

SHARP

HEAVY DUTY POWERFUL LATHE

OPERATION MANUAL & PARTS LIST

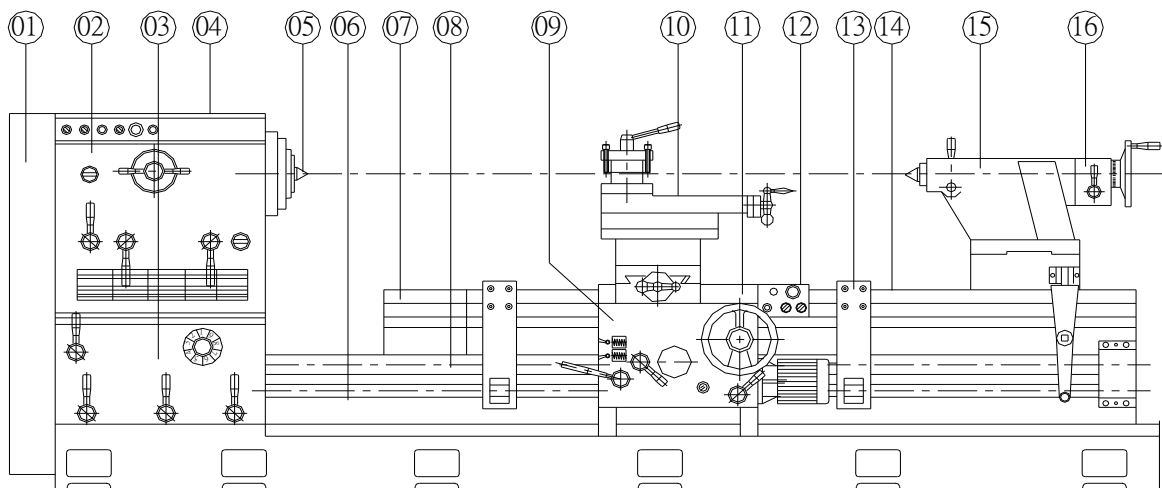
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- PART LIST - HEADSTOCK WITH SPINDLE BORE 9", 12", 15"

2. GENERAL LAYOUT

- | | |
|--------------------|---------------------------|
| 1.END GEAR TRAIN | 9.APRON |
| 2.HEADSTOCK | 10.TOP-SLIDE |
| 3.GEAR BOX | 11.SADDLE AND CROSS-SLIDE |
| 4.ELECTRIC CONTROL | 12.ELECTRIC CONTROL |
| 5.CENTER | 13.SLODEING PLATE |
| 6.FEED ROD | 14.BED |
| 7.GAP BLOCK | 15.TAILSTOCK |
| 8.LEADSCREW | |



3. Before Operation

Power Source Wiring

- 'Power connector is at lower left part of the lathe.
- 'Power source switches with fuse must be set up in the lathe and electric circuit. The wire of the lathe must be ground connected too.
- 'After wire connection, then, input the power source by power source button.

To change the spindle in low speed, check the spindle rotating direction by operating the start-lever in the right side of APRON. See the result whether it is normal or not, in this case, the spindle rotates to the direction of operator, then the rotation is normal. As the spindle rotates to the opposite direction, you should replace any two of the three electric wires.

Identification and preparation before operation

- 'To supply oil to all the necessary positions. (Check "lubrication diagram" in term of 9. lubrication system)
- 'Check all the levers and handles, whether or no in normal condition.
- 'Check the V-belt of headstock motor, whether or no in adequate tension state.
- 'Make clear the relative positions before operate the transmission mechanism, such as head stock, feed gear box, cross slide, and etc, and automatic feeding, tread cutting.

4. UNPACKING AND UNLOADING

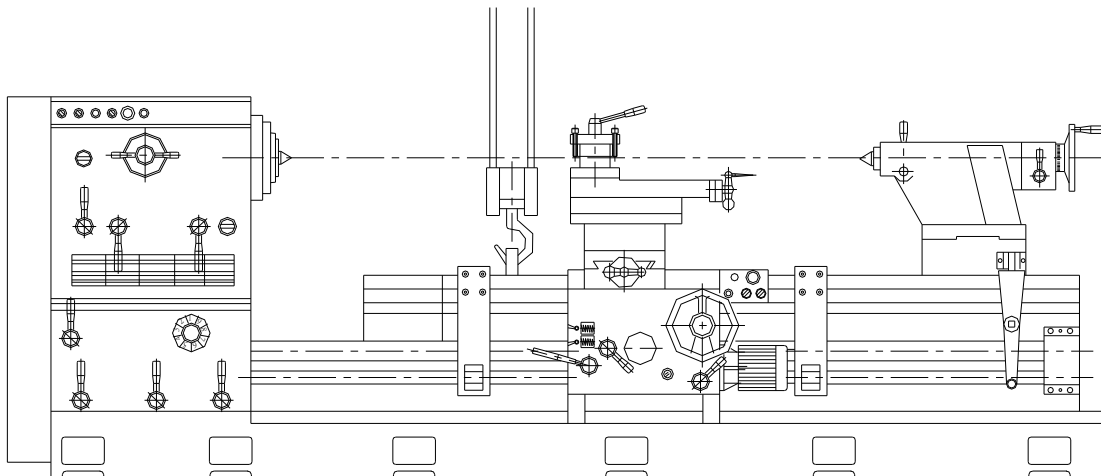
Hanging way (A)

Each machine is dispatched fully assembled except for attachment such as taper attachment etc. Unloading the machine, packed in the wooden case, should be made by wiring cable from the sleepers.

Lifting unpacked machine is made easily by the method shown in the following.

Figure and according to the center of gravity of this laths.

Raising and lowering the lathe, should be done carefully, especially when you lower the lathe, be careful not to bump it against the floor and give attention to the other men to attain the purpose of safety.



Hanging way (B)

Instruction for Machine hanging:

A) Place crossbars (square bars) at the bottom of lathe

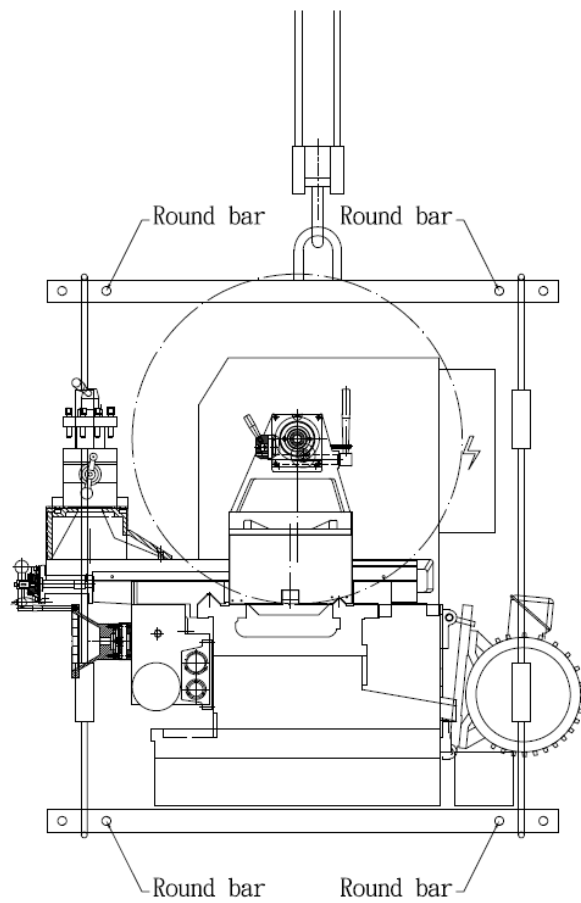
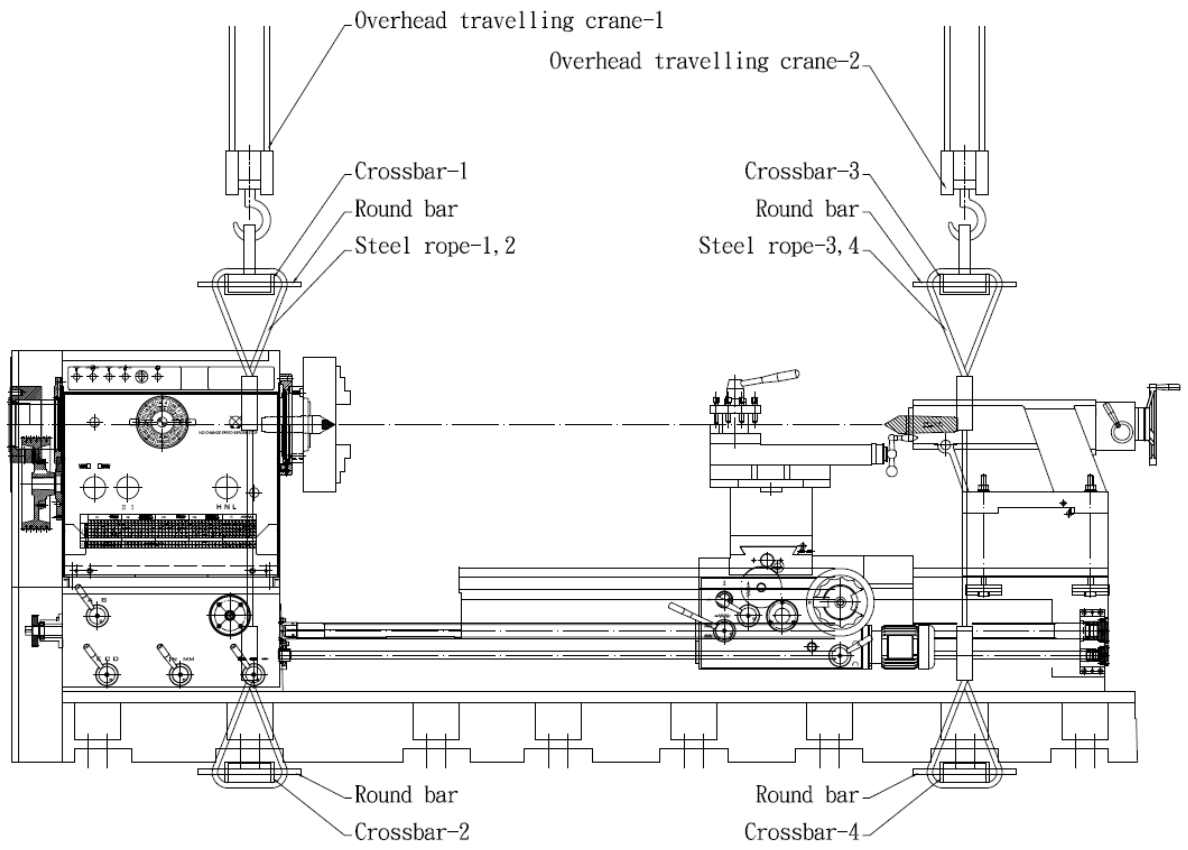
1. Prop up machine off the ground about 200mm height.
2. Place crossbars 2 & 4 at proper position on both sides in the bottom of the machine.
3. Place round bars inside the inner holes at both rear ends of crossbars for preventing the steel ropes sliding inward as shown in the figure as below.
4. Place steel ropes into the crossbars between two holes at both rear ends of crossbars.
5. Place round bars inside the outer holes at both rear ends of crossbars for preventing the steel ropes sliding outward.
6. Let Machine down.

B) Place crossbars (square bars) above in the lathe.

1. Let the hook of overhead travelling crane descend to appropriate height.
2. Place crossbars 1 & 3 at the hooks of overhead travelling craned 1 and 2.
3. Place round bars inside the inner holes at both rear ends of crossbars for preventing the steel ropes sliding inward as shown in the figure as below.
4. Place steel ropes into the crossbars between two holes at both rear ends of crossbars.
5. Place round bars inside the outer holes at both rear ends of crossbars for preventing the steel ropes sliding outward.

C) Hanging / moving machine

1. Prop up the machine slowly from the ground and check up machine's heavy point.
2. Adjust the hooks' position of overhead travelling crane, so that let the machine move horizontally.
3. Move two overhead travelling cranes at the same time. Please pay most attention to the height can't be too high.
4. It must be clearance and no goods placed in the moving direction of overhead travelling crane.
5. Decline slowing the machine after moving to a fixed position, and adjust the position above the foundation bolts.
6. Confirm the location and then let the machine down.

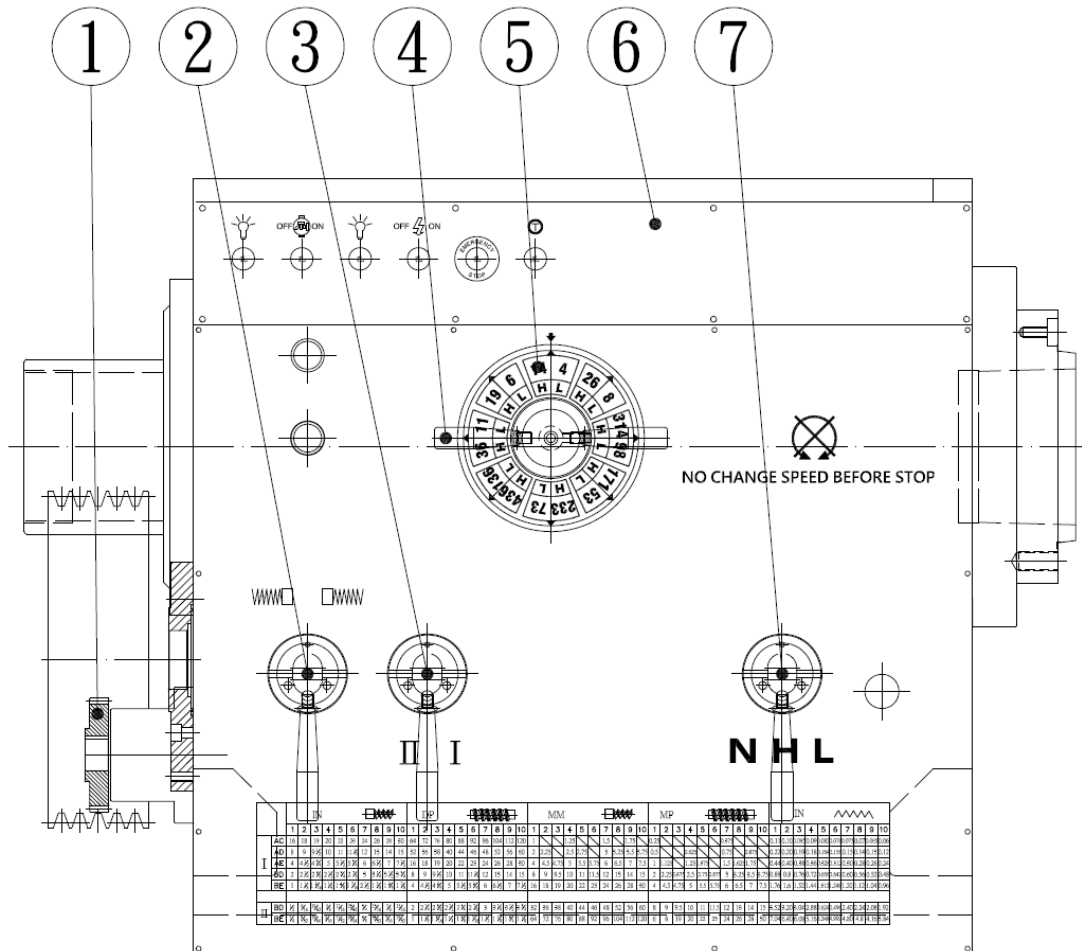


5. SPINDLE SPEED CONTROL:

(For spindle bore 6")

The 16-step spindle speeds are obtained by selecting the proper lever position shown on the speed name plate.

Do not move speed-selector controls while the spindle is rotating.

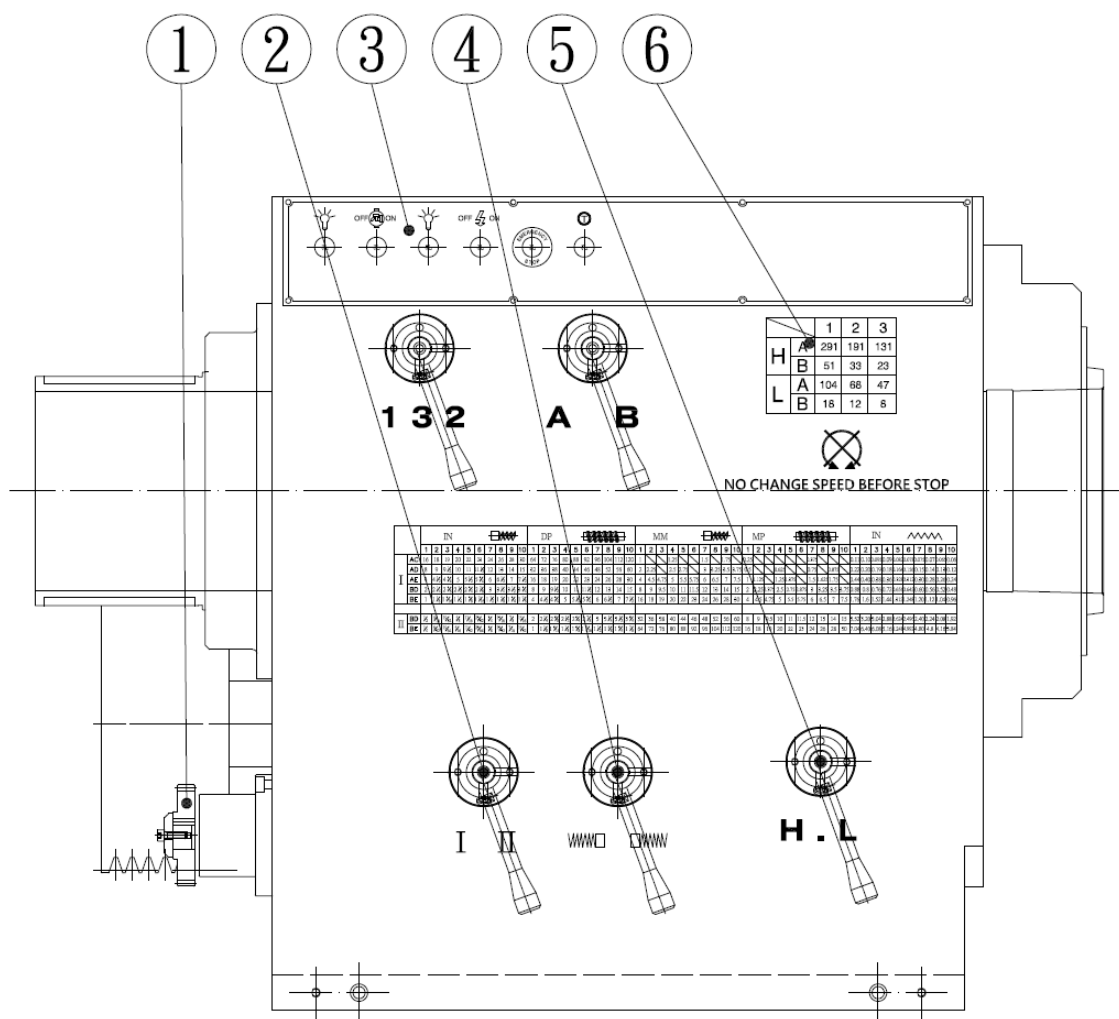


1. END GEARS OUTPUT
2. FOR/REV LEVER
3. FEEDING SPEED CHANGE LEVER
4. 16-STEP LEVER
5. SPEED NAME PLATE
6. ELECTRIC CONTROL
7. HIGH/LOW LEVER

(For spindle bore 9"~15")

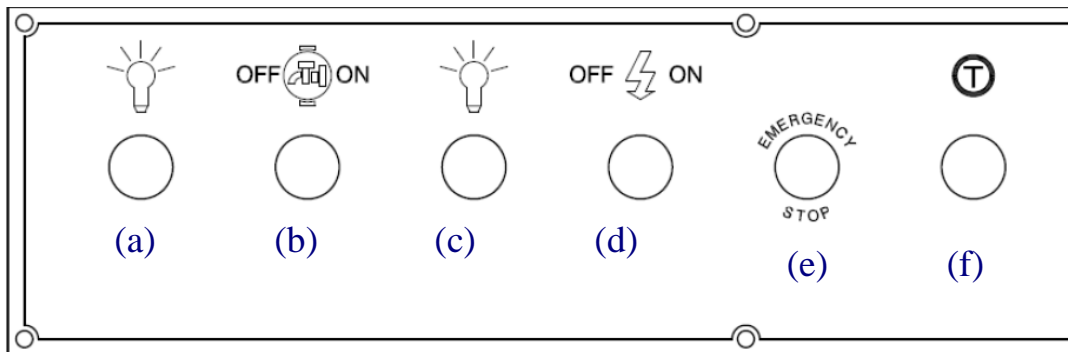
The 12-step spindle speeds are obtained by selecting the proper lever position shown on the speed name plate.

Do not move speed-selector controls while the spindle is rotating.



1. END GEARS OUTPUT
2. FEEDING SPEED CHANGE LEVER
3. ELECTRIC CONTROL
4. FOR/REV LEVER
5. HIGH/LOW LEVER
6. SPEED NAME PLATE

ELECTRIC CONTROL



3-a) pilot lamp for coolant pump

When coolant pump is ON, lamp is light. When pump is OFF, light is out.

3-b) coolant pump ON/OFF

3-c) Pilot lamp for main power switch

3-d) Main power switch

3-e) Emergency stop

Press (e) emergency stop for spindle stop, and then machine power off.

Turn right to release this emergency switch, and then end user can start the machine again.

The function of this emergency switch is the same as on Apron.

3-f) Jog button

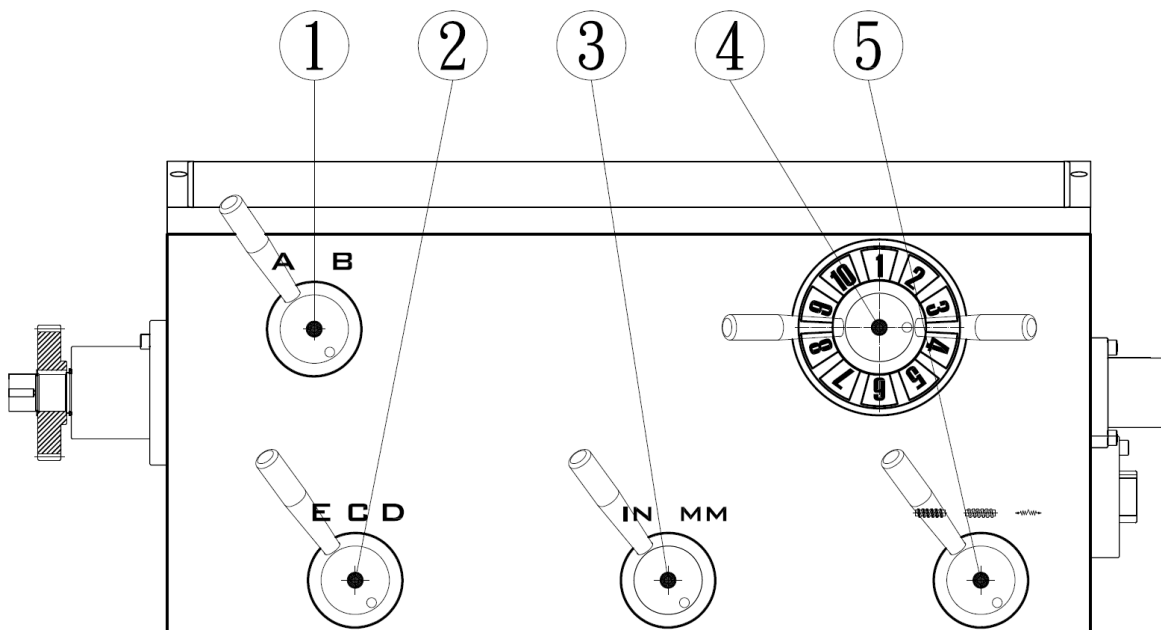
Press (f) jog button to start the machine for a moment and then user can do workpiece correcting or speed changing,

6. THREADS AND FEEDS:

(GEARBOX OPERATION)



All the threads and feeds directly available from the gearbox are shown on the data plate fitted on the front of gearbox and the setting of control levers are shown in fig.



If you want threads DP/MP, please set No-5 change lever to "DP/MP". And must set No-3 change lever to "IN" or "MM" (DP=IN,MP=MM)

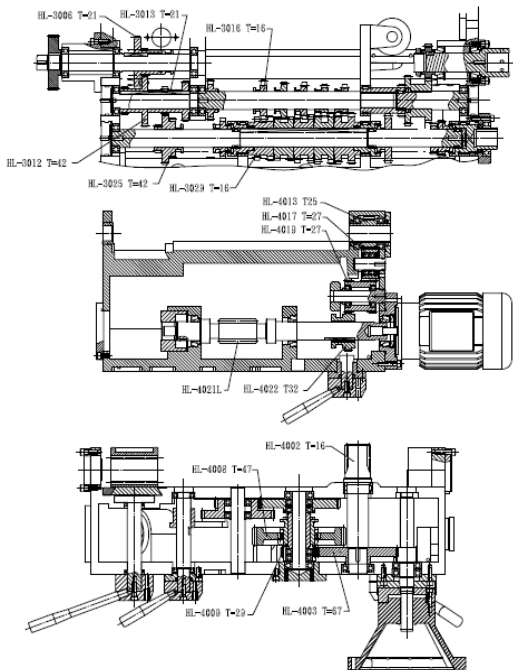



1. A,B-STEP CHANGE LEVER
2. C,D,E-STEP CHANGE LEVER
3. IN,MM-STEP CHANGE LEVER
4. 10-STEP CHANGE LEVER
5. THREADS IN/MM OR DP/MP,AND FEEDS CHANGE LEVER

THREAD CUTTING INDEX

		IN 										DP 									
		1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
I	AC	16	18	19	20	22	23	24	26	28	30	64	72	76	80	88	92	96	104	112	120
	AD	8	9	9 1/2	10	11	11 1/2	12	13	14	15	32	36	38	40	44	46	48	52	56	60
	AE	4	4 1/2	4 3/4	5	5 1/2	5 3/4	6	6 1/2	7	7 1/2	16	18	19	20	22	23	24	26	28	30
	BD	2	2 1/4	2 3/8	2 1/2	2 3/4	2 7/8	3	3 1/4	3 1/2	3 3/4	8	9	9 1/2	10	11	11 1/2	12	13	14	15
	BE	1	1 1/8	1 1/16	1 1/4	1 1/8	1 1/8	1 1/2	1 5/8	1 3/4	1 7/8	4	4 1/2	4 3/4	5	5 1/2	5 3/4	6	6 1/2	7	7 1/2
II	BD	1/2	9/16	19/32	5/8	11/16	23/32	3/4	13/16	7/8	15/16	2	2 1/4	2 3/8	2 1/2	2 3/4	2 7/8	3	3 1/4	3 1/2	3 3/4
	BE	1/4	9/32	19/64	5/16	11/32	23/64	3/8	13/32	7/16	15/32	1	1 1/8	1 3/16	1 1/4	1 3/8	1 7/16	1 1/2	1 5/8	1 3/4	1 7/8

		MM 										MP 									
		1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	0.25	0.5	0.625	0.75	0.875	1	1.125	1.25	1.375	1.5	1.625	1.75
2	2.25	2.5	2.75	3	3.25	3.5	3.75	4	4.25	4.5	4.75	5	5.25	5.5	5.75	6	6.25	6.5	6.75	7	7.25
4	4.5	4.75	5	5.5	5.75	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5
8	9	9.5	10	11	11.5	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
16	18	19	20	22	23	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54
32	36	38	40	44	46	48	52	56	60	64	68	72	76	80	84	88	92	96	100	104	108
64	72	76	80	88	92	96	104	112	120	128	136	144	152	160	168	176	184	192	200	208	216



		IN 									
		1	2	3	4	5	6	7	8	9	10
		0.1360	0.1210	0.1140	0.1080	0.0990	0.0940	0.0900	0.0830	0.0770	0.072
		0.2710	0.2410	0.2280	0.2170	0.1970	0.1890	0.1810	0.1670	0.15	0.145
		0.5420	0.4820	0.4570	0.4340	0.3950	0.3770	0.3620	0.3340	0.3100	0.289
		1.0850	0.9640	0.9140	0.8680	0.7890	0.7550	0.7230	0.6680	0.6200	0.579
		2.1701	1.9291	1.8271	1.7361	1.5791	1.5091	1.4471	1.3351	1.2401	1.157
		4.3403	3.8583	3.6553	3.4723	3.1563	3.0192	2.8932	2.6712	2.4802	2.315
		8.6807	7.7157	7.3096	6.9446	6.3126	6.0385	5.7865	5.3414	4.9604	4.629

calculation formula : REF Reference

Gear AC1 = 0.13562 (0.136)

$$0.5 \times (21/42) \times (21/42) \times (16/16) \times (25/32) \times (1/47) \times (29/67) \times 16 \times \pi$$

Part NO.	SP Set	HL-3006	HL-3012	HL-3013	HL-3025	HL-3016	HL-3029			
Gear	0.5	21	42	21	42	16	16			
Part NO.	HL-4013	HL-4017	HL-4019	HL-4022	HL-4021	HL-4008	HL-4009	HL-4003	HL-4002	gear modulus
Gear	25	27	27	32	1	47	29	67	16	3
feed rate	Gear AC1	0.13562								

FUNCTION OF GEAR BOX

The main function of the gear box is to cutting thread and auto-feed.

OPERATION OF THREAD CUTTING

When the thread cutting is desired, operate all the speed change levers and set at proper positions according to the thread cutting index, then thread cutting can be operated to cut the required kind and pitch of thread.

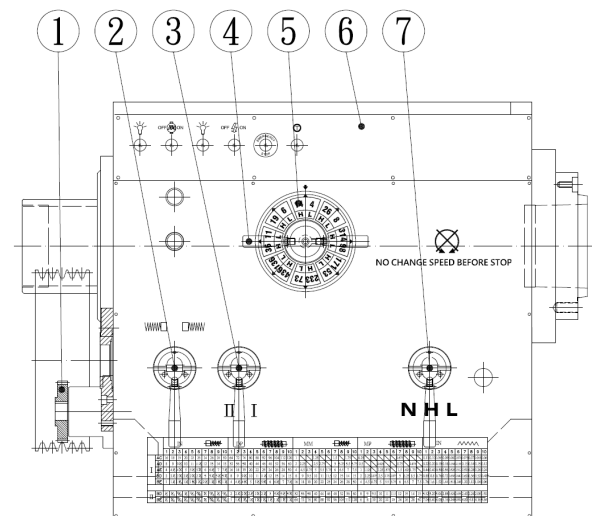
Finally, rotate the feed change lever to "lead screw" position, then the operation of thread cutting can be proceeded.

OPERATION OF AUTOMATIC FEED

When the operation of automatic feed should be operated, at first , operate all the speed change levers and set at the proper positions according to the feed speed of requirement (Refer to the thread cutting index chart, please .),and then operate the feed change lever to "feed" position, thereupon the operation of auto feed can be proceeded.

The operating method of Auto-feed:

IN									
1	2	3	4	5	6	7	8	9	10
0.1360	0.1210	0.1140	0.1080	0.0990	0.0940	0.0900	0.0830	0.0770	0.072
0.2710	0.2410	0.2280	0.2170	0.1970	0.1890	0.1810	0.167	0.15	0.145
0.5420	0.4820	0.4570	0.4340	0.3950	0.3770	0.3620	0.3340	0.3100	0.289
1.0850	0.9640	0.9140	0.8680	0.7890	0.7550	0.7230	0.6680	0.6200	0.579
2.1701	0.9291	1.8271	1.7361	1.5791	1.5091	1.4471	1.3351	1.2401	1.157
4.3403	3.8583	3.6553	3.4723	3.1563	3.0192	2.8932	2.6712	2.4802	2.315
8.6807	7.7157	7.3096	6.9446	6.3126	6.3085	5.7865	5.3414	4.9604	4.629



- | | |
|-------------------------------|---------------------|
| 1. END GEARS OUPUT | 5. SPEED NAME PLATE |
| 2. FOR/REV LEVER | 6. ELECTRIC CONTROL |
| 3. FEEDING SPEED CHANGE LEVER | 7. HIGH/LOW LEVER |
| 4. 10-STEP LEVER | |

A. Set procedure

1. According to thread cutting index, set the required feeding speed and all the shift levers at proper position.

B.)Operating example:

1. select auto-feed value "0.11"., then

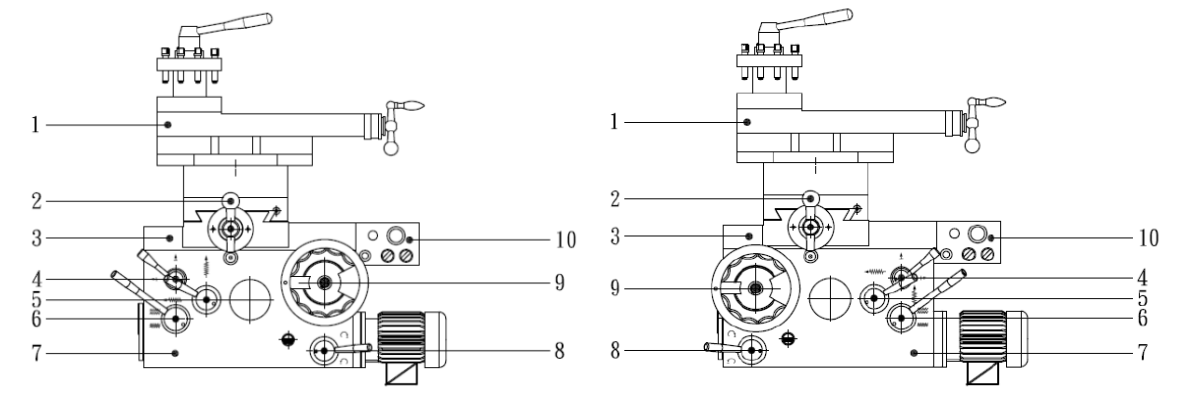
a) set "2" FOR/REV LEVER on the headstock (turn left or right).

b) Set No. 1 A/B step change lever on the gear box to "A".

c) Set C.D.E.- step change lever on the gear box to "C".

d) Set IN,MM-STEP CHANGE LEVER on the gear box to "mm" or "in"

e) set "10-STEP CHANGE LEVER" on the gear box to "1"



Operation instruction -(See Apron panle)

a) If apron in right hand side, pull up lever 4 to fix the turning direction for (longitudinal) sliding feed and down for (cross) surfacing feed.

If apron in left hand side, **press down lever 4** to fix the turning direction for (longitudinal) sliding feed and **UP** for (cross) surfacing feed.

b) Move up lever 5 for sliding feed (Longitudinal) and down for surfacing (cross) feed and middle for neutral racing.

c) Move up the lever 8 for backward and down for forward

d) Pull down lever 5 to stop auto feed ◦

LUBRICATION

The gear box is lubricated by oil bath lubrication and splash lubrication. During the machine is running, the oil will be supplied to all bearings and gears by gears and driving shafts splashed. We can check the oil quantity through the oil window and fill oil into oil inlet should up to red line of oil window in gear box.

THREAD INDICATOR

Thread cutting indicator is installed on the left side of APRON, it is used for cutting inch thread.

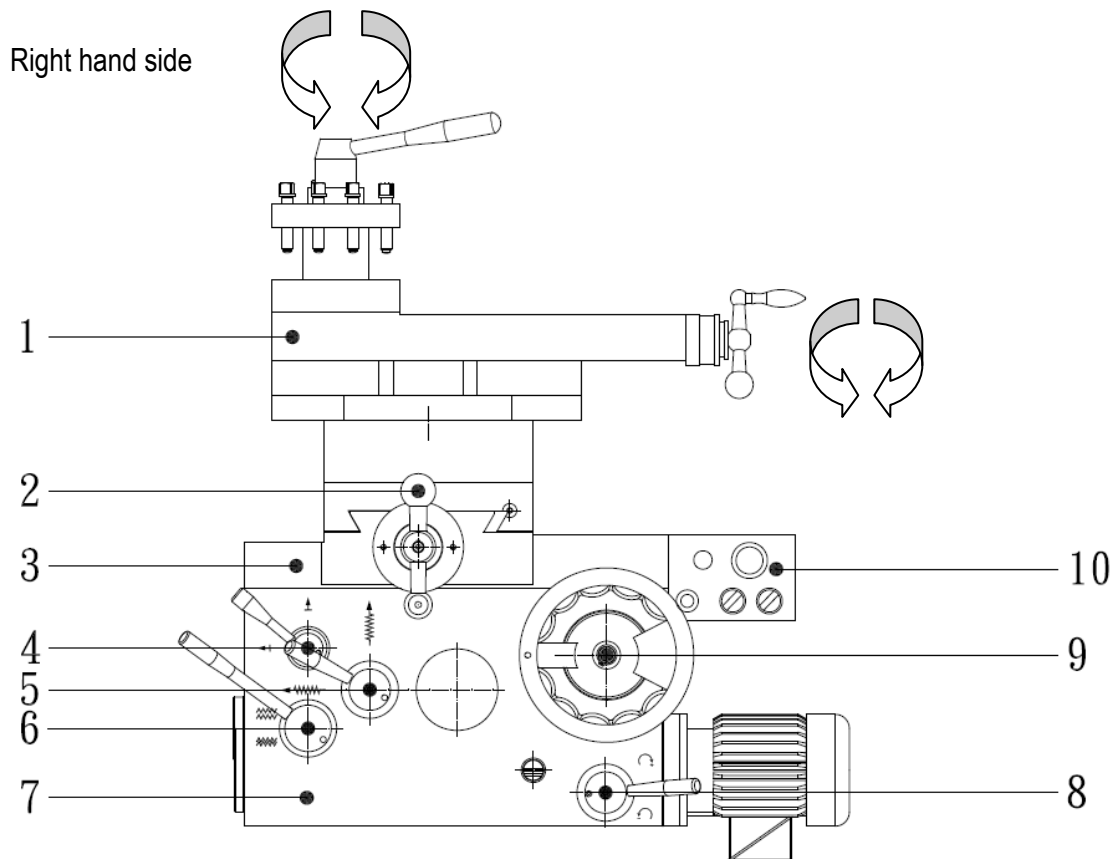
To cut threads of an even number per inch, close the half nut as any line on the dial pass datum mark.

To cut threads of odd numbers per inch close the half nut as any one long number on the dial passes datum mark.

Fractional threads of $1/2$ or $3/4$ T.P.I may be by closing the half nut at the same line on each pass of the tool.

This dial indicator can't be used with an inch lead screw to cut metric threads, D.P., module pitches. For that will cut the metric threads, the half nut of APRON must be kept closed ,can only be cut by the spindle reverse-For ward rotation lever in APRON and carriage return is driven by half nut and lead screw.

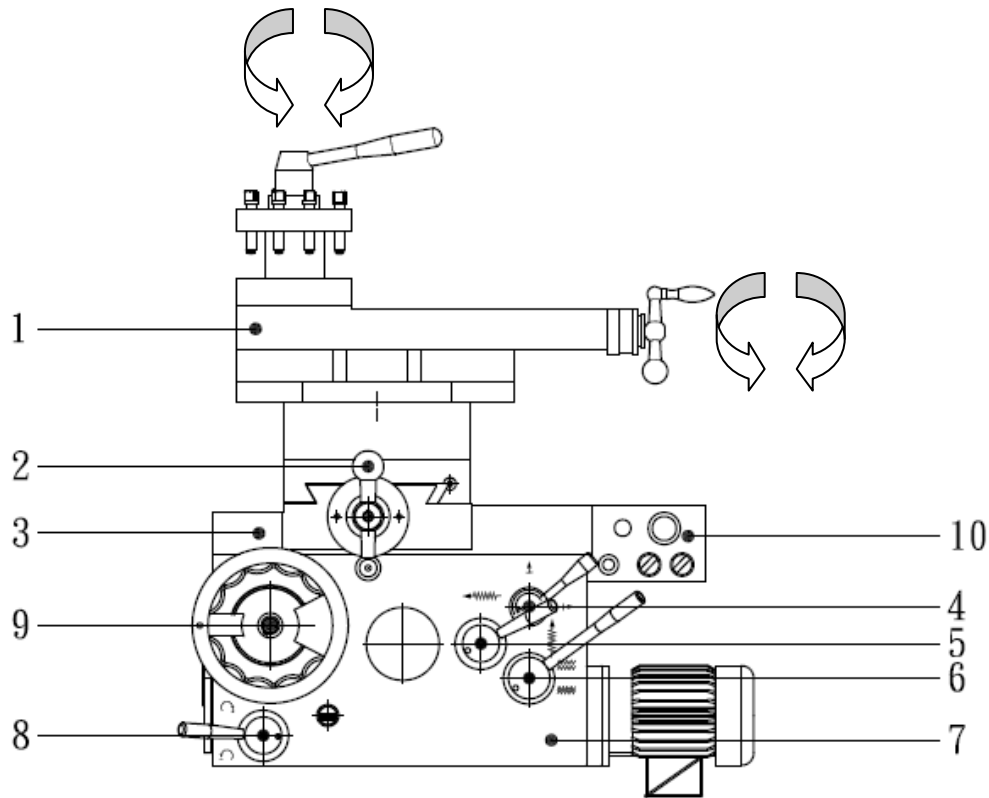
7. SADDLE AND APRON CONTROL :



1. SQUARE TOOL HODLE AND TOP-SLIDE
2. CROSS-SLIDE HANDWHEEL
3. SADDLE CASTING
4. THE LEVER IS TO FIX THE TURNING DIRECTION-UP FOR SLIDING FEED AND DOWN FOR SURFACING FEED
5. THE LEVER IS MOVE UP FOR SLIDING FEED AND DOWN FOR SURFACING FEED
6. THE LEVER IS PRESSED DOWNWARD TO ENGAGE THE LEADSCREW-NUT FOR SCREW-CUTTING.
7. APRON CASTING.
8. THE LEVER IS MOVE UP FOR AUTO-FEED AND DOWN FOR AUTO MOTOR-FEED.
9. LONGITUDINAL FEED OF HANDWHEEL
10. ELECTRIC OPERATING CONTROL.

SADDLE AND APRON CONTROL

LEFT HAND SIDE:



1. SQUARE TOOL HANDLE AND TOP-SLIDE
2. CROSS-SLIDE HANDWHEEL
3. SADDLE CASTING
4. THE LEVEL IS TO FIX THE TURNING DIRECTION –UP FOR SLIDING FEED AND DOWN FOR SURFACING FEED.
5. THE LEVEL IS MOVE UP FOR SLIDING FEED AND DOWN FOR SURFACING FEED.
6. THE LEVEL IS PRESSED DOWNWARD TO ENGAGE THE LEADSCREW-NUT FOR SCREW-CUTTING.
7. APRON CASTING.
8. THE LEVEL IS MOVE UP FOR AUTO-FEED AND DOWN FOR AUTO MOTOR-FEED.
9. LONGITUDINAL FEED OF HANDWHEEL.
10. ELECTRIC OPERATING CONTROL

ELECTRIC OPERATING CONTROL



10-a) Main switch

Select feeding direction by rotate switch (d) FOR/REV, and then press (a) main switch for spindle rotating.

10-b) Emergency stop

Press (b) emergency stop for spindle stop, and then machine power off. Turn right to release this emergency switch, and then end user can start the machine again. The function of this emergency switch is the same as on Headstock.

10-c) Jog button

Select feeding direction by rotate switch (d) FOR/REV, and then press (c) jog button to rotate spindle. If release, spindle stop rotating.

10-d) Forward /Reverse feeding direction

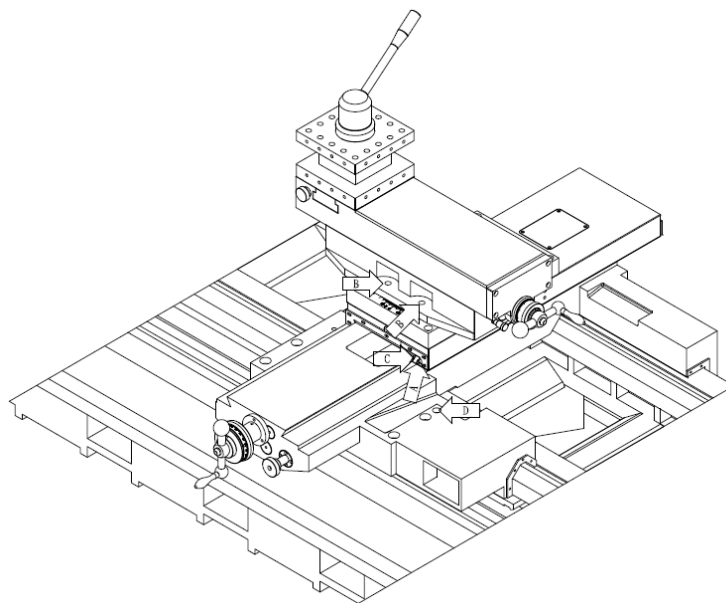
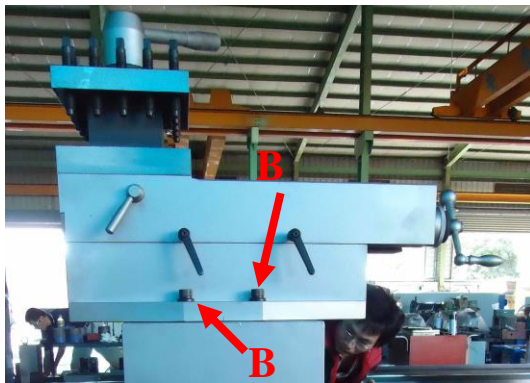
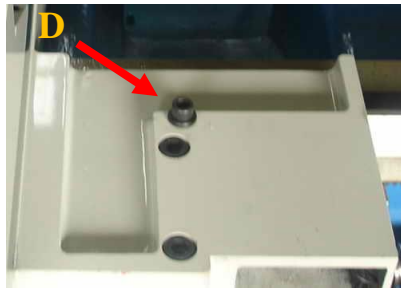
10-e) Rapid feed: Feeding direction by turn right or left. (Match with the function of auto-feed)

10-f) Spindle stop:

This effect of SPINDLE STOP push button is similar as emergency stop. Keep pressing this button to stop the spindle rotating and brake is provided. Release this push button, release brake, then the spindle rotate again.

CUTTING OF PLANE

When the longitudinal feed will be moved large in the plane cutting. In order to avoid the carriage backward and unbalance of cutting plate, so that there is a lock bolt "D" on the carriage, and fasten it tightly can increase the stability of compound rest to obtain the plane cutting in accurate value.

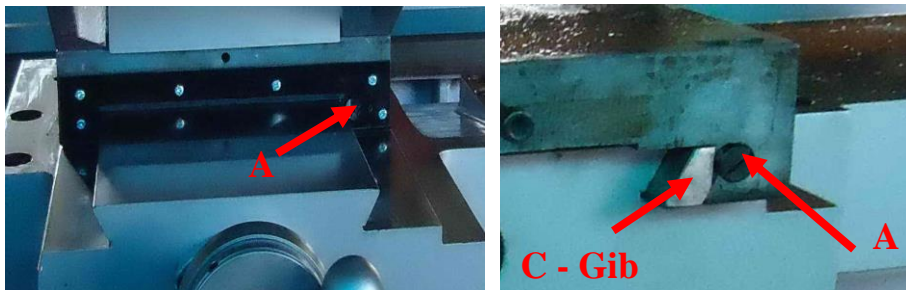


CUTTING OF TAPERED PLANE

There are many graduated divisions on the slide plate of carriage. For the cutting tapered-plane, please loose the **4 piece of locking screw "B" located in the front and rear** on the compound rest firstly, and then rotate the **compound rest** according to the required angle. After the adjustment had finished, fasten the setting screw again, then the cutting of tapered plane can be proceeding.

ADJUSTMENT OF BEVEL-GIB

Owing to the friction of long time relative motion between saddle and cross slide, there will be wear produced. In order to eliminate the excess crevice. **The Bevel-gib (Arrow C)** should be adjusted. Its adjusting method : Loose the set screw in the end of gib first, and fasten the **adjusting screw A**, then the gib will be pushed forward to proper position that the clearance between saddle and cross slide is adequate till then , fasten the setting screw again.



GRADUATED COLLAR (MICROMETER COLLAR)

There are the graduate collar on the longitudinal feed and cross feed handle. They are divided into 200 divisions, each division means 0.05mm,10mm for one revolution. When the zero will be return, please loose setting screw first. After the adjustment had finished, fasten the setting screw again.

LUBRICATION OF CARRIAGE

The oiling inlets are installed on the carriage and cross slide. Before the operating, in order to eliminate the wear, it must hand oiling usually. To lubricate the sliding surface from the oil inlet on carriage by using gun.

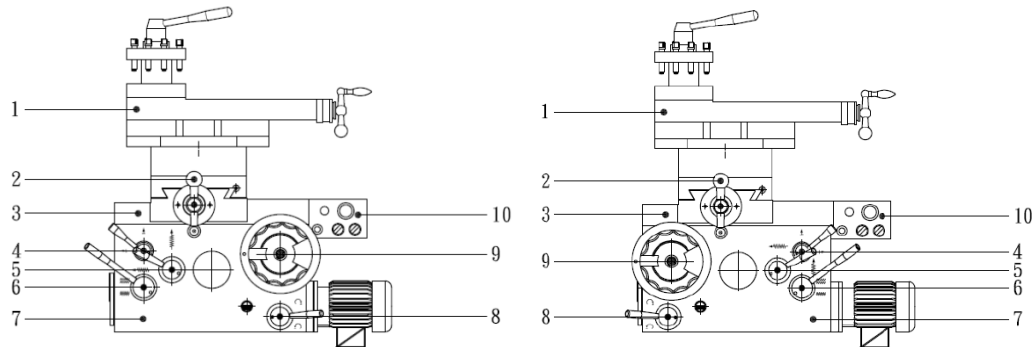
TRANSMISSION OF THREAD CUTTING

Only as the automatic feed lever at the central position, the half nut control lever can be put to downward position, and half nut engage with the lead screw, then the carriage can be moved leftward or rightward to perform the thread cutting. To stop thread cutting by push up the half nut lever only to release the engagement to half-nut with lead screw.

The safety bar installed in the apron to keep the thread cutting and auto-feed from simultaneous operation to attain the purpose of safety.

RAPID FEED

This lathe is installed with standard rapid feed.



Please refer to the layout of saddle / apron / toolpost as above and previous description.

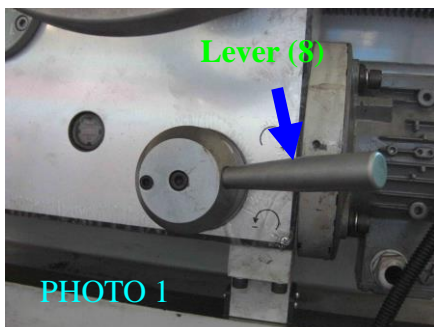
Apron handwheel in left hand side:

A) Longitudinal rapid feed:

- i) Set **lever (8)** in the neutral position as shown on the photo 1.
- ii) **press down lever (4)** to fix the turning direction for **(longitudinal) sliding feed.**
- iii) **Push up the lever 5** on the apron.
- iv) Turn the switch (10-e) Rapid feed on the ELECTRIC OPERATING CONTROL for the Feeding direction by turn right or left. Keep holding the switch till the needed position, and then release the switch to stop rapid feed.
- v) Push down the **lever 5 and set in the neutral position to stop rapid feeding and then operate manually the apron.**

B) Cross rapid feed:

- i) Set **lever (8)** in the neutral position as shown on the photo 1.
- ii) **Pull up lever (4)** to fix the turning direction for for **(cross) surfacing feed.**
- iii) **Press down the lever 5** on the apron.
- iv) Turn the switch (10-e) Rapid feed on the ELECTRIC OPERATING CONTROL for the Feeding direction by turn right or left. Keep holding the switch till the needed position, and then release the switch to stop rapid feed.
- v) Push down the **lever 5 and set in the neutral position to stop rapid feeding and then operate manually the apron.**



(10-e) switch of rapid feed

Apron handwheel in right hand side:

A) Longitudinal rapid feed:

- i) Set **lever (8)** in the neutral position as shown on the photo 1.
- ii) **Press down lever (4)** to fix the turning direction for **(longitudinal) sliding feed.**
- iii) **Press down lever 5** on the apron.
- iv) Turn the switch (10-e) Rapid feed on the ELECTRIC OPERATING CONTROL for the Feeding direction by turn right or left. Keep holding the switch till the needed position, and then release the switch to stop rapid feed.
- v) Push down the **lever 5 and set in the neutral position to stop rapid feeding and then operate manually the apron.**

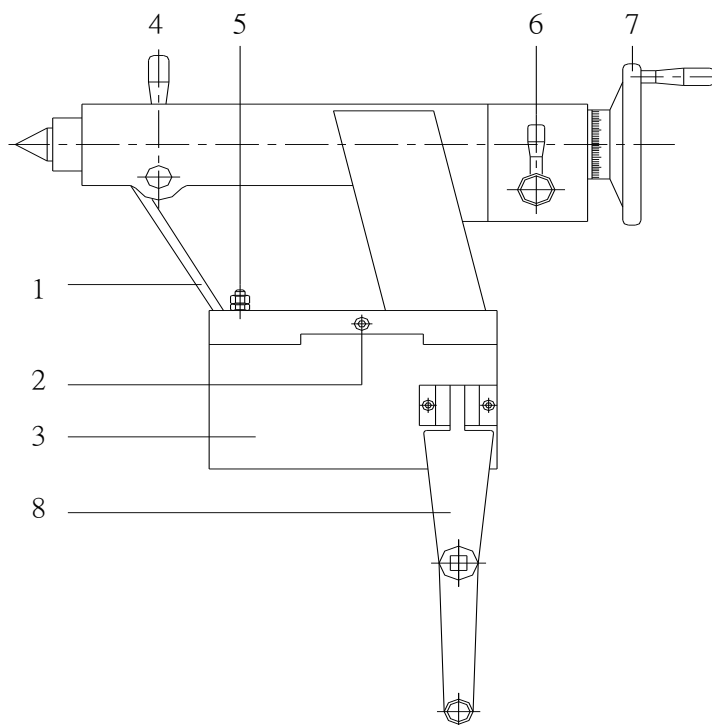
B) Cross rapid feed:

- i) Set **lever (8)** in the neutral position as shown on the photo 1.
- ii) **Pull up lever (4)** to fix the turning direction for for **(cross) surfacing feed.**
- iii) **Pull up lever 5** on the apron.
- iv) Turn the switch (10-e) Rapid feed on the ELECTRIC OPERATING CONTROL for the Feeding direction by turn right or left. Keep holding the switch till the needed position, and then release the switch to stop rapid feed.
- v) Push down the **lever 5 and set in the neutral position to stop rapid feeding and then operate manually the apron.**

8. TAILSTOCK OPERATION

GENERAL DESCRIPTION OF TAIL STOCK

The main structure of tailstock consist tailstock body, base mounting, mandrel and change speed box. The mandrel of tailstock and the spindle of headstock are in the same central line, The tailstock depend on the long or short of work pieces, or required position , can be clamped at anywhere arbitrarily along bed , then it cooperate with the spindle to spindle to proceed to cut work between two centers and to bore hole.



1. TAIL STOCK CASTING
2. ADJUST SCREW
3. BASE CASTING
4. SPINDLE LOCKING LEVER
5. BASE CLAMPING LEVER
6. HIGH-LOW SPEED CHANGE LEVER
7. SPINDLE FOR-BACKWARD HANDWHEEL
8. TAILSTOCK SLIDING BLOCK

OPERATIONAL METHOD

When the tailstock mandrel and spindle center are not in the same central line. Loose the adjusting screws "A". Use the same method to adjust the tailstock central line and to set up a deviation measure with the spindle and provide for the taper cutting between two centers.

LUBRICATION OF TAILSTOCK

Tailstock is lubricated by oil bath lubrication system and its mandrel center and slide parts must hand oiling from time to time.

9. MAINTENANCE

Identification on Operation

Operate the machine correctly to keep the machine in accurate state and long life under normal conditions.

It is important to check the oil level through oil windows all oil reservoirs and top up as necessary before starting the machine. Especially pay attention to hand oiling daily between saddle and slideway. Lubrication points are shown as "Lubrication Diagram" in term of 10.

Preventive Maintenance Check List

ITEM	CHECK POINT	BASE LINE	DAY	WEEK	MONTH	SEASON	YEAR
	Before/ During/ After Operation	Normal / Error					
Spindle Jog	Before		<input type="radio"/>				
Spindle reverse	Before		<input type="radio"/>				
Spindle Forward	Before		<input type="radio"/>				
Spindle electromagnetic brake	Before		<input type="radio"/>				
Tailstock spindle forward	Before		<input type="radio"/>				
Quill retreat	Before		<input type="radio"/>				
Interference limit of tailstock handwheel	During		<input type="radio"/>				
Tailstock body forward	Before		<input type="radio"/>				
Tailstock body retreat	Before		<input type="radio"/>				
Locking limit of tailstock body	During		<input type="radio"/>				
Anti-retreat limit switch of tailstock	During		<input type="radio"/>				
The tailstock protection switch	During		<input type="radio"/>				
Limit switch of cross slide	During		<input type="radio"/>				
Emergency stop	During		<input type="radio"/>				
Pump on / off	During		<input type="radio"/>				
Slideway lubricating oil	During		<input type="radio"/>				
Tailstock lubricating oil	After			<input type="radio"/>			
Spindle belt	After			<input type="radio"/>	<input type="radio"/>		
Headstock lubricating oil	After				<input type="radio"/>		
Tailstock wipers	After				<input type="radio"/>		
Apron wipers	After				<input type="radio"/>		
Apron lubricating oil	After				<input type="radio"/>		
Cross slide wipers	After				<input type="radio"/>		
Circulation Oil in Gear box	After				<input type="radio"/>		
Saddle taper pin	After					<input type="radio"/>	
Dynamic accuracy	After					<input type="radio"/>	
Feed sleeve	After					<input type="radio"/>	
Cross slide taper pin	After					<input type="radio"/>	
The level of the machine	After					<input type="radio"/>	
Static accuracy	After					<input type="radio"/>	

10. Lubrication system

'Renew the lubrication oil in headstock after first 3 months usage, in order to reduce the noise be produced.

'Stop the machine immediately if the following are happened, overheat in headstock, vibration, oil leakage or no oil, and then repair it as soon as possible.

'Don't use hammer or other tool to knock the workpiece, in order to keep the accuracy of spindle.

'Be care not let the tool to hurt the slide ways.

'Don't to adjust or operate this machine arbitrary unless operator to it.

'It is great profit to the life and accuracy of this machine to maintain it periodically.

Clean the machine, remove the chips from machine and surrounding, apply oil on the sliding surfaces and turn off the power source after work per day

Lubrication diagram for HL series

Part to be lubricated	Headstock	Gear box	Apron	Slide ways (Saddle & Carriage)	Tailstock slide ways	Tailstock Gears	End Gears
Recommend lubricant	Circulation Oil.	Circulation Oil.	Circulation Oil.	Way Lubricating oil		high-temperature butter	
Recommend brand	CPC R68			CPC way lubricant 68		Super Cup Grease No.3	
	Mobil: DTE-26			Mobil: Vactra #2		Shell-ALVANIA EP3	
	Shell: Tellus #68 (=S2 M68)			Shell: Tonna T68 (=S2 M68)		MOBIL LUZ EP3	
	BP: Energol HLP-HM #68			BP: Maccurat #68		BP Enorgrease LS-EP3	
	CALTEX: Rando HD #68			CALTEX: WAY #68			
	or other brand with the same level of oil,						
Refuel method	oil jug	oil jug	oil jug	oil gun	oil gun	By hand	
Initial change volume	110 liter	12 liter	8 liter	Depend on the demand for machining.		fill properly	
Oil Adding							
Interval	depend on the volume of oil consumption			every day	every day	depend on the volume of oil consumption	
Oil volume	fill properly			fill properly	fill properly	fill properly	fill properly
Exchanging Oil							
Interval	3 ~ 6 month	3~6 month	3 ~ 6 month	Please refer the detail instruction as below.		6 month	6 month
Oil volume	110 liter	12 liter	8 liter			appropriate	
CHECK POINT Before / During /After Operation	Before	Before	Before	Before	Before	Before	Before
BASE LINE (Normal/ Error)							

Capacity of coolant tank

Distance between centers	~2000 (80")	~3000 (20")	~4000 (160")	~5000 (200")	~6000 (240")	~7000 (275")	~8000 (315")
Liter	85	113	141	169	197	225	253

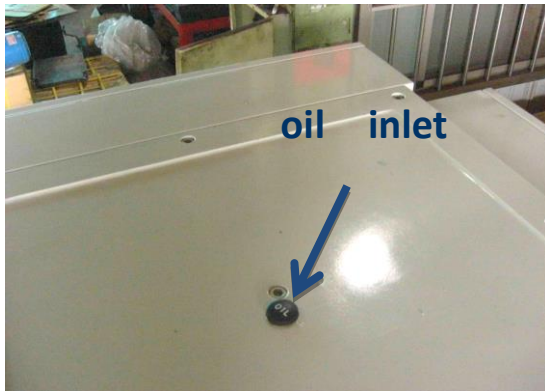
※ NOTE:

Above diagram is just for reference. Because the OIL exchanging, adding and oil volume is depended on the procedure of processing work, some parts can be finished turning within 1 min, but some parts 5 min, consumed oil is different.

Please consider by yourselves the interval of changing oil and the refueling oil volume.

Headstock:

1. The spindle head oil inlet hole is located on the top of the gear box (it has black cap with the word Oil written on them).
2. The spindle oil drain hole is located on the rear side of the spindle head under the electric box.



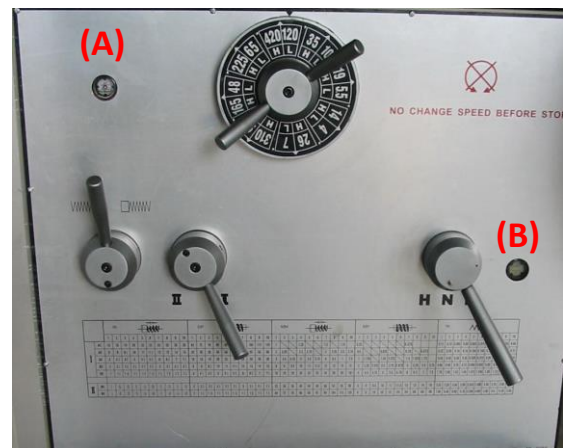
3. Lubrication oil level, there are 2 oil windows on the front side of the spindle head.

A) The oil sight on the left top side is to check the condition of lubricating in the headstock.

It will be shown the oil splash on the oil window, which indicate that the gears in the headstock are lubricating.

B) The oil sight on the right bottom side is to check the oil volume in the headstock.

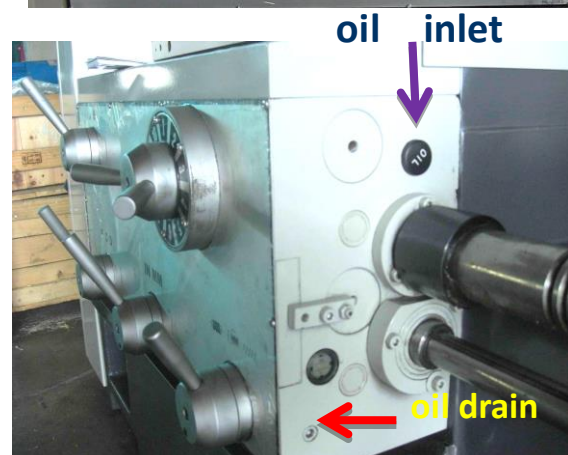
When the oil is under the level line "L", please refuel.



GEAR BOX

1. The gear box oil inlet is on the right side of the gear box (it has black cap with the word Oil written on them).
2. The gear box oil drain is on the bottom of right side of the gear box.
3. For checking the lubrication oil level, there are 1 oil windows on the front side of the gear box.

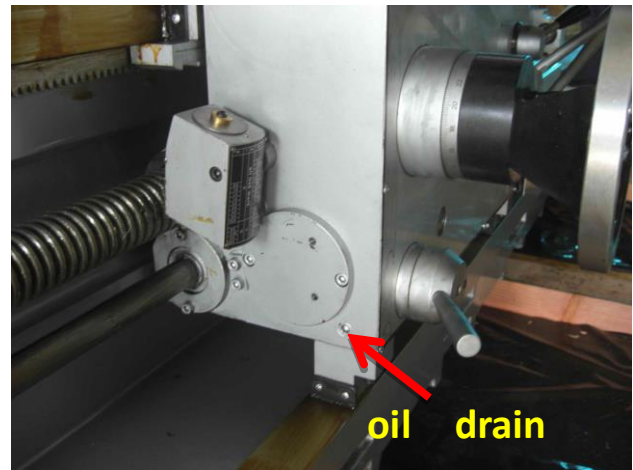
When the oil is under the level line "L", please refuel.



APRON

1. Apron oil inlet hole is located on the right side of the apron (it has black cap with the word Oil written on them).
2. Apron oil drain hole is located on the left side of the apron.
3. For checking the lubrication oil level there is 1 oil window on the front side of the apron.

When the oil is under the level line "L", please refuel.



SADDLE

1. Saddle slide ways are lubricated automatically by Auto lubricator which is located under the electric box.

Saddle slide ways is lubrication by auto lubricator.

Way lubricating oil is consumable oil. When the machine is running and gets the alarm of no oil, it is necessary to refuel.

Lubricating interval is set every 30 minutes.

Lubricating time is set for 5 seconds. (around 20 cc).

Auto lubricator operates automatically when the spindle has started, and lubricates once for 5 sec. / around 20 cc lubrication oil every 30 minutes.

Sort of lubricant oil: Way Lubricating oil
Recommend brand: CPC way lubricant 68
Mobil: Vactra #2
Shell: Tonna T68 (=S2 M68)
BP: Maccurat #68
CALTEX: WAY #68



CARRIAGE

1. Carriage cross and longitudinal slide ways are lubricated automatically by Auto lubricator which is located under the electric box.

2. Cross slide screw is lubricated manually.

1) Oil inlet is located in the middle of cross slide.

2) The refuel method for cross slide screw.

a) Loose the 4 piece screws of square black cover on the middle of cross slide.

b) Use magnetic base to pick up the square black cover. (See photo 1 & photo 2)

c) Check the oil volume and drain lubricating oil regularly.

3) When the oil is under the level of the middle of cross slide screw, please add the lubricating oil. (See photo 3)

4) Interval of adding oil is suggesting every 3 months.

But, depended on the demand for machining, please consider by yourselves the interval of changing oil and the refueling oil volume.

Sort of lubricant oil: Way Lubricating oil

Recommend brand:

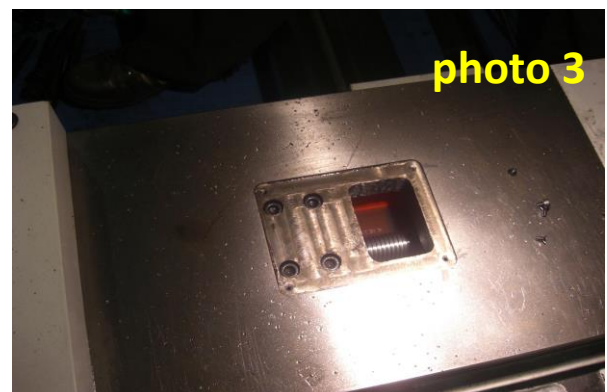
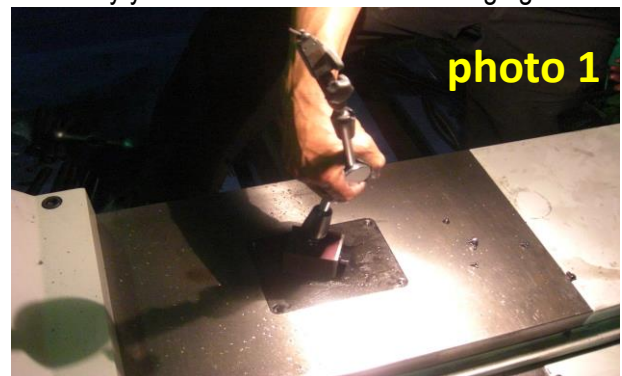
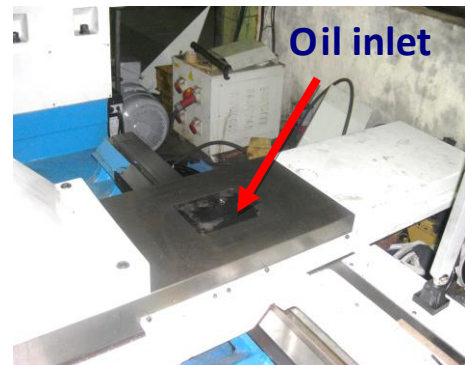
CPC way lubricant 68

Mobil: Vactra #2

Shell: Tonna T68 (=S2 M68)

BP: Maccurat #68

CALTEX: WAY #68



END GEAR

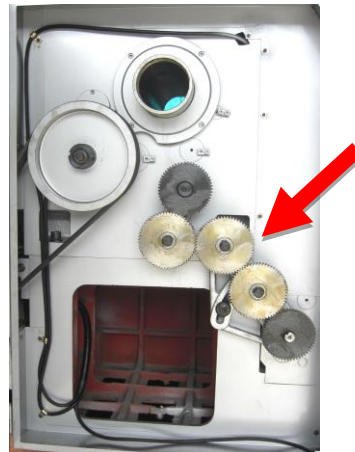
Please lubricate the end gears with high-temperature butter (yellow solid oil) regularly.

Oil interval is suggesting for every month.

Sort of lubricant oil: high-temperature butter

Recommend brand:

1. **Super Cup Grease No.3**
2. Shell-ALVANIA EP3
3. MOBIL LUZ EP3
4. BP Enorgrease LS-EP3



11. CONSUMABLE PARTS LISTS

ITEM	MODEL	PH	HP	KW	Hz	Amp	V	Ref. Delivery (days)
Pump	MC-8	3PH	1/8	0.094	60	0.23A		20
Lubrication device	CESH			22W		0.6 A	220V	20
Auto-lubricator	1RA-3FS					1/4PT		15
Spindle V-belt	Please see the size marked on the Belt							8
Tailstock Oil seals	TCZ00x230x5 & TC120x140x13 & TC120x150x14							8