OPERATOR'S MANUAL

Metal Working

Book 1 of 2

METAL LATHE

MODEL: PL-1440E-1.0

Baileigh Industrial Holdings LLC
P.O. Box 531
Manitowoc, WI 54221-0531
Phone: 920.684.4990
Fax: 920.684.3944
sales@baileigh.com

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THANK YOU & WARRANTY

Thank you for your purchase of a machine from Baileigh Industrial Holdings LLC. We hope that you find it productive and useful to you for a long time to come.

Inspection & Acceptance. Buyer shall inspect all Goods within ten (10) days after receipt thereof. Buyer's payment shall constitute final acceptance of the Goods and shall act as a waiver of the Buyer's rights to inspect or reject the goods unless otherwise agreed. If Buyer rejects any merchandise, Buyer must first obtain a Returned Goods Authorization ("RGA") number before returning any goods to Seller. Goods returned without a RGA will be refused. Seller will not be responsible for any freight costs, damages to goods, or any other costs or liabilities pertaining to goods returned without a RGA. Seller shall have the right to substitute a conforming tender. Buyer will be responsible for all freight costs to and from Buyer and repackaging costs, if any, if Buyer refuses to accept shipment. If Goods are returned in unsalable condition, Buyer shall be responsible for full value of the Goods. Buyer may not return any special-order Goods. Any Goods returned hereunder shall be subject to a restocking fee equal to 30% of the invoice price.

Specifications. Seller may, at its option, make changes in the designs, specifications or components of the Goods to improve the safety of such Goods, or if in Seller's judgment, such changes will be beneficial to their operation or use. Buyer may not make any changes in the specifications for the Goods unless Seller approves of such changes in writing, in which event Seller may impose additional charges to implement such changes.

Limited Warranty. Seller warrants to the original end-user that the Goods manufactured or provided by Seller under this Agreement shall be free of defects in material or workmanship for a period of twelve (12) months from the date of purchase, provided that the Goods are installed, used, and maintained in accordance with any instruction manual or technical guidelines provided by the Seller or supplied with the Goods, if applicable. The original end-user must give written notice to Seller of any suspected defect in the Goods prior to the expiration of the warranty period. The original end-user must also obtain a RGA from Seller prior to returning any Goods to Seller for warranty service under this paragraph. Seller will not accept any responsibility for Goods returned without a RGA. The original end-user shall be responsible for all costs and expenses associated with returning the Goods to Seller for warranty service. In the event of a defect, Seller, at its sole option, shall repair or replace the defective Goods or refund to the original end-user the purchase price for such defective Goods. Goods are not eligible for replacement or return after a period of 10 days from date of receipt. The foregoing warranty is Seller's sole obligation, and the original end-user's exclusive remedy, with regard to any defective Goods. This limited warranty does not apply to: (a) die sets, tooling, and saw blades; (b) periodic or routine maintenance and setup, (c) repair or replacement of the Goods due to normal wear and tear, (d) defects or damage to the Goods resulting from misuse, abuse, neglect, or accidents, (f) defects or damage to the Goods resulting from improper or unauthorized alterations, modifications, or changes; and (f) any Goods that has not been installed and/or maintained in accordance with the instruction manual or technical guidelines provided by Seller.

EXCLUSION OF OTHER WARRANTIES. THE FOREGOING LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. ANY AND ALL OTHER EXPRESS, STATUTORY OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. NO WARRANTY IS MADE WHICH EXTENDS BEYOND THAT WHICH IS EXPRESSLY CONTAINED HEREIN.

Limitation of Liability. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER OR ANY OTHER PARTY FOR ANY INCIDENTIAL, CONSEQUENTIAL OR SPECIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR DOWN TIME) ARISING FROM OR IN MANNER CONNECTED WITH THE GOODS, ANY BREACH BY SELLER OR ITS AGENTS OF THIS AGREEMENT, OR ANY OTHER CAUSE WHATSOEVER, WHETHER BASED ON CONTRACT, TORT OR ANY OTHER THEORY OF LIABILITY. BUYER'S REMEDY WITH RESPECT TO ANY CLAIM ARISING UNDER THIS AGREEMENT IS STRICTLY LIMITED TO NO MORE THAN THE AMOUNT PAID BY THE BUYER FOR THE GOODS.

Force Majuere. Seller shall not be responsible for any delay in the delivery of, or failure to deliver, Goods due to causes beyond Seller's reasonable control including, without limitation, acts of God, acts of war or terrorism, enemy actions, hostilities, strikes, labor difficulties, embargoes, non-delivery or late delivery of materials, parts and equipment or transportation delays not caused by the fault of Seller, delays caused by civil authorities, governmental regulations or orders, fire, lightening, natural disasters or any other cause beyond Seller's reasonable control. In the event of any such delay, performance will be postponed by such length of time as may be reasonably necessary to compensate for the delay.

Installation. If Buyer purchases any Goods that require installation, Buyer shall, at its expense, make all arrangements and connections necessary to install and operate the Goods. Buyer shall install the Goods in accordance with any Seller instructions and shall indemnify Seller against any and all damages, demands, suits, causes of action, claims and expenses (including actual attorneys' fees and costs) arising directly or indirectly out of Buyer's failure to properly install the Goods.

Work By Others; Safety Devices. Unless agreed to in writing by Seller, Seller has no responsibility for labor or work performed by Buyer or others, of any nature, relating to design, manufacture, fabrication, use, installation or provision of Goods. Buyer is solely responsible for furnishing, and requiring its employees and customers to use all safety devices, guards and safe operating procedures required by law and/or as set forth in manuals and instruction sheets furnished by Seller. Buyer is responsible for consulting all operator manuals, ANSI or comparable safety standards, OSHA regulations and other sources of safety standards and regulations applicable to the use and operation of the Goods.

Remedies. Each of the rights and remedies of Seller under this Agreement is cumulative and in addition to any other or further remedies provided under this Agreement or at law or equity.

Attorney's Fees. In the event legal action is necessary to recover monies due from Buyer or to enforce any provision of this Agreement, Buyer shall be liable to Seller for all costs and expenses associated therewith, including Seller's actual attorney fees and costs.

Governing Law/Venue. This Agreement shall be construed and governed under the laws of the State of Wisconsin, without application of conflict of law principles. Each party agrees that all actions or proceedings arising out of or in connection with this Agreement shall be commenced, tried, and litigated only in the state courts sitting in Manitowoc County, Wisconsin or the U.S. Federal Court for the Eastern District of Wisconsin. Each party waives any right it may have to assert the doctrine of "forum non conveniens" or to object to venue to the extent that any proceeding is brought in accordance with this section. Each party consents to and waives any objection to the exercise of personal jurisdiction over it by courts described in this section. Each party waives to the fullest extent permitted by applicable law the right to a trial by jury.

Summary of Return Policy.

- 10 Day acceptance period from date of delivery. Damage claims and order discrepancies will not be accepted after this time.
- You must obtain a Baileigh issued RGA number PRIOR to returning any materials.
- Returned materials must be received at Baileigh in new condition and in original packaging.
- Altered items are not eligible for return.
- Buyer is responsible for all shipping charges.
- A 30% re-stocking fee applies to all returns.

Baileigh Industrial Holdings LLC makes every effort to ensure that our posted specifications, images, pricing and product availability are as correct and timely as possible. We apologize for any discrepancies that may occur. Baileigh Industrial Holdings LLC reserves the right to make any and all changes deemed necessary in the course of business including but not limited to pricing, product specifications, quantities, and product availability.

For Customer Service & Technical Support:
Please contact one of our knowledgeable Sales and Service team members at:
(920) 684-4990 or e-mail us at sales@baileigh.com

INTRODUCTION

The quality and reliability of the components assembled on a Baileigh Industrial Holdings LLC machine guarantee near perfect functioning, free from problems, even under the most demanding working conditions. However, if a situation arises, refer to the manual first. If a solution cannot be found, contact the distributor where you purchased our product. Make sure you have the serial number and production year of the machine (stamped on the nameplate). For replacement parts refer to the assembly numbers on the parts list drawings.

Our technical staff will do their best to help you get your machine back in working order.

In this manual you will find: (when applicable)

- Safety procedures
- Correct installation guidelines
- Description of the functional parts of the machine
- Capacity charts
- Setup and start-up instructions
- Machine operation
- Scheduled maintenance
- Parts lists

GENERAL NOTES

After receiving your equipment remove the protective container. Do a complete visual inspection, and if damage is noted, **photograph it for insurance claims** and contact your carrier at once, requesting inspection. Also contact Baileigh Industrial Holdings LLC and inform them of the unexpected occurrence. Temporarily suspend installation.

Take necessary precautions while loading / unloading or moving the machine to avoid any injuries.

Your machine is designed and manufactured to work smoothly and efficiently. Following proper maintenance instructions will help ensure this. Try and use original spare parts, whenever possible, and most importantly; **DO NOT** overload the machine or make any modifications.

Note: *This symbol refers to useful information throughout the manual.*

IMPORTANT

PLEASE READ THIS OPERATORS MANUAL CAREFULLY

It contains important safety information, instructions, and necessary operating procedures. The continual observance of these procedures will help increase your production and extend the life of the equipment.

SAFETY INSTRUCTIONS

LEARN TO RECOGNIZE SAFETY INFORMATION

This is the safety alert symbol. When you see this symbol on your machine or in this manual, **BE ALERT TO THE POTENTIAL FOR PERSONAL INJURY!**

Follow recommended precautions and safe operating practices.

UNDERSTAND SIGNAL WORDS

A signal word – **DANGER**, **WARNING**, or **CAUTION** – is used with the safety alert symbol. **NOTICE**, which is not related to personal injury, is used without a symbol.

DANGER: Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING: Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

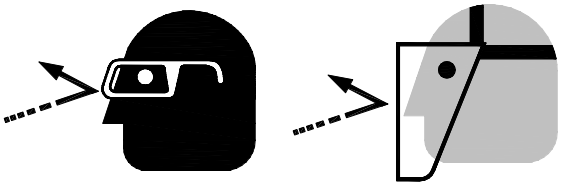
CAUTION: Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE: Indicates a situation which, if not avoided, could result in property damage.

SAVE THESE INSTRUCTIONS.
Refer to them often and use them to instruct others.

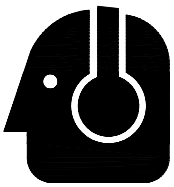
PROTECT EYES

Wear safety glasses or suitable eye protection when working on or around machinery.



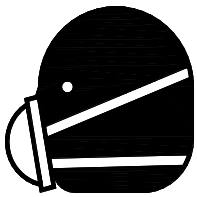
PROTECT AGAINST NOISE

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear suitable hearing protective devices such as ear muffs or earplugs to protect against objectionable or uncomfortable loud noises.



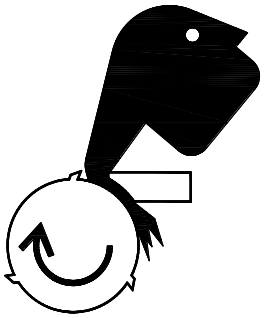
DUST HAZARD

Wear appropriate dust mask. Dust created while using machinery can cause cancer, birth defects, and long term respiratory damage. Be aware of the dust hazards associated with all types of materials.



ENTANGLEMENT HAZARD – ROTATING BLADES

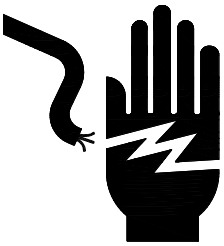
Contain long hair, **DO NOT** wear jewelry or loose fitting clothing.



ROTATING TOOL HAZARD

Keep hands and body clear while operating. Rotating chuck can cut, dismember, snag, and entrap. Flying chips, splinters, and other particles can cause serious injury or death.

HIGH VOLTAGE



USE CAUTION IN HIGH VOLTAGE AREAS. DO NOT assume the power to be off.
FOLLOW PROPER LOCKOUT PROCEDURES.

EMERGENCY STOP BUTTON

In the event of incorrect operation or dangerous conditions, the machine can be stopped immediately by pressing the **E-STOP** button. Twist the emergency stop button clockwise (cw) to reset. Note: Resetting the E-Stop will not start the machine.


Wear Eye Protection


Read Manual


Wear Ear Protection


Rotating Shaft Hazard


Do Not Remove Guards (gears)

SAFETY PRECAUTIONS

Metal working can be dangerous if safe and proper operating procedures are not followed. As with all machinery, there are certain hazards involved with the operation of the product. Using the machine with respect and caution will considerably lessen the possibility of personal injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator may result.

Safety equipment such as guards, hold-downs, safety glasses, dust masks and hearing protection can reduce your potential for injury. But even the best guard won't make up for poor judgment, carelessness or inattention. **Always use common sense** and exercise **caution** in the workshop. If a procedure feels dangerous, don't try it.

REMEMBER: Your personal safety is your responsibility.

WARNING: FAILURE TO FOLLOW THESE RULES MAY RESULT IN SERIOUS PERSONAL INJURY

Dear Valued Customer:

- All Baileigh machines should be used only for their intended use.
- Baileigh does not recommend or endorse making any modifications or alterations to a Baileigh machine. Modifications or alterations to a machine may pose a substantial risk of injury to the operator or others and may do substantial damage to the machine.
- Any modifications or alterations to a Baileigh machine will invalidate the machine's warranty.

PLEASE ENJOY YOUR BAILEIGH MACHINE! ....PLEASE ENJOY IT SAFELY!

1. **FOR YOUR OWN SAFETY, READ INSTRUCTION MANUAL BEFORE OPERATING THE MACHINE.** Learn the machine's application and limitations as well as the specific hazards.
2. **Only trained and qualified personnel can operate this machine.**
3. **Make sure guards are in place and in proper working order before operating machinery.**
4. **Remove any adjusting tools.** Before operating the machine, make sure any adjusting tools have been removed.
5. These lathes are fast, powerful machines which can cause severe bodily injury or death if not used properly and safety guidelines are not followed.
6. Always disconnect the lathe from the power supply before performing any service work, adjustments, or changing of tooling.

7. **Never** leave adjustment tools or lathe chuck wrenches in the chuck or near any moving part of the machine. They can become dangerous projectiles causing serious personal injury or death.
8. **Keep work area clean.** Cluttered areas invite injuries.
9. **Overloading machine.** By overloading the machine, you may cause injury from flying parts. **DO NOT** exceed the specified machine capacities.
10. **Dressing material edges.** Always chamfer and deburr all sharp edges.
11. **Do not force tool.** Your machine will do a better and safer job if used as intended. **DO NOT** use inappropriate attachments in an attempt to exceed the machines rated capacity.
12. **Use the right tool for the job. DO NOT** attempt to force a small tool or attachment to do the work of a large industrial tool. **DO NOT** use a tool for a purpose for which it was not intended.
13. **Dress appropriate. DO NOT** wear loose fitting clothing or jewelry as they can be caught in moving machine parts. Protective clothing and steel toe shoes are recommended when using machinery. Wear a restrictive hair covering to contain long hair.
14. **Use eye and ear protection**. Always wear ISO approved impact safety goggles. Wear a full-face shield if you are producing metal filings.
15. **Do not overreach**. Maintain proper footing and balance at all times. **DO NOT** reach over or across a running machine.
16. **Stay alert**. Watch what you are doing and use common sense. **DO NOT** operate any tool or machine when you are tired.
17. **Check for damaged parts**. Before using any tool or machine, carefully check any part that appears damaged. Check for alignment and binding of moving parts that may affect proper machine operation.
18. **Observe work area conditions**. **DO NOT** use machines or power tools in damp or wet locations. Do not expose to rain. Keep work area well lighted. **DO NOT** use electrically powered tools in the presence of flammable gases or liquids.
19. **Keep children away**. Children must never be allowed in the work area. **DO NOT** let them handle machines, tools, or extension cords.
20. **Store idle equipment**. When not in use, tools must be stored in a dry location to inhibit rust. Always lock up tools and keep them out of reach of children.
21. **DO NOT operate machine if under the influence of alcohol or drugs**. Read warning labels on prescriptions. If there is any doubt, **DO NOT** operate the machine.
22. **Turn off** power before checking, cleaning, or replacing any parts.
23. Be sure **all** equipment is properly installed and grounded per national, state, and local codes.
24. Keep **all** cords dry, free from grease and oil, and protected from sparks and hot metal.

25. Inspect power and control cables periodically. Replace if damaged or bare wires are exposed. **Bare wiring can kill! DO NOT** touch live electrical components or parts.
26. **DO NOT** bypass or defeat any safety interlock systems.
27. Keep visitors a safe distance from the work area.
28. 13) Make sure guarding does not prevent the operator from performing the necessary job tasks in a safe manner.
29. Guards should not obscure the operator's view when extending beyond the depth of the chuck.
30. Always inspect the chuck and piece part in the chuck. Be aware of any potential catch points capable of causing serious personal injury or death.
31. To avoid injuries during start-up, make sure the piece part, tooling, and tool post have adequate clearance. Always set correct RPM for the size part being turned. If the speed is set too high for a large piece part, there is a chance it could be ejected from the chuck causing serious personal injury or death.
32. Always support the piece part as necessary when it extends from the chuck using a lathe center in the tail stock or by using either a steady rest or a follow rest.
33. When the chuck and piece part are in motion, **NEVER** reach over, under, or around the piece part to make an adjustment or to retrieve anything.
34. **ALWAYS STOP THE LATHE** when removing metallic or plastic shavings from the piece part or the tooling. **NEVER** use your bare hands.

TECHNICAL SUPPORT

Our technical support department can be reached at 920.684.4990 and asking for the support desk for purchased machines. Tech Support handles questions on machine setup, schematics, warranty issues, and individual parts needs: (other than die sets and blades).

For specific application needs or future machine purchases contact the Sales Department at: sales@baileigh.com, Phone: 920.684.4990, or Fax: 920.684.3944.

***Note**: The photos and illustrations used in this manual are representative only and may not depict the actual color, labeling or accessories and may be intended to illustrate technique only.*

***Note:** The specifications and dimensions presented here are subject to change without prior notice due to improvements of our products.*

TECHNICAL SPECIFICATIONS

Swing Over Bed	14" (360mm)
Swing Over Cross Slide	9" (230mm)
Swing in Gap	20" (508mm)
Distance Between Centers	39.36" (1000mm)
Width of Bed	7.325" (186mm)
Spindle Nose	D1-4"
Spindle Bore	1.50" (38mm)
Spindle Bore Taper	Morse #5
Spindle Speeds	8 (70-2000 rpm)
Travel of Top Slide	2.68" (68mm)
Travel of Cross Slide	6.29" (160mm)
Maximum Tool Selection	.625" x .625" (16mm x 16mm)
Leadscrew Thread Pitch	8 T.P.I.
Longitudinal Feed Range	0.001" - 0.0137"/rev. (0.026 – 0.348 mm/rev)
Cross Feed Range	0.0002" - 0.0037"/rev (0.007 - 0.094 mm/rev)
Metric Thread Range	0.45 – 10mm
Sleeve Diameter	1.259" (32mm)
Sleeve Taper	Morse #3
Power Requirements	220V, 1Ph, 60hz
Main Motor	2Hp (1.5Kw), 220V, 1ph, 60hz, 10A
Coolant Pump	1/8hp (93w), 220V, 1ph, 60hz, 2A
Shipping Dimensions (L x W x H)	79" x 33" x 59" (2007 x 838 x 1500mm)
Shipping Weight	1,521lbs (690Kg)
Based on a material tensile strength of	*64000 PSI – mild steel

UNPACKING AND CHECKING CONTENTS

Your Baileigh machine is shipped complete. Separate all parts from the packing material and check each item carefully. Make certain all items are accounted for before discarding any packing material.

WARNING: SUFFOCATION HAZARD! Immediately discard any plastic bags and packing materials to eliminate choking and suffocation hazards to children and animals.
If any parts are missing, DO NOT place the machine into service until the missing parts are obtained and installed correctly.

Cleaning

WARNING: DO NOT USE gasoline or other petroleum products to clean the machine. They have low flash points and can explode or cause fire.

CAUTION: When using cleaning solvents work in a well-ventilated area. Many cleaning solvents are toxic if inhaled.

Your machine may be shipped with a rustproof waxy coating and/or grease on the exposed unpainted metal surfaces. Fully and completely remove this protective coating using a degreaser or solvent cleaner. Moving items will need to be moved along their travel path to allow for cleaning the entire surface. For a more thorough cleaning, some parts will occasionally have to be removed. **DO NOT USE** acetone or brake cleaner as they may damage painted surfaces.
Follow manufacturer's label instructions when using any type of cleaning product. After cleaning, wipe unpainted metal surfaces with a light coating of quality oil or grease for protection.

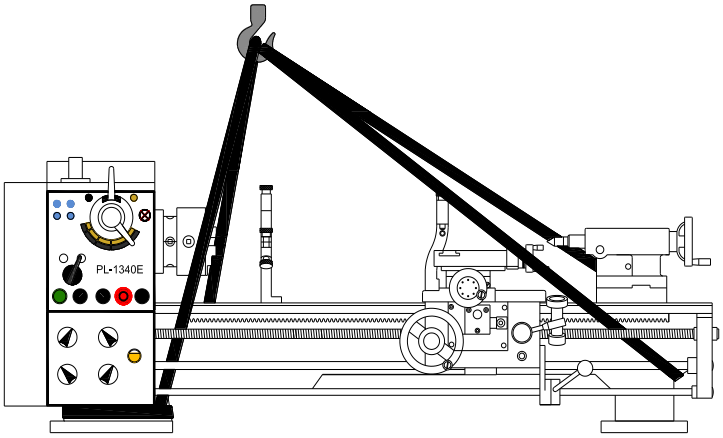
Important: *This waxy coating is **NOT** a lubricant and will cause the machine to stick and lose performance as the coating continues to dry.*

TRANSPORTING AND LIFTING

⚠ CAUTION: Lifting and carrying operations should be carried out by skilled workers, such as a truck operator, crane operator, etc. If a crane is used to lift the machine, attach the lifting chain carefully, making sure the machine is well balanced. Choose a location that will keep the machine free from vibration and dust from other machinery. Keep in mind that having a large clearance area around the machine is important for safe and efficient working conditions.

Follow these guidelines when lifting with crane or hoist:

- Use lift equipment such as straps, chains, capable of lifting 1.5 to 2 times the weight of the machine.
- Secure two lift straps around the lathe base, staying behind the lead screw, feed rod, and control rod. Be careful not to damage any electrical cables or coolant lines.
- Take proper precautions for handling and lifting by checking if the load is properly balanced by lifting it an inch or two.



- Lift the machine, avoiding sudden accelerations or quick changes of direction.
- Locate the machine where it is to be installed, and lower slowly until it touches the floor.

Follow these guidelines when lifting with truck or trolley:

- The lift truck must be able to lift at least 1.5 – 2 times the machines gross weight.
- Make sure the machine is balanced. While transporting, avoid rough or jerky motion, and maintain a safe clearance zone around the transport area.
- Use a fork lift with sufficient lifting capacity and forks that are long enough to reach the complete width of the machine.
- Remove the securing bolts that attach the machine to the pallet.
- Approaching the machine from the side, lift the machine on the frame taking care that there are no cables or pipes in the area of the forks.
- Move the machine to the required position and lower gently to the floor.
- Level the machine so that all the supporting feet are taking the weight of the machine and no rocking is taking place.

INSTALLATION

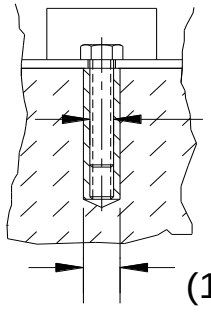
IMPORTANT:

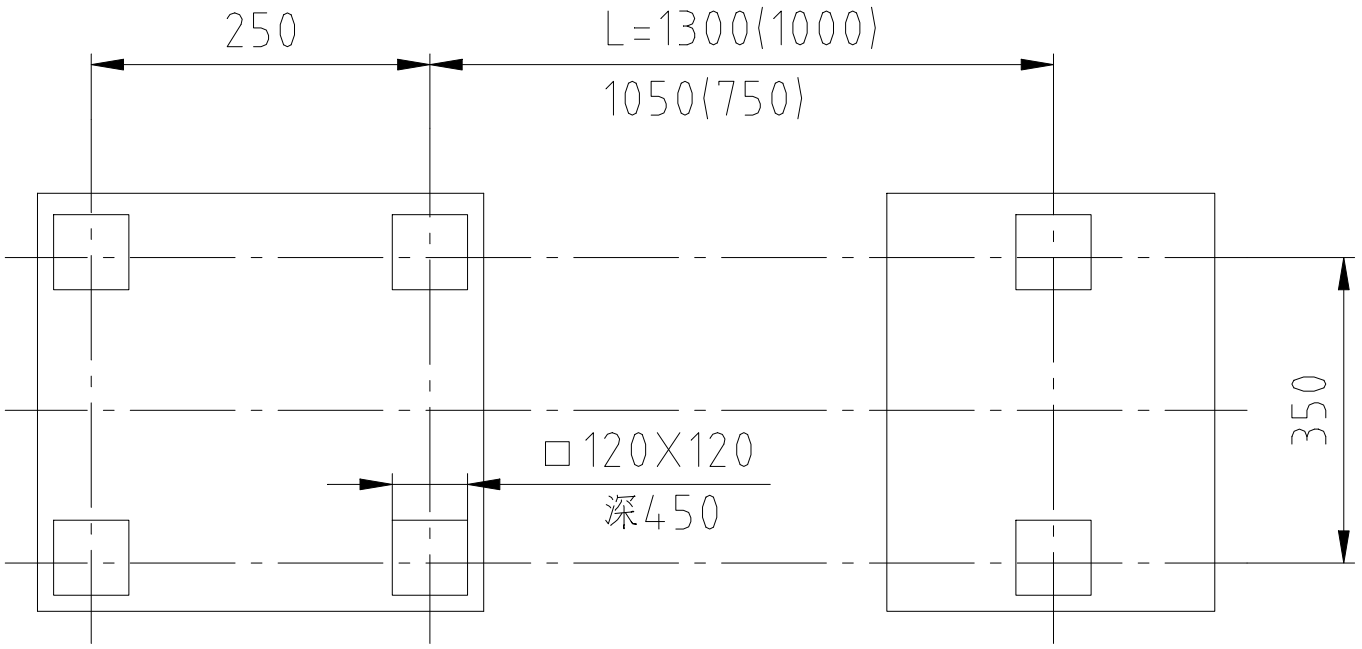
Consider the following when looking for a suitable location to place the machine:

- Overall weight of the machine.
- Weight of material being processed.
- Sizes of material to be processed through the machine.
- Space needed for auxiliary stands, work tables, or other machinery.
- Clearance from walls and other obstacles.
- Maintain an adequate working area around the machine for safety.
- Have the work area well illuminated with proper lighting.
- Keep the floor free of oil and make sure it is not slippery.
- Remove scrap and waste materials regularly, and make sure the work area is free from obstructing objects.
- If long lengths of material are to be fed into the machine, make sure that they will not extend into any aisles.
- **LEVELING:** The machine should be sited on a level, concrete floor. Provisions for securing it should be in position prior to placing the machine. The accuracy of any machine depends on the precise placement of it to the mounting surface.
- **FLOOR:** This tool distributes a large amount of weight over a small area. Make certain that the floor is capable of supporting the weight of the machine, work stock, and the operator. The floor should also be a level surface. If the unit wobbles or rocks once in place, be sure to eliminate by using shims.
- **WORKING CLEARANCES:** Take into consideration the size of the material to be processed. Make sure that you allow enough space for you to operate the machine freely.
- **POWER SUPPLY PLACEMENT:** The power supply should be located close enough to the machine so that the power cord is not in an area where it would cause a tripping hazard. Be sure to observe all electrical codes if installing new circuits and/or outlets.

Anchoring the Machine

- Once positioned, anchor the machine to the floor, as shown in the diagram. Use bolts and expansion plugs or sunken tie rods that connect through and are sized for the holes in the base of the stand.
- This machine requires a solid floor such as concrete at a minimum of 4” (102mm) thick. 6” (153mm) minimum is preferred.





Lubrication
Before putting the lathe into operation, make the following lubrication check.

Headstock
The bearings of the headstock turn in an oil bath. Ensure that the oil level reaches three quarters of the oil gauge glass.

Gear Case
Remove the end cover to expose the filling plug. Through it the Shell Tellus 32 is filled to the oil level in the oil gauge glass regularly.

Apron
The oil bath is filled with Shell Tellus 32 through the filling plug on the right side of the apron. Check the oil level in the oil gauge glass on the front regularly.

Change Gears
Lubricate the change gears with thick machine oil or grease once a month.

Other Parts
There are other lubricating points on the input shaft bracket of the gear box, the handwheel on the apron, the longitudinal and cross slide, the thread dial indicator, the tailstock and the bracket, use the grease gun to put a few drops of oil from time to time. Lubricate the apron worm and worm gear, half nut and leadscrew twice a mouth. Apply a light oil film to the bed way and all other bright parts, like the tailstock quill, feed rod etc. once a day.

ELECTRICAL

⚠ CAUTION: HAVE ELECTRICAL UTILITIES CONNECTED TO MACHINE BY A CERTIFIED ELECTRICIAN!
Check if the available power supply is the same as listed on the machine nameplate.

⚠ WARNING: Make sure the grounding wire (green) is properly connected to avoid electric shock. DO NOT switch the position of the green grounding wire if any electrical plug wires are switched during hookup.

Power Specifications

Your machine is wired for 220 volts, 60hz alternating current. Before connecting the machine to the power source, make sure the power source is OFF.
Before switching on the power, you must check the voltage and frequency of the power to see if they meet with the requirement, the allowed range for the voltage is ±5%, and for the frequency is ±1%.

Considerations

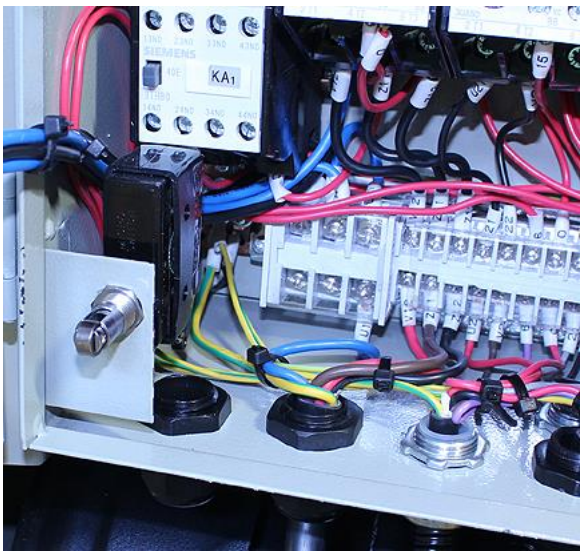
- Observe local electrical codes when connecting the machine.
- The circuit should be protected with a time delay fuse or circuit breaker with an amperage rating slightly higher than the full load current of machine.
- A separate electrical circuit should be used for your machines. Before connecting the motor to the power line, make sure the switch is in the “OFF” position and be sure that the electric current is of the same characteristics as indicated on the machine.
- All line connections should make good contact. Running on low voltage will damage the motor.
- In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This machine is equipped with an electric cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into a matching outlet that is properly installed and grounded in accordance with all local codes and ordinances.

⚠ WARNING: In all cases, make certain the receptacle in question is properly grounded. If you are not sure, have a qualified electrician check the receptacle.

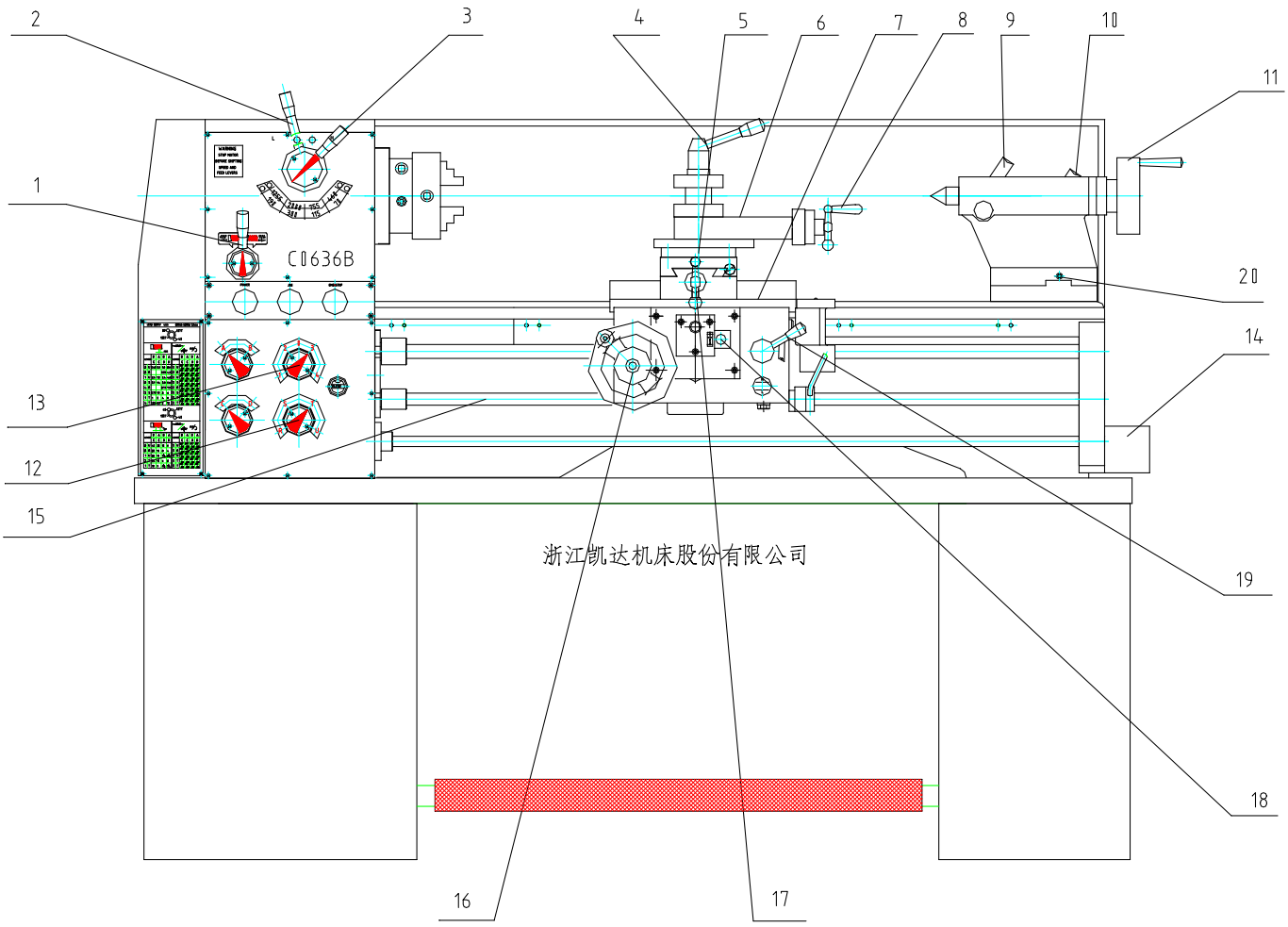
- Improper connection of the equipment-grounding conductor can result in risk of electric shock. The conductor with insulation having an outer surface that is green with or without yellow stripes is the equipment-grounding conductor. If repair or replacement of the electric cord or plug is necessary, do not connect the equipment-grounding conductor to a live terminal.
- Check with a qualified electrician or service personnel if the grounding instructions are not completely understood, or if in doubt as to whether the machine is properly grounded.
- Repair or replace damaged or worn cord immediately.

Power cord connection:

1. Turn the main disconnect switch on the control panel to the OFF position.
2. Unlock and open the electrical enclosure door.
3. Locate and install the main disconnect knob onto the switch shaft.
4. Route a power cord into the electrical cabinet (supplied by customer).
5. Connect the power cord to the terminal block at the **PE, L,** and **N** terminals.
6. Route the cord away from the machine toward the power supply.
    a. Route the power cord so that it will NOT become entangled in the machine in any way.
    b. Route the cord to the power supply in a way that does NOT create a trip hazard.
7. Connect the power cord to the power supply and check that the power cord has not been damaged during installation.
8. When the machine is clear of any obstruction. The main power switch may be turn ON to test the operation. Turn the switch OFF when the machine is not in operation.

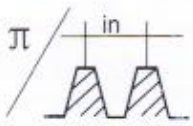
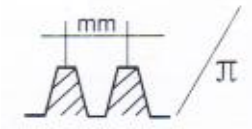
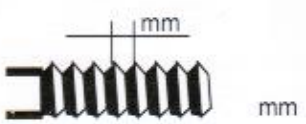
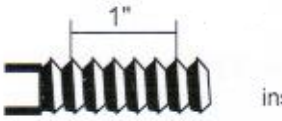
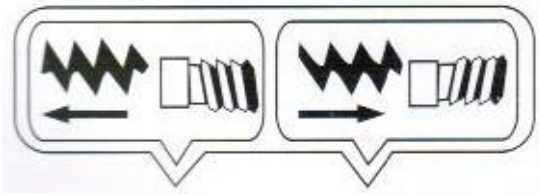


GETTING TO KNOW YOUR MACHINE



1	Feed direction selector	11	Tailstock quill traverse handwheel
2	Speed selector (high/low)	12	Feed selector handle
3	4 Steps speed selector	13	Feed/thread selector handle
4	Tool post clamping lever	14	Forward/reverse switch
5	Compound rest lock	15	Feed rod
6	Cross slide lock	16	Longitudinal traverse handwheel
7	Carriage lock	17	Cross traverse handwheel
8	Compound rest handwheel	18	Feed axis selector
9	Tailstock lock	19	Thread cutting engagement lever
10	Tailstock quill clamping	20	Tailstock set-over adjusting screw

OPERATION: SYMBOLS FOR OPERATION

<table>
<tr><td colspan="4">OPERATION: Symbols for operation</td></tr>
<tr><td>  </td><td>Electrical (danger)</td><td> 
</td><td>Diametric pitch thread</td></tr>
<tr><td>  </td><td>Coolant</td><td> 
</td><td>Module pitch thread</td></tr>
<tr><td> 
</td><td>Metric thread</td><td>  </td><td>Half nut opened</td></tr>
<tr><td> 
</td><td>Imperial thread</td><td>  </td><td>Half nut closed</td></tr>
<tr><td rowspan="2">  </td><td colspan="3">Right-hand thread and
Longitudinal feed toward
The headstock side
(Left figure)</td></tr>
<tr><td colspan="3">Left -hand thread and
Longitudinal feed toward
The headstock side
(Right figure)</td></tr>
<tr><td>  </td><td colspan="3">Feeding (Left figure)
Threading (Right figure)</td></tr>
<tr><td>  </td><td colspan="3">Longitudinal feed engaged (upward)

Longitudinal and Cross feed Disengaged (central)

Cross feed engaged (downward)</td></tr>
</table>

Steady Rest

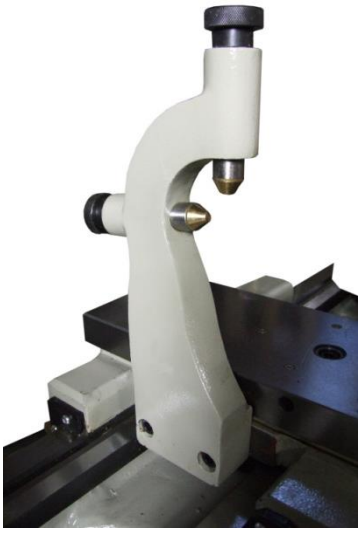
The steady rest on this lathe is used to support long, small diameter stock that otherwise could not be turned. The steady rest can also be used in place of the tailstock when access to the cutting tool is required at the outboard end of the piece part. By loosening the nut in the base, the steady rest can be re-positioned along the slide rails.

Live Center

The live center is used when the chuck alone cannot support longer length material. Stock that extends beyond the chuck more than three times its diameter should be supported by the live center. The barrel of the tailstock and the end of the live center have a Morse #3 taper. Before inserting the live center, wipe it clean and make sure the barrel entry is also clean. Insert the end of the live center into the barrel until it seats. To remove the live center, crank the barrel “OUT” until you see the knockout tool insertion slot (fig. 8). Insert a knockout tool into the slot and give it a sharp tap to push out the live center. You can also insert the tool and crank the barrel “IN” which will push out the live center. Be sure to keep the live center from falling and becoming damaged.

Follow Rest

The follow rest is typically used for small diameter stock to prevent the piece part from “springing” under pressure from the tool. The follow rests, which are opposite the tool post, act as supports to counterbalance the force exerted on the piece part by the tool. The tool and the supports form a triangle around the part to help minimize vibration. The follow rest has two adjustable brass points to allow rotation of jobs without causing abrasive scratches. The soft points will need replacement when they wear out.



Tailstock

The tailstock consists of the base, base lock, barrel, barrel lock, handwheel, body, and screw.

The tailstock on a lathe has many functions including supporting the piece part opposite the headstock. It also has a barrel imprinted with graduations in millimeters and inches and a #3 Morse taper for securing drill bits, and centers. The tailstock can be easily set or adjusted for alignment or non-alignment with respect to the center of the spindle. By turning the tailstock handwheel you can advance or retract the barrel in the tailstock.

Both live and dead centers have 60° conical points to fit center holes in the end of the cylindrical piece part.

Faceplate

The faceplate is used for holding work that cannot be swung between centers because of its shape and dimensions. The T-slots and other openings on its surface provide convenient locations for anchor bolts and clamps to secure the piece part. The faceplate can be mounted to the spindle after removing the chuck.

***Important**: **DO NOT** exceed speeds greater than 770 rev./min. for a 10" faceplate.*

Quick Change Tool Posts

This lathe comes with a quick-change tool post Model 250-200 (Phase II style) and four tool holders. These tool holders will all hold up to a 5/8" square tool. Included are (3) Model 250-201 holders and (1) Model 250-202 holder with a V-groove in the bottom of the holder so it can also accommodate a boring bar.
The 250-200 tool post is the same as a "BXA" style. The 250-201 tool holder is a BXA-1 and the 250-202 tool holder is a BXA-2.
There are other tool holders and tool posts available. In the (Phase II style) there are models 250-100, 250-200 and 250-300. The 100, 200, and 300 designate the size of the tool post and holders. The corresponding numbers for these are AXA, BXA, and CXA. The 100 or AXA being for 1/2″ (12mm) square tooling, 200 or BXA for 5/8″ (16mm), and 300 or CXA for 3/4″ (19mm).

***Note:** If you have a 200-series tool post, only 200 or BXA series tool holders will fit it, and to use other tool holders, a different tool post must be purchased.*

LATHE SETUP

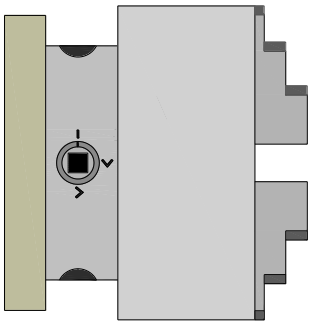
WARNING: DO NOT start the lathe until all machine assembly has been completed and you have been properly trained and understand all control functions. When performing machine assembly make sure to follow proper lockout / tagout procedures. Failure to comply could result in accidental starting of the lathe resulting in SERIOUS OPERATOR INJURY OR DEATH.

Lubrication

This lathe comes pre-lubricated from the factory. It is still recommended to review the lubrication procedure located in the Maintenance section of this manual. This will help you to become familiar with the locations of lubrication fittings and areas where lubrication is required.

Chucks

This metal lathe has a 6” (160mm) 3-jaw chuck already installed. This is a scroll- type chuck which means that all three jaws close together and are self-centering. Also included is an 8” (200mm) 4-jaw chuck. The four jaws move independently of each other and are used for holding odd shaped pieces or where it is necessary to have zero tolerance.

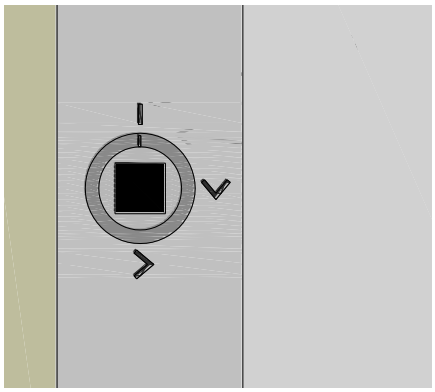


Both the 3-jaw chuck and the 4-jaw chuck have Camlock mounting. Note that there are lines stamped on the cam and on the chuck. These indicate whether the cam is in a locked position or an unlocked position where the chuck can be removed. A chuck key is used to turn the locking cams as shown.

WARNING: NEVER leave a chuck key in the chuck if the machine is not in use. If the lathe is accidentally started with the key in place, it can become a projectile and cause serious INJURY OR DEATH.

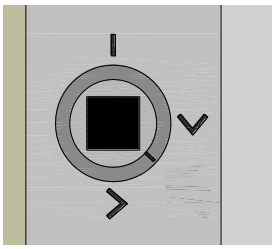
Chuck Removal

⚠ CAUTION: The Chuck is heavy. Use caution lifting the chuck during removal and installation. If the chuck slips and falls, it can trap and crush hands and fingers between the chuck and the plywood on the bed.



1. Lay a piece of plywood on the lathe bed directly beneath the chuck. This will help protect the ways if the chuck should fall.
2. Turn the first cam counterclockwise (ccw) using the chuck key until the line on the cam is aligned with the line on the spindle housing as shown.
3. Rotate the spindle housing to access the remaining cams and turn each one counterclockwise (ccw) until the marks are aligned. Make sure to support the chuck with one hand as you turn the last cam. You should now be able to remove the chuck.
4. If the chuck is still tight on the spindle, tap the back of the chuck with a wooden or rubber mallet while supporting the bottom of the chuck with your other hand. If needed, rotate the chuck a bit, and tap again. Make sure all the marks on the cams and spindle are properly aligned.

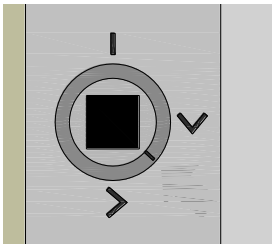
Chuck Installation



1. Lay a piece of plywood on the lathe bed directly beneath the spindle housing. This will help protect the ways if the chuck should fall.
2. Lift the chuck up to the spindle and insert the camlock pins into the face of the spindle.
3. While supporting the weight of the chuck, use the chuck key to turn one of the cams until the cam line is between the two “V” marks on the spindle as shown.
4. Rotate the spindle and repeat step 3 for the rest of the cams.
5. Starting with the first cam, snug up the cams.
6. Finally, recheck and fully tighten all of the cams.

Four Jaw Chuck Installation Preparation

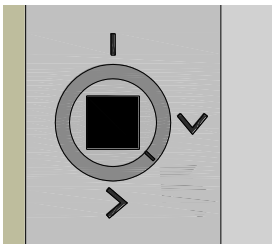
1. With the 3-jaw chuck removed, take note of how far the camlock studs protrude from the back face of the chuck and note the dimensions.
2. Thread each of the 4-jaw camlock studs into the back of the 4-jaw chuck using the dimension obtained from step 1. Screw in the locking capscrews that keep the studs from coming out.
3. Lay a piece of plywood on the lathe bed directly beneath the spindle housing. This will help protect the ways if the chuck should fall.
4. Lift the chuck up to the spindle and insert the camlock pins into the face of the spindle.
5. While supporting the weight of the chuck, use the chuck key to turn one of the cams until the cam line is between the two “V” marks on the spindle.



6. Rotate the spindle and repeat step 3 for the rest of the cams.
7. Starting with the first cam, snug up the cams.
8. Finally, recheck and fully tighten all of the cams.

Faceplate Installation Preparation

1. With the 3-jaw chuck removed, take note of how far the camlock studs protrude from the back face of the chuck and note the dimensions.
2. Thread each of the faceplate camlock studs into the back of the faceplate using the dimension obtained from step 1. Screw in the locking capscrews that keep the studs from coming out.
3. Lay a piece of plywood on the lathe bed directly beneath the spindle housing This will help protect the ways if the faceplate should fall.
4. Lift the chuck up to the spindle and insert the camlock pins into the face of the spindle.
5. While supporting the weight of the faceplate, use the chuck key to turn one of the cams until the cam line is between the two “V” marks on the spindle.



6. Rotate the spindle and repeat step 3 for the rest of the cams.

7. Starting with the first cam, snug up the cams.
8. Finally, recheck and fully tighten all of the cams.

OPERATING CONTROLS

⚠ CAUTION: Always wear proper eye protection with side shields, safety footwear, and leather gloves to protect from burrs and sharp edges.
When handling large heavy materials make sure they are properly supported.

- The main disconnect on the electrical cabinet is the Power On switch.
- Green indicator light (A) will be lit when machine is powered up.
- Two position switch (B) to start and stop coolant pump.
- Pressing the E-Stop Button (C) will immediately stop the machine in the event of incorrect operation or a dangerous situation. Twist the emergency stop button clockwise (cw) to reset.

A B C

Spindle Speeds

⚠ **IMPORTANT:** Never change spindle speeds while the motor or spindle is in motion.

- The speed of the spindle is set by the position of the two speed control handles.

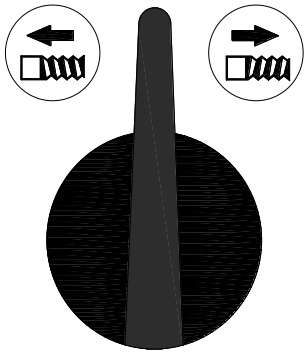
  Handle (13) selects between Low range (L) and High range (H).

  Handle (12) selects between the available speeds within each range.

- Spindle speed is measured in RPM (revolutions per minute) The following spindle speeds are possible: (L) 70, 115, 190, 300, (H) 460, 755, 1255, and 2000 RPM.

Feed Direction

This lathe can cut both left and right while feeding or threading, and across the ways when performing facing operations. The feed direction is controlled with the selection handle. The handle is shown here in the neutral position.
When rotated to the left position the apron will move to the left along the bed, as indicated by the arrow, or the cross feed will travel away from the operator.

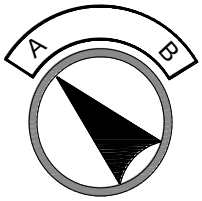


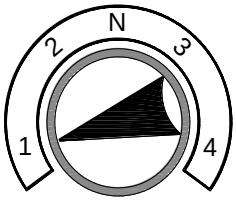
Rotating the handle to the right will reverse the direction of the feeding or threading.

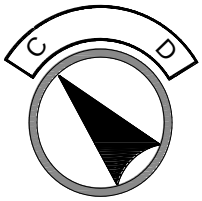
Important: *Never force any of the selection handles on the lathe. If a handle will not engage, rotate the chuck carefully by hand, while applying light pressure to the selector handle. As the chuck rotates the gears will align, allowing the selector to engage.*

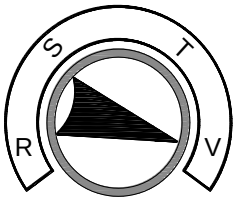
Quick Change Selection Knobs

The four knobs shown, are used to change the feed rate or number of threads-per-inch.
This part of the lathe is commonly referred to as the Quick-Change Gear Box.
The two knobs on the left: A, B, & C, D and the two knobs on the right: 1, 2, 3, & 4 and R, S, T, & V are set to a selected value from the charts on the following page. The charts are also located on the end of the gear shroud which is attached to the left side of the lathe.









Important: *Make sure to use the actual charts on your lathe to determine the correct thread settings.*

The example feed rate charts to the right show some of the more typical settings that might be used. The chart in (fig. A) shows threads per inch while the chart in (fig. B) shows distance between threads in (mm).
Besides changing the selection knobs, you may also need to change gears, labeled “a” and “b” in the diagram(s). The values in the chart(s) for lines “a” and “b” indicate the number of gear teeth.

Note: *Each gear has the number of teeth stamped on its face for easy identification.*

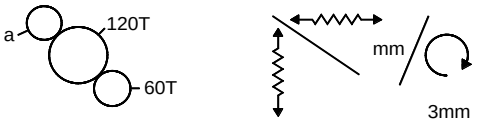
Important: *Make sure to use the actual charts on your lathe to determine the correct thread settings.*

As an example, we will pick 11½ th’ds/in. from the chart. Projecting up in the chart shows “a” as a 40T gear and “b” as a 46T gear. The quick-change selection knobs should be set at 1, V, B, & D.

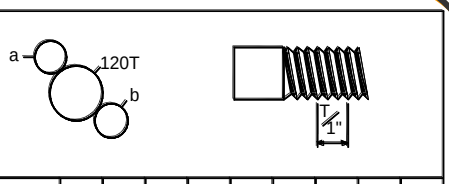
The lower left chart shows the longitudinal and cross feed values in (mm) and the lower right chart shows the values in (inches).
To perform a longitudinal cut in inches, we use .0205”/revolution as an example.
Gear “a” will need to be changed to 60 Tooth.
Change the selection knobs to B, D, and R.
If using the metric chart, the procedure would be the same.

This symbol indicates longitudinal feed.

This symbol indicates cross feed rates.

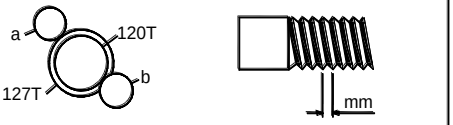


a		60T				30T			
LEVER		T	S	R	V	T	S	R	V
A	D	.1.392 / .380	.1.300 / .351	.1.044 / .282	.835 / .226	.696 / .188	.650 / .175	.522 / .141	.418 / .113
B	D	.696 / .188	.650 / .176	.522 / .141	.418 / .113	.348 / .094	.325 / .088	.261 / .070	.208 / .056
A	C	.348 / .094	.325 / .088	.261 / .070	.208 / .056	.174 / .047	.162 / .044	.130 / .035	.104 / .028
B	C	.174 / .047	.162 / .044	.130 / .035	.104 / .028	.087 / .024	.081 / .022	.065 / .017	.052 / .014



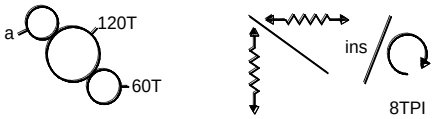
a		60	60	60	60	40	40	56	40	60
b		60	54	57	60	44	46	54	52	63
LEVER		4	1	1	1	1	1	2	1	3
		V	V	V	V	V	V	V	V	V
A	D	4	4½		5	5½		6	6½	7
B	D	8	9	9½	10	11	11½	12	13	14
A	C	16	18	19	20	22	23	24	26	28
B	C	32	36	38	40	44	46	48	52	56

figure A



a		56	60	60	30	60	60	30	60	56
b		60	60	60	60	60	60	60	60	63
LEVER		4	1	3	4	1	3	1	3	3
		R	R	S	T	V	R	T	V	V
A	D	7.0	6.0		5		4.5	4.0		
B	D	3.5	3.0		2.5		2.25	2.0	1.8	1.6
A	C	1.75	1.5	1.4	1.25	1.2		1.0	0.9	0.8
B	C		0.75	0.7		0.6		0.5	0.45	0.4

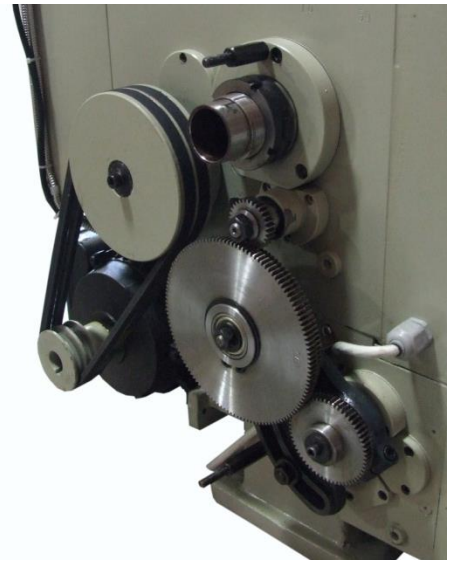
figure B



a		60T				30T			
LEVER		T	S	R	V	T	S	R	V
A	D	.0548 / .0187	.0512 / .0175	.0411 / .0140	.0328 / .0112	.0274 / .0094	.0256 / .0087	.0205 / .0070	.0164 / .0058
B	D	.0274 / .0094	.0256 / .0087	.0205 / .0070	.0164 / .0056	.0137 / .0047	.0128 / .0044	.0102 / .0035	.0082 / .0028
A	C	.0137 / .0047	.0128 / .0044	.0102 / .0035	.0082 / .0028	.0069 / .0024	.0064 / .0022	.0051 / .0017	.0041 / .0014
B	C	.0069 / .0024	.0064 / .0022	.0051 / .0017	.0041 / .0014	.0034 / .0012	.0031 / .0011	.0025 / .0009	.0020 / .0007

Changing Gears for Thread Selection

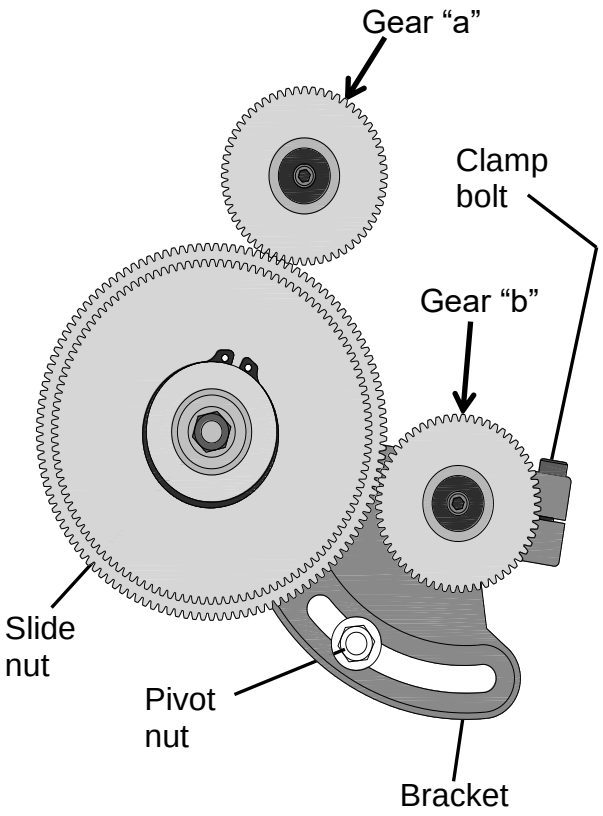
In order to cut threads as listed in the charts and set the longitudinal feed and crossfeed rates, the gears will need to be changed to match the values shown in the “a” and “b” gear rows of the charts.



1. DISCONNECT POWER TO MACHINE.
2. Take off the gear cover (located on the left side of the lathe) by removing the two thumb nuts.
3. Remove the socket bolt and flat washer to replace either gear “a” or gear “b” with another gear.

Note: *DO NOT place anything hard between the gears to prevent rotation or you could break the teeth.*

4. Loosening the clamp bolt and pivot nut will allow you to rotate the bracket.
5. To move the large gears towards or away from the small gears, loosen the slide nut.
6. After the gears are changed out, make sure they mesh properly before tightening the slide nut, pivot nut, and clamp bolt.

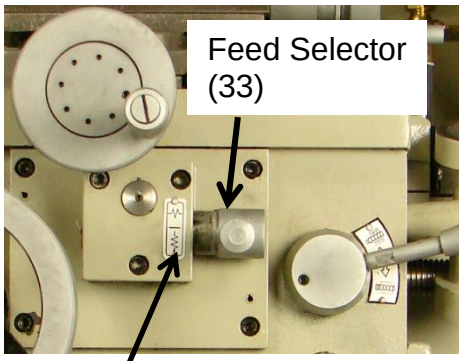


Important: *Make sure to use the actual charts on your lathe to determine the correct thread settings.*

Feed Lever

The Feed Selector handle (33) is used to select between the longitudinal and cross slide powered motions. The handle is shown in the pulled out neutral position.
Pull up on the pivot handle to engage the longitudinal motion. To get to the cross-slide position from neutral, push in and lower the handle.

Note: *Make sure the half nut engagement lever (31) is disengaged (at neutral position) before operating the feed selector handle (33). There is an interlock mechanism between the auto feeding and the thread cutting engagement.*

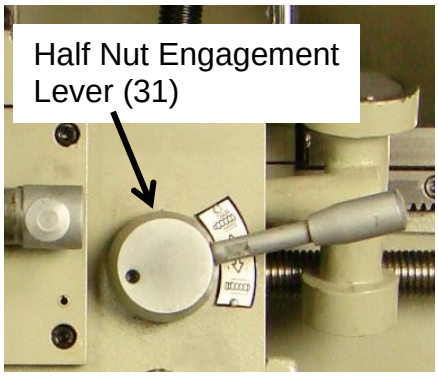


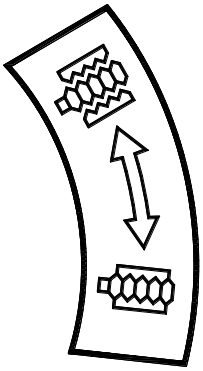
Longitudinal

Cross slide

Half Nut Engage Lever

The half nut engagement lever (31) should be in the down (engaged) position when cutting threads. When in this position the half nut will tighten onto the leadscrew and provide longitudinal travel to the carriage.



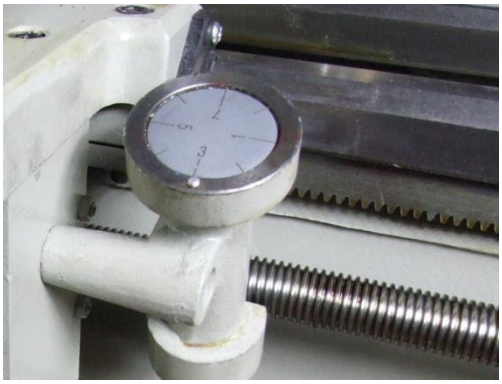


Disengaged

Engaged

Threading Dial Indicator

The threading dial indicator is located on the right-hand side of the apron. It is used when cutting imperial threads and tells you when to engage the half nut to begin the threading process. The indicator face has eight lines and four numbers printed on the dial. An indicator pin is located at the bottom of the rim. The dial is mounted to a shaft that has a small gear mounted at the opposite end. By loosening a socket capscrew you can pivot the housing to either engage or disengage from the leadscrew. When engaged, the dial will turn as the spindle rotates. If the dial does not turn re-adjust the housing position.



When the half nut is engaged, the dial stops turning. By carefully engaging the half nut as the correct number or line passes by the indicator mark, a thread can be established and the lead maintained through multiple passes, until the required depth is reached.

1. Using the chart to cut 20 threads per inch, engage the half nut when the 1, 2, 3, or 4 is at the indicator mark.
2. You must determine how long you want the thread to be. When you reach that length, disengage the half nut.
3. Return the carriage to the beginning of the cut.
4. Set the next depth for the next cutting pass.
5. Watch the dial and when the 1, 2, 3, or 4 comes around to the indicator mark, engage the half nut again.
6. Repeat the procedure until you have reached the desired depth of thread required.

INDICATOR TABLE WHIT WORTH					
TPI	SCALE	TPI	SCALE	TPI	SCALE
4	1-8	13	1.3.5.7	44	1-8
4-1/2	1-8	14	1-8	48	1-8
4-3/4	1-8	16	1-8	52	1-8
5	1.3.5.7	18	1-8	56	1-8
5-1/2	1-8	19	1.3.5.7	64	1-8
6	1-8	20	1-8	72	1-8
6-1/2	1-8	22	1-8	76	1-8
7	1.3.5.7	24	1-8	80	1-8
8	1-8	26	1-8	88	1-8
9	1.3.5.7	28	1-8	96	1-8
9-1/2	1-8	32	1-8	104	1-8
10	1-8	36	1-8	112	1-8
11	1.3.5.7	38	1-8		
12	1-8	40	1-8		

The other scale values are as follows:
1 = Engage only on 1
1, 5 = Engage on 1 or 5
1, 3, 5, 7 = Engage on 1,3,5, or 7
1 – 8 = Engage on any number or line

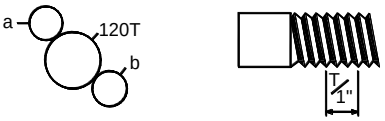
Thread Cutting Operation

In order to obtain the desired thread, change gears must be installed correctly, using the values in the charts. Failure to do so will result in incorrect threads.

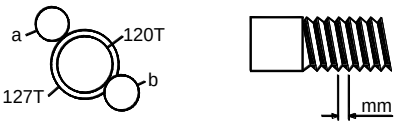
1. First rotate the leadscrew by moving the feed/thread selector (33) to any position and making sure the feed selector knobs (2), (3), (4), & (5) are engaged.
2. Operate downward, the thread cutting engagement lever (31) and it will engage with the leadscrew to obtain the longitudinal travel of the carriage; namely the thread cutting feed.
3. Make sure the feed axis selector is disengaged (at neutral position) before operating the thread cutting engagement lever (31) because there is an interlock mechanism between the auto feeding and thread cutting engagement.

Direction of the thread cutting can be chosen by turning the feed direction selector (10) at the headstock. There are 31 thread pitches each in Imperial and Diametric as well as 26 metric thread pitches which can be obtained by turning the feed selector handles (2), (3), (4), & (5).

Important: *Make sure to use the actual charts on your lathe to determine the correct thread settings.*



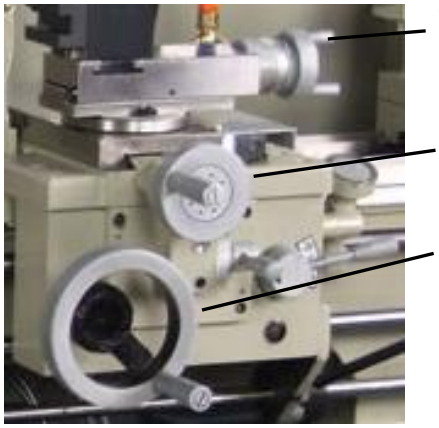
a		60	60	60	60	60	60	56	60	60
b		60	54	57	60	66	69	54	78	63
LEVER		4	1	1	1	1	1	2	1	3
		V	V	V	V	V	V	V	V	V
A	D	4	4½		5	5½		6	6½	7
B	D	8	9	9½	10	11	11½	12	13	14
A	C	16	18	19	20	22	23	24	26	28
B	C	32	36	38	40	44	46	48	52	56



a		56	60	60	30	60	60	30	60	56
b		60	60	60	60	60	60	60	60	63
LEVER		4	1	3	4	1	3	1	3	3
		R	R	S	T	V	R	T	V	V
A	D	7.0	6.0		5		4.5	4.0		
B	D	3.5	3.0		2.5		2.25	2.0	1.8	1.6
A	C	1.75	1.5	1.4	1.25	1.2		1.0	0.9	0.8
B	C		0.75	0.7		0.6		0.5	0.45	0.4

Carriage Controls

The carriage hand wheel when rotated, allows the cutting tool to travel along the length of the lathe bed. The cross-slide hand wheel when turned moves the cross slide in and out perpendicular to the lathe bed. At the top of the carriage is the compound slide which allows linear movement of the cutting tool at any preset angle.



Carriage Hand Wheel

Rotating the hand wheel clockwise (cw) will move the carriage towards the tailstock. Rotating the hand wheel counterclockwise (ccw) will move the carriage towards the headstock. This is helpful when setting up the lathe for turning or when manual movement is required during turning operations.

Compound Slide Hand Wheel

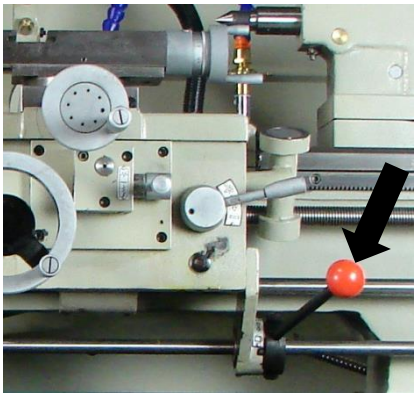
The hand wheel on the top slide controls the position of the cutting tool in relation to the piece part. The top slide is adjustable for any angle. The graduated dial can be adjusted by holding the hand wheel with one hand and turning the dial with the other. Angle adjustments are made by loosening the hex nuts on the base of the top slide.

Cross slide Hand Wheel

The cross-slide hand wheel moves the top slide towards and away from the piece part. Turning the hand wheel clockwise (cw) moves the slide towards the piece part and counterclockwise (ccw) moves the slide away from the part. The graduated dial can be adjusted by holding the hand wheel with one hand and turning the dial with the other.

Spindle Rotation Control

Spindle rotation is controlled from the handle on the right-hand side of the carriage as indicated.
Move the handle down and the spindle will rotate in a counterclockwise (ccw) direction. Move the handle up and the spindle will rotate in a clockwise (cw) direction. The middle (neutral) position stops the motor.



Tool Post and Holder

This lathe comes with a quick-change tool post and (four) tool holders. Cutting tools can be secured and removed by tightening or loosening the clamping screws on top of the holder. Located at the top of the tool post is a knurled thumb wheel, which when rotated, centers the cutting tool in the holder. The handle on the tool post can be rotated to lock and unlock the tool holder in the tool post dovetail ways. To rotate the tool post, loosen the nut at the top of the tool post.

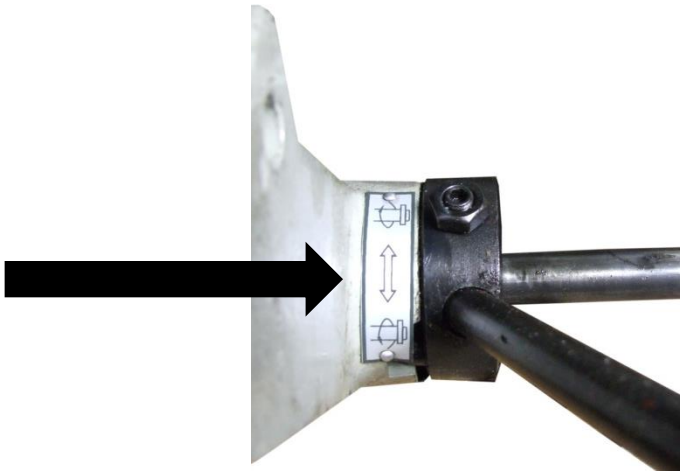
Tailstock Controls

The tailstock primary use is for holding centers and drill chucks. Turning the handwheel advances or retracts the barrel in the tailstock. The graduated dial on the handwheel is adjustable. The top lock lever locks the tailstock barrel in place. The side lock lever locks the tailstock in place on the lathe bed.

TEST RUN

⚠ WARNING: Before powering up machine, make sure Fwd/Rev. handle is in the center (neutral) position.
All machinery poses a potential for danger when being operated. Accidents result from lack of machine knowledge and failure to pay attention. Always be cautious and alert to the potential for serious injury. Follow safety rules and precautions to lessen the chances of an accident.

Pin will engage hole when
In neutral position.



1. Before proceeding with a test run, check that the machine is securely mounted in place and that you have read and understand the Operator Safety Instructions at the beginning of this manual.
2. Make sure the machine is properly grounded and the Fwd/Rev handle is in neutral.
3. Inspect the lathe bed and rest of the machine for any tools and loose parts. Check that all guarding is in place, and that nothing is obstructing the movement of the chuck.
4. Check that the gearbox and carriage sight glasses show adequate oil levels.

5. Check the tension of the two V-belts located under the gear cover. You should be able to depress the belts about 1/2” (12.7mm) with normal finger pressure. If they are too tight you could damage the shaft bearing.
6. Select the slowest spindle speed (70 RPM) and let the machine run at that speed for 20 minutes. If everything seems to be functioning normally, increase the spindle speed a step at a time until you reach the maximum speed of 2000 RPM. Run each speed change for approximately 5 minutes.

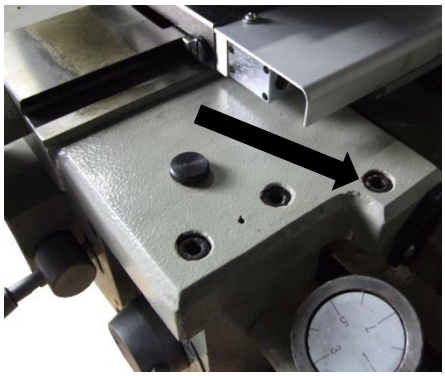
Important: *Make sure motor has completely stopped before changing speeds.*

MACHINE ADJUSTMENTS

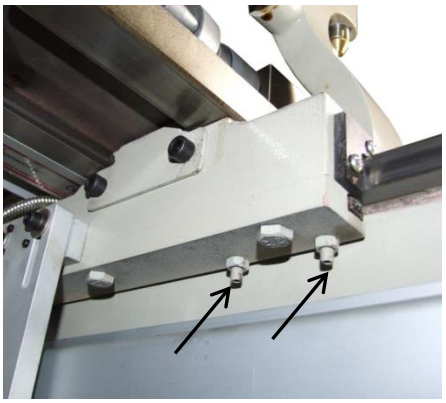
WARNING: Make sure the electrical disconnect is OFF before working on the machine.
Maintenance should be performed on a regular basis by qualified personnel.
Always follow proper safety precautions when working on or around any machinery.

Saddle Gib

Before adjusting the saddle gib, loosen the setscrew counterclockwise (ccw) as indicated by the arrow.
It is important that the saddle gib be properly adjusted. A loose gib can cause finish issues on a piece part, and a gib that is adjusted too tight can cause premature wear.



The gib adjustment for the saddle is located on the bottom of the back edge of the slide. The tension on the gib is set with four setscrews and jam nuts (2 at each end) as shown.
The gib can be tightened by loosening the jam nuts and tightening the setscrews. Loosening the setscrews will loosen the gib. A 45° turn of the setscrew will give about 0.005” (0.125mm) take up in the gib. When properly adjusted, the gib strip will drag slightly while moving the apron. DO NOT over tighten.



Cross-Slide Gib

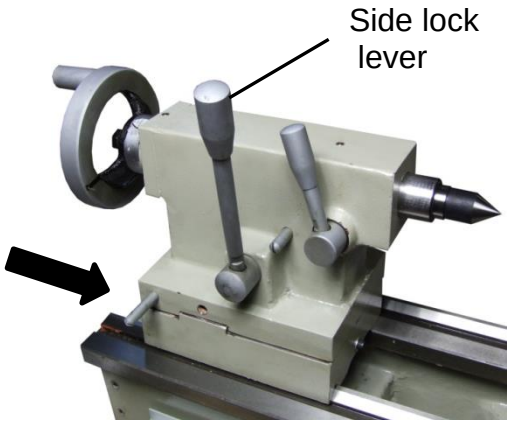
The gib on the cross-slide can be adjusted with the screws located at each end. The gib is wedge shaped and by loosening the screw closest to the operator and then tightening the opposite screw, the slide will become looser. Loosening the screw furthest away from the operator and tightening the closer screw will tighten the gib.
DO NOT over tighten.
Adjust the gib so that it creates a slight drag when the slide is in motion. This will indicate that the gib is properly adjusted.

Compound Gib

Follow the same procedure as the Cross-slide gib. The gib on the Compound rest can be adjusted with the screw located at the tool post end. The gib is wedge shaped and by loosening the screw closest to the operator and then tightening the opposite screw, the slide will become looser. Loosening the screw furthest away from the operator and tightening the closer screw will tighten the gib.
DO NOT over tighten.
Adjust the gib so that it creates a slight drag when the slide is in motion. This will indicate that the gib is properly adjusted.

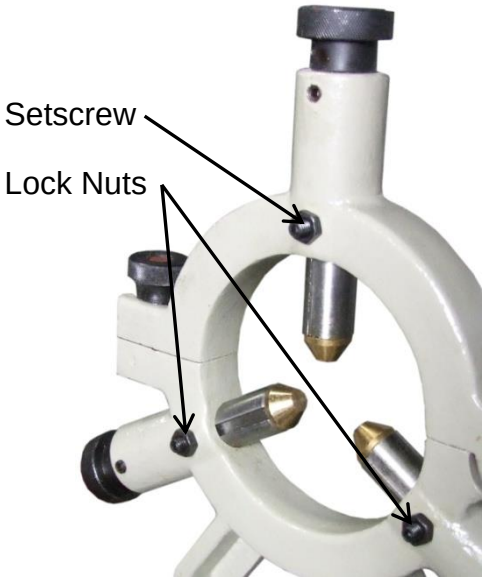
Tail Stock Bed Clamp

The angular lock position of the side lock lever can be adjusted by means of a self-locking hex head capscrew. It is located on the underside of the tail stock and between the ways of the bed.



Steady Rest

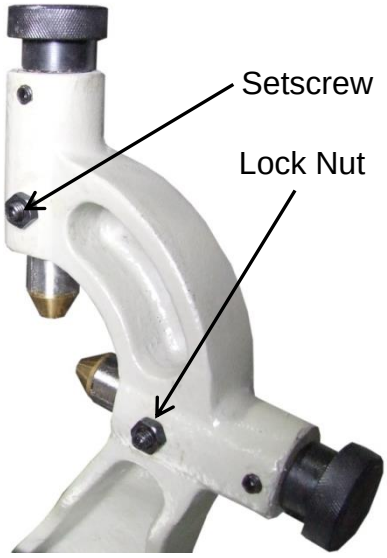
1. To adjust the steady rest, first loosen the three lock nuts.
2. To open the fingers, turn the knurled screws clockwise (cw). If a knurled screw turns hard, back out the setscrew a little.
3. Once the piece part is in the chuck and going through the steady rest, tighten the knurled screws counterclockwise (ccw) so that the fingers are snug, but not tight against the piece part.
4. Tighten the setscrews and then the lock nuts.
5. Lubricate the brass points with machine oil.



Follow Rest

The follow rest is similar to the steady rest except that the third finger is taken up by the tool bit. The follow rest keeps long, small diameter pieces from flexing under the cutting pressure from the tool bit.

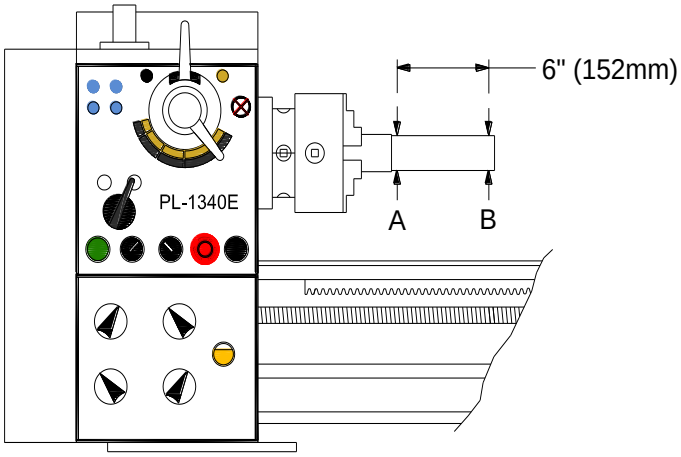
1. To adjust the follow rest, first loosen the two lock nuts.
2. To open the fingers, turn the knurled screws clockwise (cw). If a knurled screw turns hard, back out the setscrew a little.
3. Once the piece part is in the chuck and going through the follow rest, tighten the knurled screws counterclockwise (ccw) so that the fingers are snug, but not tight against the piece part.
4. Tighten the setscrews and then the lock nuts.
5. Lubricate the brass points with machine oil.

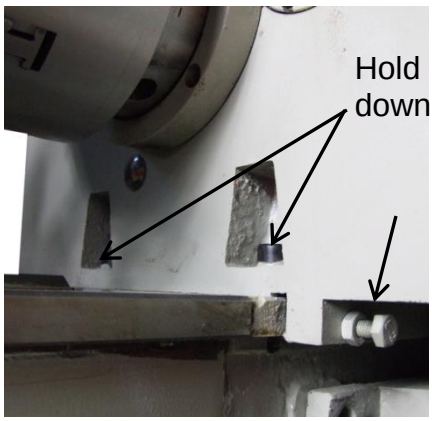


Lathe Alignment

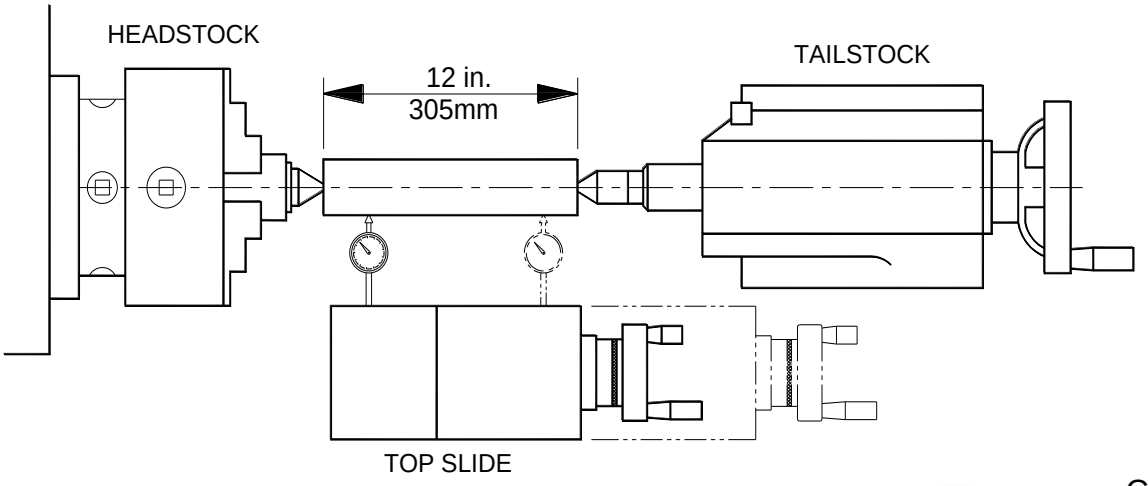
When the lathe is installed and ready for use, it is recommended to check the machine alignment before beginning work. Alignment and leveling should be checked regularly to insure continued accuracy.

1. Start with a straight steel bar with a diameter of 2.00” (approx. 50mm) x 10” (254mm long).
2. Span it in the chuck without using the tailstock.
3. Cut off a chip over a length of 6” (152mm).
4. Measure and compare the diameters at Point A and Point B. They should be the same.
5. To correct a difference in readings, loosen the four headstock hold-down bolts shown, that hold the headstock to the bed.
6. Adjust the headstock by backing off the jam nuts and re-positioning the adjusting bolts.
7. Repeat steps 4 and 5 until the A and B dimensions are the same.

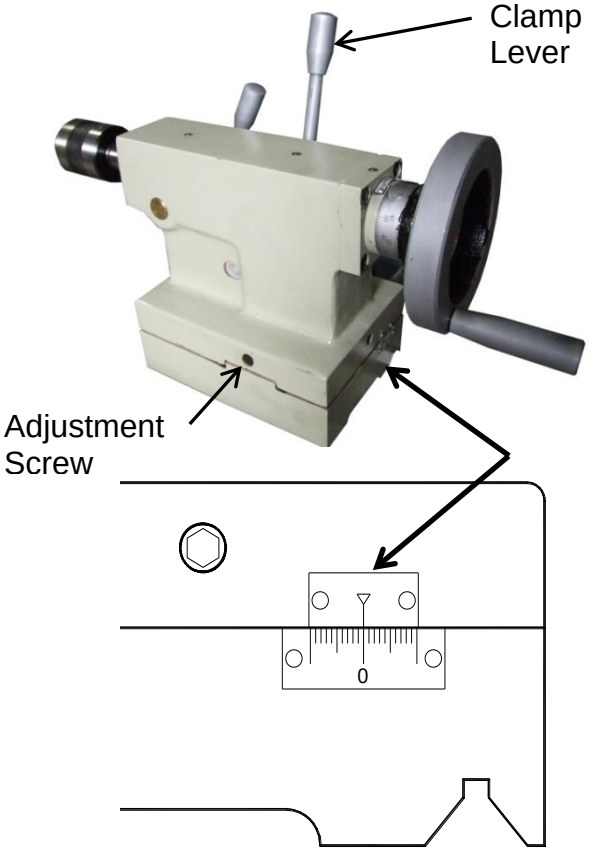




8. To perform a tailstock check, use a 12” (305mm) long ground steel bar fitted between the headstock and the tailstock.
9. Check the alignment by fitting a dial test indicator to the top slide and traversing the centerline of the bar.



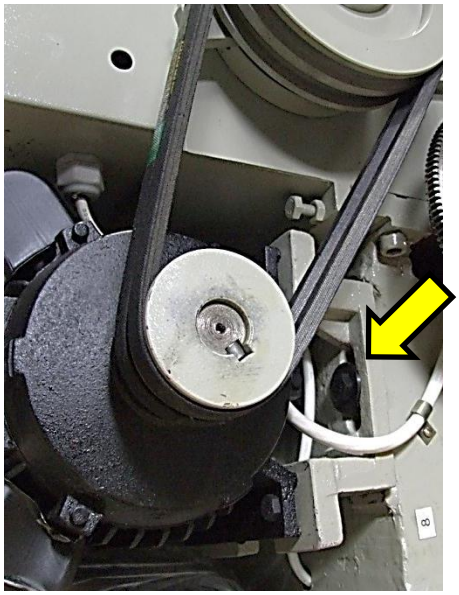
10. To correct any side to side error, release the tailstock clamp lever.
11. Using the two adjustment screws on either side of the tailstock base and the scale, lineup the tailstock to the headstock.
12. Tighten the clamp lever and re-check the alignment until perfect.



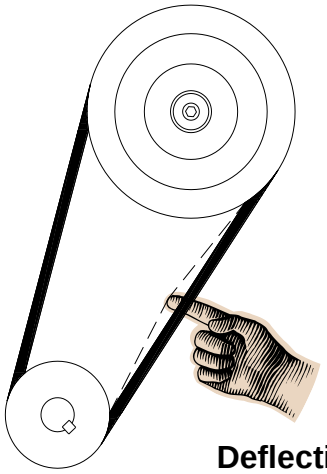
V-Belt Removal and Adjustment

Note: *Always replace belts as a matched set of two.*

V-belts will stretch through usage. Check the tension of the belts every three months. More often if the lathe is used daily.



1. Remove the gear cover at the headstock end of the machine to have access to the V-belts.
2. Loosen the two bolts as indicated by the arrow.
3. Slide the motor up to release tension on the belts so they can be removed.
4. Place the new belts onto the pulleys and let the motor down gently.
5. Push the center of each belt as shown. When properly tensioned the amount of deflection should be approximately 0.75” (19mm).
6. Retighten the motor base capscrews after adjusting or replacing the belts.
7. Replace and secure the gear cover.



Deflection

LUBRICATION AND MAINTENANCE

WARNING: Make sure the electrical disconnect is OFF before working on the machine.
Maintenance should be performed on a regular basis by qualified personnel.
Always follow proper safety precautions when working on or around any machinery.

***Note**: Proper maintenance can increase the life expectancy of your machine.*

Daily Maintenance

- Check daily for any unsafe conditions and fix immediately.
- Check that all nuts and bolts are properly tightened.
- Do a general cleaning by removing dust and metal chips from the machine.
- Top off the coolant tank. (80% of full tank capacity)
- Clean drain screen.
- Check that any guarding, shields, and emergency stop are in good working order.
- Wipe down and re-oil slideways.
- Check operation of foot brake.

Weekly Maintenance

- Thoroughly clean the machine including the coolant tank.
- On a weekly basis clean the machine and the area around it.
- Lubricate threaded components and sliding devices.
- Apply rust inhibitive lubricant to all non-painted surfaces.
- Check sight glasses for gear oil levels (add oil as needed)

3 Month Maintenance

- After initial 3 months replace the headstock, gearbox, and apron oil and then yearly after that.

Oil Disposal

Used oil products must be disposed of in a proper manner following your local regulations.

Accessing and Cleaning the Coolant System

- Access the coolant tank by removing the cover on the right end of the base and remove if desired.
- Drain the coolant from the tank and wash out any dirt and debris. (Check for anything that might be obstructing the pump inlet.)
- Refill tank with coolant solution. Approximately 1.5gal. (5.5L).
- Install tank if removed.

Oils for Lubricating Coolant

Any 10:1 (water to coolant) solution will work, however we recommend Baileigh B-Cool 20:1 (water to coolant) biodegradable metal cutting fluid. It has excellent cooling and heat transfer characteristics, is non-flammable, and extends tool and machine life. Each gallon of concentrate makes 21 gallons of coolant.

Storing Machine for Extended Period of Time

If the Lathe is to be inactive for a long period of time, prepare the machine as follows:

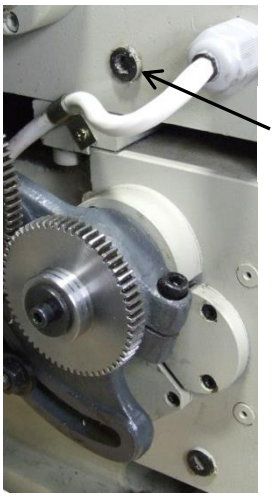
- Detach the plug from the electrical supply panel.
- Remove the chuck, steady rest, follow rest, tool post, and tail stock. Cover with a rust protectant.
- Empty and clean the coolant tank.
- Clean and grease the machine so no bare metal is left unprotected.
- Use desiccant bags (if available) to absorb moisture.
- Cover the machine

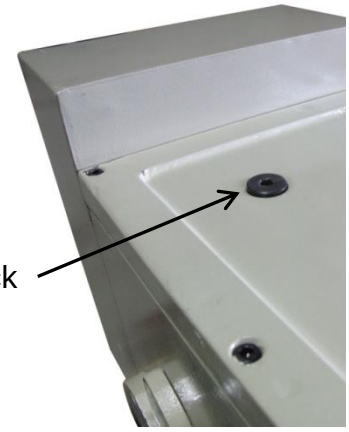
Your machine is designed and manufactured to work smoothly and efficiently.
Following proper maintenance instructions will help ensure this. Try and use original spare parts, whenever possible, and most importantly; DO NOT overload the machine or make any unauthorized modifications.

Headstock

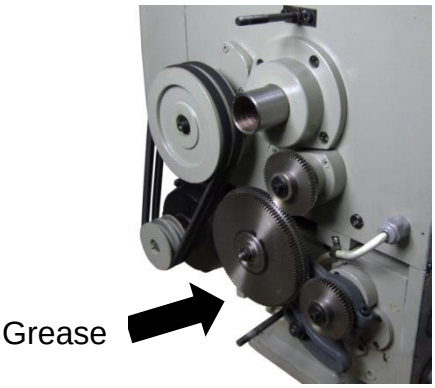
The headstock is splash lubricated from an internal reservoir of oil.

1. Ensure that the oil level shows 3/4 full in the oil sight gauge.
2. To drain the oil from the headstock, remove the pipe plug.
3. Fill the headstock reservoir by removing the fill plug.
4. The first oil change should be made after 3 months, and thereafter once a year with a (Shell Tellus #68 viscosity gear oil or equivalent)



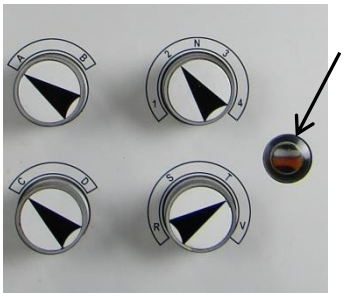


Remove the gear cover on the left end of the lathe and lubricate the change gears with a thick machine oil or grease once a month or as needed.

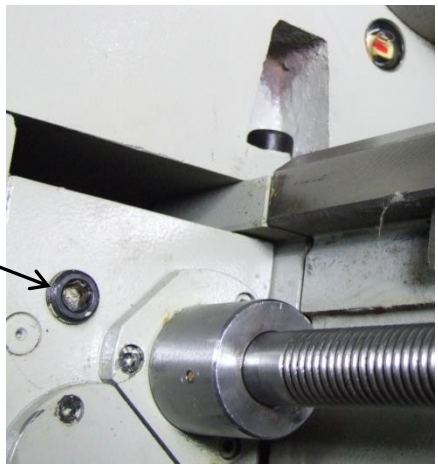


Gearbox

The gearbox is splash lubricated from an internal reservoir of oil.

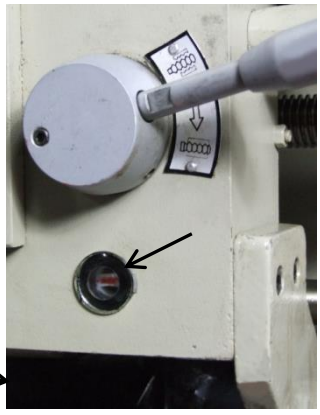


1. Ensure that the oil level shows 3/4 full in the oil sight gauge.
2. To drain the oil from the gearbox, remove the pipe plug.
3. Fill the headstock reservoir by removing the fill plug.
4. The first oil change should be made after 3 months, and thereafter once a year with a (Shell Tellus #68 viscosity gear oil or equivalent).

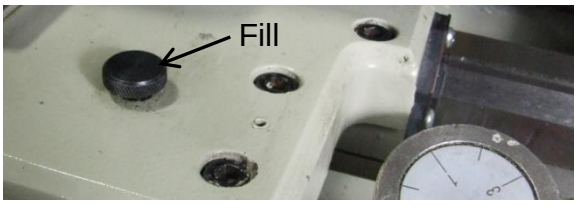


Apron

The apron is lubricated from an internal reservoir of oil.

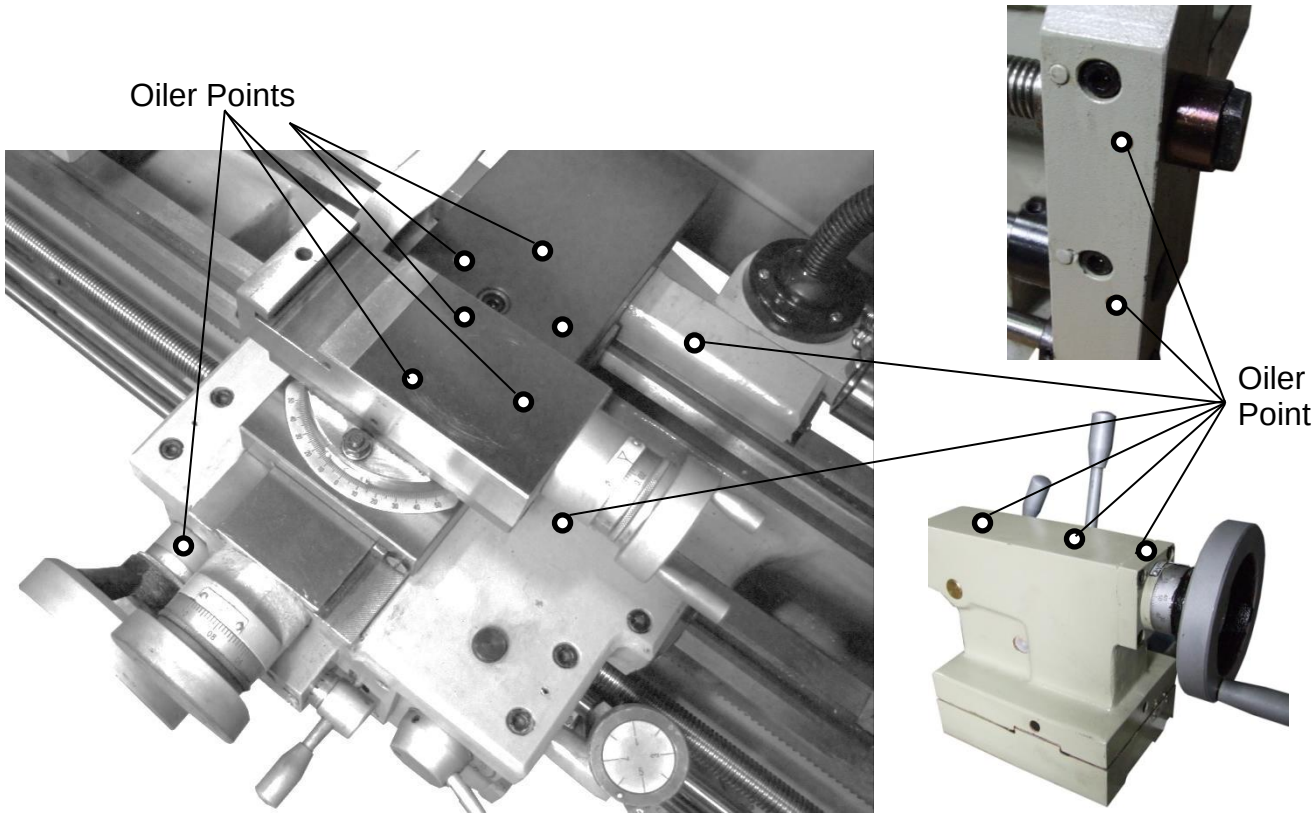


1. Ensure that the oil level shows 3/4 full in the oil sight gauge.
2. To drain the oil from the apron, remove the pipe plug.
3. Fill the apron reservoir by removing the fill plug.
4. The first oil change should be made after 3 months, and thereafter once a year with a (Mobil Vactra #2 or equivalent)

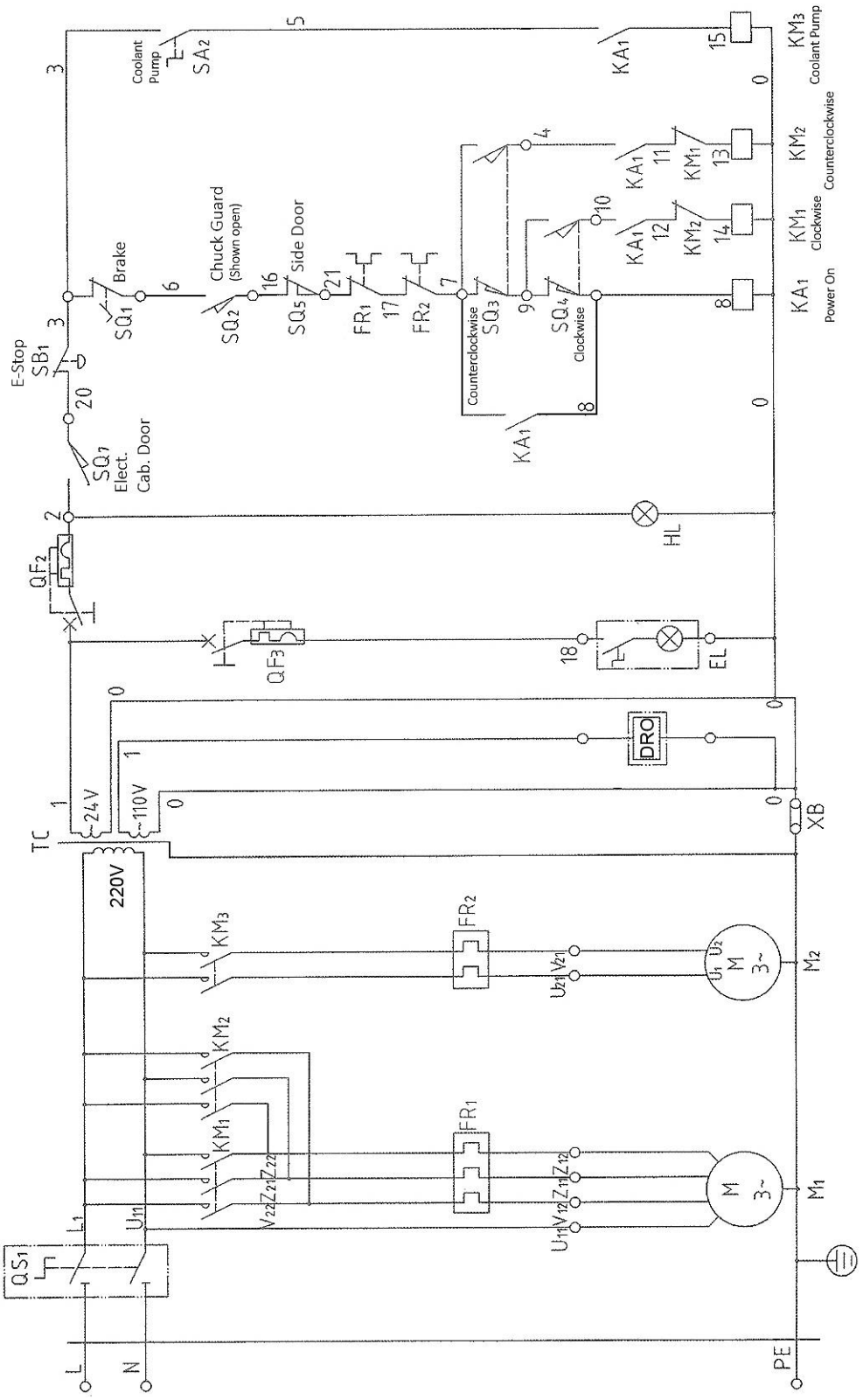


Apply lubricant to the oiler points as indicated daily.
Also oil the cross-slide nut, lead screw, and slide ways with a light machine oil or way lubricant on a daily basis.

***Note**: Use a bristle paint brush to clean the slide ways, lead screw, and feed shaft.*



ELECTRICAL DIAGRAM



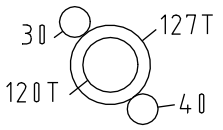
Electrical Component List

Code Name	Description	Model	Technical Data	Qty
KM1; KM2	A.C. Contactor, Motor Rotation	LC1-D189	AC110V, 50/60Hz	2
KM3	A.C. Contactor, Coolant Pump	LC1-D099	AC110V, 50/60Hz	1
KA1	Relay, Power On	CA2-DN140	AC110V, 50/60Hz	1
FR1	Thermal Relay, Main Motor	T16	9-13A	1
FR2	Thermal Relay, Coolant Motor	T16	0.35-0.52A	1
QF2	Circuit Breaker, Control Switches	DZ47-63	D3	1
QF3	Circuit Breaker, Work Lamp	DZ47-63	D6	1
EL	Work Lamp	JC52		1
SB1	E-Stop Button	LAY3-01ZS		1
SB2	Button	LAY3-10		1
SA2	Selector Switch, Coolant Pump	LAY3-10X/2		1
HL	Power Indicator Light	XDY2-AD		1
SQ1	Limit Switch, Brake Pedal	LXW5-11N1		1
SQ2	Limit Switch, Chuck Guard	LXW3		1
SQ3; SQ4	Limit Switch, Motor Rotation	LXW5-11D1		2
SQ5	Limit Switch, Change Gear Door	LXW3		1
SQ7	Limit Switch, Electrical Cabinet Door	LXW5-11Q1		1
TC	Transformer	JBK5-100TH	220 - 240V/110V.24V	1
QS1	Main Disconnect	GB/T 14048 3	AC-22A – 25A/690V	1

THREAD AND FEED SELECTION

Longitudinal and cross feed table.
Suitable for metric lead crew.

LEAD SCREW 4mm CROSS SCREW 2.5mm

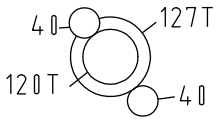


mm

LEVER		B C	A C	B D	A D
3	U	0.45	0.9	1.8	3.6
3	R			2.25	4.5
1	U	0.6	1.2	2.4	4.8
3	S	0.7	1.4	2.8	5.6
4	R			3.75	7.5
2	S	0.75	1.5	3	6
1	T	1	2	4	8
4	T	1.25	2.5	5	10

mm

LEVER		B C	A C	B D	A D
0	U	.026 / .017	.052 / .014	.104 / .028	.209 / .057
0	R	.033 / .009	.065 / .018	.130 / .035	.261 / .071
0	U	.026 / .017	.052 / .014	.104 / .028	.209 / .057
0	S	.041 / .011	.081 / .022	.162 / .044	.325 / .088
0	R	.033 / .009	.065 / .018	.130 / .035	.261 / .071
0	S	.041 / .011	.081 / .022	.162 / .044	.325 / .088
0	T	.043 / .012	.087 / .024	.174 / .047	.348 / .094
0	T	.043 / .012	.087 / .024	.174 / .047	.348 / .094



T/1"

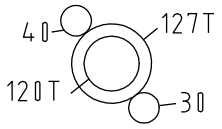
LEVER		B C	A C	B D	A D
3	U	40	20	10	5
3	R	32	16	8	4
1	U	30	15	7½	3¾
2	S	24	12	6	3
1	T	18	9	4½	2¼

mm

LEVER		B C	A C	B D	A D
0	U	.037 / .010	.074 / .020	.147 / .040	.295 / .080
0	R	.046 / .012	.092 / .025	.184 / .050	.368 / .100
0	U	.037 / .010	.074 / .020	.147 / .040	.295 / .080
0	S	.057 / .016	.115 / .031	.230 / .062	.460 / .124
0	T	.061 / .017	.123 / .033	.245 / .066	.491 / .133

Metric and imperial thread table.
Suitable for imperial leadscrew

LEAD SCREW 8TPI CROSS SCREW 8TPI

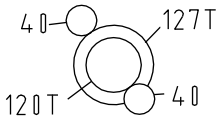


T/1"

LEVER		B C	A C	B D	A D
3	U	40	20	10	5
3	R	32	16	8	4
1	U	30	15	7½	3¾
2	S	24	12	6	3
1	T	18	9	4½	2¼

in

LEVER		B C	A C	B D	A D
0	U	.0019 / .0007	.0037 / .0013	.0073 / .0025	.0146 / .0050
0	R	.0023 / .0008	.0046 / .0016	.0092 / .0032	.0183 / .0063
0	U	.0019 / .0007	.0037 / .0013	.0073 / .0025	.0146 / .0050
0	S	.0028 / .0010	.0057 / .0020	.0113 / .0039	.0226 / .0078
0	T	.0031 / .0011	.0061 / .0021	.0122 / .0042	.0243 / .0084



mm

LEVER		B C	A C	B D	A D
3	U	0.45	0.9	1.8	3.6
3	R			2.25	4.5
1	U	0.6	1.2	2.4	4.8
3	S	0.7	1.4	2.8	5.6
4	R			3.75	7.5
2	S	0.75	1.5	3	6
1	T	1	2	4	8
4	T	1.25	2.5	5	10

in

LEVER		B C	A C	B D	A D
0	U	.0013 / .0005	.0026 / .0009	.0052 / .0018	.0104 / .0036
0	R	.0017 / .0006	.0033 / .0012	.0065 / .0023	.0129 / .0045
0	U	.0013 / .0005	.0026 / .0009	.0052 / .0018	.0104 / .0036
0	S	.0021 / .0007	.0041 / .0014	.0081 / .0028	.0161 / .0055
0	R	.0017 / .0006	.0033 / .0012	.0065 / .0023	.0129 / .0045
0	S	.0021 / .0007	.0041 / .0014	.0081 / .0028	.0161 / .0055
0	T	.0022 / .0008	.0044 / .0015	.0087 / .0030	.0173 / .0059
0	T	.0022 / .0008	.0044 / .0015	.0087 / .0030	.0173 / .0059

THREADING DIAL INDICATOR

INDICATOR TABLE WHIT WORTH					
TPI	SCALE	TPI	SCALE	TPI	SCALE
4	1-8	13	1.3.5.7	44	1-8
4-1/2	1-8	14	1-8	48	1-8
4-3/4	1-8	16	1-8	52	1-8
5	1.3.5.7	18	1-8	56	1-8
5-1/2	1-8	19	1.3.5.7	64	1-8
6	1-8	20	1-8	72	1-8
6-1/2	1-8	22	1-8	76	1-8
7	1.3.5.7	24	1-8	80	1-8
8	1-8	26	1-8	88	1-8
9	1.3.5.7	28	1-8	96	1-8
9-1/2	1-8	32	1-8	104	1-8
10	1-8	36	1-8	112	1-8
11	1.3.5.7	38	1-8		
12	1-8	40	1-8		

Important: *Make sure to use the actual charts on your lathe to determine the correct thread settings.*

NOTES

BAILEIGH INDUSTRIAL HOLDINGS LLC
1625 DUFEK DRIVE MANITOWOC, WI 54220
PHONE: 920. 684. 4990 FAX: 920. 684. 3944
www.baileigh.com

BAILEIGH INDUSTRIAL HOLDINGS LTD. UNIT D SWIFT POINT
SWIFT VALLEY INDUSTRIAL ESTATE, RUGBY
WEST MIDLANDS, CV21 1QH UNITED KINGDOM
PHONE: +44 (0)24 7661 9267 FAX: +44 (0)24 7661 9276
WWW.BAILEIGH.CO.UK