

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 **RED EMERGENCY STOP BUTTON** on the control panel. This is your emergency stop button. In case of an emergency, press the **RED EMERGENCY STOP BUTTON** 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. 36).
- 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 work holding procedures.
- Do not modify workholding equipment.
- Regularly service and grease daily your chucks 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

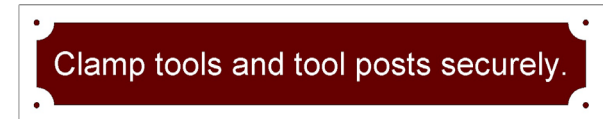
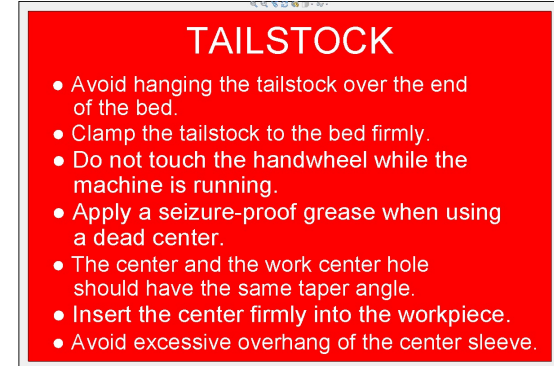
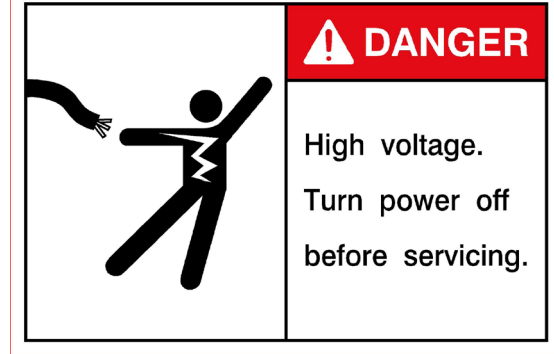
- Review the care and safety guidelines from the workholder manufacturer.
- Use the correct chuck size and never extend the chuck jaws past the body of the chuck.
- Be careful not to drop the chuck when mounting or removing it.
- The power switch must be in the OFF position when chucking a work piece.
- 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.



MACHINE OVERVIEW

DESCRIPTION OF DRIVING UNIT

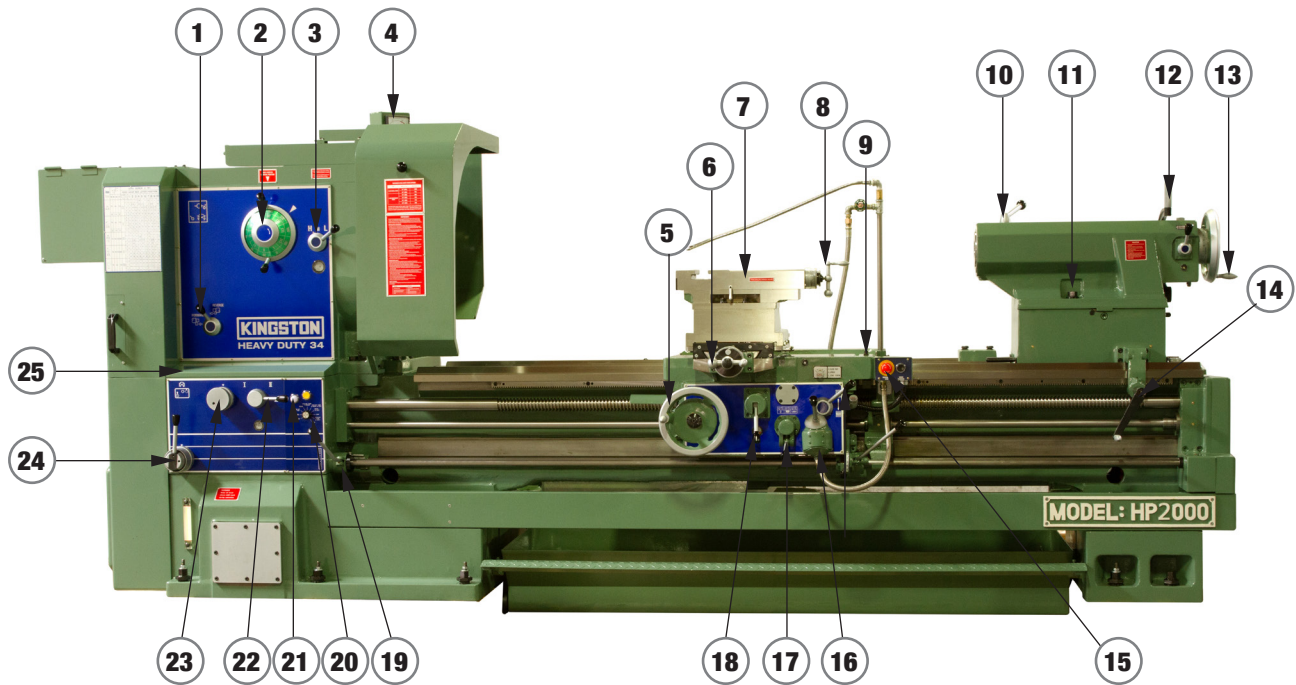


Figure A

- | | |
|--|---|
| 1. Forward and reverse lever for feeds and threads | 14. Change lever for 10 steps of feed change |
| 2. Spindle speeds change lever | 15. 4 step change knob |
| 3. Spindle speeds change lever | 16. Feeds and threads change lever |
| 4. Hand-wheel for longitudinal feeds | 17. Pilot lamp |
| 5. Toolslide | 18. Jog push button |
| 6. Toolslide clamping lever | 19. Main switch (multi-purpose select) |
| 7. Handle for cross feeds | 20. Starting-up lever |
| 8. Handle for tool slide feeds | 21. Feeds engaging and disengaging lever |
| 9. Clamping bolt for carriage | 22. Change lever for longitudinal, cross feed, and half nut |
| 10. Clamping lever for tailstock quill | 23. 4 way rapid traverse |
| 11. Clamping lever for tailstock body | 24. Oil inlet |
| 12. Hand-wheel for tailstock quill movement | 25. Half-nut lever |
| 13. Feeds and threads table | 26. Thread chasing dial |
| | 27. Ampere meter |

MACHINE OVERVIEW

DESCRIPTION OF DRIVING UNIT

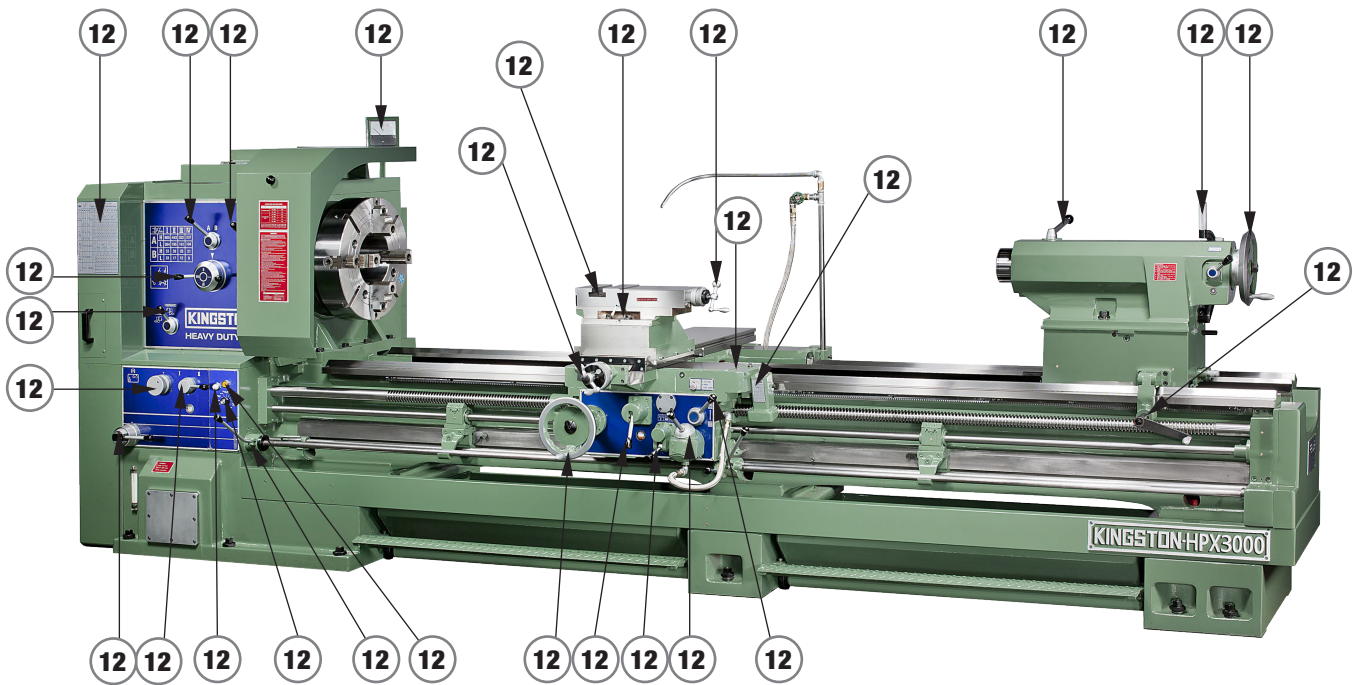


Figure A

- | | |
|---|---|
| 1. Spindle speeds change lever | 14. Feeds and Threads Table |
| 2. Spindle speeds change lever | 15. 10 Step norton system lever |
| 3. Spindle speeds change lever | 16. 4 step change knob |
| 4. Control Panel | 17. Feeds & threads change lever |
| 5. Handle for cross feeds | 18. Pilot lamp |
| 6. Handle for tool slide feeds | 19. Jog push button |
| 7. Spindle start and stop button | 20. Main Switch (multi-purpose select) |
| 8. Clamping lever for tailstock quill | 21. Starting lever |
| 9. Clamping nut for tailstock body | 22. Feeds engaging and disengaging lever |
| 10. Clamping lever for tailstock body | 23. Change lever for longitudinal, cross feed, and half nut |
| 11. Change lever of tailstock spindle feed. | 24. 4 ways rapid traverse |
| 12. Hand-wheel for tailstock spindle movement | 25. Oil inlet |
| 13. Tailstock body crank | |

HK / HG LATHE 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 Feeds per Rev	0.0024" - 0.0337" (0.06 mm - 0.89 mm)						
Longitudinal Cross	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 Cros 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 Mother is 30 HP (22.5KW). Coolant pump is ¼ HP (180W). Rapid Motor is 1HP.

AC Power Requirements

3 phase, 230V 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 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, 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.10a, 10 b) 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



Warning! 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. B**). 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 1/2" 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.

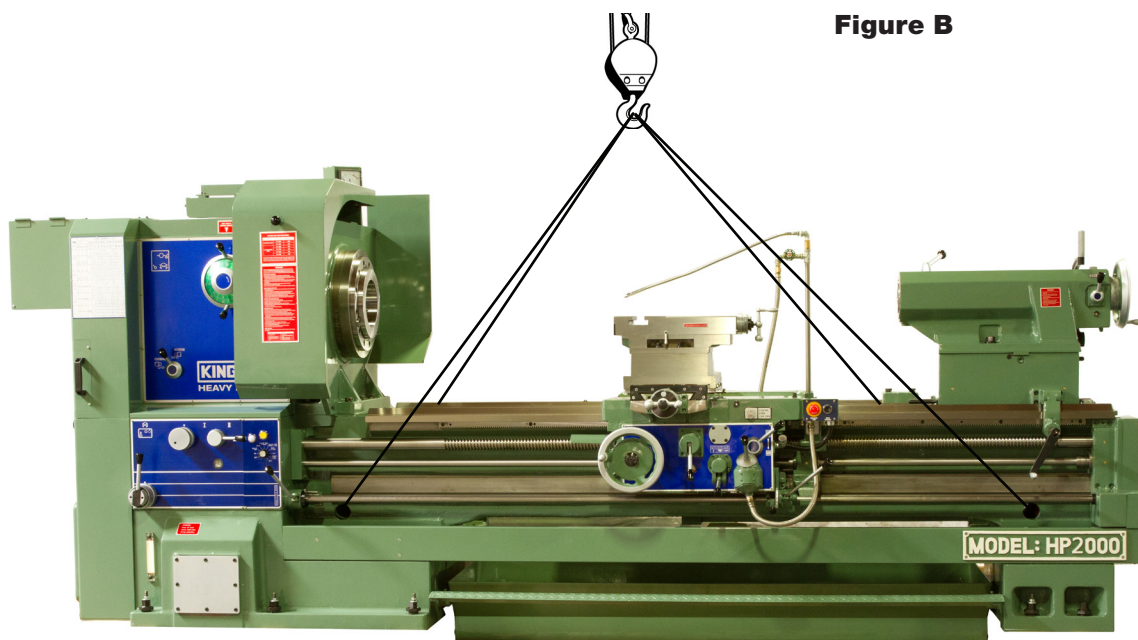


Figure B

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. C-1 & C-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.

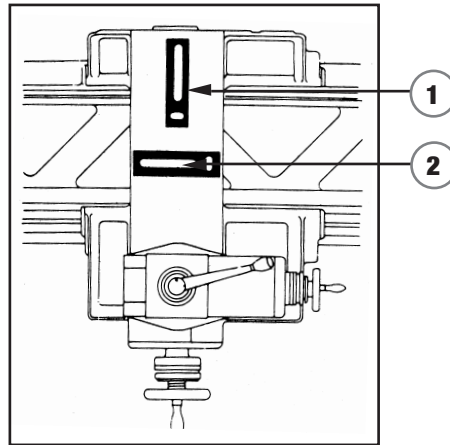


Figure C

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. 36 for scheduled maintenance.

ELECTRICAL



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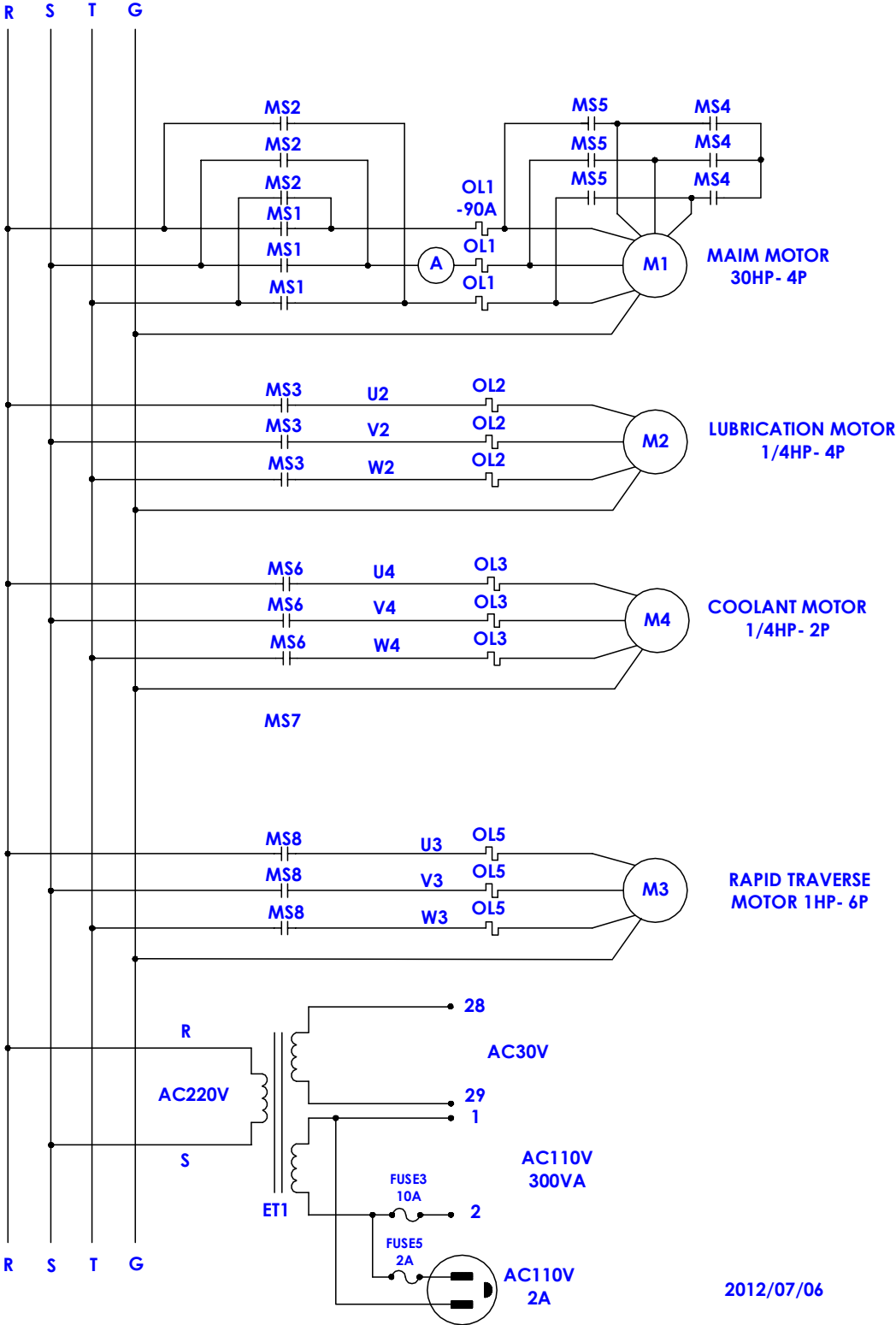
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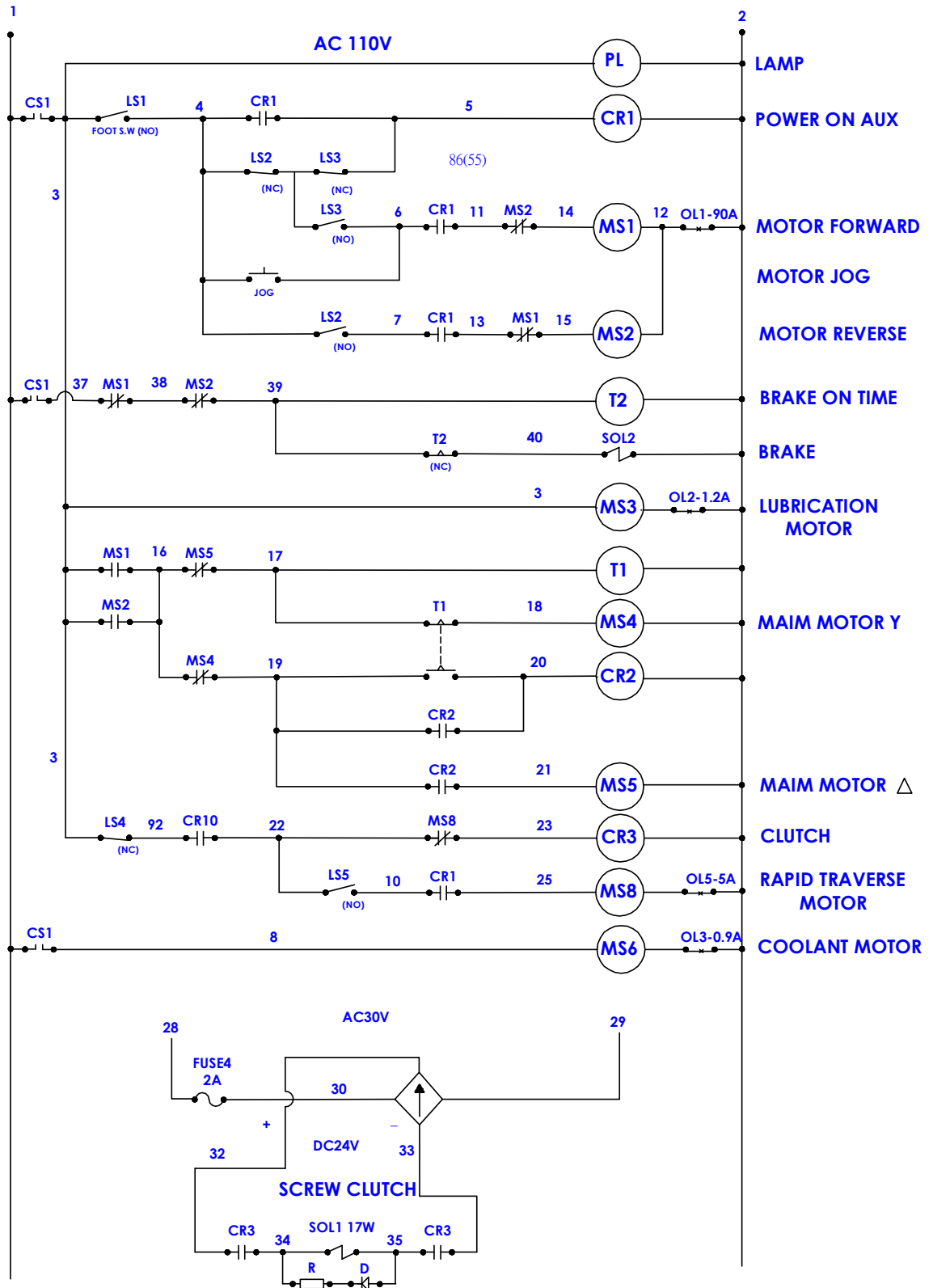
 **TIP** Routinely check for exposed cables which can be damaged by moving parts or exposure to chips. Repair damaged cables immediately.

HP / HPX ELECTRICAL WIRE DIAGRAM



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