



KL **SERIES**

CNC LATHE

KL-42 Series

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KL-50 Series

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Operator's Manual & Parts List

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WARNING

Persons unable to read English must have this manual read and explained to them before operating or maintaining the machine.

Everyone working on the machine must know how to operate it safely and correctly to avoid possible injury.

1.

SAFETY INSTRUCTIONS

1. SAFETY INSTRUCTIONS

WARNING

Do not install, operate, or service this machine until:

- 1) You have read and understand the safety instructions on the pages that follow.
- 2) You have read and understand the operator's manual, especially knowing the function and location of all machine controls and read manuals for any related accessories.
- 3) You have read and understand all safety and instruction plates attached to the machine and it's related accessories.
- 4) Prior to install or services the machine read and understand the maintenance manual.
- 5) To service the machine must be done only by competent and trained personnel.

NOTICE

The following safety instructions are general recommendations for most common operations on a turning machine.

Additional safety measures may be required for your particular application. Therefore, makes no warranty or representation as the absolute correctness of sufficiency of the instructions.

1.1 General safety instructions for operating the machine

- 1) The best defense against injuries on a turning machine is to be alert. Never initiate a machine function unless you completely understand what the function will cause the machine to do.
- 2) Never operate the machine with any cover or shield opened or removed.
- 3) Never reach into the work area when the spindle is rotating or if the machine is in automatic mode.
- 4) Put the machine in manual mode and be sure last programmed function has been Completed before reaching inside of the work area.
- 5) The functions of the machine make it impossible to eliminate all pinch points. Be particularly aware of the following pinch points:

- * Spindle and chuck rotation
 - * Indexing of turret and tools
 - * Carriage and cross-slide movement
 - * Tailstock movement, both quill and body
- 6) Keep machine and area around it clean and well lighted. Never allow chips , coolant or oil to remain on the floor. Do not leave loose objects on around machine.
 - 7) Clothing :
 - * Wear safety glasses with eye shields at all times. Protect your eyes. Never use a compressed air house to remove chips from a machine.
 - * Never wear loose fitting clothing. Remove all jewelry (rings, watches, necklaces...etc.). They can be caught in moving parts of the machine.
 - * Gloves are easily caught in moving parts. Take them off before turning the machine on.
 - * Always wear safety shoes with steel toes and oil-resistant soles.
 - * Wear a safety helmet when working near overhead hazards.
 - * If operator has long hair, hair should always be tucked under a cap or tied back and up.
 - 8) Turning machine are designed to be run by one person. Persons other than the designated operator should stay out of the machine area during operation.
 - 9) Take care, not to bump or accidentally touch the machine control. Doing so can initiate an unintended machine movement which could cause an injury or a wreck.
 - 10) Do not paint, alter, deface or remove any warning plates from the machine.
 - 11) Report any loose, worn or broken parts to your supervisor. The same action should be taken if any unusual noise or machine action occurs.
 - 12) Never operate the machine after taking strong medication, using non-prescription drugs, or consuming alcoholic beverages. Persons with illness, which might cause dizziness or fainting, should never operate this machine.
 - 13) The electric components are protected from normal moisture resulting from humidity use of water base soluble coolant, etc. Do not, however, use water house to clean the machine or the area around it.
 - 14) Never touch a machine control device or electrical component when your hand is wet. Keep flammable liquids and materials away from the work area and chips.
 - 15) Never clean up chips while the machine is running or is in automatic mode.
 - 16) Do not file work pieces being rotated under power.
 - 17) At the end of the work day the machine should be placed in either "control

off” or “power off” modes.

- 18) When restarting a machine after it has been shut down, always assume it has been tampered with. Recheck all phases of the job as though you were running the first piece.
- 19) Never touch spindle start or spindle jog control until hands, feet, and body are well clear of the work area.
- 20) Coolant and oils can make surfaces on the machine slippery. They can also present an electrical hazard if the machine has power on. For these reasons do not stand on any part of the machine at any time.
- 21) Never extend an unsupported bar out of the rear the spindle or hydraulic cylinder a distance from a concentric support more than 10 times of it's diameter. Doing so can cause the bar to bend or break. When any bar is extended, a large sign should be placed to warn people to stay away from the area.
- 22) If your turning machine has a bar-feeder interfaced to it , keep yourself and others away from the exit end of the bar-feeder when the machine running.

1.1.1 Safety instructions for work holding

- 1) Never run a job on this machine until you are 100% sure the work piece is being held in such a manner as withstand the centrifugal force from rotation and cutting forces of the tooling. If there is any doubt , whatever , consult with your supervisor.
- 2) A chuck is the most common work holding device used on this machine. Some of the factors affect the holding device used on this machine. These factors which affect the holding ability of a chuck are :
 - * Clamping force of jaws
 - * Rotational speed of the spindle
 - * Type of jaw surface (serrated , smooth , etc.)
 - * Area of chuck configuration of the work piece...shape, weight, and balance
 - * Jaw weight and location
- 3) With air or hydraulic actuated power chuck (optional accessory) , make sure the jaws are gripping the work securely before they reach the end of their travel. When using a power chuck, check the hydraulic or air pressure before every operation. Low chucking pressures will diminish jaw-gripping force, which may allow the work piece to come out of the jaws. Excessive pressure can damage a power chuck, which could cause a loss of jaw force. The gripping force of a power chuck can be diminished as much as 50% because lack of lubrication or lack of periodic cleaning. Components of the chuck are subject to wear and damage which also can lessen gripping power. Grease

the chuck at the beginning of every shift. Use only the chuck manufacturer's recommended lubricant.

- A. A weekly examination of the condition of chuck should be made. This examination should include the measurement of jaw clamping force with a jaw force gage to insure that the chuck is function , as it should.
 - B. Refer to manufacturer's manual for chuck and cylinder for any other maintenance requirements. As the spindle R.P.M. increase the gripping force of the jaw decreases. The larger the chuck diameter the more loss becomes. Various types of top jaws are serrated contact surfaces on work piece. Improper usage could cause serious injury or death. Remember-chucking a work piece safely involves many variables. If you have the slightest doubt regarding the safety of your set-up for a job , consult with your supervisor.
- 4) Never operate spindle-mounted accessories over their rated speed. If the chuck or accessory is not supplied by original maker, verify the safe operating speed with the manufacturer.
 - 5) Always be sure the chuck the chuck or accessory is located correctly on the spindle nose and it is securely bolted the face of the spindle.
 - 6) Be sure any item bolted or clamped to a chuck or fixture is securely fastened before starting the spindle.
 - 7) Proper lifting equipment should be used for heavy chucks, fixtures, and work pieces.
 - 8) Always is aware f that closing chuck jaws could trap fingers or hands.
 - 9) The same safety instructions that apply to power chucks also apply to manual operated chucks. The following additional precautions should be taken when using a manual chuck :
 - A. Always use spring-loaded, self-ejecting type safety wrenches.
 - B. Never put an extension bar on a chuck wrench or hit with hammer.
 - C. Never run a gear scroll chuck without having something chucked in the jaws. Centrifugal force can cause the scroll to unwind if the chuck is empty. If this occurs, the jaws may come out of the chuck while the spindle is turning.
 - 10) If a work piece is extended from the chuck a distance of 3 to 4 times its diameter, without being supported by the tailstock, poor cutting condition will normally occur. Under no circumstances extend an unsupported work piece more than this amount without supporting the work piece with the tailstock. Doing so can cause the part to bend or break.

1.2 Maintenance safety instruction

WARNING

High voltage is used to power the machine; only authorized electricians should correct any electrical component failure. Disconnect main power and lock in off position before attempting any repair. Tag disconnect switch "DO NOT START"

- 1) Read and understand safety instructions for machine operator before servicing this machine.
- 2) Know all points where high voltages are present on this machine and in electrical boxes.
- 3) Residual voltages can exist in electrical cabinets for a period of time after power has been turned off. Check any component inside cabinet with a meter before touching.

1.3 Installation precautions

To ensure the safe operation of the NC machine, note the following during installation.

1.3.1 Wiring

- 1) Be sure to use electrical conductors with performance ratings equivalent or superior to those described in the Maintenance Manual.
- 2) Do not connect to the power distribution panel any power cables for device, which can cause Line noise, such as ,are welders and high frequency quenching machines.
- 3) Arrange for a qualified engineer to connect the power lines.

1.3.2 Grounding

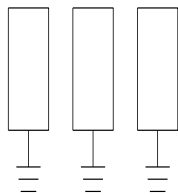
Use a grounding wire with a cross section of more than 14 mm and a resistance to ground of less Than 100 ohms.

This wire size should be greater than AWB (American Wire Gauge) No. 5 and SWG (British Legal Standard Wire Gauge) No.6.

Generally, the NC machine should be ground to a separate grounding rod. If an independent ground cannot be provided for the machine, prepare the ground connection as follow:

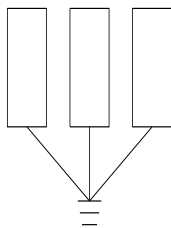
- 1) Connect a single conductor to it's own grounding terminal. This will avoid possible serious accidents resulting from ground currents ,which might otherwise flow in the NC machine if a peripheral device , should malfunction.
- 2) Be careful when using concrete reinforcing rods as grounding points. These reinforcing rods often are used to ground equipment because they usually offer a resistance to ground of less than 100 ohms. In doing so, make the connections as follow:
 - A. Do not use the same grounding-reinforcing rod or grounding terminal for other devices since this could lead to line noise such as produced electric welders and high frequency quenching machine.
 - B. Use a grounding terminal with an adequate electrical performance rating and which is durable.
- 3) A separate grounding wire should be used, one whose length is as short as possible.
- 4) Check the resistance to ground by actual measurement. This should measure less than 100 ohms if the single device is connected to its own grounding rod.

Desirable Independent Grounding:



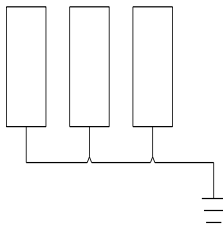
Earth resistance: Less than 100 ohms

Common grounds:



Resistance to ground = 100 the number of devices connected to the grounding (Ω)

Never ground equipment as shown in the left side figure (FORBADE) :



(Wrong Grounding)

1.3.3 Environmental conditions

Generally, the machine will be installed on the following conditions. However, these may change over a period of time or in response to seasonal changes.

- 1) Supply voltage : 90% to 110% of nominal supply voltage
- 2) Source frequency : $\pm 2\text{Hz}$ of nominal frequency
- 3) Ambient temperature : 0°C to 45°C (32°F to 113°F)
- 4) Relative humidity : Less than 80%
Temperature changes should not cause condensation.
- 5) Atmosphere : Free from excessive dust, acid fumes corrosive gases and salt
- 6) It should be avoided to expose the machine to direct sunlight or heat rays which can change the environmental temperature.
- 7) Avoid exposing the NC machine to abnormal vibration.
If it is difficult to observe meet these conditions, contact us immediately.

1.4 Safety precaution

This machine is provided with a number of safety devices to protect operator and equipment from being injured and damaged. Operators should not, however, rely solely upon these safety devices but should operate the machine after fully understanding what special precautions to take by reading the following remarks thoroughly.

Basic operating practices

DANGER

- 1) Some control panels, transformers, motors junction boxes and other parts have high-voltage terminals, these should not be touched or a severe electric

shock will be sustained.

- 2) Do not touch a switch with wet hands. This, too, can cause an electric shock.

WARNING

- 1) The emergency stop push-button should be well known so that it can be operated at any time without having to look for it.
- 2) Before replacing a fuse, switch off the machine.
- 3) Provide sufficient working space to avoid hazardous. To prevent accidents all floors should be dry and clean.
- 4) Water or oil can make floors slippery and hazardous. To prevent accidents all floors should be dry and clean.
- 5) Before operating switches, always check that they are the right ones.
- 6) Never touch a switch accidentally.
- 7) Workbenches near the machine must be strong enough to prevent accidents. Articles should be prevented from slipping off the bench surface.
- 8) If a job is to be done by two or more persons, coordinating signals should be given at each step of the operation. Unless a signal is given and acknowledged, the next step should not be taken.

CAUTION

- 1) In the event of power failure, turn off the main circuit breaker immediately.
- 2) Use the recommended hydraulic oils, lubricants and grease or acceptable equivalents.
- 3) Replacement fuses should have the proper current ratings.
- 4) Protect the NC unit, operating panel, electric control panel, etc. from shocks, since this could cause a failure or malfunction.
- 5) Do not change parameters, values and other electrical settings unnecessarily. If such changes are unavoidable, record the values prior to the change so that they can be returned to their original settings if necessary.
- 6) Do not soil, scratch or remove the caution plate. Should it become illegible or be missing, order another caution plate from the supplier. (Specifying the part number shown at the lower right of the plate.)

1.4.1 Before switching on

DANGER

Cables, cords or electric wires whose insulation is damaged can cause current leaks and electric shocks. Before using these, check their condition.

WARNING

- 1) Be sure the instruction manual and the programming manual are fully understood. Every function and operating should completely clear.
- 2) Use safety shoes, which are not damaged by oil, safety goggles with side covers, safe clothes and other safety protection.
- 3) Close all electric cabinet doors, operating cover, fully guarding door before switching machine on.

CAUTION

- 1) The power cable from the factory feeder switch to the machine main circuit breaker should have a sufficient sectional area to handle the electric power used.
- 2) Cables which have to lie on the floor must be protected against chips so that short-circuits will not occur.
- 3) Each sliding part must be freshly lubricated before starting to operate the machine after unpacking or keeping the machine idle for a long period (several or more). For the lubricating and so forth, keep lubricating oil pump working until oil oozes out from wiper. Contact our Service Station in connection with what procedure should be taken since it depends on the type of machine.
- 4) Oil reservoirs should be filled to indicate levels, check and add oil, if necessary.
- 5) For lubricating points, oil brands and appropriate levels, see the various instruction plates.
- 6) Switches and levers should operate smoothly.
- 7) Check the coolant level, and add coolant, if necessary.
- 8) When switching the machine on, connect the factory feeder switch to the machine circuit breaker, and then turn power switch to the ON position in order

1.4.2 Routine inspections

WARNING

When checking belt tensions, do not get your fingers caught between the belt and pulley.

CAUTION

- 1) Check pressure gages for proper readings.
- 2) Check motor, gearboxes and other parts for abnormal noises.
- 3) Check the motor lubrication, and sliding parts for evidence of proper lubrication
- 4) Check safety covers and safety devices for proper operation
- 5) Check belt tensions. Replace any set of belts that has become stretched with a fresh matching set.

1.4.3 Warm up

- 1) Warm up machine, especially the spindle and feed shaft by running them for 10 to 20 minutes at about half or one-third the maximum speed in the automatic operation mode.
- 2) This automatic operation program should cause each machine component to operate. At the same time check their operations.
- 3) Be particularly careful to warm up the spindle, which can turn up to 3500rpm. If the machine is used for actual machining immediately after being started; following a long idle period, sliding parts may be worn due to lack of oil. Also, thermal expansion of the machine components can jeopardize machining accuracy. To prevent this condition, always warm the machine up.

1.4.4 Preparations

WARNING

- 1) Tooling should conform to the machine specifications, dimensions types.
- 2) Seriously worn-out tools can cause injuries. Replace all such tools with new ones beforehand
- 3) The work area should be adequately lighted to facilitate safety checks.
- 4) Tools and other items around the machine or equipment should be stored to ensure good footing and clear aisles,

- 5) Tools or any items must not be place on the headstock, turret, cover and similar places.
- 6) If the center holes of heavy cylindrical work piece are too small, the work pieces can jump out when loaded. Be careful about center holes and angles.

CAUTION

- 1) Tool lengths should be within specified tolerances to prevent interference.
- 2) After installing a tool, make a trial run.

1.4.5 Operation

WARNING

- 1) Do not work with long hair that can be caught by the machine. Tie it up at the back, out of the way.
- 2) Do not operate switches with gloves on. This could cause malfunctions, etc.
- 3) Whenever a heavy work piece must be moved, two or more persons should always work together if there is any risk involved.
- 4) Only trained, qualified workers should operate forklift trucks, cranes or similar care should be taken to prevent collisions and damage to surroundings.
- 5) Whenever operating a forklift truck, crane or similar equipment, special care should be taken to prevent collisions and damage to surroundings.
- 6) Wire ropes or slings should be strong enough to handle the loads to be lifted and should conform to the mandatory provision.
- 7) Grip work pieces securely.
- 8) Stop the machine before adjusting the coolant nozzle at the tip.
- 9) Never touch a turning work piece or spindle with bare hands or in any other way.
- 10) While a work piece is turning, do not wipe it off or remove chips with a cloth or by hand. Always stop the machine first and then use a brush and a sweeper (for machine).
- 11) Do not operate the machine with safety front guard and chuck covers opened.
- 12) Use a brush to remove chips from the tool tip not bare hands.
- 13) Stop the machine whenever installing or removing a tool.
- 14) Whenever machining magnesium alloy parts, wear a protective mask.

CAUTION

- 1) The machine could not open under automatic operation. Also, the machine front guard can't be opened under automatic operation model.
- 2) When performing heavy-duty machining, carefully prevent chips from being accumulated since hot chips can catch fire.

1.4.6 To interrupt machine

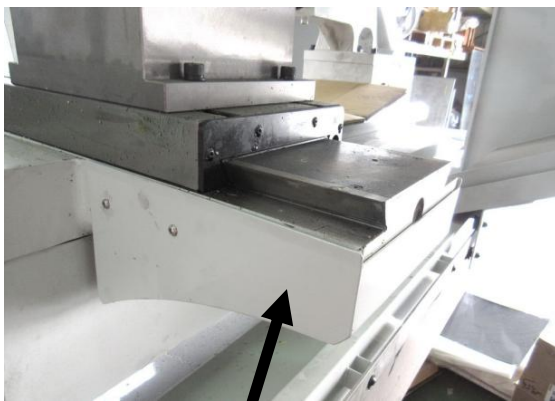
WARNING

- 1) When leaving the machine temporarily after completing a job, turn off the power switch on the operation panel, and the main circuit breaker.
- 2) When being a sudden power failure in the processing state, turn off the power first. Then open the right cover, put the L-wrench into the screw end of the Z-axis at the reverse exit from the work piece as shown as figure.

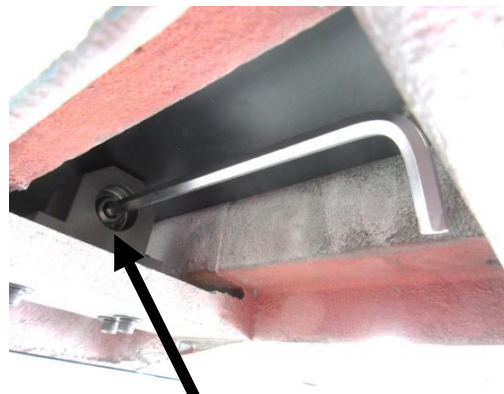
The screw end
of Z-axis ball



Drop saddle cover removed. Put the L-wrench into the screw end of the X-axis, at the reverse exit from the work piece as shown as figure.



COVER



The screw end
of X-axis ball

1.4.7 Completing a job

CAUTION

- 1) Always clean the machine or equipment. Remove and dispose of chips and clean cover, guard and windows, etc.
- 2) Do not clean the machine or equipment before it has been stopped.
- 3) Return each machine component to its initial condition.
- 4) Check wipers for breakage. Replace broken wipers.
- 5) Check coolant, hydraulic oil and lubricant for contamination. Change them if they are seriously contaminated.
- 6) Check coolant, hydraulic oil and lubricant levels. Add, if necessary.
- 7) Before leaving the machine at the end of the shift, turn off the power switch on the operating panel, machine main circuit breaker and factory feeder switch in that order.
- 8) Clean the oil pan filter.

1.4.8 Safety devices

- 1) Front guard, rear guard and chuck guard.
- 2) Over travel limit switches
- 3) Chuck barrier, tail barrier and tool barrier (NC software)
- 4) Stored stroke limit (NC software)
- 5) Emergency stop push buttons.

1.4.9 Maintenance operation preparations

- 1) Do not proceed any maintenance operation unless being instructed to do it by the foreman.
- 2) Replacement parts, consumable (packing, oil seals, O-rings, bearing, oil and grease etc.) should be arranged in advance.
- 3) Prepare to record preventive and corrective maintenance operations.

DANGER

- 1) Thoroughly read and understand the safety precautions in the instruction manual.
- 2) Thoroughly read the whole maintenance manual and fully understand the principles, constructions and precautions involved.

1.4.10 Maintenance operation

DANGER

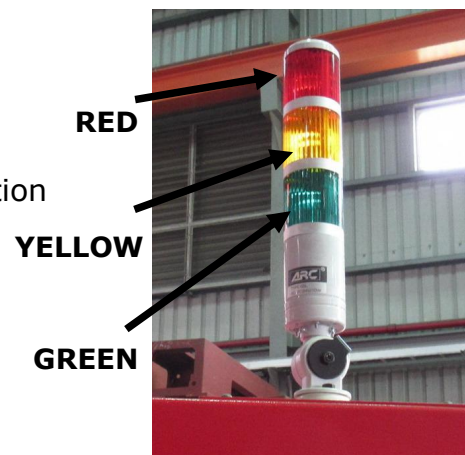
- 1) Those not engaged in the maintenance work should not operate the main circuit breaker or the control power ON switch on the operating panel. For this purpose, "Do not touch the switch, maintenance operation in progress" or similar working should be indicated on such switches and at any other appropriate locations, such indication should be secured by a semi-permanent means in the reading direction.
- 2) With the machine turned on, any maintenance operation can be dangerous. In principle, the main circuit breaker should be turned off throughout the maintenance operation.

WARNING

- 1) Maintenance operation should be done by a qualified person. Keep close contact with the responsible person. Do not decide by yourself.
- 2) Over-travel limit and proximity switches and interlock mechanisms including function Parts should not be removed or modified.
- 3) When working at a height, use steps or ladders which are maintained and controlled daily for safety.
- 4) Fuses, cables, etc. should be made by qualified manufacturers should be employed.
- 5) Main spindle motor speeds (rpm) couldn't be over the Max. speed of chuck
- 6) After boot, three-color warning light (as shown) will blink two seconds each. In this case, please confirm whether the three-color light bulb is normal or not.

Three-color light represent. :

- (1) Red represents: Exception/alarm malfunction
- (2) Yellow represents: End processing/
Information provided
- (3) Green represents: processing



1.4.11 Unit operation is begun after maintenance

WARNING

- 1) Arrange things in order around the section to receive the maintenance, including working environments. Wipe water and oil off and provide safe working environments.
- 2) All parts and waste oil should be removed by the operator and placed far enough away from the machine to be safe.

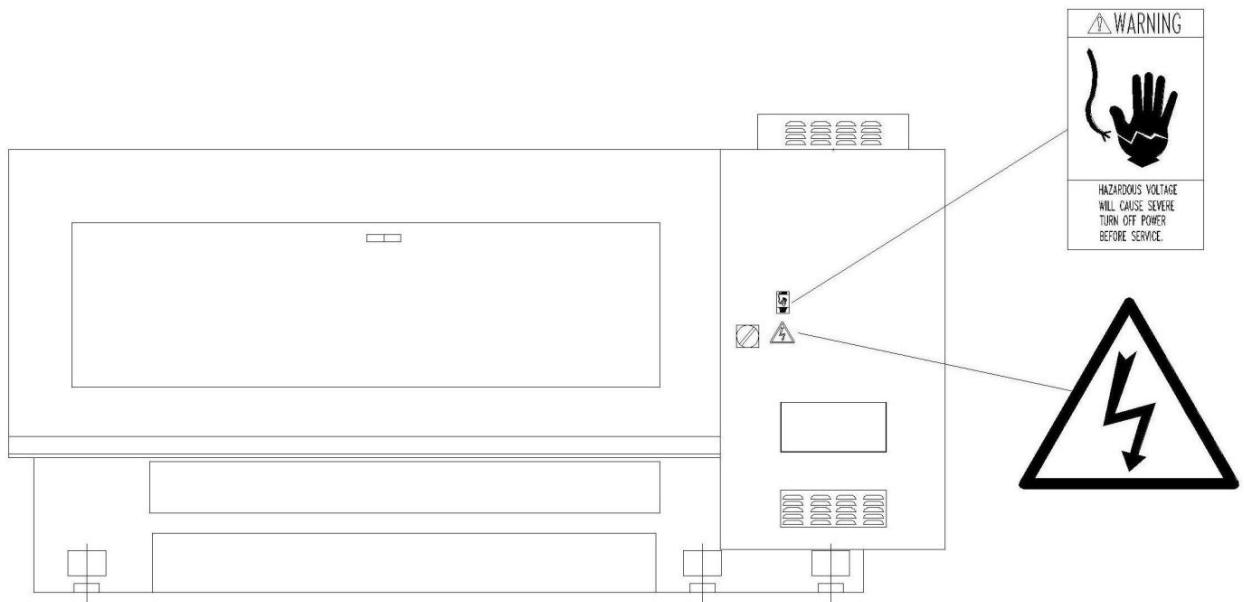
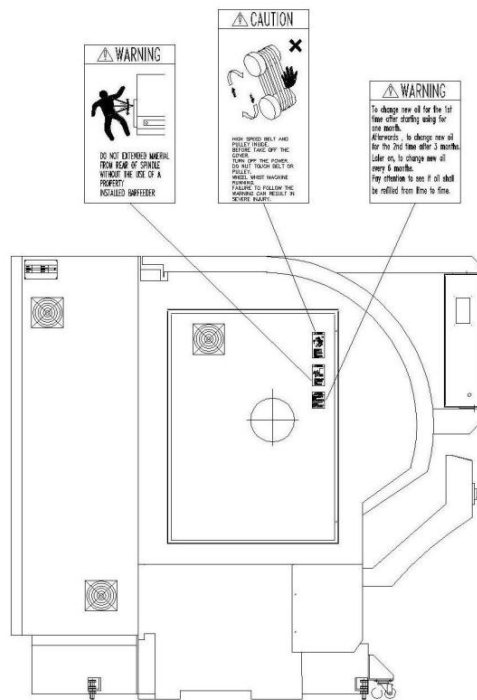
CAUTION

- 1) The maintenance person should make sure that the machine operation safe.
- 2) Maintenance and inspection data should be recorded and kept for reference.

1.5 Warning signs plate on the machine

Safety-related information, which must be strictly observed by all machine operators, is given on warning signs plate. These warning signs plate are attached to the machine.





1.6 Hazard List and Solution

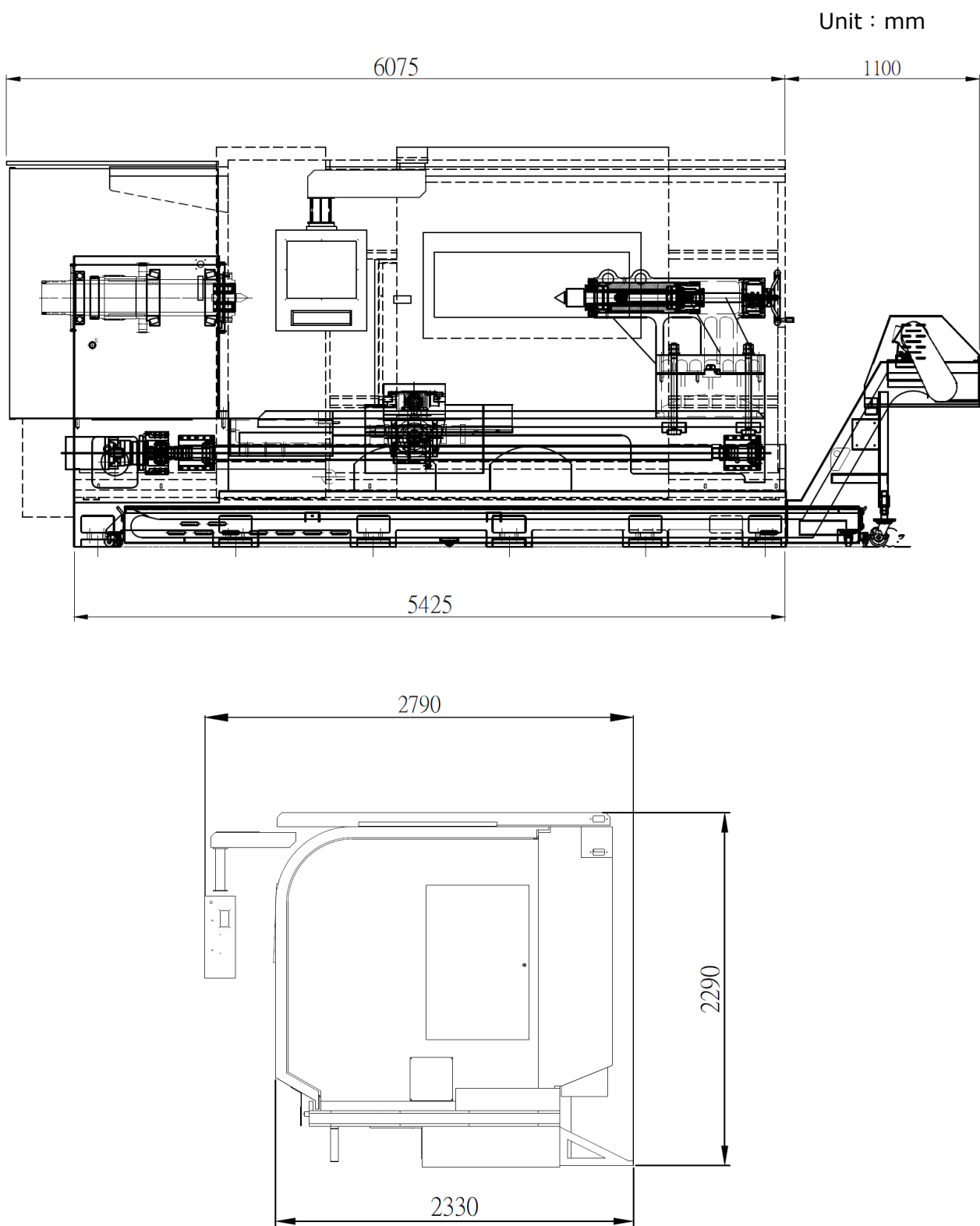
HAZARD LOCATION	RISH DESCRIPTION	SOLUTION
Z axis leads screw	When z-axis is moving, the rotating Ball screw could cause hurt to operator if he touches it unconsciously.	Fit a protection cover above The Ball screw to prevent operator from touching it with fingers or body.
Belton X-axis Transmission	When X-axis is moving. The rotating transmission Belt between Motor Pulley and Ball screw Pulley could hurt an operator if he touches it unconsciously.	Fit a protection cover on the X-axis Motor and fasten with screws. An operator can't touch it unless using tools.
Belts on Spindle Transmission	When Machine is running, the rotating transmission Belts from Spindle Motor to Gear Box, and from Gear Box to Spindle could hurt an operator if he touches it unconsciously.	Fit a protection Headstock Side Guard to cover the whole set of transmission system and prevent an operator from touching it directly.
Chain Transmission on Chip Conveyor	The power of Chip conveyor is transmitted by China. When Chip Conveyor is working, the rotating Chain could cause hurt to an operator if he touches it unconsciously.	Fit a protection cover and fasten with screws. An operator can't touch it unless using tools. Paint the cover in Black and Yellow to warn an operator.
Chip Outlet of Chip Conveyor	The turning Outlet and Chips from the Outlet could hurt an operator	Fit a protection cover to prevent an operator from touching it directly. Paint the cover in Black and Yellow to warn an operator.
Track of Conveyor	The turning Track of Conveyor could hurt operator	Fit a protection cover and fasten with screws. An operator could not touch it unless using tools. Paint the color in Black and Yellow to warn an operator.

2.

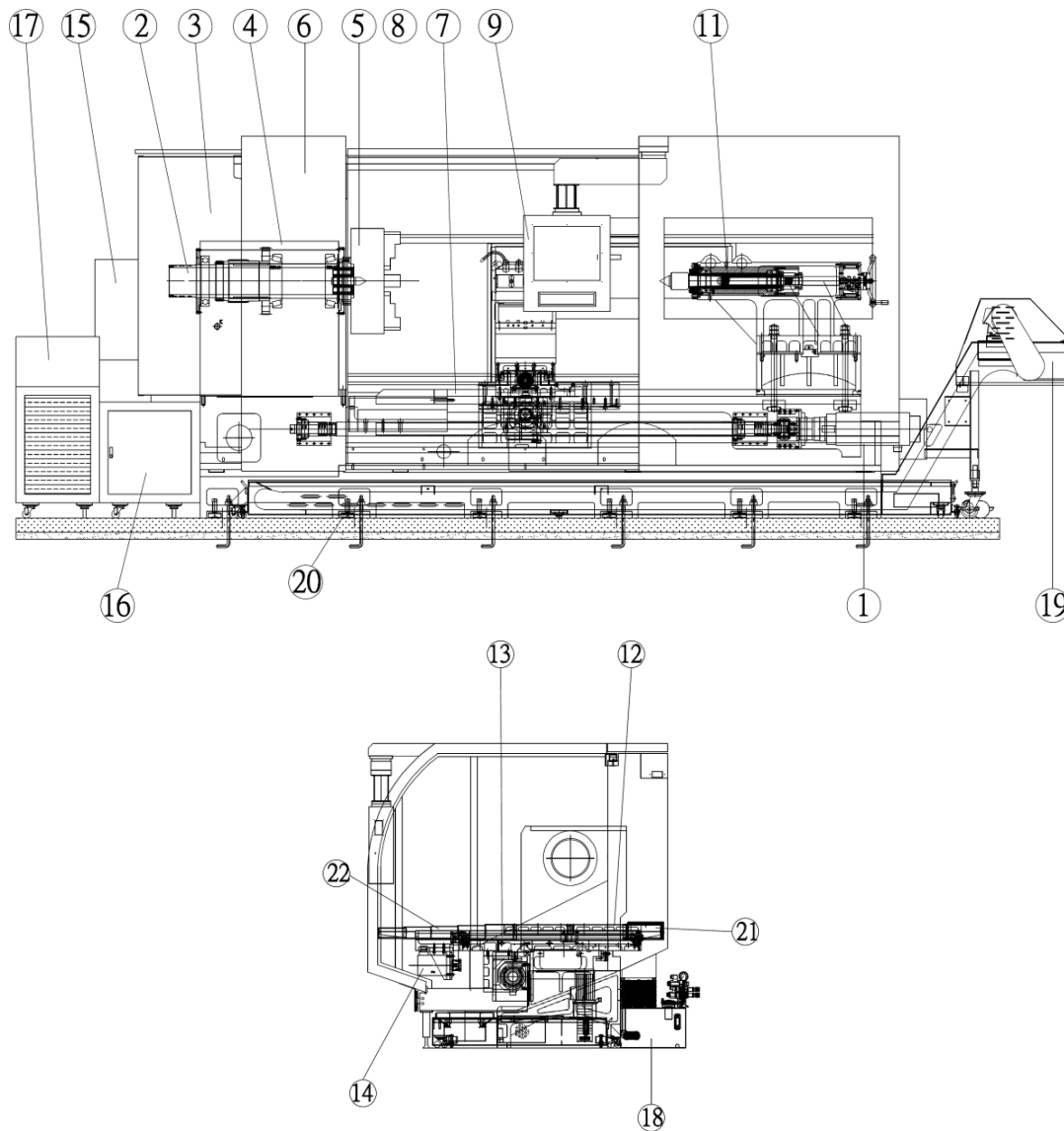
MACHINE SPECIFICATIONS

2.1 Machine Specifications

2.1.1 Dimensional drawing



2.1.2 Main Unit



Item	Description	Item	Description
01	SERVO MOTOR OF Z AXIS	13	BALL SCREW OF X AXIS
02	SPINDLE	14	SERVO MOTOR OF X AXIS
03	ELECTRIC POWER BOX	15	AIR CONDITIONER
04	HEAD STOCK	16	TRANSFORMER
05	CHUCK	17	SPINDLE OIL COOLER
06	SPLASH GUARD	18	HYDRAULIC TANK
07	BED	19	CHIP CONVEYER
08	BALL SCREW OF Z AXIS	20	FOUNDATION BOLT
09	CONTROL PANEL	21	COVER
11	TAILSTOCK	22	COVER
12	CROSS SLIDE		

2.1.3 Specifications

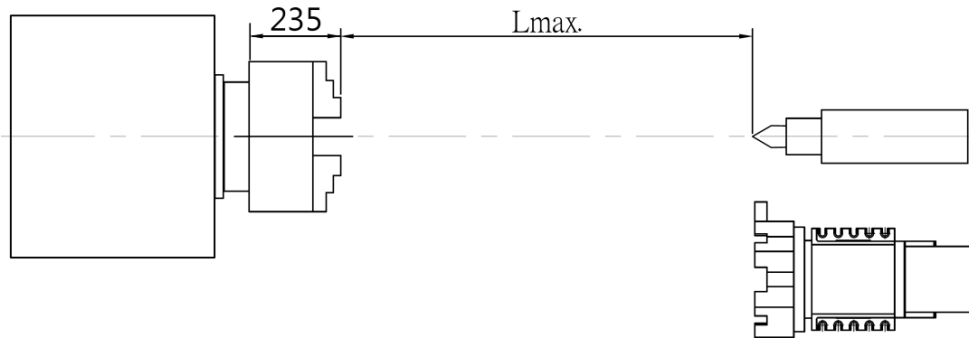
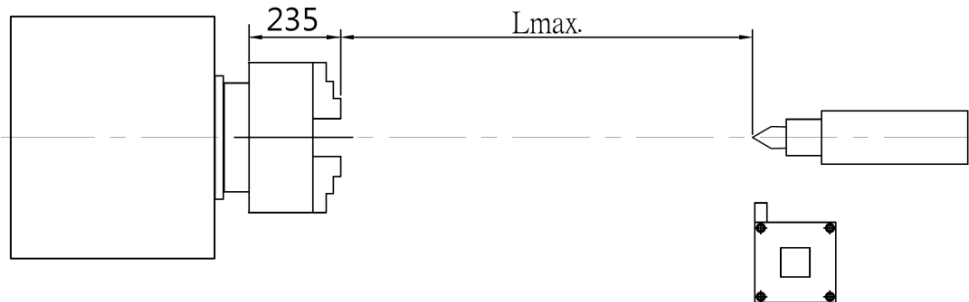
Model \ Description	KL-4260	KL-4280	KL-42120	KL-42160	KL-42200	KL-42240
Working Capacity						
Swing over bed (mm)	Φ1070					
Center height (mm)	565					
Swing over cross slide (mm)	Φ744					
Dist. between centers (mm)	1700	2200	3200	4200	5200	6200
Width of bed (mm)	625					
Headstock						
Spindle speeds (RPM)	H: 161-800			H: 111-560		
	M: 33-161			M: 21-110		
	L: 6-32			L: 4-20		
Spindle nose	A2-11			A2-15		
Spindle bore	155(6")			230(9")opt.		
Saddle						
Longitudinal travel_Z-axis (mm)	1600	2100	3100	4100	5100	6100
Cross slide travel_X-axis (mm)	580					
Ball screw (Dia. x pitch)	X: Φ40x8, Z: Φ80x16					
Tailstock						
Spindle dia. (mm)	Φ165					
Spindle travel (mm)	300					
Taper in spindle (Build In Type Quill)	MT#6					
Motor						
Spindle motor	22 / 33 KW					
X-axis drive motor (Nm)	23.5					
Z-axis drive motor (Nm)	32					
Coolant pump motor (Bar)	4.3(50HZ) / 6(60HZ)					
X/Z Feeds						
X-axis rapid travel (M/min)	5					
Z-axis rapid travel (M/min)	5					
Machine Weight						
N.W. (Approx.) (KGS)	10000	10800	12400	14000	15600	17200

Note: We have the right to modify the specification or designs. If there are subjected to change without prior notice.

Model \ Description	KL-5060	KL-5080	KL-50120	KL-50160	KL-50200	KL-50240
Working Capacity						
Swing over bed (mm)	Φ1270					
Center height (mm)	665					
Swing over cross slide (mm)	Φ944					
Dist. between centers (mm)	1700	2200	3200	4200	5200	6200
Width of bed (mm)	625					
Headstock						
Spindle speeds (RPM)	H: 161-800	H: 111-560		H: 54-270		H: 43-215
	M: 33-161	M: 21-110		M: 11-53		M: 9-42
	L: 6-32	L: 4-20		L: 2-10		L: 1.5-8
Spindle nose	A2-11	A2-15		A2-20		A2-28
Spindle bore	155(6")	230(9")opt.		305(12")(opt.)		410(16")(opt.)
Saddle						
Longitudinal travel_Z-axis (mm)	1600	2100	3100	4100	5100	6100
Cross slide travel_X-axis (mm)	680					
Ball screw (Dia. x pitch)	X: Φ40x8, Z: Φ80x16					
Tailstock						
Spindle dia. (mm)	Φ165					
Spindle travel (mm)	300					
Taper in spindle (Build In Type Quill)	MT#6					
Motor						
Spindle motor	22 / 33 KW					
X-axis drive motor (Nm)	23.5					
Z-axis drive motor (Nm)	32					
Coolant pump motor (Bar)	4.3(50HZ) / 6(60HZ)					
X/Z Feeds						
X-axis rapid travel (M/min)	5					
Z-axis rapid travel (M/min)	5					
Machine Weight						
N.W. (Approx.) (KGS)	10600	11400	13000	14600	16200	17800

Note: We have the right to modify the specification or designs. If there are subjected to change without prior notice.

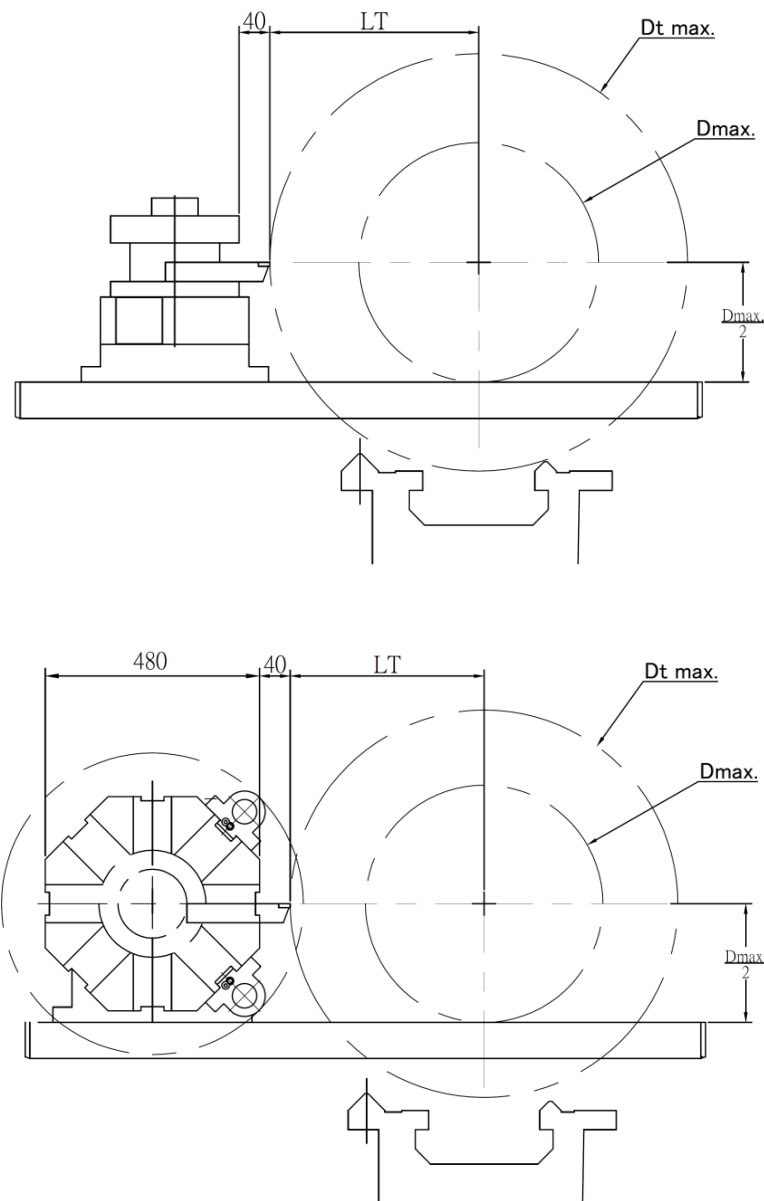
2.1.4 Interrupted diagram of tool rack



Unit : mm

TURRET	MODEL	L max.
4 WAY Toolpost	KL-42/5060	1500
	KL-42/5080	2000
	KL-42/50120	3000
	KL-42/50160	4000
	KL-42/50200	5000
	KL-42/50240	6000
8 Station Toolpost	KL-42/5060	1430
	KL-42/5080	1930
	KL-42/50120	2930
	KL-42/50160	3930
	KL-42/50200	4930
	KL-42/50240	5930

Interrupted diagram of tool rack



Unit : mm

TURRET	MODEL	Dt max.	D max.	LT
4 WAY Toolpost / 8 Station Toolpost	KL-4200	Dia.1060	Dia.740	530
	KL-5000	Dia.1260	Dia.940	630

2.2 Check list

2.2.1 Check list for operation

Item	Job	Description No
1	Read through operating manual thoroughly	
2	Read through all instruction manual thoroughly	
3	Lifting moving machine	
4	Installing machine	
5	Leveling machine	
6	Lubricating instruction	
7	Checking electrical circuit connection	
8	Main switch and button "ON"	
9	Press emergency stop button to stop machine	
10	Learn safety rules	
11	Simple trouble shooting	
12	Maintenance	

2.2.2 Check list for maintenance

Item	Job	Interval
1	Clean machine (do not use air compressor)	Weekly
2	Check electrical circuit connection	Every time before operation
3	Replace coolant ant clean coolant tank	3 months
4	Clean motor	Annually
5	Check Slide (x axis)	Annually
6	Check Slide (z axis)	Semi-annually
7	Check Spindle tip	Annually
8	Check Automatic lubrication unit	Weekly
9	Add grease	Weekly

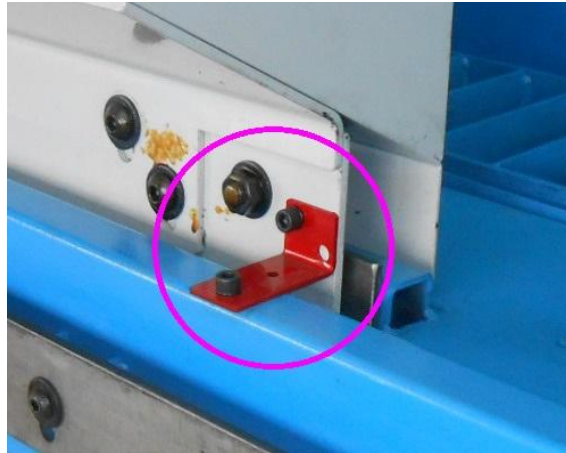
3.

INSTALLATION

3. INSTALLATION

NOTICE

When the machine is settled, please remove the red block from the machine.



3.1 Foundation

To upgrade the operation efficiency and accuracy of precision machining, a proper foundation is required.

It is recommended to locate the machine in a place away and without the influence of damping, chemical gas or trembling. The machine body is not allowed to be exposed to sunshine or rain. Please be sure not to install the machine adjacent to planning machine, milling machine molding or punching machine. Otherwise, it will result in poor performance.

A distance of at least 30" (about 760mm) is required from machine to wall and objects or between machines to ensure easy preparation, cleaning and maintenance of machine as well as easy opening of the door of electric cabinet.

With special torque-resistant capability at the machine base, this machine requires no particular foundation. Just provide 6" (150mm) thick of concrete on the floor and leave space for component for leveling.

Do not use wood foundation which with nature of unsuitability may cause the machine to move gradually.

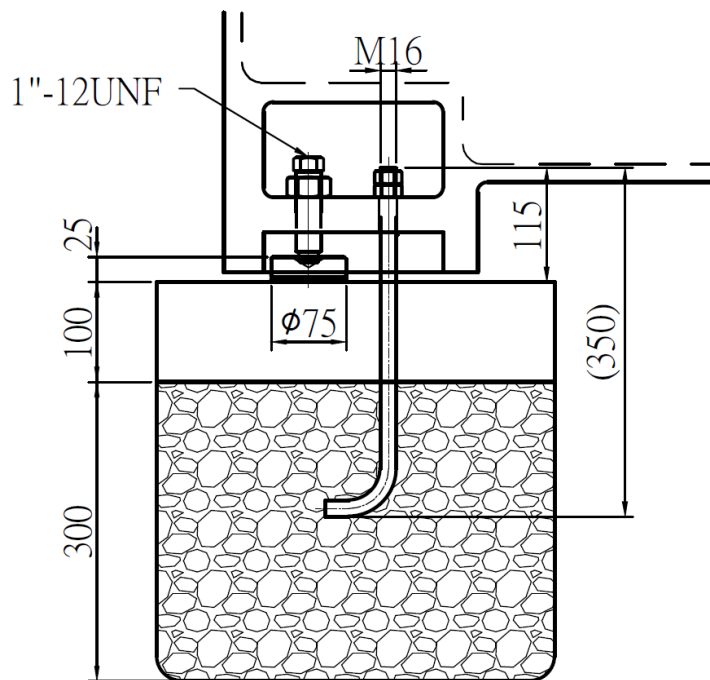
Install the machine on the first or second floor. Take the stress of ceiling and foundation into careful consideration to see if machine load can be offset.

3.1.1 Foundation Layout

Please dig holes in places as big as shown in Figure for setting foundation bolts. Place the bolts in the holes then fill the holes with cement. Lift the machine on the bolts after the cement has turned into solid concrete, and then fix the bolts with screw nuts.

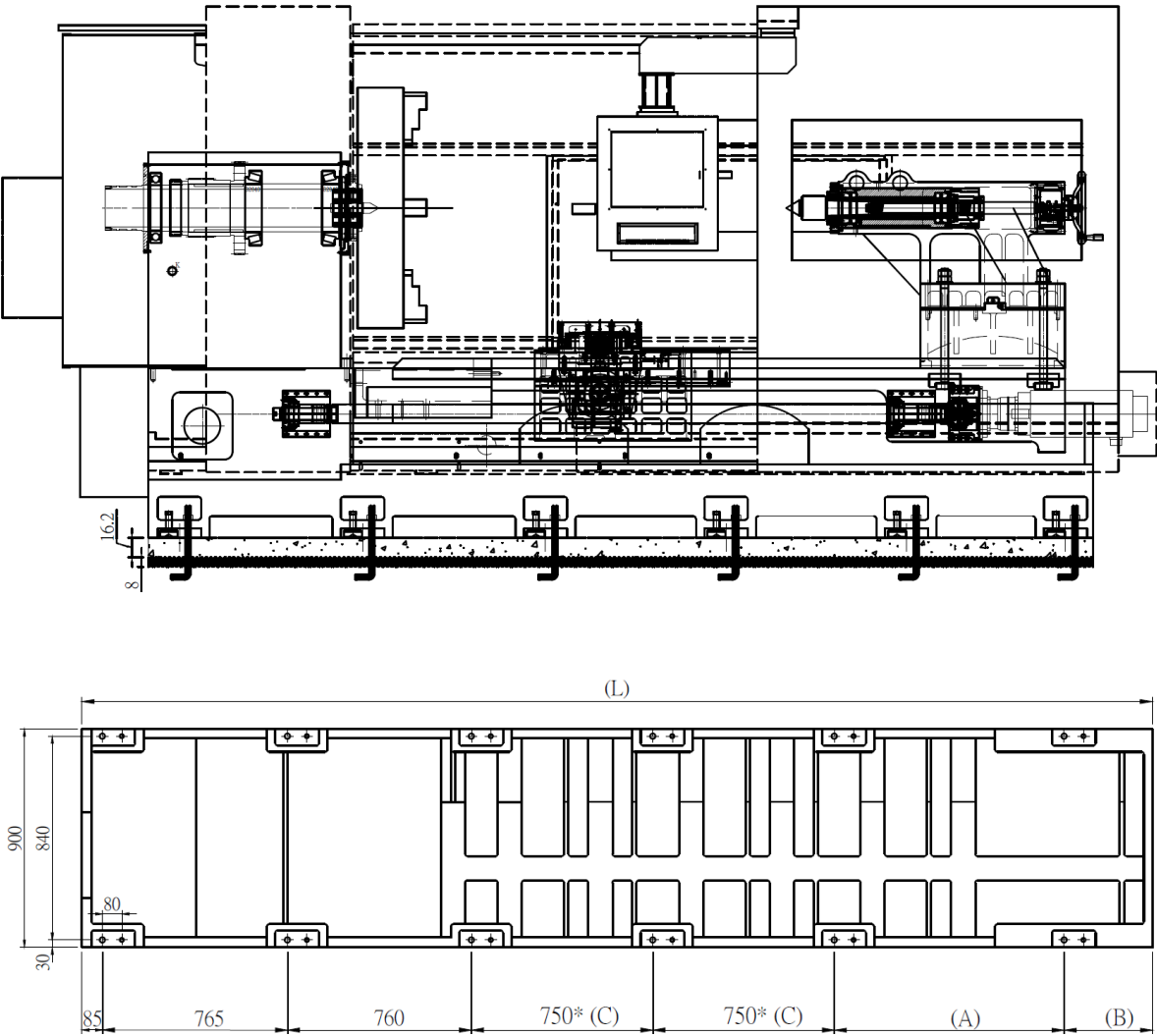
As the cutting speed and the spindle speed are much higher than before, an incomplete foundation may generate vibration and unstable condition during cutting.

It is important to conduct foundation work according to illustration shown in the figure below.



Foundation Layout

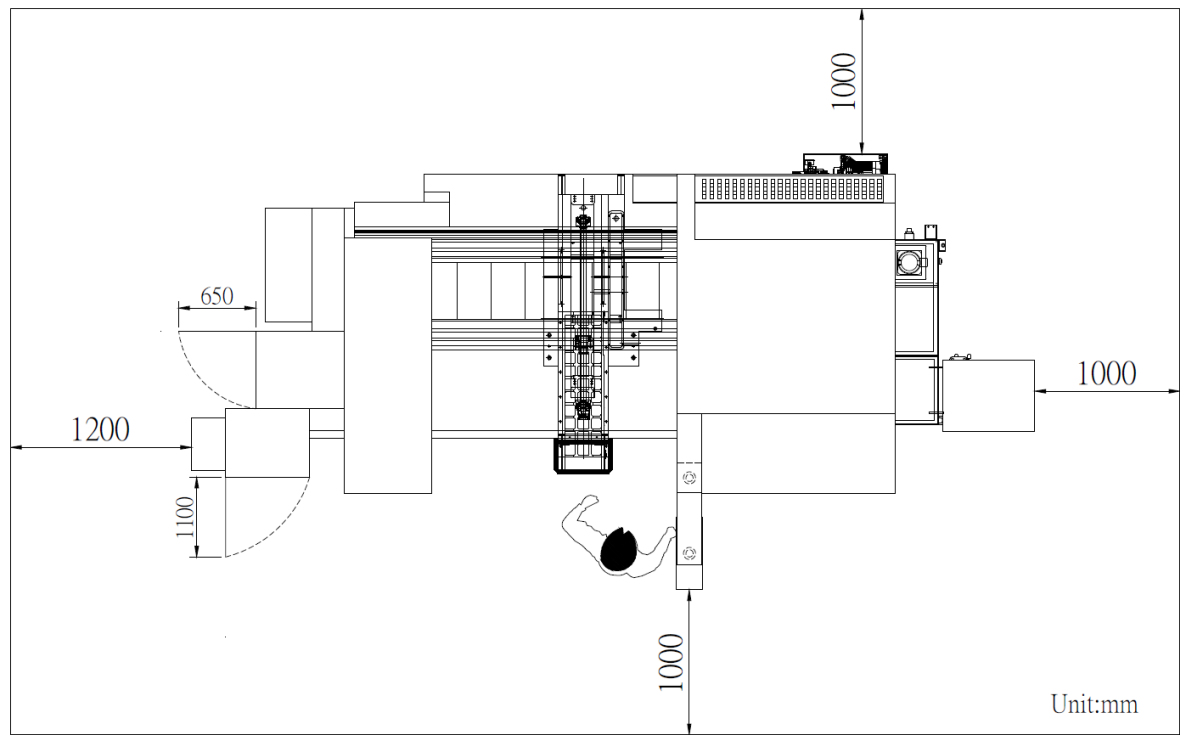
K



mm				
MODEL	(A)	(B)	間隔數 (C)	總長 (L)
KL-42/5060	660	115	2	3925
KL-42/5080	950	325	2	4425
KL-42/50120	660	115	4	5425
KL-42/50160	805	220	5	6425
KL-42/50200	950	325	6	7425
KL-42/50240	660	115	8	8425

3.1.2 Layout & Floor Plan

Following is a top view drawing.



3.2 Connection of power line

- 1) Make sure the voltage of incoming power supply is the right type that the machine requires or as marked on the unit.
- 2) Connect the power wires per electrical code in your area.
- 3) Power wires, grounding and over-voltage protector should comply with the local electricity regulations.

For wiring to other voltages, be sure to rewire the spindle motor, coolant pump, dust suction device and transformer to correct voltage. The relevant currents, fuses and overload relays are shown in the electrical manual.

NOTICE

Do not turn on the machine motor when its voltage is different from power voltage and contact electric technician for preparation.

3.3 Unpacking

Remove the top cover of wooden case first and then the plates on four sides. Carefully take out fittings at first, if necessary. Remove the set screws used for holding the machine on the base.

Disassembling packing crate and remove skids as possible to avoid damaging the machine. If the machine is damaged during transportation, contact your local dealer, insurance company and the transportation company who delivered your machine immediately.

3.3.1 Checking for shortage

Be sure to check your machine against the packing list which is shipped with every machine. In case of shortages, note items not received and contact your local dealer.

3.3.2 Machine Lifting

Please use the following equipment to lift the machine.

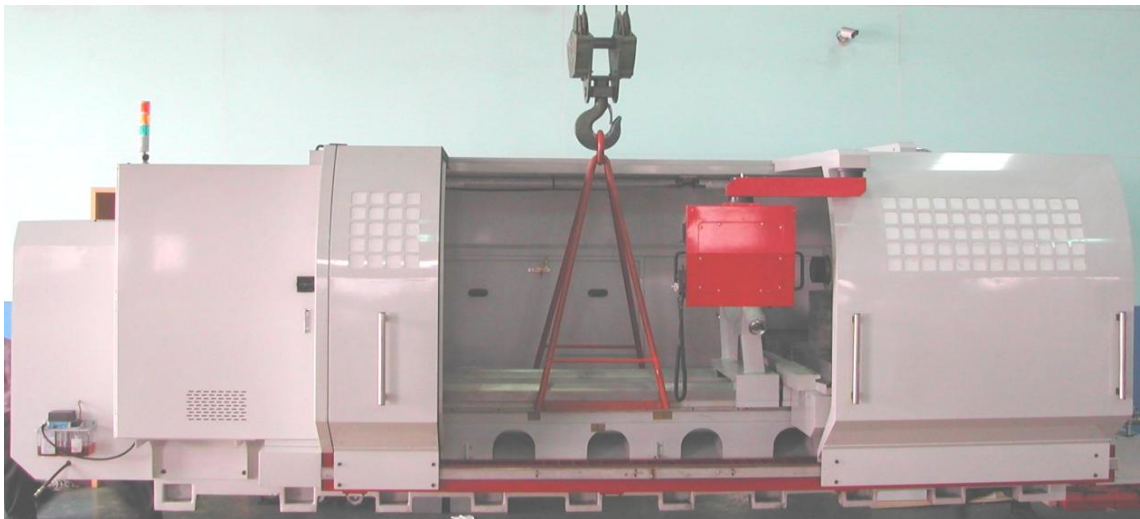
- 1) A crane which the safety loading weight required must more than the machine at least.
- 2) Some tools for lifting machine.

Wrap the straps under the ribs as shown in Figure and then lift the machine in the slowest speed of crane.

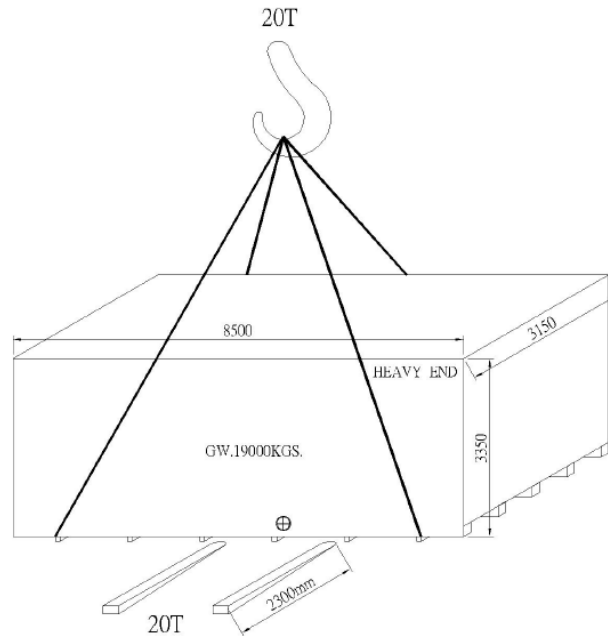
NOTICE

- 1) Machine must be always kept balanced during lifting.
- 2) Place protection material on any part of the machine that might be touched by straps.

Machine Lifting



Machine Lifting



3.3.3 Machine Placing

Before placing the machine, fix the adjusting screws on the base, make the machine as close as possible to the floor, and position the leveling pads in their most suitable place, so as to increase the stability of machine.

3.3.4 Machine Clean & Lubrication

All protective coating must be removed before using machine. Do not attempt to move any ways if the coating still exists. Be cautions while selecting a suitable cleaning agent Paraffin applied with a clean brush will soften the protective coating, The protective coating can then be removed with clean rags.

NOTICE

- 1) Do not use gasoline or any other flammable solution to clean the machine
- 2) Clean and lubricate all the exposed ways of table and saddle. Drive the table & saddle to one end of travel. Clean and lubricate ways thoroughly then drive table & saddle to the other end and clean and lubricate ways thoroughly as well. Be sure to use a suitable lubricant.

3.4 Machine Leveling

It is necessary to level the machine before starting to operate the machine.

Please prepare the following tools to adjust machine leveling:

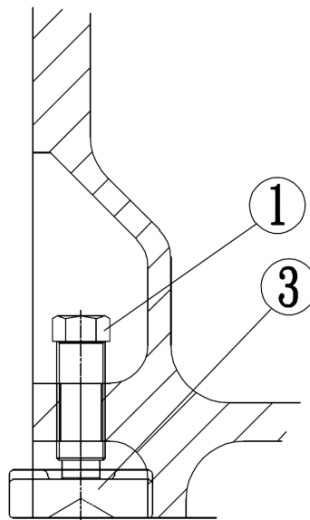
- 1) Accurate spirit leveling gauge (spec. 0.02mm/1000mm or 0.01in/4ft)
- 2) Two adjustable wrench

Clean the table surface thoroughly, set one of the spirit leveling gauge on the longitudinal direction and the other on the cross direction of the slide.

If there is only one leveling available, then use it on both directions alternately.

Adjust the six leveling screws bolts 1 located the bottom of the machine base (as shown in below) until the machine is leveled with 0.02mm/1000mm(0.001"/4ft) in both directions.

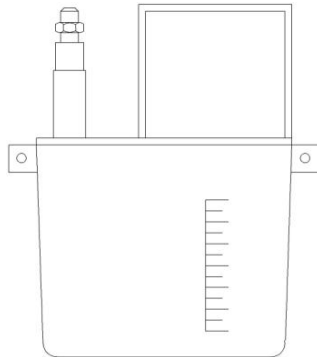
Suggestion: For the newly installed machine, check its once every week. If the foundation is rigid enough, then you may level the machine once per month.



3.5 Lubrication

3.5.1 Lubrication pump specification

Auto, manual pump tank capacity :3.0 L
Effective capacity :4.0 L
Motor : (110V) / 220V



DIRECTIONS

- * Note the oil quantity will reduce gradually under normal application.
 - * Note whether motor is running or not.
- 1) Fill clean lubricant into the oil tank up to the "MAX" marking of the oil level indicator.
 - 2) The oil tank preserves clean lubricant.
 - 3) In case impurity remains in the oil tank so as to fail the oil feeding, please clean the oil is absorbing net immediately.
 - 4) Firstly, push oil feeding button to fill up the empty pipes for normal application.
 - 5) The adjustment of discharge (Fig, shown) is to release the fixing bolt and adjust it at desired figure displayed on the scale plate, so the figure is to show the discharge C cc/cy.
 - 6) Oil surface below the "MIN" limit, it is necessary to refill oil.

CESH-TYPE

FEATURES

- 1) This new product has Taiwanese patent NO. M269392.

- 2) The standard of CESH type, operation time is 10 sec fixed, and interval time is 1-60 min optional.
- 3) The electronic box has operation indicator and interval indicator. Two types of this CESH series, CESH Turn On-Feeding Type and CESH Turn On-Interval Type, both could automatically save the original operation and interval time. If the power is suddenly off, after turning on the power, both would start the cycle again.
- 4) It has a buzzer that will alarm when the oil level is lower than the standard.
- 5) It has a float switch that can detect the volume of oil. It will have continuous signal automatically when the oil level is lower than the standard.

SPECIFICATION

TIMER	ON (ON TIME)	2/3/5/10/15/30/60 min.		
*ALM	*FLOATING SWITCH	A (MAX. 1A)		
	*BUZZER	AC 110V/220V		
MOTOR	VOLTAGE/HZ	110V/50/60HZ	220V/50/60HZ	
	CURRENT	0.3A	0.1A	
	OUTPUT 5 EXTREMILY	12W x 4P		
PUMP	OUTLET VOLUMN(MAX.)	0.5 cc/sec.		
	DISCHARGE PRESSURE	10kg /cm		
TANK	CAPACITY : LITER	2	2	2
	MATERIAL	R	R	R

Operating instruction

- 1) Instruction for manual oil feeding if continued lubricating is required. Please actuate the coercive pumping switch.
 - 2) Setting time of auto oil-feeding to take off the cover of wiring box and set the "NO" and "OFF" at the respective position for the selected discharge amount.
- Remark: Prior to the first operation push coercive pumping switch by hand in order to fill up the pipe with oil.

3.5.2 Lubrication System

This system adopts automatic intermission lubricant supply which includes metering.

Valves for proportional distribution and includes an alarm for low fluid level warning

Still, please check the fluid level before operation. Add the following recommended

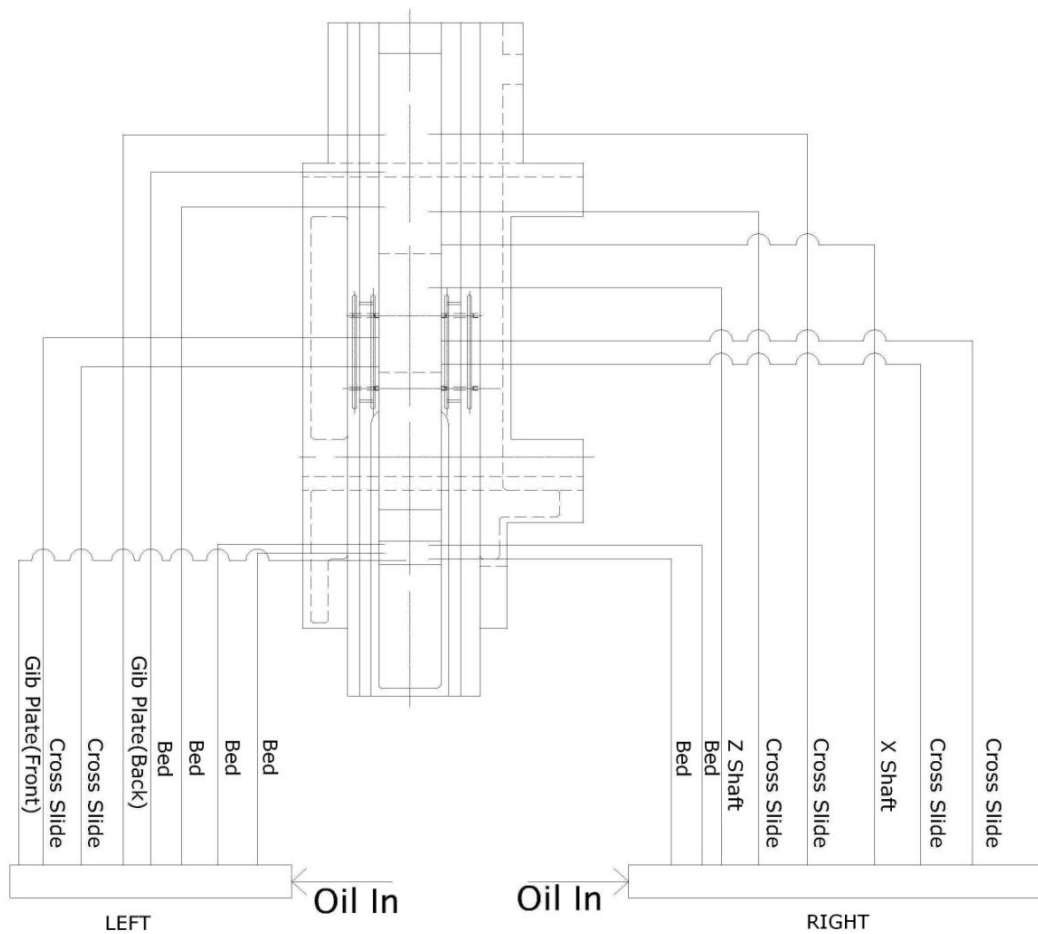
Lubricant to the reservoir.

A. Chinese petroleum Corp. 68

B. Shell Tonna 68

C. Mobil vacetra #2

D. Esso H68

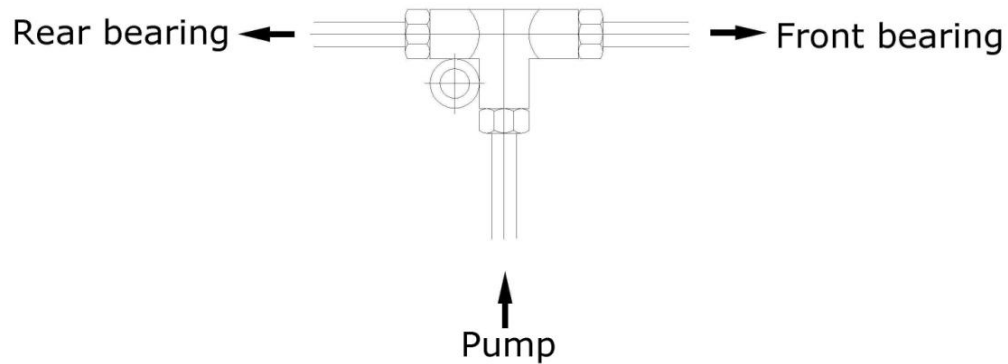


3.5.3 Lubrication system on Headstock

The Gear construction in headstock is lubricated by mechanical type of pump.

Spindle rotation

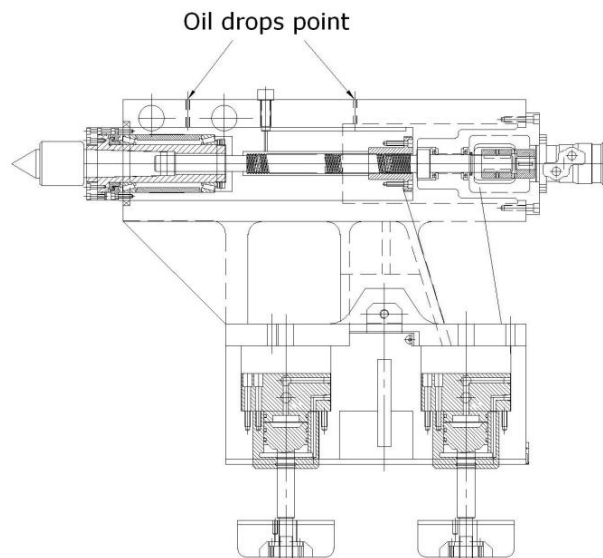
On either direction will activate the pump to supply lubricant.



3.5.4 Lubrication on Tailstock

Bed width 770mm there are two oil ball on the tailstock. Please add 10 drops of recommended lubricant to them.

Respectively every day before operating to ensure the smoothness of Ways.



3.6 Chucks and chuck mounting

NOTICE

Use only high-speed chucks which are capable of min. 750 rpm with these machines.

3.6.1 Chuck fitting on A2-11 spindle nose

When fit a A2-11 type chuck , it is necessary to fit a Back plate for chuck. Fitting the Back plate first, then fit the chuck on. It would be easier to fit chuck on when the Back plate is already well-fit on machine.

3.7 Tailstock center loading & unloading

To unload the center just hold the center and back the tail spindle.
Please wipe the taper of the center clean before loading it to the tail spindle.

3.8 Coolant

While choosing coolant for this machine, please ensure the material of the coolant excludes material of Sulfur Chlorine. The Sulfur and Chlorine may damage painting.

4.

MAINTENANCE

4 MAINTENANCE

4.1 Lubrication System

Check all the fitting of lubrication system under normal operation temperature. If oil leaking is founds, tighten the fittings. Inspect oil level daily.

4.1.1 Replacing headstock Oil

It is necessary to replace the oil for a new machine after one month. of operation. After premier replacement, it is recommended to replace the oil every **1300 operation hours**.

While replacing the oil, clean the oil tank thoroughly, just adding oil without replacing, it is a waste of time and money for the new oil will not refresh the old oil but deteriorating it. The metallic particle and dust in the old oil will form a layer on the surface which will accelerate the oxidization of oil.

For replacing the lubricant , please refer to Figure 4-1 and follow the steps below :

- 1) The recommended lubricant is **Shell Telus 32 or Mobil DTE#24**.
- 2) Prepare a large container at the front side of the headstock.
- 3) Turn off the lathe and the spindle. Disconnect the escape hose from the lubricant tank, and then connect to the container.
- 4) Turn on the lathe and the spindle. The old lubricant will flow into the container instead.
- 5) Watch out the lubricant level of the lubricant tank carefully. Turn off the lathe and the spindle. When the lubricant tank is almost empty.
- 6) Remove the plug of drain hole of the lubricant tank. Drain out all the old lubricant and get the lubricant tank really scoured. Then put the plug back.
- 7) Fill the lubricant tank with new lubricant.
- 8) Turn on the lathe and the spindle. The headstock will be flushed by new lubricant, and the dirty lubricant will flow into the container through the escape hose.
- 9) Keep adding new lubricant into the lubricant tank to sustain the lubricant level.
- 10) After a while , turn off the lathe and the spindle. Disconnect the escape hose from the container , and then connect back to the lubricant tank.

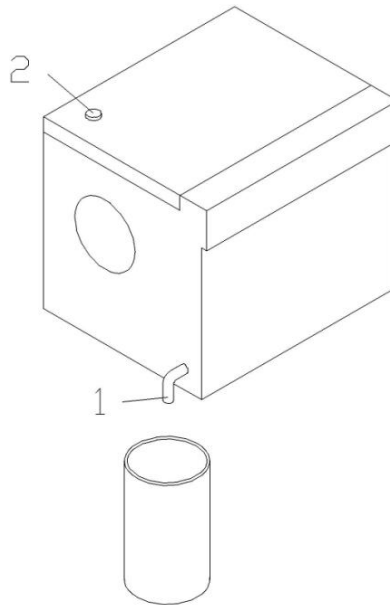


Figure 4-1

4.1.2 Fittings

Check all fittings after 500 hours of operation especially their tightness between tubes.

After that, do the regular check every 200 hours.

4.2 Machine body

In order to maximize the machine performance, the accuracy on headstock and all slides have to be re-adjust after three months of operation. After that, re-adjust every six months to one year to keep the machine in best accuracy.

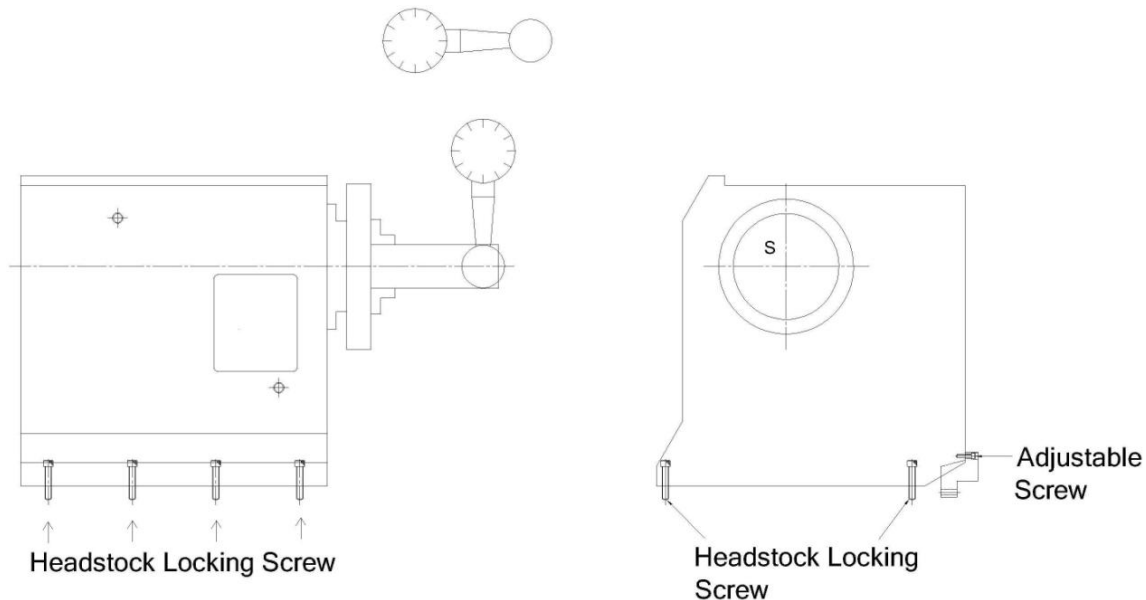
4.2.1 Headstock

Aligning headstock

If taper appears on turning work piece and convex on rounding, adjust the parallel of headstock by following steps

- 1) Insert gauge bar in the spindle bore. Attach the base of test indicator to the tool post. Apply the stylus of the indicator to the outer diameter of the bar. Move the saddle along Z axis and measure the maximal difference.

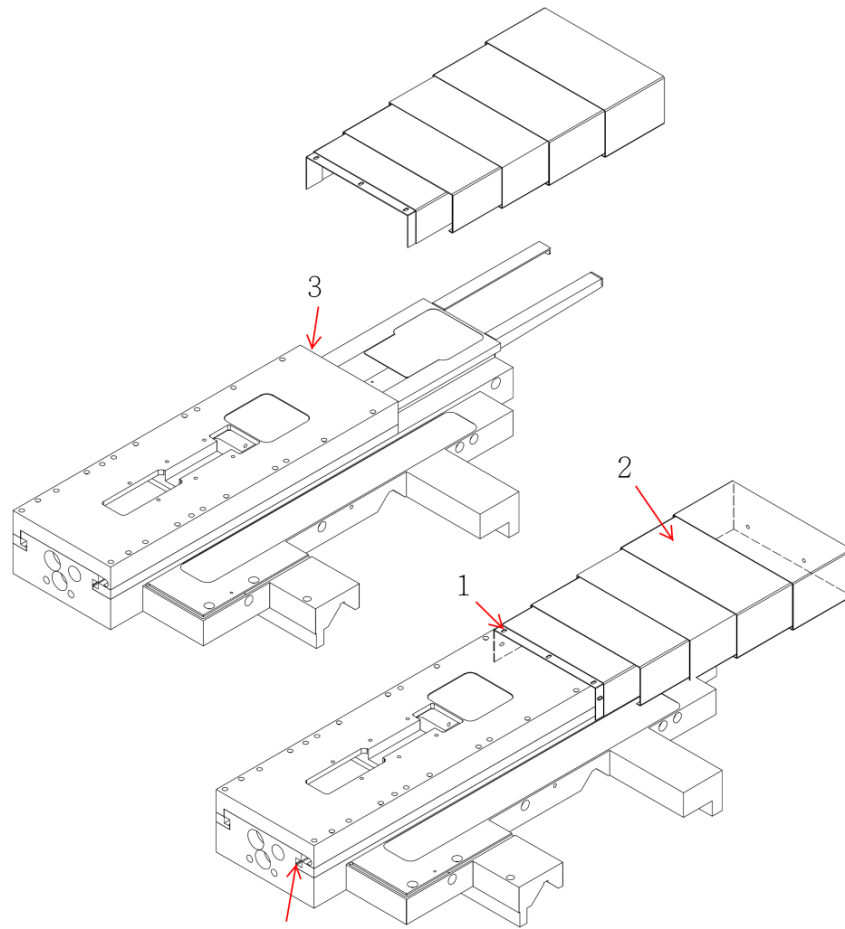
- 2) If the pointer of the in indicator swings drastically, release the headstock fixing screws and adjusting the adjusting to fine the paralleled of spindle and Z axis
- 3) After adjustment, tighten the fixing screws and move the saddle to observe the pointer of the indicator.



4.2.2 Cross-slide

If the gibs between slide and saddle become loose, it will affect the machining. You should regularly check and adjust them every six months according to the following steps.

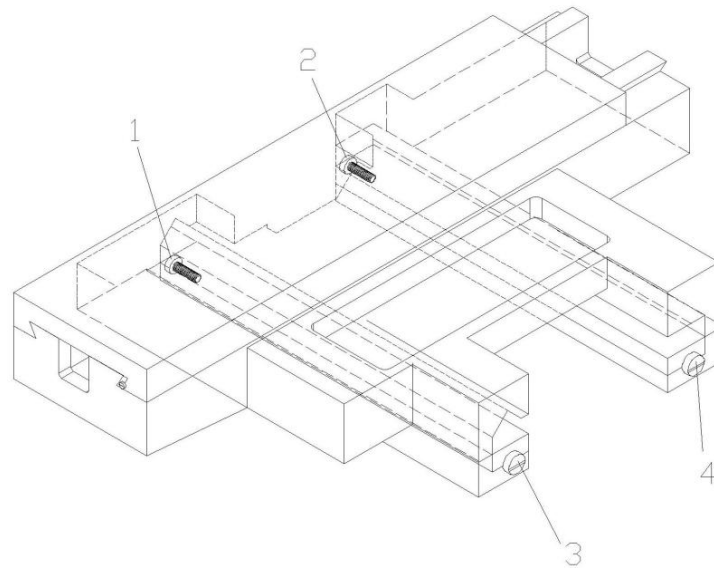
- 1) Release the screw 1
- 2) Remove slide cover 2 as shown as figure shown, then the gibs can be seen.
- 3) Use flat head screw driver to release the adjust screw 3 about 1/2 circle CCW
- 4) Tighten screw 4 about 1/2 circle CW.
- 5) Move the slide back and forth to a satisfied smoothness.
- 6) Reassemble the cover 2



4.2.3 Saddle

If the gibs between saddle and bed become loose, it will affect the accuracy of saddle travel. Check and adjust them every six months according to the following steps.

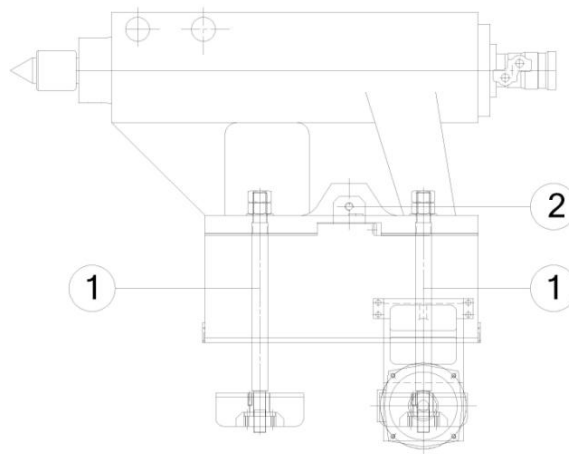
- 1) Use flat head screw driver to loosen the adjust screw 1 & 2 as shown as Fig. about 1/2 circle CCW.
- 2) Appropriately tighten adjust screw 3 & 4 as shown in figure about 1/2 circle CW.
- 3) Move saddle left and right to a satisfied smoothness.



4.2.4 Aligning tailstock to spindle

If there is taper appearing on work piece while machining it by using tailstock. Follow the following steps to re-align tailstock to the spindle.

- 1) Insert a gauge bar between the spindle and tailstock, attach the base of a test indicator to the saddle, and apply the stylus of the indicator to the surface of the bar, of its maximal difference for later adjustment.
- 2) Release the fixing screw 1 and adjust the adjusting screw 2 to fine the alignment.



4.2.5 Adjusting belt tension of X-axis

The new belt tension of X-axis should be 2.9mm elastic length when pressed by 1kg force. After a period of time, if the belt turned looser, adjust the belt to be 2.9mm by 1kg.

4.3 Electric equipment

4.3.1 Motor

Spindle motor is equipped with IP. Therefore, no special care is required. Have qualified technician check and clean it every six months is OK. Other motors should be checked annually.

4.3.2 Control units

No special care is required. Cleaning CRT or TFT display and key board by using a clean cloth. No detergent soap should be applied.

4.3.3 Wire connectors

Check them annually, and tighten them if necessary.

4.4 Simple trouble shooting

Description	Possible cause	Repair method
Lubricant level down to Bottom while spindle is running	Oil insufficient	Add oil into headstock
	Ump path clogged	Remove the object that clogs the pump outlet
Rails on bed turn black	Automatic lubrication system out of lubricant	Add lubricant
	Inappropriate oil properties	Immediately replace the oil
	Oil tube clogged	Replace tube or clear the clogged object
Cylindrical machined into conical shape	Spindle head slick	
Inaccurate machining between two centers	Poor accuracy on center	
Steps appear on the Spherical work piece surface	Inaccurate backlash compensation	Please refer to Chapter backlash offset and adjust
Too much temperature rise during spindle running	Invalid greasing	Check if there is oil leaking from the oil gauge.

4.5 Remove chip and renew coolant

- 1) There is too much chip deposited in the machine or before the end of work everyday. It is necessary to take a little time for removing the chip from the machine. First should turn off the power on the operate panel, and then opening the safety doors. Pull out the chip disposal box from the front of machine. Clean-up the chip where inside the chip disposal box. Replace chip disposal box into the initial position.
- 2) When the coolant quality is seriously contaminated or in accordance with the required of routine maintenance list to decide the timing for clean water tank and renew coolant. Always recommend to clean water tank and renew coolant will be done for one time per every 3-6 months.
- 3) Before clean the water tank, pull out the chip disposal box advance and remove the chip clearly. Provide three buckets with about each of 30 liters capacity placed on the back of machine.
- 4) Disconnect the hose at the rejection side of pump from the position where conjunction with aluminum conduits. Take this hose free side into bucket and turn on the power of pump. Rejecting the coolant from water tank until empty.
- 5) Disconnect the hose at the entrance side of pump from water tank and the 2" hose where between two water tanks. Pull out the water tank from back of machine. Move the water tank by two persons to proper height position where with safety support.
- 6) Remove the plug where in the water tank drain hole. Drain the residual coolant.
- 7) Dismantle the filter on the top of tank. Clean the internal tank and filter. Install filter to tank and plunge the plug into drain hole. Replace the water tank into the initial location from back of machine.
- 8) Link the hose with pump and tank by opposite direction of disconnect way that has been to do. Fill the equal volume of coolant into the water tank.
- 9) Install chip disposal box upon the water tank from the front of machine.

4.6 Notice for maintenance and inspection

Execute an emergency stop or switch off the main power supply before carrying out maintenance and inspection work. If the machine is still in an operable condition during this work and for example, a sensor is inadvertently touched, the machine may move due care is therefore required. Before operating the machine, make sure that there is no obstacle to motion in the vicinity of the machine.

- 1) Maintenance and inspection work must be performed without fail in order to keep the machine operating at its highest performance and make it safe to operate at all times.
- 2) Device maintenance and inspection plan and carry it out on a regular basis.
- 3) Proceed with maintenance and inspection as planned even if this interferes with the production plan.
- 4) Before starting on the maintenance and inspection work, turn the power switch off.
- 5) When working inside the electric control cabinet or repairing the machine, set the power switch to the OFF position and lock it.
- 6) Do not use air to clean the machine. This may cause dust or sand particles to cover the bearing or slide ways.
- 7) Use only lubricating oils which are recommended by + -

In order to operate machine correctly and make the most of machine's functions and performance, all operators must thoroughly understand the machine.

To keep the machine operating at its highest level, it must be inspected every day. If an abnormality is discovered during daily inspection, it must be reported to the supervisor and the person responsible for machine maintenance.

Quick action should be taken. For problems that cannot be repaired by the user or those for which the cause cannot be isolated, contact your + - service representative.

Daily Replenishing Oil and Inspections by the machine Operator
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Maintenance and Repairs by maintenance Mechanics
--



Service Request Call to our Representative
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1. Lubricating Oil and Supplying Coolant

Always use the types of oil specified. Do not mix the oil of different brands even if they are indicated as the "equivalent oil". Original maker will not be responsible for any problem arising from the use of oil not specified by + -.

2. Storing Oil

If oil is stored in user's shop, observe the following points to prevent the oil from being degraded. It is advisable to obtain only the amount of oil to be used.

- a) Store the oil in a place where it will not be subject to direct sunlight or rain.
- b) Keep the oil clean. No dirt's or water should be allowed to enter the oil storage tank.
- c) Never use degraded oil or oil with foreign matter or water.
- d) If middle tank is used. Clean the tank at least once a year.

3. Cautions when Replenishing Oil

- a) Always use the same oil jug for the same oil. Never use a jug used for different brand oil.
- b) Never remove the filter from the filter port when supplying oil.
- C) If oil other than specified by original maker, used mistakenly or different brands of oil are mixed. Clean the tank and piping immediately.

4. Disposing Waste Oil

Disposing factory waste without legal permission is not allowed. Always ask the service company when disposing oil.

5. Supplying Oil

Supplying Oil to the Slid way lubricating Oil Tank

- a) Check the lubricating oil tank volume with the oil level gage installed on the lubricating oil tank.
- b) Remove the cap on the oil supply port.
- c) Supply the specified lubricating oil from the oil jug while checking the oil level with the oil level gauge.

6. Supplying Coolant to the Coolant tank

- a) Press the coolant off switch to stop coolant supply.
- b) Check the coolant tank volume with the oil level gage.
- c) Supply coolant from the top of coolant tank.

7. Greasing the Chuck Master Jaws

- a) Stop the spindle
- b) Supply grease from the three grease cups around the chuck.
- c) Coolant splashed on the chuck will wash away the grease. Therefore, supply grease as often as possible.

8. Check before Daily Operation

Before turning on the power

- a) Make sure that there are no abnormalities for external piping, cables and coating intact, all doors closedetc.
- b) Check the shop floor around the machine for the hazards from such as coolant, hydraulic oil, lubricating oil, and obstacles.
- c) Make sure that the turret is not at the travel end in the x axis direction.

9. After Turning On the Power

- a) Listen to the sound of the hydraulic unit when it is operating.
- b) Make sure that the cooling fan in the electrical cabinet is operating.
- c) Make sure that the switches and indicators on the operation panel operate correctly.
- d) Check the screen display: no alarm should be indicated.

4.7 Maintenance and Inspection List

Cycle	Inspection
Daily inspection	<ol style="list-style-type: none"> 1. Remove chip, dust and other foreign matter around the table base, saddle, tool length measuring device, etc. 2. Wipe off lubrication, coolant and chip from the machine surface. 3. Wipe off all foreign matter from the slide ways not protected by the cover (base slide ways) 4. Clean the slide ways covers. 5. Clean the exposed limit switches and around them. 6. Clean the electrical carefully. 7. Check the centralized lubrication tank and head lubrication tank for the oil level. Always keep the recommended lubricants at proper levels. 8. Check to be sure that the water reserved in the air filter bowl completely drained. 9. Check to be sure that pressure is correctly built-up: slide way lubrication unit 3 kgf/cm² supply air 5 kgf/cm² 10. Check the machine and piping runs for oil leakage. If oil leakage is found, take necessary measures. 11. Check the coolant, hoses and coolant tanks and remove all foreign matter if any. 12. Check the amount of coolant and replenish if necessary. 13. Check to be sure that the indicator lights on the operation panel correctly turn on or flicker.
Weekly (50 H) Maintenance	<ol style="list-style-type: none"> 1. Carry out daily maintenance. 2. Check the spindle front end, tool holders and other attachment for the burrs, cracks and other damages. Clean around the spindle. 3. Check the hydraulic power unit oil level. Replenish the specified hydraulic oil, if necessary.
Monthly (250 H) Maintenance	<ol style="list-style-type: none"> 1. Carry out weekly maintenance. 2. Clean inside the electrical control cabinet and NC equipment and replace filters if they are considerably dirty. 3. Check the machine level. Also check the lock nuts on the leveling block bolt and anchor bolts for tightness.

Cycle	Inspection
Monthly (250 H) Maintenance	<ol style="list-style-type: none"> 4. Clean the air filter. Replace it, if necessary. Never use thinner or similar agents in cleaning the air filter. 5. Clean the slide ways wipers. Replace them, if necessary. 6. Check to be sure that the solenoids and limits switch can correctly function. 7. Clean the in-line filter in the headstock lubrication unit. 8. Check to be sure that wiring is properly done without looseness or disconnection. 9. Check to be sure that the interlock devices and timers can function normally. 10. Drain the coolant, clean inside the tank and hose and then fill the coolant tank with new coolant.
Every six Months (1500 H) Maintenance	<ol style="list-style-type: none"> 1. Carry out weekly maintenance. 2. Clean the NC equipment, electrical control unit and machine. 3. Change the hydraulic oil in the hydraulic power unit and the lubricant for the spindle head and the table. Before supplying new hydraulic oil or lubricant, clean the inside of the tanks. 4. Clean all the motors. 5. Check the bearing in the motor for noise. Replace the bearings. If necessary. 6. Visually check the electrical devices and reply panel. 7. Check each indicator and the voltmeter if it is correct. Adjust or replace it, if necessary. 8. Flash the lubrication pump; clean the head lubricant filter according the instructions provided by maker. 9. Check the machine movement and functions using a test tape. 10. Measure the backlash in each drive shaft and adjust for compensation date, if necessary.


5.

CHUCK

5.1 INSTRUCTION MANUAL

INTRODUCTION

To ensure safe operation of your chuck Please read this instruction

Manual and pay particular attentions marked with , including IMPORTANT instructions concerning chuck performance

5.1.1 SAFETY PRECAUTIONS

Please read this manual and following indications carefully.

DANGER

1. TURN OFF all power before setting, inspecting, lubricating or change the chuck.
Danger caused by catching operator in a machine.
2. The chuck revolutions are restricted
Gripping force decreases due to centrifugal force as speed (r.p.m) of Chuck increases, thereby causing the discharge or damage of the workpiece.
3. Main spindle motor speeds (rpm) couldn't be over the Max. speed of Chuck
4. Spindle cannot start if door is open.
Cover chuck periphery for the lathe without door.

WARNING

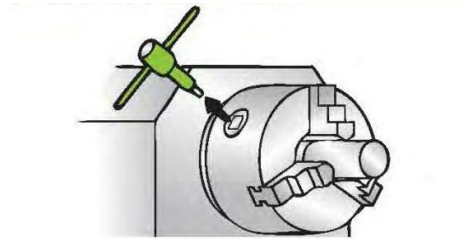
We cannot assume responsibility for damage or accidents caused by misuse of the chuck, through noncompliance with the safety instructions.

1. Secure clamp bolts with specified torque!
2. Never clamp another chuck with the chuck
Danger by discharge of chuck.
3. Lubricate lubricant once or twice every day according to used conditions
And environment.
Danger by discharge of work piece related with lowering gripping force caused by insufficient lubrication.
3. Never attempt to remodel!

Function reduces!

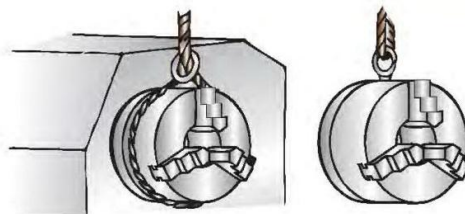
3. When clamping the work, take care not to pinch your hand.
4. After clamping the work with regulated torque, be sure to remove the Handle.

Danger by discharge of handle.



CAUTION

1. Never attempt to hammer the chuck, jaws or clamped workpieces.
Never strike a work piece, which is kept on the chuck, by a hammer or the likes, The accuracy and function of the chuck will be damaged, and its life span shortened remarkably as well.
2. Used most suitable chuck for work.
Danger by discharge of chuck or workpiece.
3. Disassemble and clean the chuck once after used two thousand times
Or every six month and lubricate it with grease.
When disassembling A \ D type scroll chuck, take off pinion before
Removing the cover.
4. Used the jaw as low as possible.
Accuracy and function decrease.
5. When the extension of workpiece is long, support it with tailstock center or follow rest.
6. Set jaw correctly for increasing accuracy.
7. Don't apply extreme start and stop without clamping workpiece.
There is a possibility that jaws are removed from chuck body by centrifugal force.
8. Use eyebolt or lifting belt when mounting or removing the chuck.
Check safety before mounting and removing the chuck.

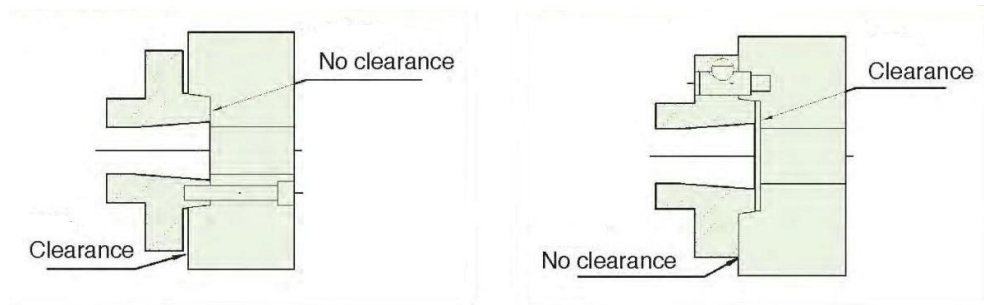


IMPORTANT

1. Frequently clean the chuck.
2. When repeat accuracy is required, it is desired to tighten with the same Pinion if it is the same diameter.

5.2 INSTALLATION

1. Adapter mounting accuracy is influenced to the chuck. Accordingly, finish the adapter run-out and face run-out within 0.005mm after mounting to spindle. If the run-out is more than 0.005mm, be sure to modify.
Clean the chuck and adapter before mounting.
2. When using direct mount type, the joined area between the spindle and the chuck is as shown in the Fig-2.



IMPORTANT

1. Carefully mount the chuck with it stabilized by using the lifting belt or touching the chuck to the spindle.
2. Tighten the chuck mounting bolts with specified torque(unequal tightening will cause chuck run-out)
3. To install the chuck accurately, mount it so that the chuck run-out and face run-out are within 0.02mm(target 0.01mm or less).
4. If chuck run-out accuracy is over 0.02mm, loosen the mounting bolts to shift chuck position 120 and tighten the boles again with the same way.

5.3 MAINTENANCE AND INSPECTION

1. Clean engagement part in the chuck body and jaw
2. Lubricate in ball cap and the engagement part in the chuck body and jaw 1 or 2 times a day.
3. If sward or foreign matter is caught inside chuck(scroll, gear part), remove the chuck immediately and disassemble and clean it.

5.4 TROUBLE SHOOTING

Trouble	Cause	Countermeasures
Chuck won't start	Chuck part is damaged	Disassemble and replace
	Slide part seized	Disassemble and remove seized and repair or replace it
Handle rotation is hard	Cutting powder or sward is entered into chuck	Disassemble and clean
	Rust occurs at slide part and rotation part	Disassemble and remove the rust
	Short taper is not coincided with spindle	Modify the short taper
Workpeice slips	Formed dia. of jaw does not match workpeice dia.	Reform it according to correct forming method
	Clamping force is insufficient	Check the chuck is tightened with regulated handle torque

Workpeice slips	Cutting force is excessively high	Calculate the cutting force and check whether the force coincides with chuck specifications
	Speed is excessively	Reduce speed to level where required clamping force can be obtained
	Oil for slide part and rotary part is run out.	Lubricate from the ball cap and make the clamp/unclamp of jaw without clamping the work
Poor accuracy	The chuck periphery is run out	Check to see that periphery and edge face run out and tighten the bolts with regulated toque
	The forming of jaw insufficient	Check the forming plug is parallel for edge face and isn't deformed for clamping force
	Height of jaw excessively high and mounting bolts are extended	Reduce the jaw height

5.5 Independent chuck

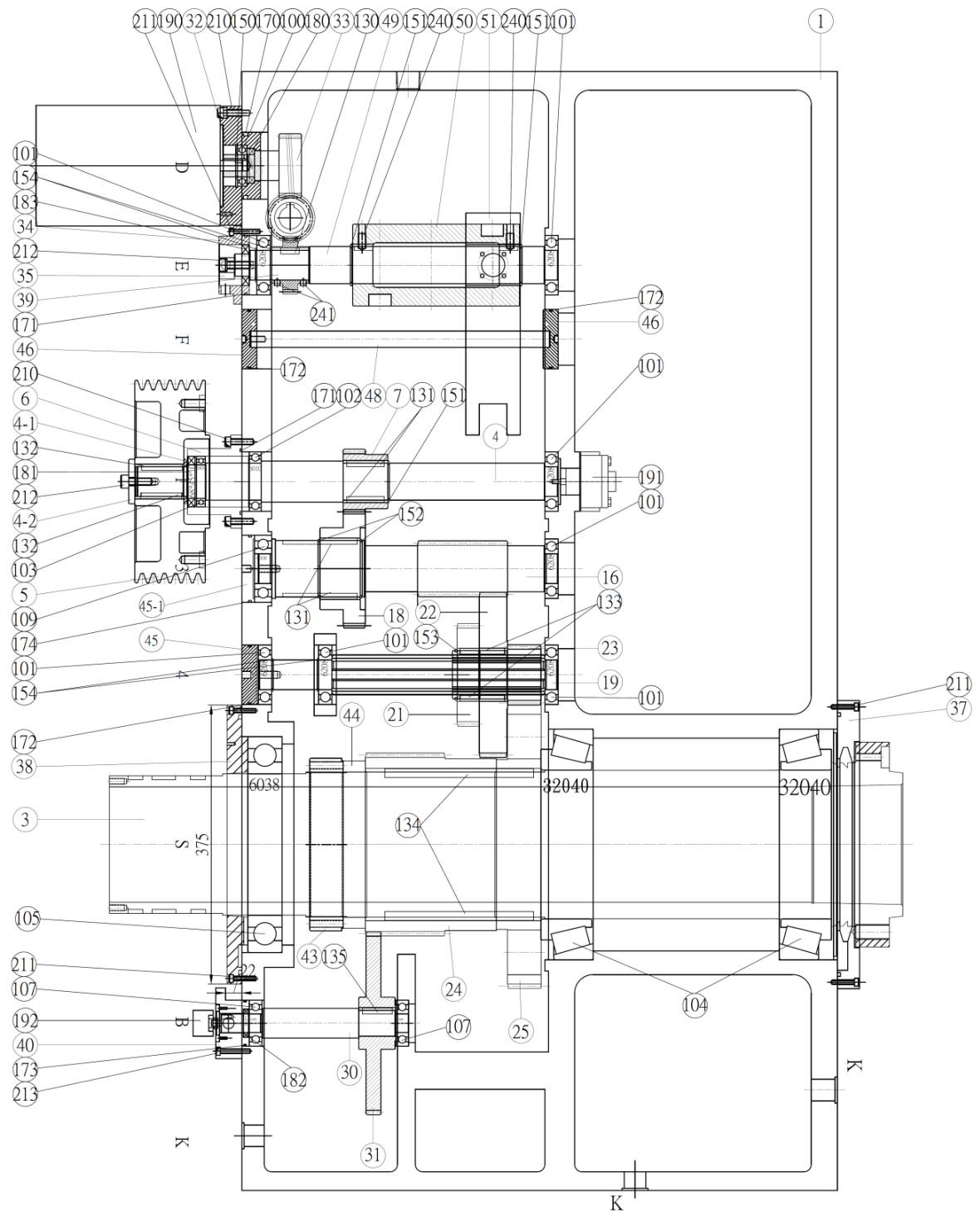
1. Note whether the clamping chuck is tight or not.
2. Reduce speed to machine irregular work pieces, in order to avoid the machine shaken.

6.

PARTS LIST

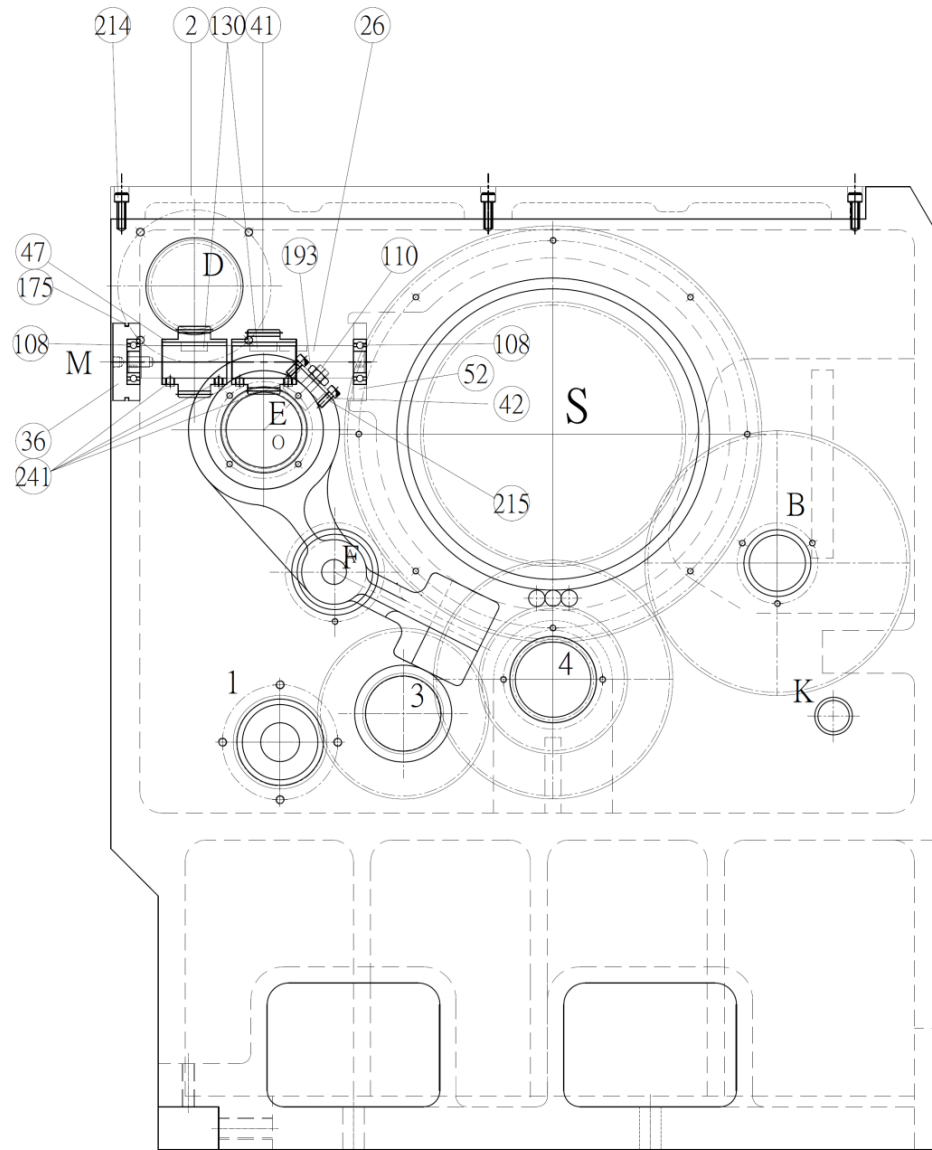
6.1 Headstock

6.1.1 42HB, Spindle bore 155mm (6")



42HB (6") 2016. 01. 25

42HB, Spindle bore 155mm (6")



42HB (6") 2016.01.25

6.1.2 PARTS LIST OF 42HB(6") HEADSTOCK

Rev.2016.01.25

NO.	PART'S NO.	DESCRIPTION	Q'TY	REMARK
001	48HB-601	HEAD STOCK	1	
002	42HA-602	COVER	1	
003	42HA-603A	SPINDLE	1	
004	42HB-604	INPUT SHAFT	1	
004-1	42HA-604-1	SPACER RING FOR PULLEY	1	
004-2	42HA-604-2	WASHER	1	
005	42HA-605	V-PULLEY	1	
006	42HA-606	COVER	1	
007	42HB-605	GEAR	1	
016	42HA-616	SHATT	1	
018	42HA-618	GEAR	1	
019	42HA-619	SHAFT	1	
021	42HA-621	GEAR	1	
022	42HA-622	GEAR	1	
023	42HA-623	GEAR	1	
024	42HA-624	GEAR	1	
025	42HA-625	GEAR	1	
026	42HB-624	SHAFT	1	
030	42HB-630	SHAFT	1	
031	42HB-631	GEAR	1	
032	50HB-044	MOTOR BASE	1	
033	42HB-643	WORM GEAR	1	
034	50HB-038	CHECKING BASE	1	
035	18HB-019	BLOCK	1	
036	42HB-636	COVER	1	
037	25HA-637	COVER	1	
038	50HB-625	COVER	1	
039	50HB-039	BEVEL GEAR	1	
040	18HB-015	COVER	1	
041	50HB-048	WORM GEAR	1	
042	50HB-042	BEARING COVER	1	
043	50HB-626	NUT OF SPINDLE	1	
044	42HA-644	SPACER OF SPINDLE	1	

PARTS LIST OF 42HB(6") HEADSTOCK

Rev.2016.01.25

NO.	PART'S NO.	DESCRIPTION	Q'TY	REMARK
045	42HA-645	COVER	1	
045-1	42HA-645-1	COVER	1	
046	42HA-646	COVER	2	
047	50HB-047	BEVEL GEAR	2	
048	42HA-648	SHAFT OF FIXED	1	
049	42HB-649	CAMSHAFT	1	
050	42HB-650	CAM	1	
051	42HB-651-1	SPEED CHANGE FORK	1	
052	42HB-652	RING	1	
100		BEARING 6006	1	
101		BEARING 6208	7	
102		BEARING 6010	1	
103		BEARING 6909	1	
104		BEARING 32040	2	
105		BEARING 6038	1	
107		BEARING 6305	2	
108		BEARING 6004	2	
109		BEARING 6308	1	
110		BEARING IKOCF12BC6J	1	
130		KEY 10*8*25	3	
131		KEY 12*8*50	4	
132		KEY 12*8*55	2	
133		KEY 12*8*60	2	
134		KEY 20*12*200	2	
135		KEY 10*8*40	1	
150		C RING S30	1	
151		C RING S50	3	
152		C RING S70	2	
153		C RING S65	1	
154		C RING S40	4	
170		O RING G90	1	
171		O RING G80	2	

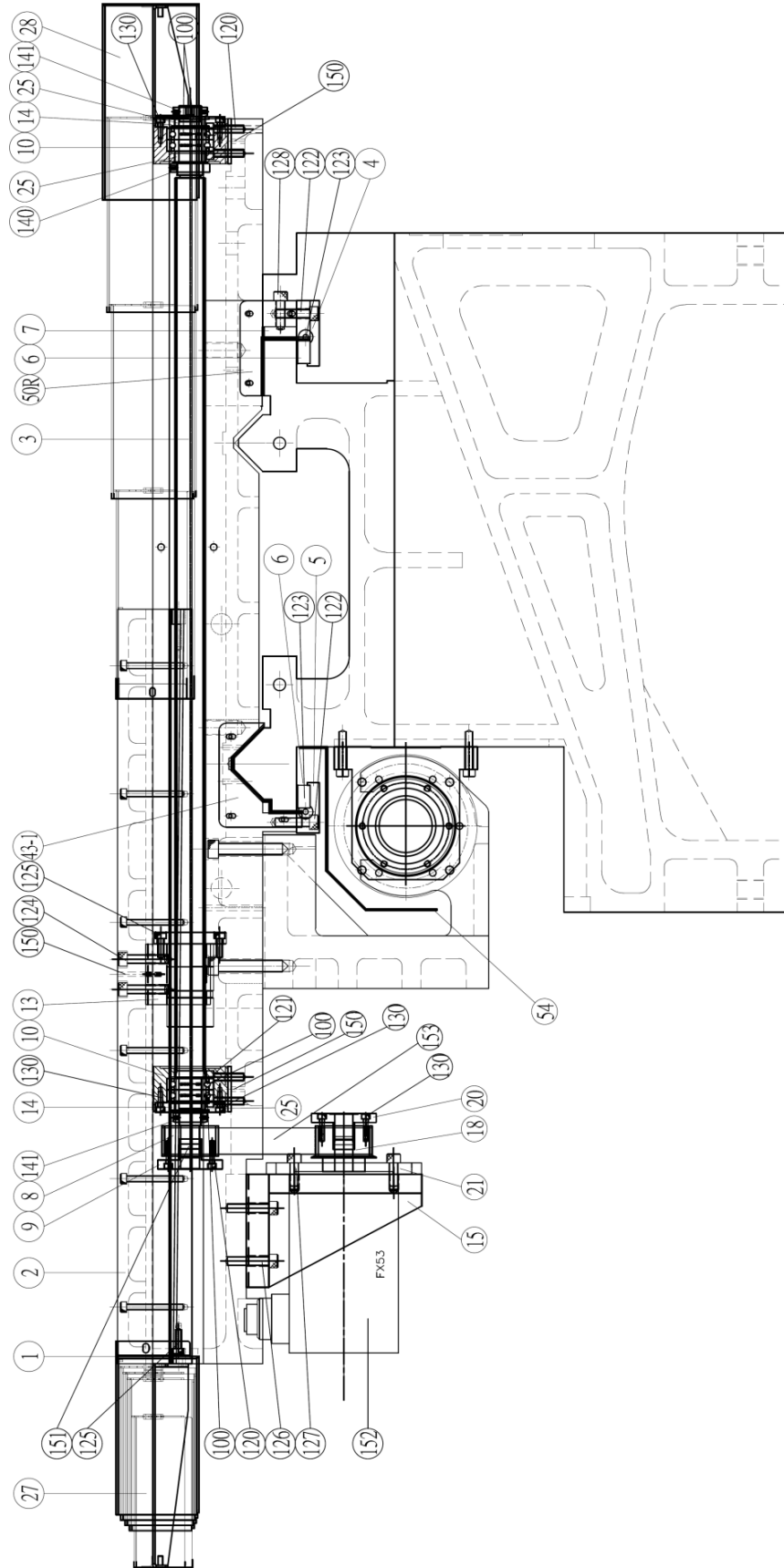
PARTS LIST OF 42HB(6") HEADSTOCK

Rev.2016.01.25

NO.	PART'S NO.	DESCRIPTION	Q'TY	REMARK
172		O RING G75	2	
173		O RING G55	1	
174		O RING G85	1	
175		O RING G65	1	
180		OIL SEAL 47*30*10	1	
181		OIL SEAL 68*45*12	1	
182		OIL SEAL 38*25*8	1	
183		OIL SEAL 55*30*11	1	
190		MOTOR	1	
191		OIL PUMP	1	
192		SENSOR	1	
193		NUT M12	1	
210		SCREW M8*35	8	
211		SCREW M6*35	20	
212		SCREW M10*30	2	
213		SCREW M6*40	3	
214		CAP SCREW M8*30	10	
215		SCREW M6*15	2	
240		CAP SCREW M10*20	2	
241		CAP SCREW M8*8	6	

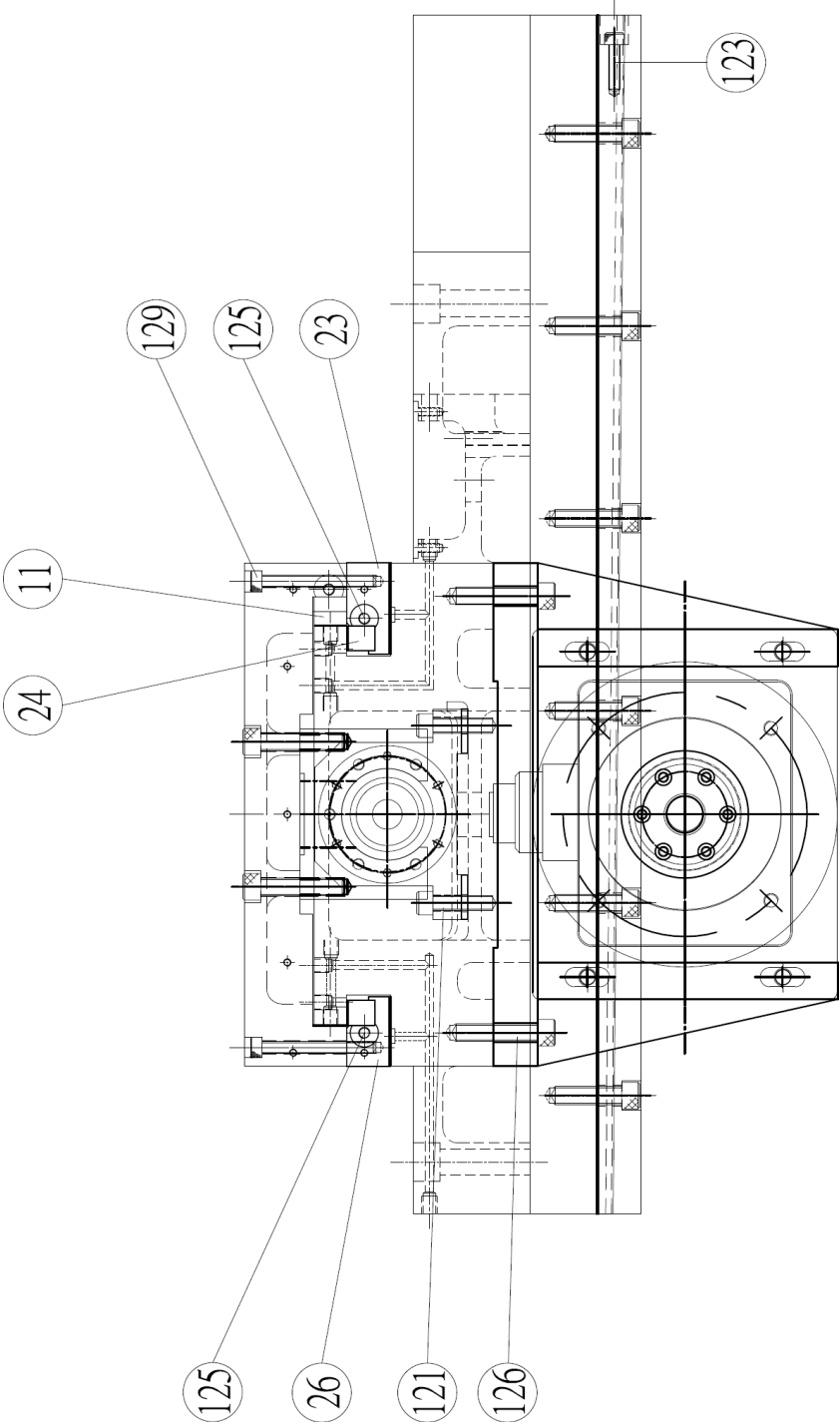
6.2 X-axis Tarns.

6.2.1 Parts List of 42CS SADDLE



42CS SADDLE 2018.04.12

Parts List of 42CS SADDLE



42CS SADDLE 2018.04.12

6.2.2 PARTS LIST OF 42CS SADDLE

Rev.2018.05.07

NO.	PART'S NO.	DESCRIPTION	Q'TY	REMARK
001	42CS-001	CARRIAGE	1	
002	42CS-002	CROSS SLIDE	1	
003	50CS-003	BALL SCREW	1	
004	42S-004	GIB PLATE	1	
005	50CS-005	WASHER	1	
006	42S-006	GIB	2	
007	42S-007	GIB	1	
008	50CS-008	PULLEY	1	
009	50CS-009	LOCKING COVER	3	
010	50CS-010	BEARING COVER	2	
011	42S-011	GIB PLATE	1	
013	50CS-004	DUST COVER	1	
014	25CB-014	BEARING COVER	2	
015	42CS-015-1	MOTOR BASE	1	
018	50CS-018	PULLEY	1	
020	50CS-020	LOCKING COVER	2	
021	50CS-021	MOTOR PLATE	1	
023	42S-009	GIB	1	
024	42S-010	GIB	2	
025	25CB-008	SPACER RING	3	
026	42S-008	GIB	1	
027	50CS-S10	TELESCOPIC SHIELD	1	
028	50CS-S10-1	TELESCOPIC SHIELD	1	
043	42CS-043	WIPER	1	
043-1	42CS-043-1	WIPER	1	
050	42S-050L	WIPER	1	
	42S-050R	WIPER	1	
054	42CS-054	LEADSCREW BLOCKER	1	
055	42CS-055	COVER	1	
100		BEARING 306215	4	
120		SCREW M6*25	6	
121		SCREW M10*40	8	

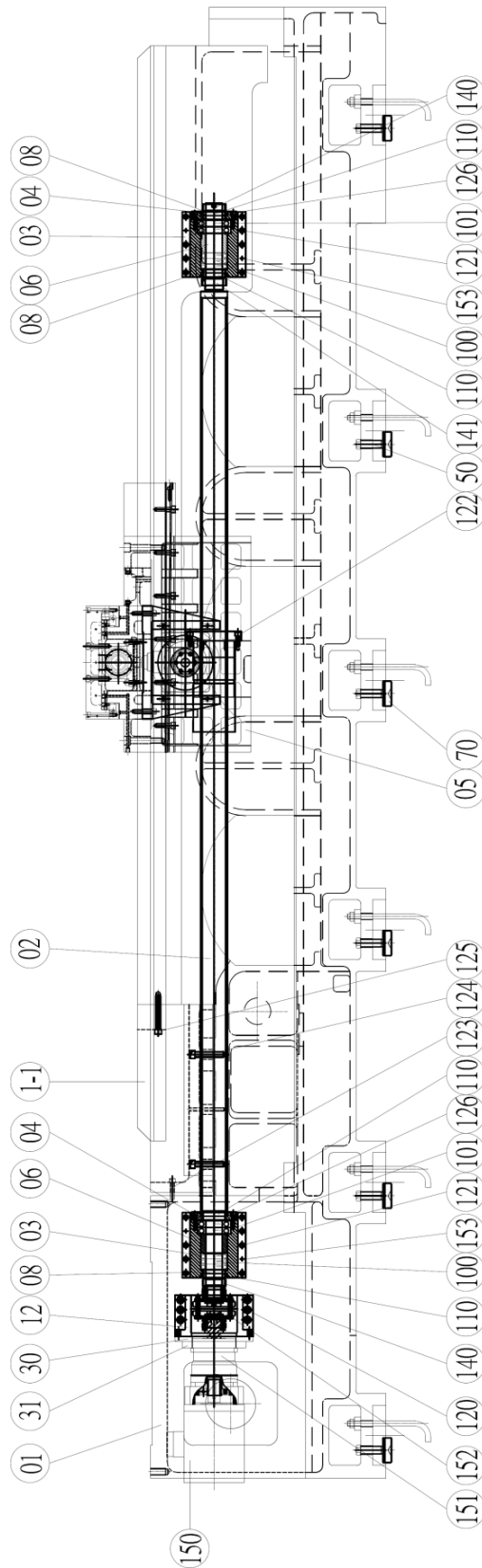
PARTS LIST OF 42CS SADDLE

Rev.2018.04.17

NO.	PART'S NO.	DESCRIPTION	Q'TY	REMARK
122		SCREW M12*40	12	
123		SCREW M8*30	2	
124		SCREW M12*50	4	
125		SCREW M8*25	7	
126		SCREW M12*55	4	
127		SCREW M12*30	4	
128		SCREW M12*35	4	
129		SCREW M8*75	12	
130		SCREW M6*20	10	
140		SCREW NUT M35*P1.5	1	
141		SCREW NUT M30*P1.5	2	
150		LOCK Φ6	4	
151		LOCKING RING 25*30	2	
152		MOTOR	1	
153		FLUSH BOLT	1	

6.3 Z-axis Trans

6.3.1 Parts list of 42CB BED



42CB BED 2018.04.25

6.3.2 PARTS LIST OF 42CB BED

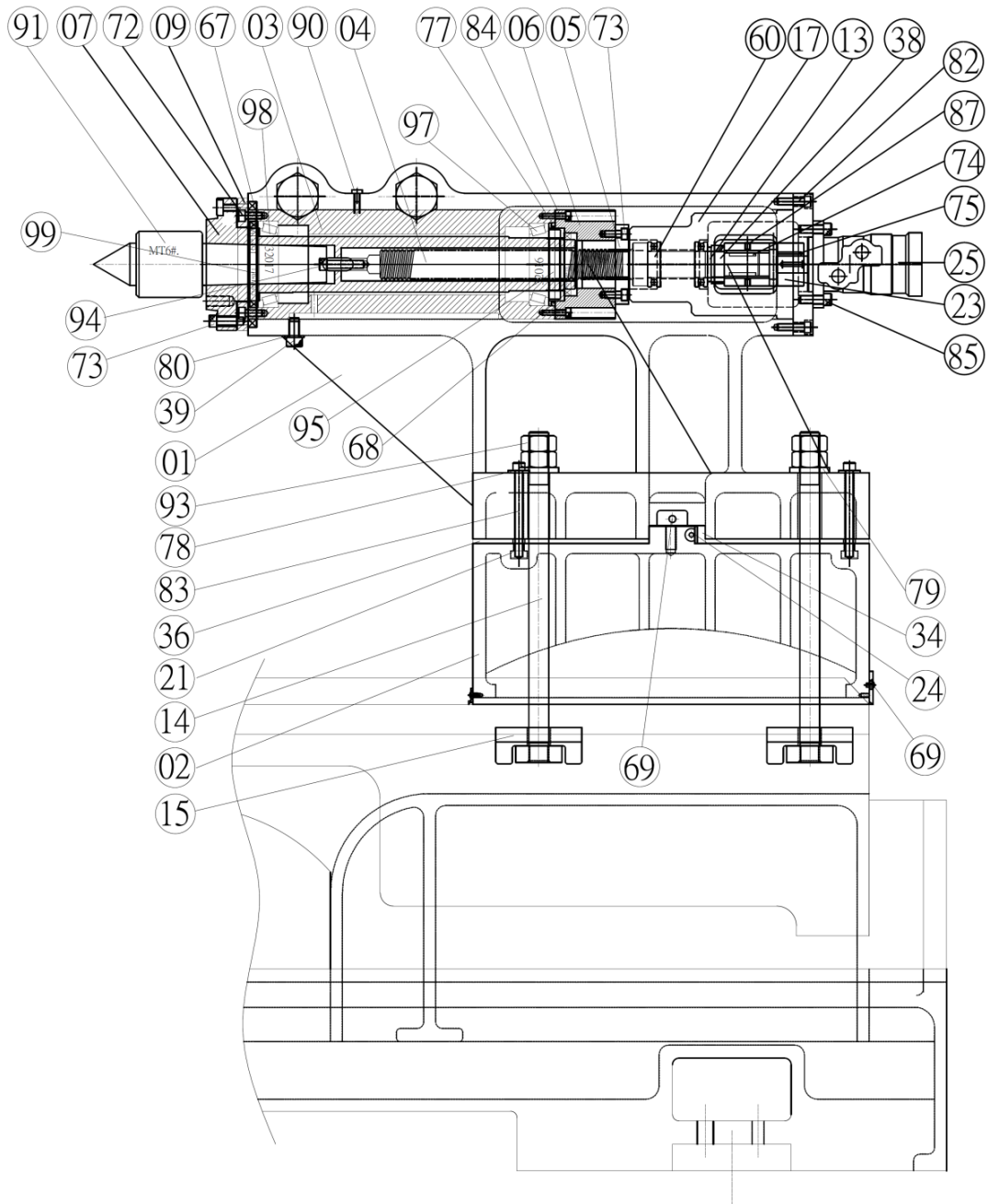
Rev.2018.04.25

NO.	PART'S NO.	DESCRIPTION	Q'TY	REMARK
01	42CB-001	BED	1	
1-1	42B-001-1	GAP	1	
02	50CB-002	BALL SCREW	1	
03	50CB-003	BEARING BASE	2	
04	50CB-004	BEARING COVER	2	
05	42CB-005	LEADSCREW BASE	1	
06	50CB-006	SPACER	2	
08	50CB-008	SPACER	2	
12	50CB-012	MOTOR BRACKET	1	
30	50CB-030-1	DECELERATOR CONNECTION PLATE	1	
31	50CB-031-1	DECELERATOR BASE	1	
40	42CB-040	X-AXIS MOTOR PLATE	1	
50	25B-050	SCREW	16	
70	25B-070	FOOT PAD	16	
100		BEARING 6010	6	
101		BEARING BST50X100-1B	4	
180		OIL SEAL 80*65*12	4	
210		SCREW M12*35	6	
211		SCREW M10*50	16	
212		SCREW M10*30	5	
213		SCREW M12*50	2	
214		SCREW M16*85	4	
215		SCREW M14*100	4	
		SCREW M8*35	12	
193		NUT M50*P1.5	2	
194		NUT M55*P2.0	1	
190		MOTOR	1	
191		DECELERATOR	1	
192		COUPLING	1	
195		PINΦ6*50	4	

6.4 Tailstock (Oil Motor)

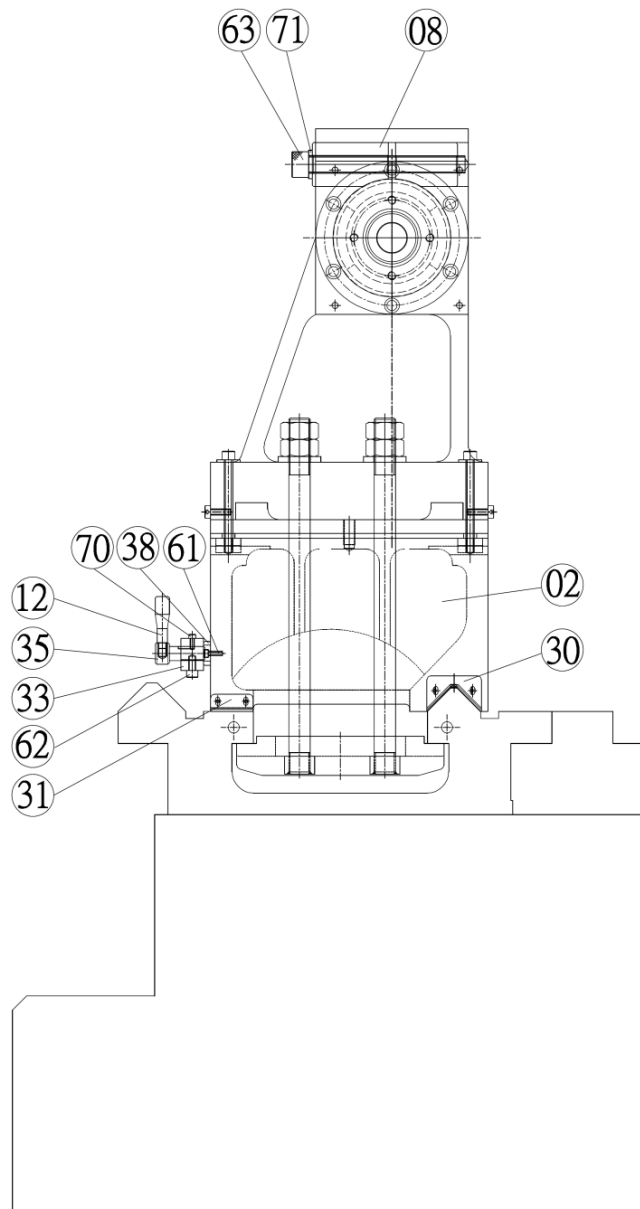
6.4.1 Parts list of 42T tailstock (Oil Motor)

2015.01.07



Parts list of 42T tailstock (Oil Motor)

2015.01.07



6.4.2 PARTS LIST OF 42T TAILSTOCK OIL MOTOR

Rev.2015.01.07

NO.	PART'S NO.	DESCRIPTION	Q'TY	REMARK
001	42T-001	TAIL STOCK	1	
002	42/48/58T-002	TAIL STOCK BASE	1	
003	42T-603	QUILL	1	
004	42T-004	SCREW	1	
005	42T-005	NUT	1	
006	42T-006	DUST COVER	1	
007	42T-607	TAILSTOCK SHAFT	1	
008	42T-008	FRONT SPACER	2	
009	42T-609	COVER	1	
012	18HA-069	HANDLE FOR SPEED CHANGE	2	
013	51CT-013	SPACER	1	
014	42/48/58T-014	BOLT	4	
015	42T-015	PLATE	2	
017	42T-017	TRANSMISSION BASE	1	
021	33CS-037	TOOL HOLDER NUT	4	
023	51CT-023	CONNECTOR	1	
024	25S-024-1	ADJUSTMENT NUT M8	2	
025	51CT-024	HYDRAULIC MOTOR	1	
030	51CT-030	WIPER	2	
031	51CT-031	WIPER	2	
033	33T-045	PIN HOLDER	1	
034	42T-034	GIB	1	
035	33T-046	BOLT	1	
036	42T-036	HOLDING DOWN PLATE	1	
038	51CT-038	SCREW NUT	1	
060		BEARING 51208	2	
061		CAP SCREW M6*20	5	
062		CAP SCREW M8*20	1	
063		CAP SCREW M24*220	2	
067		OIL SEAL 190*165*13	1	
068		OIL SEAL 75*95*12	1	
069		CROSS SCREWS M6*10	8	

PARTS LIST OF 42T TAILSTOCK OIL MOTOR

Rev.2015.01.07

NO.	PART'S NO.	DESCRIPTION	Q'TY	REMARK
070		CAP SCREW M6*15	1	
071		WASHER Ø 24* Ø 40*3	2	
072		CAP SCREW M8*25	17	
073		CAP SCREW M10*25	15	
074		KEY 12*8*55	2	
075		KEY 6*6*25	2	
077		O RING P115	1	
078		WASHER Ø 12* Ø 34*3	4	
079		WASHER Ø 40* Ø 80*5	4	
080		WASHER Ø16* Ø 40*3	1	
082		CAP SCREW M10*40	6	
083		CAP SCREW M12*130	4	
084		CAP SCREW M8*35	4	
085		CAP SCREW M12*35	4	
087		SET SCREW M8*10	2	
090		OIL PLUG 1/4"-PT	1	
091		CENTER MT6	1	
093		SCREW NUT M30*P3.5	8	
094		CAP SCREW M12*55	1	
095		LOCKING NUT AN16(M8*P2.0)	1	
097		BEARING 32016	1	
098		BEARING 32017	1	
099		OIL SEAL 110*130*12	1	

6.5 Hydraulic circuit diagram

