

# User Manual

**Model:** TF8L  
**Maximum swing over bed:** 470mm (18.5 inches)  
**Maximum turning length:** 610mm (24 inches)

Before installation and use, read this *Manual* first.

**Kimhoo Automation. US. Corporation**

## **Introduction**

Thanks for choosing Kimhoo product.

This manual book described TF8L CNC lathe which you have chosen.

And, for the special need by customer, the machine will increase some special device and accessories; for those devices, we will provide user manuals which is not repeat in this manual.

As the product is updating and improving, the configurations of lathe may different, our company keep the rights of alteration of diagram and parameter. The information will be subject to change without prior notice

This manual book is not for sale.

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## Chapter 1 Machine Feature and Specifications

### 1.1 Summarize

TF8L, a high-performance CNC lathe be designed by our company. This machine be designed as high efficiency, high accuracy, high stability and complete functions for precision mass product.

#### Main structure and specialty:

- Horizontal flatbed structure, hardened guide way;
- Independent spindle unit with high precision bearings, high speed rotation with low thermal deformation
- Whole base made in good rigidity
- 4-way automatic tool post + gang tool
- Suitable for processing mass axle workpiece or disc workpiece, also suitable for machining complex shapes.

**This machine can choose different CNC system, servo drive system, hydraulic system, power chuck and tool post.**

### 1.2 Main technical parameter

Items	Metric	S.A.E.
<b>Turning Capacities</b>		
<b>Max. Swing Over Bed</b>	470mm	18.5"
<b>Max. Swing Over Cross Slide</b>	210mm	8.3"
<b>Max. Turning Diameter</b>	470mm	18.5"
<b>Max. Turning Length</b>	610mm	24"
<b>Travels</b>		
<b>X Axis Stroke</b>	300mm	11.8"
<b>Z Axis Stroke</b>	620mm	24.4"
<b>Spindle</b>		
<b>Chuck/Collet Type</b>	3-Jaw 8" Manual Chuck	
<b>Spindle Motor Type</b>	Variable Frequency Motor	
<b>Spindle Power</b>	5.5kW	7.4 hp
<b>Max Spindle RPM</b>	3000	
<b>Spindle Nose</b>	A2-5	
<b>Spindle Bore</b>	56mm	2.2"
<b>Feeds &amp; Axis Motors</b>		
<b>Rapids on X Axis</b>	8m/min	315 ipm
<b>Rapids on Z Axis</b>	10m/min	394 ipm

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<b>Max Torque of X Axis Motor</b>	5N·m	3.7 ft·lbf
<b>Max Torque of Z Axis Motor</b>	7.5N·m	5.5 ft·lbf
<b>Tailstock</b>		
<b>Tailstock Quill Diameter</b>	65mm	2.56"
<b>Tailstock Quill Travel</b>	130mm	5.1"
<b>Tailstock Taper</b>	MT4	
<b>Accuracy</b>		
<b>Positioning Accuracy</b>	0.012mm (X) / 0.016m(Z)	0.00047" (X) / 0.00063" (Z)
<b>Machine Repeatability</b>	0.004mm (X) / 0.006m(Z)	0.00016" (X) / 0.00024" (Z)
<b>Circular Degree</b>	0.008mm	0.0003"
<b>Surface Roughness (for ASTM 1045)</b>	Ra 0.0016mm	Ra 0.000063"
<b>Tools Post</b>		
<b>Type</b>	4-Way Automatic Tool Post + Gang Tool	
<b>Number of Tools</b>	6	
<b>Tool Shank Dimensions</b>	25mm × 25mm	63/64" × 63/64"
<b>Boring Bar Mount Diameter</b>	20mm	25/32"
<b>Others</b>		
<b>AC Power Input</b>	230/460V ± 10%, 3 Phase, 60Hz	
<b>Overall Power</b>	9.78 kVA	
<b>Coolant Capacity</b>	35L	9.25 gal
<b>Coolant Pump</b>	120W	0.16 hp
<b>Overall Dimension</b>	2200 × 1350 × 1620mm	86.6" × 53" × 64"
<b>Machine Weight</b>	2100kg	4630 lbs
<b>Remark:</b> If you want servo motor spindle, hydraulic chuck, or have other requirements, contact the customer service.		

The table above is the technical parameter of standard TF8L of GSK 980TDHi CNC system. According to the requires of customer, the machine may be different with the standard machine. Please make sure before operation or contact to sales platform or our company.

## **Chapter 2 Machine unpacking and installation**

### **2.1 Unpacking**

After receiving this machine, open the case and check, pay attention on followings:

- a) Check whether the packaging is complete.
- b) Whether the machine is damp during shipping.
- c) Whether the outlay and all parts is damage during shipping.
- d) According to the packing list, check whether machine and packing list are consistent.

If there are damages and missing part of machine, contact to the agent or us.

### **2.2 Lifting**

Lifting machine with package, fix rope on marked points; not strong impaction and vibration during lifting up and down. During lifting, the package should not over slant or inverted.

After lifting and unpacking, read *Machine Layout and Installation Foundation Diagram*.

**We suggest using forklift to move and lift machine.**

### **2.3 Installation**

#### **2.3.1 Requirement of setting**

The machine is supported by multi-group of parallels, for the foundation of machine we suggest use integral type, the depth of foundation should more than 500mm (about 20 inches).

Also, the machine should not site on direct solar radiation. and there are no other dust, liquid, or vibration around the machine.

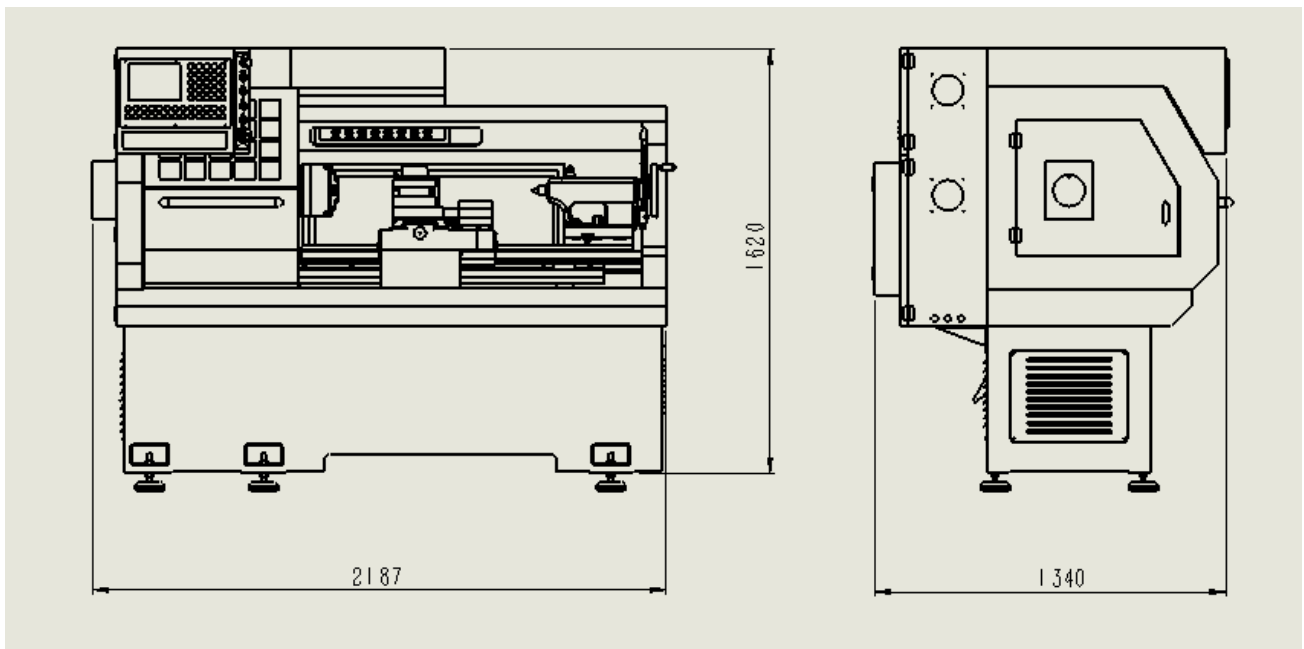
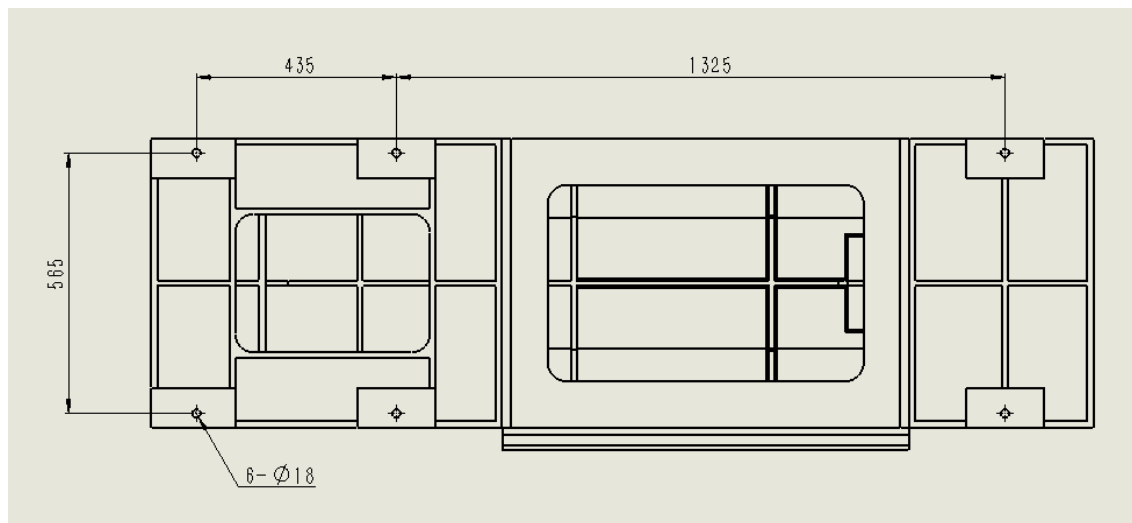
We suggest the environment temperature: 41 – 95 °F (5 - 35 °C)

Relative humidity: 75%

#### **2.3.2 Requirement of power supply**

We suggest our customer use independent power supply, that will avoid current and voltage vibration from other electricity device to fault the machine. This machine needs independent ground connection point, and the ground wire need to be as thick as possible.

## 2.4 TF8L Foundation and dimensions



## Chapter 3 Testing Running

### 3.1 Preparation

Before testing running, need to finish the following work:

- a) Clean up anti-rust oil.
- b) Make sure all screws are fixed tightly.
- c) Make sure hydraulic oil (machine with hydraulic system) and lubrication oil are full filled.

### 3.2 Testing running after power on

After machine power on, need to check the followings:

- a) Whether all cooling fans are work in functional.
- b) Whether oil lines are work, any leaking.
- c) Whether pressure meter can work normally (for machine with hydraulic system).
- d) Whether lubrication system is in work.
- e) Tight force of all belts

If all above is good to work, then test the following parts:

- Spindle system

Testing the spindle system, from low speed to high speed; we suggest test the spindle with 10% of maximum speed, then increase 10% of maximum speed each time until to the maximum speed, and more than 20 minutes running in each speed.

Check whether the spindle is steady and smooth in each speed.

Check whether the spindle emit any noise during running.

- Feed system

At condition of lubrication system working, move the carriage with manual mode, let the carriage to reach all limited position switches to make sure all limited position switches are in working.

Check whether the carriage moving on X/Z ways is smooth.

- Tool post system

Make sure tool on tool post be installed correctly; check whether there are any interference, then rotate the electricity tool post by sent an order.

Check the whole tool post, whether tool changing is steady and smooth, and tool is in position.

- Tailstock

Release the locking handle of tailstock and locking handle of sleeve, move tailstock and sleeve.

Check all move parts of tailstock, whether they are moving steady.

Check all locking handle whether they are in work.



## **Chapter 4 Adjustment Lathe Horizontal**

After finishing the run test, user need to adjust the machine horizontal, the level of horizontal will directly affect the precision of machine. User can do the following procedure to adjust the horizontal.

- a) Adjust the foundation bolts and parallels one by one, try to average the lord on every parallel.
- b) Set a leveling instrument holder on surface of guide way or set the leveling instrument holder on sliding plate; then set a leveling instrument on holder.
- c) Move leveling instrument or holder, measure and recode data on every measurement point, also adjust corresponding parallel at same time.
- d) Repeat the step e until all read of measurement points can reach the require (See 'machine tool precision inspection table', or certification inside package).
- e) Lock all foundation bolts.

**The horizontal of machine will be changed after a period of use, we suggest user to measure the horizontal every year. And if any accident happened (external force collide, crash) during using, also need to measure the horizontal.**

## Chapter 5 Spindle System

### 5.1 Specification

The spindle of the machine is an independent spindle unit, electrical motor drive spindle through belt, stepless speed changing.

The spindle system gets good accuracy, strength and thermal stability, the main spindle bearings have been adjusted and fixed in best position, and performance lubrication grease will reduce the warming of spindle, low thermal deformation.

The spindle unit is totally enclosed type, not any adjusting instrument. The spindle unit doesn't need to do any daily maintenance or refill lubrication grease.

If the machine has been not operated for over 10days, user need to follow *Chapter 3* for testing running spindle.

User may change the fixture for different workpiece, that may affect the speed of spindle; please read the speed range of spindle, it may cause heavy damage.

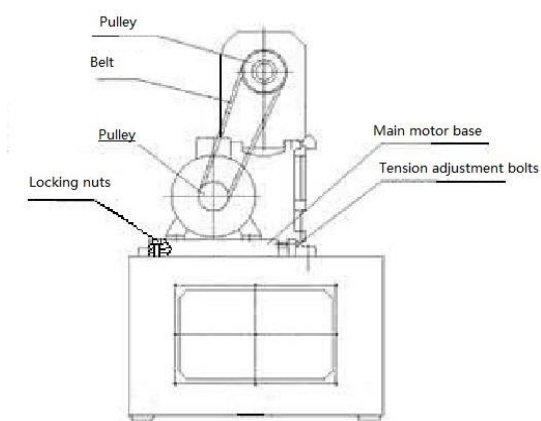
User cannot dismantle or repair the spindle unit without our agreement.

### 5.2 Structure and adjustment of spindle system

#### 5.2.1 Tension of belt

The spindle belt have been adjusted in best condition in factor, as the belt is vulnerable part, after long time use, the tension of belt will change, the belt may be stretched even be snapped. If user want to replace the belt, follow the steps below:

- a) Release all locking nuts on main motor base.
- b) Move main motor and base by adjusting tension adjustment bolts, then install a new belt.
- c) Move main motor and base to adjust the tension of belt.
- d) Lock all the locking nuts.



**High tension will increase the wear of belt and main bearing; low tension will decrease torque of spindle. User need to check the tension of belt regularly.**

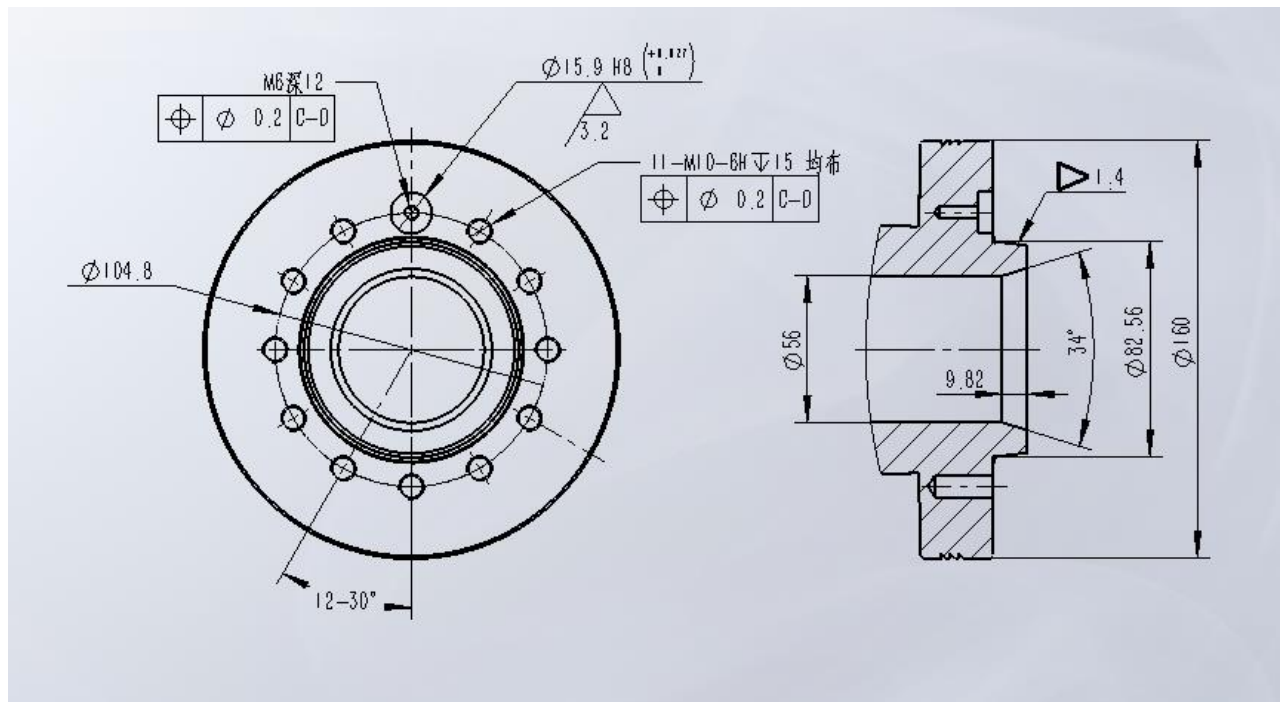
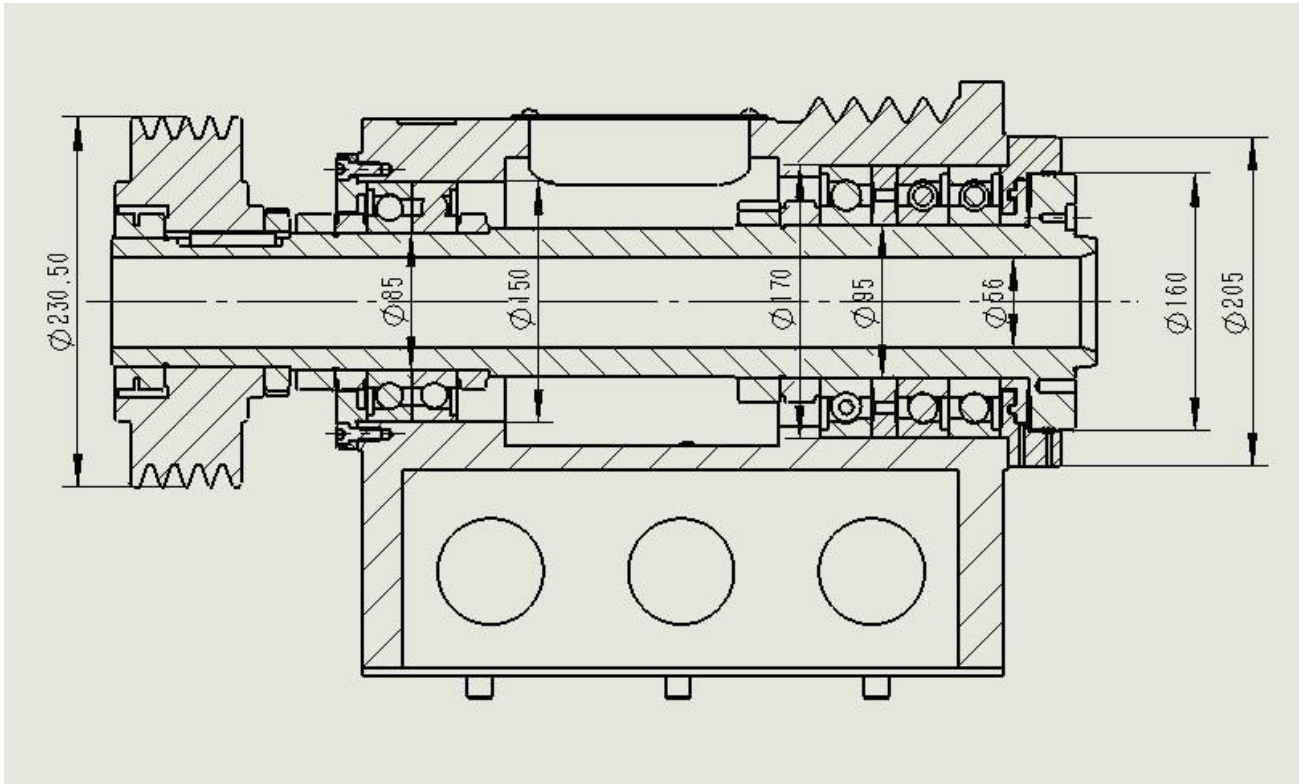
### 5.2.2 Spindle adjustment

As the figure showed, round nut is use to adjust bearing, locking screws are distributed on excircle of round nut, rotate the locking screws to adjust spindle.

If the spindle be adjusted, it must through medium and high-speed unloading test.

If there are a crash during operation, user need to check the accuracy of spindle; if any problem, please contact to us.

As the spindle unit is high precision part, user can not open, repair, and adjust spindle without our permission.



## **5.3 Chuck**

### **5.3.1 Three jaws manual chuck**

The standard of TF8L adopts  $\varnothing 200\text{mm}$  normal three-jaws manual chuck. User need to follow the operation manual of chuck to operate chuck (See user manual of chuck).

User need to maintain the chuck regularly (See user manual of chuck).

### **5.3.2 High speed three jaws manual chuck (optional)**

The structure of high speed three jaws manual chuck is similar with normal three jaws manual chuck, but their performance is different, user should follow the manual to use and maintain.

### **5.3.3 Powered chuck and rotary cylinder(optional)**

Powered chuck and rotary cylinder have been adjusted at best condition in factory, user needs to the following works before use.

- a) Install jaws according to the size of workpiece.
- b) Match jaws according to the size of workpiece.
- c) According to the condition of workpiece, adjust the pressure of rotary cylinder, try to maximum the clamping force without deformation. (The maximum pressure of rotary cylinder and maximum clamping force of chuck should be identified, according to *Powered Chuck and Rotary Cylinder User Manual*)

**Attention: The maximum spindle speed of TF8L doesn't consider the maximum speed of chuck, the maximum speed of chuck can be considered as the actual maximum speed of spindle, but it can't over the designed speed.**

## Chapter 6 Tailstock

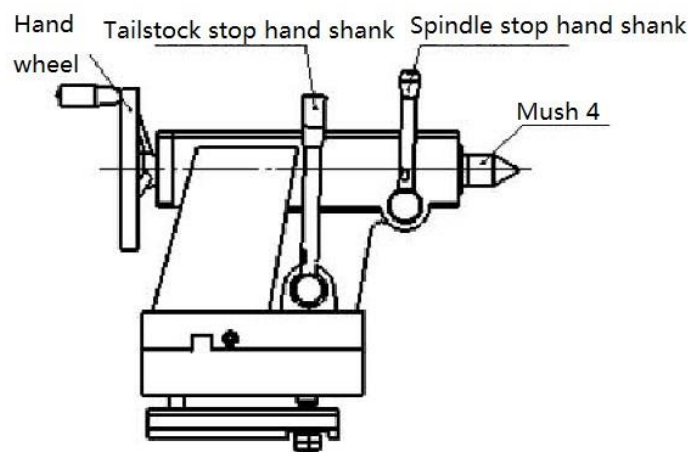
### 6.1 Specification

The tailstock of this machine is manual tailstock. There are two hand shanks for tailstock stop and spindle stop, these two hand shanks control the extension of spindle and retreat of hand wheel. During using, operator can easily move tailstock and spindle according the condition of lathe and workpiece. For the safe and reliability, when operate this lathe, check the locking device and locking force, be sure they are in good conditions.

### 6.2 Locking and moving

Operator who try to move and lock the tailstock and spindle, can follow the steps below:

- Release the spindle stop hand shank, rotate the hand wheel, that the spindle can be extended or compressed. When the spindle fully compressed, the tools and accessories (such as center, arbor).
- Release the tailstock stop hand shank, follow the rail to move tailstock.



### 6.3 Adjustment of tailstock locking force

Under the base of tailstock, operator can adjust the position of two M20 screws to change the locking force.

### 6.4 Adjustment of center axis of tailstock

To adjust the center axis of tailstock, that can be realized by adjusting the bolts on the two sides of tailstock. As the center axis of tailstock have adjusted when the machine was in factory, so the adjustment of center axis of tailstock only be used for eliminating the alignment error, if necessary.

The lubrication grease should be refilled in oil cup which on the top of tailstock.

## **Chapter 7 Tool Post**

The standard configuration of TF8L is 4-way automatic tool post, there are few notes below:

- a) Install tool without interference between tool post and safe panel, end face of spindle, tailstock.
- b) Reasonable distribute tools, avoid uneven load to wear the tool post.
- c) + Gang Tool

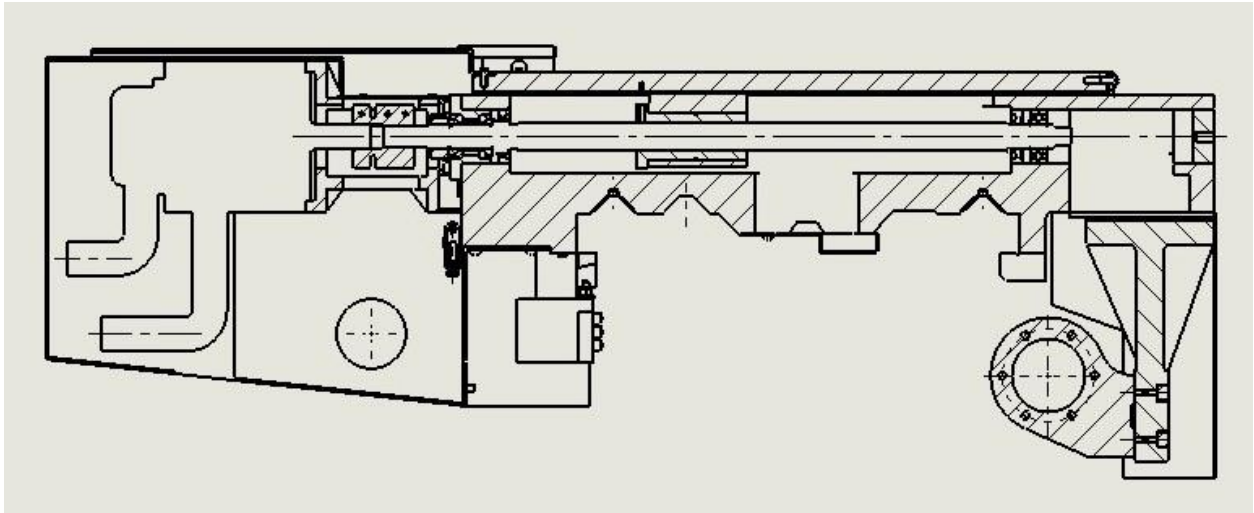
**Two additional gang tool plate will come with this machine.**

**User need to maintain the tool post regularly, see *Tool Post Manual* for maintenance.**

## Chapter 8 Feed System

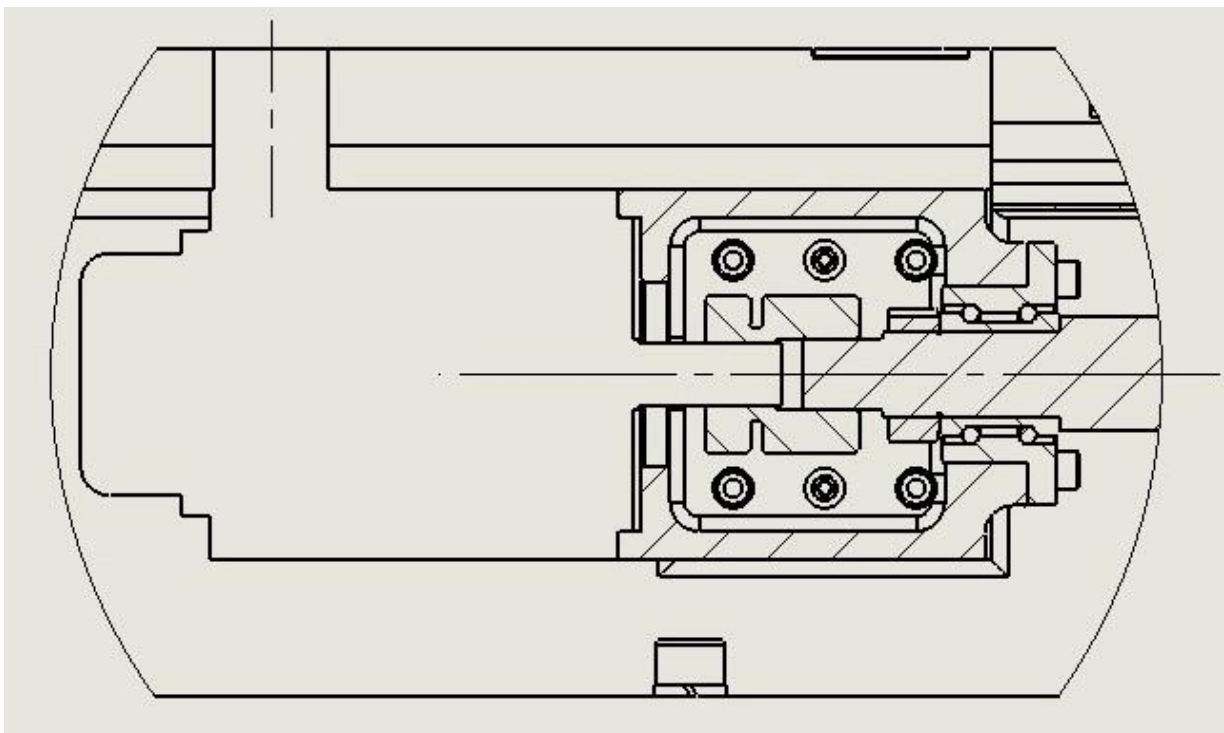
### 8.1 X-way feed structure and specification

The feed system of this machine use standard ball lead screw to be the drive. On X-way, motor contact to ball lead screw by coupler, that can keep machine running with gapless and high accuracy for long time.



### 8.2 Z-way feed structure and specification

On Z-way, motor contact to ball lead screw by coupler, that can keep machine running with gapless and high accuracy for long time.



The bearing in feed system use lubrication grease, user need to fill and replace lubrication grease during maintenance.

**The accuracy and per-extension of ball lead screw have been adjusted in factory. If there are any problem happened during using; contact to us. We are not suggesting to disassembly, repair or replace by user self.**

### **8.3 Hydraulic oil**

This machine uses 40# anti-friction hydraulic oil, the amount of usage should more than two thirds of oil tank. Normally, we suggest changing hydraulic oil every year, and clean oil tank and pipes during changing oil. As hydraulic system is high performance and special optional part; the structure, control data base and element are may change by according user's requirement. We will provide manual and drawing for special requirement.



## **Chapter 9 Lubrication System**

### **9.1 Lubricate moving part**

This machine adopts centralized auto lubrication station, it lubricates moving parts through multi-points. The lubrication station is controlled by machine PC, so user can change the PC setting according to the requirement of operation. The lubrication time and period have been set in factory. (See *Electric Manual*)

### **9.2 Lubricate rotary part**

Spindle bearings and ball lead screw bearings adopt lubrication grease, the grease can keep lubricating for long time; user don't need to replace in 4~5 years.

Ball lead screw be lubricated by lubrication station (See 9.1).

### **9.3 Lubrication oil**

The lubrication oil is N46#, refill oil on time according to the condition of operation.

## Chapter 10 Inspection and Maintenance

### 10.1 Routine inspection

NO.	Checking position	Checking items	Note
1	Auto lubrication pump	Oil level Cleanliness	Refill Replace
2	Cooling liquor	Liquor level Cleanliness	Refill Replace
3	Guide way	Flow rate of lubrication oil Damage of scraping plate	
4	Pressure meter	Pressure	
5	Belt	Tension Crack on surface	
6	Pipes/ machine layout	Leaking	
7	Moving parts	Noise, vibration/normal smooth	
8	Control panel	Switches and buttons/alarm	
9	Safe device	In functional	
10	Cooling fan	Work	
11	Wire	Short out Insulation	
12	Rotator of motor	Noise, vibration Heat	
13	Clean	Chuck, tool post, guide cover, chips remove	
14	Chuck lubrication	Jaws	
15	Workpiece	Accuracy	

## 10.2 Regularly Check

Check position		Items	Period
<b>Hydraulic system</b>	Hydraulic device	Change hydraulic oil, clean oil filter	6 months
	Pipe connector	Leaking check	6 months
<b>Lubrication system</b>	Lubrication device	Clean oil filter	1 year
	Pipe connector	Leaking check	6 months
<b>Cooling system</b>	Water tank	Change coolant, clean tank	Timeliness
<b>Gas</b>	Air filter	Clean or change air filter	1 year
<b>Belt</b>	Belt	Tension, layout	6 months
	Pulley	Clean pulley	
<b>Main motor</b>	Voice, vibration	Un normal noise	6 months
	Heating, insulation	Clean pulley	
<b>X/Z servo motor</b>	Noise	Noise and heating on bearing	1 months
	Heating		
<b>Chuck</b>	Chuck	Disassembly chips remove	1 year
	Rotary cylinder	Leaking check	3 months
<b>Control panel</b>	Electrical device	Smell discolor	6 months
	Binding screw	Clean, tightness	
<b>Inner connection device</b>	Connection between	Tight all connection screws	6 months
	Electric units	Tight all electric elements	
<b>Electric device</b>	Limited position swatch	Tight electric elements and connection screws	6 months
	Sensor	Clean dust.	1 week
	Electromagnetic valve	Check function and accuracy by operation	1 months
<b>X/Z axis</b>	Gap	Measure gaps by dial indicator	6 months
<b>Base</b>	Horizontal of machine	Check the horizontal of machine by level	1 year

**Chapter 11 Standard Parts and Vulnerable Parts**

<b>NO.</b>	<b>Name</b>	<b>Type</b>	<b>Position</b>	<b>Qty.</b>	<b>Mark</b>
<b>1</b>	<b>Angular connect ball bearing</b>	7217AC/P5/DB	Spindle box	1 set	
		7219AC/P5/TBT	Spindle box	1 set	
<b>2</b>	<b>Angular connect ball bearing</b>	DH7206B	Bed	1	
<b>3</b>	<b>Deep groove ball bearing</b>	6206	Bed	1	
<b>4</b>	<b>Deep groove ball bearing</b>	6004/P5	Encode	1	
<b>5</b>	<b>Angular connect ball bearing</b>	DH7204B	Carriage	1	
<b>6</b>	<b>Thrust ball bearing</b>	51204	Tailstock	1	
<b>7</b>	<b>Spindle belt</b>	SPA-2150La	Spindle	4	
<b>8</b>	<b>synchronous belt</b>	310XL037	Encode	1	
<b>9</b>	<b>Deep groove ball bearing</b>	608	Access door	4	
<b>10</b>	<b>Main motor</b>	YVF2-132S-4-B5	Spindle box	1	
<b>11</b>	<b>Servo motor</b>	130SJT-M075D	Bed	1	
<b>12</b>	<b>Servo motor</b>	130SJT-M050D	carriage	1	
<b>13</b>	<b>Electrical tool post</b>	LDB-81 (TF8L)	carriage	1	
<b>14</b>	<b>Water pump</b>	DB-25A	Base	1	