

ACER

FLAT BED CNC TEACH-IN LATHE

Model: ATL 1840 ATL 2140 ATL 2540

ATL 1860 ATL 2160 ATL 2560

ATL 1880 ATL 2180 ATL 2580

OPERATION MANUAL & PART LISTS

**Taiwan: Ya-Gin Machine Tool Manufacturing Inc.
Ya-Wei Machine Tool Manufacturing Inc.
No. 101, 506 Lane, Seng-Tso Road
Seng Karng Sharng, Taichung County, Taiwan
Tel: 886-4-2520-4120 Fax: 886-4-2520-4123**

**CA: Springwood Industrial, Inc.
1062 N Kraemer Place, Anaheim, CA 92806 USA
Tel: 714-632-9701 Fax: 714-632-9730**

**NJ: Klim Industrial, Inc.
244 N. Randolphville Rd, Piscataway, NJ 08854 USA
Tel: 732-752-9100 Fax: 732-752-9101**

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CONTENT

1. SAFETY INSTRUCTIONS.....	5
1.1 GENERAL SAFETY INSTRUCTIONS FOR OPERATING THE MACHINE	5
1.1.1 SAFETY INSTRUCTIONS FOR WORKPIECE HOLDING.....	7
1.2 SAFETY INSTRUCTION FOR MAINTENANCE.....	8
1.3 INSTALLATION PRECAUTIONS	9
1.3.1 GROUNDING.....	9
1.3.2 ENVIRONMENTAL CONDITIONS	10
1.4 SAFETY PRECAUTION.....	11
1.4.1 BEFORE SWITCHING ON.....	12
1.4.2 ROUTINE INSPECTIONS.....	13
1.4.3 WARM UP.....	13
1.4.4 PREPARATIONS.....	14
1.4.5 OPERATION.....	14
1.4.6 TO INTERRUPT MACHINE.....	15
1.4.7 COMPLETING A JOB.....	15
1.4.8 SAFETY DEVICES.....	16
1.4.9 MAINTENANCE OPERATION PREPARATIONS.....	16
1.4.10 MAINTENANCE OPERATION.....	16
1.4.11 UNIT OPERATION IS BEGUN AFTER MAINTENANCE.....	17
1.5 WARNING SIGNS AND PLATES ON THE MACHINE.....	17
1.6 HAZARD LIST AND SOLUTION.....	20
2. MACHINE SPECIFICATIONS	21
2.1 DIMENSIONAL DRAWING	21
2.2 GENERAL LAYOUT	22
2.3 SPECIFICATIONS	23
2.4 INTERRUPTED DIAGRAM OF TOOL TURRET	26
2.5 CHECK LIST.....	27
2.5.1 CHECK LIST FOR OPERATION.....	27
2.5.2 CHECK LIST FOR MAINTENANCE	27
3. INSTALLATION.....	28
3.1 FOUNDATION.....	28
3.1.1 FOUNDATION LAYOUT.....	29
3.1.2 LAYOUT & FLOOR PLAN	30
3.2 CONNECTION OF POWER LINE.....	30
3.3 UNPACKING	31
3.3.1 CHECKING FOR SHORTAGE.....	31
3.3.2 MACHINE LIFTING.....	31

3.3.3	<i>MACHINE PLACING</i>	33
3.3.4	<i>MACHINE CLEAN & LUBRICATION</i>	33
3.4	<i>MACHINE LEVELING</i>	33
3.5	<i>LUBRICATION</i>	34
3.5.1	<i>LUBRICATION PUMP SPECIFICATION</i>	34
3.5.2	<i>LUBRICATION SYSTEM</i>	35
3.5.3	<i>LUBRICATION SYSTEM ON HEADSTOCK</i>	36
3.5.4	<i>LUBRICATION ON TAILSTOCK</i>	37
3.6	<i>CHUCKS AND CHUCK MOUNTING</i>	37
3.6.1	<i>CHUCK FITTING ON SPINDLE NOSE</i>	37
3.7	<i>TAILSTOCK CENTER LOADING & UNLOADING</i>	38
3.8	<i>COOLANT</i>	38
4.	<i>MAINTENANCE</i>	38
4.1	<i>LUBRICATION SYSTEM</i>	38
4.1.1	<i>REPLACING OIL IN THE HEADSTOCK</i>	38
4.1.2	<i>FITTINGS</i>	39
4.2	<i>MACHINE BODY</i>	39
4.2.1	<i>ALIGNING HEADSTOCK</i>	39
4.2.2	<i>CROSS SLIDE</i>	40
4.2.3	<i>SADDLE</i>	41
4.2.4	<i>ALIGNING TAILSTOCK AND SPINDLE</i>	41
4.2.5	<i>ADJUSTING BELT TENSION OF SPINDLE</i>	41
4.2.6	<i>ADJUSTING BELT TENSION OF X-AXIS</i>	42
4.3	<i>ELECTRIC EQUIPMENT</i>	42
4.3.1	<i>MOTOR</i>	42
4.3.2	<i>CONTROL UNIT</i>	42
4.3.3	<i>WIRE CONNECTOR</i>	42
4.4	<i>SIMPLE TROUBLE SHOOTING</i>	42
4.5	<i>REMOVE CHIP AND RENEW COOLANT</i>	43
4.6	<i>NOTICE FOR MAINTENANCE AND INSPECTION</i>	44
4.7	<i>MAINTENANCE AND INSPECTION LIST</i>	48
5.	<i>OPERATION PROCEDURE</i>	50
6.	<i>WIRING DIAGRAM</i>	56
7.	<i>PARAMETER LIST</i>	57
8.	<i>PARTS LIST</i>	59
8.1	<i>HEADSTOCK</i>	59
8.1.1	<i>18" HB, SPINDLE BORE 56MM (2")</i>	59

8.1.2	21"/25" HB, SPINDLE BORE 85MM (3").....	65
8.1.3	21"/25" HB, SPINDLE BORE 105MM (4") OPTION	71
8.1.4	25" HB, SPINDLE BORE 155MM (6") OPTION.....	77
8.2	MAIN SPINDLE TRANSMISSION	83
8.3	CARRIAGE & CROSS SLIDE.....	84
8.4	BED & Z-AXIS TRANSMISSION.....	87
8.5	TAILSTOCK.....	90
8.5.1	MANUAL TAILSTOCK – 18"/21"/25" TAILSTOCK	90
8.5.2	HYDRAULIC TAILSTOCK – 18"/21"/25" TAILSTOCK OPTION	94
8.6	HYDRAULIC CYLINDER FOR HYD. CHUCK - OPTION.....	98
8.7	LUBRICATION SYSTEM	99
8.8	HYDRAULIC UNIT OPTION.....	100
8.9	AUXILIARY SIDE OIL TANK	102

WARNING

Users who are unable to read English must have this manual read and explained to, 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

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's controls and read the manuals for any relative accessories.
- 3) You have read and understand all safety and instructional plates attached to the machine when they are related to accessories.
- 4) Prior to install or service the machine, please read and understand the maintenance manual completely.
- 5) Servicing the machine must be done by competent and trained personnel only.

NOTICE

The following safety instructions are general recommendations for most of the common operations on a turning center.

Additional safety measures may be required for your particular application.

Therefore, please understand under this manual, it does not have all the absolute safety instructions for your application. Please be aware some applications may void warranty as they stretch beyond our edge of guarantee.

1.1 GENERAL SAFETY INSTRUCTIONS FOR OPERATING THE MACHINE

- 1) The best defense against injuries on a turning center is to be alert at all time. Never initiate a machine function unless you completely understand how the function will cause the machine to do.
- 2) Never operate the turning lathe with cover or shield opened or removed.
- 3) Never reach into the cutting area when the spindle is still rotating or if the machine is still in automatic mode.
- 4) Put the machine in manual mode and be sure last programmed function has been completed before reaching inside the cutting 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's rotation.
 - * Indexing of turret and cutting tools.

- * Carriage and cross-slide movement.
 - * Tailstock's 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 and around the machine.
 - 7) Clothing :
 - * Wear safety glasses with eye shields at all times. Please protect your eyes. Never use a compressed air gun to remove chips from a machine.
 - * Never wear loose fitting clothing and remove all jewelries (rings, watches, necklaces...etc.) as they can be caught in moving parts of the machine.
 - * Gloves are easily caught in moving parts. Please 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 an overhead hazard.
 - * If the operator has long hair, hair should always be tucked under a cap or be tied up and back.
 - 8) Turning machine is designed to be run by one person. Person other than the designated operator should always 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 crash.
 - 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 be allowed to operate this machine.
 - 13) The electric components are protected from normal moisture resulting from humidity created by using water base soluble coolant, etc. Do not, however, use water hose 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 working area and the cut-off chips.
 - 15) Never clean up chips while the machine is still running or is in automatic mode.
 - 16) Do not sand work piece when it is still rotating 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, please always assume it has been tampered with. Please recheck all phases of the job as though you were running the first piece.
 - 19) Never touch spindle start or spindle jog button until hands, feet, and body are

well clear of the cutting area.

- 20) Coolant and oils can make surfaces around and on the machine slippery. They can also present an electrical hazard if the machine is powered on. For these reasons, please 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 more than 10 times of the bar'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, please keep yourself and others away from the exit end of the bar-feeder when the machine is running.

1.1.1 SAFETY INSTRUCTIONS FOR WORK-PIECE HOLDING

- 1) Never run a job on this machine until you are 100% sure the work piece is being held in such a manner that it can withstand the centrifugal force from spindle rotation and cutting force of the tool. If there is any doubt, whatsoever, please consult with your supervisor.
- 2) A chuck is the most common work holding device used on this machine. Some of the below 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's configuration for the work piece--shape, weight, and balance.
 - * Jaw weight and location.
- 3) With an air or hydraulic actuated power chuck (optional accessory), please make sure the jaws are gripping the work piece securely before the jaws reach the end of their travel. When using a power chuck, please check the hydraulic or air pressure before each operation. Low chucking pressure will diminish jaw-gripping force, which may allow the work piece to fly out of the jaws. Excessive pressure can damage a power chuck, which in turn could cause a loss of jaw-force. The gripping force of a power chuck will diminish as much as 50%, because of lack of lubrication or lack of periodic cleaning. Components of the chuck are subject to wear and damage which also will decrease the gripping power. Please grease the chuck at the beginning of every shift and 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 gauge to insure that the chuck does function as it should.

- B. Please refer to manufacturer's manual for chuck and cylinder for any other maintenance requirements. As the spindle R.P.M. increases, the gripping force of the jaw will decrease. The larger the chuck diameter the more loss it will become! Various types of top jaws have serrated contact surfaces when gripping work piece. Improper usage of this type of jaws could cause serious injury or death. Please remember, chucking a work piece safely involves many variables. If you have the slightest doubt regarding the set-up's safety for a job, please consult with your supervisor.
- 4) Never operate spindle-mounted accessories over their rated speed. If the chuck or accessory is not supplied by the machine's maker, please verify the safety operating speed with its manufacturer.
 - 5) Always be sure the chuck or accessory is located correctly on the spindle nose and it is securely bolted to the face of the spindle.
 - 6) Be sure any item bolted or clamped to the 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 be aware of that closing chuck jaws could trap fingers or hands!
 - 9) The same safety instructions that apply to power chucks will also apply to manual operating 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 tube on a chuck wrench or hit with hammer.
 - C. Never run a geared 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 fly out of the chuck while the spindle is turning.
 - 10) If a work piece is extended from the chuck by a distance of 3 to 4 times of its diameter, without supported by the tailstock, poor cutting condition will occur. Under any circumstance, please do not extend an unsupported work piece more than three times of its diameter without tailstock's support. Doing so can cause the part to bend or break.

1.2 SAFETY INSTRUCTION FOR MAINTENANCE

WARNING

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

- 1) Read and understand safety instructions for operating the machine before servicing this machine.
- 2) Know all points where high voltages are present on this machine and in electrical cabinet.
- 3) Residual voltages can exist in electrical cabinet for some time after power has been turn-off. So please check any component inside electric cabinet with a voltage meter before touching them by hand.

1.3 INSTALLATION PRECAUTIONS

To ensure the safe operation of the NC or CNC machines, please note the following during installation.

WIRING

- 1) Be sure to use electrical wires or conductors with performance ratings equivalent or superior to those described in the Maintenance Manual.
- 2) Do not connect to the power distribution panel which has already connected to welders and high frequency quenching machines. The reasoning being these machines can cause line-noise which will affect the performance of the machine.
- 3) Arrange for a qualified or licensed electrician to connect the power lines on the machine.

1.3.1 GROUNDING

Use a grounding wire with a cross section of more than 14 mm^2 and a resistance value 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.

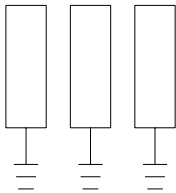
Generally, the NC machine should ground to a separated grounding rod. If an independent ground cannot be provided for the machine, please prepare the grounding connection as follow:

- 1) Connect a single conductor to its 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, please make the connections as follow:

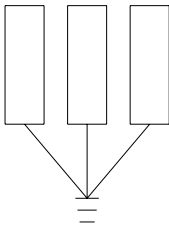
- A. Do not use the same grounding-reinforcing rod or grounding terminal for other machineries since this could lead to line-noise such as those produced by electric welders and high frequency quenching machines.
 - B. Use a grounding terminal with an adequate electrical performance rating and which 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



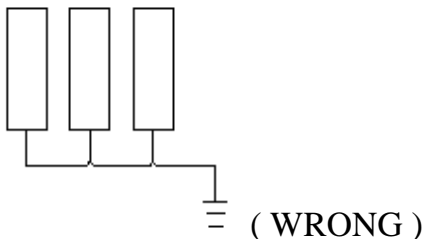
Earth resistance: Less than 100 ohms

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 (FORBITTEN):



1.3.2 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 : ± 2 hz of nominal frequency
- 3) Ambient temperature : 0 to 45 (32 to 113)
- 4) Relative humidity : Less than 80%
Temperature changes should not cause condensation.
- 5) Atmosphere : Free from excessive dust, acid fumes corrosive gases, gases and salt.
- 6) It should be avoided to expose the machine to direct sunlight or heat rays which can change on the surrounding temperature.
- 7) Avoid exposing the NC machine to abnormal vibration.
If it is difficult to meet these conditions, please contact us immediately.

1.4 SAFETY PRECAUTION

This machine is provided with a number of safety devices to protect operator and equipment from being damaged and injured. Operators should not, however, rely solely upon these safety devices but should only 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 any switch with wet hands. This, too, can cause an electric shock.

WARNING

- 1) The emergency stop push-button should be intelligently located so that it can be operated at any time without having to look for it.
- 2) Before replacing a fuse, please turn off power on the machine.
- 3) Provide sufficient working space to avoid hazardous situation. To prevent accidents, all floors should be kept dry and clean.
- 4) Water or oil can make floors slippery and hazardous. To prevent accidents, all floors should be kept dry and clean.
- 5) Before operating any switch, please 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, please turn off the main circuit breaker immediately.
- 2) Please use the recommended hydraulic oils, lubricants and grease or acceptable equivalents.
- 3) Replacement fuses should have the correct 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 plates. Should it become illegible or be missing, please 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, please check their conditions.

WARNING

- 1) Be sure the instruction manual and the programming manual are fully understood by the operators. Every function and operation should be completely clear.
- 2) Please wear safety shoes, which will not be damaged by oil, safety goggles with side covers, safe clothes and other safety protection devices.
- 3) Close all electric cabinet doors, operation cover, enclosing guard doors before switching the machine on.

CAUTION

- 1) The power cable from the factory's main fuses connecting to the machine's main circuit breaker should have a sufficient sectional area to handle the electric power required.

- 2) Cables which must be laid 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 it is unpacked or kept the machine idle for a long period (several or more weeks). For the lubricating and so forth, please keep lubricating oil pump pumping until oil oozes out from the wipers. Contact our Service Station in connection with what procedure should be taken since it depends on the type of machine.
- 4) Oil reservoirs should always be filled to indicate levels. Please check and add oil, if necessary.
- 5) For lubricating points, oil brands and appropriate levels, please see the various instruction plates on the machine.
- 6) Switches and levers should be operated smoothly.
- 7) Check the coolant level, and add coolant, if necessary.
- 8) When switching the machine on, connect the factory power fuses to the machine's circuit breaker, and then turn power switch to the ON position in order to operate the machine.

1.4.2 ROUTINE INSPECTIONS

WARNING

When you are checking belt tension, please do not place your fingers in between the belt and pulley.

CAUTION

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

1.4.3 WARM UP

- 1) To warm up the machine, especially the spindle and feed shaft please run 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 enable each machine's component to operate. At the same time, please check for their proper operations.

- 3) Be particularly careful to warm up the spindle, which can rotate up to 3500RPM. If the machine will be used for actual machining immediately after starting which has followed with a long idle time, sliding parts can be wore due to lack of lubrication. Also, thermal expansion of the machine's components can jeopardize the machine's machining accuracy. To prevent this condition, please always take some time to warm the machine up.

1.4.4 PREPARATIONS

WARNING

- 1) Tooling should conform to the machine's specifications, dimensions types.
- 2) Seriously wore-out tools can cause injuries. Please replace all such tools with new ones beforehand
- 3) The work area should be adequately lighted to facilitate safety inspections.
- 4) Tools and other items around the machine or equipment should be stored properly to ensure good footing and clear aisles,
- 5) Tools or any items should not be place on the headstock, turret, cover or similar places.
- 6) If the center holes of a heavy cylindrical work piece are too small, the work pieces can jump out after loaded. Be careful about center holes and its drilling angles.

CAUTION

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

1.4.5 OPERATION

WARNING

- 1) Do not work with long hair that can be caught by the machine. Please tie it up to the back, and out of the harm 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 forklifts and cranes or similar care should be taken to prevent collisions and damage to the surroundings.
- 5) Whenever operating a forklift, crane or similar equipment, special care should be taken to prevent collisions and damage to the surroundings.
- 6) Wire ropes or slings should be strong enough to handle the loads that is to be lifted and they should conform to the mandatory provision.
- 7) Always grip work pieces securely.

- 8) Always stop the machine before adjusting the position of the coolant nozzle.
- 9) Never touch a turning work piece or spindle with bare hands or in any other way.
- 10) While a work piece is turning, please do not wipe it or remove chips with a cloth or hand. Always stop the machine and then use a brush or a sweeper to do the work (for machine).
- 11) Do not operate the machine with safety front guard and chuck covers opened.
- 12) Please use a brush to remove chips from the tool tip not using bare hands.
- 13) Stop the machine whenever installing or removing a tool.
- 14) Whenever machining magnesium alloy parts, please wear a protective mask.

CAUTION

- 1) The machine's front guards should not be opened under automatic cycle. Also, the machine front guard can't be opened under automatic operation mode.
- 2) When performing heavy-duty machining, please carefully prevent chips from being accumulated since hot chips can ignite fire.

1.4.6 TO INTERRUPT MACHINE

WARNING

When leaving the machine temporarily after completing a job, please turn off the power switch on the control panel, and the main circuit breaker on the electric cabinet.

1.4.7 COMPLETING A JOB

CAUTION

- 1) Always clean the machine or equipment!!! Remove and dispose of chips and clean covers, guards and windows, etc.
- 2) Do not clean the machine or equipment before it has completely stopped.
- 3) Return each machine's component to its initial condition.
- 4) Check rubber wipers for breakage. Replace broken rubber wipers when needed.
- 5) Please 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, please turn off the power switch on the operating panel, machine's main circuit breaker and factory's main fuse breaker in that order.
- 8) Clean the filter of oil pan periodically.

1.4.8 SAFETY DEVICES

- 1) Front guards, rear guard and chuck guard.
- 2) Maximum travel limit switches.
- 3) Chuck barrier, tail barrier and tool barrier (on CNC software)
- 4) Stored traveling limits (on CNC software)
- 5) Emergency stops push buttons.

1.4.9 MAINTENANCE OPERATION PREPARATIONS

- 1) Do not proceed to do any maintenance operation unless being instructed to do it by the foreman.
- 2) Replacement of parts, consumables (packing, oil seals, O-rings, bearing, oil and grease etc.) should be arranged in advance.
- 3) Always 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 people not engaged in the maintenance work should not operate the main circuit breaker or the power ON switch on the control panel. For this purpose, “Do not touch the switch”, “maintenance operation in progress” or similar working labels should be indicated on such switches and at other appropriate locations, such indication should be semi-permanently secured for reading purposes.
- 2) With the machine powered on, any maintenance operation can be dangerous. In principle, the main circuit breaker should be turned off through-out the maintenance procedure.

WARNING

- 1) Maintenance operation should be done by qualified personnel. Please keep close contact with the responsible person. Do not make decision by yourself.
- 2) Over-travel limit and proximity switches and interlock mechanisms including functional parts should not be removed or modified.
- 3) When working at higher areas, please use steps or ladders that are maintained and

controlled daily for safety.

4) Please use fuses, cables, etc. that are made by qualified manufacturers.

1.4.11 UNIT OPERATION IS BEGUN AFTER MAINTENANCE

WARNING

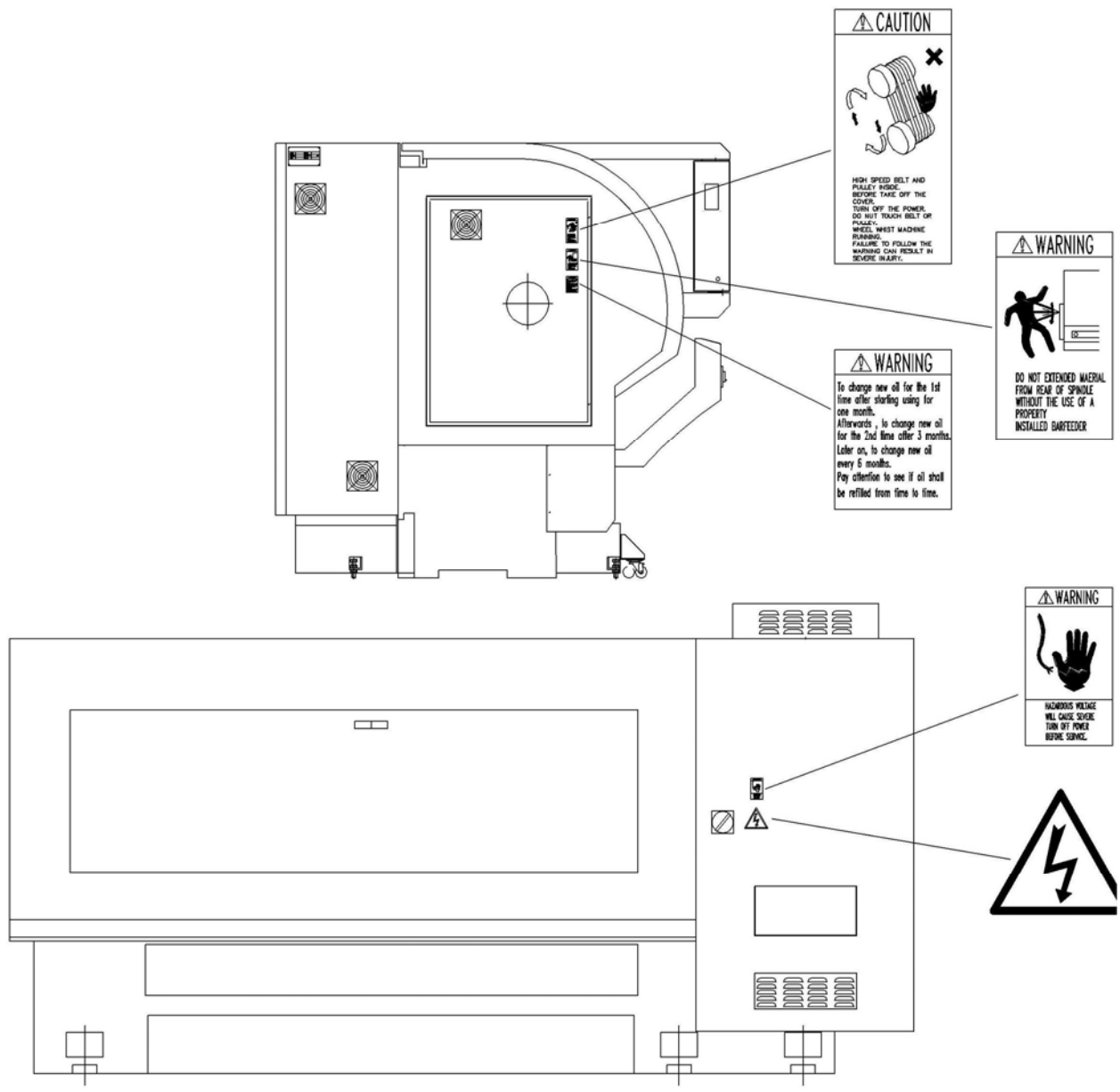
- 1) Arrange working environments in order, in around the working area to receive maintenance easily. Please wipe water and oil off and provide safe working environments.
- 2) All waste parts and oil should be removed by the operator and placed far enough away from the machine to be safe.

CAUTION

- 1) The maintenance person should make sure that the machine is operating safely.
- 2) Maintenance and inspection data should be recorded and kept for future reference.

1.5 WARNING SIGNS AND PLATES ON THE MACHINE

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



Note: Some labels' location may change due to different countries.

SAFETY INSTRUCTION


1. READ THE INSTRUCTION MANUAL CAREFULLY AND ALL WARNING PLATES BEFORE OPERATING.
2. DO NOT OPERATE THE MACHINE UNLESS PROTECTIVE COVER IS IN PLACE AND MACHINE IS STOPPED.
3. NEVER TOUCH ANY MOVING PARTS. THIS MACHINE STARTS AND MOVES AUTOMATICALLY.
4. ALWAYS CLAMP WORKPIECE AND CUTTING TOOL SECURELY. AVOID EXCESSIVE FEEDS AND SPINDLE SPEEDS.
5. SPINDLE SPEED MUST NEVER EXCEED THE LIMITATION OF YOUR HOLDING DEVICES. FAILURE TO DO THIS MAY RESULT IN A SERIOUS ACCIDENT.
6. ALWAYS WEAR SAFETY GLASSES AND SAFETY SHOES. REPAIR, INSTALLATION AND MAINTENANCE OF THIS MACHINE MUST BE PERFORMED BY QUALIFIED PERSONNEL ONLY. TURN OFF POWER BEFORE SERVICING.

PLEASE DO NOT REMOVE THIS SIGN.

SPINDLE SPEED	
3	RPM
2	RPM
1	RPM


(Refer RPM values to specification section)

WARNING




● CHECK & MAKE SURE THE MAXIMUM IS CAPACITY OF CHUCK IS SAFE TO USE.
 ● LOCK & SECURE CHECK WITH WORKING OBJECTS BEFORE USE.
 ● KEEP WORKING TOOLS, HANDS OFF ROTATING CHUCK

WARNING




Keep clear of moving parts during operation.

CAUTION

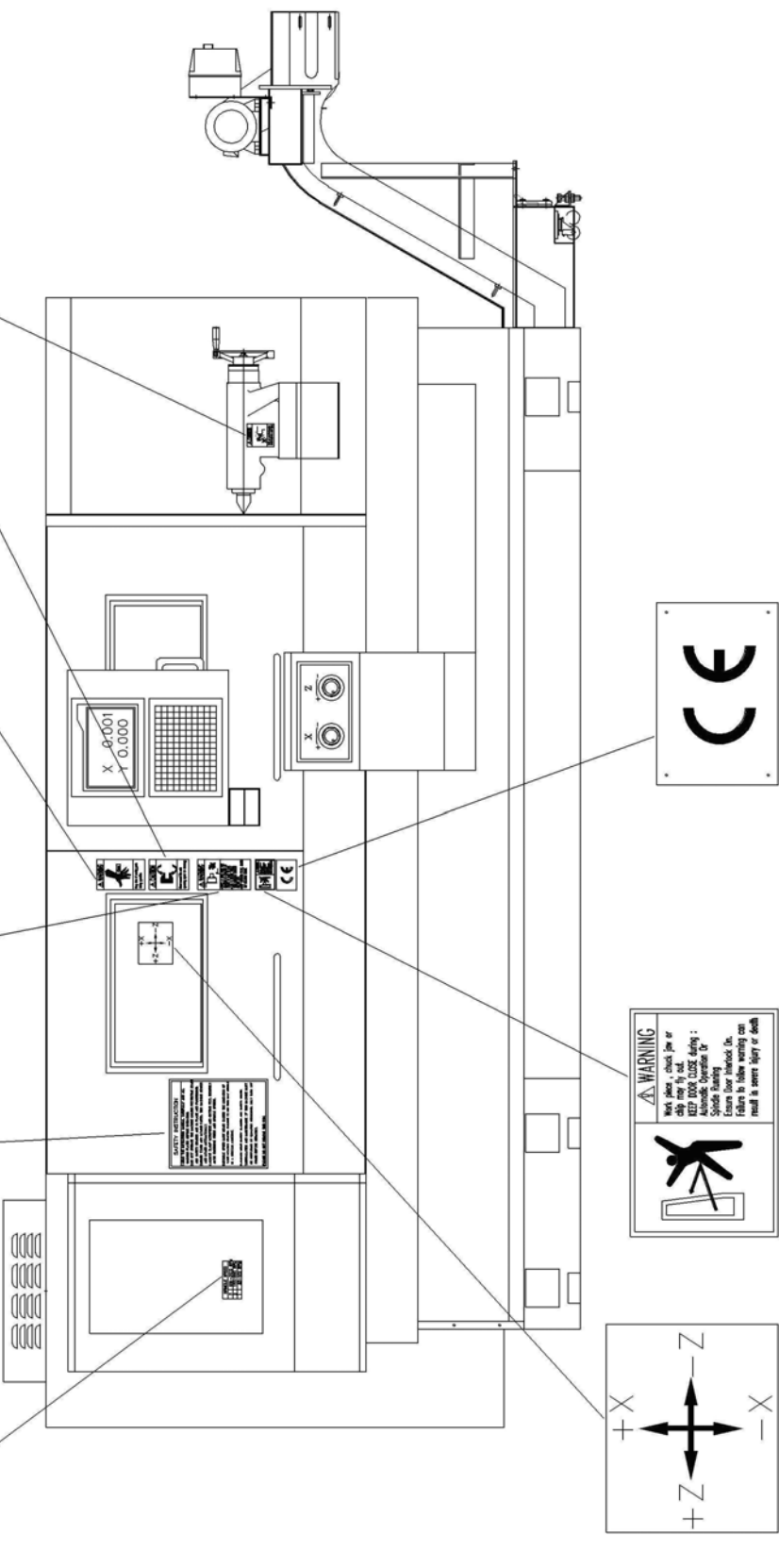


Never exceed the safe operating speed for chucking

CAUTION



Don't put your hands close to the center to avoid injury



1.6 HAZARD LIST AND SOLUTION

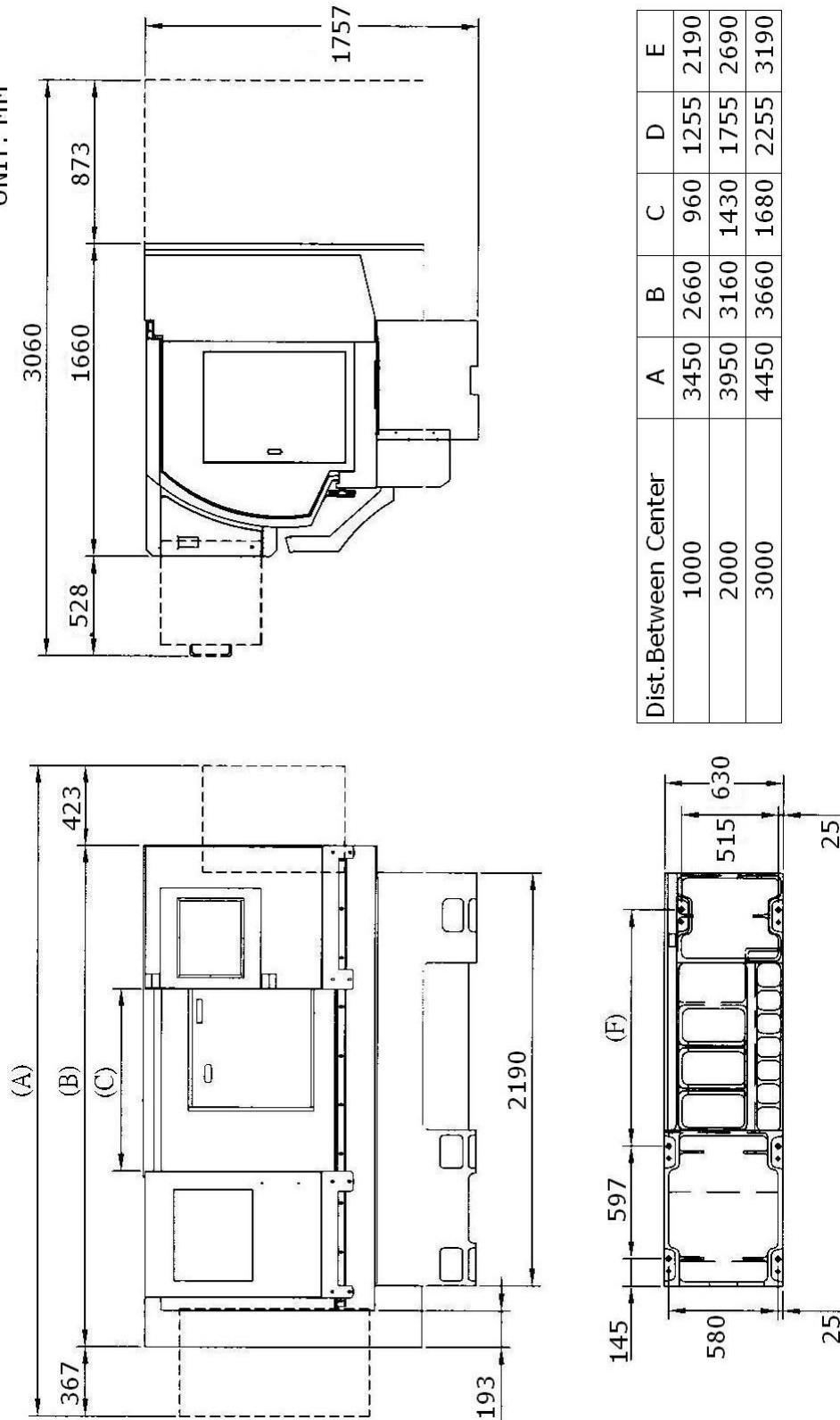
HAZARD LOCATION	RISK DESCRIPTION	SOLUTION
Z axis leadscrew	When z-axis is moving, the rotating Ball screw could cause injury to operator if he touches it unconsciously.	Fit a protection cover over the Ball screw to prevent operator from touching it with fingers or body.
Belt on X-axis Transmission	When X-axis is moving, the rotating Belt between Motor Pulley and Ball screw Pulley could cause injury to the operator if he touches it accidentally.	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 the machine is running, the rotating Belts from Spindle Motor to Gear Box, and from Gear Box to Screw could cause injury to the operator if he touches it accidentally.	Fit a protection Headstock Side Guard to cover the whole transmission system and prevent an operator from touching it directly.
Chain Transmission on Chip Conveyor	The power of Chip conveyor is transmitted by Chain. When Chip Conveyor is working, the rotating Chain could cause injury to the operator if he touches it accidentally.	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 the operator.
Chip Outlet of Chip Conveyor	The turning Outlet and Chips from the Outlet could cause injury to the 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 cover in Black and Yellow to warn the operator.

2. MACHINE SPECIFICATIONS

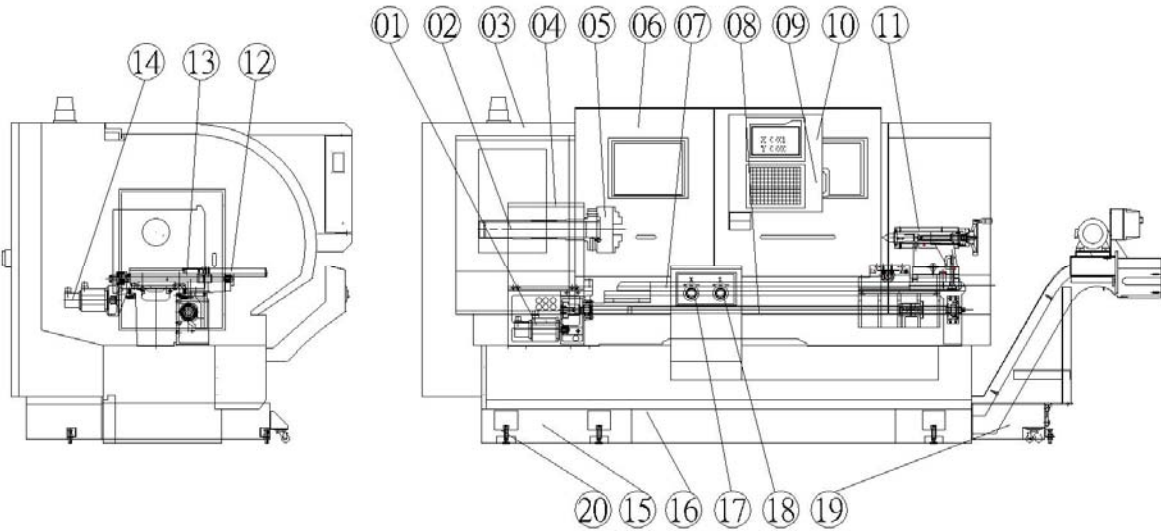
2.1 DIMENSIONAL DRAWING

18/21/25- 40/60/80

MAR. 17, 2010
UNIT: MM



2.2 GENERAL LAYOUT



ITEM	DESCRIPTION	ITEM	DESCRIPTION
01	SERVO MOTOR OF Z AXIS	11	TAILSTOCK
02	SPINDLE	12	APRON
03	ELECTRIC CABINET	13	BALL SCREW OF X AXIS
04	HEADSTOCK	14	SERVO MOTOR OF X AXIS
05	CHUCK	15	MACHINE BASE
06	SPLASH GUARD	16	CHIP PAN OR TRAY
07	BED	17	X AXIS HANDWHEEL
08	BALL SCREW OF Z AXIS	18	Z AXIS HANDWHEEL
09	CONTROL PANEL	19	COOLANT TANK
10	MONITOR	20	LEVELING SCREW

2.3 SPECIFICATIONS

Model \ Description	ATL-1840	ATL- 1860	ATL- 1880
WORKING CAPACITY			
Swing over bed	460 mm	460 mm	460 mm
Center height	230 mm	230 mm	230 mm
Swing over cross slide	230 mm	230 mm	230 mm
Dist. Between centers	1000 mm	1500 mm	2000 mm
Width of bed	350mm	350mm	350mm
HEADSTOCK			
Spindle nose	D1-6	D1-6	D1-6
Spindle bore	56mm (2")	56mm (2")	56mm (2")
Spindle speeds (RPM)	H : 3100~681 M : 680~153 L : 152~33	H : 3100~681 M : 680~153 L : 152~33	H : 3100~681 M : 680~153 L : 152~33
SADDLE			
Cross slide travel (X-axis)	280 mm	280 mm	280 mm
Longitudinal travel (Z-axis)	810 mm	1310 mm	1810 mm
Ball screw (Dia. X pitch)	X: $\Phi 25$ x 5 mm, Z: $\Phi 40$ x 10 mm	X: $\Phi 25$ x 5 mm, Z: $\Phi 40$ x 10 mm	X: $\Phi 25$ x 5 mm, Z: $\Phi 40$ x 10 mm
TAILSTOCK			
Spindle dia.	75 mm	75 mm	75 mm
Spindle travel	170 mm	170 mm	170 mm
Taper in spindle	MT# 5	MT# 5	MT# 5
MOTOR			
Spindle motor	AC 7.5HP / AC 10HP (opt.)		
X-axis drive motor	6.3 NM / Pitch 5mm 1:1		
Z-axis drive motor	6.3 NM / Pitch 10mm 1:2		
Coolant pump motor	1/6 HP		
X / Z FEEDS			
X-axis rapid travel	5 m/min	5 m/min	5 m/min
Z-axis rapid travel	7 m/min	7 m/min	7 m/min
MACHINE WEIGHT			
N.W. (Approx.)	2900 kgs	3200 kgs	3500 kgs
Floor Space (L*W*H) (mm)	2720*1760*1910	3220*1760*1910	3720*1760*1910

NOTE : We have the right to modify the specifications, designs, mechanism etc., to improve the performance of the machine without prior notice.

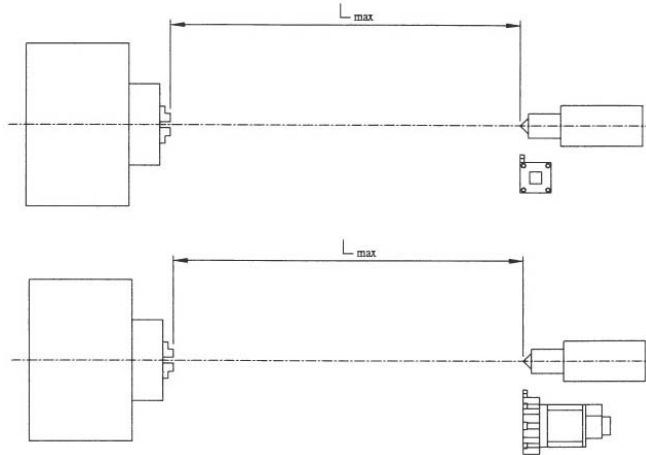
Model \ Description	ATL-2140	ATL-2160	ATL-2180
WORKING CAPACITY			
Swing over bed	540 mm	540 mm	540 mm
Center height	270 mm	270 mm	270 mm
Swing over cross slide	310 mm	310 mm	310 mm
Dist. between centers	1000 mm	1500 mm	2000 mm
Width of bed	350mm	350mm	350mm
HEADSTOCK			
Spindle nose	D1-8	A2-11	
Spindle bore	85mm (3")	105mm (4") (opt.)	
Spindle speeds (RPM)	H : 2250~491 M : 490~126 L : 125~27	H : 1500~331 M : 330~93 L : 92~20	
SADDLE			
Cross slide travel (X-axis)	350 mm	350 mm	350 mm
Longitudinal travel (Z-axis)	810mm	1310 mm	1810 mm
Ball screw (Dia. x pitch)	X: $\Phi 25 \times 5$ mm, Z: $\Phi 40 \times 10$ mm	X: $\Phi 25 \times 5$ mm, Z: $\Phi 40 \times 10$ mm	X: $\Phi 25 \times 5$ mm, Z: $\Phi 40 \times 10$ mm
TAILSTOCK			
Spindle dia.	75 mm	75 mm	75 mm
Spindle travel	170 mm	170 mm	170 mm
Taper in spindle	MT# 5	MT# 5	MT# 5
MOTOR			
Spindle motor	AC 10HP	AC 15HP (opt.)	
X-axis drive motor	6.3 NM / Pitch 5mm 1:1	6.3 NM / Pitch 5mm 1:1	
Z-axis drive motor	6.3 NM / Pitch 10mm 1:2	6.3 NM / Pitch 10mm 1:2	
Coolant pump motor	1/6 HP	1/6 HP	
X / Z FEEDS			
X-axis rapid travel	5 m/min	5 m/min	5 m/min
Z-axis rapid travel	7 m/min	7 m/min	7 m/min
MACHINE WEIGHT			
N.W. (Approx.)	3100 kgs	3400 kgs	3700 kgs
Floor Space (L*W*H) (mm)	2720*1760*1910	3220*1760*1910	3720*1760*1910

NOTE : We have the right to modify the specifications, designs, mechanism etc., to improve the performance of the machine without prior notice.

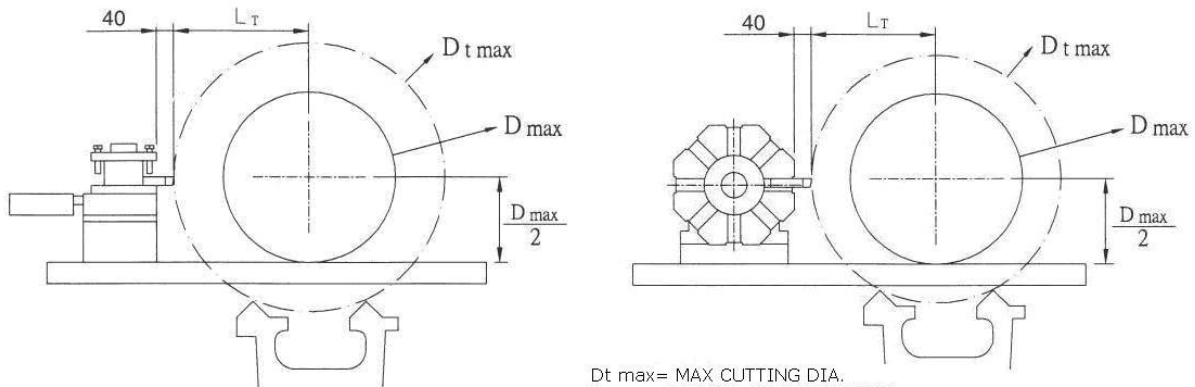
MODEL \ DESCRIPTION	ATL-2540	ATL-2560	ATL-2580
WORKING CAPACITY			
Swing over bed	630 mm	630 mm	630 mm
Center height	315 mm	315 mm	315 mm
Swing over cross slide	400 mm	400 mm	400 mm
Dist. between centers	1000 mm	1500 mm	2000 mm
Width of bed	350mm	350mm	350mm
HEADSTOCK			
Spindle nose	D1-8	A2-11	A2-11
Spindle bore	85mm (3")	105mm (4") (opt.)	155mm (6") (opt.)
Spindle speeds (RPM)	H : 2250~491 M : 490~126 L : 125~27	H : 1500~331 M : 330~93 L : 92~20	H : 800~176 M : 175~53 L : 52~10
SADDLE			
Cross slide travel (X-axis)	350 mm	350 mm	350 mm
Longitudinal travel (Z-axis)	810mm	1310 mm	1810 mm
Ball screw (Dia. x pitch)	X: $\Phi 25 \times 5$ mm, Z: $\Phi 40 \times 10$ mm	X: $\Phi 25 \times 5$ mm, Z: $\Phi 40 \times 10$ mm	X: $\Phi 25 \times 5$ mm, Z: $\Phi 40 \times 10$ mm
TAILSTOCK			
Spindle dia.	75 mm	75 mm	75 mm
Spindle travel	170 mm	170 mm	170 mm
Taper in spindle	MT# 5	MT# 5	MT# 5
MOTOR			
Spindle motor	AC 10HP / AC 15HP (opt.)		
X-axis drive motor	6.3 NM / Pitch 5mm 1:1		
Z-axis drive motor	6.3 NM / Pitch 10mm 1:2		
Coolant pump motor	1/6 HP		
X / Z FEEDS			
X-axis rapid travel	5 M/min	5 M/min	5 M/min
Z-axis rapid travel	7 M/min	7 M/min	7 M/min
MACHINE WEIGHT			
N.W. (Approx.)	3200 kgs	3500 kgs	3800 kgs
Floor Space (L*W*H) (mm)	2720*1760*1910	3220*1760*1910	3720*1760*1910

NOTE : We have the right to modify the specifications, designs, mechanism etc., to improve the performance of the machine without prior notice.

2.4 INTERRUPTED DIAGRAM OF TOOL TURRET



TURRET	MODEL	L max.
4 Way Tool post	ATL-18/21/25-40	800 mm
	ATL-18/21/25-60	1300 mm
	ATL-18/21/25-80	1800 mm
8 Station Turret	ATL-18/21/25-40	710 mm
	ATL-18/21/25-60	1210 mm
	ATL-18/21/25-80	1710 mm



Dt max= MAX CUTTING DIA.
D max=MAX DIA. OF WORKPIECE
LT=MAX CUTTING LENGTH

TURRET	MODEL	D max.	Dt max.	LT
4 Way Tool post	ATL-1800	Dia.230 mm	Dia.460 mm	230 mm
	ATL-2100	Dia.310 mm	Dia.540 mm	270 mm
	ATL-2500	Dia.400 mm	Dia.660 mm	300 mm
8 Station Turret	ATL-1800	Dia.230 mm	Dia.460 mm	230 mm
	ATL-2100	Dia.310 mm	Dia.522 mm	260 mm
	ATL-2500	Dia.400 mm	Dia.522 mm	260 mm

2.5 CHECK LIST

2.5.1 CHECK LIST FOR OPERATION

ITEM	JOB DESCRIPTION	DESCRIPTION NO.
01	Read operating manual thoroughly	
02	Read all instruction manuals thoroughly	
03	Lifting & moving machine	
04	Installing machine	
05	Leveling machine	
06	Lubricating instruction	
07	Checking electrical circuit connections	
08	Main switch and button turn "ON"	
09	Press emergency stop button to stop machine	
10	Learn safety rules	
11	Simple trouble shooting	
12	Maintenance	

2.5.2 CHECK LIST FOR MAINTENANCE

ITEM	JOB	Interval
01	Clean machine (do not use air compressor)	Weekly
02	Check electrical circuit connection	Every time before operation
03	Replace coolant and clean coolant tank	Every 3 months
04	Clean motor	Annually
05	Check Slide (x axis)	Annually
06	Check Slide (z axis)	Semi-annually
07	Check Spindle tip	Annually
08	Check Automatic lubrication unit	Weekly
09	Add grease	Weekly

3. INSTALLATION

3.1 FOUNDATION

To ensure 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 vibration. The machine body is not allowed to be exposed to sunshine or rain. Please be sure not to install the lathe adjacent to planar mills, molding machines or heavy presses. Otherwise, it will result the lathe in poor performance.

A distance of at least 20" (500mm) is required from the machine to the wall or objects or between machines to ensure easy cleaning and maintenance of machine as well as easily opening the doors of electric cabinet.

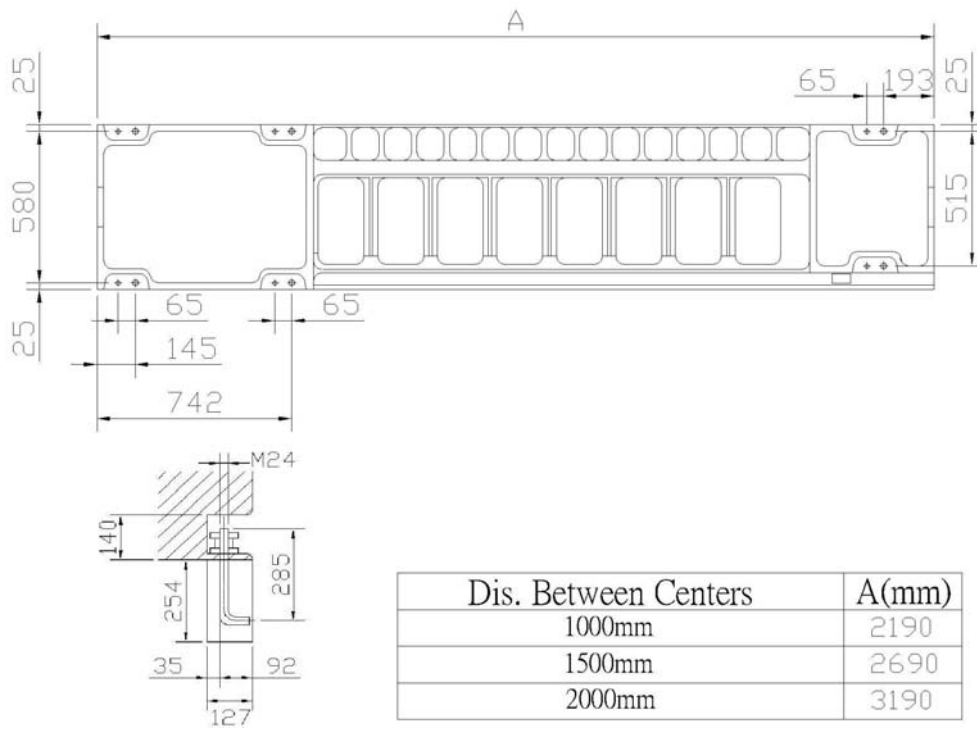
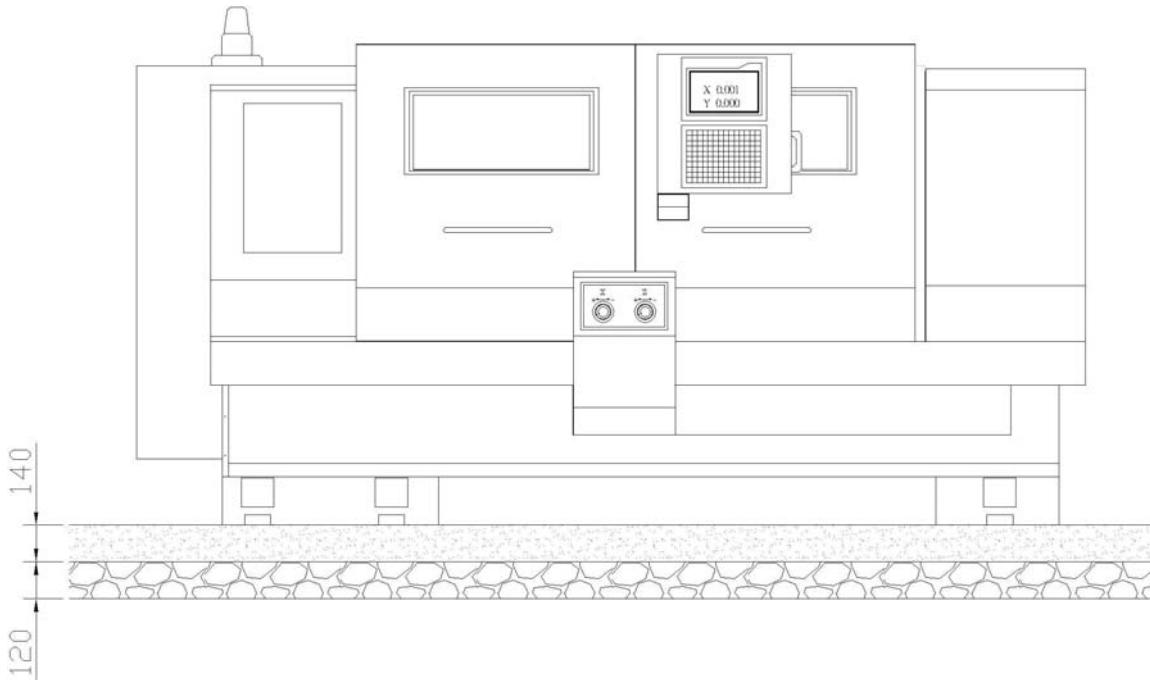
With special torque-resistant capability at the machine base, this machine requires no particular foundation. Just provide 6" (150mm) thick of concrete on the floor and leave space for leveling procedure.

Do not use wood floor for foundation which with its nature of instability may cause the machine to move gradually.

Install the machine on the first or second floor? Please take the stress of ceiling and foundation into careful consideration to see if machine weight can be sustained.

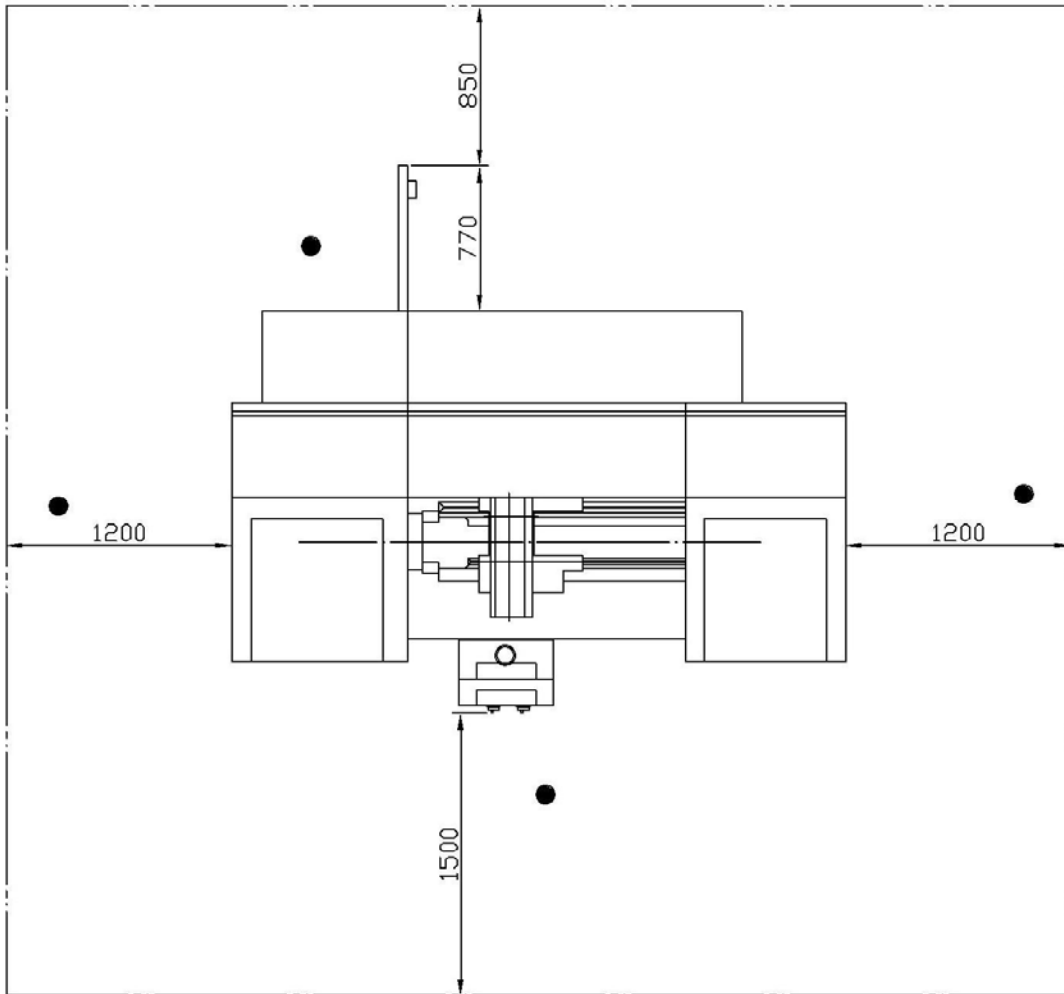
3.1.1 FOUNDATION LAYOUT

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 onto the bolts after the cement has turned solid, and then cap the bolts with screw nuts.



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 current values, fuses

and overload relays are shown in the electrical manual.

NOTICE

Do not turn on the machine when its voltage is different from power source and please contact electrician for voltage change!

3.3 UNPACKING

Remove the top cover of wooden case first and then the plates on four sides. Carefully take out joining lumbers at first, if necessary. Remove the locking screws used for holding the machine on the pallet.

Disassembling packing crate and remove pallet as carefully as possible to avoid damaging the machine! If the machine is damaged during transportation, please 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, please mark items that are not received and contact your local dealer.

3.3.2 MACHINE LIFTING

Please use the following equipment to lift the machine.

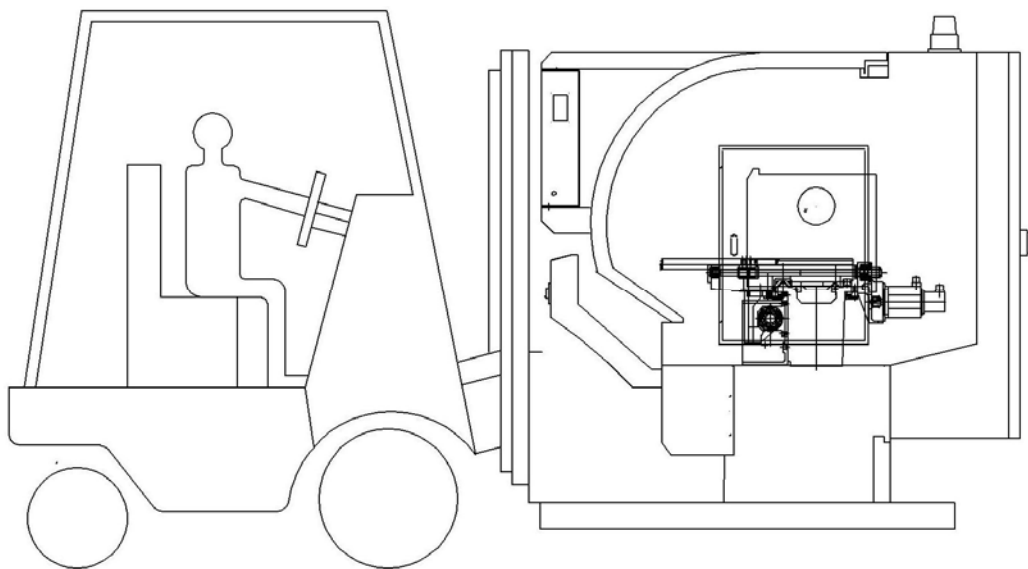
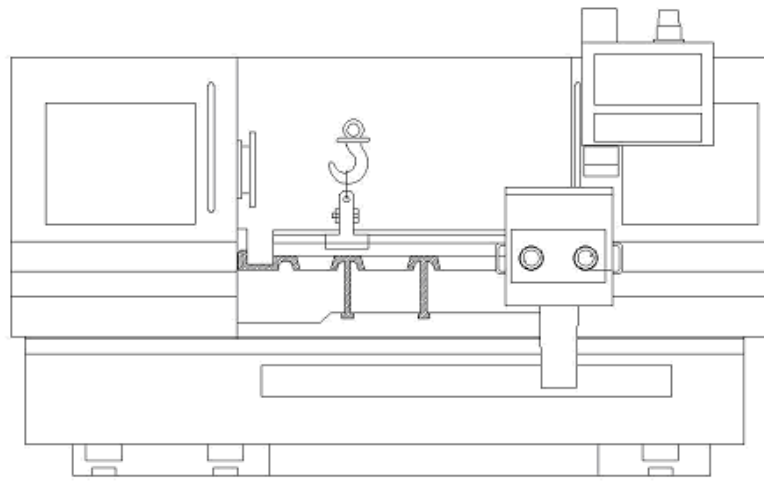
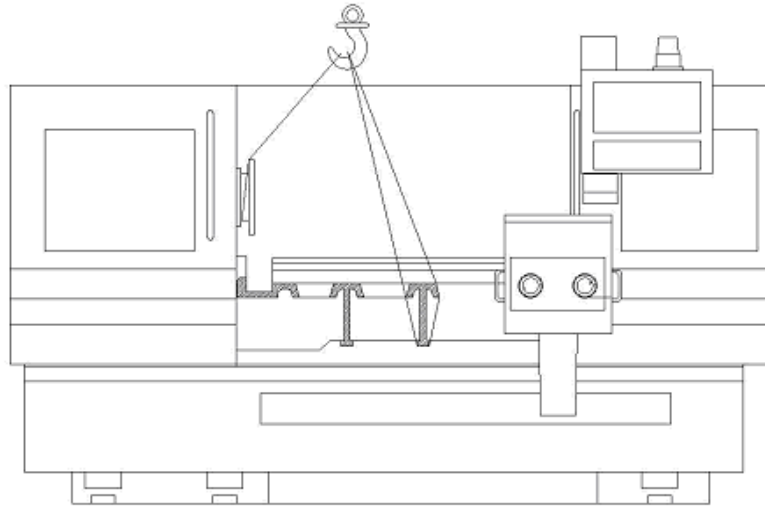
- 1) An over-head crane with the safety loading weight required more than the machine weight.
- 2) Two safety straps with width of 80 mm, thickness of 6 mm and length of 4000 mm. The safety loading weight is required is the same as the overhead crane.
- 3) Some Tools for lifting machine.

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

NOTICE

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

MACHINE LIFTING



3.3.3 MACHINE PLACING

Before placing the machine, screw in the leveling screws on the base, move the machine as close as possible to the floor, and position the leveling pads in the selected location that can increase the stability of machine.

3.3.4 MACHINE CLEAN & LUBRICATION

All protective coating must be removed before using the machine. Do not attempt to move X or Z axis if the coating still exists. Be Caution: Selecting a suitable cleaning agent such as Paraffin will only 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 topslide, saddle and machine base.
Drive the topslide & saddle to one end of travel, clean and lubricate slideways thoroughly then drive topslide & saddle to the other end and clean and lubricate slideways 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) Precision engineering levels (spec. 0.02mm/1000mm or 0.001in/4ft).
- 2) Two adjustable wrenches.

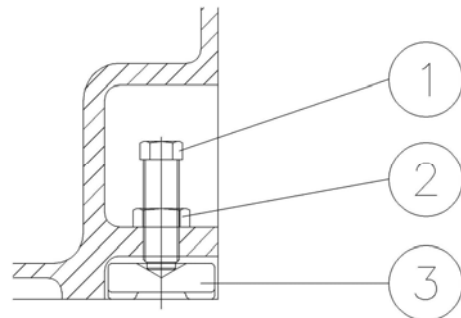
Clean the topslide surface thoroughly, set one of the precision engineer level on the longitudinal direction and the other one on the cross direction of the slide.

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

Adjust the leveling screws, # **1** on the figure, located at the bottom of the machine base (as shown in the figure) until the machine is leveled with 0.02mm/1000mm or 0.001"/4ft in both directions.

Lock the nuts # **2** on the leveling screws, and recheck the level to see whether the levelness of machine is still within tolerance.

Suggestion: For the newly installed machine,

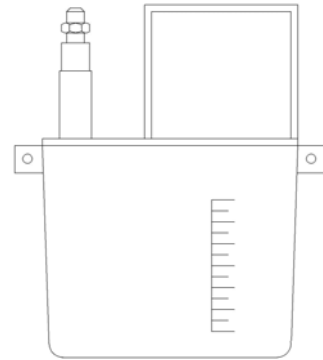


please check its level once every week. If the foundation is rigid enough, then you may check the level once every month.

3.5 LUBRICATION

3.5.1 LUBRICATION PUMP SPECIFICATION

Auto, manual pump tank capacity	:2.1 L
Effective capacity	:1.7 L
Motor	: (110V) / 220V



DIRECTIONS

* Note the oil quantity will reduce gradually under normal operation.

* 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 requires clean lubricant.
- 3) In case of impurity remains in the oil tank and causes the oil pump to fail, please clean the oil-absorbing filter immediately.
- 4) First, press oil feeding button to fill up the empty tubes before normal operation.
- 5) The adjustment of discharging amount (Fig, shown) is to release the fixing bolt and adjust it to desired amount displayed on the scale rod, so the figure displayed is to show the desired amount in cc/cycle.
- 6) When oil surface is below the “MIN” limit, it is time to refill oil.

CESH-TYPE

FEATURES

- 1) This product will supply lubrication to every part of the machine which needs to be lubricated. It is centralized and joined with proper tubings to apply lubricants automatically. The lubrication pump provides oil lubing time with precision, thus improve lubrication efficiency and lower maintenance cost.
- 2) When starting, this pump is at “OFF” position; it will avoid re-actuating this

machine with too much lubricating oil.

- 3) For the adjustment of the lubrication volume, set the “ON” and “OFF” at the respective position for the selected discharge amount, and the adjustment is complete.
- 4) If more lubrication is required, please actuate the coercive pumping switch.
- 5) According to the division of timer, please set “ON” and “OFF times (in 3% error).
- 6) The pressure switch and buzzer are optional accessories customer may purchase.

SPECIFICATION

TIMER	ON (ON TIME)	0-60 min.		
*ALARM	*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 VOLUME(MAX.)	0.5 cc/sec.		
	DISCHARGE PRESSURE	10kg /cm		
TANK	CAPACITY : LITER	2	2	2
	MATERIAL	R	R	R

Operating instruction

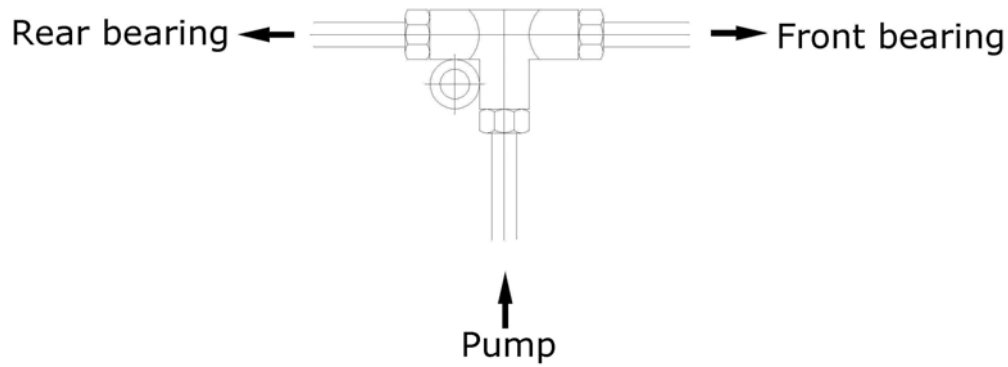
- 1) Instruction for manual oil feeding: If more lubrication is needed, please actuate the coercive pumping switch.
- 2) Setting the time of auto lubrication: Please take off the cover of wiring box and set the “NO” and “OFF” at the desired positions that indicate the selected discharging and off time.

Remark : Prior to the first operation, please press coercive pumping switch by hand in order to fill up the lubrication tubes with oil.

3.5.2 LUBRICATION SYSTEM

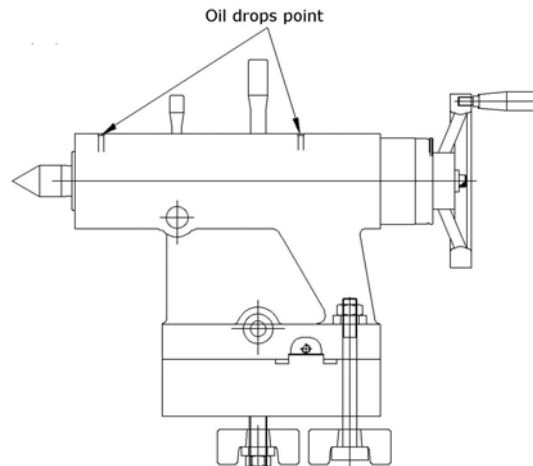
This system has automatic intermission lubrication capabilities which include direction control, metering, valves for proportional distribution and has an alarm for low fluid level warning

Still, please check the oil level before each operation. Please add the following



3.5.4 LUBRICATION ON TAILSTOCK

Bed width 350mm there are two oil points on the tailstock. Please add 10 drops of recommended lubricant to them every day before starting. This is to ensure the operating smoothness of the quill and ways.



3.6 CHUCKS AND CHUCK MOUNTING

NOTICE

Use only high-speed chucks which have minimum RPM at 3100RPM with these lathes.

Note: 21" & 25" series will have lower RPM values!

3.6.1 CHUCK FITTING ON SPINDLE NOSE

When fitting a **D type chuck**, it is necessary to have a back plate for the chuck. Fitting the back plate onto spindle first, then please fit the chuck on. It would be easier to fit the chuck on when the back plate is already mounted on the spindle.

3.7 TAILSTOCK CENTER LOADING & UNLOADING

To release the dead center from the quill, please hold the center and back the quill in until the center is released.

Please wipe the taper of the dead center clean before place it onto the quill center.

3.8 COOLANT

While choosing coolant additive for this machine, please ensure the composition of the coolant additive excludes Sulfur and Chlorine. The reason being Sulfur and Chlorine may damage machine paint.

4. MAINTENANCE

4.1 LUBRICATION SYSTEM

Please check all the fittings of the lubrication system under normal operating temperature. If any oil leaking is found, tighten the fittings. Please inspect the oil level daily.

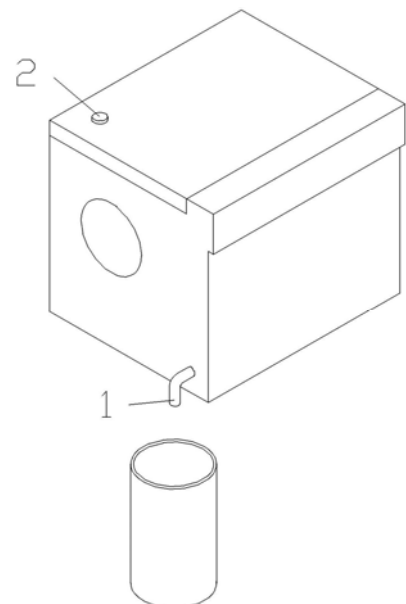
4.1.1 REPLACING OIL IN THE HEADSTOCK

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

While replacing the oil, please clean the inside of the headstock and side oil tank thoroughly. To just adding the oil without replacing it is a waste of time and money. Adding new oil will not refresh the old oil but instead it will deteriorate it. The metallic particle and dust in the old oil will form a layer on the oil surface which will accelerate the oxidization of oil.

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

1) The recommended lubricant is **Shell Tellus 32 or**



Mobil DTE medium #24.

- 2) Prepare a large container at the front side of the headstock.
- 3) Turn off the lathe and the spindle. Disconnect the returning hose from the side oil tank, and then connect it to the container.
- 4) Turn on the lathe and the spindle. The old lubricant will flow into the container instead.
- 5) Watch out for the lubricant level on the side oil tank carefully. Turn off the lathe and the spindle when the side oil tank is almost empty.
- 6) Remove the oil plug on the drain hole of the side oil tank. Drain out all lubricant and get the side oil tank really scoured. And then put the oil plug back. FIGURE 4-1
- 7) Fill the side oil 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 be flown into the container through the returning hose.
- 9) Keep adding new lubricant into the side oil tank to sustain the lubrication level.
- 10) After a while, turn off the lathe and the spindle. Disconnect the returning hose from the container, and then connect it back to the side oil tank.

4.1.2 FITTINGS

Please check all fittings after 500 hours of initial operation especially their tightness in between the tubes. After that, please do the regularly checking once every 200 hours.

4.2 MACHINE BODY

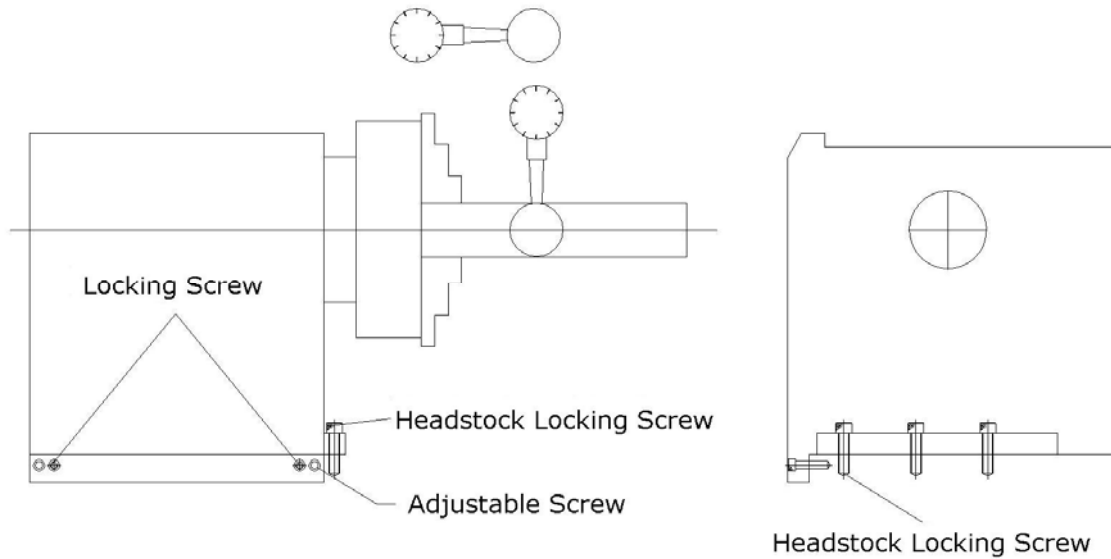
In order to maximize the machine's performance, the accuracy on headstock and all slideways have to be readjusted after three months of operation. After that, readjustment occurs every six months to one year to keep the machine in its best accuracy form.

4.2.1 ALIGNING HEADSTOCK

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

- 1) Insert gauge bar in the spindle bore. Attach the base of dial 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 stylus of the indicator moves drastically, please release the headstock locking screws and adjust the adjustment screws until the parallelism of spindle and Z axis is achieved again.

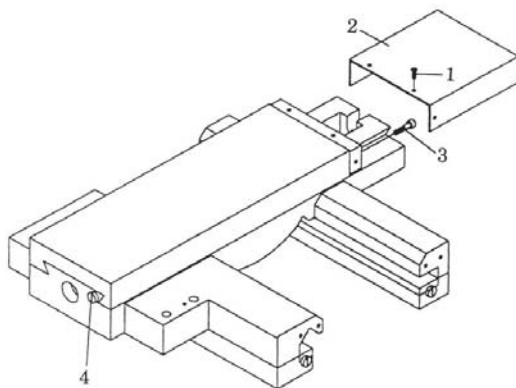
- 3) After adjustment, tighten the locking screws and move the saddle to observe the stylus of the indicator. If parallelism is not achieved, please repeat the procedure again.



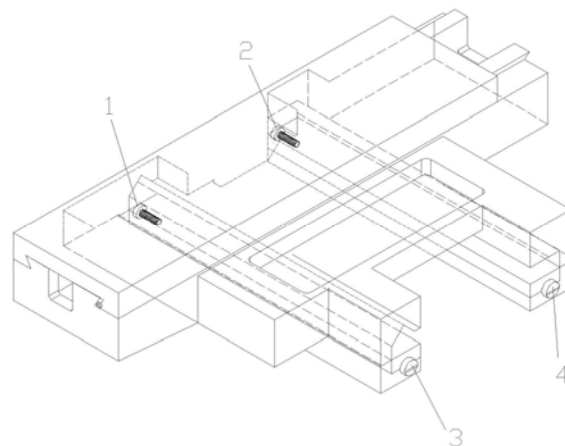
4.2.2 CROSS SLIDE

If the gib between topslide and saddle become loose, it will affect the machining accuracy and finish. Customer should regularly check and adjust the gib every six months according to the following steps.

- 1) Release the screw #1
- 2) Remove slide cover #2 as shown as figure 4.2.2 shown, and then the gib can be seen.
- 3) Use flat head screw diver to release the gib screw #3 about 1/2 circle CCW.
- 4) Tighten gib screw #4 about 1/2 circle CW.
- 5) Move the slide back and forth to achieve a satisfying smoothness.
- 6) Reassemble the cover 2



4.2.2



4.2.3

4.2.3 SADDLE

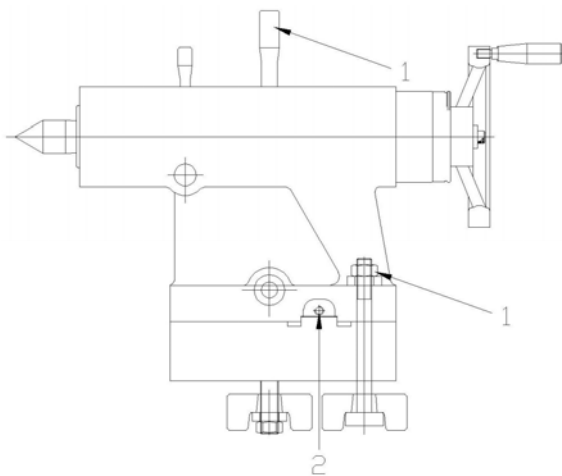
If the gibs between saddle and bedways become loose, it will affect the accuracy of saddle travel. Please check and adjust them every six months according to the following steps.

- 1) Use flat head screw driver to loosen the gib screw #1 & #2 as shown on Figure 4.2.3 about 1/2 circle CCW.
- 2) Appropriately tighten gib screw #3 & #4 as shown in figure about 1/2 circle CW.
- 3) Move saddle left and right to achieve a satisfying smoothness.

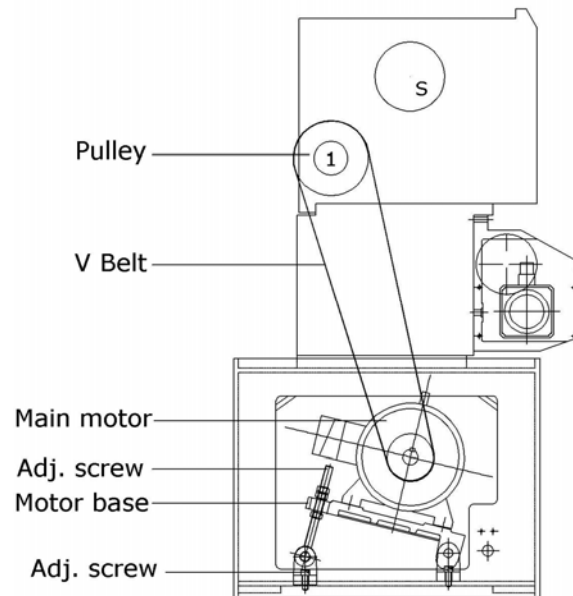
4.2.4 ALIGNING TAILSTOCK AND SPINDLE

If there is a taper appearing on work piece while machining with the tailstock. Please 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 dial indicator to the saddle, apply the stylus of the indicator to the surface of the bar, move the saddle left and right, and record the maximal difference.
- 2) Release the fixing screw #1 and adjust the gib screw #2 to fine tune the alignment.



4.2.4



4.2.5

4.2.5 ADJUSTING BELT TENSION OF SPINDLE

The main spindle torque which depends on the motor power transmitted through the belts, the operator must check the V belts' tension frequently by adjusting adjustment screw if it becomes necessary.

4.2.6 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 becomes looser, please adjust the belt to have the proper tension.

4.3 ELECTRIC EQUIPMENT

4.3.1 MOTOR

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

4.3.2 CONTROL UNIT

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

4.3.3 WIRE CONNECTOR

Please 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	Insufficient oil	Add oil into headstock
	Pump outlet is clogged	Remove the object that clogs the pump outlet
Rails on bed turn black	Automatic lubrication system is out of lubricant	Add lubrication oil
	Inappropriate oil properties	Immediately replace the lube oil with the correct specification.
	Oiling tube clogged	Replace tube or clear the clogged object

Cylindrical item machined into conical shape	Spindle head alignment	Please refer Chapter 3.10.1 to adjust the alignment
Inaccurate machining between two dead centers	Poor alignment on two centers	Please refer to Chapter 3.10.6 to adjust the alignment
Steps appear on the Spherical work-piece surface	Inaccurate backlash compensation	Please refer to Chapter backlash offset and adjustment
Too much temperature rise during constant spindle rotation	Invalid lubrication system	Check if there is oil leaking from the headstock and side oil tank.

4.5 REMOVE CHIP AND RENEW COOLANT

- 1) There are too much chips deposited in the machine after end of the work each day. It is necessary to take a little time for removing the chip from the machine. First please turn off the power on the operate panel, and then open the safety front doors. Use a soft brush to clean chips on all the working area and make sure chips fall into the chip disposal area (Swing over bed 460/540/630 mm). Pull out the chip disposal tray (Swing over bed 670/770/840 mm) from the front of machine. Clean-up the chips that are inside the chip disposal tray. Place chip disposal tray back to the original position.
- 2) When the coolant quality is seriously contaminated or it is scheduled to be replaced on the maintenance list. We always recommend to fully clean coolant tank and renew coolant, and this procedure should be done for once every 3-6 months.
- 3) Before cleaning the coolant tank, please pull out the chip disposal tray in advance and then remove the entire chips from the tank. Remember to have three buckets with 30 liters capacity located on the back side of machine for coolant collection.
- 4) Disconnect the hose at the output side of coolant pump from the position where the hose is joining with coolant nozzle. Please put this free end into one bucket and turn on the power of pump. And pump the coolant from coolant tank until it is empty.

- 5) Disconnect the hose at the entrance side of pump from coolant tank and the 2” hose between two coolant tanks. Pull out the coolant tanks from the back side of the machine, and move the coolant tank safely with proper personnel to desired height to get ready for final draining.
- 6) Remove the plug on the drain hole of the coolant tank, and drain off the residual coolant.
- 7) Dismantle the filter on the top of tank. Clean the coolant tank and the filter. Afterwards, install the filter back to the tank and re-plug the drain plug onto the drain hole. Finally return the coolant tank into the original location which is at the back of machine. Repeat tank cleaning procedure for the other coolant tank.
- 8) Reconnect the hoses to the pump and between the coolant tanks. Fill in the equal volume of coolant into the coolant tanks.
- 9) Finally install chip disposal tray on top of the coolant tank from front of machine.

4.6 NOTICE FOR MAINTENANCE AND INSPECTION

Execute a power off decision on the main power supply before carrying out maintenance and inspection work (meaning: turn off main power supply!!!). If the machine is still in an operable condition during the work and for example, if a sensor is inadvertently touched, the machine moved and injured the worker. This is what we call a careless mistake, but a dire consequence resulted! Therefore care is required when doing maintenance and inspection work. Before operating the machine, please make sure that there is no obstacle to operator’s movement in the vicinity of the machine.

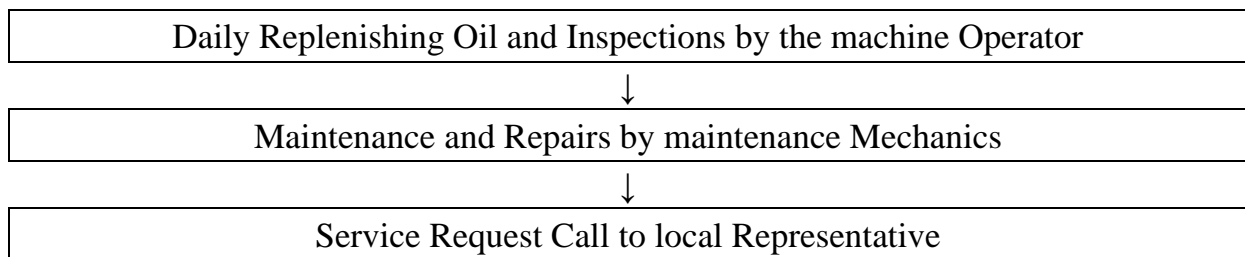
- 1) Maintenance and inspection work must be performed diligently in order to keep the machine operating at its highest performance and making the machine safe to operate at all times.
- 2) Device maintenance and inspection plan should be carried out on a regular basis.
- 3) Proceed with maintenance and inspection as planned even if this will interfere with the production plan.
- 4) Before starting on the maintenance and inspection work, please turn all the power supply off.
- 5) When working inside the electric cabinet or repairing the machine, please set the power switch to the “OFF” position and remember to lock it.

- 6) Do not use air gun to clean the machine. This may cause dust or sand particles to cover the bearing or slide ways.
- 7) Use only the lubricating oils which are recommended by this manual.

In order to operate machine correctly and utilize most of machine’s function and performance, all operators must thoroughly read the manual and understand the machine completely.

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 technician who is responsible for machine’s maintenance.

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



1. Lubricating Oil and Supplying Coolant

Always use the types of lubricating oil specified. Do not mix the lube oil from different brands even if they are indicated as the “equivalent”. Original oil manufacture will not take any responsibility for any problem arising from mixing the oil brands.

2. Storing Oil

If lubrication oil is stored in user’s shop, please observe the following points to prevent the oil from being degraded. It is advisable to purchase 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 or water should be allowed to enter the oil storage tank.
- c) Never use degraded oil or oil contaminated with foreign matter or water.
- d) If a middle tank is used, please clean the tank at least once a year.

3. Cautions when Replenishing Lubrication Oil

- a) Always use the same oil drum for the same oil. Never use a drum to contain different brands of oil.
- b) Never remove the filter from the filter port when supplying oil.
- c) If an unspecified lube oil brand is used mistakenly or different brands of oil are mixed, please clean the tank and tubings immediately.

4. Disposing Waste Oil

Disposing factory waste without legal permission is not allowed. Please always have waste management company to properly dispose the used oil.

5. Supplying Oil

Supplying Oil to the Slideway & Side Oil Tank

- a) Check the oil level on the side oil tank by inspecting the oil level gauge on the tank.
- b) Remove the cap on the oil input port.
- c) Supply the specified lubrication oil from the oil drum while checking the oil level with the oil level gauge.

6. Supplying Coolant to the Coolant tank

- a) Press the “coolant off” button to stop coolant system.
- b) Check the level gauge on the coolant tank.
- c) Add more coolant if level is too low. To add more coolant, please input them from the top of coolant tank.

7. Greasing the Chuck Master Jaws

- a) Stop the spindle.
- b) Inject grease into the three grease cups around the chuck.
- c) Coolant splashed on the chuck will always wash the grease away. Therefore, inject the grease as often as possible.

8. Checks before Daily Operation

Before turning on the power

- a) Make sure that there are no abnormalities on external tubings, cables and coating, or all doors are closedetc.
- b) Check the shop floor around the machine for the hazardous material such as coolant, hydraulic oil, lubricating oil, and slippery fluid.
- c) Make sure that the turret is not at maximum on the x axis direction.

9. After Turning On the Power

- a) Please listen to the sound of the hydraulic unit when it is operating.
- b) Make sure that the cooling fans in the electrical cabinet are operating.
- c) Make sure that the switches and indicators on the control panel are operating 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 topslide, saddle , tool length measuring device ,etc. 2. Wipe off lubrication, coolant and chips from the machine surface. 3. Wipe off all foreign matters from the slide ways that are not protected by the cover(base slide ways) 4. Clean the slideway covers. 5. Clean the exposed limit switches and areas around them. 6. Clean the electrical items carefully. 7. Check the centralized lubrication tank and side oil tank for the oil level. Always keep the recommended lubricants at proper levels. 8. Check to be sure that the water reservoir in the air filter unit completely drained. 9. Check to be sure that pressure is correctly built-up: Lubrication unit @ 3 kgf/cm²; supply air unit @ 5 kgf/cm² 10. Check the machine and tubings, 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 control panel correctly turn on or flickers.
Weekly (50 H) Maintenance	<ol style="list-style-type: none"> 1. Carry out daily maintenance routine. 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 cabinet and NC equipment and replace filters if they are considered dirty. 3. Check the machine level. Also check the lock nuts on the leveling screws and anchor bolts (if exist!)for tightness. 4. Clean the air filter. Replace it, if necessary. Never use paint thinner or similar agents to clean the air filter! 5. Clean the slideway wipers. Replace them, if necessary. 6. Check to be sure that the solenoids and limits switch will correctly function.

<p>Monthly (250 H) Maintenance</p>	<ol style="list-style-type: none"> 7. Clean the in-line filter in the side oil tank. 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.
<p>Every six Months (1500 H) Maintenance</p>	<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 tank and the lubrication oil for the headstock, topslide and saddle. Before fill in new hydraulic oil or lubrication oil, please clean inside the tanks. 4. Clean and wipe all the motors. 5. Check the bearings in the motor for noise. Replace the bearings, if necessary. 6. Visually check the electrical components and control panel. 7. Check each indicator and the voltmeter if it is correct. Adjust or replace it, if necessary. 8. Drain the lubrication pump, clean the lubrication filters according the instructions provided by maker. 9. Check the machine movement and functions using a run testing program. 10. Measure the backlash in each drive screw and adjust for compensation rate, if necessary.


5. OPERATION PROCEDURE

5.1 Power On



5.1.1 Main power switch on

	Step	Operation	Location
	1	Check the machine condition and interface	Machine panel & all switches plugs connection
	2	Main power switch on/off	Electrical cabinet
	3	CNC power on	Main control panel

5.1.2 Machine ready

	Step	Operation	Location
	1	Release EMG stop switch	Main operation panel

5.1.3 Axes reference

	Step	Operation	Location
	1	Push function key zero	Main key board
	2	Push cycle start button	Main key board


5.2 Warming up

It is necessary to warm up the machine after it has been stopped for hours, especially over night.

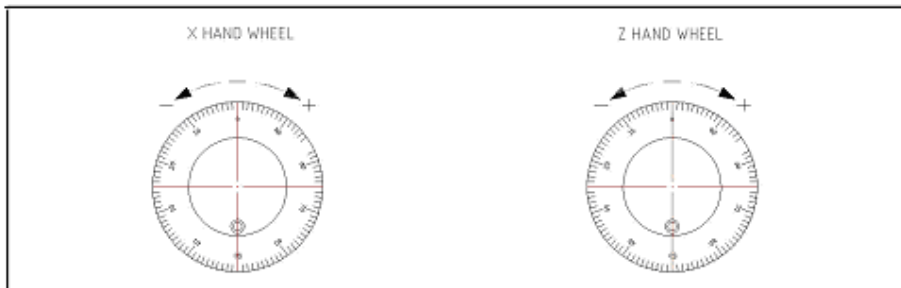
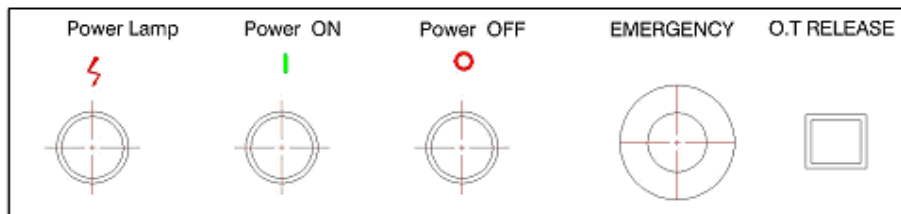
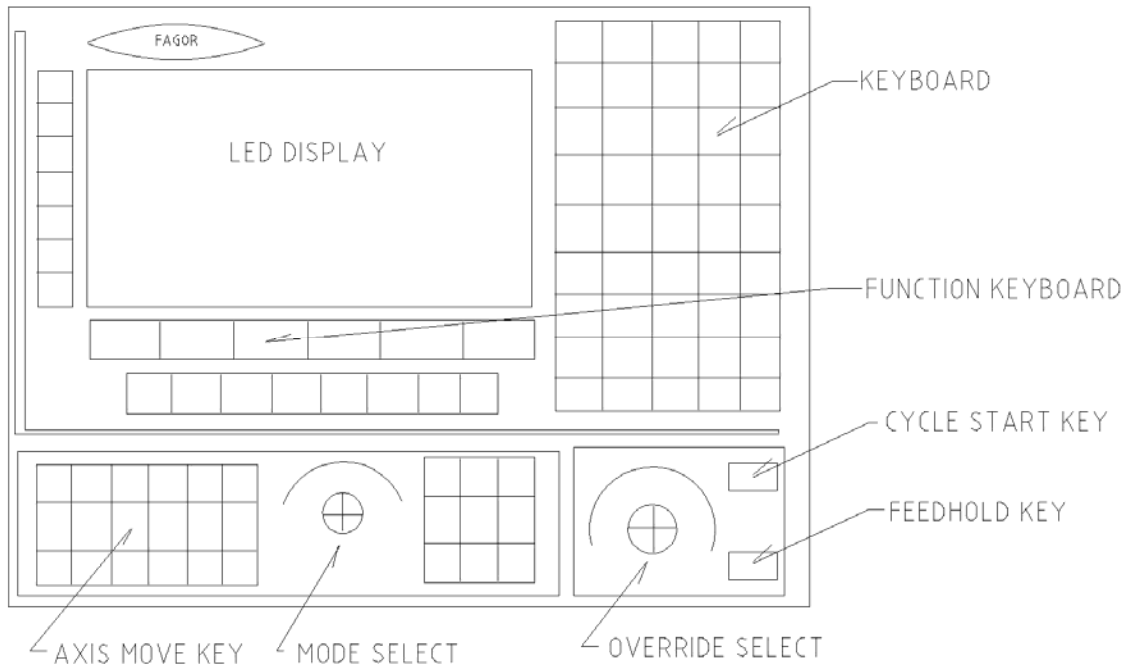
Please make sure to let the machine run free for at least 30-45 minutes before you do actual cutting.

- 1) Load free running for more than 30 minutes (longer in the winter)
- 2) Check spindle rotation and orientation function
- 3) Check tool change function
- 4) Check lubrication and coolant system function
- 5) Make sure all these are working properly.


A. Warming up procedure

	Step	Operation	Location
	1	Check machine condition and interface	Machine
	2	Select automatic mode and search a program	Refer to Fagor CNC 8055iTC operation manual chapter 6-page 1
	3	Push cycle start button	


5.3 Main operation panel




5.3.1 Coolant system

	Step	Operation	Location
	1	Push this button to start	The pump will stop if the main door is opened
	2	Push again then stop	
	3	Use M8 TO start	Use M9 to stop

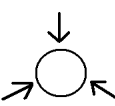
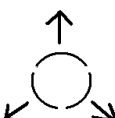
5.3.2 Working light

	Step	Operation	Location
	1	Push this button to switch on	Under any mode
	2	Push again to switch off	

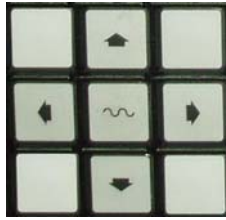
5.3.3 Next tool number

	Step	Operation	Location
	1	Push this button to CW turret one Position	Working only when front door is closed

5.3.4 OD / ID Key switch (option) – only when hydraulic chuck is supplied

	Step	Operation	Location
	1	Hydraulic chuck OD	Spindle stop
	2	Hydraulic chuck ID	Spindle need stop

5.3.5 Moving axes by arrow and manual pulse generator




Step		Operation	Remark
1	A	Push to move X + direction	Feed according to F command. Movement
	B	Push to move X - direction	
2	A	Push to move Z + direction	Will be stopped when hand moved away
	B	Push to move Z + direction	
3		X axis hand wheel	1. Hand wheel mode 2. Refer to Fagor CNC 8055iTC operation manual chapter 2 – page10
4		Z axis hand wheel	

Portable Manual Pulse Generator (option):



A Portable Manual Pulse Generator (portable electric handwheel) can be fit on machine as an optional accessory. Machine can have both fixed and portable handwheel simultaneously:

On the Control Panel “MPG”--push ”MPG MODE”:portable handwheel works; push ”MPG MODE” AGAIN: Fixed handwheel works.


5.3.6 Over travel release

	Step	Operation	Location
	1	When axis is over travel, first push this button then push Fagor ESC key to clear message. To use MPG or JOG key move axis	This button must be pressed until axis move to correct position, and then can released

5.3.7 Power on / power off

	Step	Operation	Location
	1	Push this button to switch on CNC power	Main power switch needs to be on
	2	Push this button to switch off CNC power	

5.3.8 Emergency stop

	Step	Operation	Location
	1	Push this button	

5.3.9 Note of other setting

1. SPINDLE PARAMETER P45 SETTING

NOW THE SETTING IS:

P45 = 4000 (4 SEC.)

For Bigger Chuck or Bigger Part Cutting

Please adjust Spindle Parameter P45 CHANGE long TIME

For Smaller Chuck or Smaller Part Cutting

Please adjust Spindle Parameter P45 CHANGE short TIM

NOTE: For complete parameter list and M codes, please refer to User Manual of Fagor 8055i/TC.

6. WIRING DIAGRAM

PLEASE REFER TO ELECTRICAL DIAGRAM HAND BOOK.

7. PARAMETER LIST

PLEASE REFER TO PARAMETER HAND BOOK.

Mechanical Drawings & Parts Breakdown List

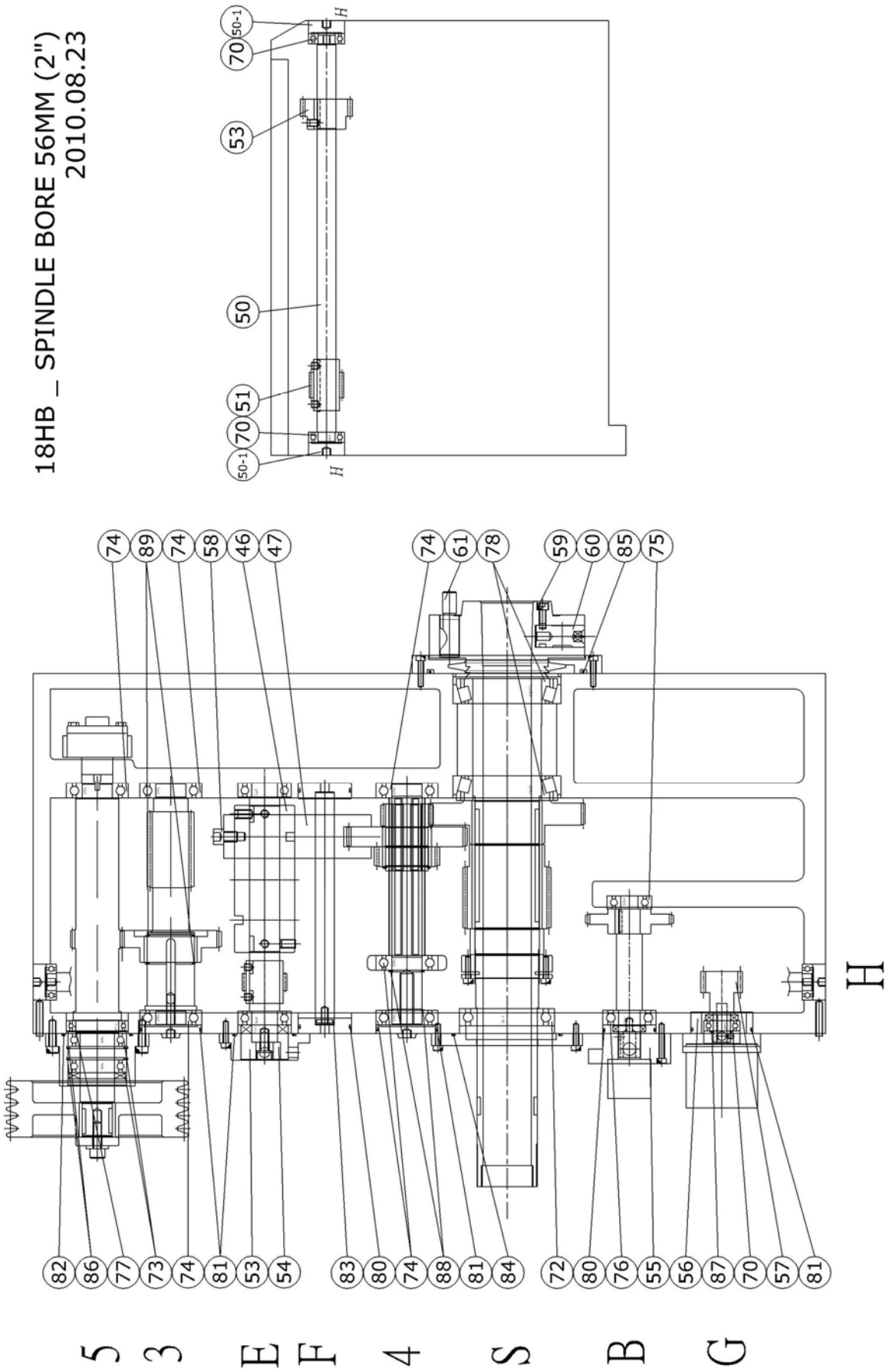
Note: When ordering parts, please be prepared with,

1. Machine model & serial number.
2. Item number.
3. Part number and description.
4. Year of Production.
5. Voltage & horsepower.
6. Quantity

Parts list of 18” Headstock, Spindle bore 56mm (2”)

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
1	18HB-001000	Headstock	1	
2	25HA-002000	Cover	1	
3	25HA-0030D0	Spindle	1	
	25HA-0030A0	Spindle	1	
4	18HB-0041A0	Pulley Shaft	1	
4-1	18HA-004100	Washer	1	
5	18HA-0052A0	V-Pulley	1	
6	18HA-006A00	Cover	1	
16	18HA-016000	Gear Shaft	1	
18	18HA-018000	Gear	1	
19	18HA-019000	Splined Shaft	1	
21	18HA-021000	Gear	1	
22	18HA-022000	Gear	1	
23	18HA-023000	Gear	1	
24	18HA-024000	Gear	1	
25	18HA-025000	Gear	1	
28	18HB-014100	Shaft	1	
	18HB-014200	Shaft	1	Opt.
	18HB-014500	Shaft	1	Opt.
31	18HA-031000	Gear	1	
35	18HA-035000	Clocker Nut	1	
36	18HA-036000	Collar	1	
37	18HA-037001	Cover	1	
38	18HA-038000	Cover	1	
40	18HA-040000	Cover	2	
41	18HA-041000	Cover	2	
41-1	18HA-041100	Idle Axle	1	
43	18HB-017000	Shaft	1	
44	18HB-021000	Bevel Gear	1	

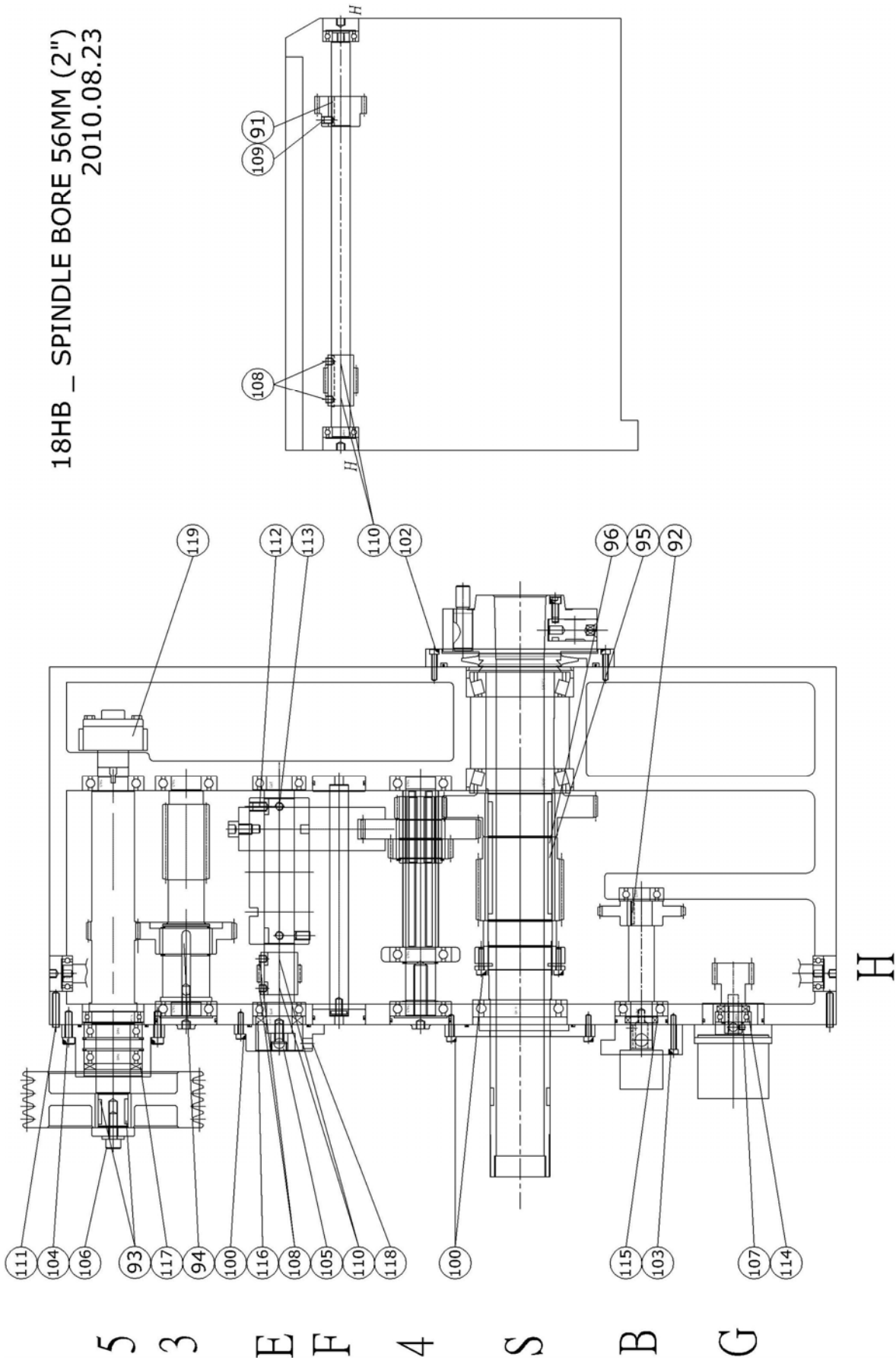
18HB _ SPINDLE BORE 56MM (2")
2010.08.23



Parts list of 18” Headstock, Spindle bore 56mm (2”)

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
46	18HB-022000	Cam	1	
47	18HB-023000	Speed Change Fork	1	
50	25HB-024000	Shaft	1	
50-1	18HB-024100	Stuff	2	
51	18HB-025000	Worm Gear	1	
52	18HB-026000	Bevel Gear	1	
53	18HB-020000	Transferring Post	1	
54	18HB-019000	Block	1	
55	18HB-015000	Cover	1	
56	18HB-028002	Cover	1	
57	18HB-027002	Worm Gear	1	
58	18HB-048000	Screw	1	
59	18HA-074000	Screw	6	
60	18HA-075000	Cam	6	
61	18HA-076000	Short Shaft	6	
70	Bearing	6004	3	
71	Bearing	6008	2	
72	Bearing	6014Z	1	
73	Bearing	6206	2	
74	Bearing	6207	6	
75	Bearing	6304	1	
76	Bearing	6305	1	
77	Bearing	6910	1	
78	Tapered Roller Bearing	32016	2	
80	O-Ring	G55	2	
81	O-Ring	G65	4	
82	O-Ring	G75	1	
83	O-Ring	P18	1	
84	O-Ring	G120	1	
85	O-Ring	G170	1	
86	C-Locker	R68	2	
87	C-Locker	S20	1	
88	C-Locker	S35	2	
89	C-Locker	S55	2	

18HB _ SPINDLE BORE 56MM (2")
2010.08.23



5 3 E F 4 S B G H

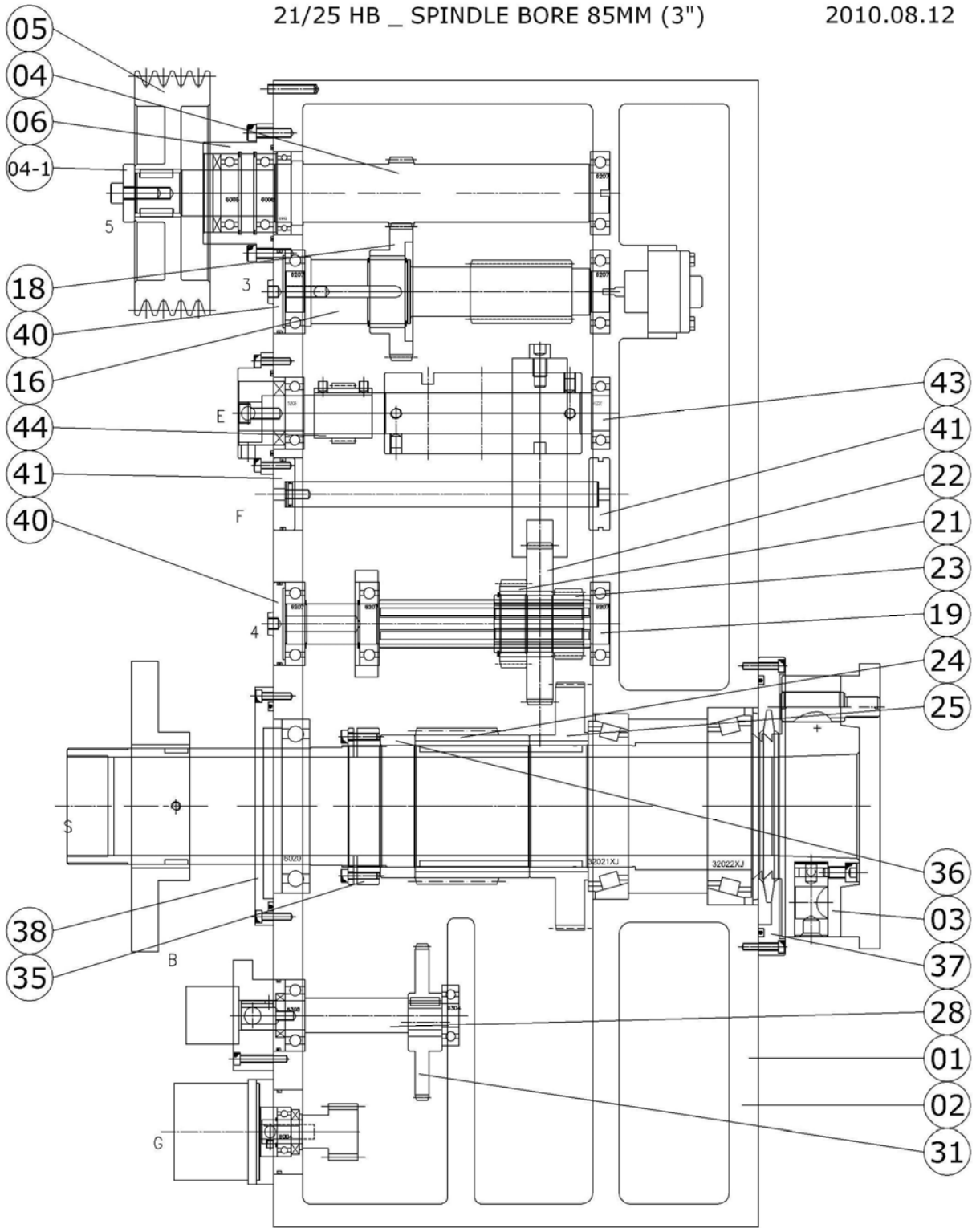
Parts list of 18" Headstock, Spindle bore 56mm (2")

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
91	Key	6*6*28	1	
92	Key	8*7*25	1	
93	Key	8*7*28	2	
94	Key	10*8*25	2	
95	key	10*8*60	2	
96	Key	10*8*70	2	
100	Cap Screw	M6*25	12	
102	Cap Screw	M6*30	6	
103	Cap Screw	M6*40	3	
104	Cap Screw	M8*30	4	
105	Cap Screw	M10*20	1	
106	Cap Screw	M10*30	1	
107	Set Screw	M6*6	1	
108	Set Screw	M8*8	4	
109	Set Screw	M8*10	1	
110	Set Screw	M8*18	4	
111	Set Screw	M8*40	1	
112	Set Screw	M10*10	4	
113	Set Screw	M10*16	2	
114	Oil Seal	20*38*7	1	
115	Oil Seal	25*38*8	1	
116	Oil Seal	30*55*10	1	
117	Oil Seal	40*68*7	1	
118	Sensor		3	
119	Oil Pump		1	

8.1.2 21”/25” HB, SPINDLE BORE 85MM (3”)

21/25 HB _ SPINDLE BORE 85MM (3”)

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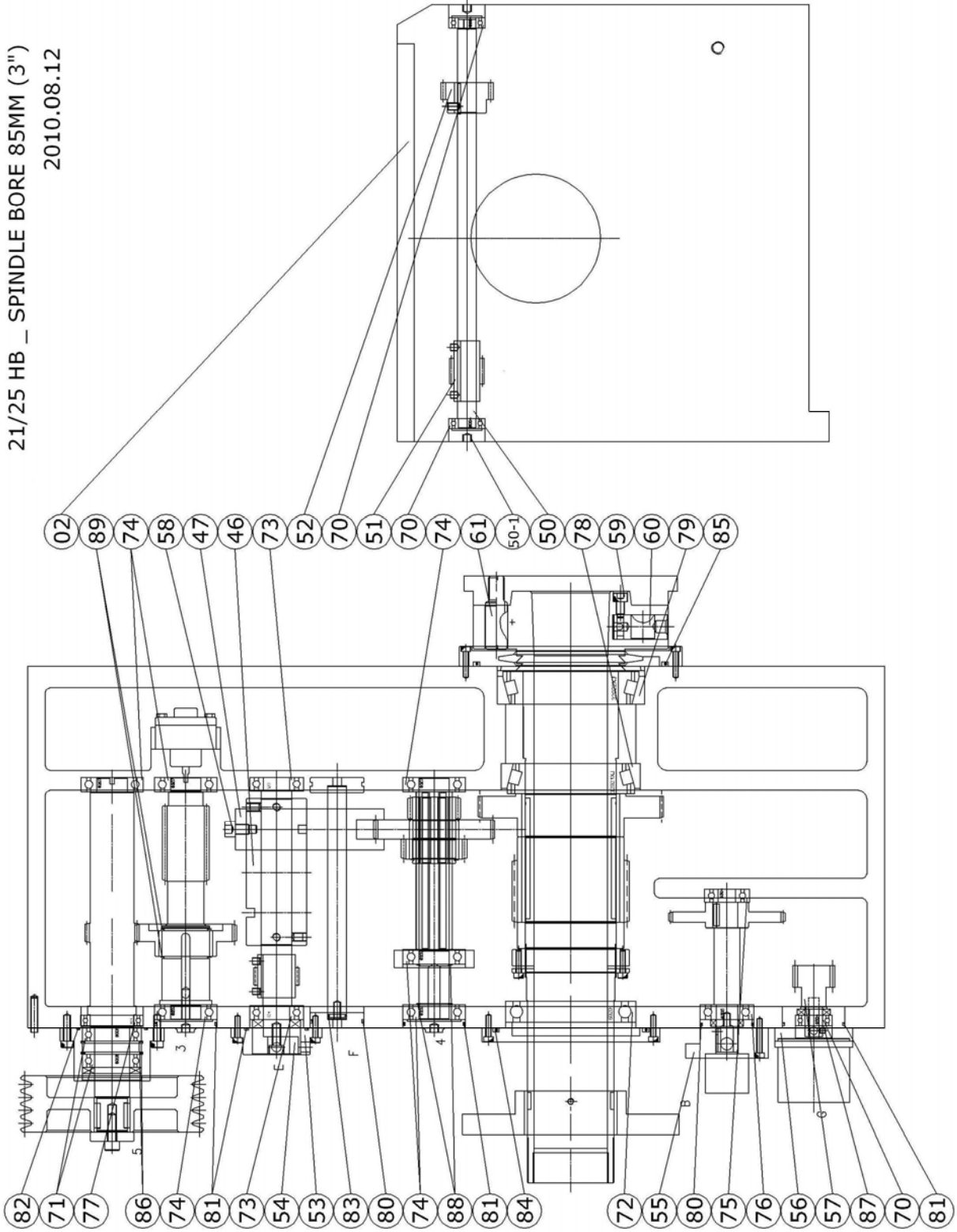


Parts list of 21"/25" Headstock, Spindle bore 85mm (3")

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
1	21HB-001000	Headstock	1	
	25HB-001000	Headstock	1	
2	25HA-002000	Cover	1	
3	25HA-0030D0	Spindle	1	
	25HA-0030A0	Spindle	1	Opt.
4	18HB-0041A0	Pulley Shaft	1	
4-1	18HA-004100	Washer	1	
5	18HA-0051A0	V-Pulley	1	
6	18HA-006A00	Cover	1	
16	18HA-016000	Gear Shaft	1	
18	18HA-018000	Gear	1	
19	18HA-019000	Splined Shaft	1	
21	18HA-021000	Gear	1	
22	18HA-022000	Gear	1	
23	18HA-023000	Gear	1	
24	25HA-024000	Gear	1	
25	25HA-025000	Gear	1	
28	18HB-014100	Shaft	1	Opt.
	18HB-014200	Shaft	1	Opt.
	18HB-014500	Shaft	1	Opt.
31	25HB-031000	Gear	1	
35	25HA-035000	Clocker Nut	1	
36	25HA-036000	Collar	1	
37	25HA-037001	Cover	1	
38	25HA-038000	Cover	1	
40	18HA-040000	Cover	2	
41	18HA-041000	Cover	2	
43	18HB-017000	Shaft	1	
44	18HB-021000	Bevel Gear	1	

21/25 HB _ SPINDLE BORE 85MM (3")

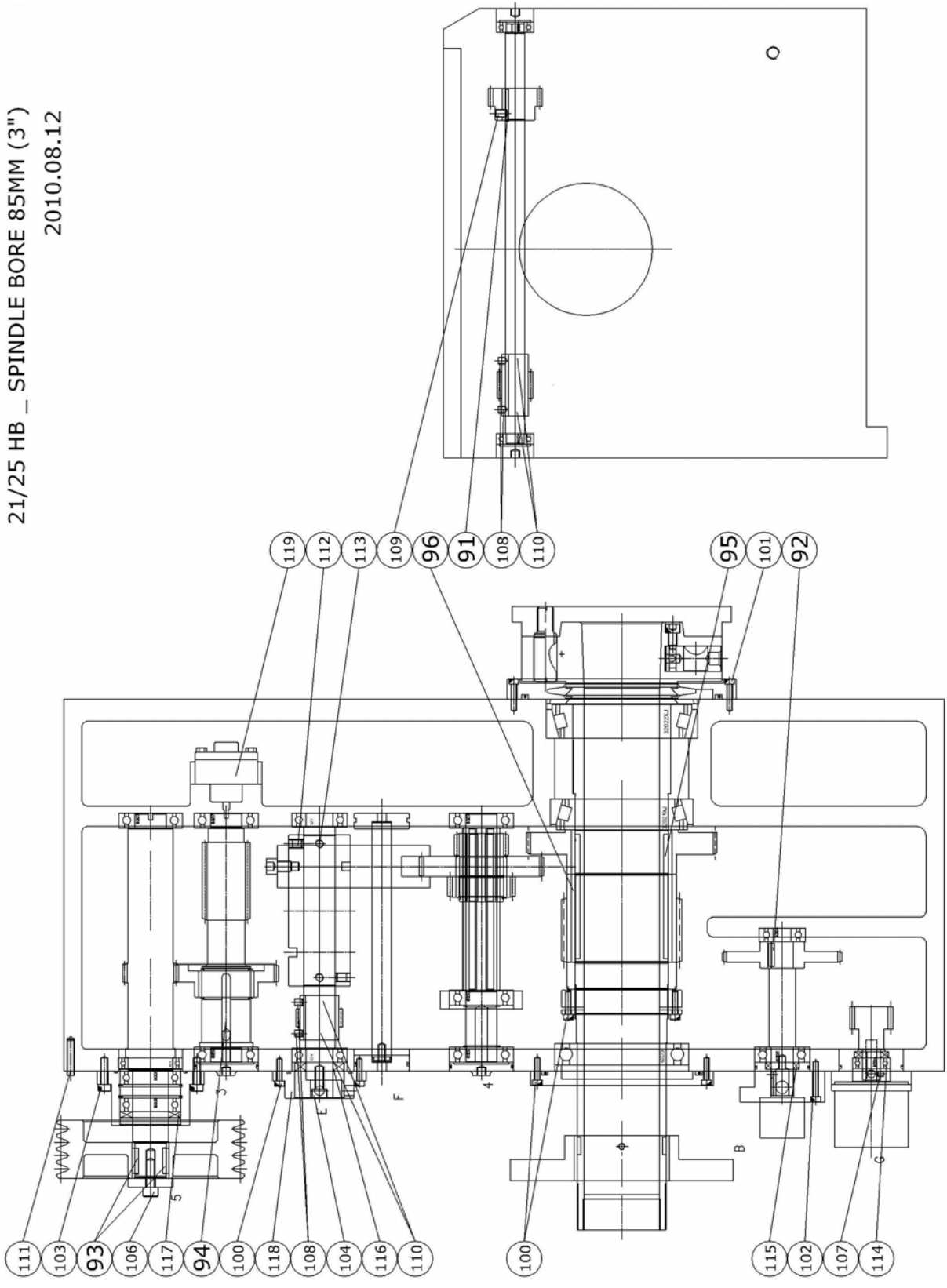
2010.08.12



Parts list of 21"/25" Headstock, Spindle bore 85mm (3")

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
46	18HB-022000	Cam	1	
47	18HB-023000	Speed Change Fork	1	
50	25HB-024000	Shaft	1	
50-1	18HB-024100	Stuff	2	
51	18HB-025000	Worm Gear	1	
52	18HB-026000	Bevel Gear	1	
53	18HB-020000	Transferring Post	1	
54	18HB-019000	Block	1	
55	18HB-015000	Cover	1	
56	18HB-028001	Cover	1	
57	18HB-027000	Worm Gear	1	
58	18HB-048000	Screw	1	
59	25HA-074000	Screw	6	
60	25HA-075000	Cam	6	
61	25HA-076000	Short Shaft	6	
70	Bearing	6004	3	
71	Bearing	6008	2	
72	Bearing	6020Z	1	
73	Bearing	6206	2	
74	Bearing	6207	6	
75	Bearing	6304	1	
76	Bearing	6305	1	
77	Bearing	6910	1	
78	Tapered Roller Bearing	32021	1	
79	Tapered Roller Bearing	32022	1	
80	O-Ring	G55	2	
81	O-Ring	G65	4	
82	O-Ring	G75	1	
83	O-Ring	P18	1	
84	O-Ring	G165	1	
85	O-Ring	G210	1	
86	C-Locker	R68	2	
87	C-Locker	S20	1	
88	C-Locker	S35	2	
89	C-Locker	S55	2	

21/25 HB _ SPINDLE BORE 85MM (3")
2010.08.12



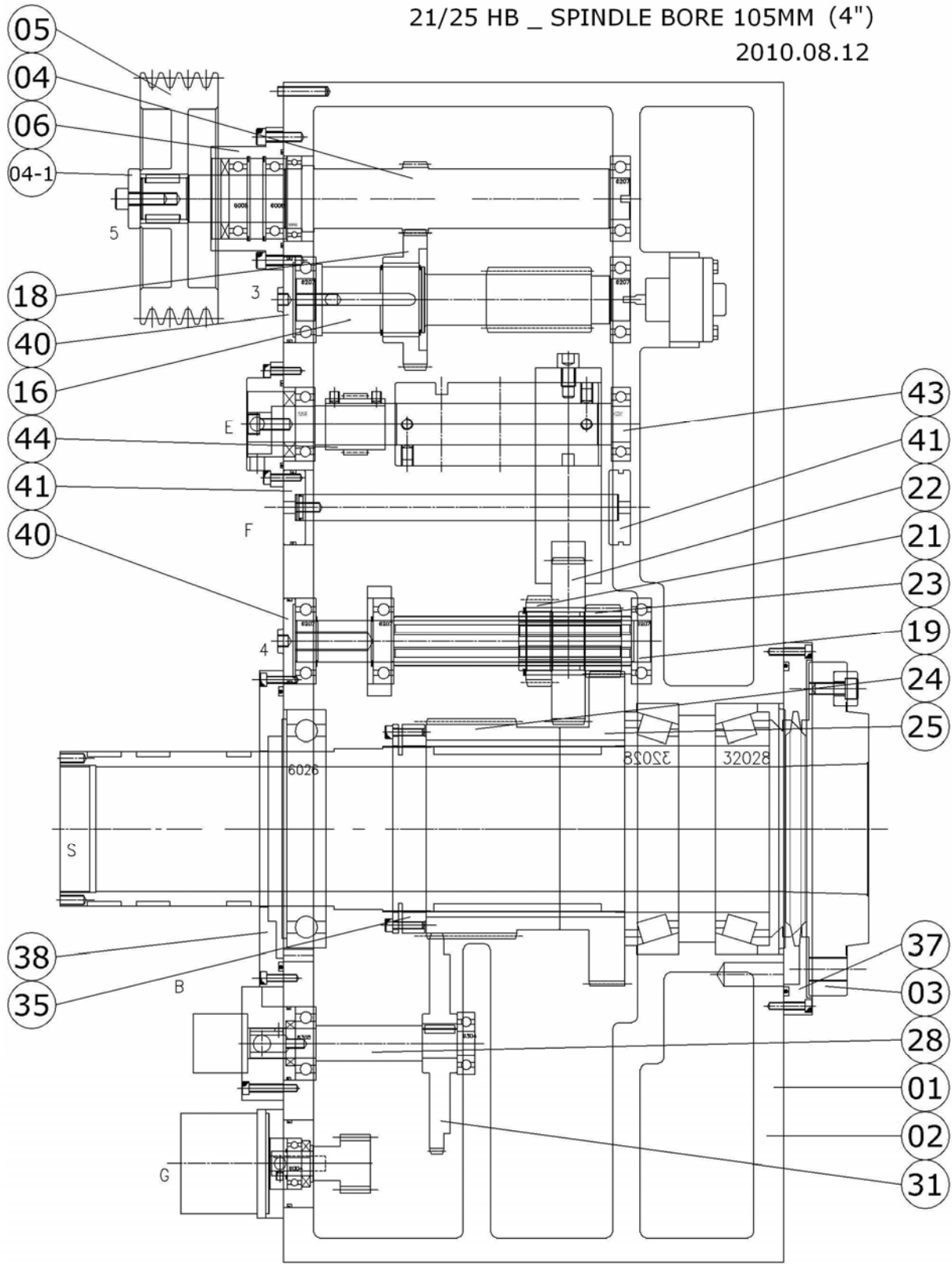
Parts list of 21"/25" Headstock, Spindle bore 85mm (3")

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
91	Key	6*6*28	1	
92	Key	8*7*25	1	
93	Key	8*7*28	2	
94	Key	10*8*25	2	
95	key	14*9*60	2	
96	Key	14*9*80	2	
100	Cap Screw	M6*25	15	
102	Cap Screw	M6*40	3	
103	Cap Screw	M8*30	4	
104	Cap Screw	M10*20	1	
105	Cap Screw	M10*25	1	
106	Cap Screw	M10*30	1	
107	Set Screw	M6*6	1	
108	Set Screw	M8*8	4	
109	Set Screw	M8*10	1	
110	Set Screw	M8*18	4	
111	Set Screw	M8*40	1	
112	Set Screw	M10*10	4	
113	Set Screw	M10*16	2	
114	Oil Seal	20*38*7	1	
115	Oil Seal	25*38*8	1	
116	Oil Seal	30*55*10	1	
117	Oil Seal	40*68*7	1	
118	Sensor		3	
119	Oil Pump		1	

8.1.3 21”/25” HB, SPINDLE BORE 105MM (4”) OPTION

21/25 HB _ SPINDLE BORE 105MM (4")

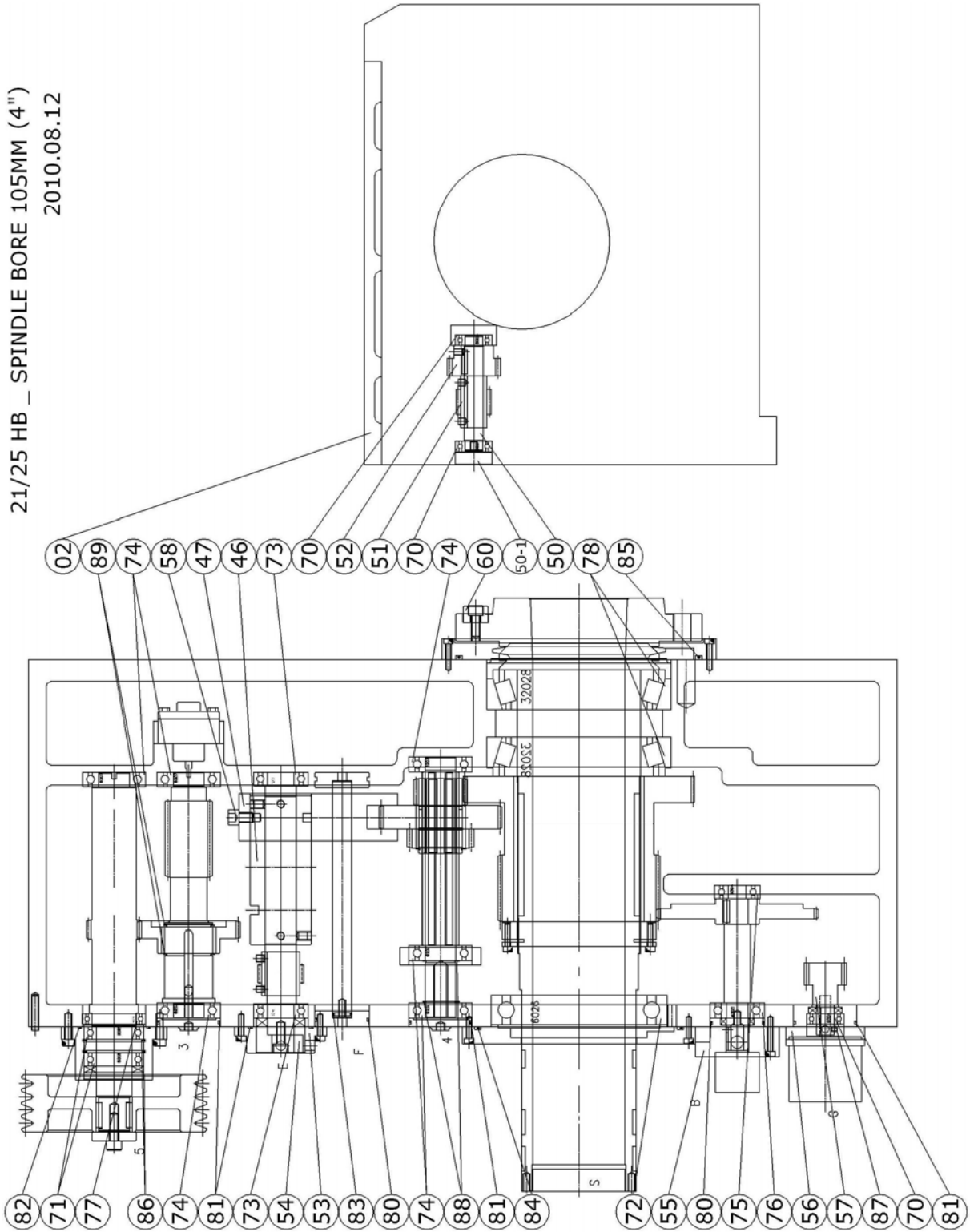
2010.08.12



Parts list of 21"/25" Headstock, Spindle bore 105mm (4")

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
1	21HB-401000	Headstock	1	Opt.
	25HB-401000	Headstock	1	Opt.
2	25HA-002000	Cover	1	
3	25HA-4030D0	Spindle	1	
	25HA-4030A0	Spindle	1	Opt.
4	18HB-0041A0	Pulley Shaft	1	
4-1	18HA-004100	Washer	1	
5	18HA-0051A0	V-Pulley	1	
6	18HA-006A00	Cover	1	
16	18HA-016000	Gear Shaft	1	
18	18HA-018000	Gear	1	
19	25HA-419000	Splined Shaft	1	
21	25HA-421000	Gear	1	
22	25HA-422000	Gear	1	
23	25HA-423000	Gear	1	
24	25HA-424000	Gear	1	
25	25HA-425000	Gear	1	
28	18HB-014100	Shaft	1	Opt.
	18HB-014200	Shaft	1	Opt.
	18HB-014500	Shaft	1	Opt.
31	25HB-431000	Gear	1	
35	25HA-435000	Clocker Nut	1	
37	25HA-4370A1	Cover	1	
	25HA-4370D0	Cover	1	
38	25HA-438000	Cover	1	
40	18HA-040000	Cover	2	
41	18HA-041000	Cover	2	
43	18HB-017000	Shaft	1	
44	18HB-021000	Bevel Gear	1	

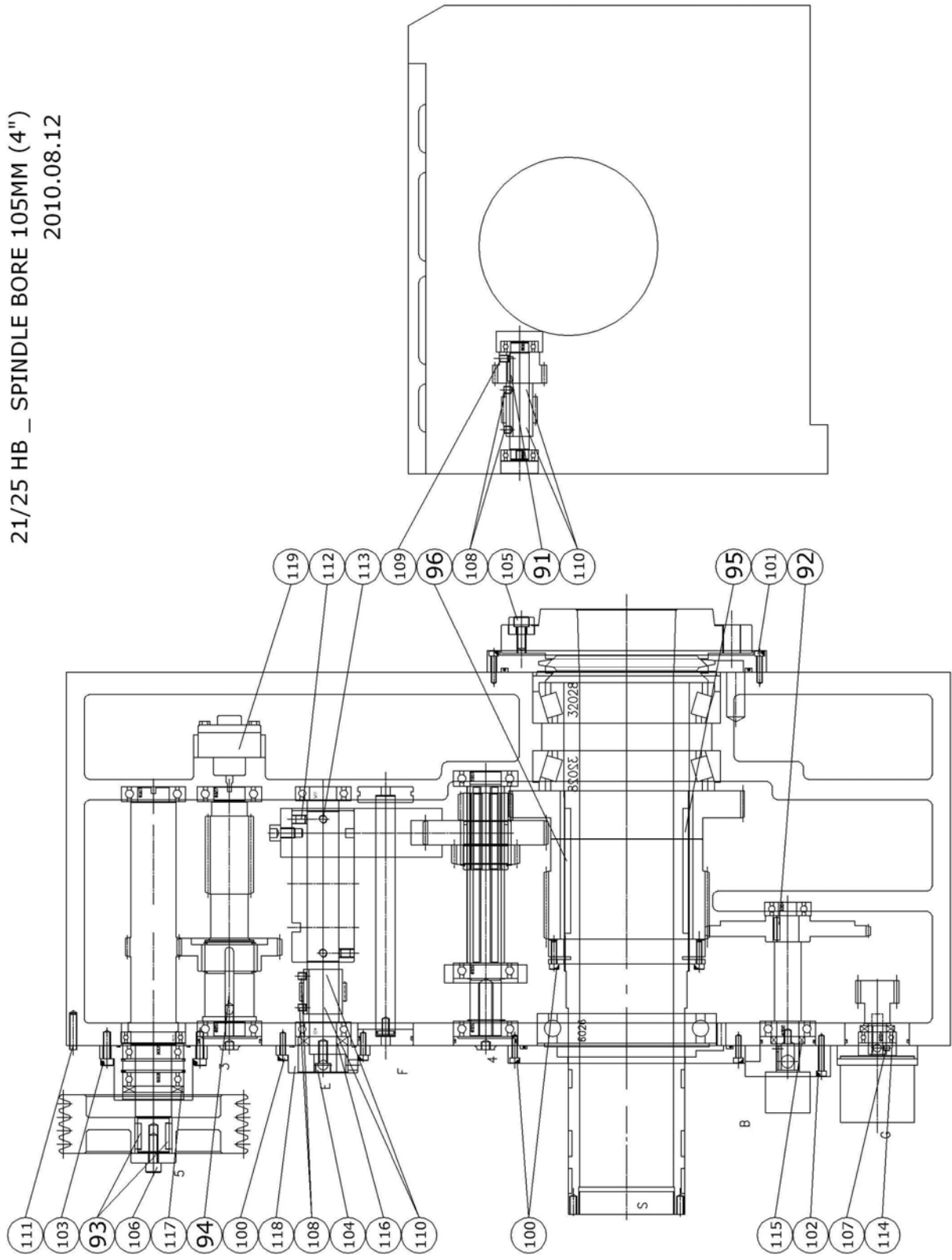
21/25 HB _ SPINDLE BORE 105MM (4")
2010.08.12



Parts list of 21"/25" Headstock, Spindle bore 105mm (4")

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
46	25HB-422000	Cam	1	
47	25HB-423000	Speed Change Fork	1	
50	25HB-424000	Shaft	1	
50-1	18HB-024100	Stuff	1	
51	18HB-025000	Worm Gear	1	
52	18HB-026000	Bevel Gear	1	
53	18HB-020000	Transferring Post	1	
54	18HB-019000	Block	1	
55	18HB-015000	Cover	1	
56	18HB-028001	Cover	1	
57	18HB-027000	Worm Gear	1	
58	18HB-048000	Screw	1	
60	25HA-483000	Fixed Block	1	
70	Bearing	6004	3	
71	Bearing	6008	2	
72	Bearing	6026	1	
73	Bearing	6206	2	
74	Bearing	6207	6	
75	Bearing	6304	1	
76	Bearing	6305	1	
77	Bearing	6910	1	
78	Tapered Roller Bearing	32028	2	
80	O-Ring	G55	2	
81	O-Ring	G65	4	
82	O-Ring	G75	1	
83	O-Ring	P18	1	
84	O-Ring		1	
85	O-Ring		1	
86	C-Locker	R68	2	
87	C-Locker	S20	1	
88	C-Locker	S35	2	
89	C-Locker	S55	2	

21/25 HB _ SPINDLE BORE 105MM (4")
2010.08.12

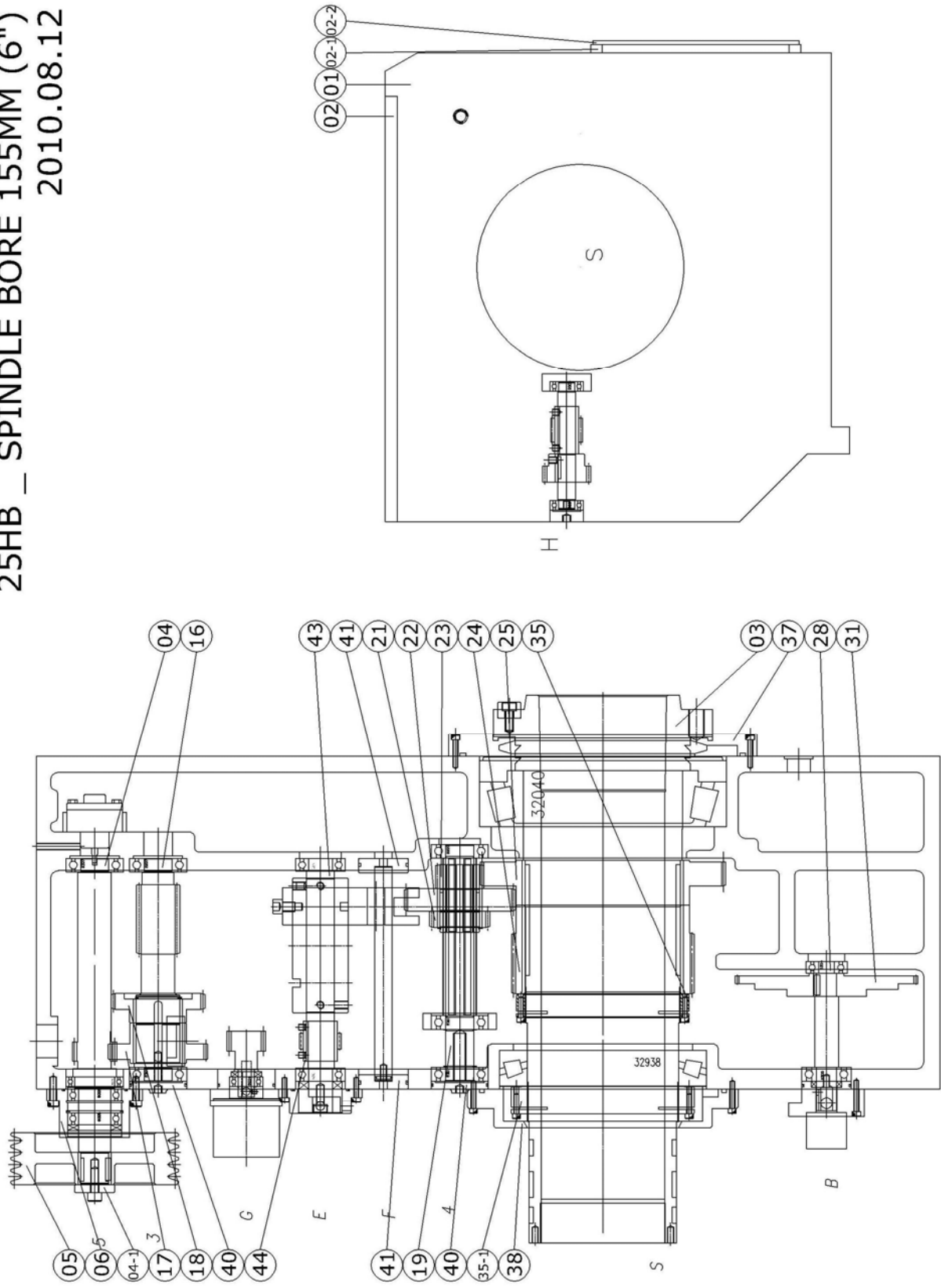


Parts list of 21"/25" Headstock, Spindle bore 105mm (4")

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
91	Key	6*6*28	1	
92	Key	8*7*25	1	
93	Key	8*7*28	2	
94	Key	10*8*25	2	
95	key	18*11*60	2	
96	Key	18*11*80	2	
100	Cap Screw	M6*25	12	
101	Cap Screw	M6*30	6	
102	Cap Screw	M6*40	3	
103	Cap Screw	M8*30	4	
104	Cap Screw	M10*20	1	
105	Cap Screw	M10*25	1	
106	Cap Screw	M10*30	1	
107	Set Screw	M6*6	1	
108	Set Screw	M8*8	4	
109	Set Screw	M8*10	1	
110	Set Screw	M8*18	4	
111	Set Screw	M8*40	1	
112	Set Screw	M10*10	4	
113	Set Screw	M10*16	2	
114	Oil Seal	20*38*7	1	
115	Oil Seal	25*38*8	1	
116	Oil Seal	30*55*10	1	
117	Oil Seal	40*68*7	1	
118	Sensor		3	
119	Oil Pump		1	

8.1.4 25" HB, SPINDLE BORE 155MM (6") OPTION

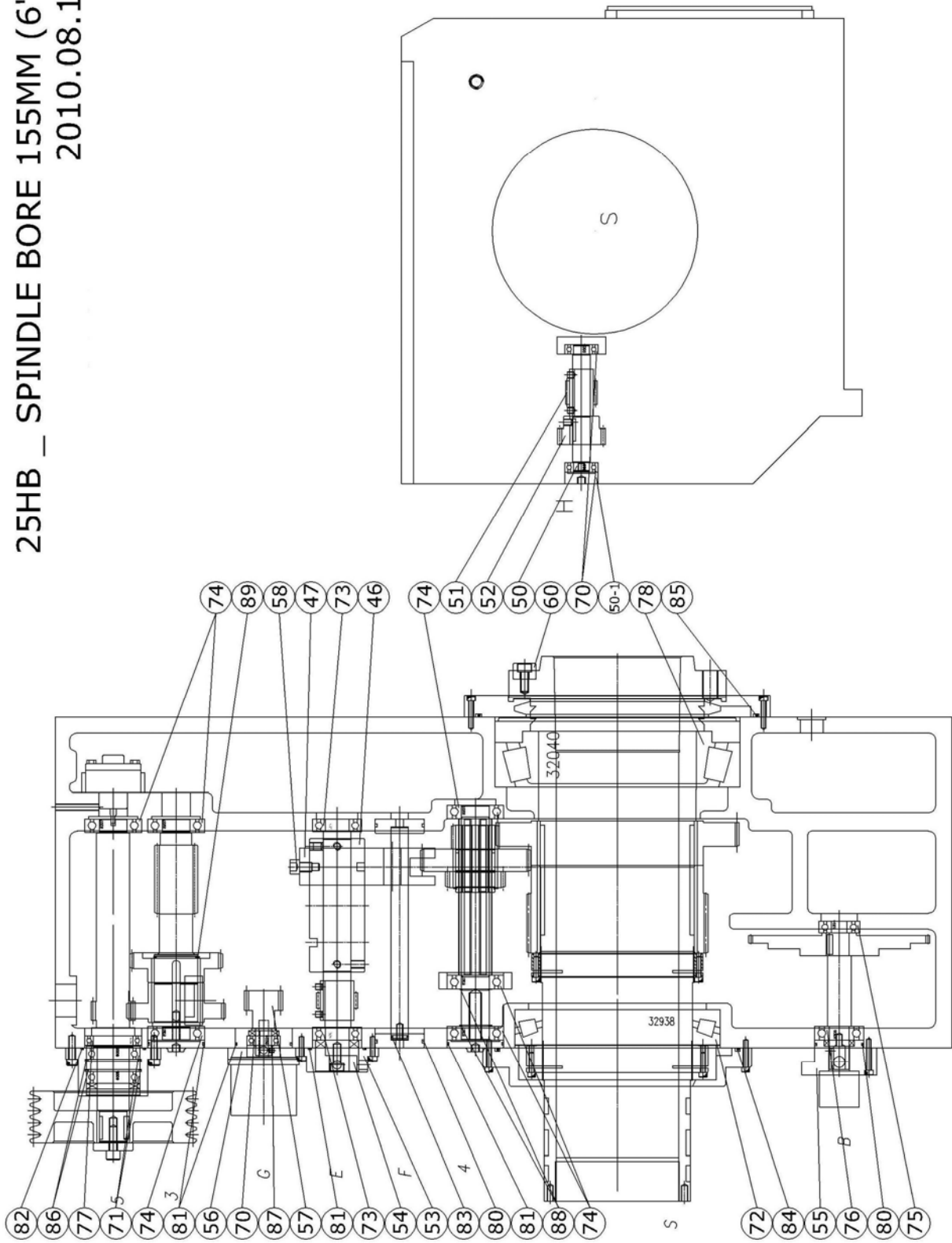
25HB _ SPINDLE BORE 155MM (6")
2010.08.12



Parts list of 25" Headstock, Spindle bore 155mm (6")

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
1	25HB-601000	Headstock	1	Opt.
2	25HA-602000	Cover	1	
2-1	25HA-602100	Cover	1	
2-2	25HA-602200	Cover	1	
3	25HA-6030A0	Spindle	1	
4	25HC-6041A0	Pulley Shaft	1	
4-1	18HA-004100	Washer	1	
5	18HA-0051A0	V-Pulley	1	
6	18HA-006A00	Cover	1	
16	18HA-016000	Gear Shaft	1	
17	25HC-617000	Gear	1	
18	18HA-018000	Gear	1	
19	25HA-419000	Splined Shaft	1	
21	25HA-421000	Gear	1	
22	25HA-422000	Gear	1	
23	25HA-423000	Gear	1	
24	25HA-624000	Gear	1	
25	25HA-625000	Gear	1	
28	18HB-014100	Shaft	1	Opt.
	18HB-014200	Shaft	1	Opt.
	18HB-014500	Shaft	1	Opt.
31	25HB-631000	Gear	1	
35	25HA-635000	Clocker Nut	1	
35-1	25HA-635100	Clocker Nut	1	
37	25HA-6370A1	Cover	1	
38	25HA-638000	Cover	1	
40	18HA-040000	Cover	2	
41	18HA-041000	Cover	2	
43	18HB-017000	Shaft	1	
44	18HB-021000	Bevel Gear	1	

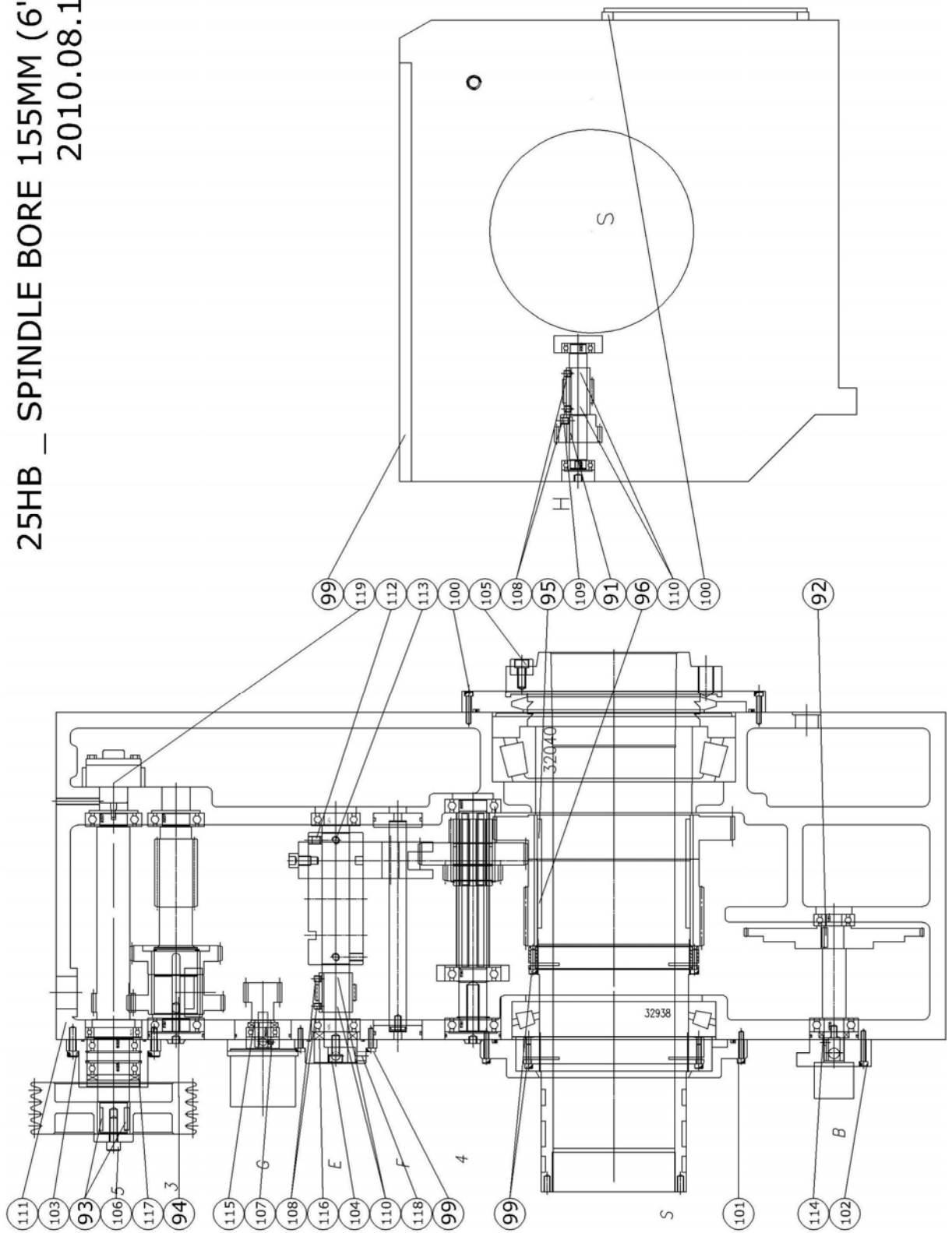
25HB _ SPINDLE BORE 155MM (6")
2010.08.12



Parts list of 25" Headstock, Spindle bore 155mm (6")

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
46	25HB-422000	Cam	1	
47	25HB-423000	Speed Change Fork	1	
50	25HB-624000	Shaft	1	
50-1	18HB-024100	Spacer	1	
51	18HB-025000	Worm Gear	1	
52	18HB-026000	Bevel Gear	1	
53	18HB-020000	Transferring Post	1	
54	18HB-019000	Block	1	
55	18HB-015000	Cover	1	
56	18HB-028001	Cover	1	
57	18HB-027000	Worm Gear	1	
58	18HB-048000	Screw	1	
60	25HA-483000	Fixed Block	1	
70	Bearing	6004	3	
71	Bearing	6008	2	
72	Tapered Roller Bearing	32938	1	
73	Bearing	6206	2	
74	Bearing	6207	6	
75	Bearing	6304	1	
76	Bearing	6305	1	
77	Bearing	6910	1	
78	Tapered Roller Bearing	32040	1	
80	O-Ring	G55	2	
81	O-Ring	G65	4	
82	O-Ring	G75	1	
83	O-Ring	P18	1	
84	O-Ring		1	
85	O-Ring		1	
86	C-Locker	R68	2	
87	C-Locker	S20	1	
88	C-Locker	S35	2	
89	C-Locker	S55	1	

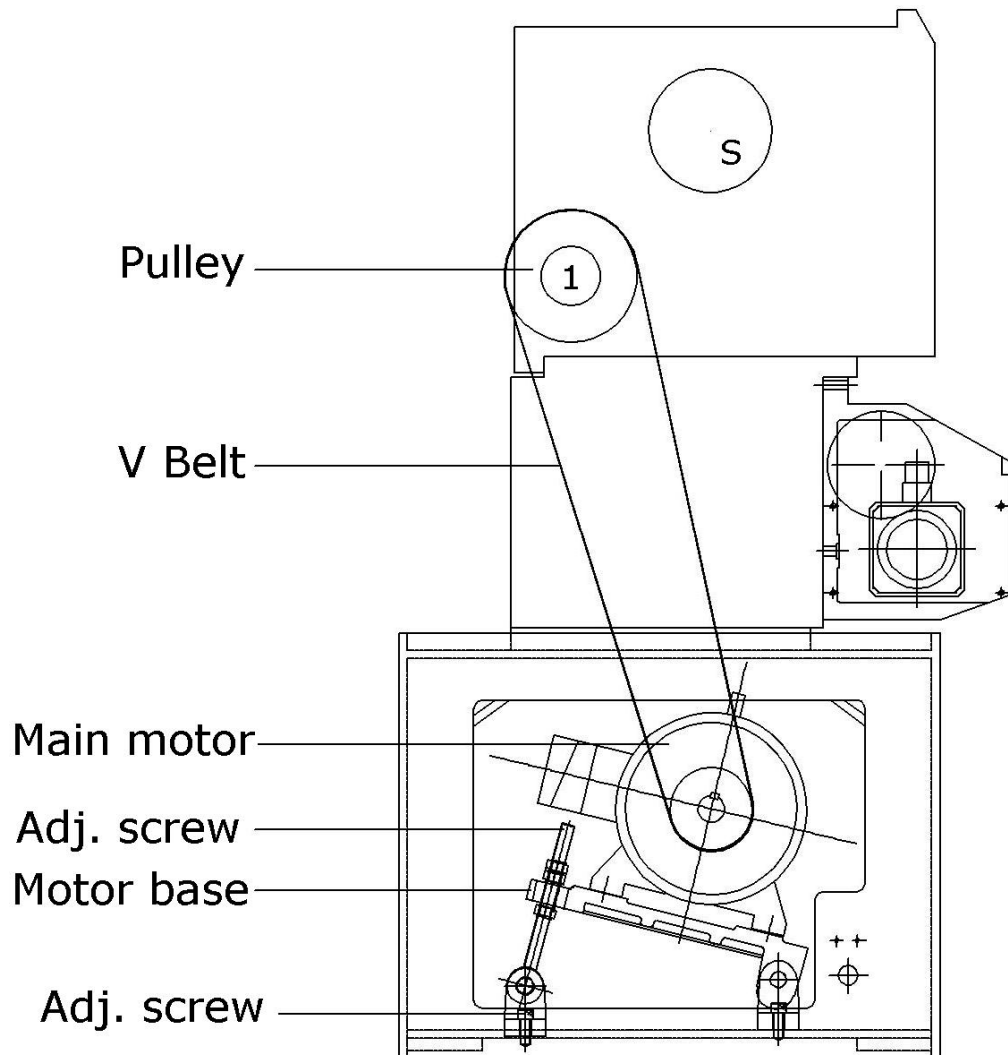
25HB _ SPINDLE BORE 155MM (6")
2010.08.12



Parts list of 25" Headstock, Spindle bore 155mm (6")

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
91	Key	6*6*28	1	
92	Key	8*7*25	1	
93	Key	8*7*28	2	
94	Key	10*8*25	2	
95	key	18*11*60	2	
96	Key	18*11*70	2	
99	Cap Screw	M6*25	15	
100	Cap Screw	M6*30	18	
101	Cap Screw	M6*35	8	
102	Cap Screw	M6*40	3	
103	Cap Screw	M8*30	4	
104	Cap Screw	M10*20	1	
105	Cap Screw	M10*25	1	
106	Cap Screw	M10*30	1	
107	Set Screw	M6*6	1	
108	Set Screw	M8*8	4	
109	Set Screw	M8*10	1	
110	Set Screw	M8*18	4	
111	Set Screw	M8*40	1	
112	Set Screw	M10*10	4	
113	Set Screw	M10*16	2	
114	Oil Seal	20*38*7	1	
115	Oil Seal	25*38*8	1	
116	Oil Seal	30*55*10	1	
117	Oil Seal	40*68*7	1	
118	Sensor		3	
119	Oil Pump		1	

8.2 MAIN SPINDLE TRANSMISSION

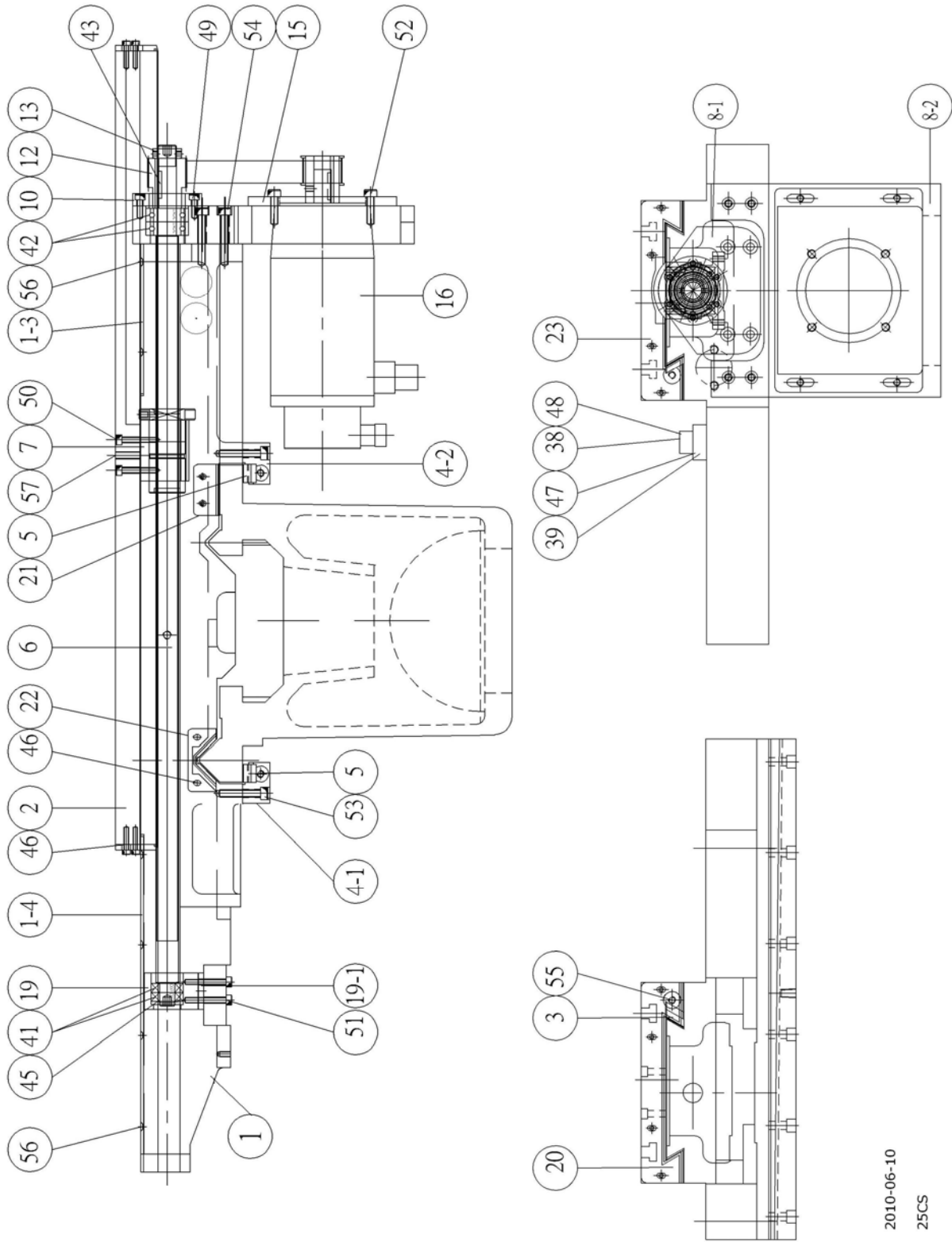


Parts list of main spindle transmission.

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
1		Pulley	1	
2		V belt	4	
3		Motor	1	
4		ADJ. screw	1	
5		Motor Base	1	
6		ADJ. screw	1	

Different models will have different part numbers. When ordering, please specify HP, spindle bore size, and model number. Thanks for helping!

8.3 CARRIAGE & CROSS SLIDE



2010-06-10
25CS

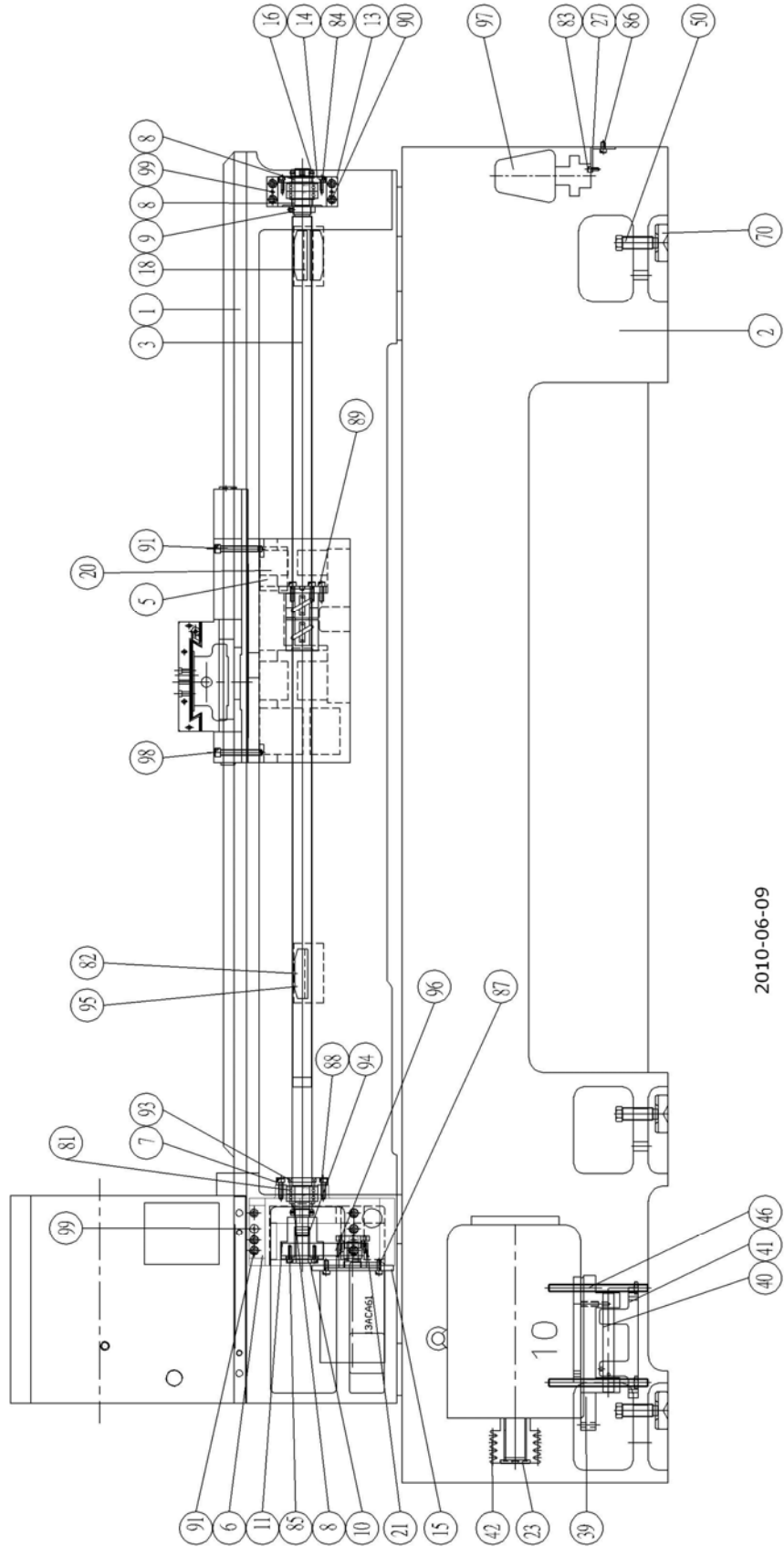
Parts list of Carriage & Cross slide

No.	PARTS NO.	DESCRIPTION	Q'T Y	NOTE
001	25CS-001000	Carriage	1	
001-3	25CS-001300	Cover	1	
001-4	25CS-001400	Cover	1	
002	25CS-002100	Cross Slide	1	
003	25CS-003000	Gib	1	
004-1	25CS-004100	Gib Plate(Front)	1	
004-2	25CS-004200	Gib Plate(Back)	1	
005	25CS-005000	Gib	2	
006	25CS-006A00	Ball Screw	1	x-axis
007	25CS-007000	Bracket	1	
008-1	25CS-008100	Ball Screw bracket	1	
008-2	25CS-008200	Motor Bracket	1	
010	25CS-010000	Bearing. Cover	1	
012	25CS-012100	Pulley	1	
013	25CS-013000	Lock Nut	1	
015	25CS-015100	Motor plate	1	
016		Motor	1	
019	25CS-019000	Bearing Block	1	
019-1	25CS-019100	Washer	1	
020	25CS-020000	Wiper	1	
021	25S-029000	Wiper	2	
022	25S-027000	Wiper	2	
023	25CS-023000	Wiper	1	
035	21CS-035100	Turret Base	1	
038		Limit switch - double connection	1	
039		Limit switch - single connection	1	
041		Bearing 6003	2	
042		Bearing 2047	2	
041		Bearing 6003	2	
042		Bearing 2047	2	
043		Key 7*7*28	1	
045		C-Locker S17	1	
046		Half-Screw M5*20	16	
047		Screw M5*30	2	
048		Screw M5*45	2	
049		Screw M6*20	6	

Parts list of Carriage & Cross slide

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
050		Screw M6*40	4	
051		Screw M6*45	4	
052		Screw M8*30	4	
053		Screw M8*35	12	
054		Screw M8*55	4	
055	25S-024100	Adj. screw	2	
056		Flat head Screw M4*10	12	
057		Pin dia.5*45	2	

8.4 BED & Z-AXIS TRANSMISSION



Parts list of Bed & Z-axis Transmission

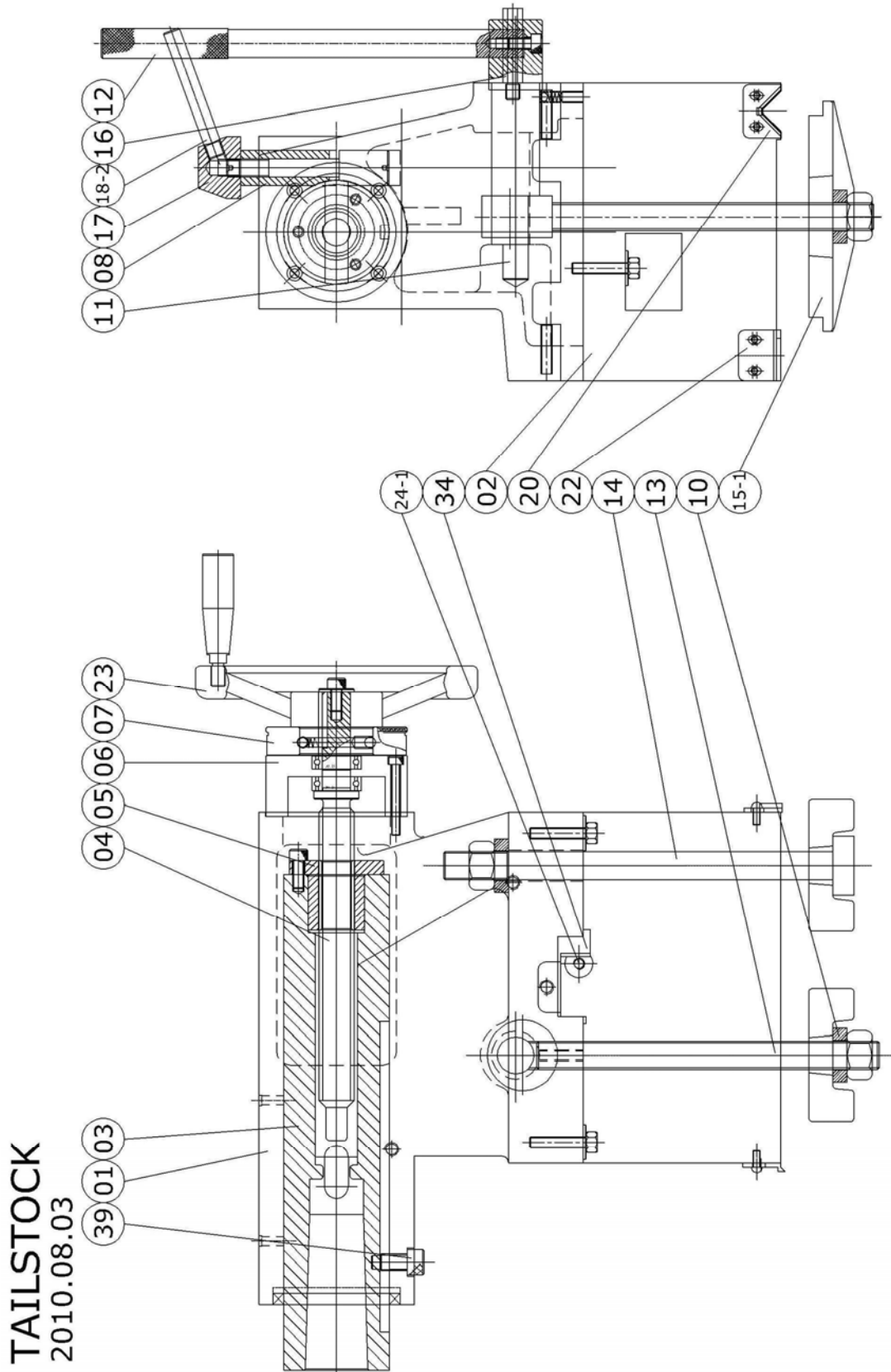
No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
001	25B-001B00	Bed	1	
002	25B-002B00	Machine Base	1	
003	25CB-003	Ball Screw	1	Z Axis
005	25CB-005000	Bracket	1	
006	25CB-006000	Motor Bracket	1	
007	25CB-007000	Bearing. Cover	1	
008	25CB-008000	Collar	3	
009	25CB-009000	Lock Nut	1	
010	25CB-010000	Snap Cover	1	
011	25CB-011200	Pulley	1	
013	25CB-013000	Bearing. Housing	1	
014	25CB-014000	Bearing. Cover	1	
015	25CS-015200	Base	1	
016	25CB-016000	Lock Nut	2	
018	25CB-018000	Sensor Block	3	
020	25CB-020000	Base	1	
021	25CB-021300	Pulley	1	
023	25B-023000	Washer	1	
027	25B-027000	Pump Frame	1	
039	25B-039000	Motor Base	1	
040	25B-040000	Shaft	1	
041	25B-041000	Base Plate	1	
042	25B-042300	Motor Pulley	1	
046	25B-046000	Adjustment Screw	1	
050	25B-050000	Screw	6	
070	25B-070000	Gasket	6	
081		Bearing 3062	4	
082		Half-Screw M5*10	6	
083		Screw M6*16	2	
084		Screw M6*20	6	
085		Screw M6*25	6	
086		Screw M8*14	2	
087		Screw M8*20	4	
088		Screw M8*25	4	
089		Screw M8*30	5	
090		Screw M10*35	4	

Parts list of Bed & Z-axis Transmission

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
091		Screw M10*50	6	
092		Screw M12*75	4	
093		Oil Seal 40*55*8	1	
094		Packing Ring 30*25	3	
095		Spacer M5	6	
096		Belt	1	
097		Coolant Pump	1	
098		Screw	2	
099		Pin		

8.5 TAILSTOCK

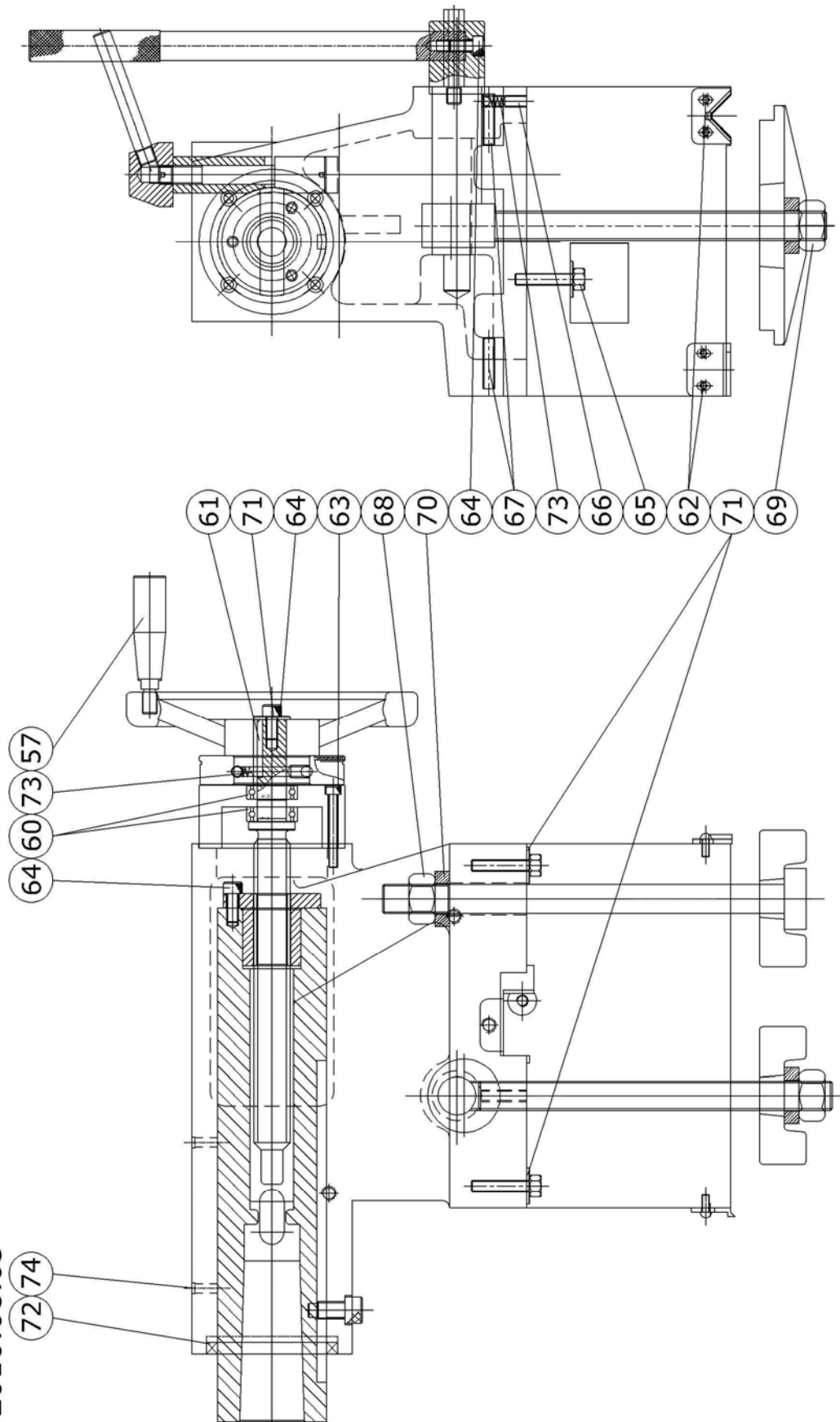
8.5.1 MANUAL TAILSTOCK -18"/21"/25" Tailstock



Parts list of 18"/21"/25" Manual Tailstock

No.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
001	25T-001000	TAILSTOCK BODY	1	H4 TURRET
	25CT-001000	TAILSTOCK BODY	1	V8 TURRET
002	18T-002000	BASE	1	
	21T-002000	BASE	1	
	25T-002000	BASE	1	
003	25T-003000	QUILL	1	
	25T-0040M0	SCREW	1	MM
004	25T-0040I0	SCREW	1	INCH
	25CT-0040M0	SCREW	1	FOR 25CT-001
	25CT-0040I0	SCREW	1	FOR 25CT-001
005	25T-0050M0	NUT	1	MM
	25T-0050I0	NUT	1	INCH
006	25T-006000	BRACKET	1	
007	25T-0070M0	DIAL	1	MM
	25T-0070I0	DIAL	1	INCH
008	25T-008009B	BOSS STUD	1	
010	25T-010000	WASHER	1	
011	25T-011000	ECCENTRIC LOCK STUD	1	
012	25T-012000	LOCKING LEVER	1	
013	18T-013000	CLAMPING BOLT	1	
	21T-013000	CLAMPING BOLT	1	
	25T-013000	CLAMPING BOLT	1	
014	18T-014000	CLAMPING BOLT	1	
	21T-014000	CLAMPING BOLT	1	
	25T-014000	CLAMPING BOLT	1	
015-1	25T-015100	HOLDING DOWN PLATE	2	
016	25T-016000	STOP PIN	1	
017	25T-017000	HEAD BOSS	1	
018-2	25T-018200	HANDLE	1	
020	25T-020000	WIPER	2	
022	25T-022000	WIPER	2	
023	25A-010000	HAND WHEEL	1	
024-1	25S-024100	ADJUSTMENT BOLTS	2	
034	25T-034000	GIB	1	
039	25T-039000	FIXING SCREW	1	

TAILSTOCK
2010.08.03

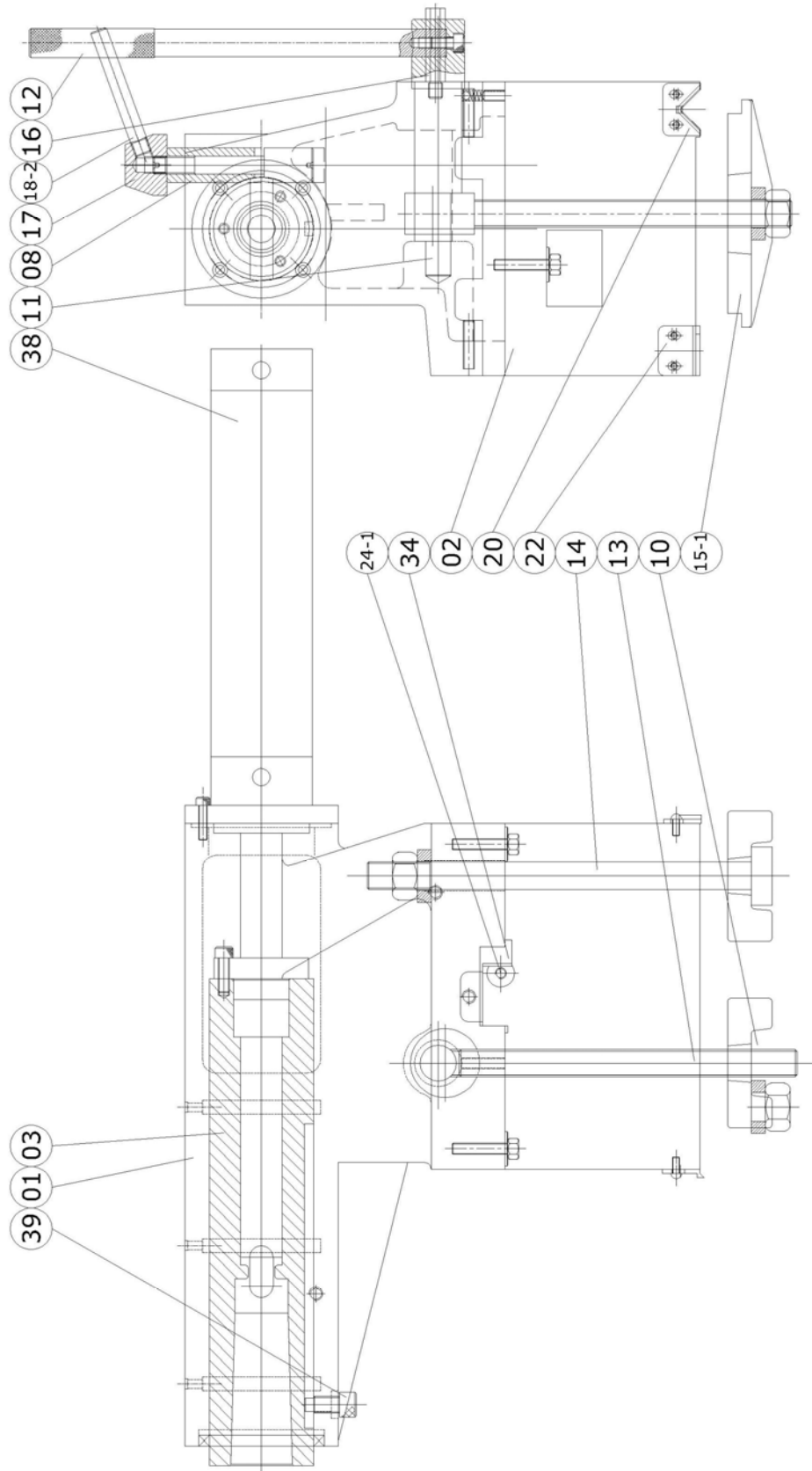


Parts list of 18"/21"/25" Manual Tailstock

NO.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
057	25T-057000	HANDLE	1	
060		BEARING 51104	2	
061		KEY 6*6*14	1	
062		SCREW M5*12	4	
063		SCREW M6*50	4	
064		SCREW M8*20	5	
065		SCREW M8*40	2	
066		SCREW M6*16	1	
067		SCREW M8*35	2	
068		NUT 3/8"	1	
069		NUT M20	1	
070		SPACER 20*37*4	1	
071		SPACER M8	3	
072		OIL SEAL 75*90*8	1	
073		STEEL BALL & SPRING	2	
074		OIL STUFF	2	
		OIL STUFF	3	FOR 25CT-001

8.5.2 HYDRAULIC TAILSTOCK -18"/21"/25" Tailstock Option

HYD. TAILSTOCK
2010.08.21

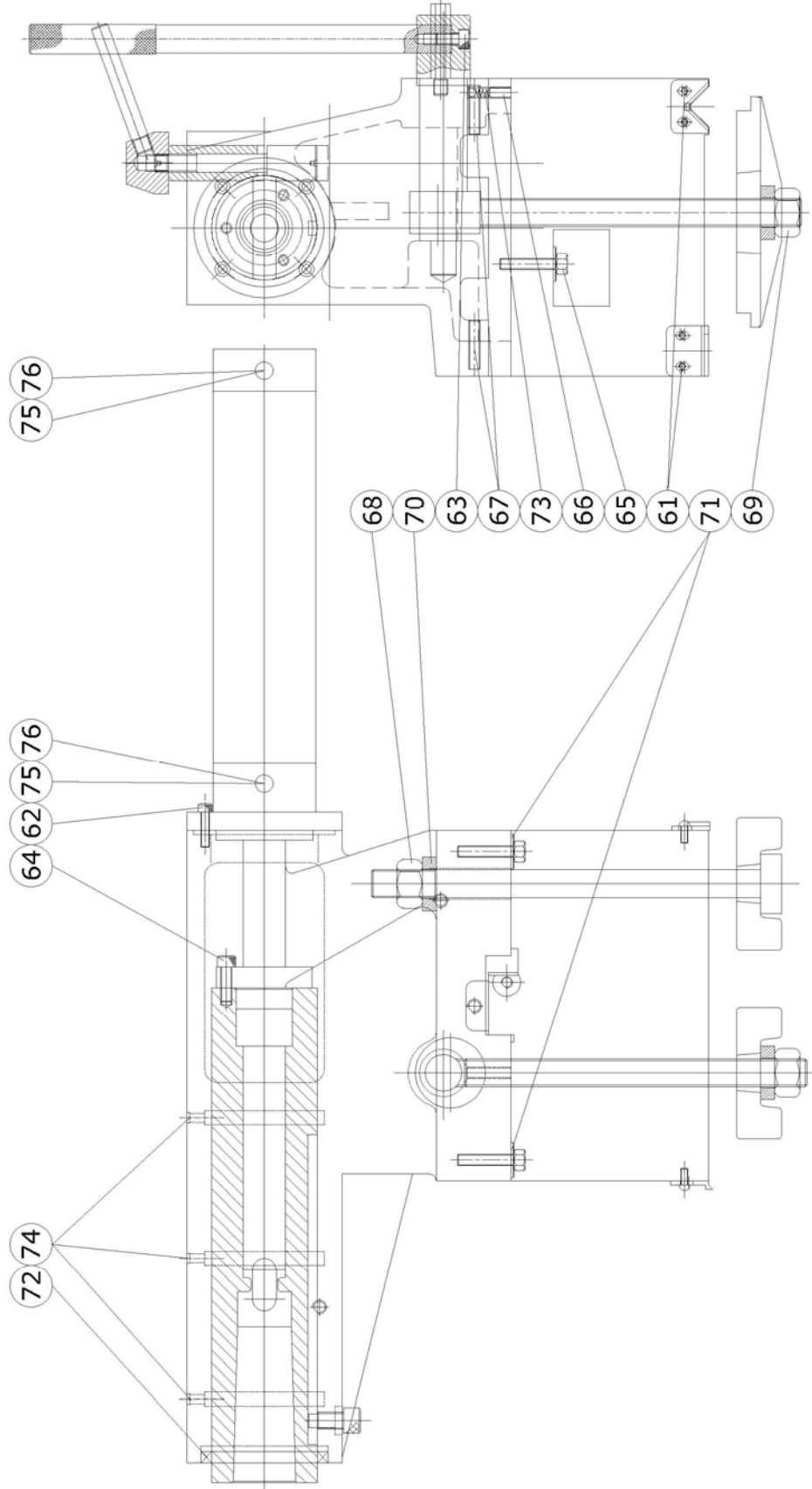


Parts list of 18"/21"/25" Hydraulic Tailstock

OPTION

NO.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
001	25CT-001000	TAILSTOCK BODY	1	
002	18T-002000	BASE	1	
	21T-002000	BASE	1	
	25T-002000	BASE	1	
003	25T-003000	QUILL	1	
008	25T-008009B	BOSS STUD	1	
010	25T-010000	WASHER	1	
011	25T-011000	ECCENTRIC LOCK STUD	1	
012	25T-012000	LOCKING LEVER	1	
013	18T-013000	CLAMPING BOLT	1	
	21T-013000	CLAMPING BOLT	1	
	25T-013000	CLAMPING BOLT	1	
014	18T-014000	CLAMPING BOLT	1	
	21T-014000	CLAMPING BOLT	1	
	25T-014000	CLAMPING BOLT	1	
015-1	25T-015100	HOLDING DOWN PLATE	2	
016	25T-016000	STOP PIN	1	
017	25T-017000	HEAD BOSS	1	
018-2	25T-018200	HANDLE	1	
020	25T-020000	WIPER	2	
022	25T-022000	WIPER	2	
024-1	25S-024100	ADJUSTMENT BOLTS	2	
034	25T-034000	GIB	1	
038	25CT-038000	HYD. CYLINDER	1	
039	25T-039000	FIXING SCREW	1	

Hydraulic Tailstock-18"/21"/25" Tailstock **OPTION**

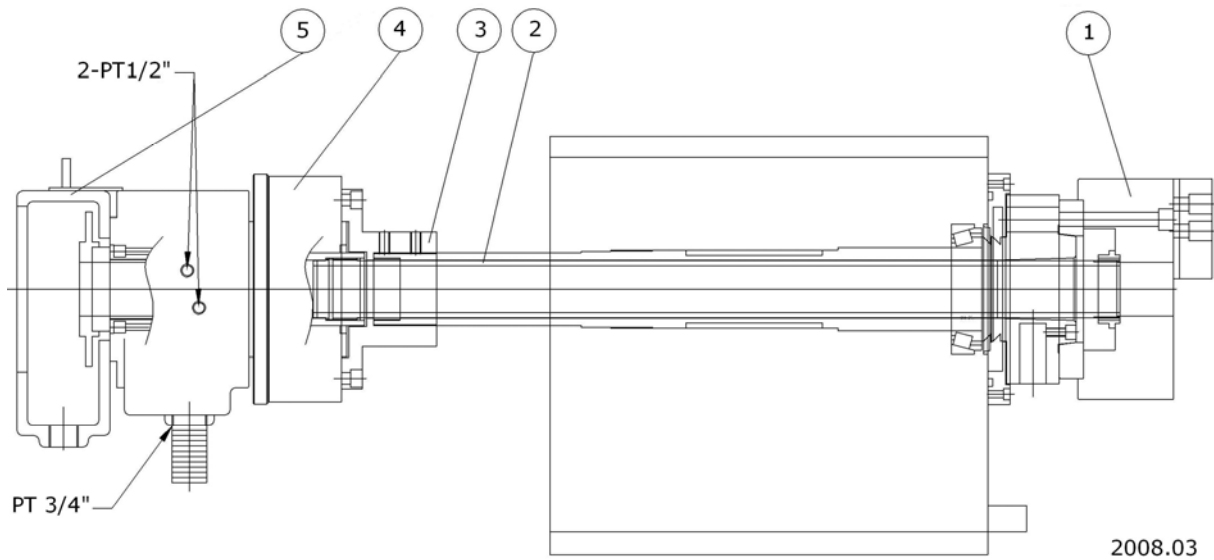


HYD. TAILSTOCK
2010.08.21

Parts list of 18"/21"/25" Hydraulic Tailstock**OPTION**

NO.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
061		SCREW M5*12	8	
062		SCREW M6*25	4	
063		SCREW M8*20	1	
064		SCREW M8*25	3	
066		SCREW M6*16	1	
067		SCREW M8*35	2	
068		NUT 3/8"	1	
069		NUT M20	1	
070		SPACER 20*37*4	1	
071		SPACER M8	2	
072		OIL SEAL 75*90*8	1	
073		STEEL BALL & SPRING	2	
074		OIL STUFF	3	
075		CONNECTION 3/8T*3/8H	2	
076		CONNECTION 3/8T*3/8H	2	90°

8.6 HYDRAULIC CYLINDER FOR HYD. CHUCK - OPTION

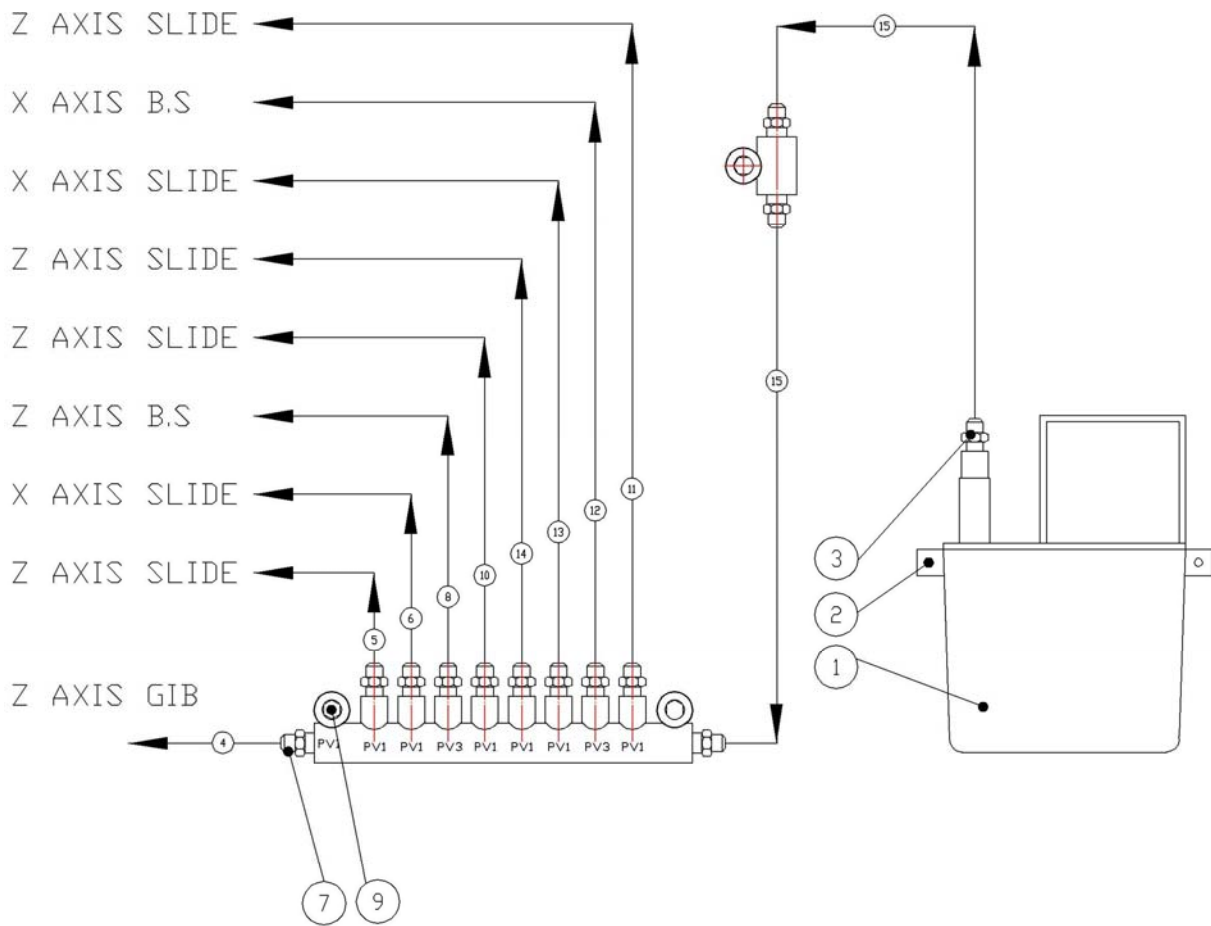


Parts list of hydraulic cylinder for hyd. Chuck

NO.	PARTS NO.	DESCRIPTION	Q'TY	NOTE
1		Chuck	1	
2		Draw Bar	1	
3		Bracket	1	
4		Hydraulic Cylinder	1	
5		Back cover	1	

Different models have different part number. When ordering parts, please specify model number, spindle bore, HP and size of hydraulic chuck.

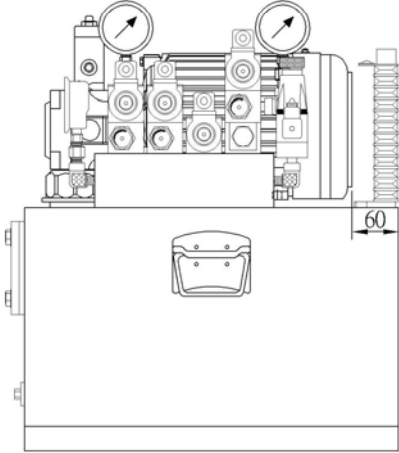
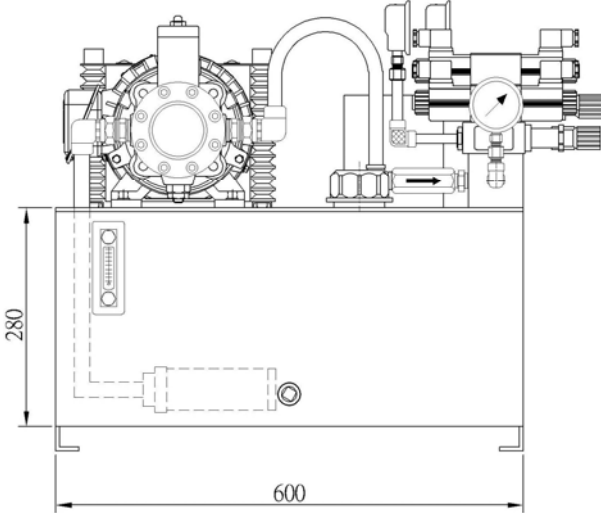
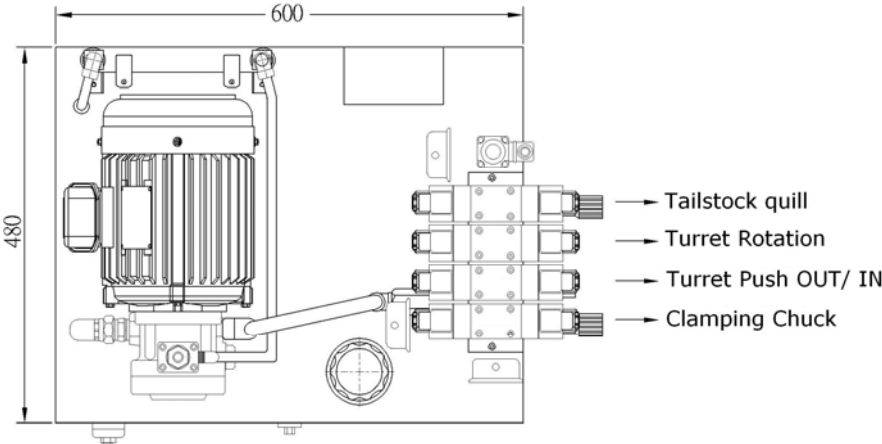
8.7 LUBRICATION SYSTEM



NO	PART NO	PART NAME	QTY	REMARK
1		LUB. PUMP	1	
2		SOCKET HD. SCREW	2	
3		PIPE LOCK NUT	1	
4		ALUMINUN PIPE $\phi 4$		
5		ALUMINUN PIPE $\phi 4$		
6		ALUMINUN PIPE $\phi 4$		
7		PIPE LOCK NUT PIPE JOINT		
8		ALUMINUN PIPE $\phi 4$	1	
9		SOCKET HD. SCREW	2	
10		ALUMINUN PIPE $\phi 4$		
11		ALUMINUN PIPE $\phi 4$		
12		ALUMINUN PIPE $\phi 4$	1	
13		ALUMINUN PIPE $\phi 4$		
14		ALUMINUN PIPE $\phi 4$		
15		ALUMINUN PIPE $\phi 6$		

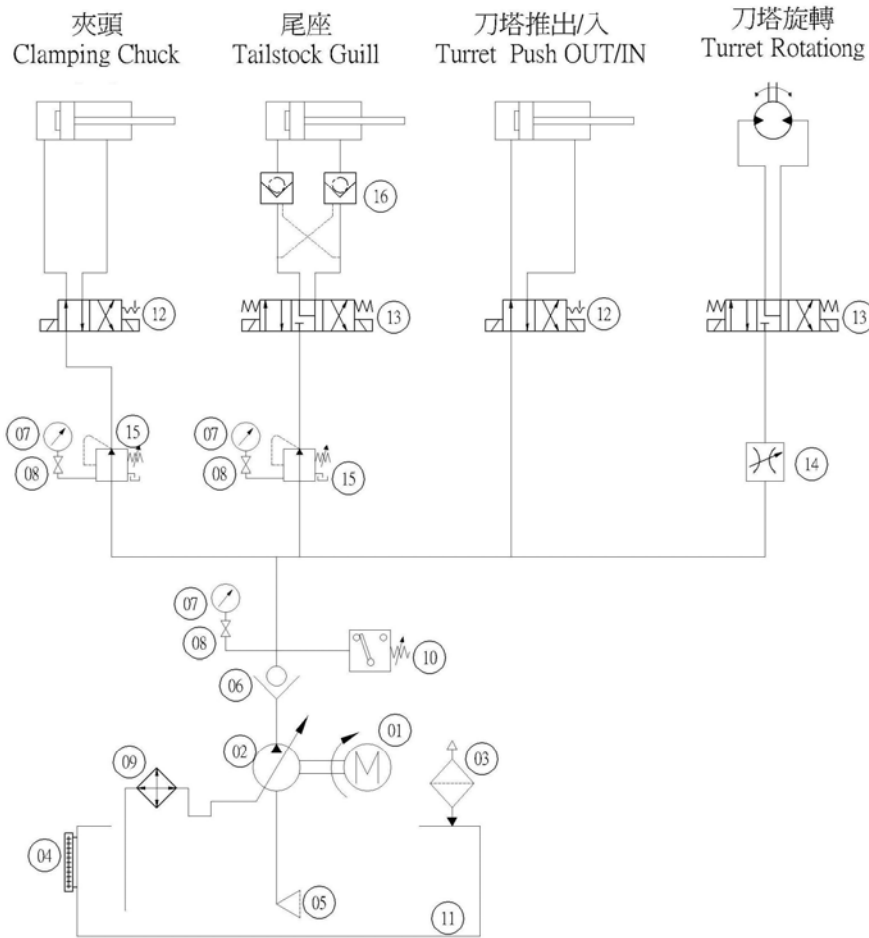
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8.8 HYDRAULIC UNIT OPTION



2010.08

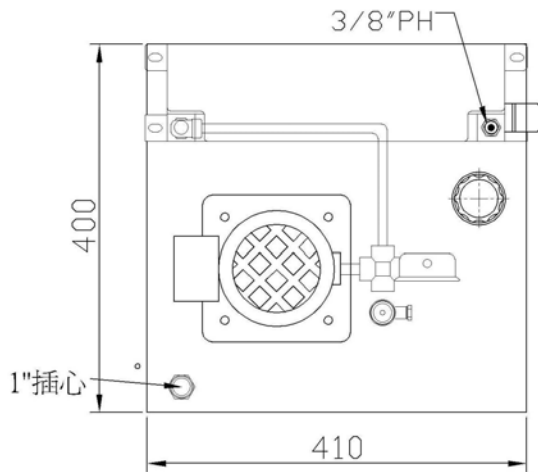
HYDRAULIC CIRCUIT DIAGRAM



NO	Item	Qty
1	Motor	1
2	Pump	1
3	Filler breather filter	1
4	fluid level	1
5	Sunction filter	1
6	Check valve	1
7	Pressure gauges	3
8	Joint	3
9	Heat exchangers	1
10	Pressure switch	1
11	tank	1
12	Solenoid valve	2
13	Solenoid valve	2
14	Flow control valve	1
15	Pressure relief valves	2
16	check valve	1
17		
18		

1037-024
2010.08

8.9 AUXILIARY SIDE OIL TANK



DRAWING NO. 1037-EL 2010-08-18

NO	物件名稱	Item	Qty	model
1	馬達	Motor	1	1/4HP
2	注油器	Filler breather filter	1	AB-1162
3	油面計	fluid level	1	LS-3"
4	壓力計	Pressure gauges	1	3231122 2KG
5	銜接	Fitting	1	BH57-01
6	風冷式鋁合金冷卻器	Heat exchangers	1	AW-0608L-CA2
7	壓力開關	Pressure switch	1	PMM2A14K
8	油桶組立	Oil Tank	1	410x400x300
9				
10				

