OPERATOR'S MANUAL

Metal Working

Book 1 of 3

ENGINE LATHE

MODEL: PL-1860E-1.0

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

Rev. 03/2018

Table of Contents

THANK YOU & WARRANTY

Thank you for your purchase of a machine from Baileigh Industrial. 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 30 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 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 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 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 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.

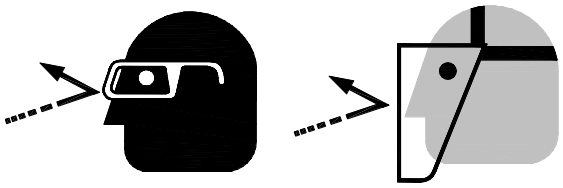
CAUTION: Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

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.

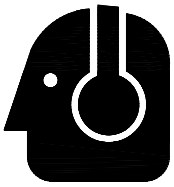
PROTECT EYES

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



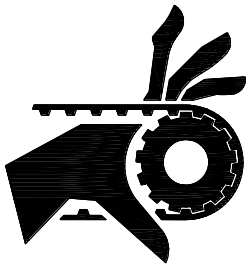
PROTECT AGAINST NOISE

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.



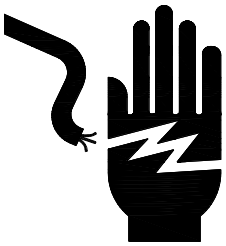
BEWARE OF PINCH POINTS

Keep hands and fingers away from the motors drive belt and pulleys when performing maintenance. Keep motor guards in place at all times while the machine is running.



HIGH VOLTAGE

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

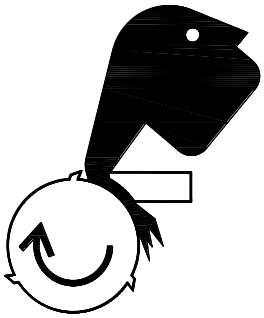


ROTATING TOOL HAZARD

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.

ENTANGLEMENT HAZARD – ROTATING SHAFTS

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



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.

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. **Only trained and qualified personnel can operate this machine.**

2. **Make sure guards are in place and in proper working order before operating machinery.**

3. **Remove any adjusting tools.** Before operating the machine, make sure any adjusting tools have been removed.

4. **Keep work area clean.** Cluttered areas invite injuries.

5. **Overloading machine.** By overloading the machine you may cause injury from flying parts. **DO NOT** exceed the specified machine capacities.

6. **Dressing material edges.** Always chamfer and deburr all sharp edges.

7. **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.

8. **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.

9. **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.

10. **Use eye and ear protection**. Always wear ISO approved impact safety goggles. Wear a full-face shield if you are producing metal filings.

11. **Do not overreach**. Maintain proper footing and balance at all times. **DO NOT** reach over or across a running machine.

12. **Stay alert**. Watch what you are doing and use common sense. **DO NOT** operate any tool or machine when you are tired.

13. **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.

14. **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.

15. **Keep children away**. Children must never be allowed in the work area. **DO NOT** let them handle machines, tools, or extension cords.

16. Keep visitors a safe distance from the work area.

17. **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.

18. **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.

19. **DO NOT** touch live electrical components or parts. **Turn off** power before checking, cleaning, or replacing any parts.
20. Be sure **all** equipment is properly installed and grounded according to national, state, and local codes.
21. Inspect power and control cables periodically. Replace if damaged or bare wires are exposed. **Bare wiring can kill!**
22. **DO NOT** bypass or defeat any safety interlock systems.
23. Follow maintenance instructions and lubrication schedules to ensure the machine is in good working condition at all times.
24. Set up a scheduled machine inspection to look for damaged parts, loose hardware, misaligned components, or other conditions that will affect the safe operation of the machine.
25. 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.
26. To avoid injuries during start-up, make sure the piece part, tooling, and tool post have adequate clearance.
27. 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.
28. 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.
29. 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.
30. **ALWAYS STOP THE LATHE** when removing shavings or chips 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@baileighindustrial.com, Phone: 920.684.4990, or Fax: 920.684.3944.

***Note**: The photos illustrations using 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

Max. Swing Over Bed	18" (460mm)
Max. Swing Over Cross Slide	10.75" (273mm)
Max. Swing In Gap Diameter	27.5" x 12.3” (698.5 x 312mm)
Distance Between Centers	60" (1524mm)
Cross Slide Travel	10.5" (267mm)
Bed Width	13.125" (333mm)
Spindle Speeds	12 @ 25 – 1800rpm
Number of Turning/Facing Feeds	122
Range of Y Feed	.0015” - .0913” /rev (.0381 – 2.319mm/rev)
Range of X Feed	.006” - .0365” /rev (.1524 – .9271mm/rev)
Spindle Through Bore	3.125" (79.4mm)
Spindle/Chuck Mount	D1-D8
Threads Diametrical Qty. Type	45 / 3.5 – 96
Threads Imperial Qty. Type	61 / 1-5/8 - 72 T.P.I.
Threads Metric Qty. Type	24 / .5 - 20mm
Threads Module Qty. Type	21 / .25 - 10
Spindle Taper	MT-7 (MT-5 Sleeve Included)
Steady Rest Capacity	.375” – 7.75” (9.5 – 197mm)
Compound Rest Travel	5.125" (130mm)
Carriage Travel	55.56" (1411mm)
Tailstock Quill Diameter	2.96" (75mm)
Tailstock Quill Taper	MT-5
Tailstock Quill Travel	6" (152.4mm)
Longitudinal Feed Trip Dogs	5 Indexable
Power	220V, 3-phase, 60hz
Main Motor	7hp (5.4kw), 220V, 3-phase, 60hz, 23A
Coolant Pump	1/8hp (90w), 220V, 3-phase, 60hz, .5A
Coolant Capacity	11.3gal (43L)
Headstock Oil	3 gal (11.4L) ISO 68 Hyd. Circulating Oil
Transmission Oil	.5 gal (1.9L) ISO 68 Hyd. Circulating Oil
Apron Oil	.4 gal (1.6L) ISO 68 Hyd. Circulating Oil
Foot Print	114” x 42” x 62” (2900 x 1067 x 1575mm)
Shipping Dimensions	116" x 45" x 66" (2950 x 1143 x 1677mm)
Shipping Weight	5,650lbs. (2570kg)

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.*

Contents of the Shipping Container

1	Lathe
1	Steady Rest (mounted on lathe)
1	Follow Rest
1	250mm Three Jaw Chuck (mounted on lathe)
1	320mm Four Jaw Chuck
1	Face Plate
1	Tool Box

Tool Box Contents

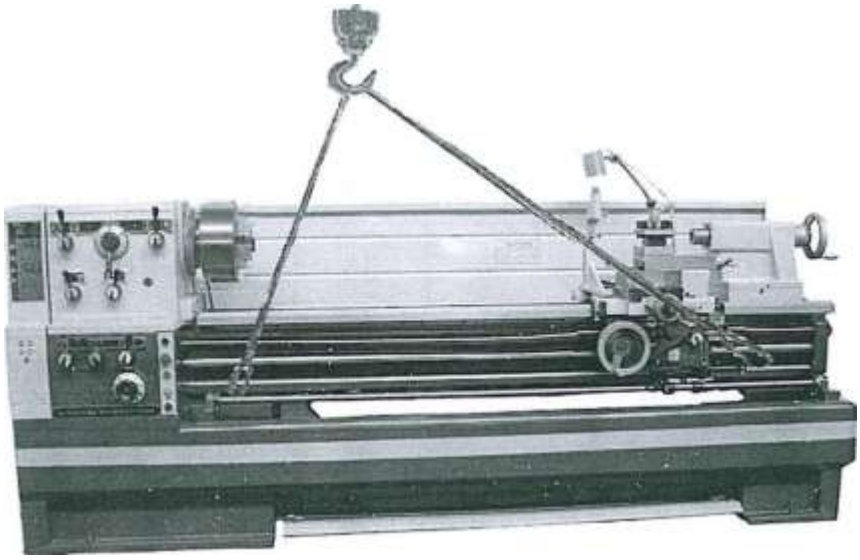
7	Hex Wrench Set
4	Open End Wrench Set
1	Spindle Sleeve
1	Center
6	Leveling Bolts
6	Leveling Pads
1	Flat Blade Screwdriver
1	Cross Point Screwdriver
1	Chuck Wrench
1	Tool Post Wrench
1	Light bulb
1	Adjustable Wrench
1	Oil Gun
1	Cross Feed Handle
2	Shear Pins
1	Live Center (MT5)
1	Key For Cam Locks
1	Round Nut Spanner
1	Gap-Bridge Pin Driver
5	Fuse
1	Taper Piece
1	Paint Can

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.

Guidelines when lifting:

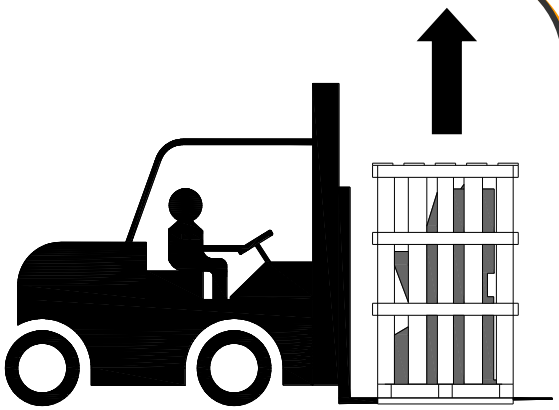
- Always lift and carry the machine with the lifting holes provided.
- Preparing two round steel rods (approx.830mm long x 40mm diameter) insert into the preserved holes on lathe bed. Then lift up with applying wires on both end of the stick.
- Before lifting adjust the position of Lathe Apron and Tailstock to maintain the balance of machine.



- Use lift equipment such as straps, chains, capable of lifting 1.5 to 2 times the weight of the machine.
- Take proper precautions for handling and lifting.
- Check 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, then lower slowly until it touches the floor.

- 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:

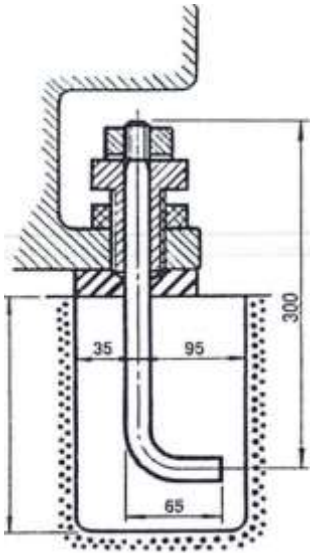
Consider the following when looking for a suitable location to place the machine:

- 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 machine 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

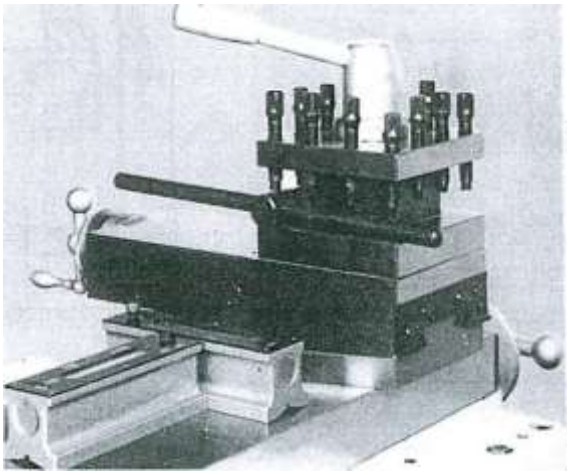
- Once positioned, anchor the machine to the floor, as shown in the diagram, using bolts and expansion plugs or sunken tie rods that connect through holes in the base of the stand.



Level Adjustments

Wait until the fixture screws and cement completely cure to start adjusting lathe bed horizontally. In doing this, place a leveling instrument (with accuracy 0.02 mm / 1000mm) upon the grooves of lathe bed to confirm the level of right and left side. Use the same procedure for the front and rear leveling. The allowance of level should be adjusted within 0.04mm / 1000mm.

Screw up the nuts, check again, if whatever errors occur due to tightly screw-up there in after, adjustment may require to be done again.
As per illustration indicated, place two leveling instruments on lathe bed to check the level by pushing them back and forth in its possible maximum moving range.



GUIDELINE FOR SAFETY OPERATION

⚠ WARNING: A lathe is a high speed and powerful machine which can cause serious injury and death if operate it improperly. Before operating the lathe, read, understand and follow every guideline of safe operation.

1. Do not place any objects in the processing area of the lathe as they may bump with rotating or moving parts.
2. **Before starting the lathe, you should understand how to stop it.**
3. Stop running of the lathe immediately in case any accident occurs.
4. The chuck should be properly and firmly mounted on the spindle of the lathe.
5. Take care that the workpiece should be gripped firmly and the speed of the spindle cannot exceed the safe speed of the chuck.
6. As it is possible to contact with human body, especially when the material with small diameter is used, it is not allowed in any case that the rod material extend out the end of the spindle of the headstock which has no special guard and relative support.

Danger of Operation

When operating the lathe you should fully understand the danger of following operations:

Cutting Fluid

Cutting fluids can be hazardous to human body. Contact with the cutting fluid continuously especially the original fluid, can cause skin allergy or illness.
Therefore following precautions should be taken:
a. Avoid any unnecessary contact.
b. Put on the protective clothes.
c. Adopt guard shield or plate.
d. Do not wear oily or dirt clothes.
e. Clean all parts of the body where the cutting fluid is contacted after work.
f. Do not mix different cutting fluids.
g. Replace the cutting fluid regularly.
h. Correctly treat the cutting fluid.
Contact the cutting fluid supplier for additional details.

General Safe Rules for Operator of the Lathe

1. When jigging the workpiece, the surface must be clean and dry. It cannot be oily or greasy. All parts should be jigged firmly. Do not intend to jig a workpiece which is unsuitable or poorly seated to the chuck. Do not jig the workpiece exceeding the weight allowed by the lathe. Use suitable hoisting method when the workpiece is hoisted.
2. Ensure to remove oil or grease on handy tools and operation grippers. Ensure the structures of handy tools and operation grippers are suitable to touch safely by hand.
3. Take care of large flashes and burrs on the workpiece.
4. Always take care to select correct tool in work.
5. It is not allowed to leave other unfixed tools or operation gripper on the chuck.
6. Do not allow to use the tool without the handle.
7. Always adopt the chuck, the follow rest and the center to support the workpiece.
8. The workpiece should have correct position in the hexagon hole and the groove of the screwdriver.
9. Take care that the locking screw should be tightened.
10. Never use a substitute tool if no suitable tool is available or prepared in the workshop.
11. Do not let your hands or body be within the working area of moving parts.
12. Do not let your hands or body be on the place where they could be hurt by the chuck or the workpiece.
13. Take care not to push the handle, to operate the clutch or to switch on power supply to cause accident.
14. Master every function and all kinds of operation methods.
15. Never put your hands on the chuck or the workpiece to stop rotation of the spindle.
16. For the lathe driven by the clutch, in case the clutch is disengaged, the spindle should be stopped running otherwise the clutch or the brake device should be adjusted.
17. When the lathe is not in use, ensure to switch off power supply of the lathe.
18. Stop the rotation of the chuck before replacing the new workpiece.
19. When the chuck key is in the chuck, never start the spindle.
20. Additional personal safety equipment should be worn if the operator has long hair to avoid danger due to hair is wounded by rotating parts of the machine.
21. Take special care to make operation if you are closing to rotating part of the machine.
22. Always pay attention to filing and deburring.
23. Take special care when the file or the deburring tool is closing to the chuck. The file or the deburring tool could bump the chuck.

24. For the lathe driven by the clutch, take care that the clutch should be at the position the lathe is stopped when making measurement.
25. Take care of rotating and stopping positions of the spindle when hand is on the handle of the clutch.
26. Ensure the spindle of the lathe should be at the stop position when measuring the workpiece jigged on the chuck.
27. When the measuring meter is used on the lathe, ensure the motor is at the stop status.
28. Take cares of cuttings flying out from the lathe.
29. Select suitable guard plate on the operation position.
30. Never leap over or go around the chuck or the workpiece to make adjustment when they are in running status.
31. Take care of the place the workpiece is put when making adjustment of the lathe or the workpiece.
32. Never leap over or go around the chuck or the workpiece to move the tool/lathe to other position.
33. Never leap over or go around the chuck or the workpiece to tighten parts on the lathe.
34. Never leap over or go around the chuck or the workpiece to remove iron chips.
35. Never mount the workpiece too large or heavy for the operator.
36. Use necessary tools to treat the workpiece.
37. Never apply excessive force on the attachment or the operation lever.
38. Take care to jig the workpiece firmly.
39. Tighten all claws, nuts, screws and fasteners.
40. Always take care to use correct equipment.
41. Never make cutting beyond the ability of the lathe.
42. Do not apply excessive force to polish or to deburr.
43. Always take care to adopt suitable tool to deburr. Do not deburr in a hurry and take care of burrs on the chuck and the workpiece.
44. Switch off power supply to stop all movements of the lathe before replacing the exchange gears.
45. Take care if the chuck / parts could drop down when the lathe is in operation.

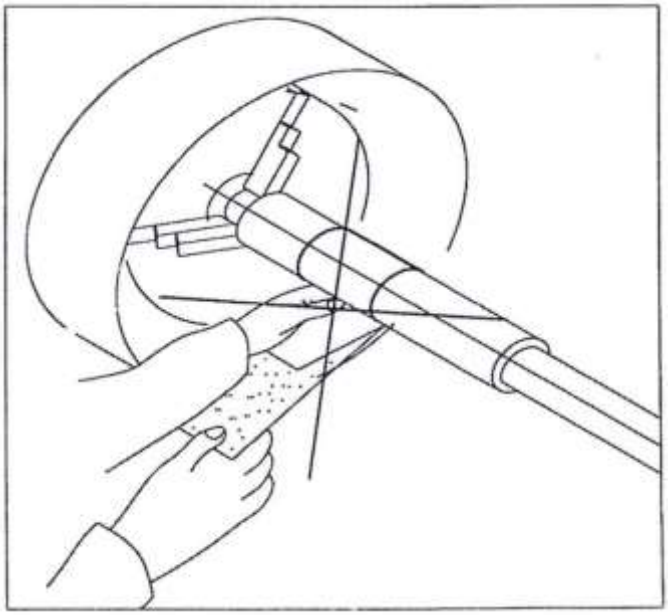
Protection of the Chuck

The lathe is equipped with the guard of the chuck which is suitable for the standard chuck.
It should be in a closed status before the spindle is running.

1. When the machine is equipped with larger chuck, the chuck guard should be replaced with one which has corresponding diameter with that of the chuck.
2. It is suggested that claws cannot extend out the outer diameter of the chuck in order to avoid bump with the chuck guard. For the sake of safe operation, always take care not to extend claws out of the outer diameter of the chuck.

The Use of Emery Cloth in Metal Processing Can Cause Danger

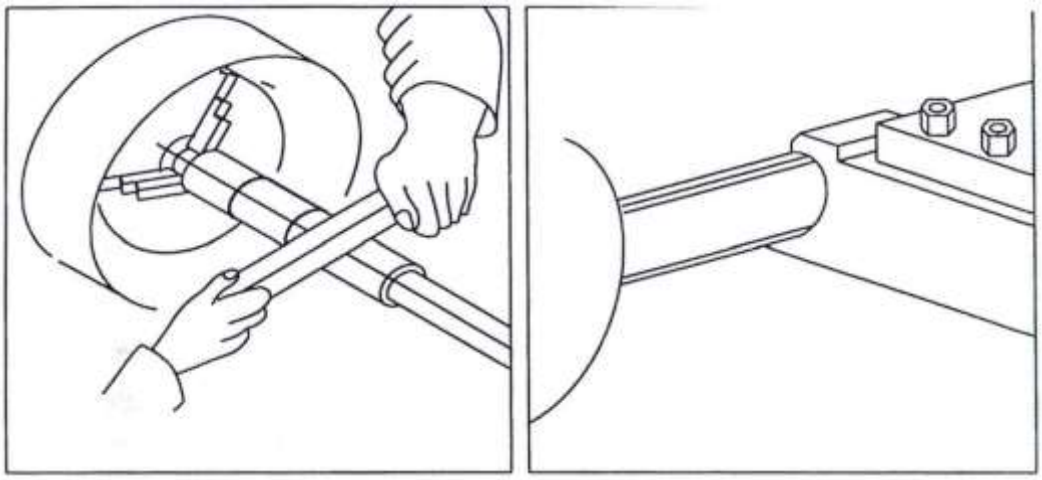
In all accidents occurred on the lathe, most are from the use of emery cloth to cause breakage of fingers, or even to amputate occasionally.
When workpieces with different shapes are rotating on the lathe, if using emery cloth to deburr, to polish or to process finished sizes, it can cause the accident when winding emery cloth on the workpiece to be ground by two hands. If winding the emery cloth on the finger or to make rough grinding, the finger could be seized firmly to cause serious Injury.



Precautions

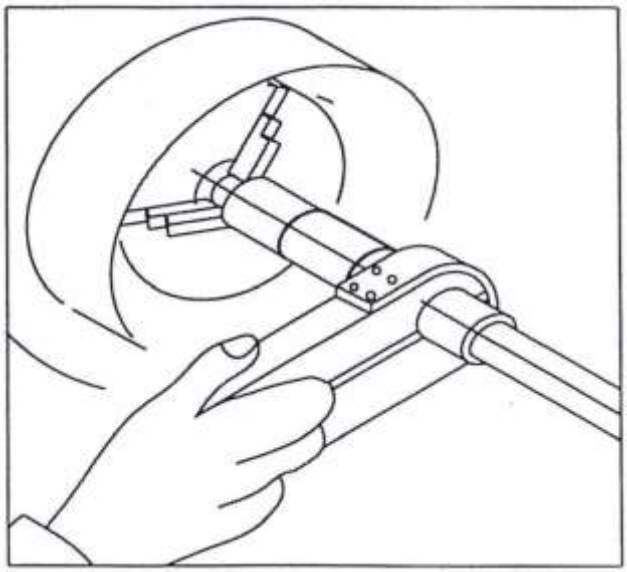
The operator should have certain recognition and knowledge on the necessity to treat part by emery cloth on the lathe.
It is not needed to process by emery cloth in following cases:
If the requirement of the surface finish is not critical.
Make processing by turning or on special polisher or grinding machine, the finished sizes and surface roughness can be achieved well.

If technological rule defines that the workpiece should be ground by emery cloth, then the emery cloth should be used in following cases:
a. Nail the emery cloth on a quality wood board to grind.



b. The emery cloth is fixed on and jigged by the tool holder to grind.
c. The "Robust Grinder" consists of two pieces of jointed wood board and the emery cloth to make grinding and the workpiece to be polished can go through its hole.
d. The polish is made by the wire brush stuck with abrasive material.

Apply force at the both ends of the emery cloth to pull it upward. Never pull it loosely or wind it on your finger or on the workpiece.
When the end of the workpiece is polished, only a short piece of the emery cloth shall be used as it cannot be wound.
When polish by the emery cloth is made, never operate by wearing gloves.



Safety Devices

Operate the lathe only with properly functioning safety devices.
Stop the lathe immediately if there is a failure in the safety device or if it is not functioning for some reason.
It is your responsibility!
If the safety device has been activated or has failed, the lathe must only be operated again when:

- The cause of the failure has been removed.
- You have made sure that there is no existing danger for persons or objects.
- Check the lathe at least once per work shift. Inform the person responsible immediately of any damage, defect or change in the operating function.
- Check that the prohibition, warning and information labels as well as the markings on the lathe are legible (clean them, if necessary).

⚠ WARNING: If you bypass, remove or override a safety device in any other way you are endangering yourself and other persons working on the lathe.

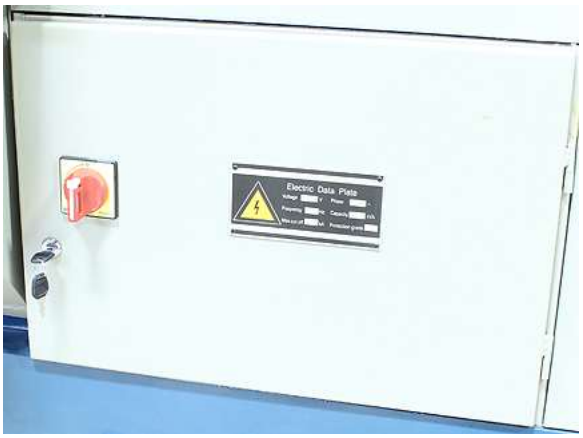
The possible consequences are the following:

- injuries due to components or parts of components flying off at high speed.
- contact with rotating parts.
- fatal electrocution.
- pulling-in of clothes.

The lathe includes the following safety devices:

Main Disconnect Switch

In the position "0", the lockable main disconnect switch can be secured against accidental or non-authorized switching-on by means of a padlock.
When the main switch is switched OFF the current supply is being interrupted.



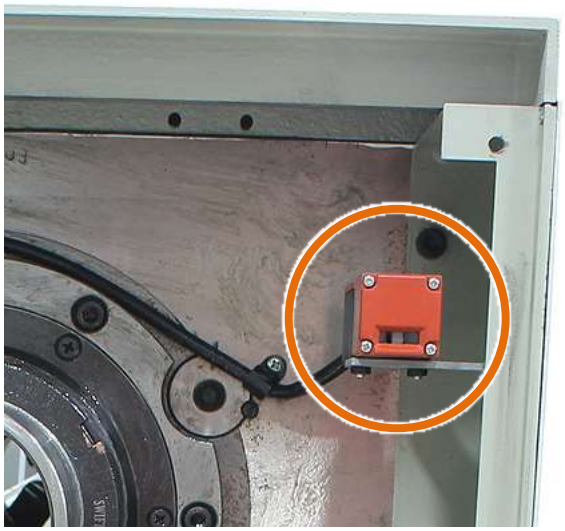
EMERGENCY-STOP Button

The EMERGENCY-STOP button is located on the control face just to the left and below the chuck.
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.

Headstock Access Door

The headstock of the lathe is provided with an interlock switch to ensure that access door is closed during operation to prevent entanglement.
The lathe only starts when the access door is closed.

WARNING: Only open the access door when the main disconnect switch of the lathe is turned off and secured by a padlock.



Electrical Cabinet Access Door

The electrical cabinet of the lathe is provided with an interlock switch to ensure that access door is closed during operation to prevent contact to energized electrical circuits.
The lathe only starts when the door is closed.

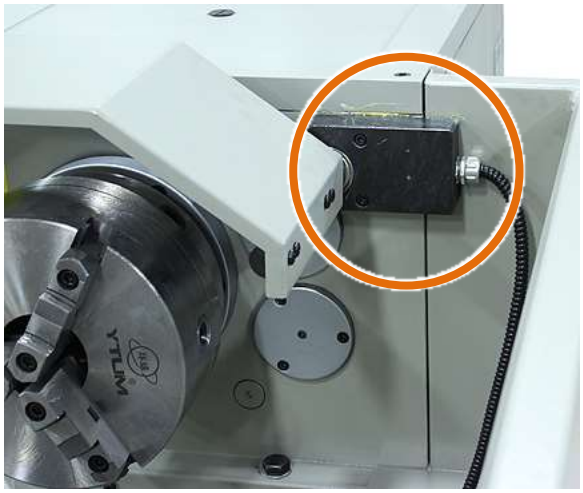
WARNING: Only open the access door when the main disconnect switch of the lathe is turned off and secured by a padlock.

Brake Pedal

The lathe has a manual braking system used to stop the chuck rotation. Stepping on the brake pedal manually engage the brake and activate the limit switch to stop the moor from turning the chuck. Note: Releasing the brake pedal will not start the machine. The Run lever must be cycled through the off position to start the lathe again.

Lathe Chuck Guard Interlock Switch

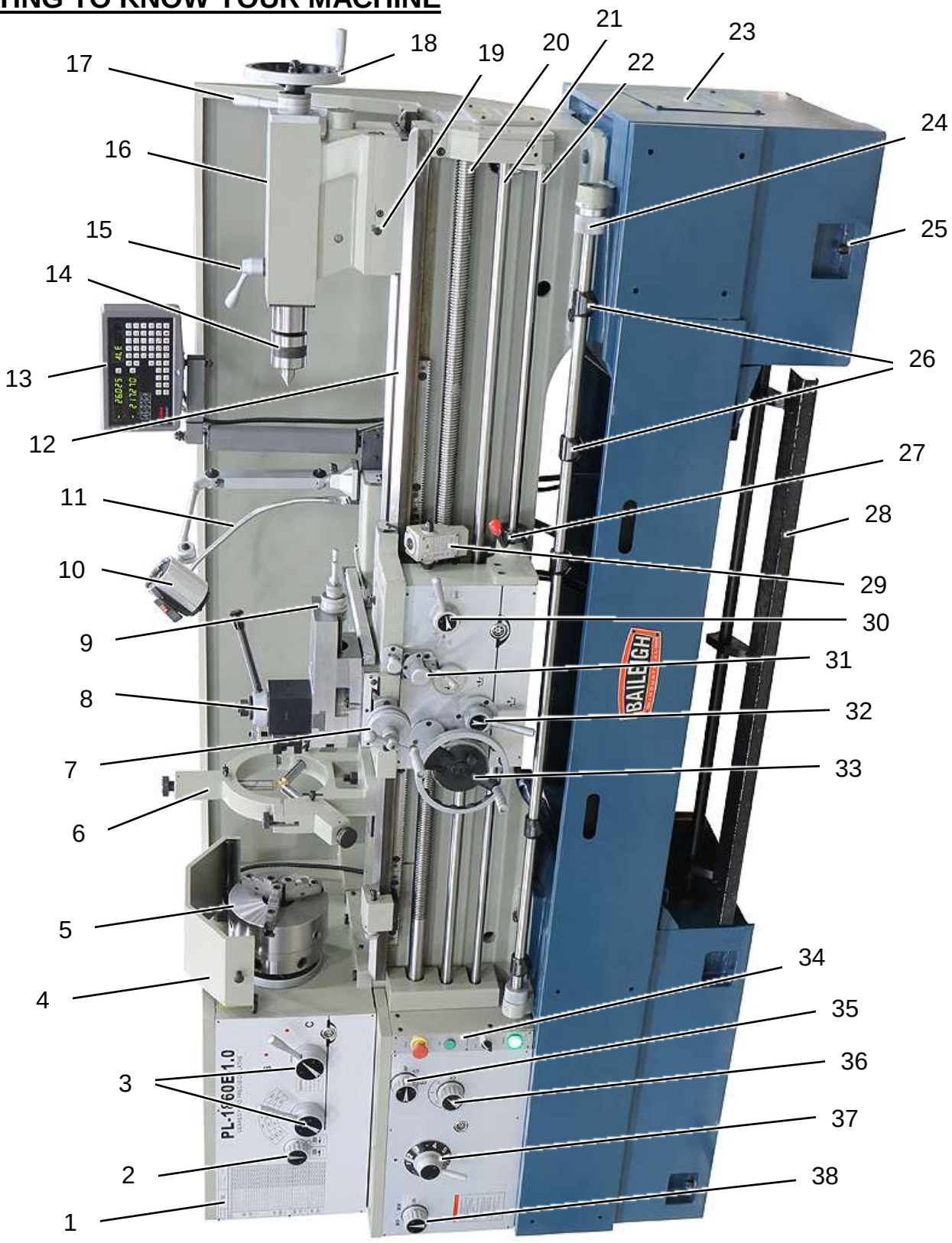
The lathe is provided with a lathe chuck guard. The chuck guard uses a limit switch at the guard pivot point to ensure that the lathe can only be switched on if the lathe chuck guard is closed.



Securing Screw

Tighten the securing screw at the end of the lathe bed in order to prevent the tailstock from unintentional being slid out of the lathe bed.

GETTING TO KNOW YOUR MACHINE



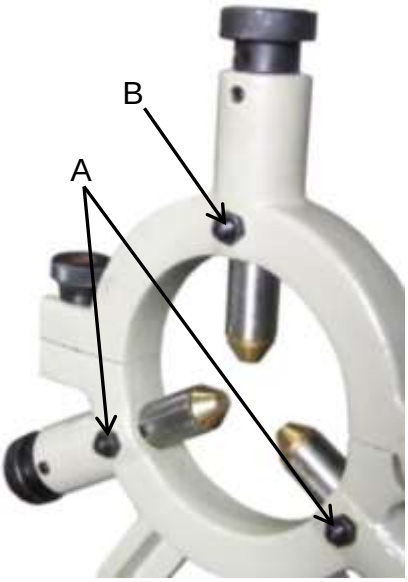
No.	Description	No.	Description
1	Thread Cutting Chart	21	Auto Feed Rod
2	Lead Screw Feed Direction Knob	22	Spindle Run Rod
3	Main Spindle Speed Change Levers	23	Coolant Pump (inside cover)
4	Chuck Guard	24	7-Position Auto Stop Lever
5	Chuck (3 Jaw Shown)	25	Foundation Adjustment Bolts
6	Compound Rest	26	Eccentric Center Ring
7	Cross Slide Feed Knob	27	Spindle Run Control Lever
8	Tool Post	28	Foot Brake Pedal
9	Compound Rest Handle	29	Thread Dial Indicator
10	Lamp	30	Half Nut Engaged Lever
11	Coolant Hose and Nozzle	31	Longitudinal & Cross Feed Select Lever
12	Rack	32	Feed Engagement Lever
13	Digital Read Out (DRO)	33	Longitudinal Apron Hand-wheel
14	Tailstock Spindle	34	Electrical Controls Emergency Stop Jog Push Button Coolant On/Off Switch Power Indicator Lamp
15	Tailstock Spindle Locking Lever	35	Feed Selection Lever – Letter or Neutral
16	Tailstock Body	36	Feed Selection Lever – Numeral
17	Tailstock Body Clamping Lever	37	10 Step Feed Selection Lever – Number
18	Tailstock Hand-wheel	38	Thread Type Selector
19	Tailstock Set Over Adjust Screws	39	
20	Lead screw		

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.

Steady Rest

1. To adjust the steady rest, first loosen the three lock nuts (A).
2. To open the fingers, turn the knurled screws clockwise (cw). If a knurled screw turns hard, back out the setscrews (B) 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.

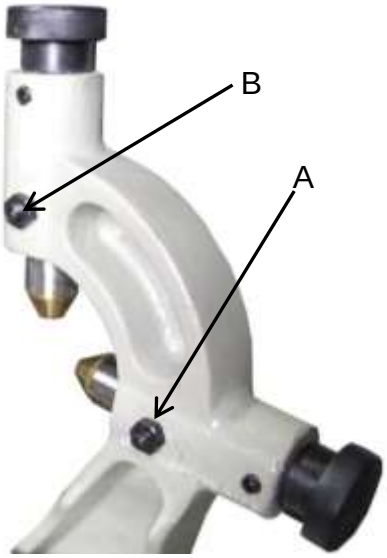


Follow Rest

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. The follow rests, which are opposite the tool post, act as supports to counter balance 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.

Follow Rest

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.



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 MT-5 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. When mounting a long slender piece part that extends more than 2-1/2 times its diameter beyond the jaws of the chuck, mount a center in the tailstock to support it.

1. Before mounting a piece part onto the tailstock dead center, DISCONNECT POWER TO THE LATHE.
2. Thoroughly clean and dry the tapered surfaces of the tailstock quill bore and the point of the dead center. Apply a thin coat of light weight machine oil to the surfaces and wipe again to leave a minimal amount of oil on the mating surfaces.
3. Using the tailstock hand wheel, feed the quill out from the casting at least 1” (25.4mm) but not more than 2” (50.8mm).
4. Center drill the tailstock end of the piece part to match the tip of the dead center. This will help keep the piece part from slipping off the center tip.
5. Seat the dead center into the quill and position the tailstock so that the tip of the center presses against the piece part to hold it in place. Tighten the tailstock lock lever.
6. Rotate the tailstock hand wheel clockwise (cw) to press the center into the piece part until snug. Tighten the quill lock lever.
7. To remove the dead center from the quill, hold onto it with one hand and rotate the hand wheel counterclockwise (ccw) until the center falls out.

Dead Center

⚠ WARNING: When using a center in the spindle to mount a work piece, the other end of the work piece MUST be supported by a center installed in the tailstock quill to safely hold the work piece in place during operation. If a center is not used the work piece can be ejected from the lathe when the spindle rotates. This could cause serious personal injury or property damage.

A dead center is a one-piece center that does not rotate with the component it is mounted into. It is used to support long, slender piece parts. Use the dead center when the piece part does not rotate on the tip and does not generate friction.

Note: *To avoid wearing out the dead center prematurely or damaging the piece part, use low spindle speeds. Also keep the tip of the dead center mounted in the tailstock well lubricated with an anti-seize compound.*

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 MT-5 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. 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.

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 16" faceplate.*

Quick Change Tool Posts

This lathe comes with a quick-change tool post Model 250-200 (Phase II style) and two tool holders. These tool holders will all hold up to a 5/8" square tool. Included are (1) 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.*

ELECTRICAL

⚠ WARNING: Baileigh Industrial is not responsible for any damage caused by wiring up to an alternative 3-phase power source other than direct 3-phase. If you are using an alternate power source, consult a certified electrician or contact Baileigh Industrial prior to energizing the machine.

⚠ 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 tool is wired for 220 volts, 60Hz alternating current. Before connecting the tool to the power source, make sure the machine is cut off from power source.
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 a amperage rating slightly higher than the full load current of machine.
- A separate electrical circuit should be used for your tools. 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 tool.
- 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 tool 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 tool is properly grounded.
- Repair or replace damaged or worn cord immediately.

Power cord connection:

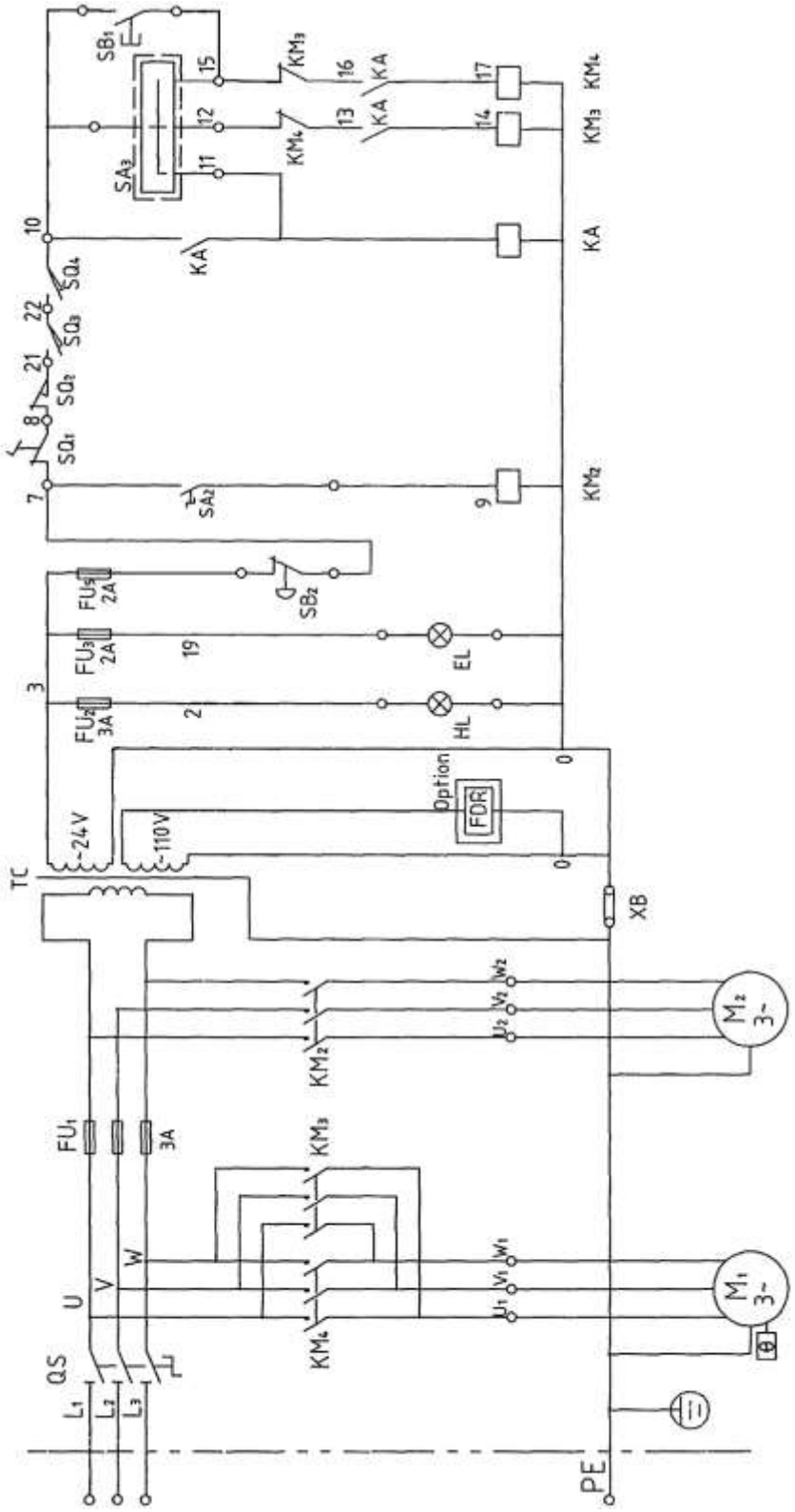
⚠ WARNING: Failure to follow proper lockout / tagout procedures can result in SERIOUS OPERATOR INJURY OR DEATH.

1. Locate the junction box at the rear of the lathe and open the cover.
2. Insert a fitting into the open hole at the bottom of the enclosure to grip the power cord (supplied by customer).
3. Connect the three power wires to the terminals labeled **L1, L2, and L3**. Connect the ground wire (typically green) to the **E** ground terminal. (Check that the screws are securely tightened.)
4. Inspect the power cord for any damage incurred during installation.

Check for correct rotation of the motor

1. Tum on the power switch.
2. Momentarily push "JOG" button while watching the rotation direction of Main Spindle from Tailstock.
3. If it is counter-clockwise, wiring is correct.
4. If not, disconnect power to the machine, and switch the L1 and L2 wires. **DO NOT** move the ground wire.

ELECTRICAL SCHEMATIC



Electrical Listing Component

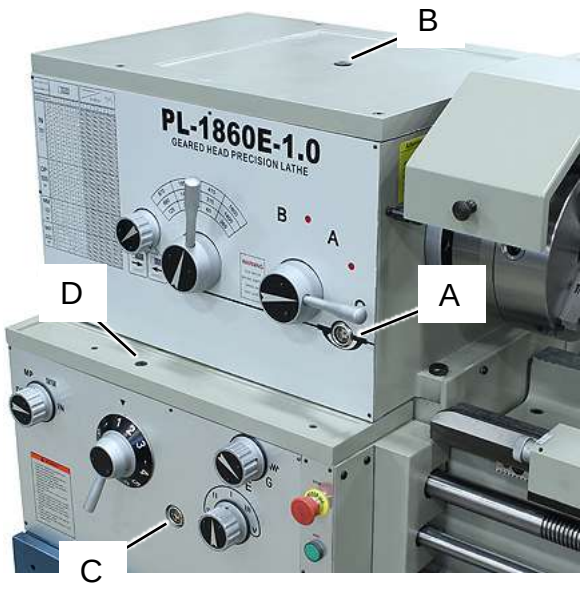
Item	Name	Qty.
QS	Main Disconnect Switch	1
FU1	QF1 Breaker for Main	1
FU2	QF2 Breaker for Power Lamp	1
FU3	QF3 Breaker for Work Lamp	1
FU5	QF4 Breaker for Control Circuit	1
KA	Contactor, Main Circuit Engagement	1
KM2	Contactor, Coolant Pump	1
KM3, KM4	Contactor, Main Motor / Direction	2
TC	Control Transformer	1
SA3	Rotary Spindle Run/Direction Switch	1
SA2	Coolant Pump Switch	1
SB1	Emergency Stop Button	1
SB2	Jog Switch	1
SQ1	Switch for Brake	1
SQ2	Switch for Chuck Guard	1
SQ3	Switch for Headstock Cover	1
SQ4	Switch for Electrical Cabinet Door	1
HL	Pilot Lamp	1
EL	Work Lamp	1
M1	Main Motor	1
M2	Coolant Pump	1
FDR	Digital Read Out (DRO)	1

LATHE SETUP

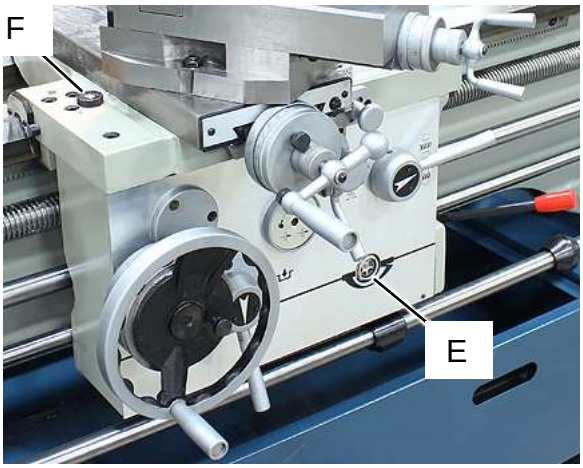
⚠ WARNING: DO NOT start the lathe until all machine assembly has been completed and you have been properly trained and understand all control functions. When performing machine assembly make sure to follow proper lockout / tagout procedures. Failure to comply could result in accidental starting of the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

Lubrication (Before operating this lathe, make the following important checks.)

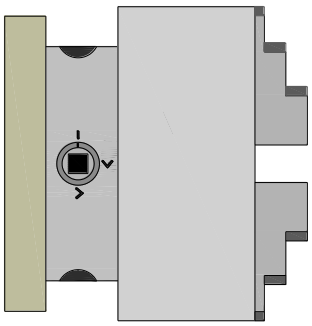
- Fill the headstock to the mid-level of the sight gauge window (A) with Shell Tellus #68 viscosity oil (or equivalent). Use the fill port (B) at the top of the headstock.
- Fill the gearbox to the mid-level of the sight gauge window (C) with Shell Tellus #68 viscosity oil (or equivalent). Use the fill port (D) at the top of the gearbox.



- Fill the carriage apron to the mid-level of the sight gauge window (E) with Shell Tellus #68 viscosity oil (or equivalent). Use the fill port (F) at the top of the gearbox.



Chuck



This lathe has a 10” (254mm) 3-jaw chuck already installed. This is a scroll- type chuck which means that all three jaws close together and are self-centering.
The 3-jaw chuck has cam lock 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.

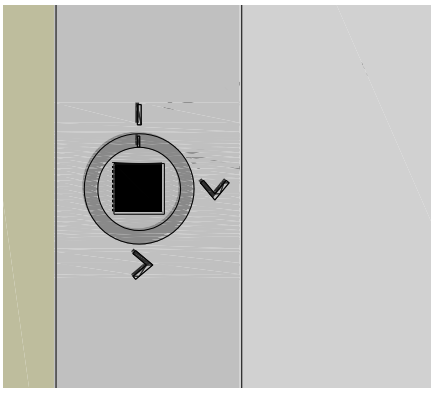
A chuck key is used to turn the locking cams as shown.

⚠ 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

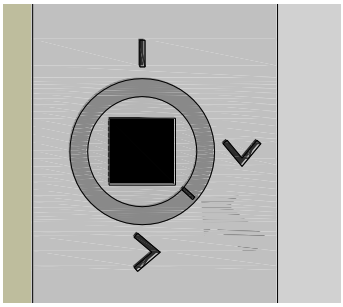
1. Lay a piece of plywood on the lathe bed directly beneath the chuck. This will help protect the ways if the chuck should fall.

⚠ CAUTION: Use extreme care when installing or removing a chuck so that your hands do not become trapped between the chuck and the plywood.



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.

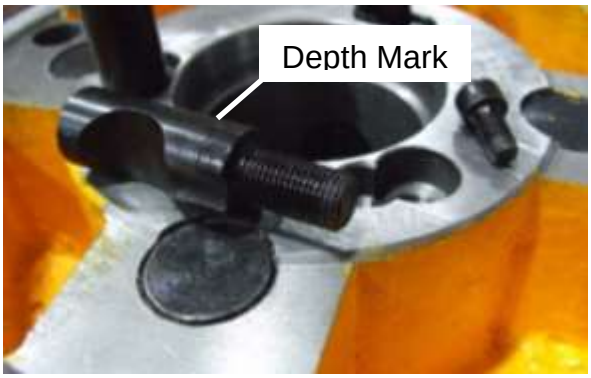
Chuck Installation



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 go around and tighten all of the cams.

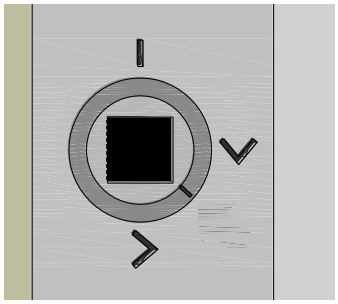
To Install Cam lock Studs

1. Lay the chuck or faceplate upside down on a flat protected surface.
2. Screw in the three studs up to the depth mark as indicated in photo below.
3. Once the studs are properly positioned, secure them with the socket head cap screws.
4. To adjust the cam lock studs, remove the cap screw and rotate the stud 1 full turn in or out. Re-insert the cap screw and tighten.



Four Jaw Chuck/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 camlock studs into the back of the 4-jaw chuck / faceplate using the dimension obtained from step 1. Screw in the locking cap screws 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 / faceplate should fall.
4. Lift the chuck / faceplate up to the spindle and insert the camlock pins into the face of the spindle.
5. While supporting the weight of the chuck / 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.

- When power is connected to the machine and the main disconnect is turned On, the green indicator light (A) will be lit.
- Pressing the E-Stop Button (B) will immediately stop the machine in the event of incorrect operation or a dangerous situation. Twist the emergency stop button clockwise (cw) to reset.
- The two position switch (C) is used to start and stop coolant pump.
- Pressing button (D) will jog the spindle during setup. If the Forward / Reverse knob is in neutral, the jog button will not function.

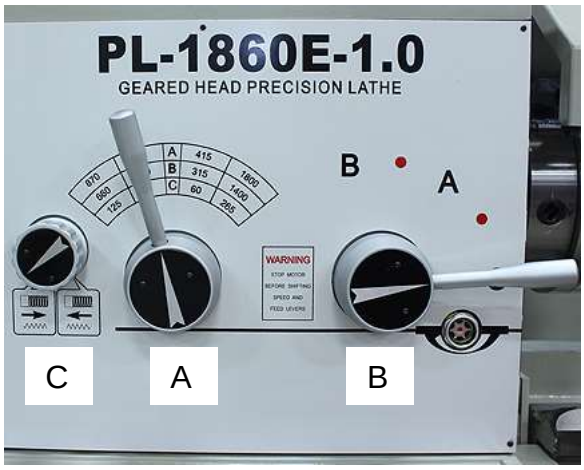
Spindle Speeds

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.
- Spindle speed is measured in RPM (revolutions per minute) The following spindle speeds are possible: 25, 60, 125, 140, 185, 265, 315, 415, 660, 870, 1400, and 1800 RPM.

Example: 25 RPM (shown)

- Shift the left selector handle (A) until the arrow (and handle) are pointing to the column in the speed chart which includes the desired rpm speed.
- Shift the right selector handle (B) until the arrow (and handle) is pointing to the letter for the row in the speed chart which has the desired rpm speed.



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 knob (C).
The knob is shown here in the right feed position. In this position, the apron will move to the right along the bed, as indicated by the arrow, or the cross feed will travel away from the operator.
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 toward from the operator.

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 settings for the quick change gearbox are determined by the chart located on the left end of the headstock (similar to next page).

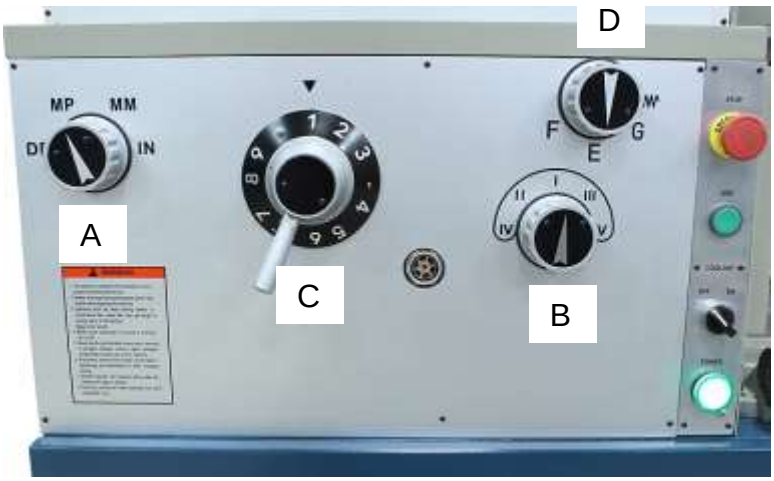
⚠ ***Important:*** *Make sure to use the actual chart on your lathe to determine the correct thread settings.*

The chart is divided into two column to reflect either Thread cutting or Feed Rate cutting.
The column under the threaded shaft is for creating threads. The column under the wavy lines is for feed rate. Notice that the feed rate is measured in inches of travel per revolution of the chuck. Also notice, that the upper number in each of the chart boxes is for the travel in the longitudinal direction while the lower wavy line is for the travel in the cross feed direction.

1. Determine if the cut is to make threads or remove material at a specific rate.

⚠ ***Important:*** *Never force the selection knobs into position. If they do not engage, carefully rotate the chuck by hand while keeping light pressure on the knob. As the chuck is rotated, it aligns the gears, and the selector will engage.*

2. If the outcome is threads, select which type of thread. IN, DP, MM, or MP and place the selector knob (A) in the position match the threads desired.
3. Determine the thread pitch.
4. From the box which has the number of threads desired, move up to the row marked LEVER and place the selector knob (B) to point to that Roman numeral.



5. Return to the box with the desired thread number and move to the left to the column number and letter in it.
6. Shift the numbered selector (C) to have the number from the chart under the pointer arrow.
7. Shift the lettered knob (D) to point at the latter from the chart.
8. The lathe is now set to run the lead screw at a speed that will create the type and pitch of threads chosen.
9. For feed rate, start from the desired feed rate and direction and work back to set four knobs to match that choice.

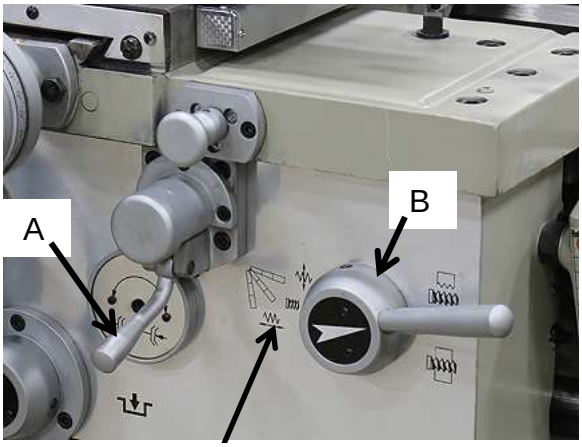
LEAD SCREW 4T.P.I

CROSS SCREW 8T.P.I

	LEVER →	I	II	III	IV	V	I	II	III	IV	V
IN T/1"	1G	72	36	18	9	4½	.0015 / .0006	.0031 / .0012	.0062 / .0025	.0124 / .0050	.0248 / .0099
	4G	60	30	15	7½	3¾	.0018 / .0007	.0037 / .0015	.0073 / .0029	.0147 / .0059	.0294 / .0118
	6G	54	27	13½	6¾	3⅜	.0020 / .0008	.0041 / .0016	.0081 / .0032	.0162 / .0065	.0325 / .0130
	1E	48	24	12	6	3	.0015 / .0006	.0031 / .0012	.0062 / .0025	.0124 / .0050	.0248 / .0099
	2E	46	23	11½	5¾	2⅞	.0016 / .0006	.0031 / .0012	.0063 / .0025	.0125 / .0050	.0250 / .0100
	3E	44	22	11	5½	2¾	.0016 / .0006	.0033 / .0013	.0066 / .0026	.0132 / .0053	.0263 / .0105
	8G	42	21	10½	5¼	2⅝	.0026 / .0010	.0052 / .0021	.0104 / .0042	.0209 / .0084	.0418 / .0167
	4E	40	20	10	5	2½	.0018 / .0007	.0037 / .0015	.0073 / .0029	.0147 / .0059	.0294 / .0118
	5E	38	19	9½	4¾	2⅜	.0019 / .0008	.0039 / .0016	.0077 / .0031	.0155 / .0062	.0309 / .0124
	6E	36	18	9	4½	2¼	.0020 / .0008	.0041 / .0016	.0081 / .0032	.0162 / .0065	.0325 / .0130
	7E	32	16	8	4	2	.0022 / .0009	.0044 / .0018	.0089 / .0036	.0178 / .0071	.0356 / .0142
	8E	28	14	7	3½	1¾	.0026 / .0010	.0052 / .0021	.0104 / .0042	.0209 / .0084	.0418 / .0167
	9E	26	13	6½	3¼	1⅝	.0028 / .0011	.0056 / .0022	.0112 / .0045	.0224 / .0090	.0449 / .0180
DP DP	1E	96	48	24	12	6	.0023 / .0009	.0046 / .0018	.0093 / .0037	.0186 / .0074	.0371 / .0148
	2E	92	46	23	11½	5¾	.0025 / .0010	.0050 / .0020	.0101 / .0040	.0201 / .0080	.0402 / .0161
	3E	88	44	22	11	5½	.0026 / .0010	.0052 / .0021	.0104 / .0042	.0209 / .0084	.0418 / .0167
	4E	80	40	20	10	5	.0029 / .0012	.0058 / .0023	.0116 / .0046	.0232 / .0093	.0464 / .0186
	5E	76	38	19	9½	4¾	.0030 / .0012	.0060 / .0024	.0120 / .0048	.0240 / .0096	.0480 / .0192
	6E	72	36	18	9	4½	.0032 / .0013	.0064 / .0026	.0128 / .0051	.0255 / .0102	.0511 / .0204
	7E	64	32	16	8	4	.0036 / .0014	.0072 / .0029	.0143 / .0057	.0286 / .0114	.0573 / .0229
	8E	56	28	14	7	3½	.0041 / .0016	.0081 / .0032	.0162 / .0065	.0325 / .0130	.0650 / .0260
	9E	52	26	13	6½	3¼	.0044 / .0018	.0087 / .0035	.0174 / .0070	.0348 / .0139	.0696 / .0278
MM MM	1G	0.5	1	2	4	8	.0021 / .0008	.0043 / .0017	.0085 / .0034	.0170 / .0068	.0340 / .0136
	1E	0.75	1.5	3	6	12	.0021 / .0008	.0043 / .0017	.0085 / .0034	.0170 / .0068	.0340 / .0136
	4F		1.75	3.5	7	14	.0025 / .0010	.0051 / .0020	.0102 / .0041	.0205 / .0082	.0410 / .0164
	6E	1	2	4	8	16	.0028 / .0011	.0057 / .0023	.0114 / .0046	.0228 / .0091	.0456 / .0182
	7E		2.25	4.5	9	18	.0032 / .0013	.0064 / .0026	.0128 / .0051	.0255 / .0102	.0511 / .0204
	8F	1.25	2.5	5	10	20	.0037 / .0015	.0073 / .0029	.0146 / .0058	.0293 / .0117	.0585 / .0234
MP MP	1G	0.25	0.5	1	2	4	.0034 / .0014	.0068 / .0027	.0135 / .0054	.0271 / .0108	.0542 / .0217
	1E		0.75	1.5	3	6	.0034 / .0014	.0068 / .0027	.0135 / .0054	.0271 / .0108	.0542 / .0217
	4F			1.75	3.5	7	.0041 / .0016	.0081 / .0032	.0162 / .0065	.0325 / .0130	.0650 / .0260
	6E	0.5	1	2	4	8	.0044 / .0018	.0089 / .0036	.0178 / .0071	.0356 / .0142	.0712 / .0285
	7E			2.25	4.5	9	.0050 / .0020	.0101 / .0040	.0201 / .0080	.0402 / .0161	.0805 / .0322
	8F		1.25	2.5	5	10	.0057 / .0023	.0114 / .0046	.0228 / .0091	.0456 / .0182	.0913 / .0365

Feed Lever

The Feed Selector handle (A) is a three-position lever which is used to select between the longitudinal and cross slide powered motions.
Push down on the pivot handle to engage the longitudinal motion.
Pull up on the pivot handle to engage the cross-slide motion.
The center position is a neutral position.



Longitudinal - Down

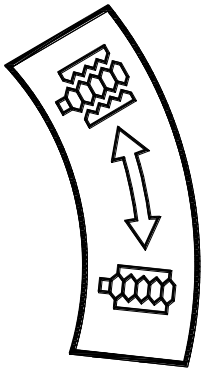
Neutral - Center

Cross Slide - Up

Note: *Make sure the half nut engagement lever (B) is disengaged (at neutral position) before operating the feed selector handle (A).*

Half Nut Engage Lever

The half nut engagement lever (B) 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.
Always place the engagement lever in the disengaged position when shifting other levers, and when not intended to be used.



Disengaged

Engaged

Threading Dial Indicator

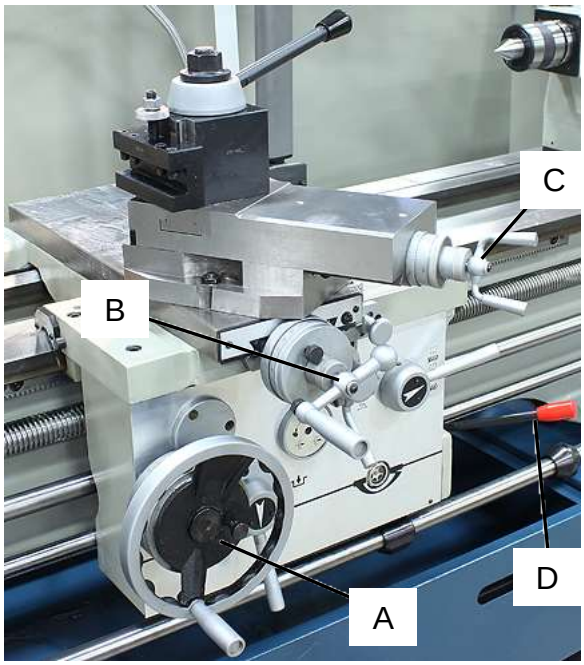
The threading dial indicator is located on the right-hand side of the apron. It is used when cutting imperial threads and tells you when to engage the half nut to begin the threading process. The indicator face has eight lines and four letters printed on the dial. Indicator marks are located at the top of the rim. The dial is mounted to a shaft that has a small gear mounted at the opposite end. By loosening a socket acorn nut you can pivot the housing to either engage or disengage from the leadscrew. When engaged, the dial will turn as the lead screw 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. The thread dial indicator is set to provide engagement for four types of threads.
    a. Even number threads; May be engaged at any mark.
    b. Odd number threads; May be engaged at one of three marks.
    c. Fractional half threads; May be engaged at one of two marks.
    d. Fractional quarter threads; May be engaged at only one mark.
2. Using the chart to identify the threads, engage the half nut exactly when the needed mark is aligned with the indicator mark.
3. When the desire thread length is reached, disengage the half nut.
4. Return the carriage to the beginning of the cut.
5. Set the next depth for the next cutting pass.
6. Repeat the procedure until you have reached the desired depth of thread required.

Carriage Controls

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



Carriage Hand Wheel

Rotating the hand wheel (A) 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 (C) 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 (B) 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

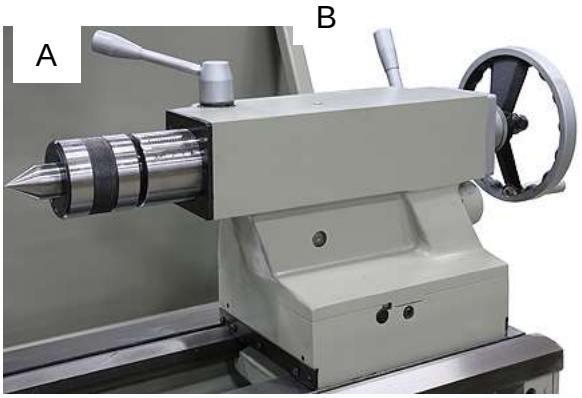
Spindle rotation is controlled from the handle (D) on the right-hand side of the carriage.
Move the handle down and the spindle will rotate in a counterclockwise (ccw) direction.
Move the handle up and the spindle will rotate in a clockwise (cw) direction.
The middle (neutral) position stops the motor.

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.

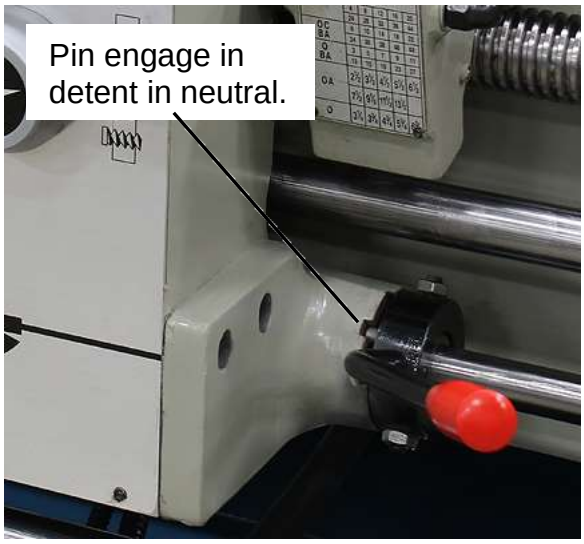
Tailstock Controls

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 barrel lock lever (A) locks the tailstock barrel in place.
The slide lock lever (B) locks the tailstock in place on the lathe bed. The tension nut (back side not shown) adjusts the slide lock lever id



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.



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 (25 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 1800 RPM. Run each speed change for approximately 5 minutes.

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

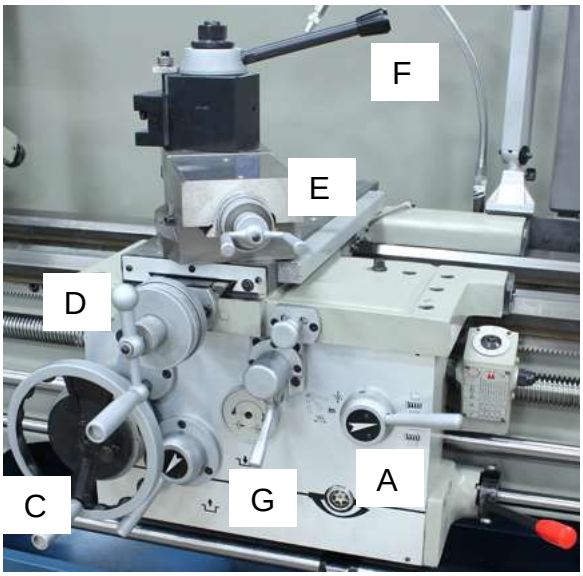
OPERATION

⚠ CAUTION: Always wear proper eye protection with side shields, safety footwear, and leather gloves to protect from burrs and sharp edges.

Manual Operations

1. Shift the Half Nut Engaged Lever (A) and Forward/Reverse Lever (B) to "N" position.
2. Then the Longitudinal Apron Hand-wheel (C), Cross Slide Handle (D) and Compound Rest Hand-wheel (E) may be used either separately or together at the operator's discretion.
3. Release Tool Post Clamping Lever (F) and the Tool Post may be rotated to the desired angle to give the cutting tool the correct angle of attack to the material. Then tighten it.

Auto Feed Operation



1. Shift Forward/Reverse Change Lever (A) on Headstock to decide the direction of feeding.
2. Select proper Feed Speed by shifting Gear Box Feed Change Lever.
3. Push down Half Nut Engaged Lever (A) to engage the apron to move for either feed rate or threading.
4. Pull up on the Feed Select Lever (G) when it needs to feed the tools crosswise.
5. Push down on the Feed Select Lever (G) when it needs to feed longitudinally.

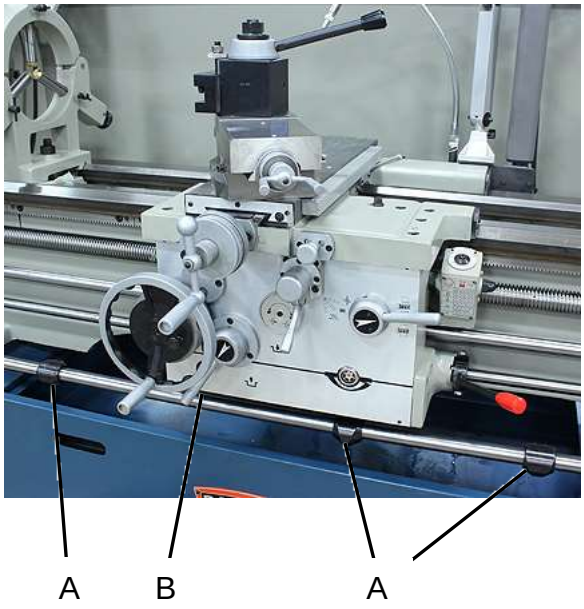
Auto Feed Stop Operation

The machine is equipped with Auto Stop Feed in Apron.

1. Loosen the set screw on Eccentric Ring (A) and slide to desired position. (Three shown, five total.)

***Note**: The highest point of Eccentric Ring has to be upward to activate the stop switch (B). This will work with either forward or reverse apron travel.*

- The eccentric shaft is indexable with 5 index positions. This means that each eccentric ring may be set on a different index mark so that it can be used again at a later time to repeat the same cutting process.
- Test once before beginning to process in preventing to process in preventing unnecessary damage or danger.



Four Position Auto Feed Stop Operation

If it requires processing the object to a certain length or object with steps, you may use this utility to complete a multi-section cutting.

1. Place an eccentric ring (A) to any desired position. The highest point of the eccentric ring pointing directly upward. Firmly tighten it the set screws. DO NOT overtighten.

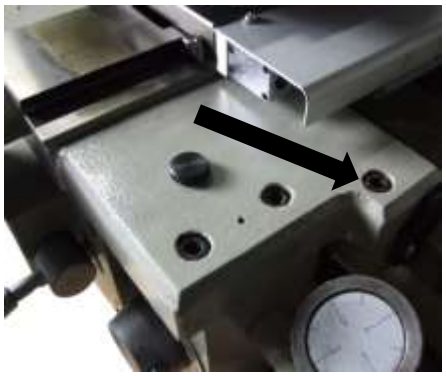
***Note**: The limit switch that is activated by the eccentric rings is located at the bottom from corner of the apron. When the limit switch rolls up onto the lobe of the eccentric, it will depress the limit switch plunger and stop the lathe. This should be taken into consideration when placing and setting the eccentric rings.*

2. Now operate the Auto Feed of Apron without material to test and verify the position of the Eccentric Ring.
3. Turn eccentric shaft to the second index mark and set the second eccentric ring in the desired position.
4. Follow the same step to set the remaining eccentric rings if desired.

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.

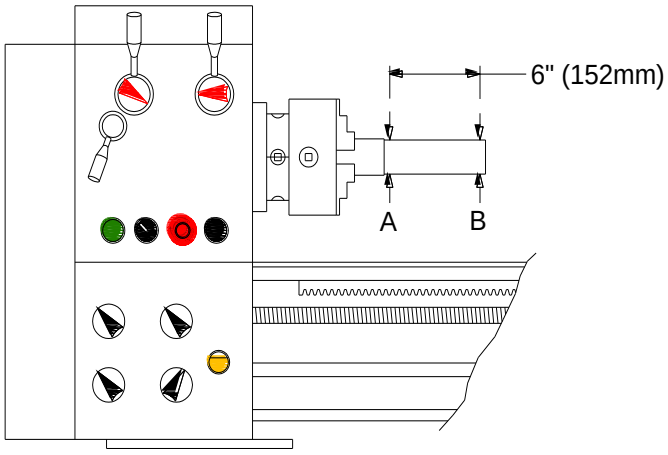
Compound Gib

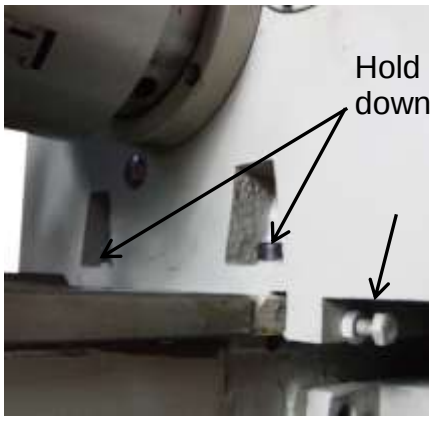
Follow the same procedure as the Cross-slide gib. The gib on the Compound rest can be adjusted with the screw located at the tool post end. The gib is wedge shaped and by loosening the screw closest to the operator and then tightening the opposite screw, the slide will become looser. Loosening the screw 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.

Lathe Alignment

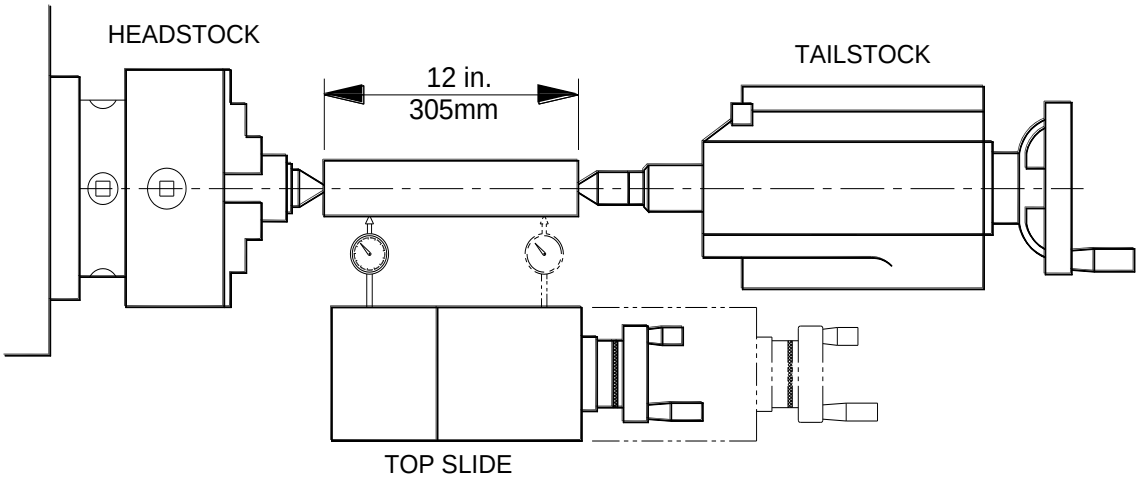
When the lathe is installed and ready for use, it is recommended to check the machine alignment before beginning work. Alignment and leveling should be checked regularly to insure continued accuracy.

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.

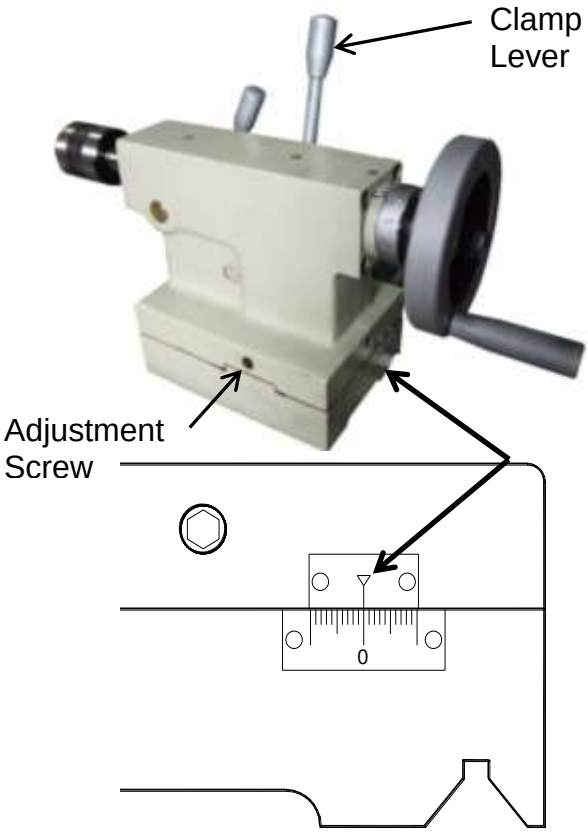




8. To perform a tailstock check, use a 12” (305mm) long ground steel bar fitted between the headstock and the tailstock.
9. Check the alignment by fitting a dial test indicator to the top slide and traversing the centerline of the bar.



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.

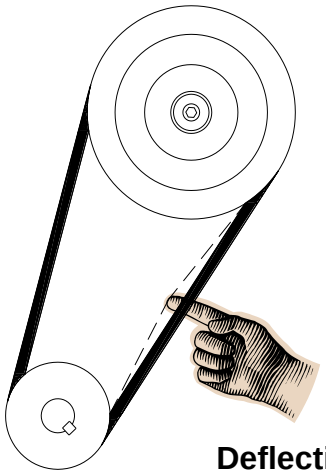


V-Belt Removal and Adjustment

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

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 access cover at the headstock end and back of the machine base to have access to the V-belts and tension adjustment bolts.
2. Loosen the two double nuts so that motor plate can pivot up or down as needed to obtain the correct belt tension.
3. Hold the motor plate in this position and tighten the nuts back to hold the belt tension.
4. If replacing the belts, loosen the top nuts enough to lift the motor and allow the belts to be removed from the motor sheave.
5. Place the new belts onto the pulleys and let the motor down gently.
6. Tension the belts.
7. Replace and secure the gear cover.



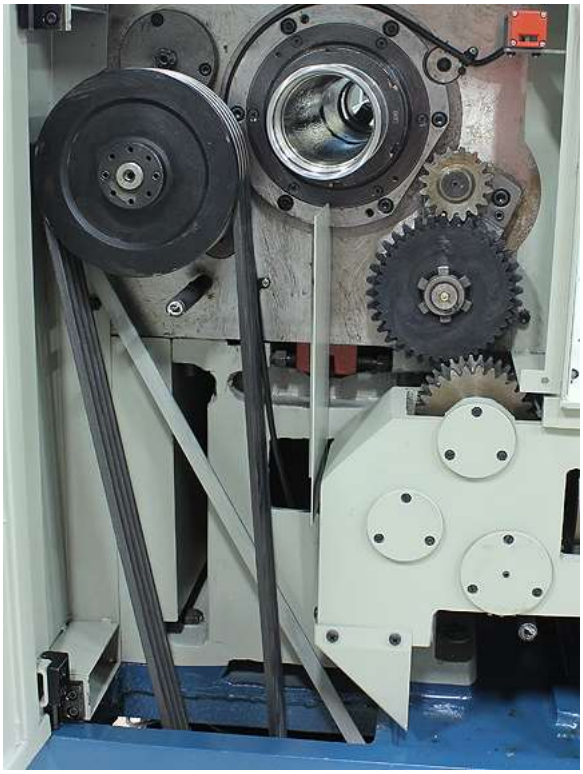
Deflection

Belt Tension Adjustment

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

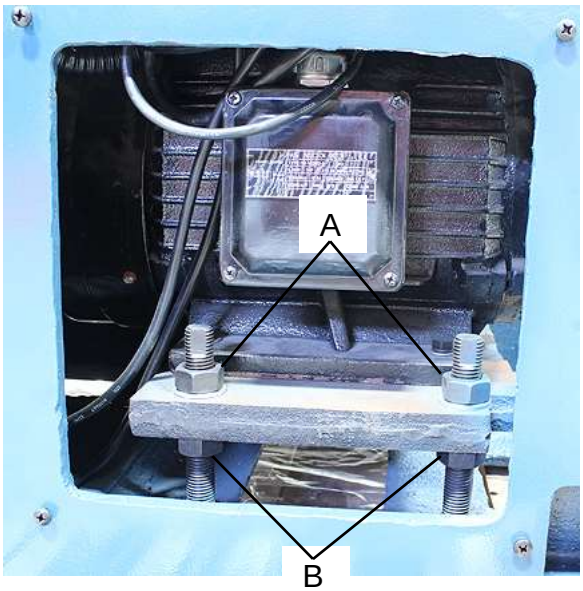
V-belts will stretch through usage. Check the tension of the belts every three months. More often if the lathe is used daily.

1. To access the drive belts, open the gear cover and remove the lower end plate, and the lower back plate from the head stock end of the lathe.
2. Loosen the top motor plate nuts (A) so that the motor may pivot up to remove tension from the belts.
3. Carefully raise the motor bracket up to release tension on the belts so they can be removed. (Note that the brake assembly also raises with the motor).
4. Place the new belts onto the pulley grooves and let the motor down gently.
5. Evenly tighten the top nuts (A) until the belts deflect deflection is between 0.5” (12.7mm) and 0.75” (19mm). This may require that the lower nuts (B) be loosened.



Note: *If you change the position of the motor mounting bracket due to belt stretching or belt replacement, it may be necessary to re-adjust the foot pedal brake and the micro limit switch.*

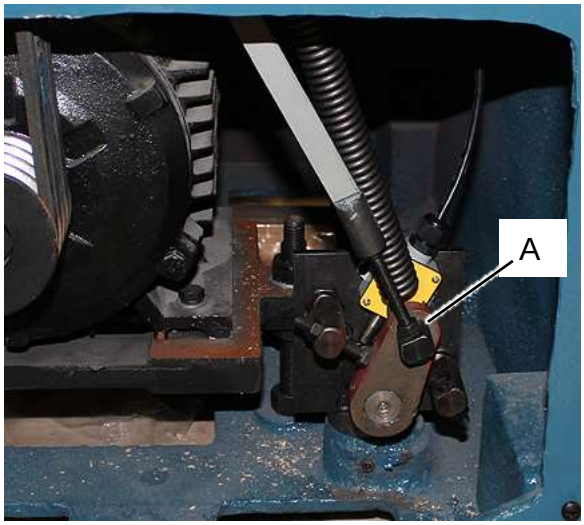
6. When the belt is properly tensioned and the upper (A) and lower (B) nuts are tightened, install and secure the covers.



Foot Brake Belt Adjustment

Brake pad fading may be caused by slack of brake belt.

1. Disconnect power to the machine.
2. Open the lower end cover on the headstock.
3. Loosen the top nut (A) on brake belt.
4. Turn the lower nut until the brake belt has very little slack but is not tight on the drum.
5. Turn the lower nut back 1/4 turn and hold this position while tightening the top nut (A).
6. Install the side end cover.



NOTES

NOTES

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

BAILEIGH INDUSTRIAL, INC. 1455 S. CAMPUS AVENUE ONTARIO, CA 91761
PHONE: 920. 684. 4990 FAX: 920. 684. 3944

BAILEIGH INDUSTRIAL 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