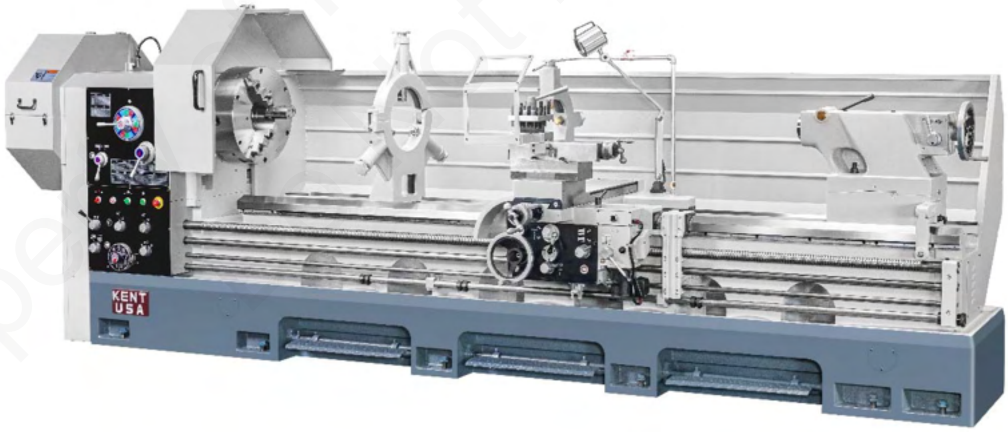
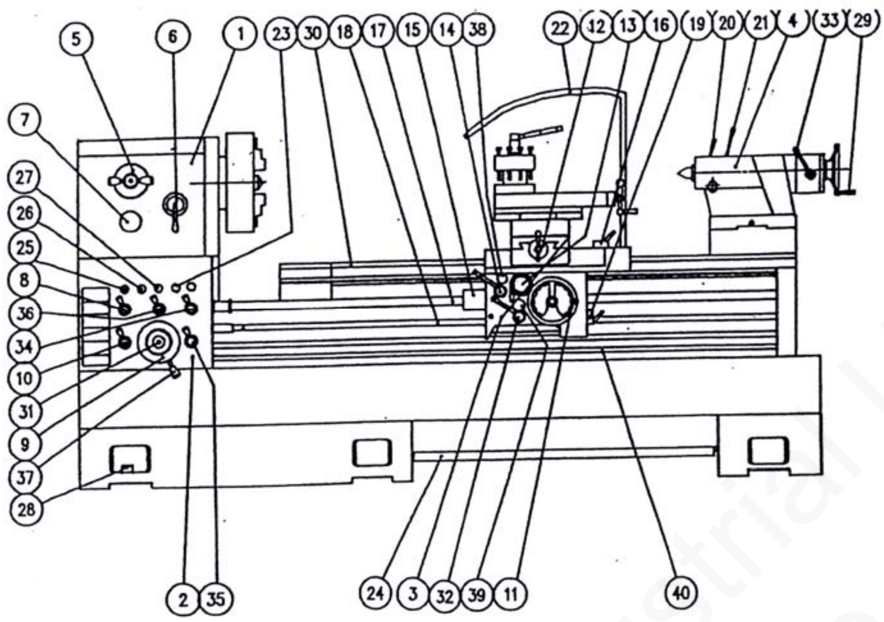
Kent USA

HEAVY DUTY PRECISION LATHE
OPERATOR'S MANUAL
PART LIST

MODEL: LA-3480(SP)



INDEX



GENERAL STRUCTURE OF LATHE:

1.Headstock	15.Threading Indicator Dial	29.Quill Transverse hand wheel
2.Feed Gear Box	16.Carriage Lock	30.Gap
3.Apron	17.Leadscrew	31.Feed Selector
4.Tailstock	18.Feed Bar	32.Longiudinal-Cross Feed Clutch
5.Spindle Speed Selector	19.Spindle Control Lever	33.Quill Speed Selector
6.High-Low Speed Selector	20.Quill Lock	34.Feed Selector
7.Feed Direction Selector	21.Tailstock Clamp	35.Feed Selector
8.Feed Selector	22.Coolant Pipe	36.Feed Selector
9.Feed Selector Dial	23.Jogging Switch	37.Engage Lever
10.Feed-Threading Selector	24.Brake Pedal	38.Hand Pump
11.Longiudinal Transverse Hand wheel	25.Drive Motor Starter	39.Pressure Adjusting Screw
12.Cross Feed Handle	26.Drive Motor Indicator	40.Longi. Kick-out Device
13.Longitudinal-Cross Feed Selector	27.Coolant Pump Starter	
14.Threadcutting Engagement Lever	28.Fonudation Bolts	

FEATURES:

1. Hardened ground bed ways are made of high tensile cast iron.

2. Strong steel plates are welded in box shape, make as lower portion of the bed for legs, chip pan and coolant reservoir.

3. The main spindle is supported by high precision bearing can be used for precise and heavy cutting.

4. All gears are made of Cr-Mo steel. They have been manufactured with carbonization hardness, precisely ground by precision gear grinding machine.

5. The speeds of spindle have 12 steps and designed on theoretical base.

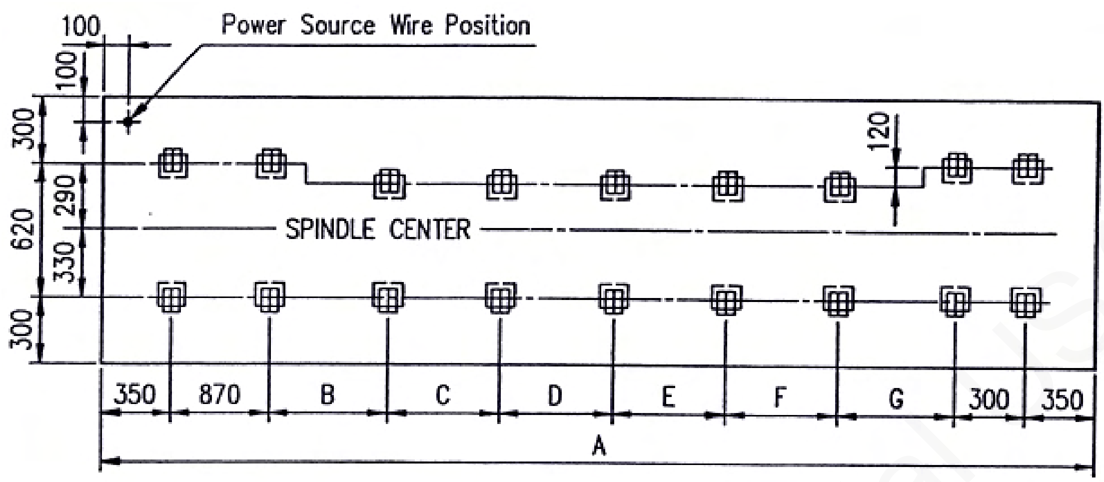
6. An inner look of feeding device is also equipped on this lathe to keep thread cutting and auto-feeding from simultaneous operation.

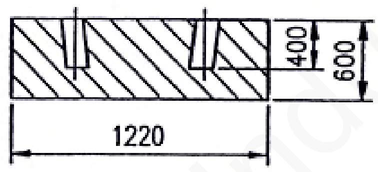
7. Longitudinal and cross feed possess safety device. If the carriage meets an obstruction on the bed, the overload safety device will release and prevent feed for avoiding damage.

8. Electrical equipment adopt magnetic contactor and overload safety devices to avoid any destroy or accident on machine.

9. The emergency stop button can cut off the power immediately.

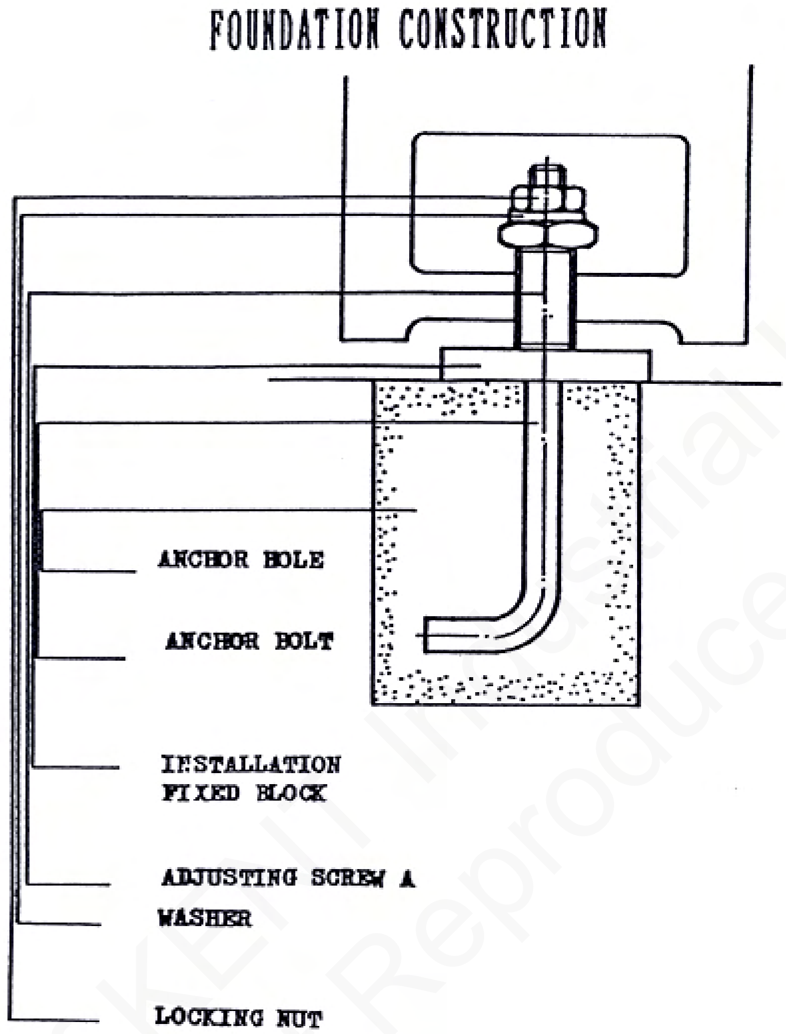
10. The strong and rigid tailstock is easy to move and ensures maximum cutting accuracy for long distance support.





TYPE	D.B.C	A	B	C	D	E	F	G
SDT-60	1500	3420	1550	0	0	0	0	0
SDT-80	2000	3920	1025	1025	0	0	0	0
SDT-100	2500	4420	1275	1275	0	0	0	0
SDT-120	3000	4920	1025	1000	1025	0	0	0
SDT-160	4000	5920	1025	1000	1000	1025	0	0

SDT-200	5000	6920	1025	1000	1000	1000	1025	0
SDT-240	6000	7920	1025	1000	1000	1000	1000	1025



FOUNDATION CONSTRUCTION

Before the machine be installed on foundation, with motor fixed the anchor bolt in base anchor hole, need about two week.

If you have need to adjust the level of the machine, employ the adjusting screw "A" and nut to accomplish the purpose.

Attention: IN order to keep the accuracy and heavy cutting of lathe, must be from foundation work started and wish fitter follow as above figure to do.

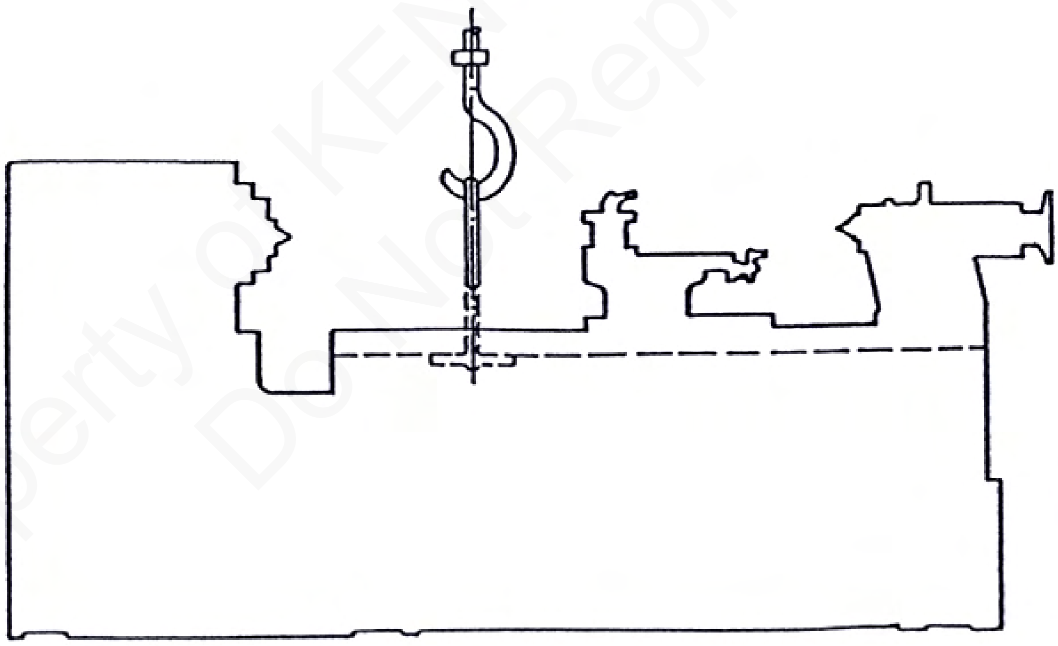
UNPACKING AND UNLOADING

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

FIG: ARRANGEMENT OF LIFTING TACKLE



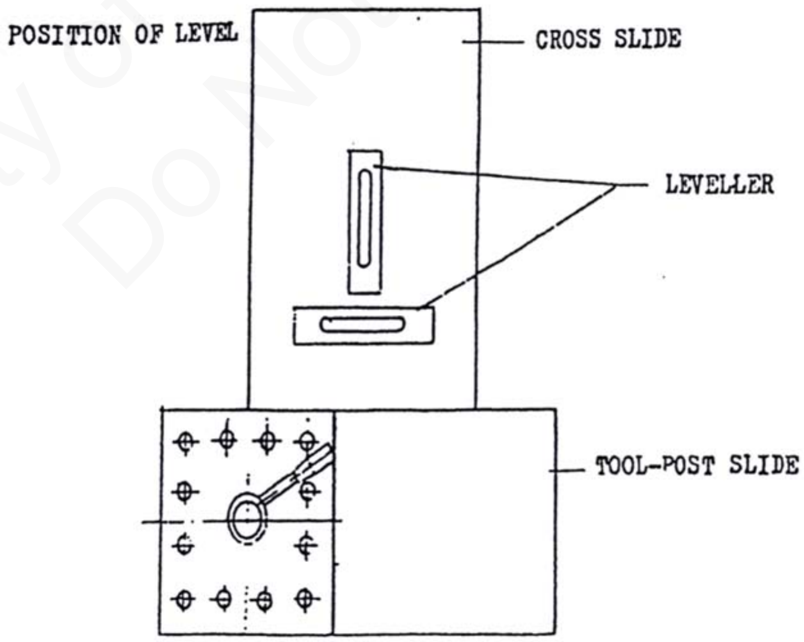
POSITIONING AND LEVELLING

The production accuracy of all precision machinery depends on the accuracy with which the machine is installed. Manufacturing tolerance of the machine can only be guaranteed if the machine is firmly and accurately installed. The foundation should support the entire weight bearing surfaces of the lathe base.

Once the machine is lowered on the prepared foundation, machinist's levels should be used alternately on the cross slide and slide ways of the lathe. Readings of the level should be taken on the extreme ends of the slide ways as well as in the center. Minute adjustments of adjusting bolts should be made until the machine is perfectly level.

When the level of the lathe has been established, immediately grout the machine base to the foundation with the highest quality, shock vibration-resistant mortar.

Care must be taken not to jar the machine or the foundation after grouting mortar is set; and spirit levels should again be used to ensure absolute leveling of the lathe.



MACHINE 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 AD PREPARETHI BEFORE OPERATION

Supply oil to all the place that required.
Check all the levers and handles, whether or not in normal condition.

Check the V-belt of headstock motor, whether or not in adequate tension.

Make clear the relative positions before operate the transmission mechanism, such as head stock, feed gear box, cross slide, automatic feeding, thread cutting etc.

MAINTENANCE

Keep the machine in accurate state long life under normal conditions of usage.

It is important to check the oil level through oil window in all oil reservoirs and top up as necessary before starting the machine.

Especially pay attention to hand oiling daily between saddle and bed -

ways.

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, then repair it as soon as possible.

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

Be care not let the tool, fixture to hurt the slide ways.

Don't to adjust or operate this machine arbitrary unless well-known 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 surroundings, apply oil on the sliding surfaces and turn off the power source after work per day.

HIGH SPEED PRECISION LATHE

OIL LIST

Oil recommendations

OILING OSITION VOLUME	PARTS TO BE LUBRICATED	RECOMMENDED OIL
Headstock (Approx. 24.5 lit)	All the gears, shafts, bearings, holes and shifters in headstock.	1. Shell Vitre oil 32. 2. Eso nuto 30.
Feed gear box (Approx. 3 lit)	All the gears, hafts, bearings, holes and shifters in geed gear box.	1. Shell X-100ortor oil 30. 2. Esso tractorlube HDX 30.
Apron (Approx. 2 lit)	All the gears, shafts, bearing, holes in apron. And guide way (bed - way). Cross slide and top of saddle.	1. Shell X-100 Motor oil 30. 2. Esso tractorlube HDX 30.
Hand oiling (proper quantity)	Chang gears, lead screws of longitudinal, cross and compound rest. Tailstock, center sleeve and lead screw bracket	1. Shell X-100 Motor oil 30. 2. Esso tractorlube HDX 30.

HEADSTOCK

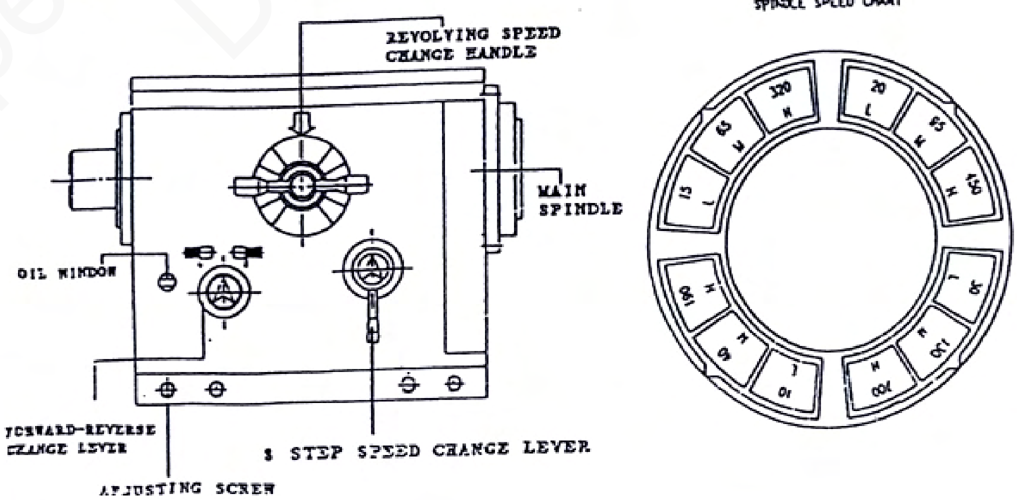
The headstock is made of high-strength cast Iron, that is durable and sturdy, enabled to stand high load under high speed operation.
All gear in headstock are made of chrome-molybdenum steel, metallurgically heat treated, then ground by high precision gear grinder to provide quite accuracy running, low noise and long life under high speed operation.

The speeds of spindle have 12 steps and classified: revolving change handle, 3 steps speed change lever and forward-reverse change lever; and designed on cutting theoretical osse. Stop the spindle completely before you will change the speed of spindle, otherwise, it is apt to creat he collision between the gears and induced hurt on gear face or caused the crako of gears, so as to decreased the vibration & noise, increased the accuracy & life of this machine.

SELECTION OF SPINDLE SPEED

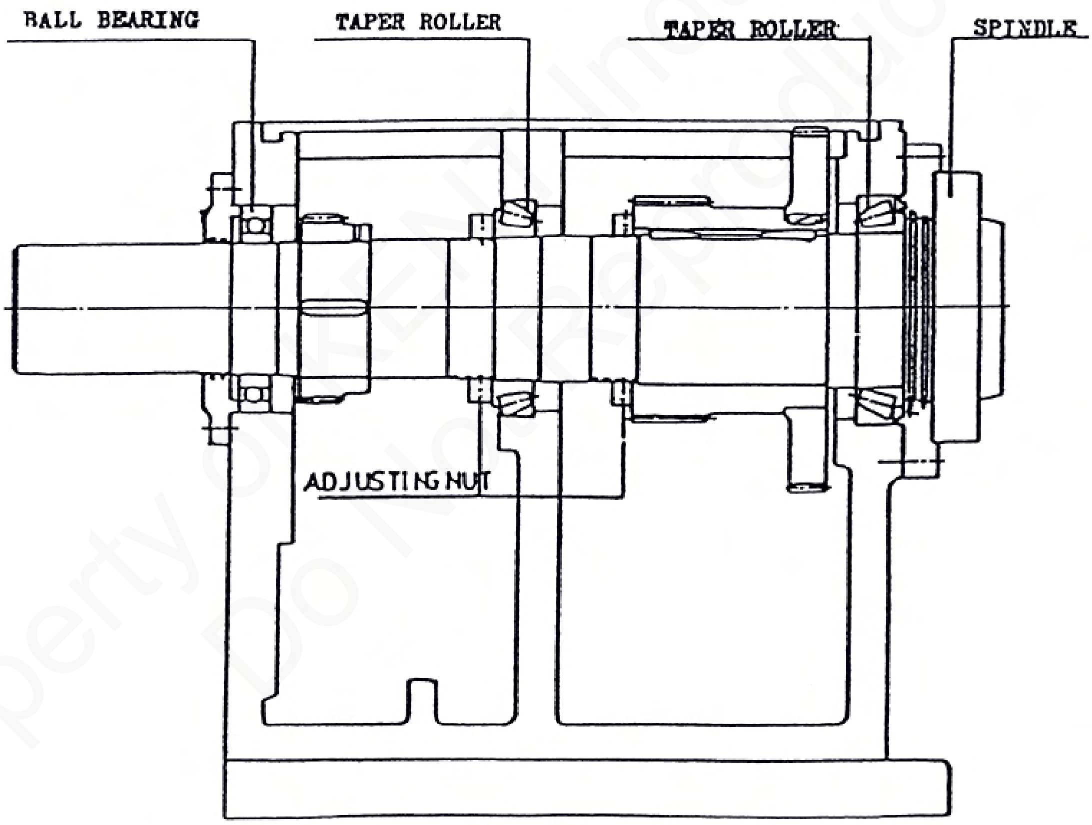
The operation of spindle speed change, please refer to the chart of spindle peed as follow choose the required spindle speed by operating the 3 step change lever, and revolving speed leer to the positions as shown.
OPERATIONAL EXAMPLE: If the spindle peed 1200 rpm is required, set 3 steps change lever to red area first, then et revolving speed lever at “700” position, and then he spindle speed 120 rpm is obtained.

NOTE: Push buttion to adjust it if the change lever don'teasily operate/



MAIN SPINDLE

The main spindle is made of high grade forging alloy steel by special treated and precision grinding finished.
O called “Three points support” with three et of super-precision bearing is adopted for the spindle. Its short taper nose (ASA A-1-6”) is designed o make the front bearing near work piece and provide heavy duty & precision cutting.
When it must adjust clearance of two taper roller bearings to proper condition. Please loose the setting screw on adjusting nut first, then adjust I with care. (Refer to following FIGURE)



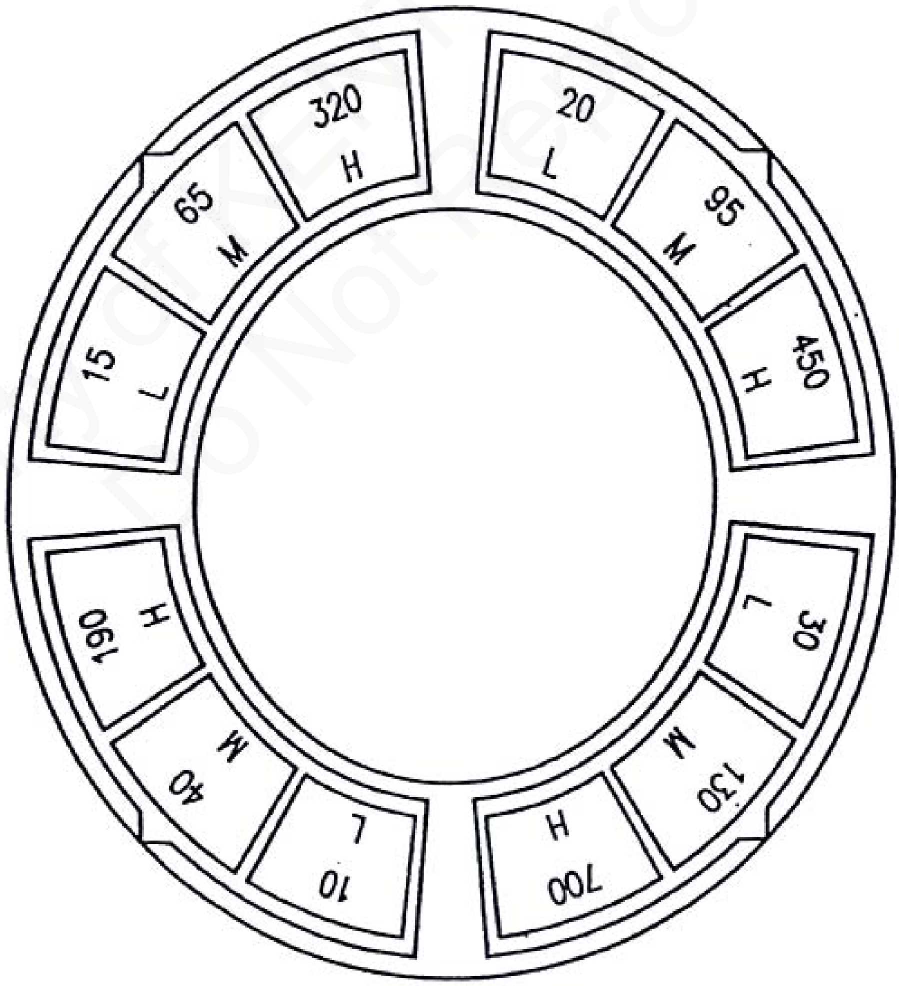
STRUCTURE OF MAIN SPINDLE

SELECTION OF SPINDLE SPEED

The operation of spindle speed change, please refer to the chart of spindle speed a follow choose the required spindle speed by operation the 3 steps change lever and revolving speed lever to the positions as shows.
Operational Example: If the spindle 700 rpm I require, set 3 steps change lever to red area first, the et revolving speed lever at “700” position, and, then the spindle speed 70 rpm is obtained.

NOTE: Push “JOG” button to adjust it if the change lever don’t easily operate

SPINDLE SPEED CHART



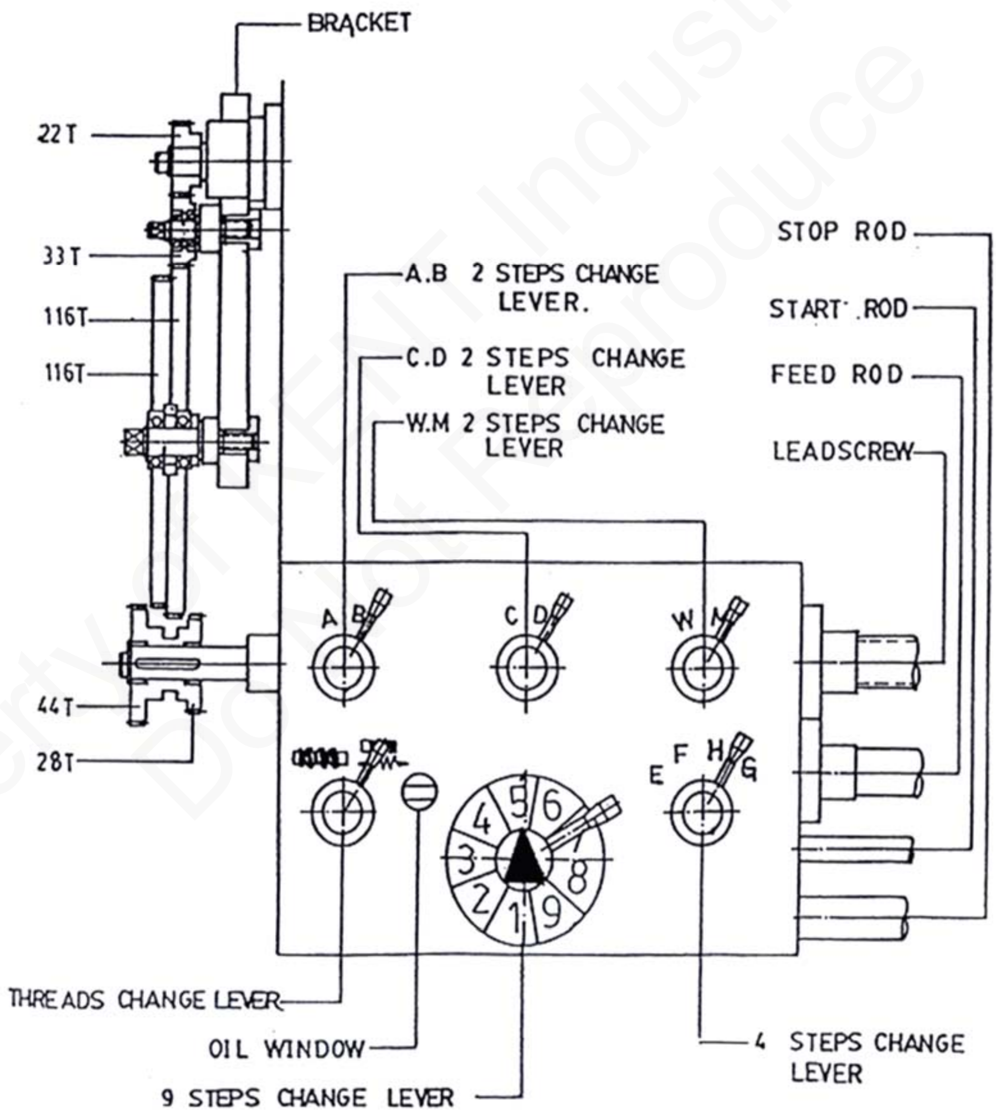
LUBRICATION DIAGRAM

No Inlet	Method	Q'ty	Oil no	Schedule	Recommend
1. Headstock Feed gear box	Open Oil Tank cover	Few	1	Gauge once A moth of oil tank Left stand	New machine Once a month Later every other month
2. Change Gears	Open tev-pully cover	Few	2	Daily	
3. Compound	Use gun oiler	Few	2	Daily	
4. Apron	Open the cup, Fill by gun oiler	Few	2	Daily	
5. Tails Tock	Use gun oiler	Few	2	Daily	
6. Lead Screw Feed Rod	Fill with gun oiler	Few	2	Daily	
7. Bed way	Fill with gun oiler	Few	2	Daily	
8. Bracket	Fill with gun oiler	Few	2	Daily	
9. Carriage Screw	Fill with Hand pump	Few	2	Daily	
10. Oiling Position Volume	All the gears, shafts ,bearings ,holes and shifters in headstock				1. shell Vitre oil 32 2. Eso nuto 30
11. Headstock	All the gears, hafts, Bearings, holes and Shifters in geed gear box.				1. Shell X-100 Mortor oil30. 2. Esso tractorlube HDX 30.
12. Feed Gear Box	All the gears, shafts, Bearing, holes in apron. And guide way(bed-way). Cross slide and top of saddle				1. Shell X-100 Motor oil30. 2. Esso tractorlube HDX 30.
13. Apron	Chang gears, lead screws Of longitudinal, cross and Compound rest. Tailstock, Center sleeve and lead Screw bracket				1. Shell X-100 Motor oil30. 2. Esso tractorlube HDX 30.
14. Hand Oiling	All the gears, shafts ,bearings ,holes and shifters in headstock				1. 1.shell Vitre oil 32 2. Eso nuto 30

GEAR BOX
TRANSMIIONE OF THE GEAR BOX

The feed mechanism including two steps feed change gear in headstock, change gears, feed gear box then to feed rod or lead screw. To accomplish the feeding and thread cutting function.

Quick change lever was specially designed as rotating type for easy operating. The liver could stand heavy cutting and no gear jumping will be happened.



FUCTION OF GEAR BOX

The main function of the gear box I to cutting thread and auto-feed, it can be used for cutting “inch metric thread” and D.P. module thread, besides, it doesn’t need to change any “the gear train”, easy and simple operation.

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 inde, then thread cutting can be operated to cut the required kind and pitch of thread.

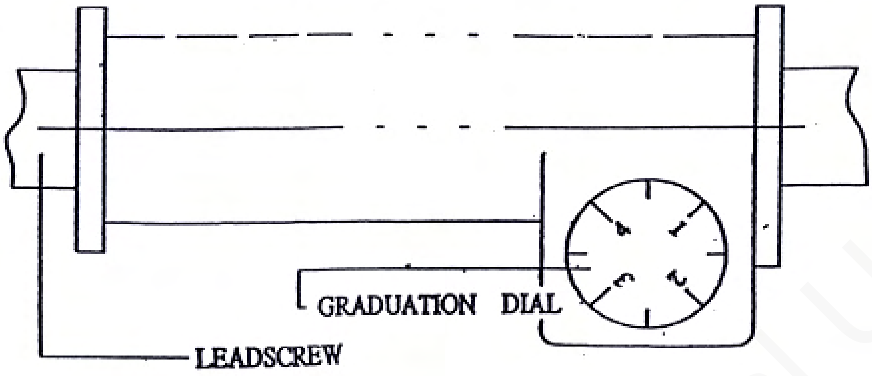
OPERATION OF AUTOMATIC FEED

When the operation of automatic feed should be operated, at first, operate all the speed change levers and set at the proper position 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 automatic feed can be proceeded.

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 the red line of oil window in gear box.

FIG 5-105 INDICATOR OF THREAD CUTTING



<table>
<tr><th>Ph</th><th>T</th><th>點</th><th>Ph</th><th>T</th><th>點</th></tr>
<tr><td>0.25</td><td rowspan="15">12</td><td rowspan="15">12</td><td>0.35</td><td rowspan="7">14</td><td rowspan="12">2</td></tr>
<tr><td>0.3</td><td>0.7</td></tr>
<tr><td>0.4</td><td>1.4</td></tr>
<tr><td>0.5</td><td>1.75</td></tr>
<tr><td>0.6</td><td>3.5</td></tr>
<tr><td>0.75</td><td>7.0</td></tr>
<tr><td>0.8</td><td>14.0</td></tr>
<tr><td>1.0</td><td>1.25</td><td rowspan="4">10</td></tr>
<tr><td>1.2</td><td>2.5</td></tr>
<tr><td>1.5</td><td>5.0</td></tr>
<tr><td>2.0</td><td>10.0</td></tr>
<tr><td>3.0</td><td>8.0</td><td>12</td></tr>
<tr><td>4.0</td><td>1.1</td><td rowspan="4">11</td><td rowspan="8">1</td></tr>
<tr><td>6.0</td><td>2.75</td></tr>
<tr><td>12.0</td><td>5.5</td></tr>
<tr><td>0.45</td><td rowspan="5">12</td><td rowspan="5">4</td><td>11.0</td></tr>
<tr><td>0.9</td><td>1.3</td><td rowspan="4"></td></tr>
<tr><td>2.25</td><td>3.25</td></tr>
<tr><td>4.5</td><td>6.5</td></tr>
<tr><td>9.0</td><td>13.0</td></tr>
</table>

KNOWLEDGE OF THREAD CUTTING (METRIC THREAD)

1. The dial address on APRON of lift side, it can supply when you cutting metric thread.
2. When you cutting metric thread, look the indicator of thread cutting, there have six line, when across line rotate on match point, but have 1~2mm interspaces, it can slowly push down half-nut lever, don't quickly push down when across line rotate on match point.
3. Cutting metric threads of pitch and match point address, you can refer FIG5-105, you can see this dial aside indicator of thread cutting.
4. Cutting metric threads, it can open half-nut, then, closed the match point, if you want to cutting inch metric, it must retain half-nut close, and back-up the tooling, the, back-up the apron, and repeat it.(across the match point)

IN									
	1	2	3	4	5	6	7	8	9
ADWF	2	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{7}{8}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$
BDWF	4	$4\frac{1}{2}$	$4\frac{3}{4}$	5	$5\frac{1}{2}$	$5\frac{3}{4}$	6	$6\frac{1}{2}$	7
ACWF	8	9	$9\frac{1}{2}$	10	11	$11\frac{1}{2}$	12	13	14
BCWF	16	18	19	20	22	23	24	26	28

MM									
	1	2	3	4	5	6	7	8	9
ACME	8	9	9.5	10	11	11.5	12	13	14
BCME	4	4.5	4.75	5	5.5	5.75	6	6.5	7
ADME	2	2.25		2.5	2.75		3	3.25	3.5
BDME	1			1.25			1.5		1.75
BDHM	0.8	0.9	0.95	1	1.1	1.15	1.2	1.3	1.4

DP									
	1	2	3	4	5	6	7	8	9
ADWF	4	$4\frac{1}{2}$	$4\frac{3}{4}$	5	$5\frac{1}{2}$	$5\frac{3}{4}$	6	$6\frac{1}{2}$	7
BDWF	8	9	$9\frac{1}{2}$	10	11	$11\frac{1}{2}$	12	13	14
ACWF	16	18	19	20	22	23	24	26	28
BCWF	32	36	38	40	44	46	48	52	56

MP 									
	1	2	3	4	5	6	7	8	9
ACME	4	4.5	4.75	5	5.5	5.75	6	6.5	7
BCME	2	2.25		2.5	2.75		3	3.25	3.5
ADME	1			1.25			1.5		1.75
BDME	0.5						0.75		
BDMH	0.4						0.6		

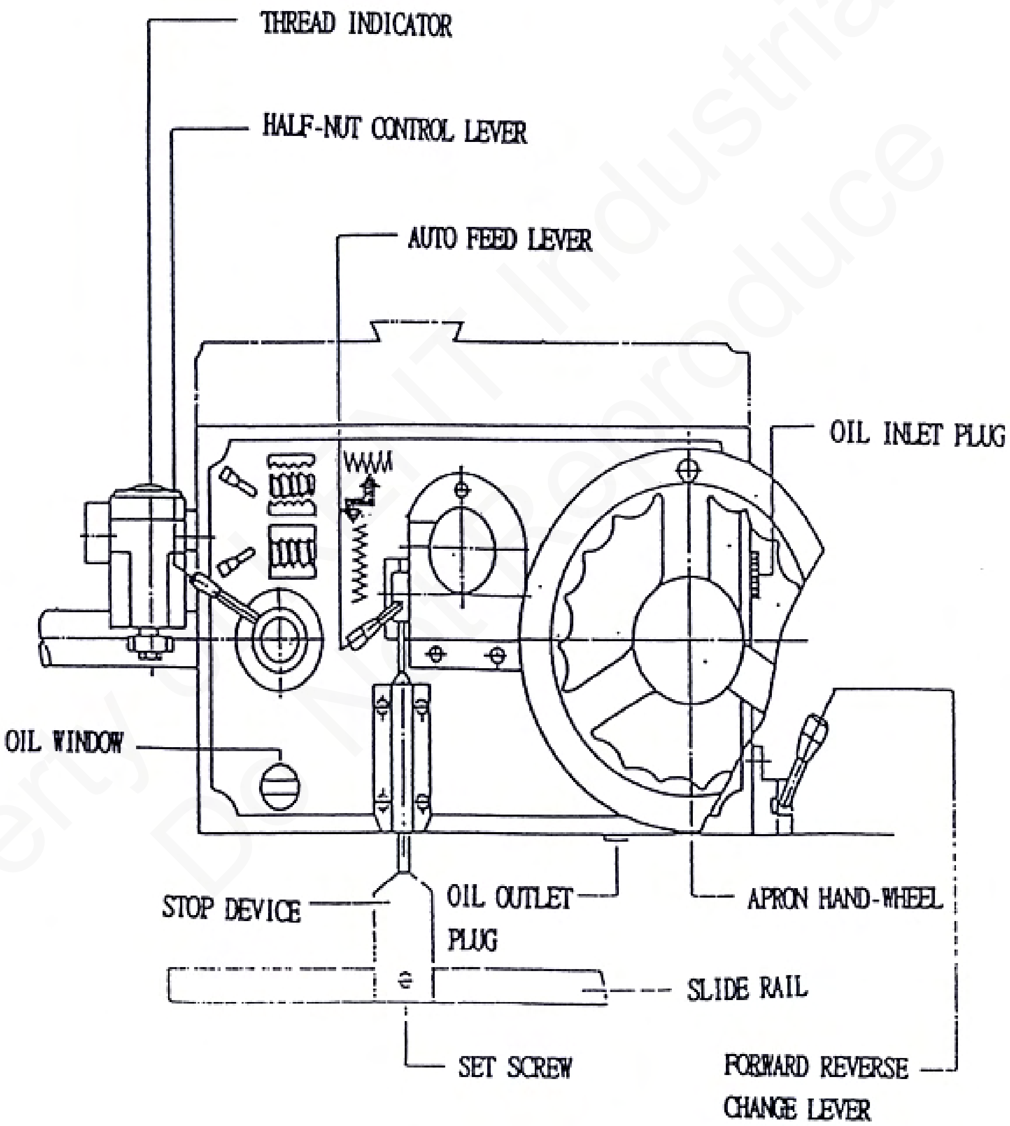
MM 									
	1	2	3	4	5	6	7	8	9
ACMG	0.40	0.44	0.46	0.48	0.52	0.56	0.60	0.64	0.70
BCMG	0.20	0.22	0.23	0.24	0.26	0.28	0.30	0.32	0.35
ADMG	0.10	0.11	O.11	0.12	0.13	0.14	0.15	0.16	0.17
BDMG	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.08

MM 									
	1	2	3	4	5	6	7	8	9
ACMG	0.02	0.22	0.23	0.24	0.26	0.28	0.30	0.32	0.35
BCMG	0.10	0.11	0.11	0.12	0.13	0.14	0.15	0.16	0.17
ADMG	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.08
BDMG	0.025	0.025	0.025	0.030	0.030	0.035	0.035	0.040	0.040

APRON (RIGHT)

GENERAL DESCRIPTION

The main function of the APRON mechanism is to move the carriage leftward-rightward and to over the cross slide forward-backward and traverse auto feed an also to accomplish the thread cutting in auto feed. There are thread cutting indication, half-nut control lever, auto feed lever, top device and longitudinal feed hand-wheel in apron mechanism.



AUTOMATIC FEED TRANSMISSION

The auto-feed transmission of apron include cross feed and longitudinal feed. According to the index plate, when you pull the auto feed lever upward, the carriage with apron can be moved to perform the longitudinal feeding. When you pull this lever to downward position, the tool-rest with cross slide can be moved to perform the cross feeding. The stop device installed in the underside of auto-feed lever and it is used for stopping the auto-feeding. When you made use of this stop device, loose this setting screw of stop block first, then move stop block to proper position, and then fasten it.

TRANS MISION OF TREAD CUTTING

Only as the automatic feed lever at the central position, the half nut control lever can be put to downward position, and the half-nut engage with the lead screw, then carriage can be moved left ward o rightward to perform the thread cutting. TO stop thread cutting by pull up the half nut lever only to release the engagement of 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 propose of safety.

FORWARD-REVERE CHANGE LEVER

The forward-reverse change lever installed at the right side of apron. It couple on the starting rod, so that the cutting ad feeding work can be operated conveniently. When you pull this lever left and upward, the spindle will rotate in reverse direction. When you push this lever left and downward, the spindle will rotate in for =ward direction. When this lever at central position, the spindle will stop.

SAFETY DEVICE

The safety device installed I the upper side of auto-feed lever, when the overload happens in operating of auto-feed, the taper-clutch was divided, and the auto-feed of APRON will stop transmission to attain the purpose of safety. According to the over-load or lower-load will must adjust the screw"A", the over-load is clockwise & the lower-load is counter clockwise.

LUBRICATION OF APRON

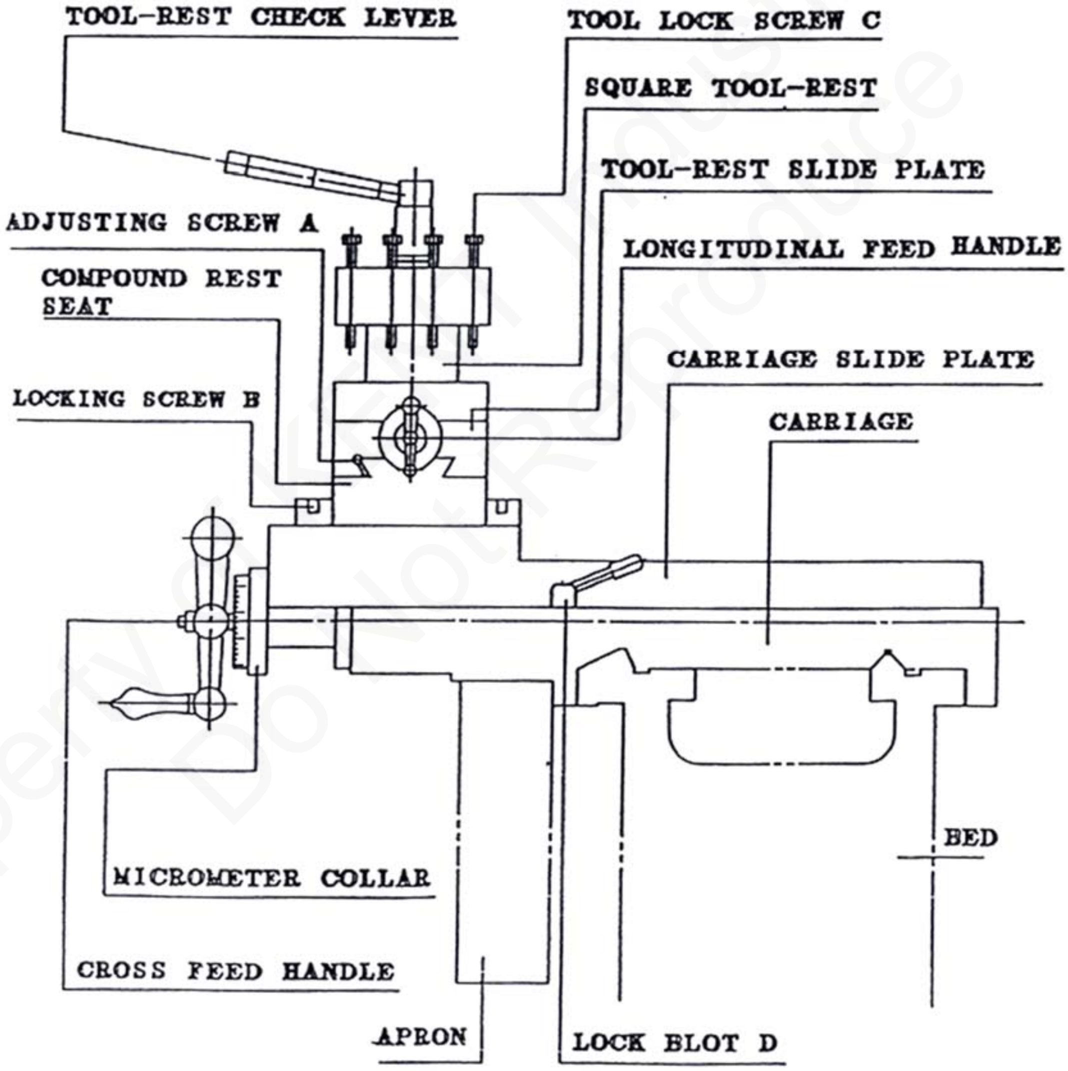
The oil bath lubrication and splash lubrication are adopted in the apron. When the hand-wheel is rotated, the oil will be slashed by gears and shafts to lubricate each part of apron.

Supply oil into oil inlet should up to the red line of oil window.

CARRIAGE (SADDLE)

1. CARRIGE STRUCTURE

The carriage bestrides and crosses on the bed with way in front and plane in rear side designed as narrow rail type. Its main structure include addle body slide plate, compound rest and square tool rest. Its function consists that “installed the tool rest on compound rest seat and fixed the tool” and provide the operation of traverse and longitudinal feed.



CUTTING OF PLANE

When the longitudinal feed will be largely moved in the plane cutting. In order to avoid the carriage backward and unbalance of cutting plate, so that there I 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 PLATE

There are many graduated divisions on the slice plate of carriage. For the cutting tapered-plane, please loose the locking screw “B” first, then rate 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 proceeded.

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 clearance, the Bevel-Gib should be adjusted. Its adjusting method: Loose the set screw in the tip 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 (MICTOMETER COLLAR)

There are the graduated collars on the longitudinal feed and cross feed handle. They are divided into 250 divisions; each division means 0.025mm, 5mm for one revolution. When the zero will be return, please loose the setting screw first. After the adjustment had finished, fasten then setting screw again.

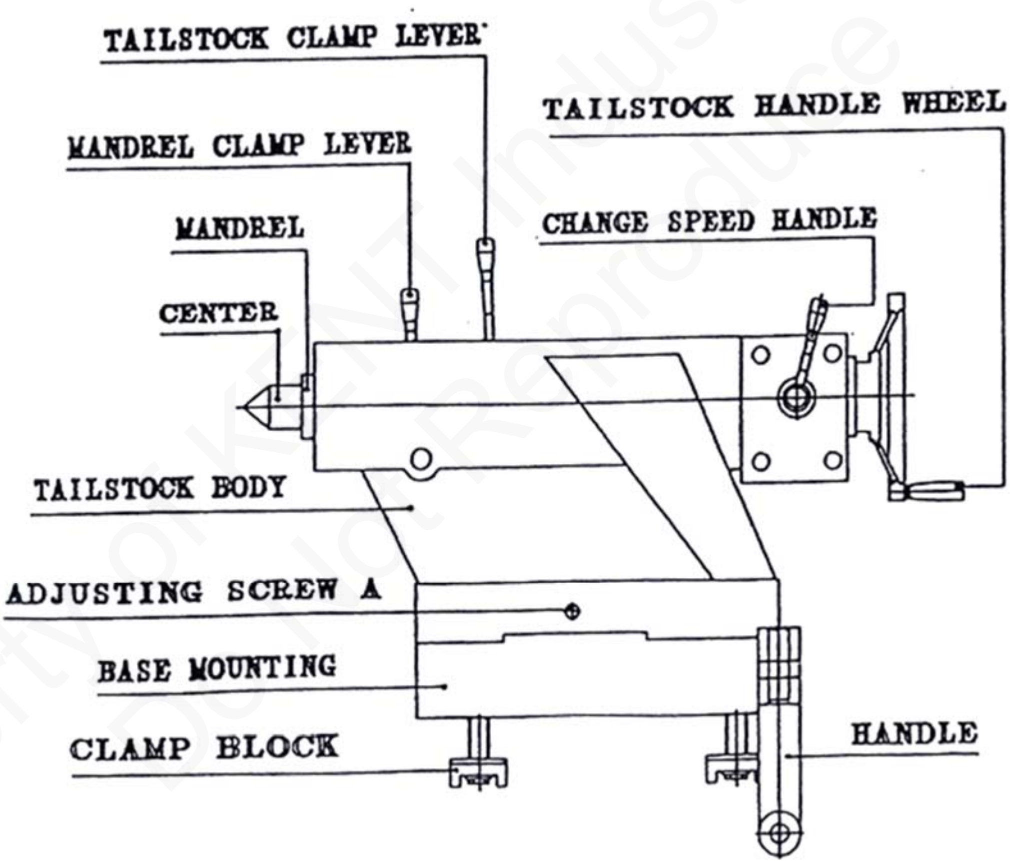
LUBRICATION OF CARRIAGE

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 iron the oil inlet on carriage by oil gun.

TAIL STOCK

GENERAL DESCROTION OF TAIL STOCK

The main structures of tailstock consist of 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 depends on the long or short of work pieces, or required position, can be clamped at anywhere arbitrarily along bed, then in cooperate with the spindle to proceed to cut work between two centers and to bore holes.



OPERATIONAL METHOD

The tailstock hand-wheel located on the rear side of change speed box, first operate the cage speed handle, then rotate the had-wheel, the mandrel of tailstock will be moved slowly or rapidly by 1/4 of 1/1 speed, and that provide for drilling, feeding and retreating. If you want to remove the center, rotate the hand-wheel in counter-clockwise direction, the center will be pulled back to the end, then it will be removed easily.

The mandrel clamp lever is used for fixing the mandrel of tailstock.

The tailstock clamp lever is used for fixing the tailstock on the bed-ways.

When the tailstock mandrel and spindle center are not in the same central line, loose the adjusting screw "A" in the both side, adjust the tailstock center until its central line is same as spindle, then fasten both adjusting screws "A". Use the same method; adjust the tailstock central line to set up a deviation measure with the spindle as provide for the taper cutting between two centers.

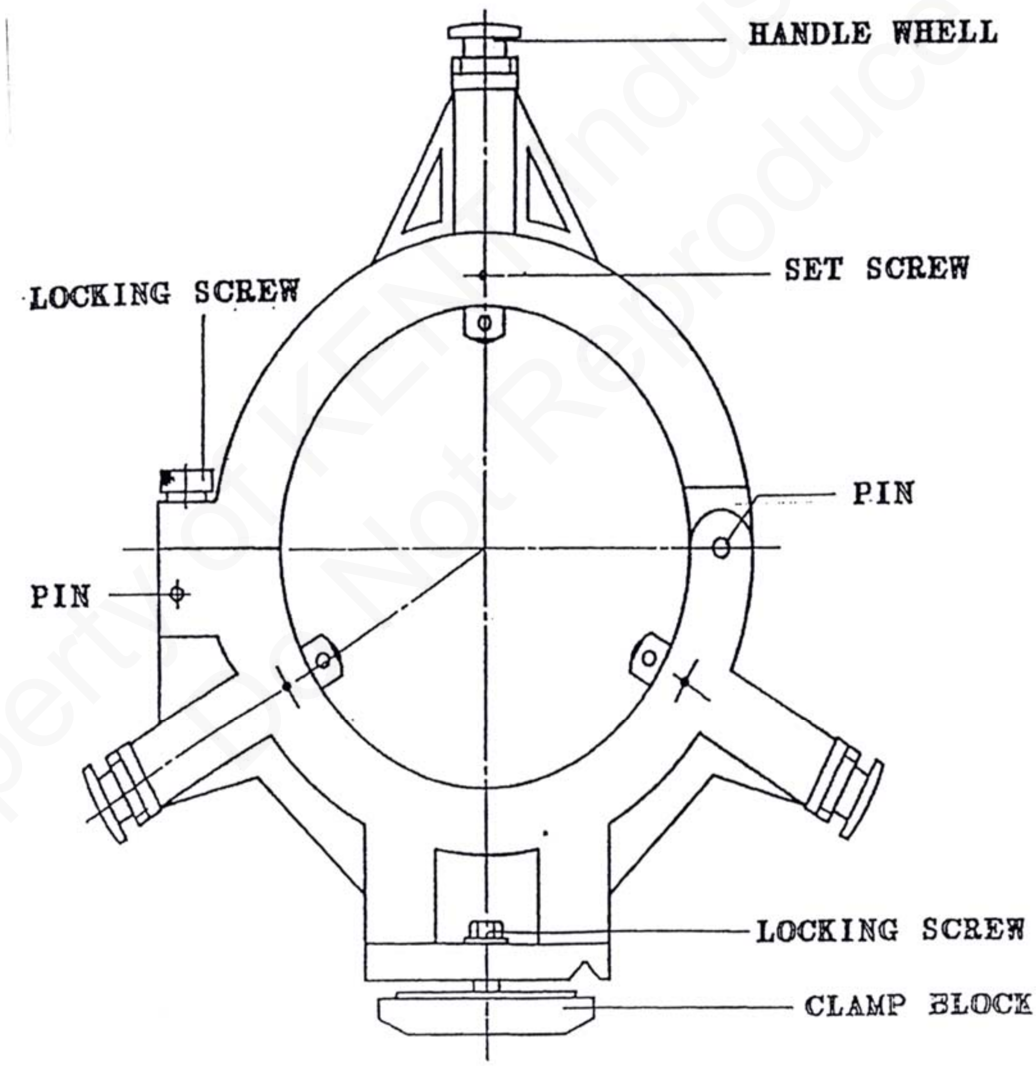
LUBRICATON OF TAILSTOCK

Tailstock is lubricated by hand oiling from time to time.

STEADY REST

The steady rest function is for cutting length rigidiess work pieces and set the center. First must fix the clamp block at the suitable position in operation before. Loose the setting screws A, please, then rotate three handle-wheel by clockwise and it transmit three mandrel to contact with the work-piece, then lock the set screw A.

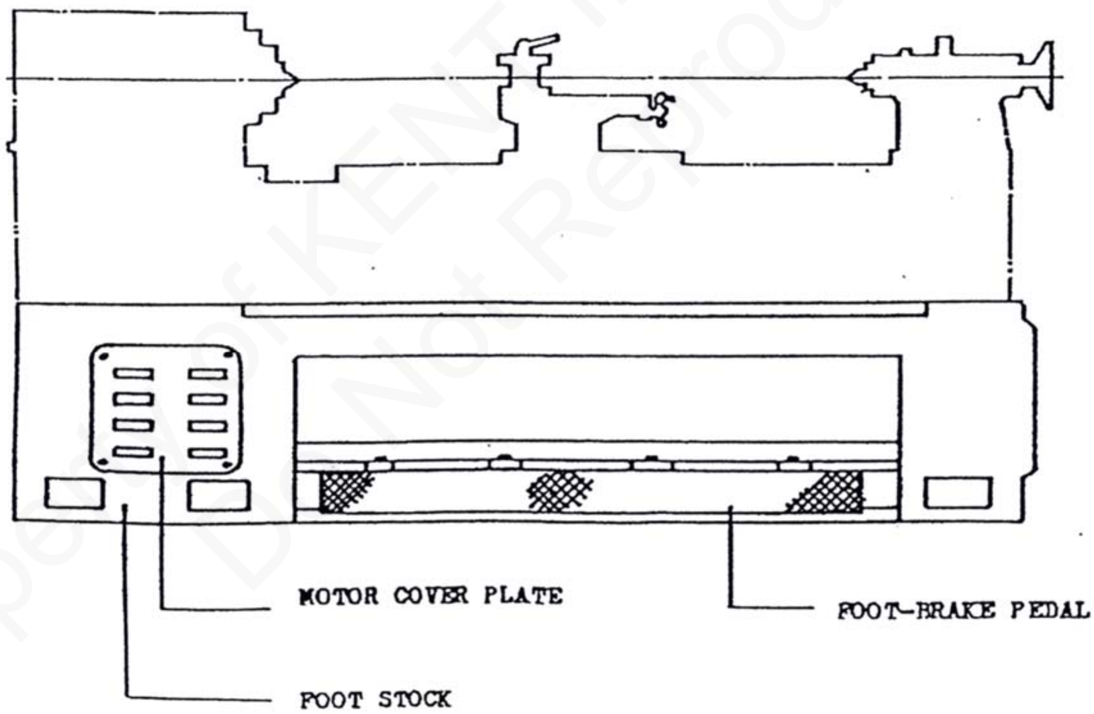
NOTE: The end of mandrel, those touch parts are made of bearing, it must hand oiling usually in operation.



BRAKE DEVICE

Use foot to tread upon the pedal is adopted for the brake mode of this machine. When the stopping of machine operation is necessary, a momentary force applied to the foot-brake pedal after can stop he spindle running immediately, and it had been touched the limited switch to cut off he power source of motor, and the brake band with brake lining apply to the motor pulley directly.

While to adjust the brake lining it is need to open the motor cover plate firs and loose the setting crew on the brake lining. The adjustment of brake lining would consider to the displacement of setting screw.
After the desirable adjustment had finished, the setting screw of brake lining and pedal would be locked again.



ELECTRICAL LOOP DRAWING