KINGSTON

OPERATING MANUAL & PARTS LISTS

HP / HPX Series

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SAFETY

Only authorized and trained personnel should operate this machine. All operators must read and familiarize themselves with the Operator's Manual, safety decals, and safety procedures and instructions for safe machine operation before turning on the lathe. Improper operation can lead to serious injury, can damage the machine, and will void the warranty.

GENERAL RULES OF SAFETY

- Appropriate eye, ear, and foot protection should be used at all times when operating this lathe. Consult your local safety codes and regulations before operating the machine.
- Keep the ground near the lathe clean and dry. Leave the passageways around the machine clear.
- The machine uses a high voltage system and some components operate at high temperature, so extreme caution is required. Keep the electrical panel closed and locked at all times except during installation and service. Only properly trained and skilled electricians or technicians should have access to the control box. During maintenance the main power must be shut off.
- Identify the **FOOT BRAKE** on the machine. In case of an emergency, press the **FOOT BRAKE** until the spindle comes to a complete stop.
- Inspect the lathe, its components, and all tooling for improper wear and damage. **DO NOT** operate the machine if any components or tools do not appear to function properly. Any component or tool that is damaged should be properly repaired or replaced by authorized personnel before beginning operation. Replace damaged or severely scratched windows immediately.

- **DO NOT** touch or place any part of your body near or on any rotating or moving components of the machine.
- **DO NOT** place a tool, workpiece or any other items on any part of the machine during operation.
- **DO NOT** wear gloves when operating this machine to avoid incorrect activation of switches.
- **DO NOT** start the lathe until the workpiece is balanced, centered, and secured properly. (See Workholding Safety)
- **DO NOT** touch the chips. Use the proper tools or brushes to remove chips from the machine.
- **DO NOT** leave a running machine unattended.
- Avoid unsafe and excessive feed rates and ultra-high speed spindle rotation.
- Shut down all power and tag “Out of Service” before cleaning or repairing the machine.
- **DO NOT** modify or alter this lathe without prior authorization from Kingston. Any unauthorized modification or alteration of any Kingston lathe could lead to personal injury and/or mechanical damage and will void your warranty.
- During a power failure, turn OFF the machine to prevent damage to the machine and for the safety of individuals around the machine.
- When transporting the machine, special measures should be taken to properly secure and cover the machine and it’s components.
- For optimal machine performance, regular cleaning and maintenance is required. Please use manufacturer’s suggested fluids and oil (p. 20).
- Protect and regularly inspect cables for damage by chips and coolant.
- The ultimate responsibility for safety rests with the shop owner and the individuals who work with the machine. Please make sure that only skilled and trained individuals work on this machine and that everyone involved in the installation and operation of the machine has read and understood all instructions provided with the machine **BEFORE** they begin.

WORKHOLDING SAFETY

- Review the care and safety guidelines from the work holder manufacturer. Follow all manufacturer warnings regarding the chuck and workholding procedures.
- Do not modify workholding equipment.
- Service chucks regularly as well as grease daily for optimal performance.
- The power switch must be in the **OFF** position when chucking a work piece.
- Use the correct chuck size and never extend the chuck jaws past the body (diameter) of the chuck.
- Check that the chuck and work piece turn without interference with the carriage or any other parts of the lathe. Interference between the moving parts will cause damage to both. **DO NOT** machine parts larger than the chuck.
- Before beginning work, please ensure the work piece is securely fastened in the chuck and properly supported by the tailstock. **DO NOT** start the lathe until the workpiece is balanced, centered, and secured properly. Improperly clamped parts may be ejected with deadly force and can cause serious injury and damage.
- Longer parts must be held in two or more places before turning and cutting.
- Heavy parts and out of round parts may need to be held with two or more supports before turning and cutting.
- Use only the proper chuck wrench supplied with the chuck.
- **DO NOT** leave the chuck wrench or anything else on the radius of the chuck.
- **DO NOT** hit the workpiece with a hammer, or any improper tooling, while held by the chuck. This can cause a loss of accuracy and shorten the life of the chuck.
- Keep a safe distance from the chuck when the machine is running.
- Never exceed the maximum speed of the chuck.
- Remove the workpiece from the chuck when the machine will not be in use for an extended period of time.
- In the event of a crash of your tooling due to improper operation, press the foot brake to stop the spindle immediately.

WARNING DECALS

IMPORTANT!

Only authorized personnel trained to operate high-speed lathes should work on this machine. **ALL OPERATORS MUST READ** and familiarize themselves with the safety procedures and instructions in **THE OPERATING MANUAL** before turning on the lathe. Improper operation can cause injury, can damage the machine and will void the warranty.

GENERAL SAFETY PROCEDURES

- Only skilled and trained technicians should install and operate this lathe.
- Carefully read and understand the Operating Manual, all warning signs and identify the safety features (chart below) on the machine BEFORE beginning operation. Failure to do so will result in misuse and seriously bodily injury.
- Appropriate eye, ear and foot protection should be used at all times when operating this lathe.
- Keep the ground near the lathe clean and dry. Leave the passageways around the machine clear.
- Do not touch chips or any rotating or moving components on the machine.
- Do not leave a running machine unattended.
- Shut down all power and tag "Out of Service" before cleaning or repairing the machine.

BEFORE TURNING ON YOUR LATHE

- Place all levers to the OFF position and check that all operating controls and switches are functioning properly.
- Inspect the lathe and all its components for improper wear and damage. Do not operate the machine if any components do not appear to function properly.
- HK/HG MODELS ONLY, identify the RED EMERGENCY BUTTON on the hanging control panel. In case of emergency, press this button to stop the spindle.
- All other Kingston models, identify the FOOT BRAKE on your machine. In the case of emergency, hold the foot brake down until the spindle comes to a complete stop.

POWERING UP AND DOWN YOUR LATHE

- The power source for your lathe must be grounded.
- Inspect and confirm all cables are connected before powering up the machine.
- Beware of high voltage around the machine.
- When the power switch is ON, the power indicator lamp with light up.
- During a power failure, turn OFF the machine to prevent damage to the machine and for safety to those around it.
- Turn the power OFF when leaving the machine.

WORKHOLDING SAFETY

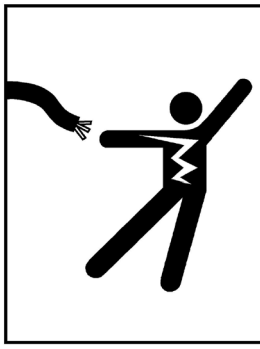
- Review the care and safety guidelines from the workholder manufacturer.
- Use the correct chuck size and never extend the chuck jaws past the body of the chuck.
- Be careful not to drop the chuck when mounting or removing it.
- The power switch must be in the OFF position when chucking a work piece.
- Check that the chuck and work piece turn without interference with the carriage or any other parts of the lathe. Interference between the moving parts will cause damage to both.
- Do not start the lathe until the workpiece is balanced, centered, and secured properly.
- Longer parts must be held in two or more places before turning and cutting.
- Heavy parts and out of round parts may need to be held with two or more supports before turning and cutting.
- Use only the proper chuck wrench supplied with the chuck.
- Never leave the chuck wrench or anything on the radius of the chuck.
- Do not modify workholding equipment.
- Keep a safe distance from the chuck when the machine is running.
- Never exceed the maximum speed of the chuck.

SAFETY FEATURES

These features are designed to protect both the operator from injury and the machine from damage:

FEATURE	LOCATION
Emergency Stop	Foot Brake or Hanging Control Panel (HK/HG)
Overload Protection Device	Apron
Thermal Overload Device	Electrical Control Panel
Fuse	Electrical Control Panel

- Damage can result when shifting levers while the spindle is running.
- Make sure the spindle comes to a complete stop before shifting.



TAILSTOCK

- Avoid hanging the tailstock over the end of the bed.
- Clamp the tailstock to the bed firmly.
- Do not touch the handwheel while the machine is running.
- Apply a seizure-proof grease when using a dead center.
- The center and the work center hole should have the same taper angle.
- Insert the center firmly into the workpiece.
- Avoid excessive overhang of the center sleeve.

ELECTRICAL SAFETY CAUTIONS

(1) Don't touch switches with wet hands.

(2) Avoid using fuses other than those specified.

(3) Turn the main switch OFF whenever replacing fuses.

Clamp tools and tool posts securely.

MACHINE OVERVIEW

DESCRIPTION OF THE DRIVING UNIT - HP MODEL

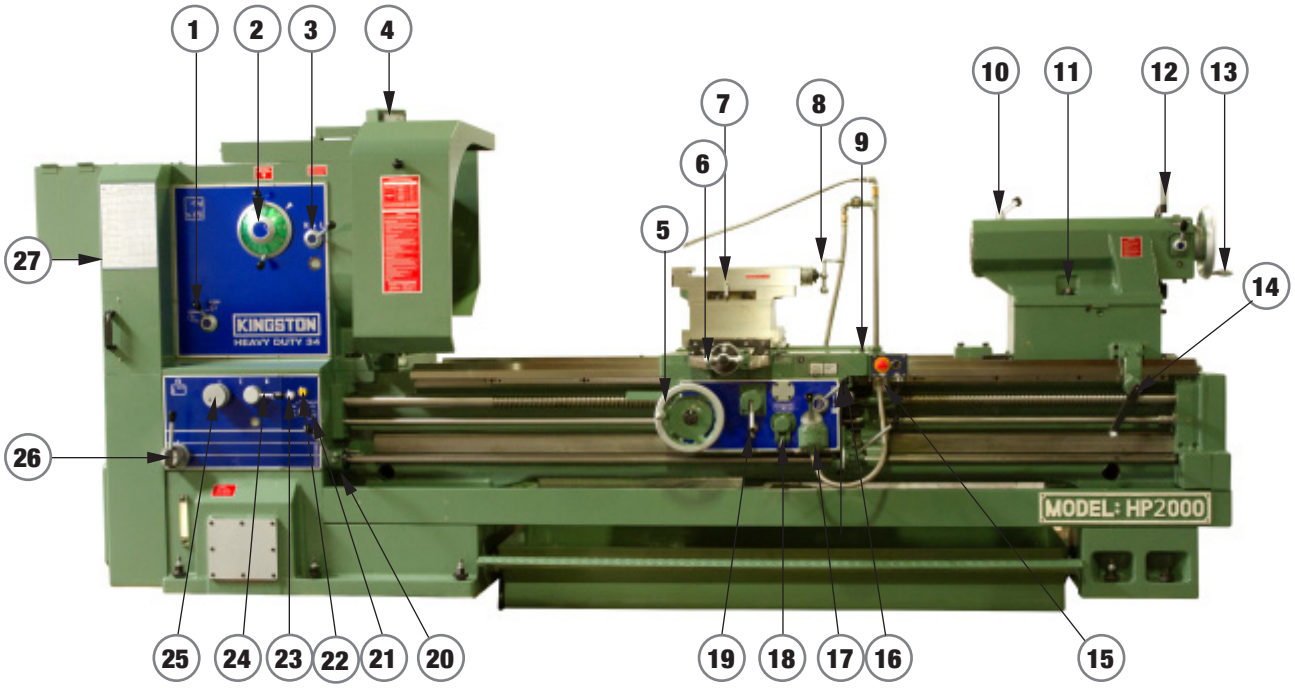


Figure A

1. Forward and reverse lever for feed and thread
2. Spindle speed change lever
3. Spindle speed change lever
4. Amp meter
5. Hand-wheel for longitudinal feed
6. Handle for cross feed
7. Toolslide clamping lever
8. Handle for tool slide feed
9. Clamping bolt for carriage
10. Clamping lever for tailstock quill
11. Clamping nut for tailstock body
12. Clamping lever for tailstock body
13. Hand-wheel for tailstock quill movement
14. Tailstock body crank
15. Thread chasing dial
16. Half nut lever
17. 4 way rapid traverse
18. Change lever for longitudinal, cross feed, and half nut
19. Feeds engaging and disengaging lever
20. Starting lever
21. Main switch (Multi-purpose select)
22. Jog push button
23. Pilot light
24. Feed and thread change lever
25. 4 Step change knob
26. 10 Step Norton system lever
27. Feed and thread table

DESCRIPTION OF THE DRIVING UNIT - HPX MODEL

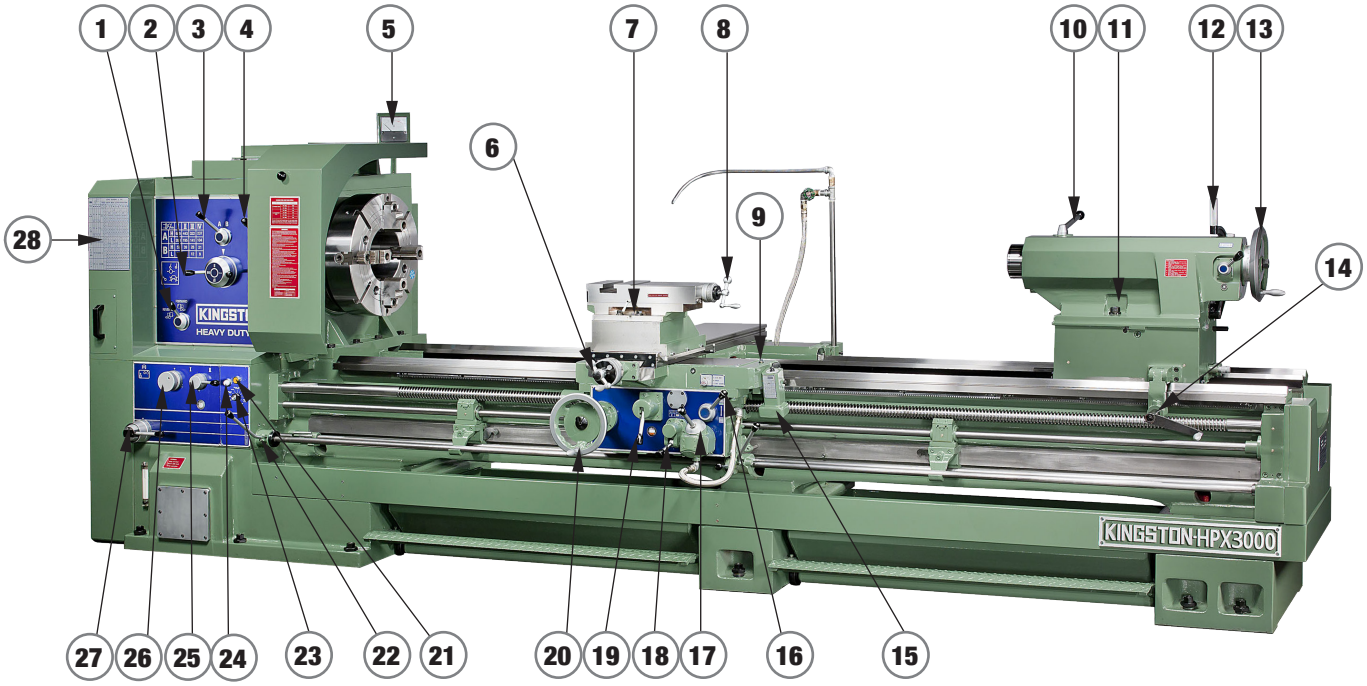


Figure B

1. Forward and reverse lever for feed and thread
2. Spindle speed change lever (I, II, III, IV)
3. Spindle speed change lever (A, B)
4. Spindle speed change lever (H, N, L)
5. Amp meter
6. Handle for cross feed
7. Toolslide clamping lever
8. Handle for tool slide feed
9. Clamping belt for carriage
10. Clamping lever for tailstock quill
11. Clamping nut for tailstock body
12. Clamping lever for tailstock body
13. Hand-wheel for tailstock quill movement
14. Tailstock body crank
15. Threading chasing dial
16. Half nut lever
17. 4 way rapid traverse
18. Change lever for longitudinal, cross feed, and half nut
19. Feed engaging and disengaging lever
20. Hand-wheel for longitudinal feed
21. Jog push button
22. Starting lever
23. Main switch (Multi-purpose select)
24. Pilot light
25. Feed and thread change lever
26. 4 step change knob
27. 10 Step norton system lever
28. Feed and thread chart

MACHINE SPECIFICATIONS

		HP-34		HP-40		HPX-34		HPX-40	
CAPACITY									
Swing Over Bed		34" (870 mm)		40" (1020 mm)		34" (870 mm)		40" (1020 mm)	
Swing Over Cross slide		25 1/8" (638 mm)		31" (788 mm)		25 1/8" (638 mm)		31" (788 mm)	
Distance Between Centers		80"(2032 mm))	120"(3048 mm)	160"(4064 mm)		200"(5080 mm)	240"(6096 mm)		280"(7000 mm)
Width of Bed		22" (559 mm)							
Height of Center from Leg Bottom		48 5/8" (1235 mm)		51 5/8" (1310 mm)		48 5/8" (1235 mm)		51 5/8" (1310 mm)	
HEADSTOCK									
Spindle Bore		7 1/8" (180 mm)				9 1/4" (235mm)			
Taper of Spindle Bore & Center		3/4 Taper per Foot							
Type of Spindle Nose		ASA A2-15							
Number of Spindle Speeds		16							
Spindle Speed		8-700 RPM				9-600 RPM			
GEAR BOX									
Number of Feed Changes		40 kinds							
Range of Longitudinal Feed per Rev		0.0024" - 0.0337" (0.06 mm - 0.89 mm)							
Cross Feed		1/2 of Longitudinal Feed							
Leadscrew diameter & threads per inch		1 7/8" (48 mm) / 2TPI (P=12mm)							
Threading Range	**Whitworth**	1 to 28 TPI (50 kinds)							
	Metric	1 to 28 mm pitch (41 kinds)							
	Module	0.5 to 7 M (20 kinds)							
	D.P.	4 to 56 D.P. (40 kinds)							
TOOL SLIDE									
Maximum Travel of Compound		9 3/4" (240 mm)							
Maximum Travel of Cross Slide		21 1/4" (540 mm)							
TAILSTOCK									
Tailstock Quill Travel		11 3/4" (300 mm)							
Tailstock Quill Diameter		5 1/8" (130 mm)							
Taper in Tailstock Quill		M.T. #6							
MOTOR									
Main Drive Motor		30 HP (15KW)							
Rapid Traverse Motor		1 HP							
Coolant Pump Motor		1/4 HP							
DIMENSIONS	83" W (2100 mm)	198" (5020)	205" (5920)	245" (6952)		285" (7922)	325" (9042)		365" (10000)
HP 34" Swing	lbs (kg)	13655 (6200)	15200 (6900)	17730 (8050)		19270 (8750)	21810 (9900)		23855 (10830)
HP 40" Swing		13920 (6320)	15460 (7020)	17995 (8170)		19540 (8870)	22070 (10020)		24120 (10950)
HPX 34" Swing		13985 (6350)	15540 (7050)	18060 (8200)		19600 (8900)	22135 (10550)		24185 (10980)
HPX 40" Swing		14320 (6500)	15860 (7200)	18325 (8320)		19930 (9050)	22465 (10200)		24515 (11130)

INSTALLATION

Only authorized personnel or a qualified electrician should perform any electrical work on the lathe. Prior to repair or inspection, disconnect the main power supply. Refer to local code requirements before wiring machines.

ELECTRICAL REQUIREMENTS

The electrical power must meet the specifications listed. Running the machine from any other source can cause severe damage and will void the warranty. Ground the machine and use only properly rated wires.

The HP / HPX Model Main Motor is 30 HP (22.5KW). Coolant pump is ¼ HP (180W). Rapid Motor is 1HP.

AC Power Requirements
3 phase, 230/460V only 60Hz
Input power to the machine must be grounded.
All other voltage will require the use of a transformer.
Power Cable
AWG#6 or larger
Cables should be connected with terminals R.S.T. in the electrical box. Once connected, you must check and confirm the rotation of the main motor.

NOTE: If the voltage drops down to less than 70% of the required voltage, the magnetic contactor may fail and the main motor will stop running.

☑ **TIP** Routinely check for exposed cables which can be damaged by moving parts or exposure to chips. Repair damaged cables immediately.

MACHINE PLACEMENT

Place machine in a well-ventilated location, away from direct sun exposure, heat, humidity, and welding & high electric discharge machining (EDM) areas.

Operating Room Temperature
50 - 104˚ F (10˚ - 40˚ C)
Storage and Transport Temperature
14 - 122˚ F (-10˚ - 50˚ C)
Ambient Humidity
20 - 90% RH

Make sure there is adequate space around the machine to allow for opening the electrical cabinet doors for maintenance and easy cleaning.

FOUNDATION LAYOUT

Preparing a firm and stable foundation is essential to reaching optimal performance from your lathe. We recommend using a high quality concrete with a depth of at least 22.5” (570mm) and installing the machine with foundation bolts in the locations shown on the following (p.12a,12b) to avoid excessive vibration and maintain your machine’s accuracy.

Leave adequate space around the machine for operator safety, cleaning and maintenance. We recommend a minimum distance of 24” from the rear electrical control box to any wall or obstacle, and a minimum of 20” on both head and tailstock sides for easier access to the headstock’s side cover for maintenance.

LIFTING THE LATHE

Check and confirm the machine weight and rope strength before lifting.

Movement of the lathe should be done by an experienced and licensed crane or forklift operator.

Step 1 Firmly clamp Tailstock and Carriage at the extreme right hand position for a properly balanced machine.

Step 2 Place two solid steel bars of 2 1/4" diameter and minimum 60" length into the lifting holes (**Fig. C**). The steel bar should extend at least 6" on each side of lathe for the sling. **DO NOT** use hollow steel pipes!

Step 3 Use minimum ½" steel wire rope or cable. When securing your cable slings, place wood blocks or cloth between the sling and the machine to prevent any damage to the spindle, lead screw, hand wheels and paint while lifting.

Step 4 Lift machine gradually keeping the lathe in an equilibrium state at all times. Sudden jerks can damage the slings and may effect the machine.

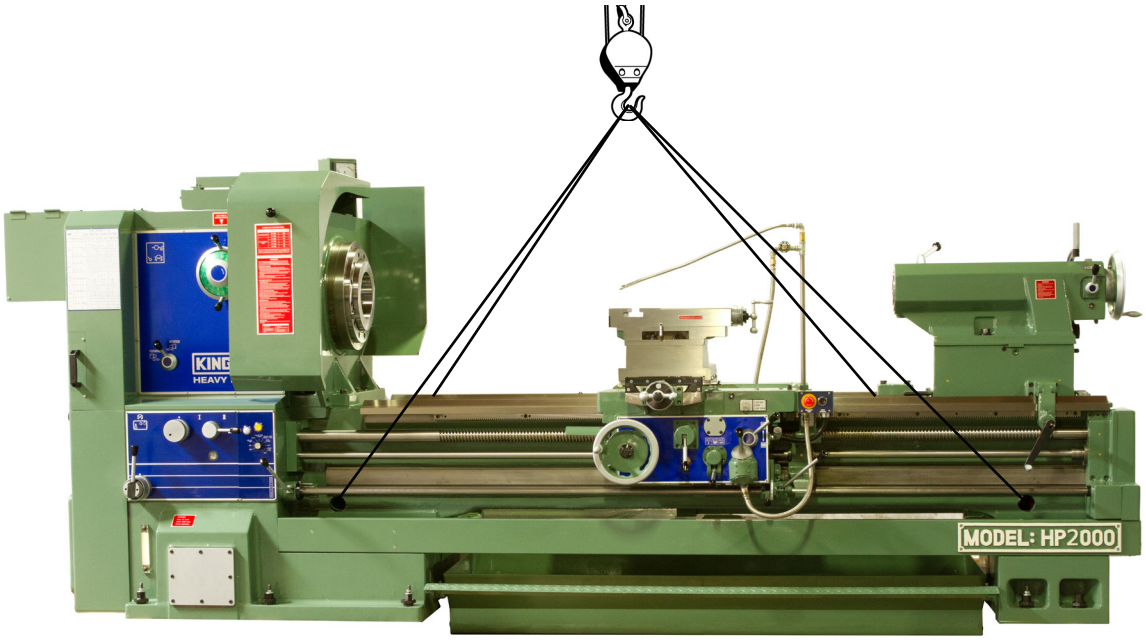


Figure C

LEVELING THE LATHE

Once your lathe is set on the prepared foundation and the bed ways and slides are cleaned thoroughly, the machine is ready to be leveled. Leveling your machine will not only enhance performance but also help to keep your machine's accuracy.

Step 1 Place two precision levels (**Fig. D-1 & D-2**) on the cross slide of the lathe. The accuracy of the level should be a minimum of 0.02mm/m.

Step 2 Using the hand wheel on the apron, move the apron from spindle side to tailstock side and adjust the foundation bolts to achieve tolerances.

Step 3 After you complete your adjustments and your lathe is correctly level, check and tighten the lock nuts.

☑ **TIP** For optimal performance, check the level of your lathe periodically.

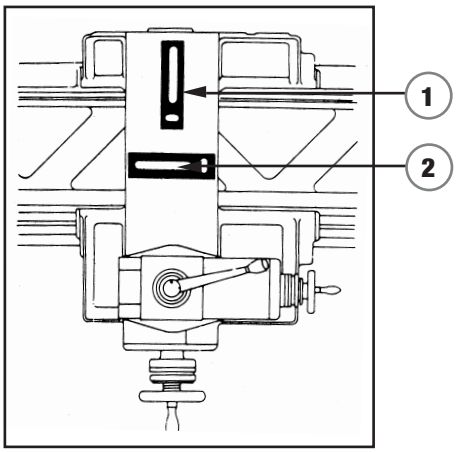


Figure D

CLEANING THE LATHE

All machine surfaces are coated with an anti-rust protection. Before operating the machine, clean all parts thoroughly, especially the lead screw, rack, and all ground surfaces with a soft brush or cloth soaked with cleaning solvent.

Lubricate the machine properly before use. To lengthen the life of your machine, clean and lubricate the machine regularly. See the lubrication chart on p. 20 for scheduled maintenance.

ELECTRICAL

Only authorized personnel or a qualified electrician should perform any electrical work on the lathe. Prior to repair or inspection, disconnect the main power supply. Refer to local code requirements before wiring your lathe.

ELECTRICAL REQUIREMENTS

The electrical power must meet the specifications listed. Running the machine from any other source can cause severe damage and will void the warranty. Ground the machine and use only properly rated wires.

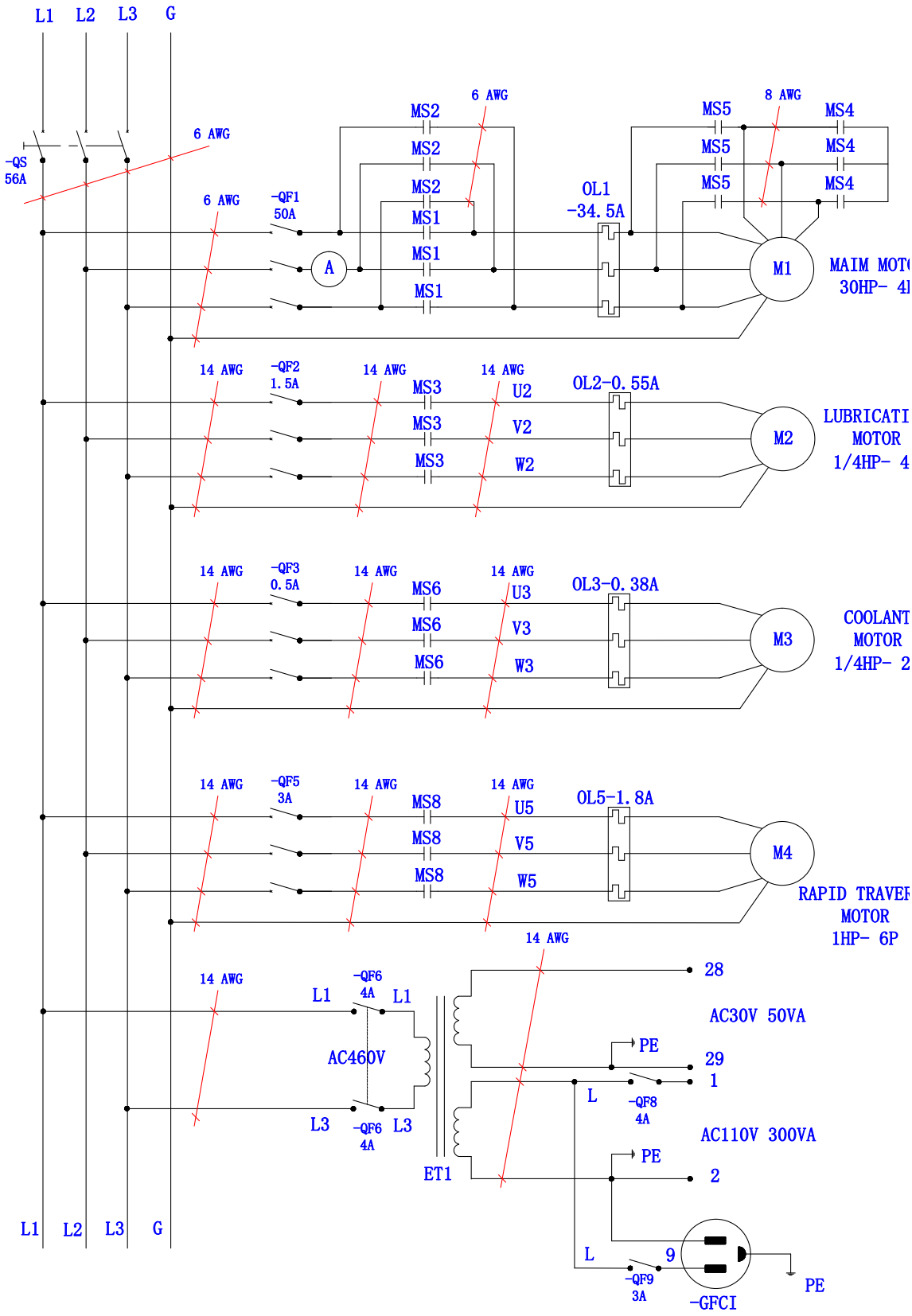
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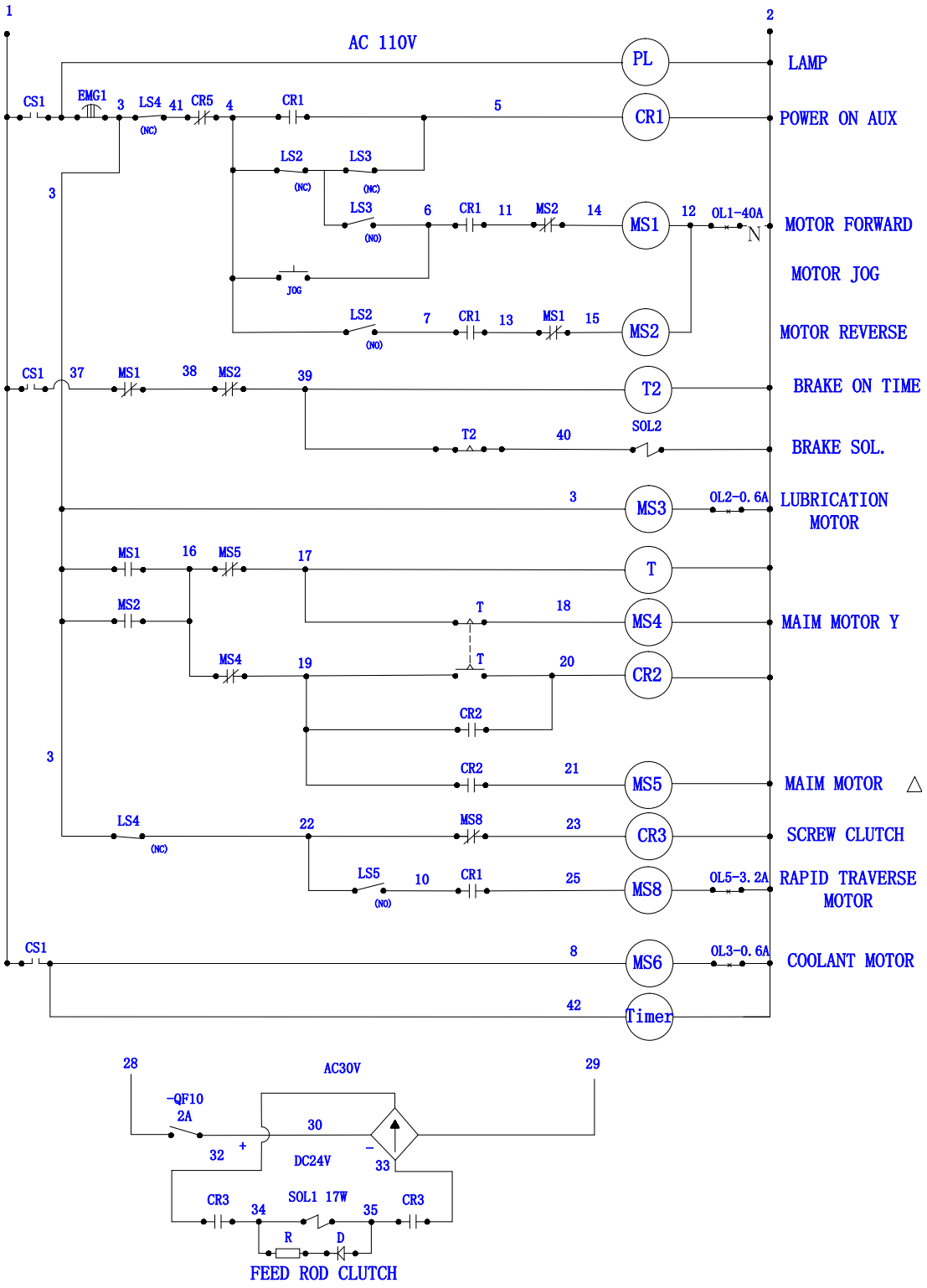
NOTE: If the voltage drops down to less than 70% of the required voltage, the magnetic contactor may fail and the main motor will stop running.

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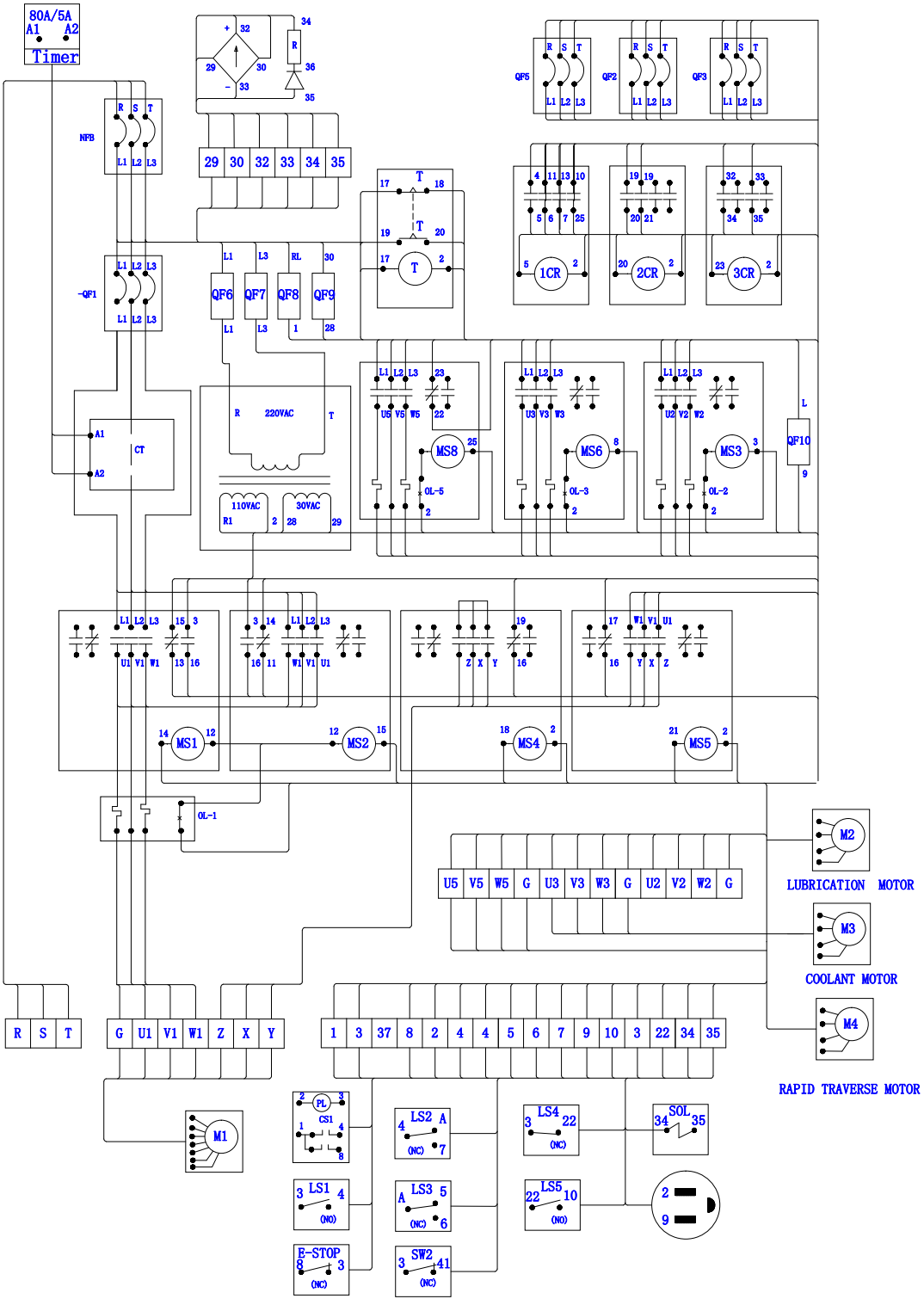
HP / HPX ELECTRICAL WIRE DIAGRAM



HP / HPX ELECTRICAL WIRE DIAGRAM



HP / HPX ELECTRICAL WIRE DIAGRAM FOR AIR THREADING SYSTEM CONTROL



LUBRICATION

Oil levels should be strictly observed. Regularly scheduled maintenance and proper lubrication of the lathe will ensure optimal performance and a long service life. Please refer to the charts on p. 20 for the recommended oil and maintenance schedules.

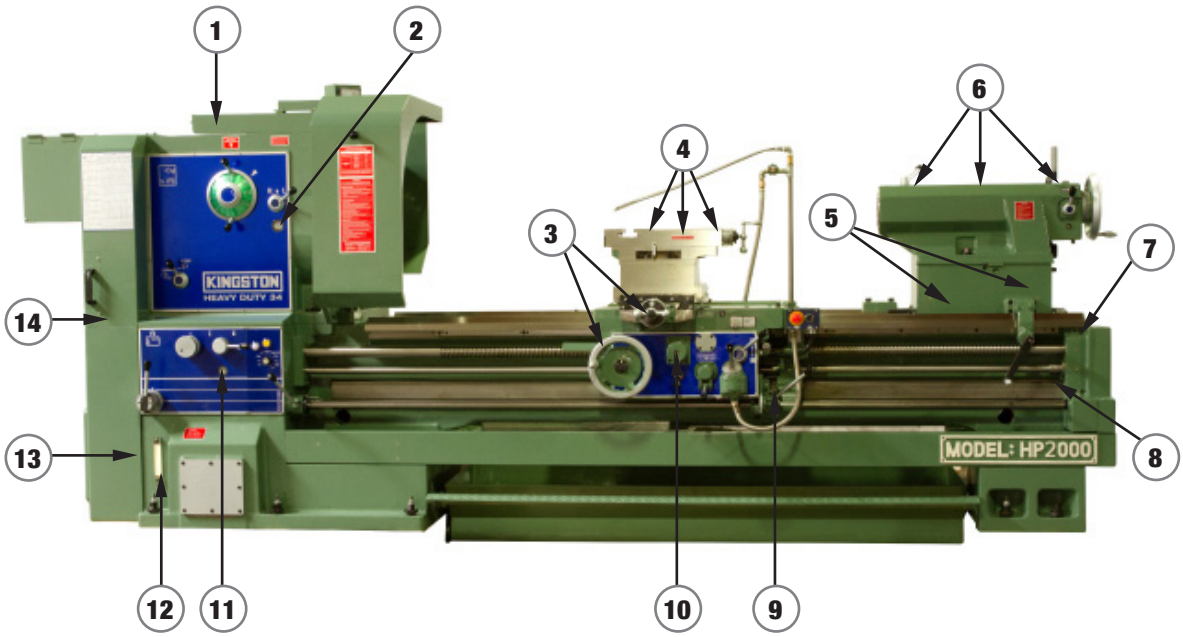


Figure E

1. Oil inlet for oil tank
2. Head stock oil sight glass
3. Hand wheel oil inlet
4. Compound oil inlet
5. Tail stock bed oil inlet
6. Quil oil inlet
7. Lead srew oil inlet
8. Feed rod oil inlet
9. Apron oil inlet
10. Apron oil window
11. Feed box oil sight glass
12. Oil tank gauge
13. Drain plug
14. Quadrant oil inlet

OIL LUBRICATION CHART AND SCHEDULE

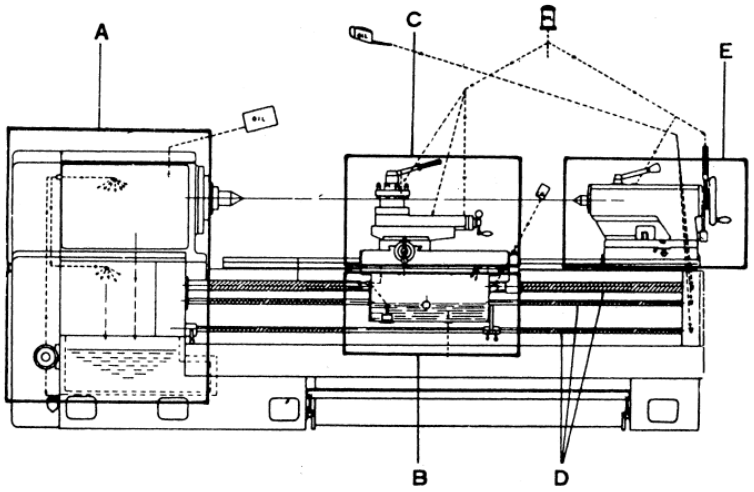


Figure F

	Lubrication Point	Oil Change and/or replenish	Quantity	Viscosity S.S.U. 100° F
A	Headstock	Twice a year	48 liters	160
B	Apron & Carriage	Twice a month	6.5 liters	320
C	Cross slide	Once a day		320
D	Other parts	Once a day		320
E	Tailstock	Once a day		320

RECOMMENDED OIL

	Headstock & Feed gear box (48 liters)	Apron (6.5 liters)
SHELL	TELLUS 27	Tonna 33
ESSO	TERESSO 43	Teresso 52
CALTEX	REGAL R & O 68	Uni-way Oil 70
MOBIL	D.T.E LIGHT	Vactora No.2

HEADSTOCK AND FEED GEAR BOX LUBRICATION

☑ **TIP** When starting the machine, check the oil windows on the head stock and feed gear box to ensure the lubrication system is functioning properly. Oil should be visibly running down the window.

The lubrication of the Kingston HP / HPX headstock and feed gear box is provided by an oil pump. (**Fig. G**) Oil is collected in the oil tank found below the gear box, filtered, and then pumped back up to the headstock and gearbox.

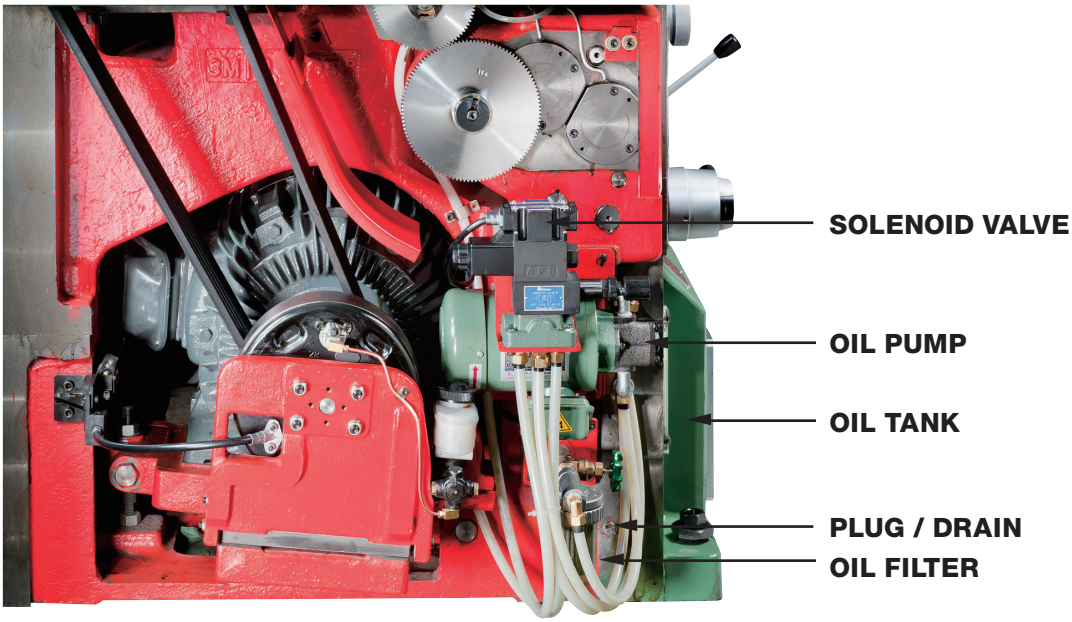


Figure G

To add oil, take away the plug on the top cover of headstock (**Fig. G**) and pour the recommended oil into the headstock. The oil will run down through the headstock and drop into the oil tank. Make sure you check the oil level gauge and do not overfill the tank.

☑ **TIP** Change the oil twice a year or when oil appears dirty.

CARRIAGE AND APRON LUBRICATION

Within the apron there is a cam device that automatically lubricates all gears, shafts, bearings and running parts. This device also supplies lubricant to the carriage and cross slide.

If a machine has not been in use for some time, pump the manual plunger pump (Fig. H-1) several times before you begin use.

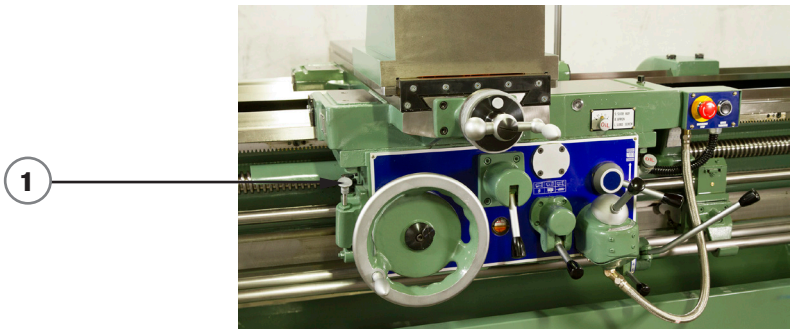


Figure H

LEAD SCREW AND FEED ROD LUBRICATION

Lubricate your lead screw and feed rod at least once or twice a day using an oil gun. Use only the grade of oil recommended (Oil Lubrication Chart p. 20).
Lubricate the starting rod regularly as well.

TAILSTOCK LUBRICATION

Daily lubrication should be done on the tailstock before operating the machine. Three oil inlets are located on the top of the tailstock (**Fig. I-1**) to add lubrication for the quill. Additional inlets are located on the front (**Fig. I-2**) and back side of the tailstock to lubricate the slide way. Use recommended oil (Oil Lubrication Chart, p. 36).

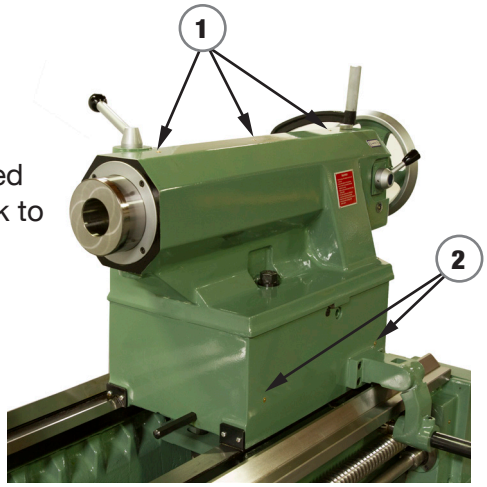


Figure I

OPERATION

Only authorized and trained personnel should operate this machine. All operators must read and familiarize themselves with the Operator's Manual, safety decals, and safety procedures and instructions for safe machine operation before turning on the lathe. Improper operation can lead to serious injury, can damage the machine, and will void the warranty.

Identify the foot brake on your lathe. The foot brake is your emergency stop and will overide any and all start commands. In case of emergency, press the foot brake until the spindle comes to a complete stop.

Before starting the lathe, check the following things:

☑ **Make sure your lathe is clean and properly lubricated** (see Lubrication Chart, p.20).

☑ **Check the spindle rotation**. When pushing the Jog Button, the main spindle rotation should be counter clockwise. If the direction of rotation is incorrect, interchange any two of the three phase lines to the power source.

☑ **Run the spindle at low speed for a few minutes**. Check the oil sight gauge to ensure the headstock lubrication pump is working.

STARTING AND STOPPING

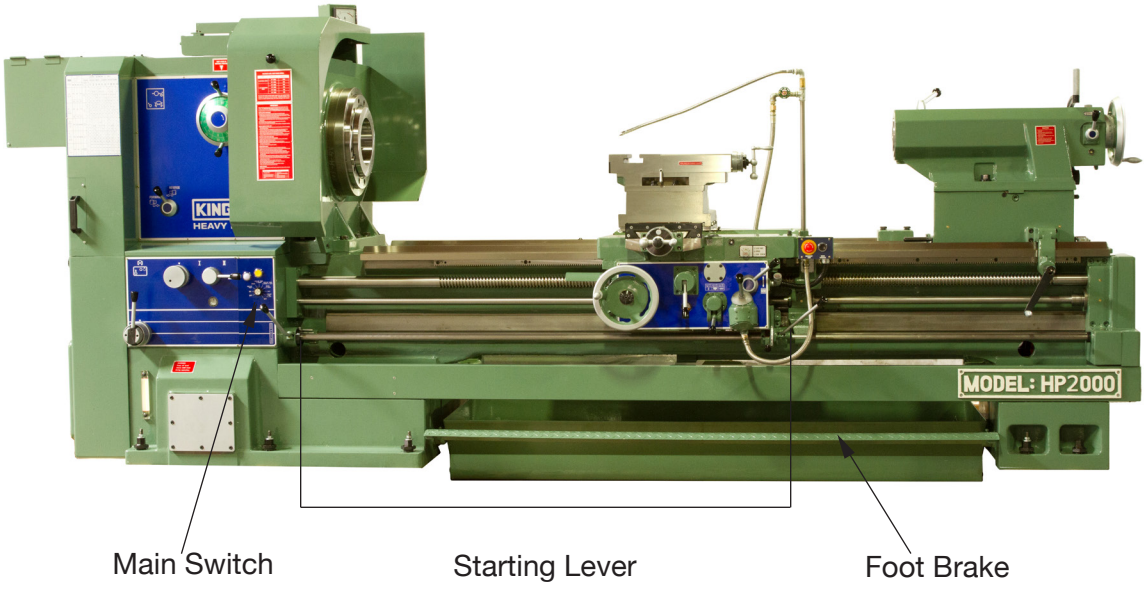


FIGURE J

Step 1 Place the starting levers in the neutral position.

Step 2 Turn the power switch ON. The power indicator should light up.

Step 3 To start the main spindle, hold and push the starting lever LEFT and then DOWN for forward revolution, or UP for reverse revolution.

Step 4 The foot brake can also be used to stop the spindle. The foot brake will override any start commands. After releasing the brake, use the starting lever to restart the spindle.

- ☑ The main spindle incorporates a safety pin to prevent abrupt starts. When the lever returns to the neutral position it engages the safety pin and the main spindle will stop.
- ☑ To jog the spindle, place the starting lever in the neutral position, then press and release the JOG button or hold down the button to run.
- ☑ A thermal relay is provided to protect the motor from overheating or from power surges. If the spindle does not run when moving the starting lever, please open the rear electrical cabinet and reset the thermal relay.

SELECTING SPINDLE SPEEDS - HP MODEL

Do not change the spindle speed while the spindle is rotating. Doing so will result in damage to the lathe and will void your warranty.

The HP model is equipped with a 16 step spindle speed range from 8 – 800 RPM.

Select the desired spindle speed (**Fig. K**) also located around the spindle speed lever (**Fig**. **L-1**). Select H or L (**Fig. L-2**) for High or Low.

H	275	370	500	700	24	30	45	60
L	95	130	175	243	8	11	15	20

FIGURE K



FIGURE L

☑ **TIP** Make sure the spindle speed dial lever is in the vertical position after the selected speed is in line with the indicating arrows. Do not turn the select lever while gears are running.

SELECTING SPINDLE SPEEDS - HPX MODEL

Do not change the spindle speed while the spindle is rotating. Doing so will result in damage to the lathe and will void your warranty.

The HPX model is equipped with a 16 step spindle speed range from 9 – 600 RPM.

Select your desired speed by looking at the chart on the headstock (**Fig. M-1**), then set the lever to either the H or L position (**Fig. M-2**) for high or low speed range. Shift-lever (**Fig M-3**) to either A or B, and finally shift lever (**Fig. M-4**) to the correct position I, II, II or IV.

Note: Select dial (**Fig. M-4**) can be turned in either direction.



min	I	II	III	IV
A H	600	443	322	237
A L	264	195	141	104
B H	53	39	28	21
B L	23	17	12	9

FIGURE M

SELECTING FEEDS

Determine the proper feed rate using the Feed and Thread Chart.

Step 1 Place lever (**Fig. N-1**) to position III for feeding.

Step 2 Select and turn dial (**Fig. N-2**) to H, S, T or L.

Step 3 Pull down the 10 step change lever (**Fig. N-3**) to disengage the gear and turn to select Step 1-10 for desired feed rate. Push back the lever to engage the gear.

Note: Fine & Coarse feeds can be adjusted by lever (A/B) on the headstock.

☑ **TIP** The cross feed is 1/2 of the longitudinal feed.

SELECTING THREADS

Place Lever (**Fig. N-1**) to position I or II for threading

SELECTING MULTI START THREAD

To cut a regular multi start thread (**Fig. O & P**) such as a 2 start thread, pull out the inner index gear (C) and turn the main spindle so that the gear tooth at the 0 position indicated on the plate (B) is turned to the 30 position. Then, push the gear back in to reengage the gear.

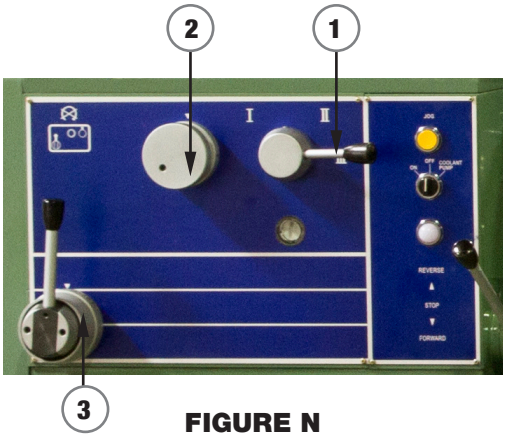


FIGURE N

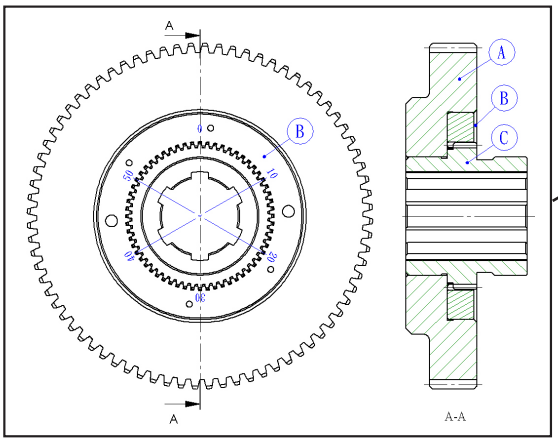


FIGURE O

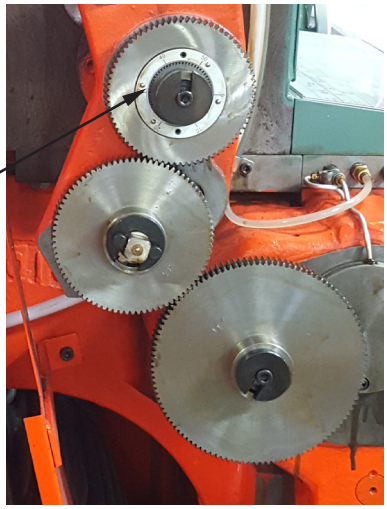


FIGURE P

FEED AND THREAD CHARTS

LEAD SCREW = 2TPI

	M	N1	N2	O			LEAD SCREW 2 TPI FEED GEAR BOX LEVER POSITION 1	2	3	4	5	6	7	8	9	10
mm	76	84		114	II	L	1	–	–	1.25	–	–	1.5	–	–	1.75
						T	2	2.25	–	2.5	2.75	–	3	3.25	–	3.5
						S	4	4.5	4.75	5	5.5	5.75	6	6.5	6.75	7
						H	8	9	9.5	10	11	11.5	12	13	13.5	14
	76	114		57		H	16	18	19	20	22	23	24	26	27	28
1"	76	84		114	I	H	2	2¼	2⅜	2½	2¾	2⅞	3	3¼	3⅜	3½
						S	4	4½	4¾	5	5½	5¾	6	6½	6¾	7
						T	8	9	9½	10	11	11½	12	13	13½	14
						L	16	18	19	20	22	23	24	26	27	28
	76	114		57		H	1	1⅛	1⅜	1¼	1⅜	1⅞	1½	1⅝	1¹⁵⁄₁₆	1¾
mm / π	76	76	110	105	II	L	.5	–	–	–	–	–	.75	–	–	–
						T	1	–	–	1.25	–	–	1.5	–	–	1.75
						S	2	2.25	–	2.5	2.75	–	3	3.25	–	3.5
						H	4	4.5	–	5	5.5	–	6	6.5	–	7
π / inch	76	76	110	105	I	H	4	4½	4¾	5	5½	5¾	6	6½	6¾	7
						S	8	9	9½	10	11	11½	12	13	13½	14
						T	16	18	19	20	22	23	24	26	27	28
						L	32	36	38	40	44	46	48	52	54	56
inch	76	84		114	III	L	.0024	.0027	.0029	.0030	.0033	.0035	.0036	.0039	.0041	.0042
						T	.0048	.0054	.0057	.0060	.0066	.0069	.0072	.0078	.0081	.0084
						S	.0096	.0108	.0114	.0120	.0132	.0138	.0144	.0156	.0162	.0168
						H	.0192	.0216	.0228	.0240	.0265	.0277	.0289	.0313	.0325	.0337

LEAD SCREW P = 12mm

	M	N1	N2	O			LEAD SCREW P= 12mm FEED GEAR BOX LEVER POSITION 1	2	3	4	5	6	7	8	9	10
mm	76	87	84	104	II	L	1	–	–	1.25	–	–	1.5	–	–	1.75
						T	2	2.25	–	2.5	2.75	–	3	3.25	–	3.5
						S	4	4.5	4.75	5	5.5	5.75	6	6.5	6.75	7
						H	8	9	9.5	10	11	11.5	12	13	13.5	14
	76	87	126	78		H	16	18	19	20	22	23	24	26	27	28
1"	76	87	84	104	I	H	2	2¼	2⅜	2½	2¾	2⅞	3	3¼	3⅜	3½
						S	4	4½	4¾	5	5½	5¾	6	6½	6¾	7
						T	8	9	9½	10	11	11½	12	13	13½	14
						L	16	18	19	20	22	23	24	26	27	28
	76	87	126	78		H	1	1⅛	1⅜	1¼	1⅜	1⅞	1½	1⅝	1¹⁵⁄₁₆	1¾
mm / π	76	78	99	87	II	L	.5	–	–	–	–	–	.75	–	–	–
						T	1	–	–	1.25	–	–	1.5	–	–	1.75
						S	2	2.25	–	2.5	2.75	–	3	3.25	–	3.5
						H	4	4.5	–	5	5.5	–	6	6.5	–	7
π / inch	76	78	99	87	I	H	4	4½	4¾	5	5½	5¾	6	6½	6¾	7
						S	8	9	9½	10	11	11½	12	13	13½	14
						T	16	18	19	20	22	23	24	26	27	28
						L	32	36	38	40	44	46	48	52	54	56
mm	76	87	84	104	III	L	.06	.07	.07	.08	.08	.09	.09	.10	.10	.11
						T	.12	.13	.14	.15	.16	.17	.18	.19	.20	.21
						S	.24	.27	.29	.30	.33	.35	.36	.39	.41	.42
						H	.48	.54	.57	.60	.66	.69	.72	.78	.81	.84

CARRIAGE AND APRON

Lever (**Fig. Q-1**) engages and disengages the longitudinal and cross feeds.

Select lever (**Fig. Q-2**) changes the longitudinal feeds, cross feeds and thread cutting.

Lever **(Fig.Q-3**) the 4 way rapid traverse. If you push up on the lever you can have three times the normal feed.

Lever (**Fig. Q-4**) engages and disengages the thread cutting.

An interlocking device is incorporated so that the feed and the half nut engagement will not work at the same time.

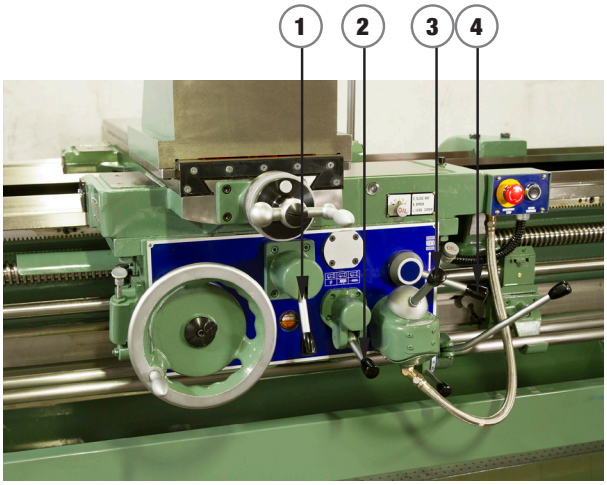


FIGURE Q

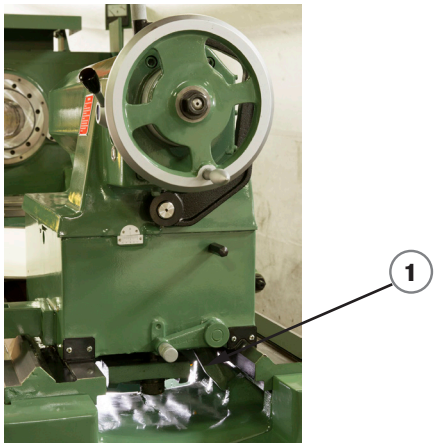


FIGURE R

TAILSTOCK

The diameter of the tailstock quill is 5 1/8” (130mm) for heavy duty loading and cutting. A uniguely designed stopper (**Fig. Q-1**) beneath the tailstock can be locked to avoid any slippage while cutting.

HYDRAULIC BRAKE SYSTEM

When pressing the spindle stop button to cut off the main motor, the hydraulic brake system stops the spindle automatically. The circuit diagram of this system is shown in Figure R.

When the main spindle is running, the solenoid valve (**Fig. S**) is in the OFF position and the lubrication system will continue to run. When the main spindle is stopped, the solenoid valve turns ON and the hydraulic brake system is ON.

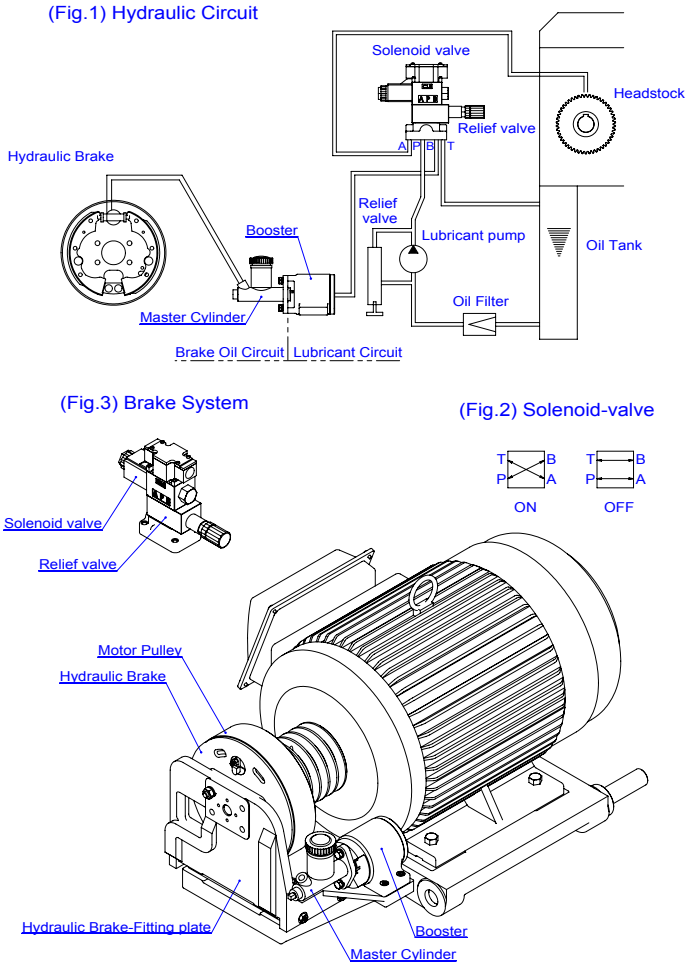


FIGURE S

TIP Hydraulic pressure can be adjusted from 3kg/cm^2 to 10kg/cm^2.

TIP Automotive brake fluid, such as DOT 3 can be used in this hydraulic brake system.

SEMI-AUTOMATIC AIR THREADING ATTACHMENT (OPTION)

The Semi-Automatic Air Threading Attachment is an optional feature on the HP and HPX models. Please find a sample procedure below and the diagram on p. 32 - 34 to help you understand how to operate this useful feature.

Procedure to thread an oil pipe at 4 threads per inch and ¾ inch taper per foot:

Step 1 Adjust the regulator pressure (**Fig. T**).

Step 2 Set the taper attachment to ¾" taper per foot.

Step 3 Select 4 TPI from the feed gear box.

Step 4 Select the main spindle speed.

Step 5 Move the carriage until the tool almost touches the end of the thread.

Step 6 Set the micrometer carriage until it is lightly touching the micro switch on the carriage that will actuate air cylinders when threading.

Step 7 Turn on the spindle.

Step 8 Select Internal or External thread.

Step 9 Make the first thread cut by pushing the thread button that actuates the system. This will cause the cross feed to move toward the center of the lathe for external threads or away from the center of the lathe for internal threads and simultaneously close the half nuts. When the carriage has moved towards the headstock far enough, it will engage the micro switch of the Micrometer Carriage Stop and actuate the cross slide to retract away from the lathe center for external threads or towards the center for internal threads and open the half nuts. (**Fig. U**)

Step 10 Using the hand wheel, move the carriage back into position for the second thread cut.

Step 11 Turn the cross feed handle to the desired depth of cut for the next thread cut. While the carriage is following the lead toward the headstock, the operator can adjust the Micrometer Carriage Stop, if necessary.

Step 12 Repeat step #11 as many times as necessary until the thread cut is completed.

☑ **TIP** The kick-out / kick-in cross slide stroke is properly set at about ¼" by the factory. To adjust this stroke see **Fig. U**. Air flow can also be adjusted see **Fig. V**.

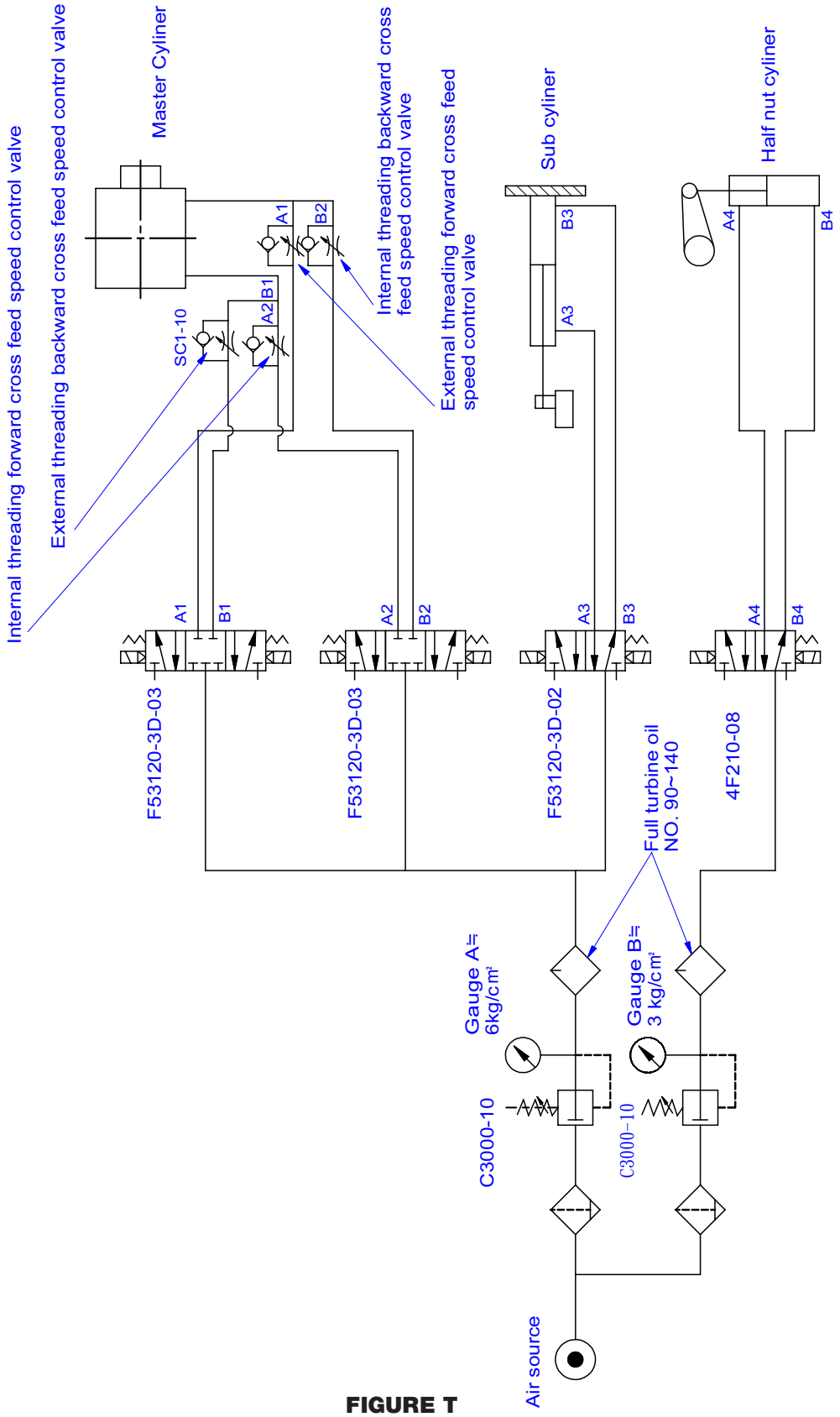

Internal threading forward cross feed speed control valve
External threading backward cross feed speed control valve
Master Cyliner
Internal threading backward cross feed speed control valve
External threading forward cross feed speed control valve
Sub cyliner
Half nut cyliner
SC1-10
A1
B2
B1
A2
A3
B3
A4
B4
F53120-3D-03
F53120-3D-03
F53120-3D-02
4F210-08
Full turbine oil NO.90~140
Gauge A≒ 6kg/cm²
Gauge B≒ 3 kg/cm²
C3000-10
C3000-10
Air source

FIGURE T

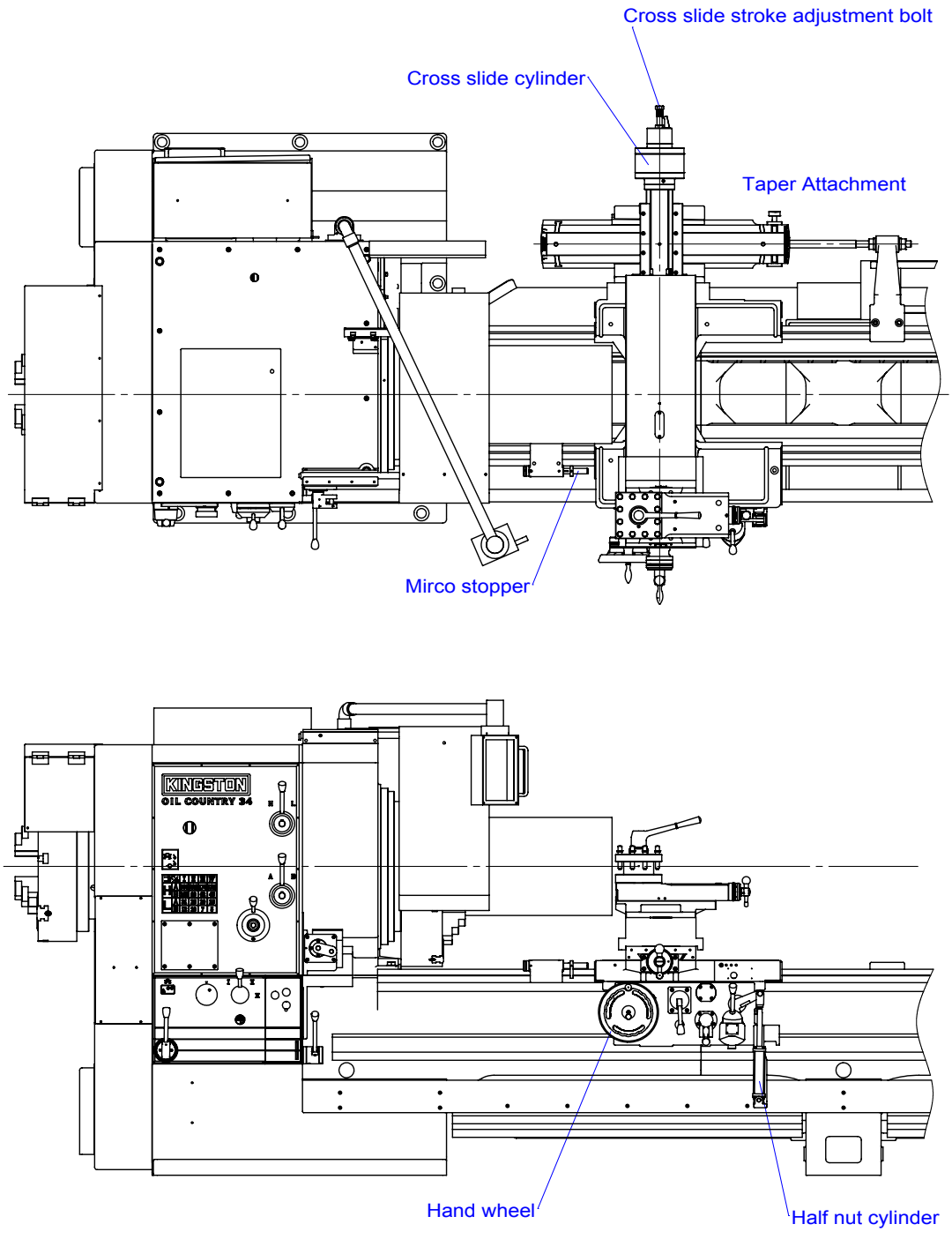

Cross slide stroke adjustment bolt
Cross slide cylinder
Taper Attachment
Mirco stopper
KINGSTON
OIL COUNTRY 34
Hand wheel
Half nut cylinder

FIGURE U

SEMI-AUTO THREADING SPEED CONTROL

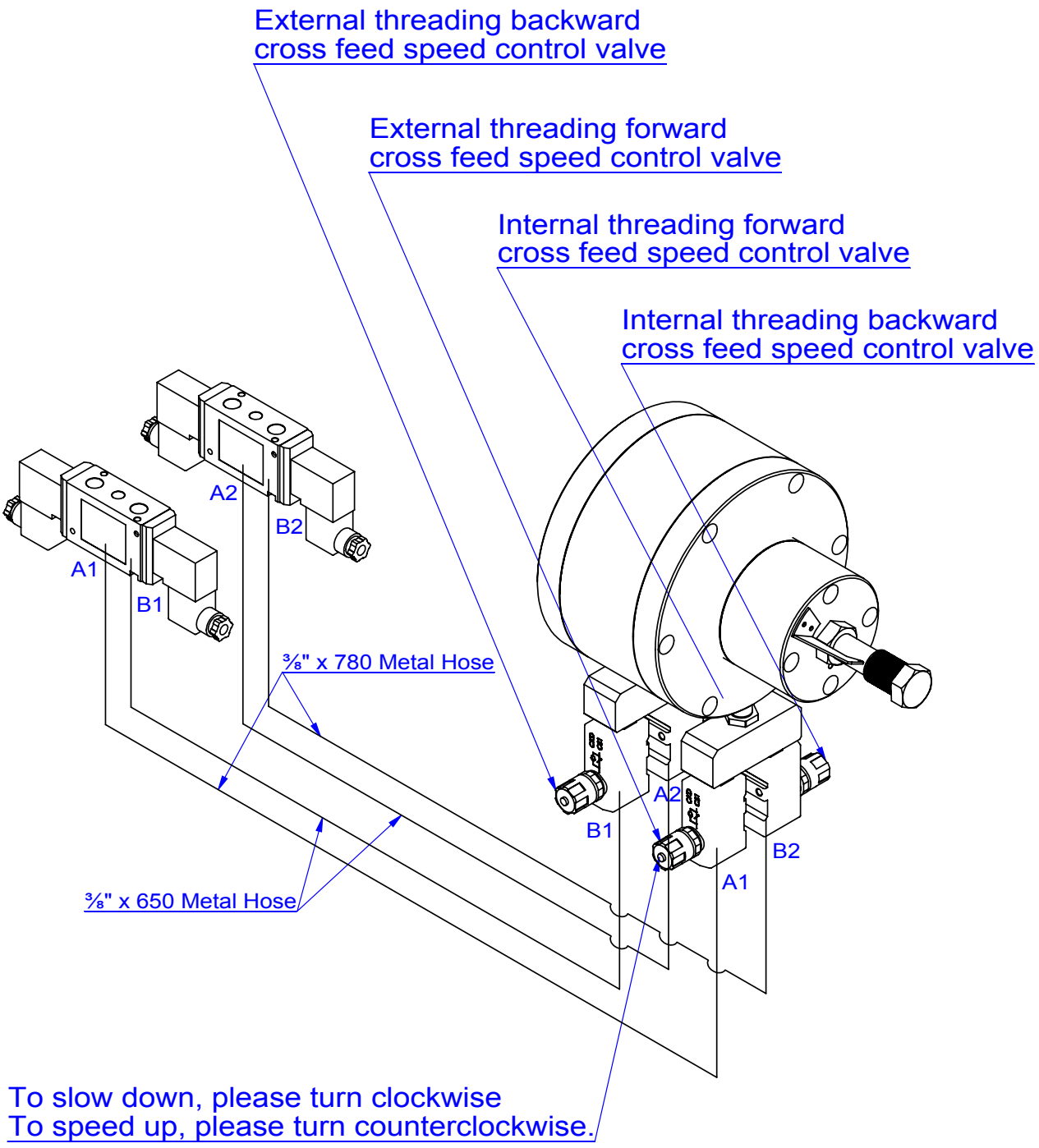


FIGURE V

MAINTENANCE

SPINDLE BEARING ADJUSTMENT

Do not adjust bearings unless absolutely necessary. Spindle bearings are adjusted and set by the factory prior to delivery. If you must adjust, only authorized personnel or qualified technicians should perform any adjustments.

After long time use, chatter may occur on the cutting surface which may be caused by loss of pre-load pressure on the bearings. If an adjustment is unavoidable, follow the steps below:

Step 1 Place lever to the neutral position so that all gears disengage from the main spindle.

Step 2 Remove the spindle end cover and tighten lock nuts (**Fig.W-1 & Fig.W-1**) carefully to pre-load the bearings. Check the resistance of the spindle rotation by hand as you gradually tighten the nuts.

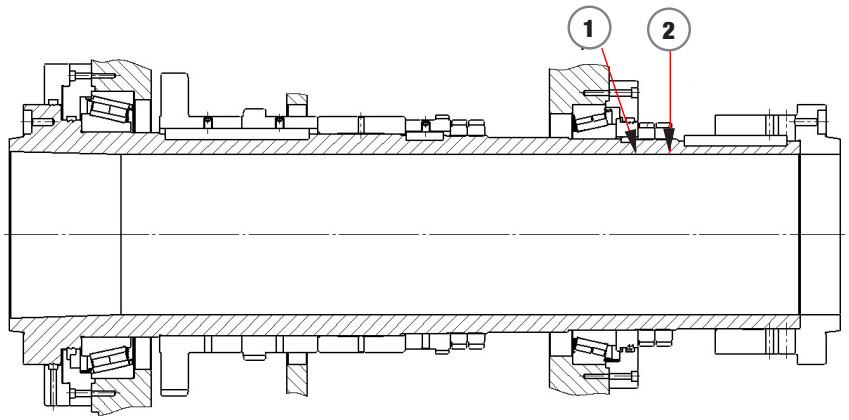


FIGURE W

Excessive pressure can cause serious damage to the bearings. Too much pre-load on the bearing may cause it to overheat, make an abnormal noise, or damage the spindle bearings.

GIB ADJUSTMENT

There is a gib in the cross slide and another in the tool slide.

To adjust the gib in the tool slide (**Fig. X**), loosen adjusting screw (B) and tighten adjusting screw (A). Move the tool slide and check the adjustment. When satisfied with the adjustment, then tighten screw (B).

To adjust the gib in the cross slide, remove the felt cover at the front and loosen the adjusting screw beneath. Tighten the adjusting screw at the rear of the cross slide until satisfied, then retighten the front screw and replace felt cover.

ADJUSTING THE FEMALE SCREW ON CROSS SLIDE

To adjust the backlash for the cross slide female screw (**Fig. Y**), remove screw (A) and take off the cover (B). Loosen bolt (E) and tighten bolt (D). This should minimize the backlash. When finished, then retighten (C), (D) & (E.) Then replace the cover (B) and replace screw (A).

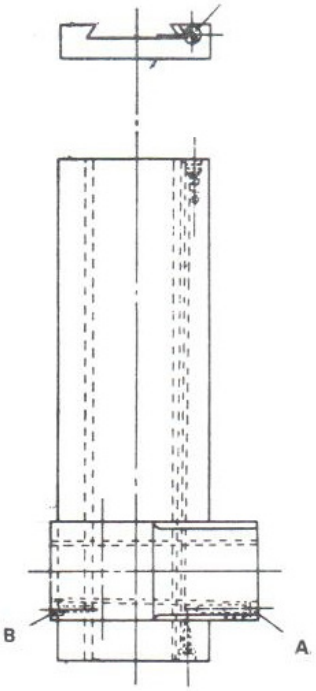


FIGURE X

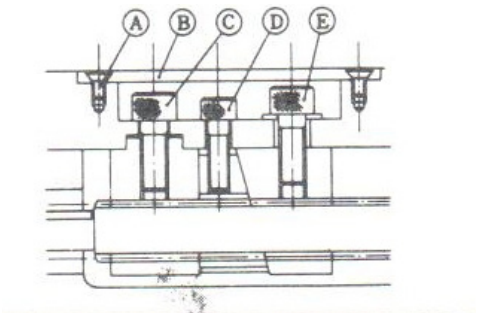


FIGURE Y

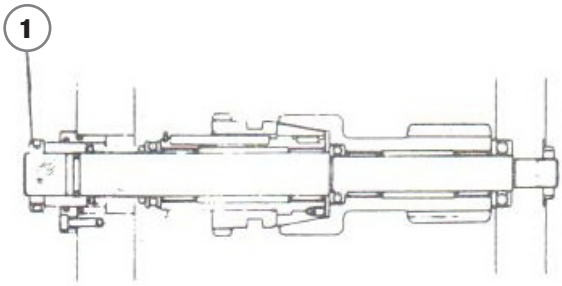


FIGURE Z

ADJUSTING THE OVERLOAD SAFETY DEVICE

A cone clutch is incorporated in the apron (**Fig.Z**). To adjust, tighten the clamping nut (**Fig. Z-1**) located at the left of the apron. Do not over-tighten the nut to extend the life of your lathe's cone clutch.

PARTS LIST

Headstock I - HP	39
Headstock II - HP	43
Headstock I - HPX 34”	47
Headstock I - HPX 40”	51
Headstock II - HPX	55
Feed Gear Box I	57
Feed Gear Box II	61
Apron	65
Carriage	71
Tool Slide	75
Tool Slide (American Type)	77
Tailstock	79
Assembly of Bed and Leg	83
Quadrant	85
Support for Lead Screw, Feed Rod & Starting Rod	87
Rapid Traverse Attachment	89
Accessories Start Page	91
Micro-Carriage Stop	92
Thread Chasing Dial	94
Turret Carriage Stop	96
Follow Rest	98
Steady Rest	101
Coolant System	104
Chip Cover	106
Infeed Plunge Cutting Attachment	108
Drilling Attachment	110
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