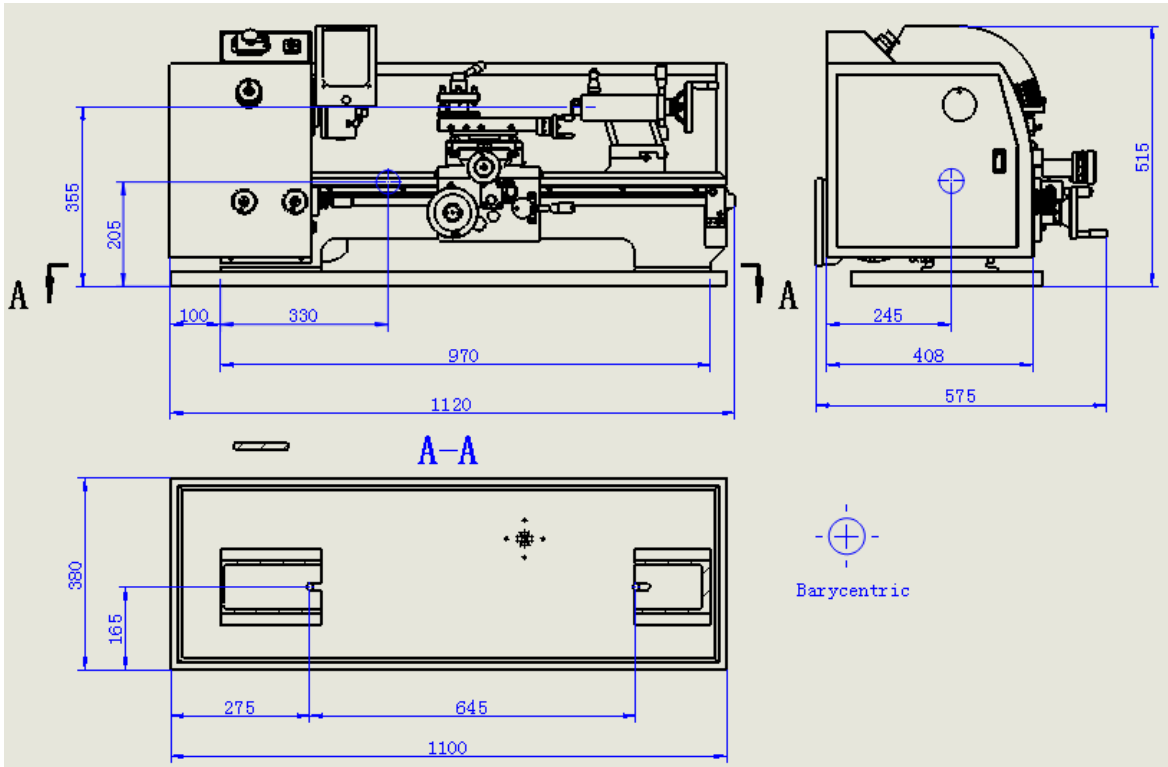


If the machine tool is installed near to a vibration source, it will affect the accuracy of the machine tool.

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3.5 Dimensions and Installation Drawings

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3.6 Trial Run

1. Ensure that the carriage has left the chuck and is in its disengaged position, then insert the power wires into the socket of the work site(220V), open the red cover of the emergency stop switch on the top of the electrical switch box, press the green button and the machine tool power is turned on. Then turn the positive/reverse rotation switch to the positive rotation position. Finally rotate the stepless variable speed regulation button clockwise slowly. Pay attention that, for a new startup each time, the acceleration should not be too fast and, as the electronic circuit board has a protective function, if accelerating too quickly, it may cause a circuit failure, while the lathe will not start.

2. Having lasted in this way for 1-2 minutes, the spindle speed is increased gradually from the lowest speed and runs for a few minutes before stopping. Stop the machine tool and check all parts, so as to make sure that everything works smoothly. In the meantime, check the quality of installation.



Notice!

When the lathe is running, the direction of the spindle or the screw can not be changed! If doing so, there will be damage done to your lathe! Such damage shall not belong to the scope of warranty.

1. Forward rotation/Off/Reverse rotation switch: Change the spindle rotation clockwise/neutral/counterclockwise. When the lathe is running, its direction can not be changed.



2. Emergency Stop Button: Pressing down this button, it is in a shutdown state and



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the motor will be stopped.

3.High/Low Speed Range Control: Spindle rotation speed range: High speed: 620RPM、1000RPM、2000RPM. Low speed: 125RPM、210RPM、420RPM. When the lathe is running, its high/low speed can not be changed!



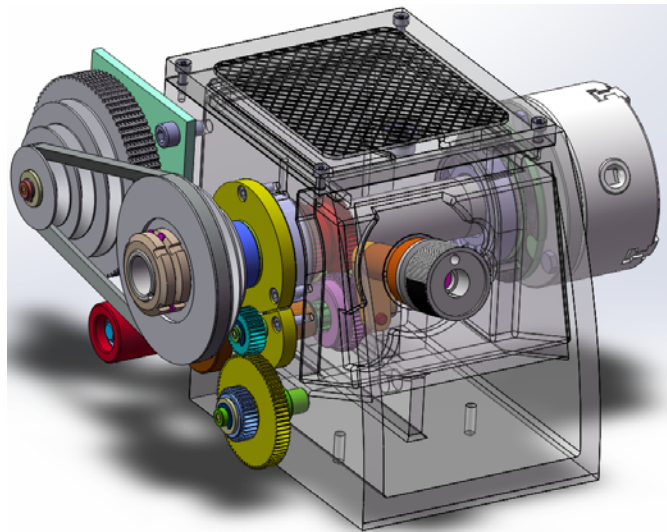
4. Screw Forward/Neutral/Reverse Screw: Change the screw rotation direction. . When the lathe is running, the screw rotation direction can not be changed!

Machine Tool Structure

4.1 Headstock

The headstock is one of the important components of this machine tool, which has a great effect on the machining accuracy.

The headstock is fixed by screws on the left top of the bed of the machine tool, the power for the headstock operation is provided by the motor mounted on the rear side of the bed, the rotation of the motor is transmitted through a synchronous belt to the pulley of the headstock to change the gear transmission mode, so that the spindle has such two speeds as the high and the low speed.



Lathe Chuck

The 3-jaw chuck equipped with two sets of clamping chucks, which are called positive-jaw chuck and anti-jaw chuck, supplied in accompaniment with the machine tool as shown in the figure. The positive-jaw chuck is used to clamp the workpiece from its internal or external side (the internal or external side suitable for comparatively small diameter workpieces). The reverse rotation chuck is used to clamp comparatively smooth workpieces (external). (the positive-jaw chuck has been mounted in the chuck).



Replacing Lathe Chuck

Replace the positive-jaw chuck and the anti-jaw chuck in the 3 jaw chuck according to the sequences but they must be mounted into their corresponding slots according to the No. of the positive-jaw chuck and the anti-jaw chuck.



Unplug the power!

Insert the chuck key, turn it counterclockwise and rotate the chuck to remove all the positive-jaw chucks.

Check the interior of each slot of the chuck to clear off debris.



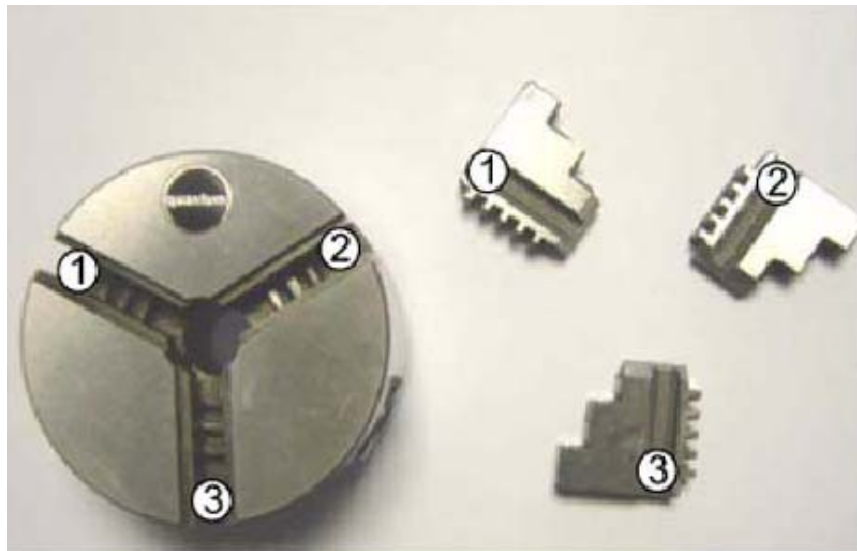
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Number each chuck to be No. 1, 2 and 3 or No. A, B and C. The number can be found at the bottom of the slots of each chuck.

Find out the No.1 chuck.

Insert the chuck key into the chuck.

Turn the chuck key clockwise to find out the top end of the flange slot (see the figure).



Insert the chuck No 1 into the slot and go on to rotate until the chuck is fixed.

Repeat these steps said above for the chucks No.2 and 3.

When replacing the positive chucks of the 3 jaw chuck, attention shall be paid to the points below:

☞ Beginning from the chuck No1, the replacement must be carried out in order.

☞ Before assembly, the chuck, the slot and the positive-jaw chuck must be cleaned thoroughly.

☞ It is strictly forbidden to used the positive-jaw chuck and the anti-jaw chuck in a mixed way.

☞ Do not clamp the positive –jaw chuck too tightly in the chuck, or otherwise it will cause damage and lose its accuracy.

☞ When machining the non-standard workpieces, it is forbidden to mount non-standard chuck and a 4-jaw chuck shall be mounted to fulfill the job.

☞ There is always a small jerking motion in the 3-jaw chuck. When the 3-jaw chuck is used to clamp the workpiece, it is recommended to measure the concentricity of it. If the test value is too high, it is recommended to use a 4-jaw chuck instead of the 3-jaw chuck, use a concentricity meter for a test and adjust the workpiece until its best position is achieved.

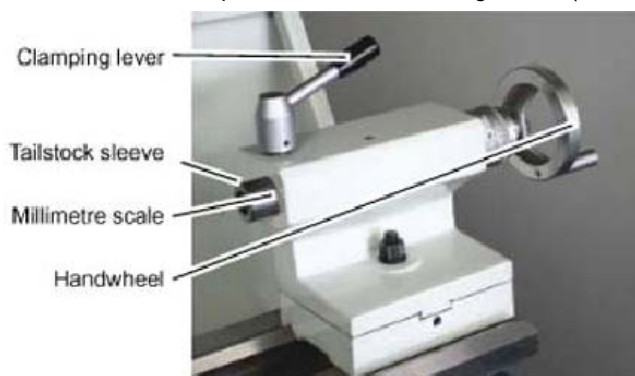
4.2 Tailstock

The tailstock, which slides along the guideway on the machine bed, is fixed on any position of the base with a fast locking device. The tailstock sleeve is a Morse No. 2 taper and a fixed matching centre (thimble), such as fixed centre, rolling center, drill chuck taper shank and drill bit centre.

The components of the tailstock include, as shown in the figure:

Locking handle: To lock the sleeve at a fixed position.

Tailstock handwheel: Turn it to adjust the length of the part extending out of the tailstock.



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Tailstock locking handle: To lock the Tailstock at a position on the machine bed.

Adjusting bolt: When adjusting the tailstock, it helps to keep the tailstock at its center position.

Sleeve: To fix the conical tools, such as the dead centre.

Adjusting nut: To adjust the right and the left centre of the tailstock.

Dead centre

When the length of the protruding part of the workpiece exceeds 2.5 times of its diameter, there shall be a dead centre placed (which is equipped in this machine tool) or a rolling centre placed (purchased separately).



When using it, the top of the dead centre shall be coated with oil and it shall be rotated with a very slow speed. The heated friction will reduce the service life of the centre point and may do damage to the workpiece. If it must be required for a higher speed, please use the rolling centre instead.

Mounting the dead centre:

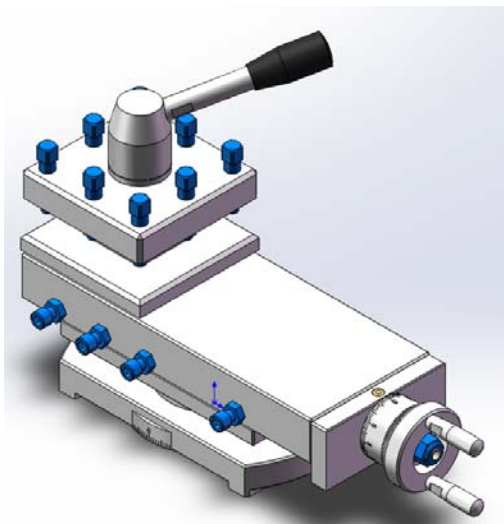
Verify that the dead centre and the tailstock bore are clean without any dirt, dust, grease or oil. If there is dirt or excessive oil on the equipment surfaces, the Morse drill chuck taper will not be locked tightly.

Turn the tailstock handwheel to make the fixed component extending about 20MM.

Place the dead centre into the tailstock bore and the dead centre will be fixed in its suitable central position.

When taking out the dead centre, rotate the turn plate on the tailstock to make the fixed component retracted into the tailstock and, in this way, the dead centre will be jacked out of it.

4.3 Tool Post



The tool post can be rotated to the predetermined 90-degree position or any angle in-between and can fix 4 tools one by one at most.

Tool use:

Tool is selected according to the requirement.

The tool bit exposed out of the tool post shall be as little as possible and shall be fixed securely with two nuts, which is helpful to maintain its sturdiness.



Ensure that the tool bit is just on the center line of the workpiece. If not, use the gasket to have it just on the center line.



Notice: Check the tool bit to find out whether it is at the correct height and ensure

that the tool bit should be kept on a same height with the dead centre of the tailstock.

If both the tops are at the same height or the top of the tool bit is lower than the top of the dead centre, then the height is correct.

If the tool bit is higher than the dead centre, then grind the tool to a suitable position or replace it with a correct tool.

4.4 Longitudinal Carriage

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Move the longitudinal carriage so that it is perpendicular to the longitudinal axis and the precision displayed on the dial plate on the hand crank is 0.025mm.

Adjust the longitudinal carriage:

Rotate the hand crank to draw back the longitudinal carriage from the starting point for 0.5mm at least and then move it forward to its starting point.

Note: This step will eliminate any non-controlled move of the lead screw (or backlash), so that the readings on the hand wheel scale are more accurate.



Turn the hand crank to make the "0" marking line on the dial plate on the longitudinal carriage in alignment with the "0.000" marking line. As long as the hand crank going back is avoided, continue to move longitudinal carriage in the same direction and readings shown in the dial plate on the hand crank will be accurate.

After moving the longitudinal carriage away from the workpiece, don't forget to move the longitudinal carriage to "0" marking line gain and to get ready for the next processing, that is to remove the original scale, namely zeroing. Remember that the cross holding plate should be moved backward from the workpiece.



4.5 Cross Slide

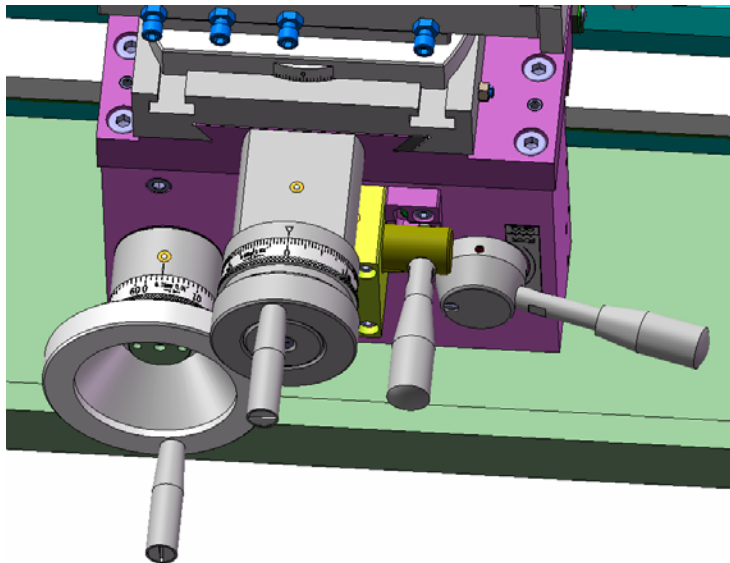
Similar to the longitudinal carriage, the precision on the dial plate of the cross slide is displayed to be 0.025mm. The cross slide, which is different from the longitudinal carriage, can be rotated at an angle and then can move back and forth at this angle along the axis.

Adjust the cross slide:

Loosen the bolt of the cross slide, see the figure for detail, so that the cross slide can be rotated.

According to the requirement of your steps, rotate the cross slide to an angle.

Tighten up the bolt of the cross slide and check the angle again to ensure that it does not move in the tightening up.



Use the hand crank of the cross slide to move the cross slide back and forth at a new angle along the axis. Similar to the hand crank after adjustment of the longitudinal carriage, before setting up "0" on the dial plate on the hand crank, ensure that the original scale should be removed, namely zeroing. Remember that the cross holding plate should be moved backward from the workpiece, or otherwise it will not be accurate.

4.6 Saddle

There are the manual and the automatic control for the longitudinal movement of the machine tool.

1. Manual movement:

Rotate the hand crank clockwise to move the lathe tool post rightward and rotate the hand crank counterclockwise to move the lathe tool post leftward.

Same as the description for the longitudinal carriage said on the previous page, set up the scale on the dial plate on the hand crank, remove the original scale, namely zeroing. Remember that the cross holding plate should be moved backward from the workpiece.



2. Automatic movement of the lathe tool post

The feedrate is determined by the rotational speed of the screw and the rotational speed of the screw is determined by the combination of gears in the head of the machine tool. The normal rotation of the feed rate is much lower than the thread cutting. Therefore, it is very important that, when cutting threads, the combination of the gears must be checked to be correct. The lathe is set up according to the normal rotation speed before delivery from the factory. When machining different threads later on, the combination of the gears are required to be changed frequently.



Warning!

Very dangerous! Pay close attention to the feed rate before closing the automatic feed device. Be alert and ready all the time to stop the power, or otherwise the lathe tool post will collide against the rotating spindle, causing damage and possible injury!

Use the automatic feed, when in normal rotation:

- 1) Use the manual feed handwheel to move the lathe tool post to the required position.
- 2) Set the Forward / Stop / Backward lever of the screw to the Forward position.
- 3) Adjust the rotation speed of the machine tool to the speed required.
- 4) Pull the automatic feed lever downward to the automatic feed position.
- 5) Pull the automatic feed lever upward to the automatic feed stop position.
- 6) The automatic feed can also be operated in the opposite direction, shutdown the lathe and change the direction of the screw.

4.7 Change Gears

There are various gear combinations for a variety of different feed rates in this machine tool and so there is a comparison table posted on the machine body to explain how to select the gear combinations for each thread. The standard size is the metric thread (Note: This lathe is a metric machine tool, the inch thread is an approximate value and, if required to process the inch threads, it is required to purchase an Inch machine tool).



Comparison Table:

You can, according to the size of the thread, find out the appropriate gear combinations and, by setting up the automatic feed rate, machine the thread you want.

Note! There are many details of the thread cutting not included in this manual, for example, the cutting tools the cutting speeds and the detailed relationship with the different types of metals. If you do not have this knowledge, please consult professionals before proceeding!



During the period of the engagement of the change gears, first cut off the power. Turn the switch of the machine tool to the "Off" position and then loosen the two hexagon socket head



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cap screws on the gear housing to dismount the housing.

The simple gear rotation structure is illustrated on the left and the intermediate idler gear is illustrated on the right in the figure above and, as long as the size of the gears can meet the connection between A and D, it will be all right.

(1) Loosen the hexagon socket head screws to ensure that the change gears A and D should be connected to change gears B and C.

(2) Disengage the gears B and C completely, loosen the nut on the fixed axle and re-adjust as required to ensure them engaged with gear A.

(3) When replacing the change gears required for change of the thread pitch for thread cutting, attention should be on the small keys on each axis and the gear marking engraved on each gear and do not engage them in a wrong way.

Notice: For the system of a set of gears, the gear D has a pad with a key on the screw shaft used for positioning, which is designed to ensure that the gear D and the gear C engaged and connected shall be in alignment and maintained in a straight line.

(4) Go on to regulate gears B, C and A, then rotate the spindle by hand, try to rotate back and forth and observe and, when the situation is normal, tighten up the nut of the axis on the change gear frame.

When recovering the gear housing, ensure that the two cylinder head bolts are tightened up.

Turning Thread

Turning the screw threads is, in fact, to rely on the shape of the tool for cutting, the product operation instructions will not contain any relevant provisions of the cutting tool types, the scopes, the cutting speeds and suitable materials. For specific details, consult the experienced professionals or refer to the professional manuals for details.

Services

If there is any fault occurred in the machine tool, please observe the fault phenomena, according to the following fault comparison table, find out the cause of the fault and the method for solution. If it is required to change any parts or you can't confirm whether you can repair it, please feel free to call our technical support phone.

7.1 Fault Comparison Table

7.1.1 Engine and Electrical

Symptom	Possible Causes	Possible Method for Solution
Machine does not start or stop.	<ol style="list-style-type: none"> 1. Fuse has blown. 2. Emergency stop button is closed or faulty. 3. Plug/socket faulty or power line faulty. 4. Circuit board faulty. 5. Power fault/power interruption. 6. Motor button or switch fault. 7. Spindle rotation switch fault. 8. Connection line open/resistance higher. 	<ol style="list-style-type: none"> 1. Exclude short circuit / replace fuse on the control panel. 2. Turn emergency stop button gently clockwise until it springs out or replace it with a new one. 3. Check and find out plug/socket fault or power line fault. 4. Check circuit board and, if damaged, replace it with a new one. 5. Ensure power line voltage and power is energized. 6. Replace faulty button or switch with a new one. 7. Rotate switch forward and backward and replace faulty with a new one.



	9. Motor fault.	8. Check for damaged or disconnected wires/Reconnect/If necessary, replace the wire. 9. Check/repair/replacement.
Machine power or power shortage.	<ol style="list-style-type: none"> 1. Workpiece material (mainly metal) not suitable for machining 2. Computer circuit board fault. 3. There is mistake in motor speed regulation rheostat. 4. Motor carbon brush fault. 5. Pulley/sprocket slipping. 6. Motor bearing fault. 7. Workpiece machined exceeds machining range of machine. 8. Spindle rotation switch fault. 	<ol style="list-style-type: none"> 1. Select metal suitable for machining. 2. Check computer circuit board and replace faulty with a new one. 3. Check and test it and replace faulty with a new one. 4. Remove brush and clean/replace if damaged. 5. Replace loose pulley / shaft. 6. Rotate axis for test, rotary grinding/loosen axis, if bearing damaged, replace it with a new one. 7. Use sharp tool/adjust to correct angle/reduce feed speed/cutting depth and, if possible, use cooling fluid. 8. Rotate switch forward and backward and replace faulty with a new one.
Loud and, repetitive noise near machine or noto.	<ol style="list-style-type: none"> 1. Fixed nut missing or loose. 2. Motor fan gets in touch with lid. 	<ol style="list-style-type: none"> 1. Check nut, replace or screw up as tightly as possible. 2. Tighten up fan or replace part faulty.
Motor overheating.	<ol style="list-style-type: none"> 1. Motor overload. 2. Motor cooling vents blocked. 	<ol style="list-style-type: none"> 1. Reduce motor load. 2. Clean up motor to maintain proper air circulation.
When cutting, motor is too noisy. Overheating or pause in cutting.	<ol style="list-style-type: none"> 1. Cutting depth or feed speed is too great. 2. During cutting operation, motor or feed speed is wrong. 	<ol style="list-style-type: none"> 1. Reduce cutting depth or feed speed. 2. Use suitable speed according to the feed speed table.



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	<ol style="list-style-type: none"> 3. Cutting tool is not sharp. 4. Gear is set too tight, causing being bitten. 	<ol style="list-style-type: none"> 3. Tool sharpened or replaced. 4. Fine-tuning gear until, when turning the chuck by hand, gear rotates smoothly.
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7.1.2 Symptoms in Operation and Work

Symptoms	Possible Causes	Corrective Action
Vibration is too large in startup and running of overall machine.	<ol style="list-style-type: none"> 1. Workpiece is placed out of balance. 2. Belt loose or damaged. 3. V-pulleys are not aligned. 4. Gear worn or damaged. 5. Chuck or flower-shaped chuck is not balanced. 6. Spindle bearing worn seriously. 	<ol style="list-style-type: none"> 1. Remount workpiece and mount it on the center position of the axis to the utmost. 2. Tighten/replace belt, if necessary. 3. Align V-pulleys. 4. Check gear and replace it, if necessary. 5. Adjust chuck or flower-shaped chuck, contact manufacturer for help. 6. Replace worn-out spindle bearing.
Finished product surface finish is not enough.	<ol style="list-style-type: none"> 1. Wrong speed or feed rate used. 2. The tool is not sharp or poor in quality. 3. Pad iron is too loose. 4. Tool is too high. 	<ol style="list-style-type: none"> 1. Adjust rotation speed or feed rate properly. 2. Sharpen or select better tool. 3. Tighten up pad iron. 4. Reduce tool height.
Taper centre can not removed from tailstock.	<ol style="list-style-type: none"> 1. Tail shaft has not retracted completely into tailstock. 2. Before placing centre into tail shaft, garbage on it has not been cleaned. 	<ol style="list-style-type: none"> 1. Turn rotation plate of tailstock to make centre falling automatically. 2. Always ensure that centre surface is clean.

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<p>Longitudinal carriage, cross slide or saddle does not move smoothly.</p>	<ol style="list-style-type: none"> 1. Pad iron has not been adjusted properly. 2. Hand crank loose. 3. Lead screw mechanism worn-out or adjusted improperly. 	<ol style="list-style-type: none"> 1. Adjust pad iron screws properly. 2. Tighten up hand crank fasteners 3. Tighten up fasteners that are loose in the Lead screw mechanism.
<p>Hand cranks of longitudinal carriage, cross slide or saddle are rotated difficultly.</p>	<ol style="list-style-type: none"> 1. There are shavings, dust or dirt on pad iron. 2. Pad iron screws are too tight. 3. Machine bed is too dry. 	<ol style="list-style-type: none"> 1. Remove pad iron, clean track/make them coincide with each other, lubricate them and re-adjust pad iron. 2. Loosen screws slowly, so as to move machine bed smoothly. 3. Lubricate machine bed and handles.
<p>During cutting, there is excessive vibration in cutting tool or machine components.</p>	<ol style="list-style-type: none"> 1.Tool post is not tight enough. 2.Tool is placed too far away from the tool post, which is lack of support. 3.Pad iron adjusted improperly. 4.Tool not sharp. 5.Spindle speed or feed rate not right. 	<ol style="list-style-type: none"> 1. Check to find out and clean off debris, and then re-fix them. 2. Remount tool, so that portion of tool projecting out of tool post should not be more than 1/3 of total length. 3. Tighten up screws of component affected. 4. Replace or sharpen tool. 5. Use spindle speed recommended.
<p>When workpiece is machined from one end to the other end, there is incorrect result obtained.</p>	<ol style="list-style-type: none"> 1.Machine Head and tailstock head is not in a flat line. 	<ol style="list-style-type: none"> 1. Re-adjust tailstock and make it in a flat line with machine spindle position.
<p>Chuck clamp can not be moved or moved difficultly.</p>	<ol style="list-style-type: none"> 1. There is foreign object in clamp. 	<ol style="list-style-type: none"> 1. Remove clamp, clean and lubricate threads before mounting it again.
<p>Saddle can not be moved.</p>	<ol style="list-style-type: none"> 1. Gears are not all engaged. 2. Gears are damaged. 	<ol style="list-style-type: none"> 1. Adjust position of gear. 2. Replace damaged gear.

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Saddle is moved difficultly.	<ol style="list-style-type: none"> 1. Saddle lock is too much tightened. 2. There are too many foreign objects over machine bed. 3. Machine bed is too dry and needs to be lubricated. 4. Pad iron is too tight. 	<ol style="list-style-type: none"> 1. Check to ensure saddle lock fully released. 2. Clean off foreign objects frequently during cutting. 3. Lubricate machine bed and handle. 4. Loosen pad iron screws slowly.
Gear-shifting lever can be not in place.	<ol style="list-style-type: none"> 1. Gears in machine head do not coincide with each other completely. 	<ol style="list-style-type: none"> 1. Rotate spindle with hand until gears coincide with each other completely.
Loud and repetitive noise comes from machine.	<ol style="list-style-type: none"> 1. Gears in machine head do not coincide with each other completely. 2. Gear or bearing damaged. 3. Workpiece hits stationary object. 	<ol style="list-style-type: none"> 1. Adjust gear spacing. 2. Replace damaged gear or bearing. 3. Stop machine tool and get rid of trouble immediately.
Tailstock chuck did not come out of tailstock.	<ol style="list-style-type: none"> 1. Tailstock lock knob is too much tightened. 	<ol style="list-style-type: none"> 1. Turn locking handle counterclockwise.

7.2 Adjusting Pad Iron



When adjusting the pad iron, it is aimed at the position restoration of the unnecessary displacement between the pad iron and the slip sheet and keep the pad iron and the slip sheet not too tightly between each other. If the pad Iron gets loose, it will result in the damage of the workpiece and the wear and tear of the slip sheet, nut and the lead screw and if the pad iron is too tight, it will cause the hand wheel steering difficulty.

There are two places of pad iron to be adjusted in the CQ6128 Lathe, namely the pad iron of the longitudinal carriage and the pad iron of the cross slide. The pad iron of the saddle has been adjusted properly in the factory before delivery and it should not be required to be adjusted any more.

Tools required	Q'ty
5mm Allen wrench	1
8mm Wrench	1

Procedures to adjust the pad iron of the longitudinal carriage and the pad iron of the cross slide:

- 1) Unplug the power!
- 2) Loosen the three lock nuts (as shown in A).
- 3) Tighten or loosen the screws, check their sliding condition, they should be smooth,

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eliminate looseness or too tightness and, if necessary, adjust them again.

4) Finally tighten up the three locking nuts.

Packing List

Machine Tool Type:

Net/Gross Weight [kg]:

Machine Tool Name: Bench Lathe

Case Size (LxWxH)[cm]:

Manufacturer's Serial No:

Ser.No.	Name	Specification	Q'ty	Remarks
1	Main machine		1 pc	
Accessories accompanied with the machine:				
2	Chuck key	K11125 Chuck	1	
3	Anti-jaws of chuck	K11125Chuck	1 pair	3 pcs/pair
4	Double-end spanner	8-10,14-17	1 each	
5	Allen wrench		1 set	
6	Plastic oiler		1 pc	
7	Fixed centres	MT4 & MT2	1 pc	
8	Head wrench	8×8	1	
9				
Technical documents accompanied with the machine:				
10	Operation Instructions		1 copy	

Warehouse Manager:

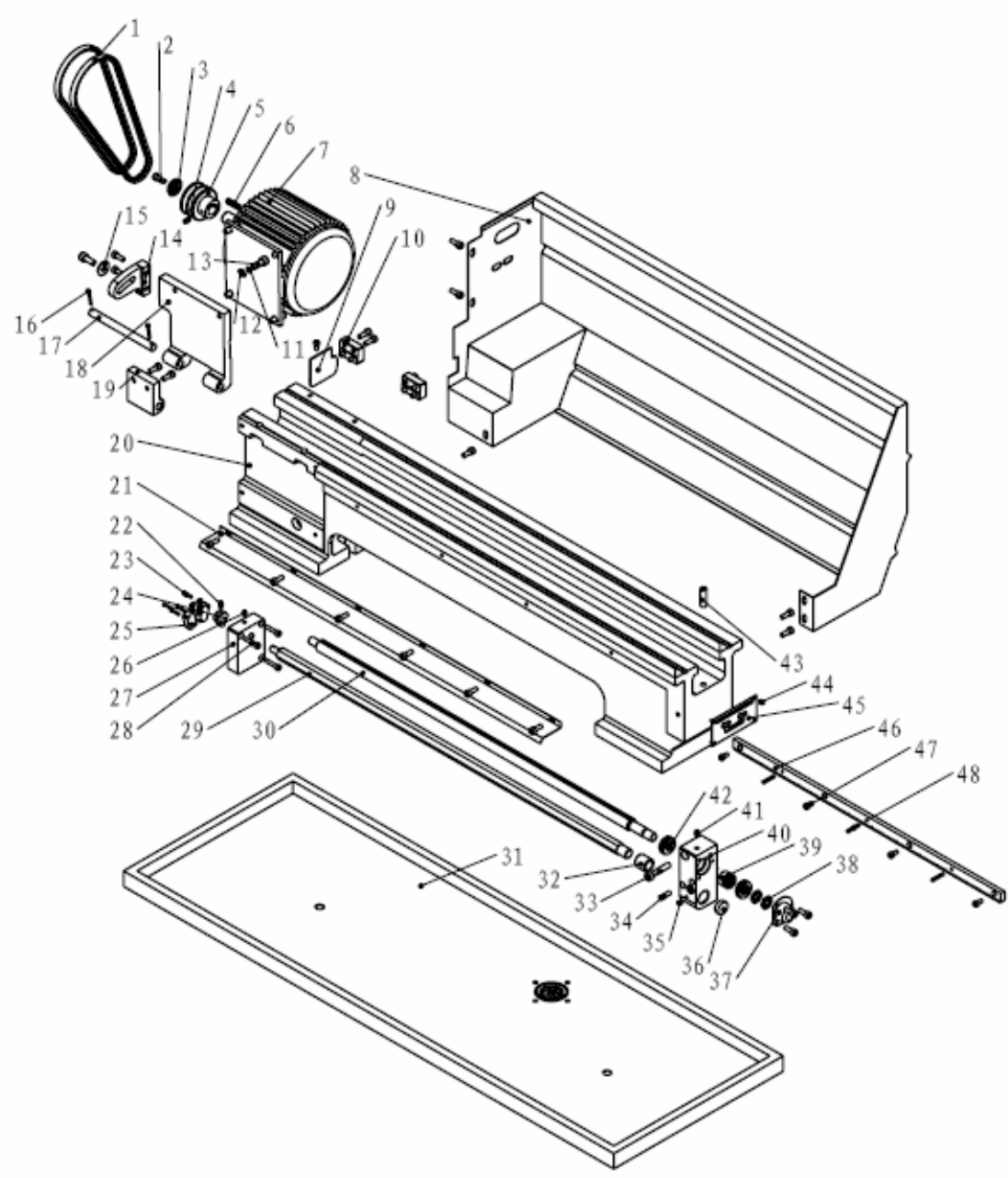
Quality inspected by:

Examined & verified by:

Date:

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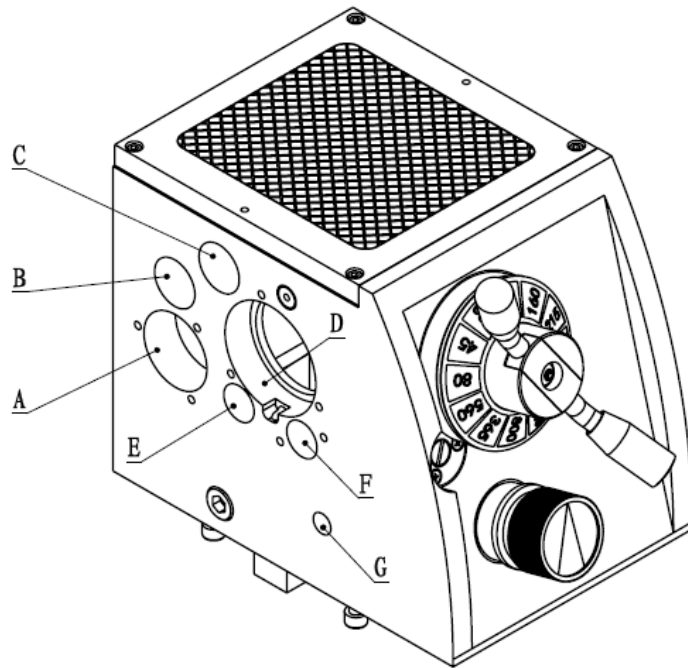
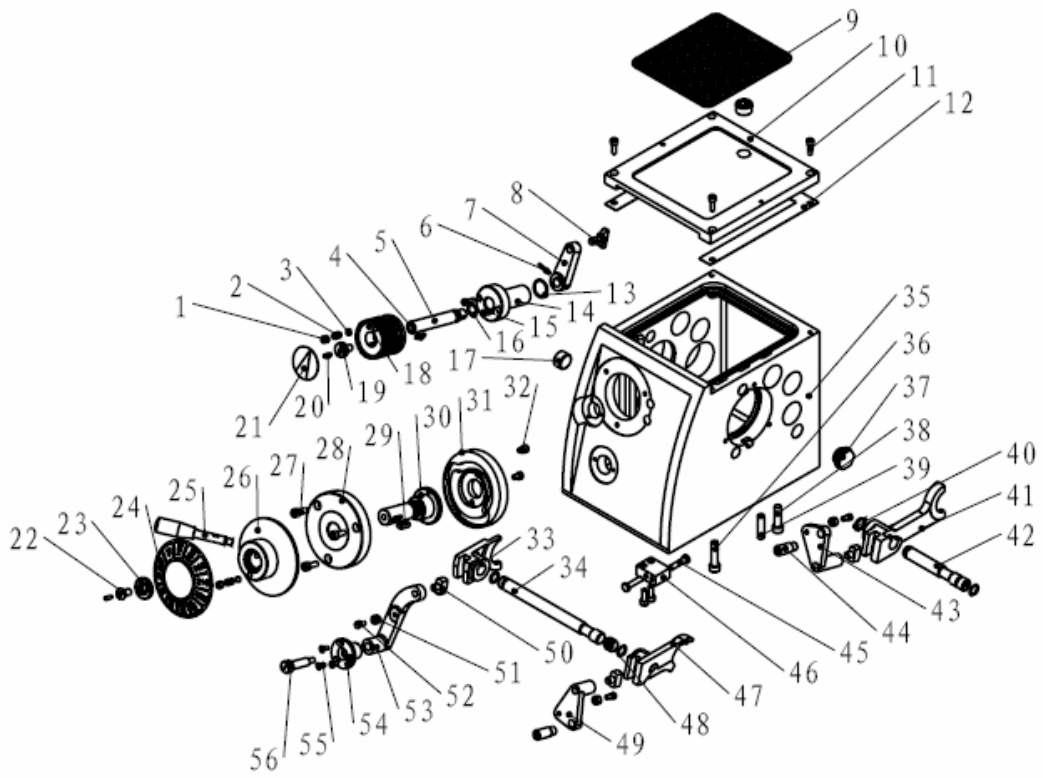
Bed Assembly

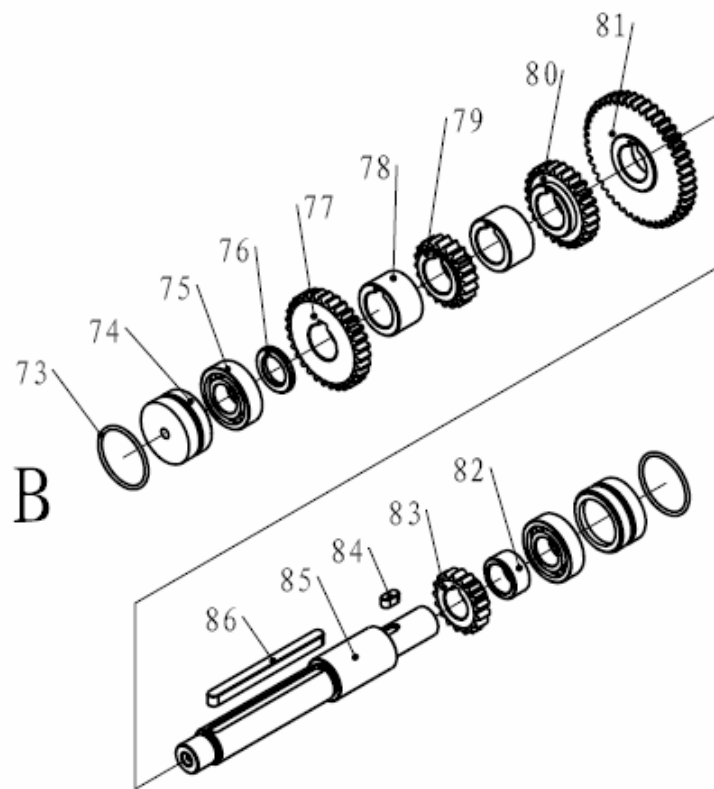
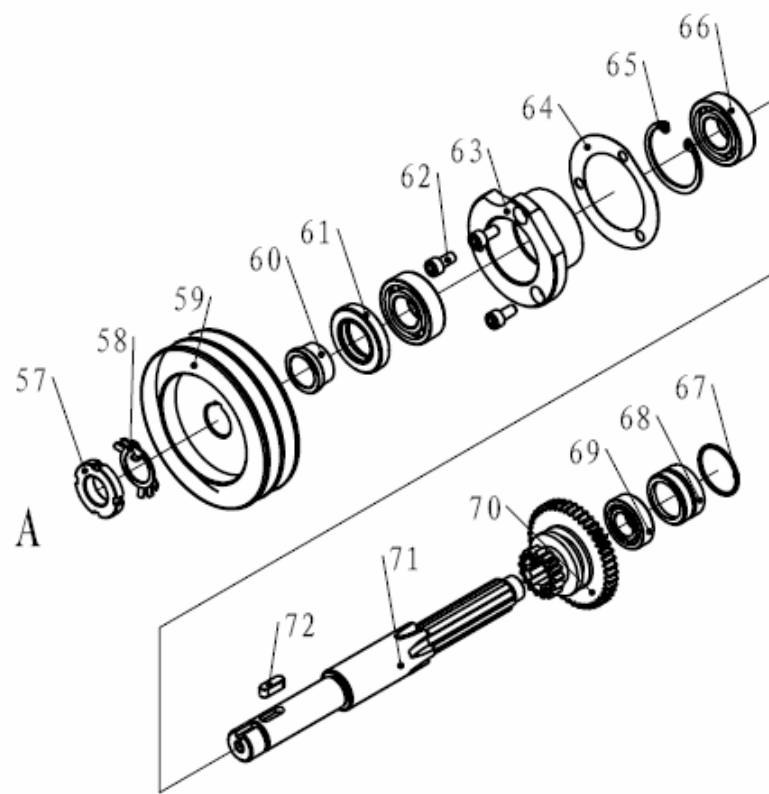


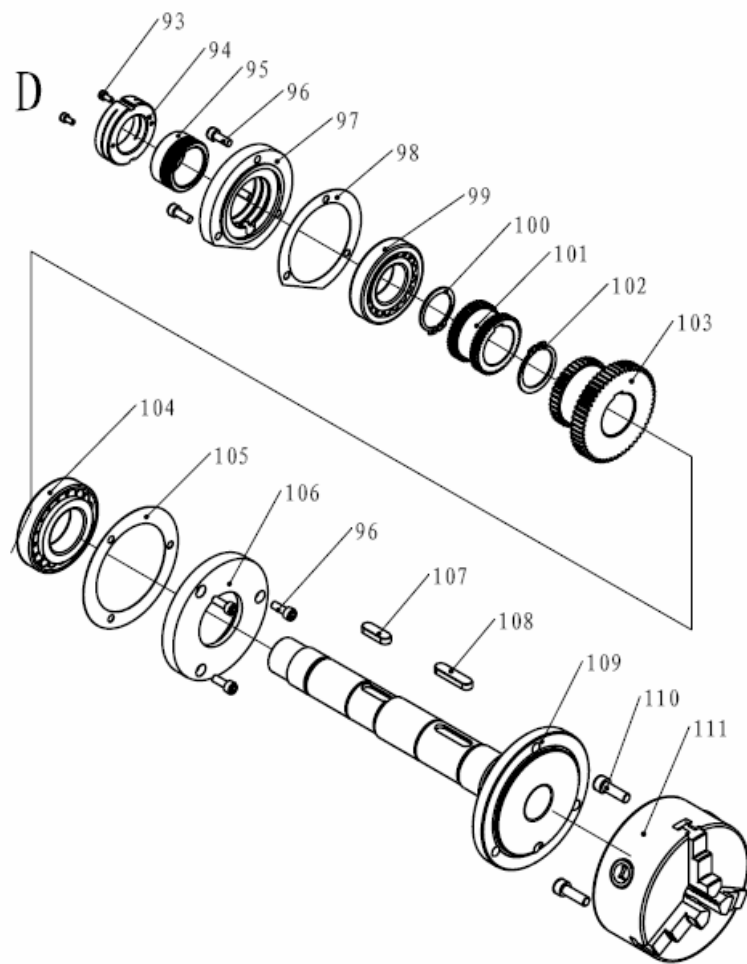
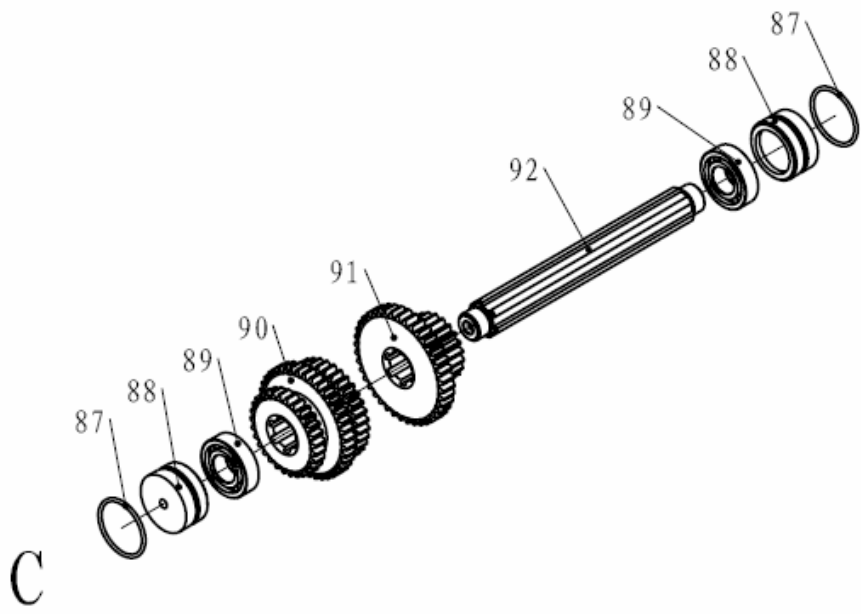
No.	Part No.	Name	Specification	Qty.
1	Z660	Belt		2
2	GB70-85	Screw	M6×16	27
3	ML260-01-009	Gland		1
4	GB78-85	Screw	M6×12	1
5	ML260-08-003A	Belt Pulley		1
6	GB1096-79	Key	B6×28	1
7	YL8024(0.75Kw)	Motor		1
8	ML260-01-014	Guard Assembly 550		1
8	ML260-01C-014	Guard Assembly 610		1
8	ML260-01D-014	Guard Assembly 815		1
9	ML260-01-007	Partition		1
10	ML260-01-016	Set Piece		2
11	GBT93	Washer	8	4
12	GBT97, 1	Washer	8	4
13	GB70-85	Screw	M8×20	5
14	ML260-08-004	Adjustable Stand		1
15	GB96-85	Washer	8	1
16	GB/T91-2000	Pin	3.2×22	2
17	ML260-08-012	Supporting Axle		1
18	ML260-08-010	Motor Base Plate		1
19	ML260-08-011	Support Seat		1
20	ML260-01-001	Bed 550		1
20	ML260-01-001A	Bed 610		1
20	ML260-01-001B	Bed 815		1
21	ML260-01-004	Shield 550		1
21	ML260-01C-004	Shield 610		1
21	ML260-01D-004	Shield 815		1
22	GB/T831-1988	Screw	M4×8	1
23	GBT818	Screw	M3×16	4
24	ML260-01-017	Cam		1
25	V-156-1C25	Micros Witch		2
26	GBT73	Screw	M5×8	1
27	ML260-01-006	Witch Base		1
28	GB70-85	Screw	M5×25	3
29	ML260-01-013	Start Lever 550		1
29	ML260-01C-013	Start Lever 610		1
29	ML260-01D-013	Start Lever 815		1
30	ML260-01-002	Lead Screw 550		1
30	ML260-01C-002	Lead Screw 610		1
30	ML260-01D-002	Lead Screw 815		1

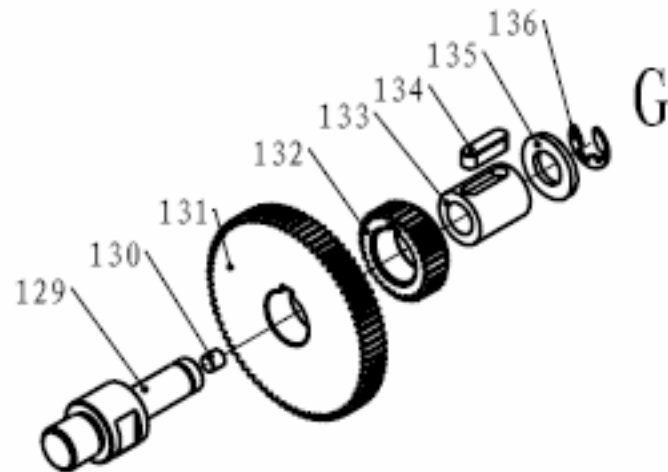
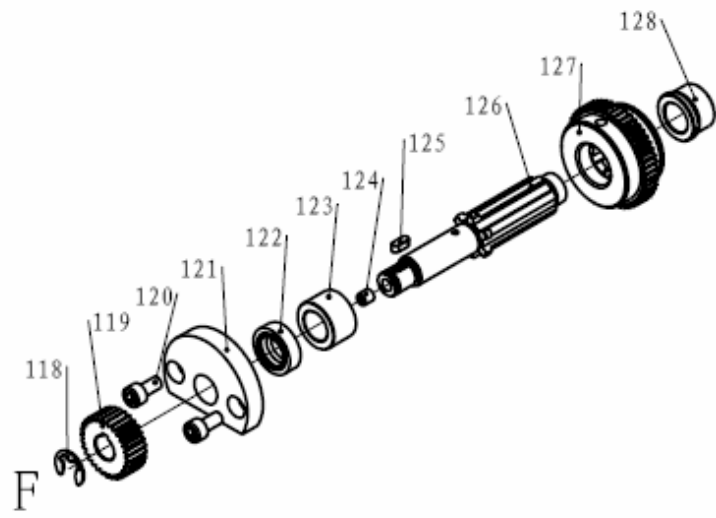
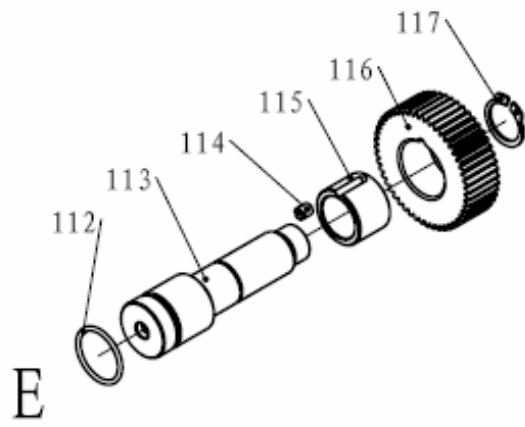
No.	Part No.	Name	Specification	Qty.
31	ML260-01-015	Lacquer Tray 550		1
31	ML260-01C-015	Lacquer Tray 610		1
31	ML260-01D-015	Lacquer Tray 815		1
32	ML260-01-012	Starting Lever Sleeve		1
33	GB70-85	Screw	M8×40	2
34	GB118-86	Taper Pin	6×22	2
35	GBT80	Screw	M5×6	1
36	ML260-01-011	Plug		1
37	ML260-01-010	Helmet		1
38	GB/T808-2000	Nut	M14 × 1	2
39	ML260-01-010	Copper Sheathing		1
40	ML260-01-005	Hang Foot		1
41	GB1155-79	Ball Cup	6	1
42	GBT301	Thrust Bearing	51102	2
43	GB/T878-1986	Pin	10×40	1
44	GBT818	Screw	M3×6	4
45	ML260-09-005	Label		1
46	ML260-01-003	Rack 550		1
46	ML260-01C-003	Rack 610		1
46	ML260-01D-003	Rack 815		1
47	GB70-85	Screw	M5×12	5
48	GB/T117-2000	Pin	4×25	3

Headstock









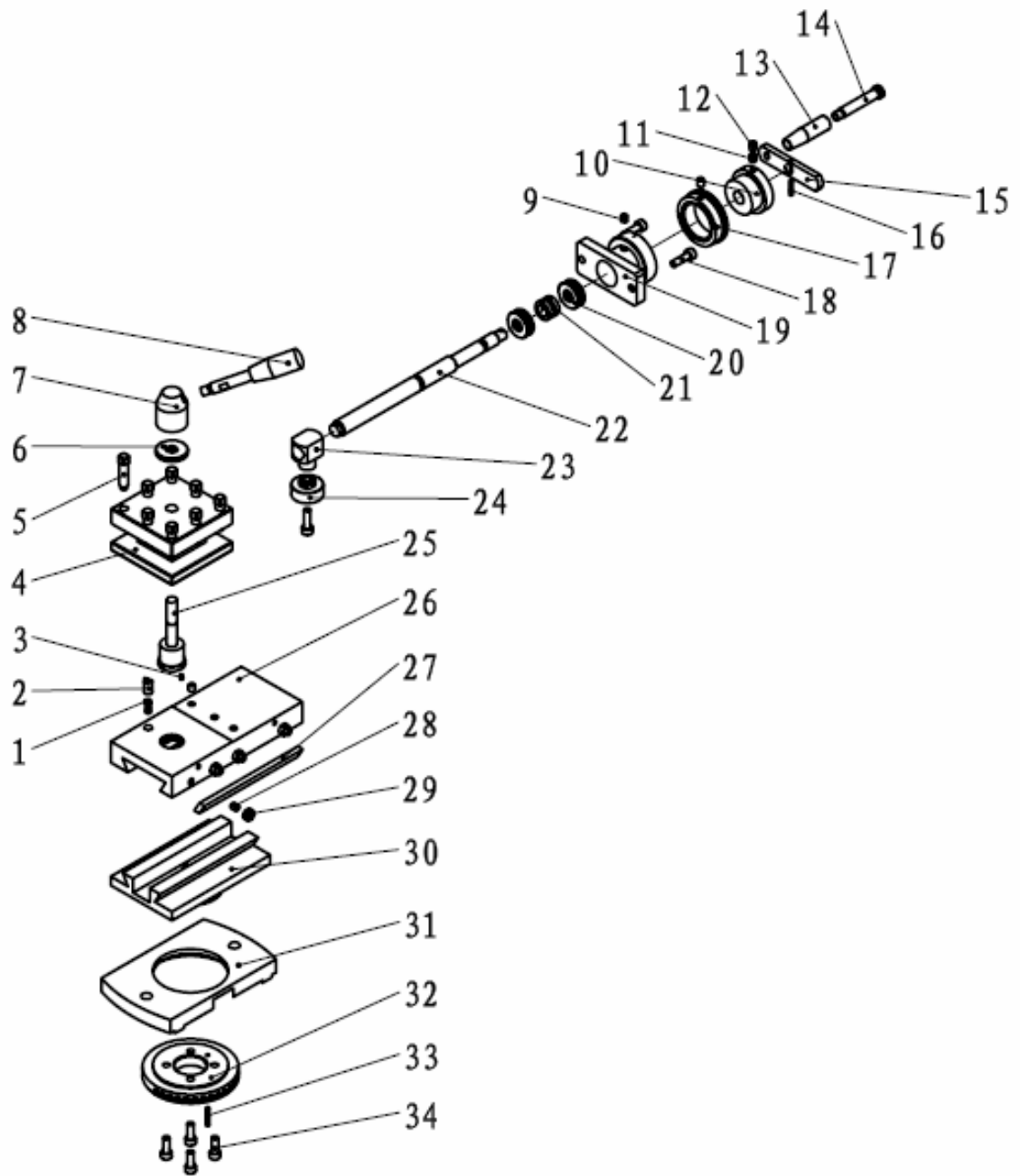
No.	Part No.	Name	Specification	Qty.
1	GB73-85	Screw	M8×8	2
2	GB2089-80	Spring	1×6×20	2
3	GB308-84	Steel Ball	6	2
4	GB1096-79	Key	4×16	1
5	ML280-02-26	Shaft		1
6	GB879-86	Spring Pin	3×20	3
7	ML280-02-22	Lever		1
8	ML260-02-059	Fork		1
9	ML260-02-060	Shock Pad		1
10	ML280-02-35	Headstock Cover		1
11	GB70-85	Screw	M5×16	4
12	ML280-02-36	Sealed Mat		1
13	GB3452.1-82	O-Ring	20×1.8	1
14	ML260-02B-003	Fix Set		1
15	GB70-85	Screw	M4×14	2
16	GB3452.1-82	O-Ring	11.8×1.8	4
17	G38-3A	Oil Plug	Z1/2"	2
18	ML260-07-029	Lever		1
19	ML280-02-27	Screw		1
20	GB79-85	Screw	M4×12	2
21	ML260-09-008	Plate		1
22	GB70.2-85	Screw	M8×14	1
23	ML280-02-30A-1	Washer		1
24	ML280-02-31	Plate		1
25	ML260-02-062	Lever		1
26	ML280-02-30A	Handel		1
27	GB70-85	Screw	M6×16	5
28	ML280-02-29	Stand		1
29	GB1096-79	Key	6×18	1
30	ML280-02-28	Set		1
31	ML260-02-052	Cam		1
32	GB70-85	Screw	M5×8	2
33	ML260-02-043	Fork		1
34	ML280-02-24	Shaft		1
35	ML280-02-12	Headstock Casting		1
36	GB70-85	Screw	M8×35	2
37	GB1160-2A	Oil Sight Glass	M20×1.5	1
38	GB70-85	Screw	M8×30	2
39	GB120-86	Pin	8×35	1

No.	Part No.	Name	Specification	Qty.
40	GB894.1-86	Snap Ring	15	1
41	ML260-02-045	Fork		1
42	ML280-02-23	Shaft		1
43	ML260-02-046	Fork Plate		1
44	ML260-02-061	Shaft		1
45	GB/T5780-2000	Hexagon Headed Bolt	M6×25	2
46	ML280-02-21	Adjustment Block		1
47	ML260-02-047	Fork		1
48	ML280-02-25	Oil Plug		1
49	ML260-02-044	Fork Plate		1
50	ML260-02-042	Slider		3
51	ML260-02-041	Sleeve		3
52	ML260-02-065	Shaft		3
53	ML260-02-040	Fork Rod		1
54	ML260-02-039	Sleeve		1
55	GB819-85	Screw	M4×10	3
56	ML260-02-038	Shaft		1
57	GB812-88	Net	M20×1.5	1
58	GB858-88	Washer	20	1
59	ML260-02-019A	Pulley		1
60	ML260-02-020	Spacer		1
61		Oil Seal	TC25×42×8	1
62	GB70-85	Screw	M6×12	3
63	ML260-02-021	Bearing Sleeve		1
64	ML260-02-064	Sealed Mat		1
65	GB893.1-86	Snap Ring	42	1
66	GB276-89	Ball Bearing	6004 P5	2
67	GB3452.1-82	O-Ring	28×1.8	1
68	ML260-02-022	Oil Plug		1
69	GB276-89	Ball Bearing	6002 P5	1
70	ML280-02-03	Gear		1
71	ML280-02-14	A Shaft		1
72	GB1096-79	Key	6×18	1
73	GB3452.1-82	O-Ring	28×1.8	2
74	ML260-02-022	Oil Plug		2
75	GB276-89	Ball Bearing	6002 P5	2
76	ML260-023	Washer		1
77	ML280-02-04	Gear		1
78	ML280-02-08	Sleeve		2
79	ML280-02-05	Gear		1

No.	Part No.	Name	Specification	Qty.
80	ML280-02-06	Gear		1
81	ML280-02-02	Gear		1
82	ML280-02-16	Sleeve		1
83	ML280-02-01	Gear		1
84	GB1096-79	Key	5×10	1
85	ML280-02-07	B Shaft		1
86	GB1096-79	Key	6×75	1
87	GB3452.1-82	O-Ring	28×1.8	2
88	ML260-02-022	Oil Plug		2
89	GB276-89	Ball Bearing	6002 P5	2
90	ML280-02-09	Gear		1
91	ML280-02-10	Gear		1
92	ML280-02-13	C Shaft		1
93	GB70-85	Screw	M4×8	2
94	ML260-02B-015	Set Nut		1
95	ML260-02-016B	Oil Retainer		1
96	GB70-85	Screw	M6×16	6
97	ML260-02-017B	Back Seal Oil Cover		1
98	ML260-02-049	Sealed Mat		1
99	GB297-84	Taper Roller	30207 P5	1
100	GB894.1-86	Snap Ring	35	1
101	ML260-02-018	Gear		1
102	GB894.1-86	Snap Ring	38	1
103	ML280-02-11	Gear		1
104	GB297-84	Taper Roller	30208 P5	1
105	ML260-02-063	Seal Ring		1
106	ML260-02-037	Oil Seal Cover		1
107	GB1567-79	Key	10×30	1
108	GB1567-79	Key	10×40	1
109	ML280-02-15	Spindle (D Shaft)		1
110	GB70-85	Screw	M8×35	3
111		Three-Jaw Chuck	K11-125	1
112	GB3452.1-82	O-Ring	21.2×1.8	1
113	ML260-02-009	E Shaft		1
114	GB73-85	Screw	M5×6	1
115	ML260-02-005	Sleeve		1
116	ML260-02-004	Gear		1
117	GB894.1-86	Snap Ring	18	1
118	GB896-86	Split Washer	9	1
119	ML260-02-014	Gear		1

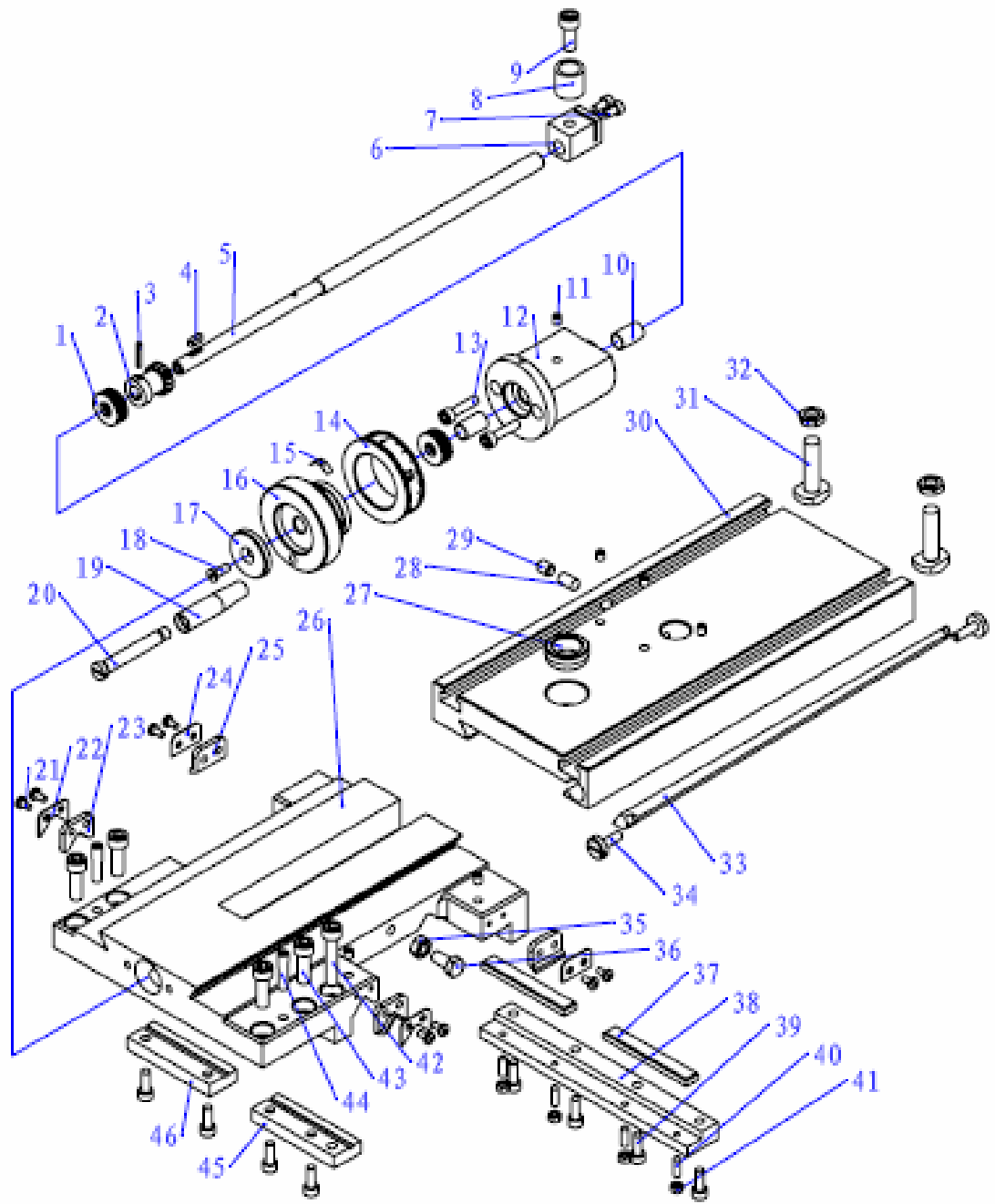
No.	Part No.	Name	Specification	Qty.
120	GB70-85	Screw	M6×12	2
121	ML260-02-011	Sleeve		1
122		Oil Seal	TC15×24×7	1
123	ML260-02-012	Sleeve		1
124	GB1155-79	Ball Cup	6	1
125	GB1096-79	Key	4×10	1
126	ML260-02-013	F Shaft		1
127	ML260-02-010	Gear		1
128	ML260-02-003	Sleeve		1
129	ML260-02-006	G Shaft		1
130	GB1155-79	Ball Cup	6	1
131	ML260-02-007	Gear		1
132	ML260-02-036	Gear		1
133	ML260-02-008A	Sleeve		1
134	GB1096-79	Key	6×20	1
135	GB97.1-85	Washer	12	1
136	GB896-86	Split Washer	9	1

Blade Adapter



No.	Part No.	Name	Specification	Qty.
1	GB2089-80	Spring	1×5×12	1
2	ML260-04-016	Pin		1
3	GB879-86	Spring Pin	2.5×5	1
4	ML260-04-011	Tool Post		1
5	GB85-88	Screw	M8×30	8
6	ML260-04-010	Washer		1
7	ML260-04-012	Clamping Handle		1
8	ML260-04-032	Clamp Handle		1
9	GB1155-79	Ball Cup	6	4
10	ML260-04-007	Seat		1
11	GB80-85	Screw	M6×8	1
12	GB77-85	Screw	M6×8	2
13	ML260-04-020	Handle Sleeve		1
14	ML260-04-021	Handle Shaft		1
15	ML260-04-008	Crank		1
16	GB879-86	Spring Pin	3×16	1
17	ML260-04-018	Dial-Compound Rest		1
18	GB70-85	Screw	M6×20	2
19	ML260-04-006	Bracket		1
20	GBT301	Thrust Bearing	51101	2
21	ML260-04-015	Supporting Sleeve		1
22	ML260-04-005	Feed Screw		1
23	ML260-04-004	Nut		1
24	ML260-04-014	Locating Sleeve		1
25	ML260-04-009	Tool Post Shaft		1
26	ML260-04-003	Compound Rest		1
27	ML260-04-017	Panel		1
28	GB78-85	Screw	M6×20	4
29	GB/T6170-2000	Nut	M6	4
30	ML260-04-002	Swivel Table		1
31	ML260-04-013	Backplane		1
32	ML260-04-001	Connector		1
33	GB879-86	Spring Pin	3×20	1
34	GB70-85	Screw	M6×16	4

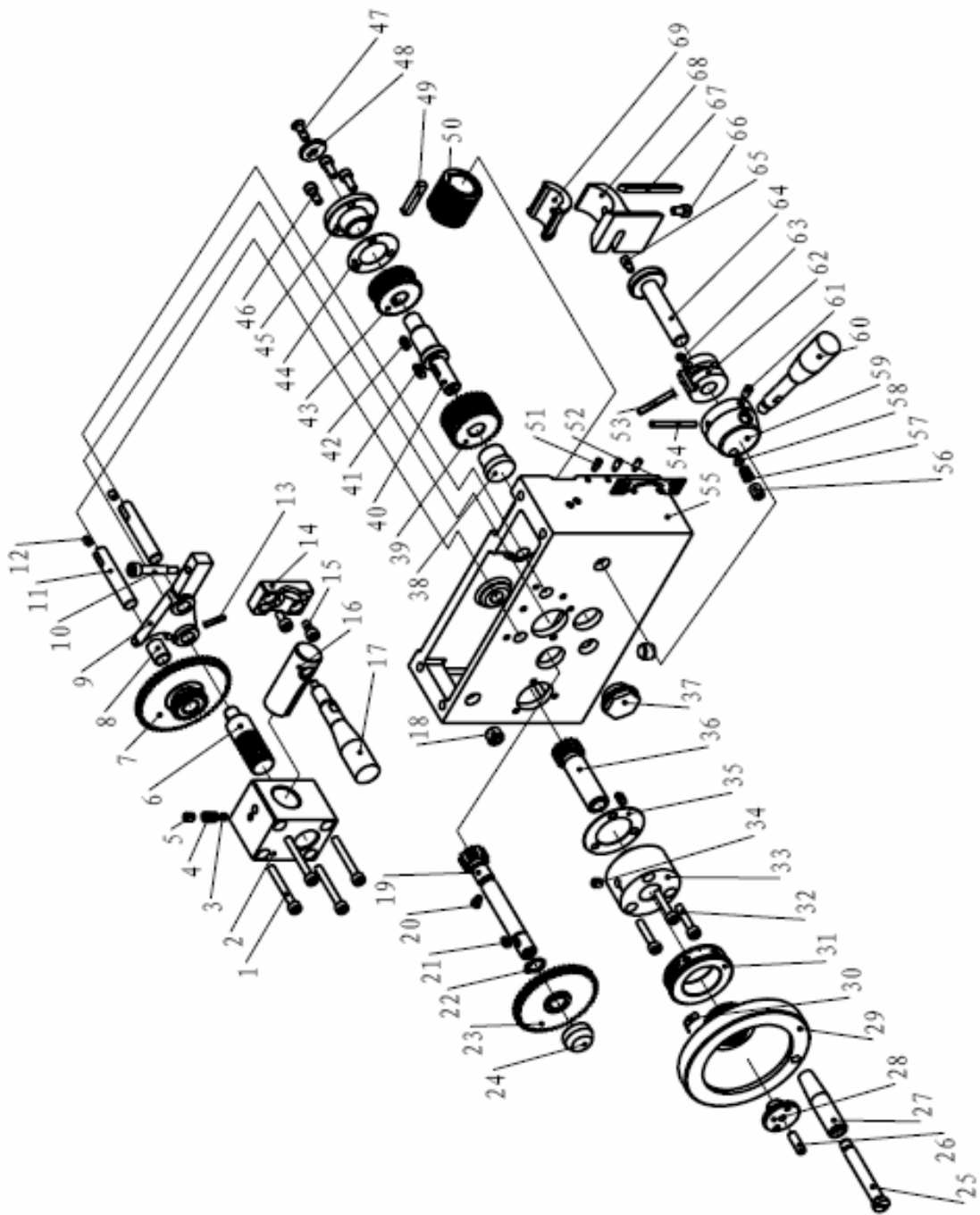
Saddle



No.	Part No.	Name	Specification	Qty.
1	GBT301	Thrust Bearing	51100	2
2	ML260-05-007	Gear		1
3	GB879-86	Spring Pin	3×20	1
4	GB1096-79	Key	4×12	1
5	ML260-05-006	Cross Feed Screw		1
6	ML260-05-009	Nut		1
7	GB70-85	Screw	M5×10	2
8	ML260-05-001	Nut Sleeve		1
9	GB70-85	Screw	M8×20	1
10	SF-1	Bearing	10×12×20	2
11	GB1155-79	Ball Cup	6	6
12	ML260-05-005	Handle Seat		1
13	GB70-85	Screw	M6×25	2
14	ML260-05-016	Dial-Compound Rest		1
15	ML260-05-015	Spring		1
16	ML260-05-003	Hand Wheel		1
17	ML260-05-017	Washer		1
18	GBT70.3	Screw	M5×12	1
19	ML260-05-019	Handle Sleeve		1
20	ML260-05-018	Handle Shaft		1
21	GB818-85	Screw	M4×8	8
22	ML260-05-013	Wiper Cover		2
23	ML260-05-014	Wiper		2
24	ML260-05-010	Wiper Cover		2
25	ML260-05-011	Wiper		2
26	ML260-05-012	Saddle		1
27	ML260-05-022	Locating Sleeve		1
28	GB78-85	Screw	M8×16	1
29	GB77-85	Screw	M8×10	1
30	ML260-05A-002	Saddle		1
31	GB37-88	Bolt	M10×40	2
32	GB/T6170-2000	Nut	M10	2
33	ML260-05A-001	Panel		1
34	ML260-05A-003	Screw		2
35	GB/T6170-2000	Nut	M8	1
36	GB/T5378-2000	Bolt	M8×16	1
37	ML260-05-023	Panel		2
38	ML260-05-008	Back Pressure Plate		1
39	GB70-85	Screw	M6×16	8
40	GB78-85	Screw	M5×16	4

No. Part No.	Name	Specification	Qty.
41 GB/T6170-2000	Nut	M5	4
42 GB70-85	Screw	M8×40	1
43 GB70-85	Screw	M8×25	4
44 GB118-86	Taper Pin	6×30	2
45 ML260-05-021	Locking Press Plate		1
46 ML260-05-020	Forward Pressure Plate		1

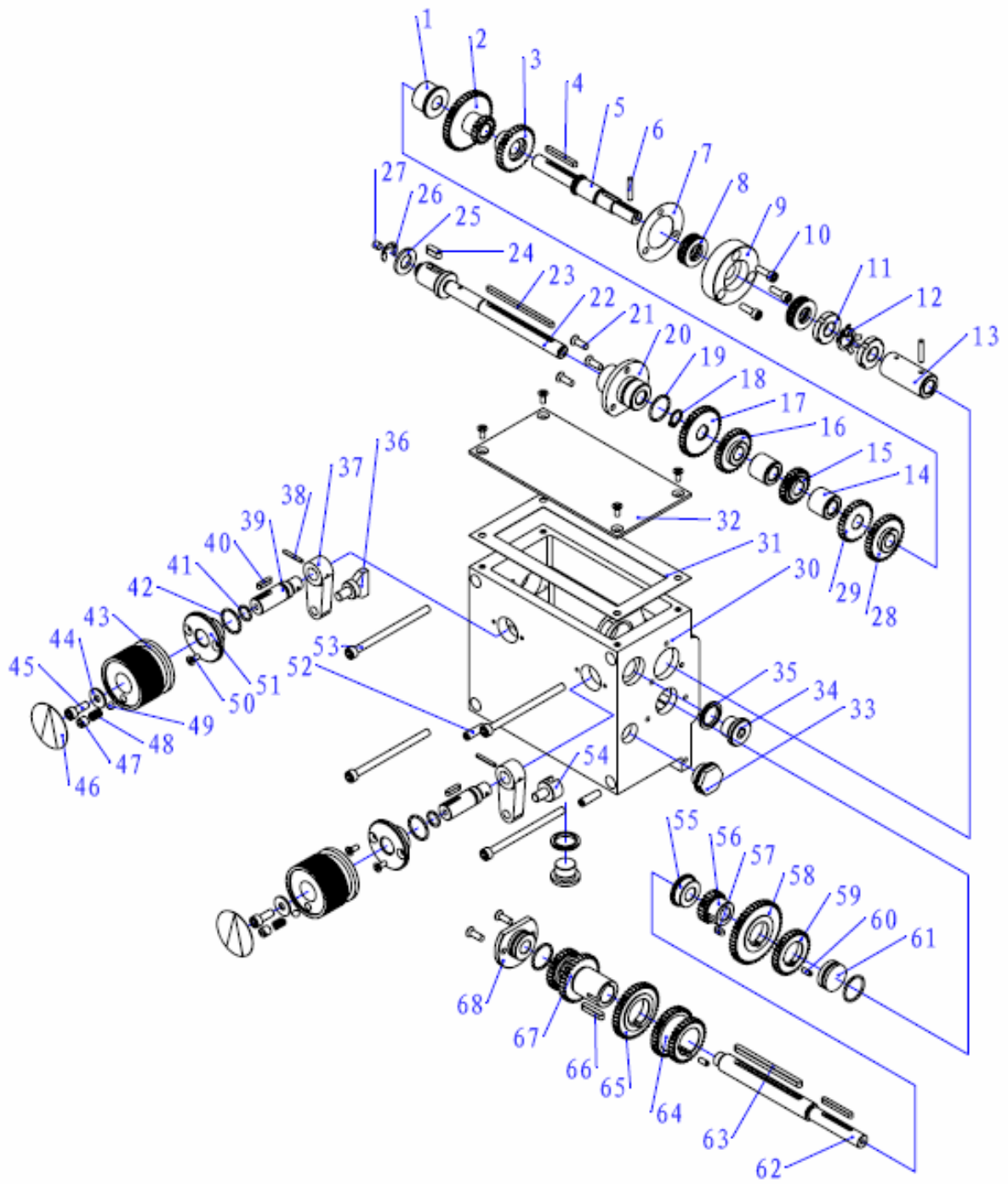
Apron



No.	Part No.	Name	Specification	Qty.
1	GB70-85	Screw	M5×40	4
2	ML260-06-020	Claw Seat		1
3	GB308-84	Steel Ball	5	1
4	GB2089-80	Spring	0.8×5×15	1
5	GB78-85	Screw	M6×8	1
6	ML260-06-007	Shaft		1
7	ML260-06-015	Gear		1
8	SF-1	Bearing	10×12×15	1
9	ML260-06-029	Fork		1
10	ML260-06-030	Limit Rod		1
11	ML260-06-028	Shaft		2
12	GB73-85	Screw	M5×6	2
13	GB879-86	Spring Pin	3×16	1
14	ML260-06-037	Limit Plate		1
15	GB70-85	Screw	M5×10	2
16	ML260-06-017	Shaft		1
17	ML260-06-035	Lever		1
18	G38-3A	Oil Plug	Z1/4"	2
19	ML260-06-013	Shaft		1
20	GB79-85	Screw	M6×8	1
21	GB1096-79	Key	4×8	1
22	GB894.1-86	Snap Ring	12	1
23	ML260-06-012	Gear		1
24	ML260-06-014	Bushing		1
25	ML260-05-018	Handle Shaft		1
26	GB78-85	Screw	M6×20	1
27	ML260-05-019	Handle Sleeve		1
28	ML260-06-045	Screw		1
29	ML260-06-034	Hand Wheel		1
30	ML260-05-015	Spring		1
31	ML260-06-009	Dial-Rack		1
32	GB70-85	Screw	M5×25	3
33	ML260-06-010	Bushing		1
34	GB1155-79	Ball Cup	6	1
35	ML260-06-033	Sealed Mat		1
36	ML260-06-008	Shaft		1
37	GB1160-2A	Oil Sight Glass	M20×1.5	1
38	ML260-06-006	Bushing		1
39	ML260-06-018	Gear		1
40	ML260-06-005	Shaft		1

No.	Part No.	Name	Specification	Qty.
41	GB1096-79	Key	4×12	1
42	GB1096-79	Key	4×10	2
43	ML260-06-025	Worm Gear		1
44	ML260-06-016	Sealed Mat		1
45	ML260-06-019	Worm Wheel		1
46	GB70-85	Screw	M5×12	3
47	GB819-85	Screw	M5×12	1
48	ML260-06-022	Washer		1
49	ML260-06-027	Key		1
50	ML260-06-026	Worm		1
51	GB79-85	Screw	M4×10	3
52	ML260-09-003	Plate		1
53	GB879-86	Spring Pin	4×30	1
54	GB879-86	Spring Pin	4×40	1
55	ML260-06-011	Apron		1
56	GB73-85	Screw	M8×8	1
57	GB2089-80	Spring	1×6×20	1
58	GB308-84	Steel Ball	6	1
59	ML260-06-004	Lever		1
60	ML260-06-032	Lever		1
61	GB78-85	Screw	M5×10	1
62	ML260-06-002	Stop Collar		1
63	GB78-85	Screw	M5×6	1
64	ML260-06-003	Opening And Closing Axis		1
65	ML260-06-031	Shaft		1
66	GB70-85	Screw	M5×8	1
67	ML260-06-001	Panel		1
68	ML260-06-024	Opening And Closing Nut Seat		1
69	ML260-06-023	Opening And Closing Nut		1

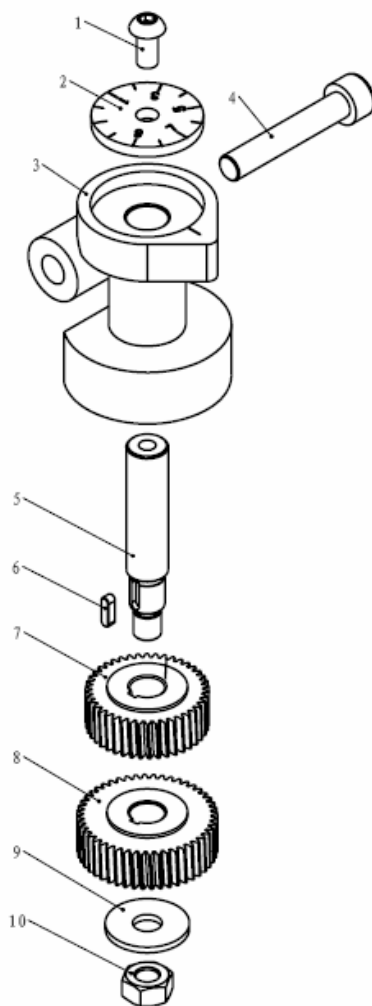
Gearbox Control



No.	Part No.	Name	Specification	Qty.
1	ML260-07-019	Bushing		1
2	ML260-07-020	Gear		1
3	ML260-07-022	Gear		1
4	GB1096-79	Key	4×36	2
5	ML260-07-021	Shaft		1
6	ML260-07-035	Pin	4×22	2
7	ML260-07-034	Sealed Mat		1
8	GBT301	Thrust Bearing	51102	2
9	ML260-07-023	Bearing Sleeve		1
10	GB70-85	Screw	M5×16	3
11	GB812-88	Net	M20×1.5	2
12	GB858-88	Washer	20	1
13	ML260-07-024	Bushing		1
14	ML260-07-006	Bushing		2
15	ML260-07-007	Gear		1
16	ML260-07-004	Gear		1
17	ML260-07-003	Gear		1
18	GB894.1-86	Snap Ring	12	1
19	GB3452.1-82	O-Ring	21.2×1.8	3
20	ML260-07-002	Bushing		1
21	GB819-85	Screw	M5×10	5
22	ML260-07-009	Shaft		1
23	GB1096-79	Key	4×80	1
24	GB1096-79	Key	6×16	1
25	GB97.1-85	Washer	12	1
26	GB896-86	Split Washer	9	1
27	GB1155-79	Ball Cup	6	1
28	ML260-07-014	Gear		1
29	ML260-07-013	Gear		1
30	ML260-07-001	Gear Box		1
31	ML260-07-033	Sealed Mat		1
32	ML260-07-030	Plate		1
33	GB1160-2A	Oil Sight Glass	M20×1.5	1
34	JB1001-77	Oil Plug	M18×1.5	2
35	JB982-77	Sealed Mat	18	2
36	ML260-07-025	Fork		1
37	ML260-07-027	Lever		2
38	GB879-86	Spring Pin	3×22	2
39	ML260-07-028	Shaft		2
40	GB1096-79	Key	4×16	2

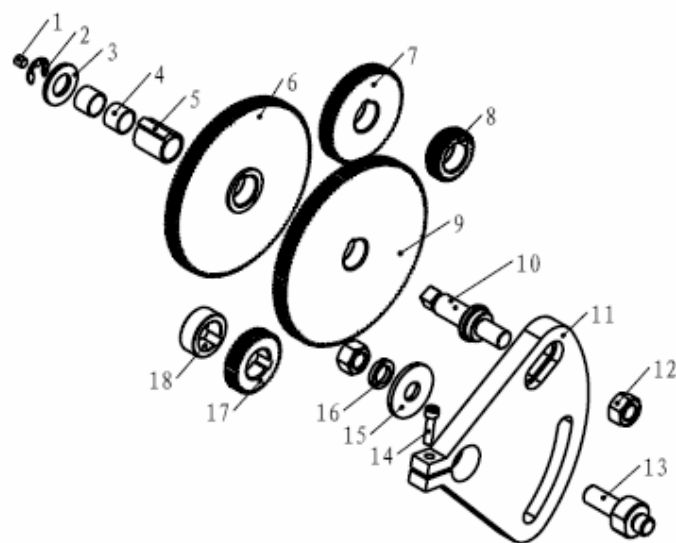
No.	Part No.	Name	Specification	Qty.
41	GB3452.1-82	O-Ring	11.2×1.8	2
42	GB3452.1-82	O-Ring	20×1.8	2
43	ML260-07-029	Lever		2
44	GBT96-85	Washer	6	2
45	GB70-85	Screw	M6×16	2
46	ML260-09-008	Plate		2
47	GB73-85	Screw	M8×8	2
48	GB2089-80	Spring	0.8×6×20	2
49	GB308-84	Steel Ball	6	2
50	GB819-85	Screw	M4×10	7
51	ML260-07-032	Sleeve		2
52	GB118-86	Taper Pin	6×22	2
53	GB70-85	Screw	M6×90	4
54	ML260-07-026	Fork		1
55	ML260-07-015	Bushing		1
56	ML260-07-016	Gear		1
57	GB1096-79	Key	4×10	1
58	ML260-07-017	Gear		1
59	ML260-07-018	Gear		1
60	GB73-85	Screw	M4×10	2
61	ML260-07-031	Cover		1
62	ML260-07-008	Shaft		1
63	GB1096-79	Key	5×80	1
64	ML260-07-012	Gear		1
65	ML260-07-011	Gear		1
66	GB1096-79	Key	5×25	1
67	ML260-07-010	Gear		1
68	ML260-07-005	Bushing		1

Thread Chasing Dial



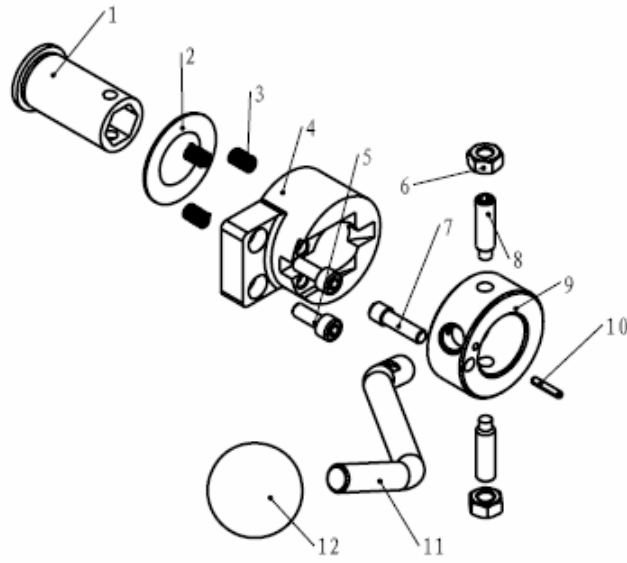
No.	Part No.	Name	Specification	Qty.
1	GB/T70.2-2000	Screw	M6×12	1
2	ML280-8104	Thread Chasing Dial		1
3	ML280-8101	Clasp Seat		1
4	GB70-85	Screw	M8×45	1
5	ML280-8102	Shaft		1
6	GB1096-79	Key	3×10	1
7	ML280-8105	Gear		1
8	ML280-8106	Gear		1
9	GB96-85	Washer	8	1
10	GB/T6170-2000	Nut	M8	1

Change Gear



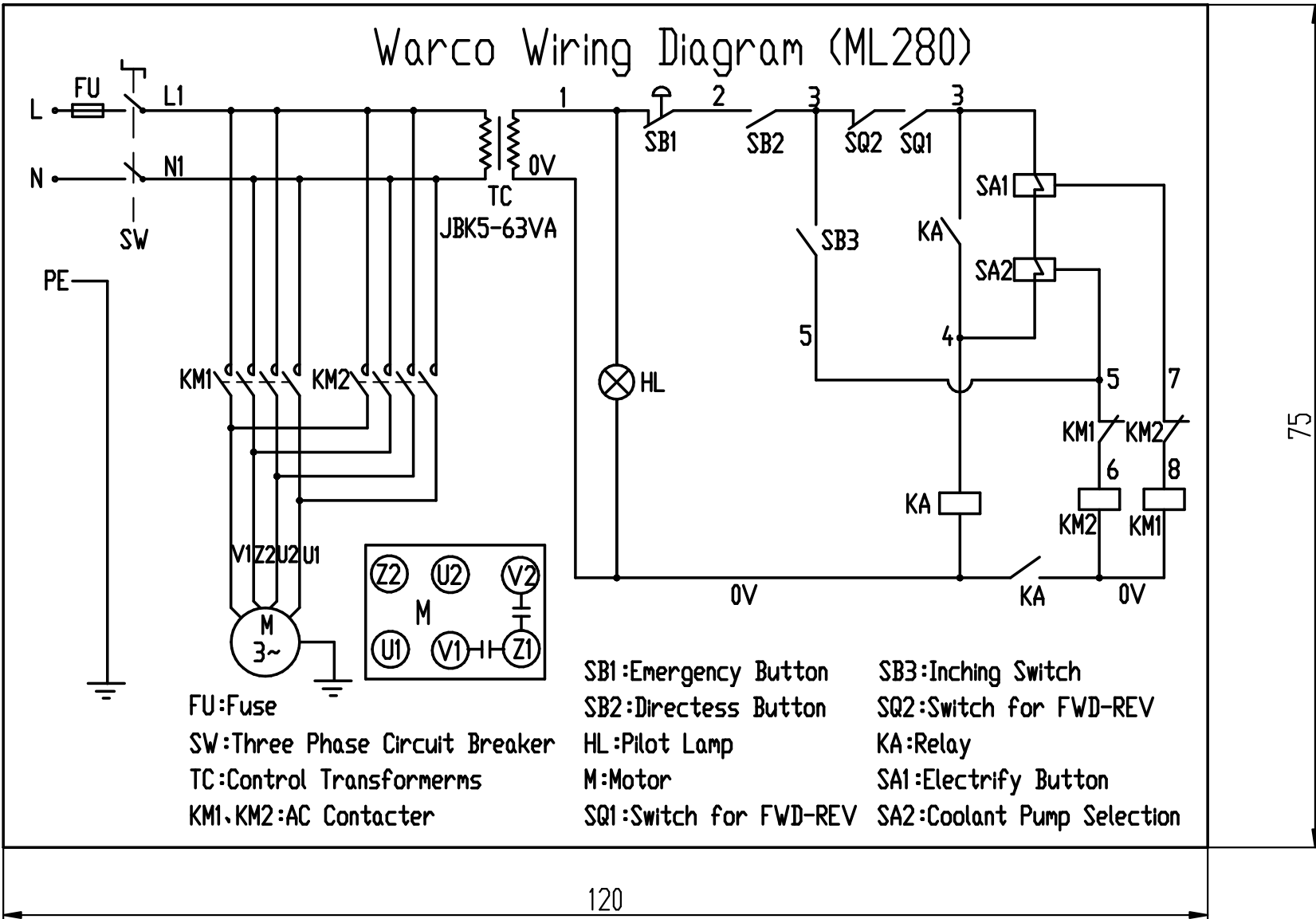
No.	Part No.	Name	Specification	Qty.
1	GB1155-79	Ball Cup	6	1
2	GB896-86	Split Washer	9	1
3	GB97.1-85	Washer	14	1
4	SF-1	Bushing	1412	2
5	ML280-02-008	Key Sleeve		1
6	ML260-07-037	Gear	Z120	1
7	ML260-07-040	Gear	Z64	1
8	ML260-07-036	Gear	Z32	1
9	ML260-07-038	Gear	Z127	1
10	ML280-08-006	Shaft		1
11	ML280-07-041	Bracket		1
12	GB/T6170-2000	Nut	M12	2
13	ML260-07-042	Shaft		1
14	GB70-85	Screw	M5 × 20	1
15	GB96-85	Washer	12	1
16	GB93-87	Washer	12	1
17	ML260-07-039	Gear	Z40	1
18	ML260-08-008	Washer		1

Reversing Maneuver



No. Par t No.	Name	Specification	Qty.
1 ML260-06-042	Shaft Sleeve		1
2 ML260-06-039	Washer		1
3 GB2089-80	Spring	1×6×20	3
4 ML260-06-038	Switch Bracket		1
5 GB70-85	Screw	M6×12	2
6 GB/T6170-2000	Nut	M8	2
7 ML260-06-041	Pin		1
8 GB79-85	Screw	M8×25	2
9 ML260-06-040	Bracket		1
10 GB879-86	Spring Pin	3×20	1
11 ML260-06-043	Lever		1
12 GB4141.11	Lever Bush	AM12×40	1

Warco Wiring Diagram (ML280)



FU:Fuse
 SW:Three Phase Circuit Breaker
 TC:Control Transformer
 KM1.KM2:AC Contacter

SB1:Emergency Button
 SB2:Directess Button
 HL:Pilot Lamp
 M:Motor
 SB3:Inching Switch
 SQ2:Switch for FWD-REV
 KA:Relay
 SA1:Electrify Button
 SA2:Coolant Pump Selection
 SQ1:Switch for FWD-REV

75

120