S M T C L

STC34 pipe SERIES CNC PIPE THREADING LATHES

INSTRUCTION BOOK

(For Mechanical Unit)

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THE PEOPLE'S REPUBLIC OF CHINA

THE CHINESE VERSION OF THIS TECHNICAL DOCUMENT IN ENGLISH IS REGARDED AS FINAL.

IT IS NECESSARY FOR YOU TO READ THIS BOOK CAREFULLY AND THOROUGHLY BEFORE OPERATING THE MACHINE.

MATTERS NEEDING ATTENTION TO OPERATION

Before operating the machine, please read this Instruction Book carefully and understand the whole content thoroughly. Only in this way, the machine can run safely.

Although the content of this Instruction Book is checked carefully, there are still some doubtful points, incorrect explanations or omissions, if there are, please contact our factory.

In order to explain the specific substance of this machine, some figures in the Instruction Book haven't shown the doors, protection devices, sleeves, etc. Therefore, before operating the machine, close all doors according to the content of the Instruction Book. Otherwise, some troubles may occur, making the main pats and other accessories damaged.

The protection doors of the machine are fixed to guarantee the safety of transportation. Before operating the machine, the users shall dismount the above-mentioned fixing devices; otherwise, the machine may be damaged.

This Instruction Book is compiled according to the present modules. Later, if there is any new module added, we shall revise this Instruction Book at any time. If you need to change a new one due to that the Instruction Book is damaged or lost, pay attention to the points mentioned above, please.

MATERS NEEDING ATTENTION TO INSTALLATION

In order to insure the machine run normally, care must be greatly taken to following items during installation of the machine:

1. Wiring Connection

1.1 The performance values of wire used for connecting the electrical parts should be equal to or more than the specified values in this book.

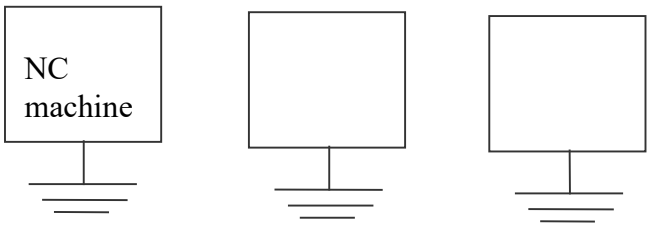
1.2 Never use the common terminal block with the equipment like welding machine or high frequency quencher, etc., which can make noise.

1.3 Power cable should be connected by skilled electrician.

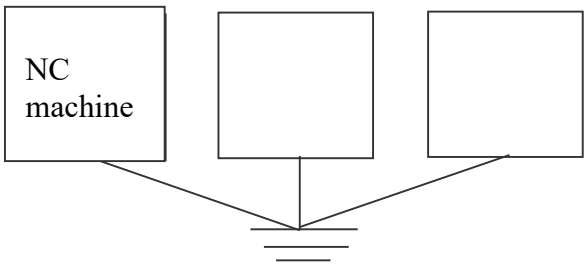
2. Grounding

The cross section and the grounding resistor of used grounding wire as well as matters needing attention to grounding should be in compliance with the standard GB5226.1-2002. The grounding wire shall be connected as shown by the figures given below.

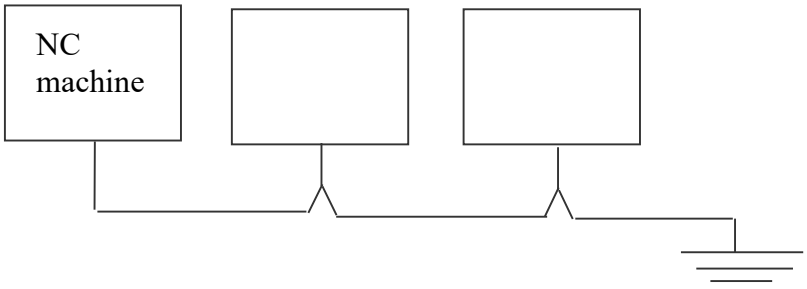
Single grounding wire:



Common grounding wire:



Never connected to one grounding rod for some equipment like the figure given below:



3. Environmental Conditions

The practical environment and running conditions available for the machine working have to be in accordance with following stipulation.

- Voltage of power supply: ±10% of the rated voltage of power supply.
- Frequency of power supply: 50Hz±0.5Hz (other special frequencies are also available)
- Environmental temperature: within the range of 5℃ ~ 40℃ the average temperature shall not be over 35℃for 24h running.
- Humidity: when the max. temperature is 405℃, relative humidity shall not be over 50%. Lower temperature is corresponding to higher permissible relative humidity (for example, when the temperature is 20°Ç, the corresponding relative humidity is 90%). Never cause condensation while humidity changing.
- Atmosphere: without excessive dust, acid gas, corrosive gas and salt composition.
- It is necessary to prevent the machine from sunlit case or thermal radiation, which can result in environmental temperature changing.
- The machine has not to be under the outside abnormal vibration.

If it is difficult for you to satisfy these requirements, please feel free to contact with us directly.

NOTICE TO ENVIRONMENTAL PROTECTION

The following stipulations have to be followed when the machine is finally scrapped:

- It is necessary to deliver some harmful or non-degradable wastes, including used batteries, electrical elements, rubber components, etc. which cannot be recovered or re-utilized to designated local recovering unit.

- For any waste liquid, such as lubricating oil, coolant, etc. that cannot be recovered or reutilized and lead to polluting environment, they have to be drained off at designated place in the factory.

CONTENTS

1 GENERAL DESCRIPTION

1.1 Applicable Range and Purpose of the Instruction Book

The machines of this series belong among the CNC pipe threading lathes which adopts semi-close ring with MITSUBISHI 64AS, FANUC 0i TC or Spain FAGOR 8035 control system and it is mainly applied to turn cylindrical/taper pipe threads of Inch/Metric system. In addition, the machine can also undertake the jobs of universal machine, such as turning external/internal cylindrical surface, arc, conic surface common threads and various profiles of shaft/chuck workpieces. The machine is available to turn drill rods, drill collars, casing rods and petroleum casing rods for petroleum, metallurgical, chemical department, water and electricity, geologic industries, etc. and the machine is especially suitable to turn casing rod in petroleum industry. Normal turning accuracy of the machine can be up to IT7, and the roughness of workpiece surface Ra 1.6μm.

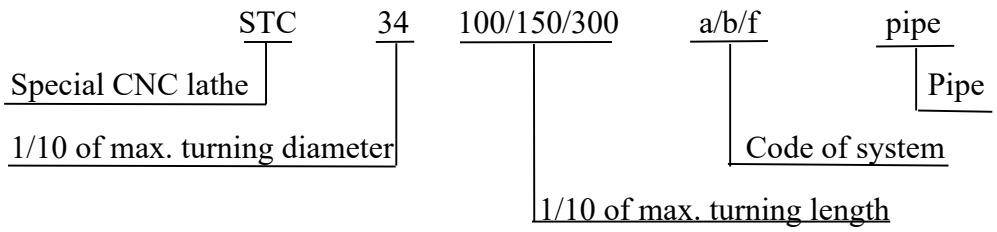
The important unit of mechanical unit of this machine are all treated by means of reinforcement, and the electric and hydraulic components are all selected from famous manufacturers both at home and abroad. The control system of the machine is provided with multi functions.

STC34 pipe Series CNC pipe threading lathes are reliable in structure, convenient in operation, particular in design, economic and practical, which creates fine working condition for users.

Table 1 Type of the machine and control system equipped

Type of the machine	Control system equipped
STC34100a pipe	MITSUBISHI -M64AS
STC34150a pipe	MITSUBISHI -M64AS
STC34100b pipe	FANUC 0i TC
STC34300b pipe	FANUC 0i TC
STC34300f pipe	FAGOR 8035

1.2 Meaning of Product Model



2 MATTERS NEEDING ATTENTION TO SAFEGUARD

The machines of this series are provided with various safety devices to prevent the operators from injury and the equipment from damage. Therefore, before operating the machine, it is necessary for the operator to understand the content of various safety labels and the following specifications completely and thoroughly.

2.1 Requirements of Basic Operation

Danger

- Never touch some devices such as control panel, transformer, motor, wiring box as well as other places with high voltage terminals, otherwise, they may cause shock.
- Never touch the switch with wet hand; otherwise, it will result in shock, too.

Notice:

- Be familiar with the position of emergency stop button, and in this way it is able to touch it immediately whenever they are needed.
- It is necessary to cut off the power of the machine before changing fuse.
- Enough space for working should be provided to avoid accidents.
- Water/Oil can make the floor slipping to cause hazard, and in order to avoid accidents, it is necessary to keep the working floor clean and dry.
- Confirm the switch to be used, never mistake.
- Don’t touch switch at will.
- The worktable near the machine shall be strong and stable to prevent accidents. In addition, it is necessary to avoid something sliding down from the worktable.
- If a job has to be completed by two persons or more, it is necessary to set the correspondence signal for each step, and the next step operation can’t be done unless the signal specified is offered.
- Turn off the switch of main circuit immediately as soon as any trouble occurs to the power supply.
- The recommended hydraulic oil, lubricating oil and grease or the confirmed oil with the same performance as the recommended ones should be used.
- It is necessary to use the fuse which has satisfied rated current value.
- Protect the operator’s panel or electric control panel from being attacked; otherwise, it may result in trouble, making device work abnormally.

- Don't change parameter value or other electric devices. If it must be changed, you should register the original value before changing, so it can recover to the original value when needed.
- Don't dirty, scratch or get down the warning labels. If the words on the labels are not clear or they are lost, order a new one from us. And when you order it, write the part No. of the required label clearly, please.

2.2 Requirements before Switching On the Power Supply

Danger:

All cables, wires or patch cord whose insulating covers are damaged will cause current leakage or shock, so check them before using.

Notice:

- It is necessary to understand all the details specified in the Instruction /book and Programming Manual, and make clear for every function and operation procedure.
- Wear the insulating shoes, overalls and other articles for safeguard.
- Close the doors and covers of NC unit, operator's panel, and electric control panel.
- The cables used for electrifying switch to the general breaker for power supply of the machine should have enough section to meet the needs of electric power.
- The cables set on the floor must be chip proof to avoid short circuit.
- After unpacking the wooden cases of the machine, when the machine is used for the first time, it is necessary to let the machine dry run for several hours. And every sliding part should be lubricated with new lubricating oil. The lubricating pump of the machine should work continuously until the oil seeps from the scraper.
- The oil in the oil tanks has to be filled to the oil level, check it, and refill it if necessary.
- For lubricating points, the kind of oil and relative oil position, please refer to their relative sign label separately.
- Every switch and operating lever should be nimble, smooth and their actions should be checked.
- When operating power-on of the machine, switch on the switch of supplying power (feeding) of the factory, the general breaker of power supply and the switch of power supply on the operator's panel of the machine in order.
- Check the amount of coolant, and add more coolant if needed.

Warn:

It is prohibited to shift the speed-changing lever in front of the headstock under any case

while the machine is running. Besides, starting is forbidden when the machine is at neutral step position.

2.3 Requirements after Switching On the Power Supply

Notice:

Check whether the light READY (Preparation) is light on, when the switch of power supply on the operator's panel is shifted to the position ON (switch on) according to the above-mentioned operating order.

2.4 Normal Inspection

Warn:

Never insert your finger in-between the pulley and belts when checking the tension of the belts.

Notice:

- Check if there is abnormal noise from the motor, gearbox and other parts.
- Check the lubricating condition of every slipping part.
- Check whether the safeguard devices and protective cover are under well status.
- Check the tension of belts, and if they are too loose, replace them with new matchable belts.

2.5 Temperature Raising

Notice:

- For raising the temperature of the machine, especially the temperature of the spindle and the feeding axes, it is necessary to make the temperature of the machine be up to the stable temperature while the machine is running at the mid-speed and under automatic status.
- Various actions of the machine are controlled by automatic operating program of the machine; therefore, check every action of the machine.
- If the machine has stood for a long time, don't carry out the actual turning as soon as it started, for the lack of lubricating oil may cause damage of slipping parts. Hereby, the thermal expansion resulted in of machine parts will be affecting the accuracy of machining. In order to avoid the status mentioned above, raising the temperature of the machine before actual working is necessary.

2.6 Preparation before Starting the Machine

Notice:

- The tooling shall be in accordance with the technical parameters, size and type of the machine.
- Excessive tool wearing can cause the damage of the machine; therefore, the seriously worn tools should be replaced by new ones beforehand.
- For the convenience of safety check, the working area should be enough brightened.
- Tools or other things around the machine or equipments shall be orderly, arranged keeping well relation and letting the path unblocked.
- Never put tools or other things on the headstock, tool-bracket cover or other similar positions.
- If the central hole of the heavy cylindrical workpiece is tool small, the workpiece will kip out of the center after being loaded. Therefore, pay attention to the specification and angle of the central holes.
- To avoid interference, the length of workpiece should be limited in the stipulations.
- Trial-running shall be carried out after installing the tools.
- The machine has to be carefully with kerosene for leaning up rust-proof materials; the inside of the headstock shall be cleaned by heated kerosene; the oil-leading knitting wool used various points should be cleaned up and then pull them back to their original position, the oilpaper and grease on the guideways should also be ridded of and they should be re-lubricated with guideway lubricating oil after guideways are cleaned up. Never use abrasive cloth or other hard things to scrap the machine. Fill the oil tank and water tank with proper quantity of lubricating oil and coolant separately according t the requirements.

  Before using the machine, it is necessary to read this Instruction Book in detail and be acquainted with the various requirements and working conditions of the machine, the functions and applying method of every button and knob. And then carefully check whether the electric system is in good status, whether the connection of wires and plugs are correct, whether there is vibrated loose or virtual connection in wiring and whether there is humidity to motor before switching on. And after switching on, pay attention to whether the rotating direction of the motor is in accordance with the specifications. It is necessary to know the instruction for the structure, functions, operation, lubrication and electric units carefully before starting the machine. Check the work of every part of the machine manually at first, and then input one single-program manually, and at last, manually input the auto.-cycle test of the whole machine. During the testing, the machine must run stably and be lubricated completely. Only when the machine is of nimble action and various functions in accordance with the requirements, it can be started to work.

2.7 Operation

Warn:

- The operators with un-restrained long hair are forbidden to operate the machine, and they should wear working cap while operating the machine.
- Don't wear gloves while operating the switches; otherwise, it is possible to cause fault actions, etc.
- Whenever move the heavy workpieces, it is necessary to carry out the work by two persons or more to eliminate the hidden trouble of danger.
- The operator of the fork type lifter, crane or other similar equipments, must have been professionally trained and have gained certificates.
- Whenever operating the fork type lifter, crane and other similar equipments, great attention must be paid to avoid collide with the surrounding equipments.
- The steel wire or hook being applied for handling must have enough rigidity and strength to meet the requirements of loading, and their working must be limited in the safe rules.
- The workpiece must be firmly chucked.
- The adjusting of coolant nozzle can only be carried out when the machine is stop status.
- Don't touch the workpieces that are under the machining or the rotating spindle by hand or in other ways.
- It is necessary to stop the working of tools and spindle before unloading the workpieces from the machine.
- Never clean the chips while cutting workpieces.
- It is prohibited to operate the machine before closing the safeguard devices well.
- Don't clear the chips on the cutter by bear hand, and do clear them by brush.
- The work of mounting and dismounting tools should be carried out only under machine stop status of the machine.
- While machining magnesium-alloy workpiece, the operator should wear gas mask.
- During the process of auto. Machining, don't open the door of the machine.
- The hot chips during heavy-load turning can cause fire, so the piling up of cutting chips should be avoided.

2.8 Interruption of Machining

Notice:

After completion of machining, before operator wants to leave from the machine temporally, the operator should turn off the switch of power supply on the operator's panel, and switch off the main circuit switch at the same time.

- After the machine stops, it is necessary to removal the chip and clean the doors, windows, covers, etc.
- Don't carry out the clearing work before stopping the machine stops.
- Back every part of the machine to its original position.
- Check whether the chip scraper is damaged, if it is, replace it with a new one.
- Check the polluting condition of coolant, hydraulic oil and lubricating oil, and if they are mixed-up seriously, replace them with fresh ones.
- Check the used quantity of coolant, hydraulic oil and lubricating oil, if necessary, add more to them.
- Clear the filter of oil plate.
- Before leaving from the machine, it is necessary to turn off the switch of the power supply on the operator's panel, the switch of main circuit of the machine and the switch of supplying power in the workshop.

2.9 Safeguard Devices

- Travel limitation.
- Storage-travel limitation (NC software)
- Emergency stop button.

2.10 Preparation before Maintenance of the Machine

- Any maintenance can't be done without allowance.
- Replacement of parts, wearing parts (seal, O-type ring, bearing, grease and oil) should be beforehand planed.

Notice:

- Carefully read and acquaint the safeguard devices specified in the Instruction Book.
- Read the Instruction Book carefully and be acquainted with the relative principles, structure and notices included in the book.

2.11 Maintenance Operation

Danger:

- During the maintenance, any one who has no relationship with the maintenance should not operate the main circuit or power on switch "ON" on the operator's panel, therefore, a sign plate with "the machine is under maintenance, don't touch the switch" or with the word of similar meaning should be hang on the switch or other suitable plate warning label should be easy to see to get down, but uneasy to fall down.
- It is dangerous to carry out the maintenance while power on. Principally, the switch of main circuit should keep being switched off from the beginning to the end of the maintaining period.

Notice:

- The electric maintenance work should be undertaken by professional maintainer(s) and the maintainer(s) should keep intimate contact with the personnel in charge, never make any decision by himself.
- Travel limiting devices, approach switches and other interlock devices shall not be dismounted or modified.
- It is necessary to use the fuse, cables, etc. produced by the qualified manufacturers.

2.12 Handling after Maintenance

Notice:

- After completing the maintenance, the working environment should be cleaned and re-arranged, the water and oil on every part should be cleared away to provide well turning environment.
- The unloaded parts and the cleaned waste oil all should be placed far away from the machine to guarantee the safety.
- The maintainer shall check whether the safety of the machine's operation is safe.
- Register and keep the data of maintenance and check for reference.

2.13 Miscellaneous

- Before the operator use the machine for the first time, it is necessary to know the structure, performances, operation and maintaining principles according to Instruction Book and the assembling drawing provided with the machine.

- It is necessary to add/change oil periodically in accordance with the Lubricating Chart, especially, when adding and changing oil for the oil tank, you have to clean out the impurity inside the oil tank completely.
- While starting the machine for the first time or re-starting the machine after long-period stop of the machine, it is necessary to start the hydraulic motor for one minute to lubricate every sliding part with lubricating oil completely at first, and then start the spindle.
- The operator must turn off the power before leaving from the machine.
- The carriage of the machine must be locked while handling the machine.

Warn:

When the chuck is running at high speed, the jaws must chuck the workpiece firmly to avoid being thrown off from the workpiece running.

3 HANDLING AND INSTALLATION

3.1 Preparation before Installation of the Machine

3.1.1 Environmental Requirements (for Machine)

The machine should not be installed in the following positions:

- The ambient temperatures can obviously change. For example, the machine's installing position is close to the heat resource or there is a heat resource near the machine.
- Too wet place.
- Too dusty, and too dirty places
- The vibration-resource place around the machine.
- The floor for installing the machine is not strong enough or soft.

Notice:

- If the machine has to be installed near the position with vibration resource, dig a canal around the machine or make similar measures for anti-vibration.
- If the machine has to be installed on the soft soil, it is necessary to use the pile way or similar measures to increase the supporting force of support of the soil, so that the machine will not sink or incline.

3.1.2 Environmental Requirements (for NC)

- Environmental temperature: (under the operation) Range of 5℃ ～40℃.
- Humidity: when the max. temperature is 405℃, relative humidity shall not be over 50%. Lower temperature is corresponding to higher permissible relative humidity (for example, when the temperature is 20℃, the corresponding relative humidity is 90%).

3.1.3 Power Interface

Wiring terminal of the power supply is at the side wall of the front leg of the machine.

3.1.4 General Power Supply

Prepare the wires for the general power supply and grounding according to the specifications given by the specifications table, refer to 《 Instruction Book for Electric Equipment and Operation of the Machine 》 for details.

3.2 Handling

- During handling, great attention must be paid to avoid the NC system and the high-voltage switchboard to be shocked. Before handling the machine, check if every part is stable or movable, whether there are articles that are not allowed to be put on the machine.

Handle the machine according to the following requirements:

- When handling the machine, fix the protective door at first; while lifting the machine packed in wooden case by a crane, it is necessary to carry out the lifting by strong steel rope in accordance with the lifting sign outside the case, and reduce the various shocks and vibrations to the packing case as fully as possible; while moving and unloading the case, the shock or strong vibration to the case bottom and sides and over including of the case should all be avoided to prevent the affect to the accuracy of the machine, and even damage to the machine; while the strong steel bars is applied to move the packing case on the slope, the inclining angle shall not be over 15° and the diameter of the bars shall not be over 70 mm; Never place the packing case on a prismatic body or upside down to avoid the affect to the accuracy of the machine.

  When unpack the packing case, at first, check the external condition of the machine and then check if the accessories and tools of the machine are complete according to the Packing List of the product.

  While lifting the machine unpacked by a crane, it is necessary to insert two round-steel rods of ϕ65-ϕ70 into the No. 1 and the No. 3 holes in front of the bed, and move the carriage and tailstock for balancing the machine. Before lifting the machine up, the wood blocks should be padded between the strong steel wire ropes and the positions touched with the machine, or sleeve the surface of steel wire rope with rubber hose to avoid the damage to the machine, the protective plate, etc.

- The machine should be kept balance both in horizontal and vertical directions. Therefore, at the very beginning when the machine being lifted up from the ground, the machine should be kept balancing.

- The angle of the handling steel wire rope shall not be over 60° .

Whenever the handling work is carried out by more than one person, signals shall be used mutually for cooperation.

3.3 How to Install the Machine

Before being dispatched from our factory, the machine has been checked and tested

completely. Incorrect installation will affect the accuracy and using performances of the machine, therefore, great attention must be paid to the installation f the machine. To guarantee the normal working of the machine, the foundation of the machine must have enough depth, and the practical depth of the foundation depends on the quality of local soil.

When applying the screws or wedge irons to adjust the position of the machine bed, it is necessary to tighten the foundation bolts up. While adjusting the leveling of the machine bed, it is necessary to make the carriage be at the middle of the travel. And then set the level on the two ends of the machine guideways, and the vertical reading number shall not be over 0.04/1000. Then fix he wedge irons with cement, fill cement mortar into the gap between the machine leg and the foundation of the machine to avoid the seeping in of oil.

The performances of a machine is greatly influenced by the installation way if the guideways of a machine is precisely made, but the installation of the machine is bad, the original accuracy of machining can't be reached, therefore, it is difficult to obtain the required machining accuracy. And most troubles are caused by improper installation.

It is necessary to read the installing procedures carefully and install the machine according to the requirements specified so that the machine can perform the turning of high accuracy.

3.3.1 Foundation

For installing machine, a plane installation place should be found at first. And then determine the installing space according to the foundation plan and arrange working environment in accordance with the specification, and at last, make foundation for the machine.

The floor space of the machine includes the floor space of the machine itself and its maintenance, and its requirements have been specified in the foundation plan of as shown in Fig. 1.

3.3.2 Temporary Leveling

- Lift up the machine, put the foundation bolts and wedge irons into leveling bolt holes.
- Put down the machine slowly, put he foundation bolts into foundation-bolt holes according to he specifications given by the foundation plan.
- Make the wedge irons be inserted into the bottom of the machine for rough adjustment.
- After completing the leveling adjustment, fix the foundation bolt by cement.

- If vibration-proof wedges are applied, the machine can be directly put on the even and plane floor.

3.4 Inspection of Inner Devices Connection

After the leveling adjustment, before switch-on of the machine, the following work shall be done:

- Be sure that the connection of earthing wire is correct (installing resistance should be lower than 10Ω).
- Tighten the screws on terminals.
- Re-check if every connector is tightly connected.
- Make sure the print-circuit board inside the NC devices is firmly fixed.
- Make sure the phase of the input power supply is correct. If the phase of the power supply is reverse, the trouble from NC devices and AC transfer-control board will be caused.

3.5 Inspection before Operation

After connecting the inside devices, check the mechanical system and the electrical system of the machine according to the following items.

- Cleaning

  The sliding surface and some metal-part surface of the machine are all coated with rustproof material for antirust. During the transportation of the machine, some dust, sand and other dirty things may get into the rust-proof coating, therefore, before cleaning the rust-proof coating of every part, the machine can't be started.

  While cleaning, it is necessary to apply the cloth dipped with cleaning-oil for cleaning. After clearance, film each sliding part with specified lubricating oil on its face.

- Inspect the machine.
  - Check if any part of the machine has been damaged.
  - Check if any part or attachment is lost.
  - Check if lubricating position has been well connected.
  - Check if the hydraulic pipes have been well connected.
  - Check electrical system before/after switching on (refer to the Instruction Book for《Electric Equipments and operation of the Machine》)
- Matters needing attention when the machine is under the stop status for a long time:

  When the machine is started first time after installation or after a long term of unused, it is necessary to press the lubricating button to lubricate the sliding surface

completely with lubricating oil.

3.6 Final Leveling Adjustment for the Machine Bed

After the solidification of the cement in the foundation holes, use the leveling bolts to do the leveling adjustment again, and set the level according to the specifications of "temporary leveling". For the steps and errors of leveling, refer to the "Test Certificate" provided with the machine.

Note:

After leveling, it is necessary to tighten the foundation bolts and leveling nuts firmly and guarantee there is no change in level accuracy. In addition, the min. graduation of the applied level shall be 0.02 mm.

3.7 Maintenance after Installation and Check of the Inner-device Connection

3.7.1 Maintenance of Primary Period after Installation

For the primary period after the machine installed, the level of the machine bed will change obviously for reasons of unstable solidifying of the surface and the un-stable solidification of foundation, thus, the accuracy of the machine will be greatly affected. On the other hand, the machine is very easy to be polluted by primary wear, very easy to result in machine trouble.

Some measures that shall be taken for primary period service after installation are given below.

- Trial-run

  Before the first time trial-run, it should be carried out with great care, and the time of trial-running is about one hour. Heavy load can't be used during trial running and after clearing the rustproof grease with cotton yarn and kerosene and then coat lubricating oil (other hard things are forbidden to apply to avoid scraping the machine). Before switching on the power supply, it is necessary to check whether the electrical system is under well condition, whether the connection of wires and wiring plug between electric cabinet is correct, and whether the motor is moist after switching on the power supply, pay attention to whether the rotating direction of the motor is in accordance with the specification. It is necessary to know the structural performance, the operating and lubricating instruction of the machine before starting the machine. Check the working condition of every part of the machine manually, and then check the auto-cycle trial-run condition. During the trial run, the machine is required to run stably, be lubricated completely, be stopped sensitively, and the machine can be started to work.

- Check the leveling condition of the machine bed in the primary period.

  Check the leveling of the machine bed after the machine is installed for six months, and check the changing condition of foundation at least once a month. If any abnormal phenomenon is found, correct it to reach the specified requirement so that the leveling accuracy of the machine bed can be ensured.

- Six months later, the checking period can be properly extended according to the situation of practical change, when the change reaches to a certain steadiness, the periodic check can be carried out once or twice a year.

3.7.2 Check the Connection of Inner Devices

Check NC devices, main machine, hydraulic devices, control panel and other devices to make sure that the electric connection is correct.

- Check if there is any loose in the connection of connector.

  Check if electric connections between devices are loose, if there are, tighten them.

- Check if the terminals are connected well.

  Check the machine interface and the terminal screws of electric equipments on control board; if any of them is loose, tighten it according to the requirements.

- Check if the terminal screws of installing screws on micro switch are loose, and tighten them when needed.

3.7.3 Check Electric Control Panel

Before checking, switch off the power supply of the machine, and then do the following inspections.

- Terminal screws and weldments

  Check every terminal screw on electric equipment, tighten them when they are loose, and slightly pull the weldments on relay board to make sure they are welded well.

- Inserted-type fuse

  Check if the fuse is loose, if it is, tighten it.

- Arc-quencher

  Check every arc-quencher, and it is necessary to change the one that has changed color.

- Cleaning

  When some dust, chip and dirty things or other similar foreign matters were inside the electric control panel, clean them carefully; otherwise, the trouble will result in.

- When the air filter become black, which means the air filter is polluted, dismount it

and wash it softly with water.

3.8 Floor Space and Drawing of the Foundation of the Machine

Refer to Fig. 1 and Fig. 2.

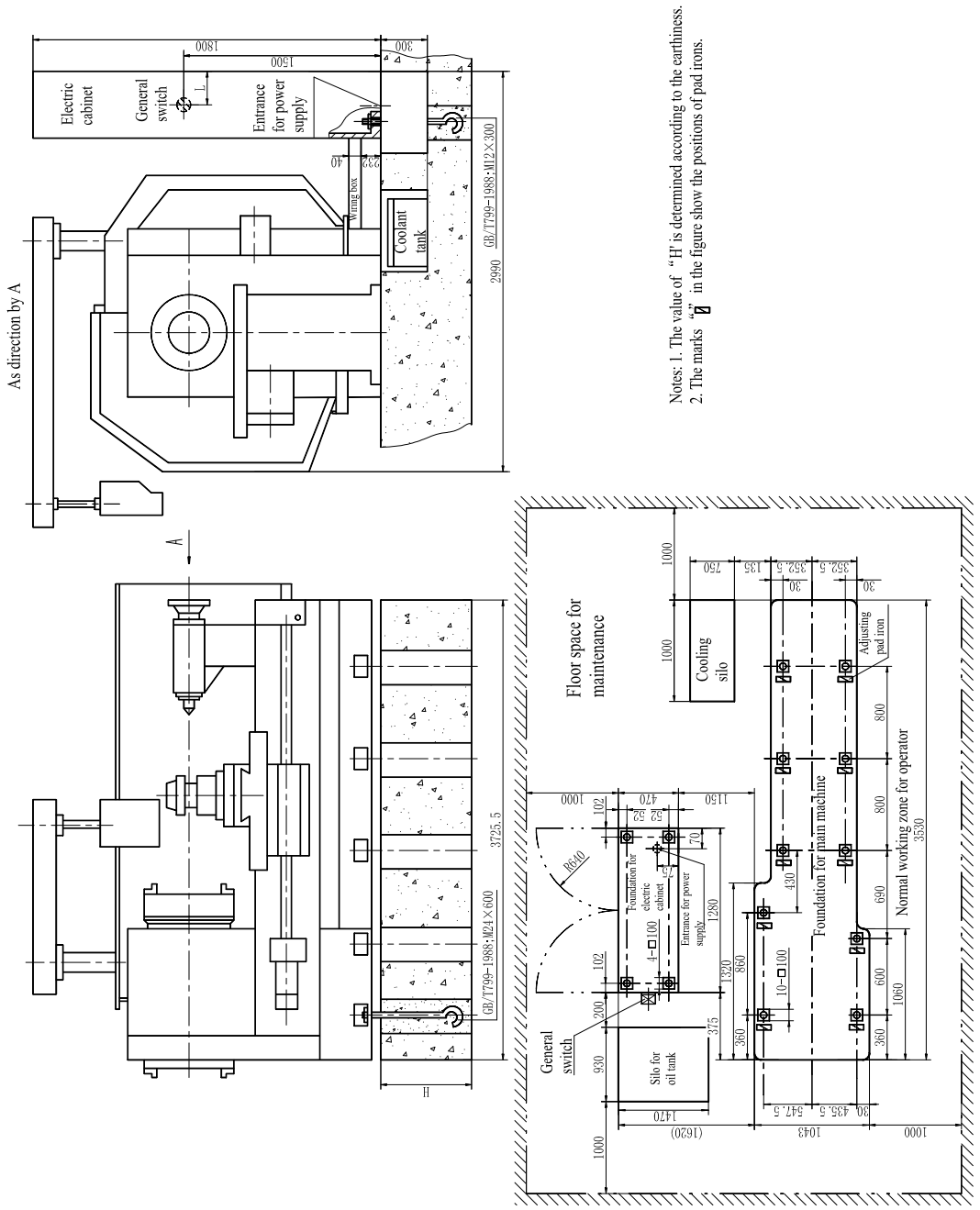
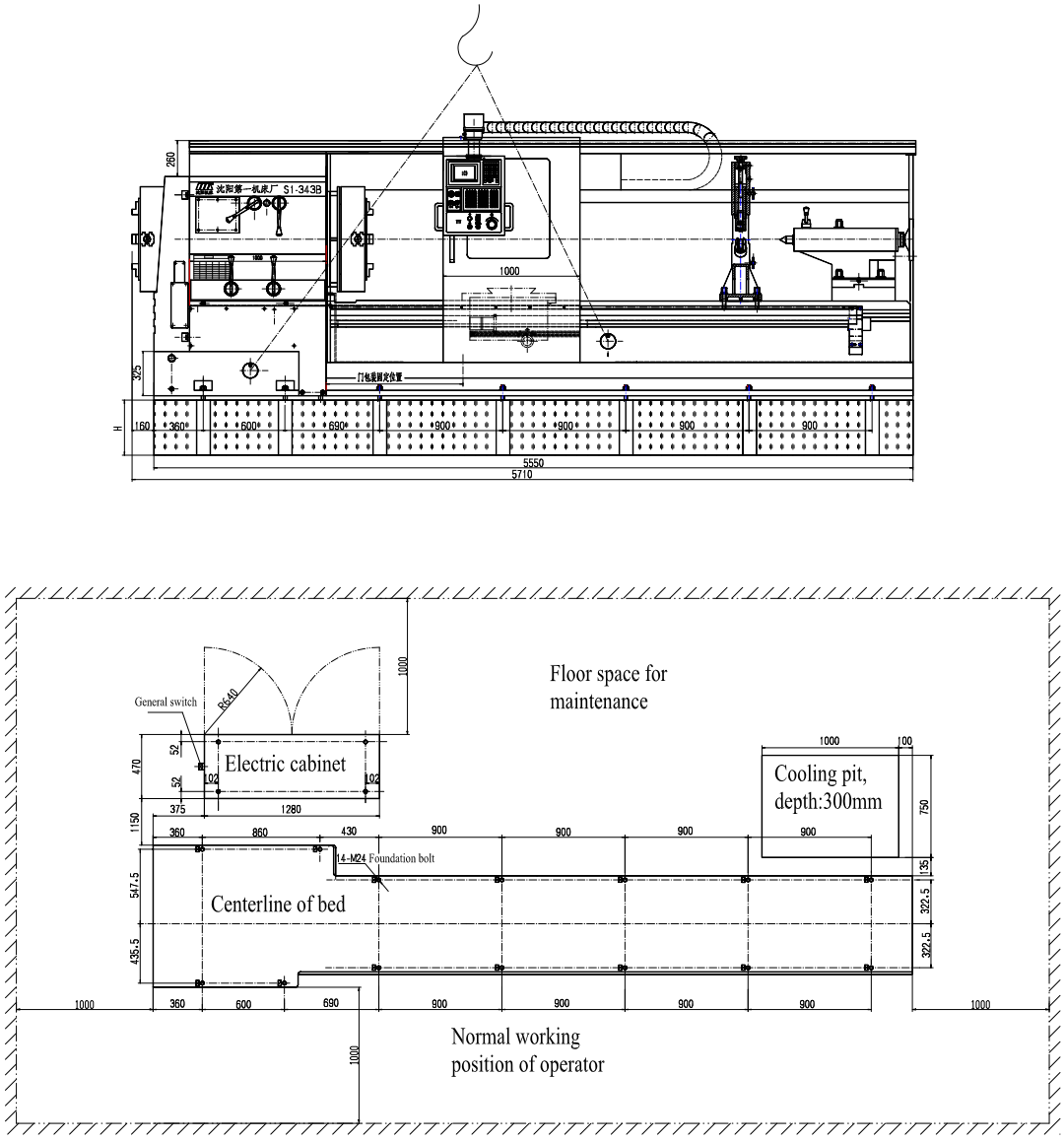


Fig. 1 Foundation plan of the machine (1000mm)



Notes: 1. The value of "H' is determined according to the earthiness.

2. The marks "▯" in the figure show the positions of pad irons.

Fig. 2 Handling and foundation plan of the machine (3000mm)

4 TECHNICAL PARAMETERS OF THE MACHINE

4.1 Major Specifications of the Machine

Height from the spindle center to guideway face	450 mm
Height from the spindle center to the floor	1150 mm
Max. outer dia. of pipe to be turned	340 mm
Max. center distance (with tailstock)	1000 mm; 1500mm; 3000mm (power-driven chuck) 900mm; 1400mm; 2900mm(hydraulic chuck)
Max. turning length (longitudinal travel of apron)	1000 mm; 1500mm; 3000mm (power-driven chuck) 900mm; 1400mm; 2900mm(hydraulic chuck)
Max. transverse travel of saddle	300 mm

4.2 Headstock

Dia. of spindle bore	355 mm
Steps of spindle speed	12 mm
Range of spindle speed	7-301r/min (power-driven chuck) 7.5-305 r/min (hydraulic chuck)

4.3 Feed System

Longitudinal/Transverse feed of turret and pitch range	
Longitudinal (Z-axis)	
Minute feed	0-8000 mm/min
Rotation feed	0.01-50 mm/r
Transverse (X-axis) (Dia. value)	

Feed per minute	0.6000 mm/min
Feed per revolution	0.01-50 mm/r
Min. setting unit of transverse/longitudinal feed of turret	
Longitudinal (Z-axis)	0.001 mm
Transverse (X-axis) (Dia. value)	0.001 mm
Travel of tool post per graduation of handwheel pulse generator	
Longitudinal (Z-axis)	0.001 mm
Transverse (X-axis)	0.001 mm

4.4 Tailstock

Dia. of center sleeve	100 mm
Travel of center sleeve	250 mm
Taper of tailstock center	Morse No. 5

4.5 Turret

Turret type	Vertical four-station turret
Cross section of tools	40×40
Number of tools	4 pcs.

4.6 Power System

4.6.1 Main Driving Motor

Table 2

Type	Y180M-4 B3	Y180L-4 B3
Power	18.5 kW	22 kW
Speed	1500 r/min	1500 r/min

4.6.2 Clamping Motor

Type	Y112M-4 B3
Power	4 kW
Speed	1450 r/min

4.6.3 Hydraulic Motor

Type	Y802-4 B3
Power	0.75 kW
Speed	1450 r/min

4.6.4 Operating and Lubricating System

Gear pump

Type	CB-B10
Pressure	2.5 MPa
Flow	0.01 m^3/min
Lubricating electronic pump	JB-35

4.7 Servo System

4.7.1 Longitudinal Servo Motor

Table 3

Type	HA200NC-S	α22/3000i
Power	3.5kW	4.0kW
Max. speed	2000 r/min	3000 r/min

4.7.2 Transverse Servo Motor

Table 4

Type	HA100NC-S	α12/3000i
Power	2.0kW	3.0kW
Max. speed	2000 r/min	3000 r/min

4.8 Cooling System

Cooling pump

Type	AOB-25
Power	90W
Flow rate	0.025 m^3/min

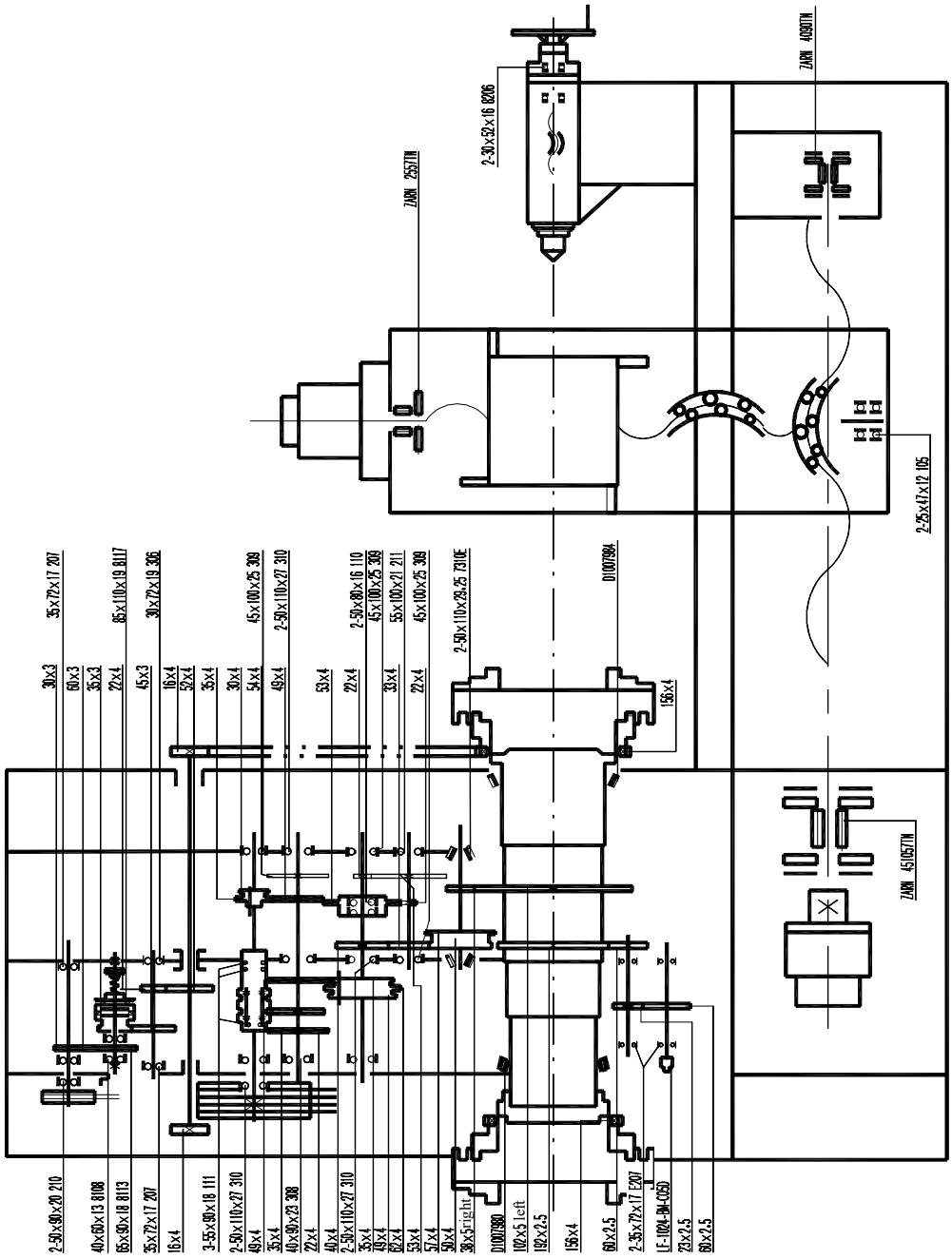
4.9 Net Weight and Overall Dimensions of the Machine

Table 5

Size (mm)	Overall Dimensions (mm)			Net Weight (kg)
	Length	Width	Height	
1000	3744	2000	1995	8300
1500	4180	2170	2042	9000
3000	5710	2170	2042	12000

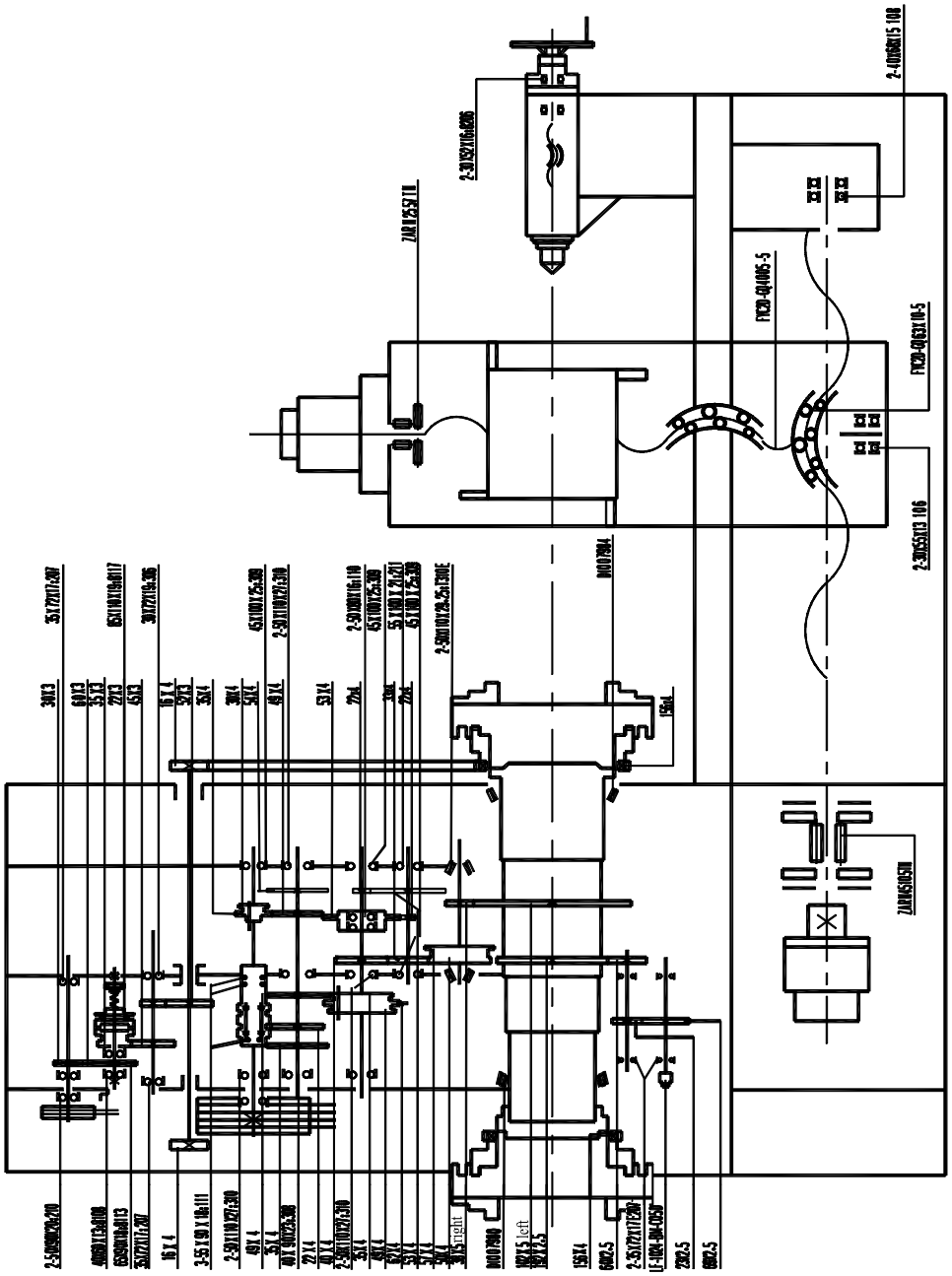
5 STRUCTURE AND FUNCTIONS OF THE MACHINE

For transmitting system and bearing arrangement of the machine, refer to Fig. 3 and Fig. 4, please.



Note: For the transmission of turret, refer to the Technical Document of Turret.

Fig. 3 Drawing for transmitting system and bearing arrangement of the machine (STC34100/150a pipe)



Note: For the transmission of turret, refer to the Technical Document of Turret.

Fig. 4 Drawing for transmitting system and bearing arrangement of the machine (STC34100/300b pipe)

5.1 Headstock

- Clearance of the single-row cone roller bearings on the spindles of the machine, are adjusted mainly through adjusting the rear nuts.
- The shaft I is provided with clutch to realize the braking of main transmitting system and the coupling of transmission (for power-driven chuck).
- The insurance device provided on the shaft X can cut off the oil line of shaft I when the clamping handle is at the position of clamping/releasing of the front and the rear chuck. In addition, the insurance device can control the spindle transmission to play a role in insurance and interlocking (for power-driven chuck).
- The front and rear chucks of the machine adopt the working way of mechanical driving workpiece and manual clamping and releasing. The rear end of the shaft VII is provided with electric control switch, and when the clamping motor is overloaded, the drag rod will switch off the travel switch by pressing. And then, the motor will stop immediately through feedback. The clamping force of the chuck can be changed through adjusting the spring nut (for power-driven chuck).
- The time for spindle braking must be controlled to be over 6 seconds.
- Speed changing of spindle is manual mode. When the clutch on the shaft I is unengaging, the speed of 12 steps can be obtained by the handle, and while changing speed, refer to the speed labels.
- The spindle box is provided with the spindle pulse encoder is provided on the headstock which couples with the spindle by two pairs of gears, when the data selected by F function is input into the CNC device, the machine can cut the thread with the corresponding pitch.

5.2 Tailstock

- Turn the center sleeve back, and make the screw rod end pushing ahead with the center, the center can be pushed out.
- The tailstock can move transversely, it is necessary to calibrate the index line on the tailstock against that of the base while recovering the calibration of spindle central line.

5.3 Feed

The longitudinal/transverse feed is realized through such a way that the servomotor is directly engaged with the ball screw to drive the transverse/longitudinal feed of the carriage.

5.4 Hydraulic System

The hydraulic system of the machine is divided into two parts: one is used for action control and lubrication of headstock, and the other is used for control of hydraulic chuck, action control of sizing device and lubrication of chuck (optional).

5.4.1 Function of the Hydraulic System of Standard Disposition

This hydraulic unit is mainly responsible for: starting spindle, braking spindle, and lubricating (including the headstock and coupler). This part of hydraulic system shares one gear pump for oil supply with the lubricating system, and the oil tank provided with gear pump and oil-pump motor is at the end of the bed under the rear chuck, and a volume of the oil tank is 60L, the oil draining hole is connected with the hydraulic control board on the headstock. The oil filter in the oil tank is connected with the sucking oil mouth of the oil pump. The pressure of oil pump is adjusted by the direct-action spill valve, and in general case, the pressure is 0.8~1.2Mpa. The pressure oil will flow to the panel-type oil filter first, and then flow to every action oil cylinder and lubricating point. For details, refer to principle drawing of hydraulic system (Fig. 5), please.

5.4.1.1 Components and Their Functions for Hydraulic System

Name	Type	Function	Qty.	Remarks
Direct-action spill valve	DBDS6P10/25	Adjusting the pressure	1	
Solenoid valve	4WE6J50/AG24NZ4	For braking/starting of the spindle	1	
Travel valve	23C-25B	Action insurance	1	In the headstock
Switch for pressure gauge	K-3B	For measuring the pressure of each point	1	
Pressure gauge	Y-60Z 4MPa	For observing the pressure of every point	1	Thread M14×1.5
Double/single direction throttle valve	Z2FS6-30	For adjusting the speed of starting /stopping	1	On the operator′s panel
Gear pump	CB-B10	Oil-supply of this system	1	On the cover of oil tank
Oil filter	S1-12TY38-1B	For filtering oil of the system	1	Manufactured by our factory

5.4.1.2 Pressure of Each Measured Point

- Working pressure P3

  While measuring the pressure, make the pointer of the switch of pressure gauge point downward at first, and then adjust the direct-action spill valve (with outer hexagonal spanner); clockwise rotating of the pointer is raising pressure, and counter-clockwise rotating it decreasing pressure; the reading from the pressure in general case, it shall be adjusted to the range of 0.8-1.2Mpa.

- The pressure before the oil filter P2

  While measuring the pressure, make the pointer of the switch for pressure gauge point left at first, and the reading from the pressure gauge is the pressure before the oil filter. When the value difference of the pressure before the oil filter P2 minus the working pressure P3 is more than 0.1Mpa, the panel-type oil filter (S1-12TY38-1B) shall be cleaned.

- Lubricating pressure P1

  While measuring the pressure, make the pointer of the switch for pressure gauge point upward at first, and the reading from the pressure gauge is the lubricating pressure that is created by flow distribution.

5.4.1.3 Oil Return and Protection of Pressure Gauge

When read out the pressure of every measured point, let the pointer of the switch for pressure gauge point right and cut off the pressure oil line; then the oil in the pressure gauge will return to the headstock through oil-returning hole, therefore, the pressure gauge can be protected.

5.4.1.4 Maintenance and Matters Needing Attention to This Part of Hydraulic System

- The oil tank and oil filter must be cleaned before starting the new machine.
- While filling oil, the oil tank must be filled to its max. volume .
- The pure hydraulic oil No. HL46 shall be used.

  Before starting the motor of oil pump, release the spill valve (the counter-clockwise rotation is decreasing pressure), and then start the motor of oil pump to observe if the oil pumped by the motor of oil pump. Adjust the pressure as requires, and check if there is any leakage in any oil pipe (oil-sucking pipes and oil-pressuring pipes); and the start the main motor to observe if the spindle has the actions of forward rotation, braking, etc.

- It is necessary to check whether the pressure of every part is normal before starting the machine every shift, if it isn’t normal, adjust or clean the oil filter

(S1-12TY38-1B) immediately.

- The overlaid single-way throttle valve is provided with on the operator's panel, it is used to adjust the starting and braking speed of the spindle.
- The pipes inside the headstock is provided with travel valve 23C-25B which is controlled by the cam on the transmitting shaft of clamping system; when the actions of clamping or releasing of the chuck is carried out, the cam will leave from the travel valve, and then the spindle will start at this time, the oil from the cylinder will return to the headstock through the travel valve, therefore, the insurance function is achieved.
- In order to guarantee the reliable and normal work of the machine, it is necessary to observe and adjust the working pressure (shall not be too high) often to keep the oil clean and to clean the oil filter headstock and oil tank on time according to the schedule.

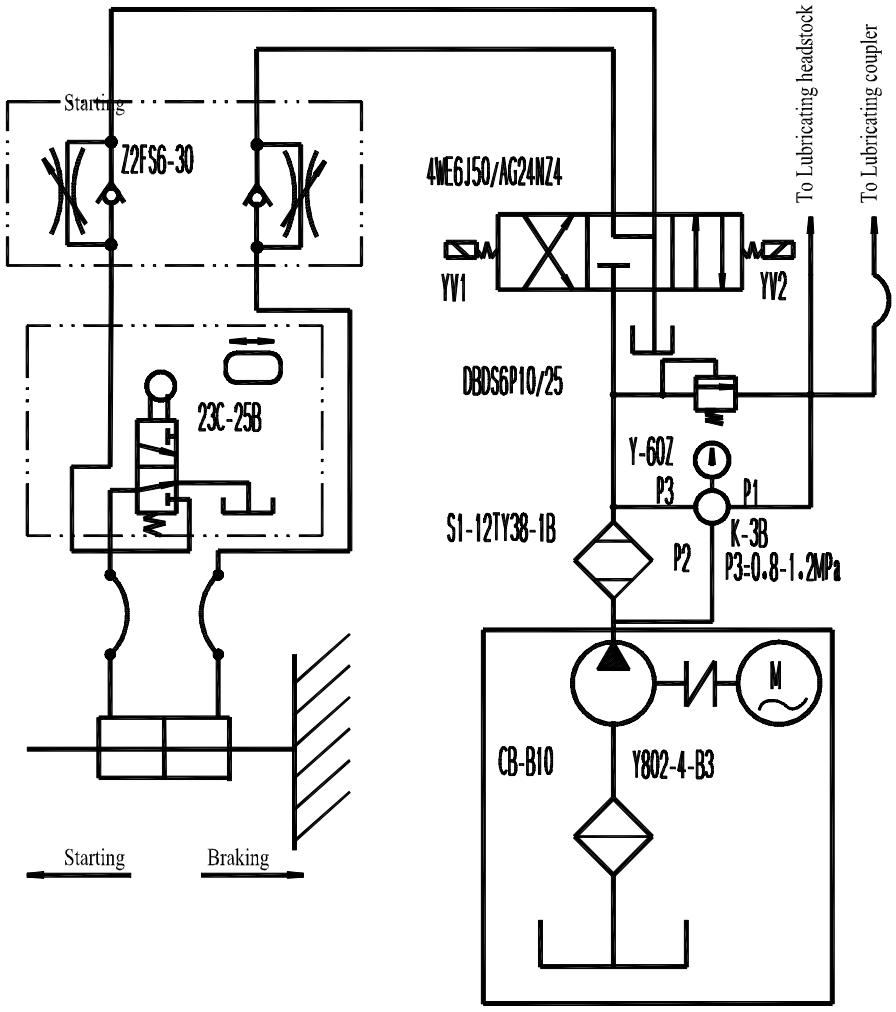


Fig. 5 Principle drawing of hydraulic system

5.4.2 Selection of Function of the Hydraulic System Equipped

This part of hydraulic system includes chuck clamping, sizing-device positioning, and sizing device rotating and chuck lubrication. The oil tank of this part is mounted at the side of the headstock, and the major control units of hydraulic system of this part are all selected from the products of Taiwan Northman Company. The hydraulic system and the lubricating system are controlled by their own motor and the pump separately. In addition, the motor and the pump are installed on the oil tank in the way of overlaying installation, with the compacting structure and convenient installation.

5.4.2.1 Major Specifications of the Hydraulic System

Motor pump group of the hydraulic system:	SMVP-30-3-3
Motor power of hydraulic system:	2.2 kW
Discharge capacity of variant pump of hydraulic system	16.7 ml/r
Adjustable range of pressure of hydraulic system	3.5~7 MPa
Adjusted pressure of hydraulic system	4MPa
Motor for lubricating system	Y80-4 (B3)
Type of gear pump of hydraulic system	P2-04-R-P-01-C-D
Adjustable range of pressure of lubricating system	0.5~1MPa
Power of motor for lubricating system	0.75kW
Volume of oil tank	250L
Overall dimensions of hydraulic station	1100 mm×1000 mm×620 mm

5.4.2.2 Working Principle of Control Return

See Fig. 6: Drawing of Hydraulic Principle.

- Setup of Hydraulic System ‘

  The variable pump employed by hydraulic system is variable vane pump. The pump is low in noise and stable in performance, the rated discharge capacity is 16.7m/r, and the adjustable range of pressure is 3.5~7Mpa.The actual flow of the pump can be adjusted according to the movement speed of chuck, and the adjusted pressure is about 4MPa.

- Chuck clamping return

  During the machining process, the clamping force of the chuck can be adjusted in accordance with the actual machining status by means of the pressure-relief valve, and generally, the working pressure can be adjusted to about 4Mpa. When the YV1.1 is electrified, the chuck is clamping, and when theYV1.2 is electrified, the chuck is releasing. During the cutting process, SP3 will alarm if the pressure drops because of the trouble in the system, and then the machine stops.

- Sizing-device positioning return

  In general case, the working pressure of sizing-device positioning can be adjusted by corresponding pressure-relief valve. And the adjusted pressure is about 1Mpa and its action is controlled by electromagnet YV5.1.

- Return for revolving of sizing-device

  In general case, the working pressure of sizing-device return can be adjusted by corresponding pressure-relief valve. The adjusted pressure is about 1Mpa and its action is controlled by electromagnet YV11.1.

5.4.2.3 Lubrication of Chuck

Refer to Fig. 6: Principle drawing of hydraulic system

The lubrication return consists of lubricating pump, lubricating motor, spill-valve, etc. Spill-valve RF-G02-1-10 is used to adjust the pressure of lubricating points, and its adjustable range of pressure is about 1.0Mpa. The lubricating oil will return to the oil tank through oil filter, and in order to prevent blocking up of oil filter for oil return which may result in non-free of oil return, clearance for oil filter shall be carried out in time.

5.4.2.4 Maintenance and Matters Needing Attention of This Part of Hydraulic System

This part of hydraulic system employs No. HL46 hydraulic oil, and it should be changed regularly according to the used condition. Check the level of oil in the oil tank often, and if it is lower than the lowest level, add oil in time. While oiling, the added oil must be filled through air filter. Periodically check, clean or change the oil filter for oil suction in the oil tank. If abnormal noise or vibration occurs in the hydraulic system, check and maintenance shall be immediately carried out.

5.4.2.5 List of Main Hydraulic Units of This Unit

List of Hydraulic Elements

Name	Type	Qty.	Manufacturer
Oil filter for oil-suction	WU-63×80-J	1	
Air filter	AB-1163	1	Taiwan Northman Company

Name	Type	Qty.	Manufacturer
Meter for oil level and temperature	LS-5"	1	Taiwan Northman Company
Motor-pump group	SMVP-30-3-3	1	Taiwan Northman Company
Check valve	CI—T04—05—10	1	Taiwan Northman Company
Six-point pressure gauge	MS2A/20-60-5	1	
Check valve	MC-02P-05-30	1	Taiwan Northman Company
Pressure-relief valve	MPR—02P—K0—20	1	Taiwan Northman Company
Electromagnetic reversing valve	SWH—G02—B2—D24—20	1	Taiwan Northman Company
Check valve	MC-02P-05-03	1	Taiwan Northman Company
Pressure-relief valve	MPR—02P—K0—20	1	Taiwan Northman Company
Electromagnetic reversing valve	SWH—G02—B2—D24—20	1	Taiwan Northman Company
Check valve	MC-02P-05-03	1	Taiwan Northman Company
Pressure-relief valve	MPR—02P—K1—20	1	Taiwan Northman Company
Pressure relay	MPS-02P-K1-20	1	Taiwan Northman Company
Electromagnetic reversing valve	SWH—G02—D2—D24—20	1	Taiwan Northman Company
Air cooler	ACE4-M1-02-65	1	
Air filter	AB1162	1	Taiwan Northman Company
Meter for oil level and temperature	LS-5"	1	Taiwan Northman Company
External gear	P2-04-R-P-01-C-D	1	Taiwan Northman Company
Oil filter for pressure oil	BYH-63×10BS	1	
Spill valve	RF—G02—1—10	1	Taiwan Northman Company
Oil filter	WU-160×80-J	1	

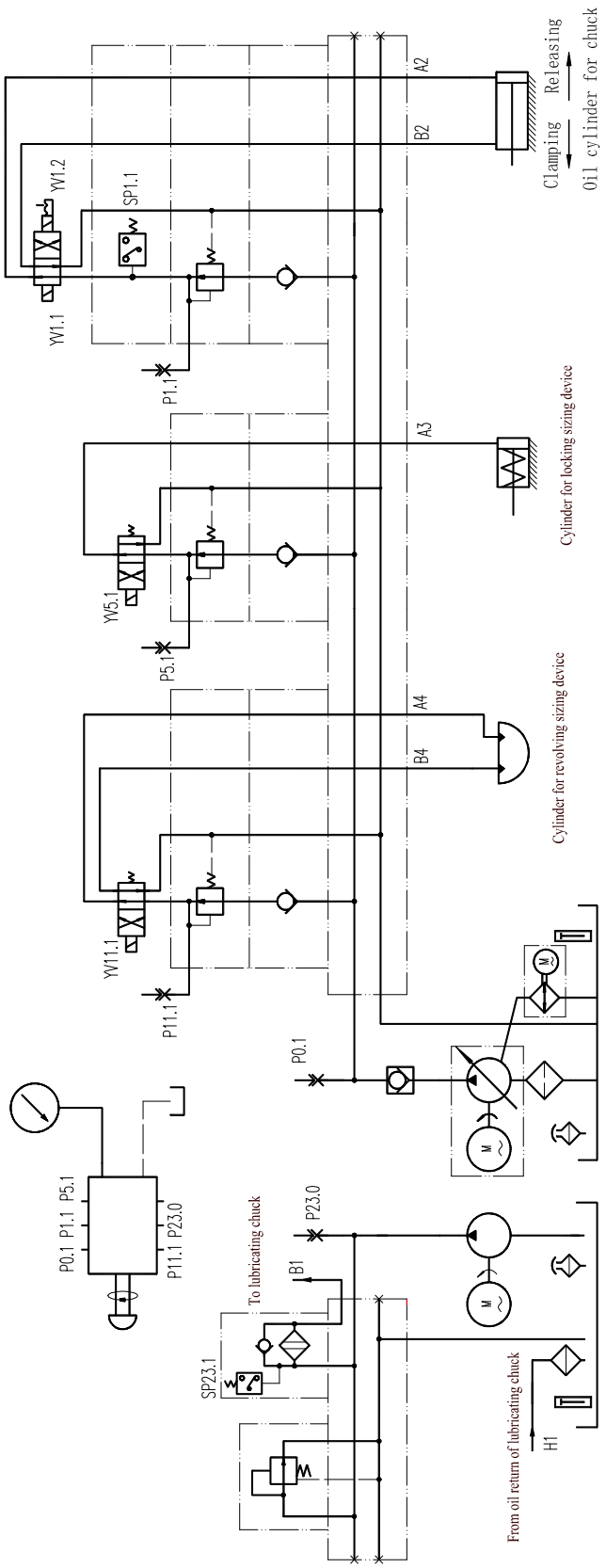


Fig. 6 Principle drawing of the hydraulic system

6 INSPECITON AND MAINTENANCE

6.1 Routine Inspection

Routine Inspection			
No.	Inspected Positions	Inspected Items	Remarks
1	Oil leveler of lubricating position	● Whether the oil is enough. ● Whether the oil is obviously Polluted.	If the oil is not enough, please add more.
2	Coolant level	● Whether the coolant level is suitable. ● Whether the coolant is obviously polluted. ● Whether the filter of oil plate is blocked.	If necessary, please add more. If necessary, please change oil. If necessary, please clean the filter.
3	Guideways	● Whether the oil supply is enough. ● Whether the scrapper is damaged.	
4	Pressure gauge	● Whether the pressure is enough.	See Chapter 5.2.6 “Hydraulic system”.
5	V-belts	● Whether the tensioning force is suitable. ● Whether there is breakage and scratching.	
6	Overview of pipes and the machine	● Whether there is oil leakage. ● Whether there is coolant leakage.	
7	Movable parts	● Whether there is noise and vibration. ● Whether the movement is even and normal.	
8	Operator′s panel	● Whether the functions of switches and handles are normal.	
9	Safeguard devices	● Whether under the normal working condition.	
10	Cooling fan	● Whether the fan of control box and operator’s panel rotates.	
11	Outer wires and cables	● Whether the wire/cable is broken. ● Whether the insulting cover is damaged.	
12	Motor, gear box and other rotary parts	● Whether there is noise or vibration. ● Whether there is abnormal heat-output.	

Routine Inspection			
No.	Inspected Positions	Inspected Items	Remarks
13	Cleaning	● Clean the surface of chuck the guideway cover of saddle and chip shield and chips.	Be carried out when finish the work.
14	Lubrication of chuck	● Lubricate the surrounding of the chuck-jaws.	Once a week.
15	Machining work of the machine	● Whether the machining accuracy is in accordance with the specifications.	

6.2 Periodical Inspection

No.	Inspected Positions		Material Items	Interval
1	Hydraulic system	Hydraulic devices Pipe joints	● Change the hydraulic oil and clean the filter. ● Inspection of oil leakage.	Six months Six months
2	Lubricating system	Lubricating devices pipes	● Clean the suction filter. ● Check if there is oil leakage, blocking and breakage of pipes.	One year Six months
3	Cooling devices	Filter Chip plate	● Clean chip plates. ● Change coolant, and clean filter and water tank.	Carry it out properly. Carry it out properly.
4	Air devices	Air filter	● Clean the filter and change it.	One year
5	V-belts	Belts and pulleys	● Overview inspection, and tension inspection. ● Clean the pulleys.	Six months
6	Spindle motor	Sound, vibration, temperature-raising and insulting resistance	● Check the abnormal sound of bearing. ● Clean the pulleys.	Six months
7	Servo motors of X-axis and Z-axis	Sound, temperature -raising	● Check the abnormal sound and temperature-rising condition of bearings, etc.	One month
8	Chucks	Chucks rotary oil cylinder	● Dismount the chuck and clean the chips out of the chuck. ● Check the oil leakage of revolution oil-cylinder.	One year Three months

No.	Inspected Positions		Material Items	Interval
9	Operator′s panel	Electric devices and wiring screws	● Check if there is any abnormal odor, and color changing of electric device and any abrasion on the contacting surface, and check the tension of contacting screws. ● Check the dirty things and clean out.	Six months One month
10	Connection of inner devices	Electric connection among controlling box and other devices of machine	● Check and tighten every wiring screw. ● Check and re—tighten the screws on the wiring terminals like relay.	Six months
11	Electric devices	Switch of limit stopper Sensor solenoid valve	● Inspect and re-tighten the installing screw and wiring screws. ● Check its functions and cutting condition through specific actions.	Six months One month
12	X-axis and Z-axis	Clearance	● Measure the clearance by dial gauge	Six months
13	Foundation	Leveling of machine bed	● Inspect and adjust the leveling of machine bed by level.	Once a year

6.3 Lubricating and cooling

For the Lubrication Chart of the machine, refer to Fig. 7, please

6.3.1 Hydraulic Devices

The major items of hydraulic device maintenance: change and supply of hydraulic oil, and check and cleaning of oil filter.

- Change of hydraulic oil

  Although the hydraulic oil changing is determined by the frequency of oil used by machine, basically speaking, for the first time changing oil, all the oil shall be changed after the machine has been operated for 3 months. Later on, change once for every six months.

  If the customer requires using the oil products like hydraulic oil, etc. from other manufacturers, please refer to the following table for the product codes of the famous brands in the world that corresponds to the oil products used for the machine.

List for Names of Oil Products both at Home and Abroad

China	MOBIL	SHELL	CASTROL
HL32 hydraulic oil	DTE Light hydraulic oil	Tellus Oil 32 hydraulic oil	Hyspin 32 hydraulic oil
HL46 hydraulic oil	DTE Medium hydraulic oil	Tellus Oil 46 hydraulic oil	Hyspin 46 hydraulic oil
No.3 common Li-based grease	Mobilux 3 Li-based grease	Alvania Grease 3 Li-based grease	Spheerol AP3 Li-based grease
No.2 Ca-based grease	Grease 2 Ca-based grease	Unedo Grease 2-based grease	Spheerol UW Ca-based grease

- Cleaning of oil filter

  While changing oil, it is necessary to inspect the oil filter and clean it, and it is necessary to dismount the oil-sucking pipe before dismounting oil filter from the oil tank. Change the oil filter once a year according to the using situation.

6.3.2 Lubricating Devices

Major inspecting/maintaining items of lubricating devices are as following:

6.3.2.1 Adding Oil

Add oil according to the specifications.

6.3.2.2 Cleaning or Changing of Oil Filter

- Cleaning of the oil filter

  Clean/change the oil filters inside the apron box once a year. The oil filter will be seen when the oil pump is taken out from the apron box, and never forget to clean the inside of the apron box after the oil pump is taken out.

- Cleaning and changing

  The oil filter on the headstock shall be cleaned once for every six moths. Take out the oil filter and copper mesh from the left endface of the headstock and clean them, if necessary, change the copper mesh with a new one.

- Inspection for the lubricating condition of lubricating parts

  Ensure every lubricating part is lubricated. If a certain lubricating part is not lubricated, the leakage may result from lubricating oil pipeline or the blocking from pipe joints. The blocked pipe joints can’t be further used, and it must be replaced by a new one.

6.3.3 Cooling Devices

Maintaining items of cooling devices are as following:

- Normality of cooling pump.
- Change of coolant

  When the spurted quality of coolant from coolant-spurting nozzle reduces, it is necessary to check the coolant level in coolant tank (chip plate) immediately. If you find the coolant is not enough, it is necessary to add coolant and let the level be over the sucking mouth of cooling pump. If the coolant is too dirty, it is necessary to change all the coolant. At the same time, it is necessary to clean the inside of chip plate.

- Cleaning of the filter

  Take out the filter to clean and change it with a new one.

6.4 Adjustment and Maintenance of the Machine

6.4.1 Adjustment of V-belts

If the borne tension force of the V-belts is more than the permissible value, service life of the belts and bearings may be shortened. Oppositely, if the tension force is too small, the belts will not have enough force to transfer the rated power.

Move the base of motor upward and downward to adjust the tension force of the belts. The proper tension force of the belts shall be determined by the swag force resulting from the loading of belts.

Adjust the tension of belts periodically according to the following steps. For the first time, the period is 3 months, and later on, adjust it once for every six months.

Steps:

- Pull the belts by hand in the vertical direction of the belts and the acting force must be acted between the two pulleys.
- Tighten the four installing bolts on the motor seat.
- Tighten the adjusting bolts and move the motor seat to make the belts be of proper tension.
- Clean the slot-channel of the pulleys.

  If there is oil, dirty things, dust or the similar things like the above in the slot-channel of the pulleys, the belts will be sliding, and therefore, the service life of the belts will be shortened.

6.4.2 Headstock

Excessive clearance in the spindle bearings directly influences the turning accuracy. Rotary accuracy of the spindle includes two kinds: that is, radial run-out and periodic axial slip. The former is guaranteed by the double-row centripetal short cylinder roller bearing set on he front end of the spindle and the later by the centripetal thrust-force bearing at the rear end of the spindle. And the accuracy of this item had been adjusted well before dispatch of the machine, and no needing to adjust in general case.

6.4.3 Chuck

After long period working, chips will pile up in case inside the applied hydraulic chuck and this case will cause troubles. Therefore, dismounting and installing shall be carried out every six months to clean chuck.

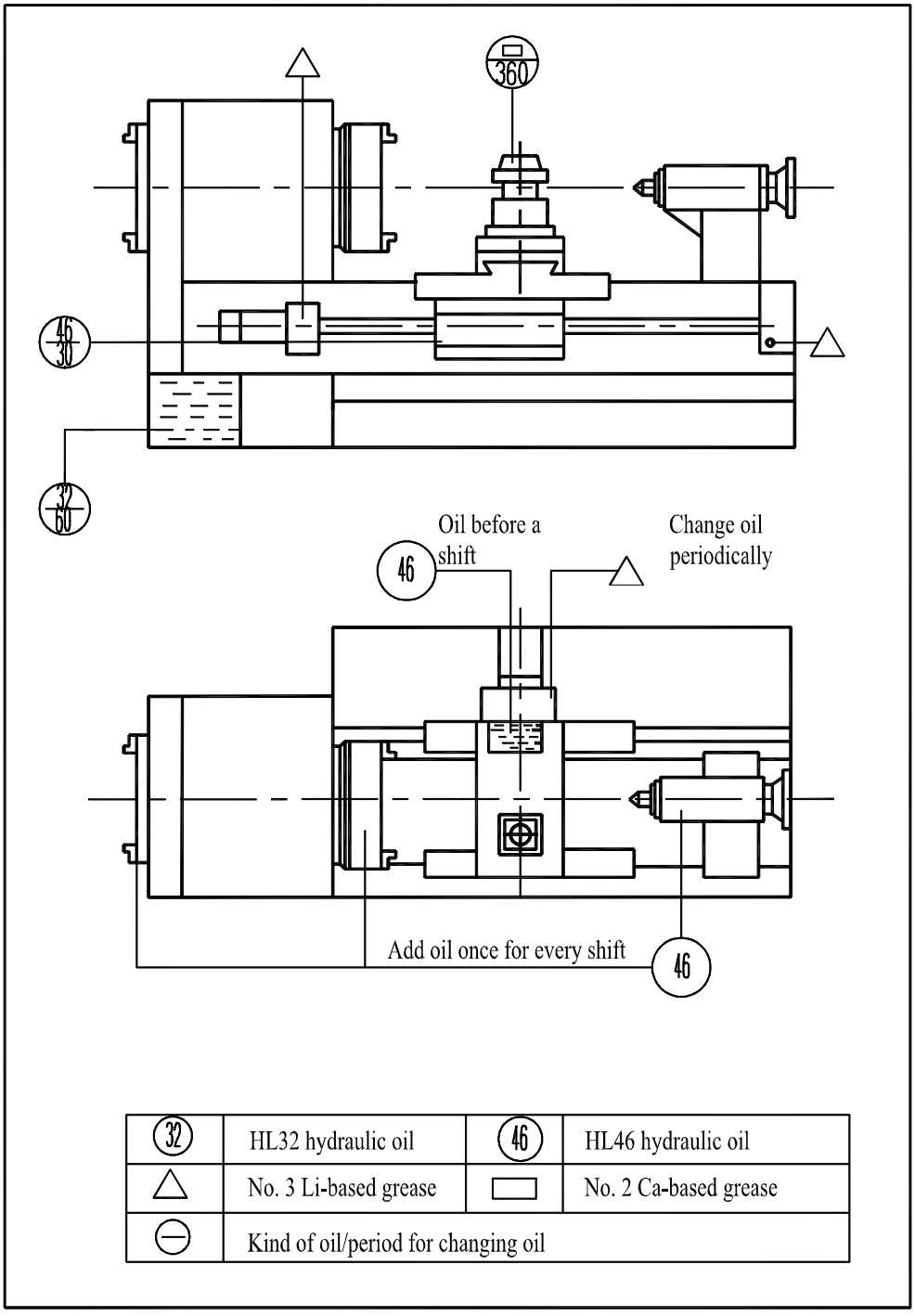


Fig. 7 Lubrication chart of the machine

7 ACCERRORIES AND IMPLEMENTS OF THE MACHINE

No.	Name	Type and Marks		Qty. and Unit	Remarks
1	Middle-size rotary center	5	S26—2A	1 set	
2	Screw-driver	9×12	S81—1	1 pce	
3	Screw-driver with wood lever	150×0.5	S81—2	1 pce	
4	Double-head spanner	12×14	S91—1A	1 pce	
5	Double-head spanner	17×19	S91—1A	1 pce	
6	Double-head spanner	21×24	S91—1A	1 pce	
7	Double-head spanner	27×30	S91—1A	1 pce	
8	Inner-hexagon spanner	6	S91—7	1 pce	
9	Inner-hexagon spanner	8	S91—7	1 pce	
10	Inner-hexagon spanner	10	S91—7	1 pce	
11	Inner-hexagon spanner	12	S91—7	1 pce	
12	Inner-hexagon spanner	14	S91—7	1 pce	
13	Jaws	φ114～φ250		8 pcs	Power-driven chuck
14	Jaws	φ200～φ340		8 pcs	
15	Spanner for square-head screw	17	S92—5	1 pce	
16	Hook wrench	28~32；	S93—1	1 pce	
17	Hook wrench	35~42；	S93—1	1 pce	
18	Hook wrench	45~52；	S93—1	1 pce	
19	Hook wrench	55~62；	S93—1	1 pce	
20	Hook wrench	110~130；	S93—1	1 pce	

No.	Name	Type and Marks	Qty. and Unit	Remarks
21	Pincers for retaining ring	2.2； S94—1A	1 pce	
22	Oil gun	YQ100	1 pce	
23	Foundation bolts	GB/T799-1988 M24×600；	10 pcs	1000 mm
			14 pcs	3000 mm
24	Nuts	GB/T6170-2000 M24	10 pcs	1000 mm
			14 pcs	3000 mm
25	Washers	GB/T97.1-1985 24	10 pcs	1000 mm
			14 pcs	3000 mm
26	Foundation bolts	GB/T799-1988 M12×300	4 pcs	
27	Nuts	GB/T6170-2000 M12	4 pcs	
28	Washers	GB/T97.1-1985 12	4 pcs	
29	Chuck tools		1 set	

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0086 24 25842189 (For foreign users)

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