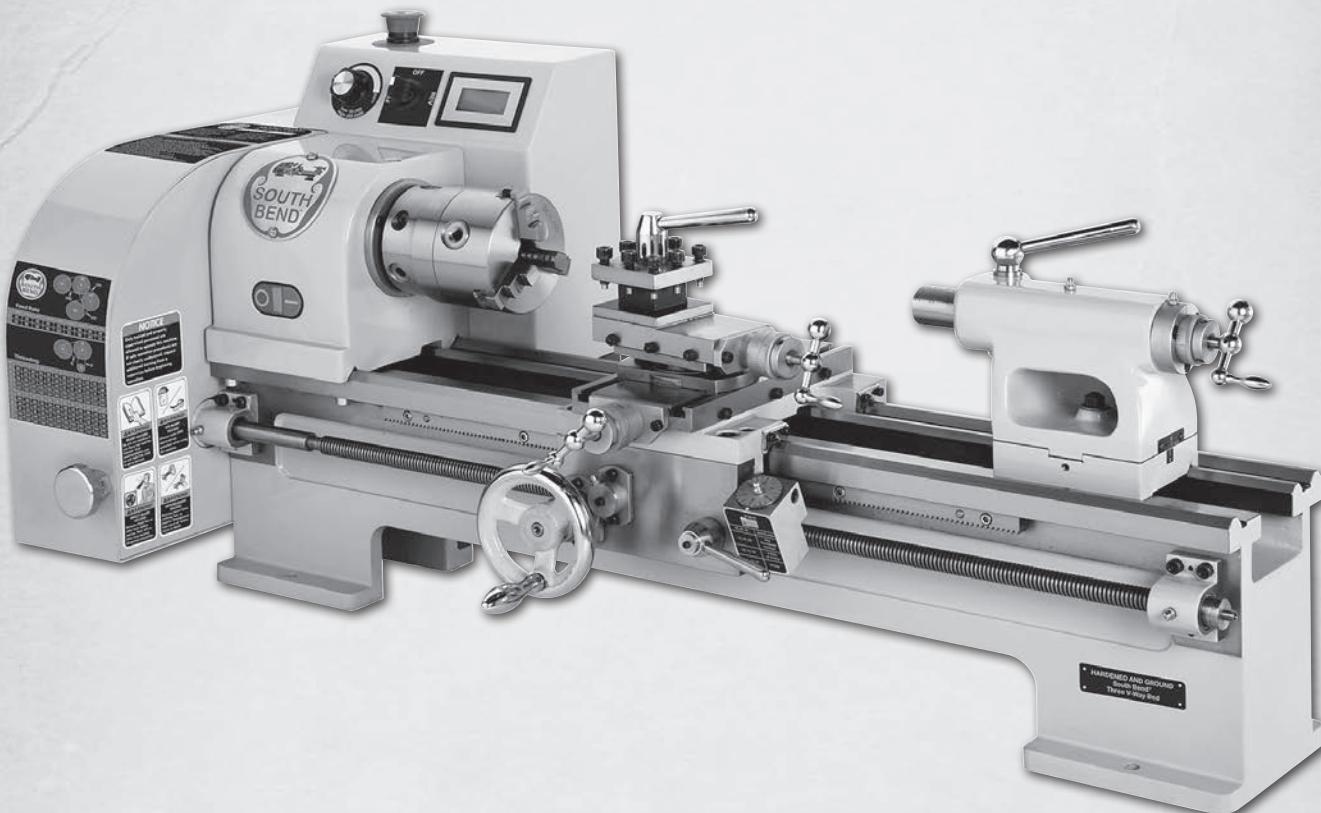




**8K™ 8" X 18"
VARIABLE SPEED LATHE
MODEL SB1001**



OWNER'S MANUAL

South Bend Lathe Co.®

Hundreds of Thousands of Lathes Sold With a Tradition of Quality Since 1906!



Scope of Manual

This manual helps the reader understand the machine, how to prepare it for operation, how to control it during operation, and how to keep it in good working condition. We assume the reader has a basic understanding of how to operate this type of machine, but that the reader is not familiar with the controls and adjustments of this specific model. As with all machinery of this nature, learning the nuances of operation is a process that happens through training and experience. If you are not an experienced operator of this type of machinery, read through this entire manual, then learn more from an experienced operator, schooling, or research before attempting operations. Following this advice will help you avoid serious personal injury and get the best results from your work.

Manual Feedback

We've made every effort to be accurate when documenting this machine. However, errors sometimes happen or the machine design changes after the documentation process—so the manual may not exactly match your machine. If a difference between the manual and machine leaves you in doubt, contact our customer service for clarification.

We highly value customer feedback on our manuals. If you have a moment, please share your experience using this manual. What did you like about it? Is there anything you would change to make it better? Did it meet your expectations for clarity, professionalism, and ease-of-use?

**South Bend Lathe, Inc.
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Updates

For your convenience, any updates to this manual will be available to download free of charge through our website at:

www.southbendlathe.com

Customer Service

We stand behind our machines. If you have any service questions, parts requests or general questions about your purchase, feel free to contact us.

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About This Machine

Foreword

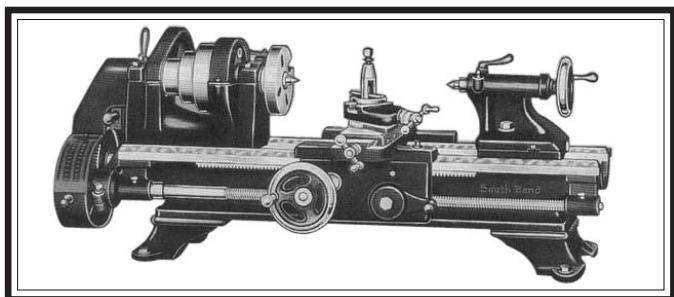
"The screw cutting engine lathe is the oldest and most important of machine tools and from it all other machine tools have been developed. It was the lathe that made possible the building of the steamboat, the locomotive, the electric motor, the automobile and all kinds of machinery used in industry. Without the lathe our great industrial progress of the last century would have been impossible." —**How To Run a Lathe**, 15th Edition, South Bend Lathe.

The lathe represented in this manual is a modern day version of the screw cutting lathes that trace their roots back to the 1700's, which were themselves technological improvements of the bow lathe that can be traced back thousands of years to the ancient Egyptians.

Now, almost 300 years later, these modern lathes are a refined culmination of human ingenuity and knowledge embodied into the design and synergy of many different interworking parts—some of which represent the life's work and dreams of many inventors, mechanical engineers, and world-class machinists—including the likes of Leonardo da Vinci, Henry Maudsley, and the founders of South Bend Lathe, John and Miles O'Brien.

And now the torch is passed to you to carry on the tradition. As the operator of a South Bend Lathe, you join the ranks of some very famous and important customers, such as Henry Ford, who used his South Bend lathe to help him change the world.

Thank you for being a part of the new South Bend Lathe Co. We appreciate your business and hope this machine serves you well for a lifetime!



8" South Bend Precision Bench Lathe (Circa 1932)

8K™ Lathe

Dating back to 1931, the first South Bend 8" Bench Lathe made it much easier for machinists around the world to own a professional-duty lathe of exacting precision that was built to provide a lifetime of dependable service. In this same tradition, we are proud to offer the SB1001 8K Variable-Speed Bench Lathe.

This lathe is especially designed for discriminating machinists making small parts to extremely precise tolerances (jewelers, RC enthusiasts, watchmakers, model makers, optical engineers, gunsmiths, etc.).

Its compact size with heavy-duty construction and traditional South Bend "big lathe" features also make this lathe equally valuable for close-in precision toolroom or manufacturing operations.

The bed is constructed of hardened and ground castings in the traditional three V-way prismatic design—long used on South Bend Lathes for accuracy, durability, and rigidity. Its length allows for 18" between centers.

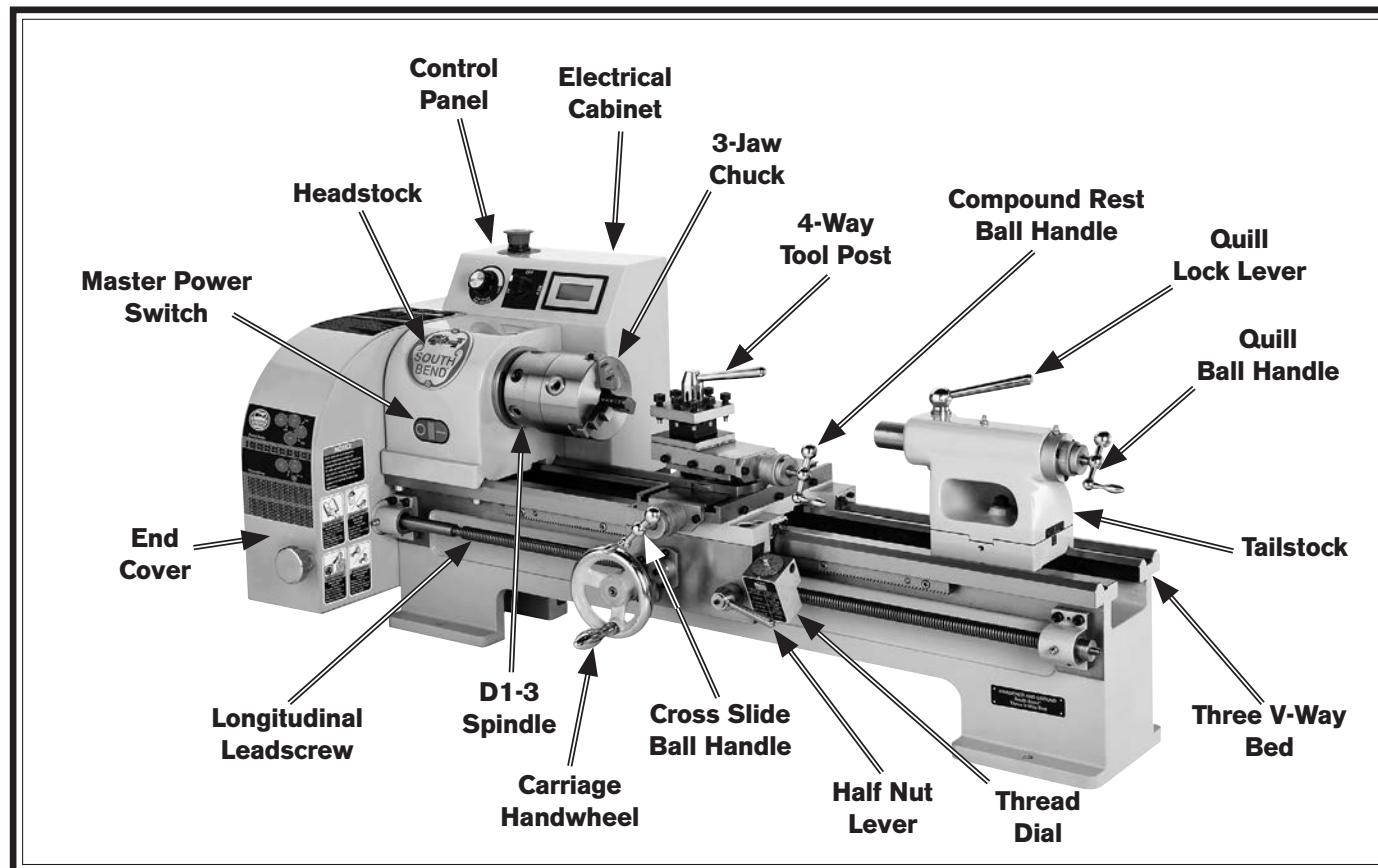
The headstock features a D1-3 variable-speed spindle that operates at 50–2300 RPM. Spindle speed changes are done very quickly and accurately with the convenient adjustment knob and digital display. Variable speed control allows the operator to "dial in" the perfect cutting speed for super-fine finishes.

The carriage has longitudinal power feeding capabilities with 9 available feed speeds ranging from 0.003"-0.0051" per revolution.

The South Bend 8K is capable of cutting inch or metric threads—12 inch threads from 10–32 TPI and 12 metric threads from 0.4–3.0mm.

Accessories include a heavy-duty tailstock, a 4-way tool post, MT#2 dead center, MT#3 dead center, and 3-jaw scroll chuck.

Identification



!WARNING

Serious personal injury could occur if you connect the machine to power before completing the setup process. DO NOT connect power until instructed to do so later in this manual.

!WARNING

Untrained users have an increased risk of seriously injuring themselves with this machine. Do not operate this machine until you have understood this entire manual and received proper training.

Basic Controls & Components

Refer to **Figures 1–4** and the following descriptions to become familiar with the features and basic controls of this lathe. This knowledge will be necessary to properly set up the lathe for the test run and spindle break-in.

Master Power Switch

The switch shown in **Figure 1** toggles incoming power ON and OFF to the lathe controls.



Figure 1. Master power switch location.

CAUTION

Always disconnect the lathe from power before performing any adjustments, maintenance, or service. Turning the master power switch to OFF is NOT a safe alternative to completely disconnecting the machine from power when performing these tasks.

Control Panel

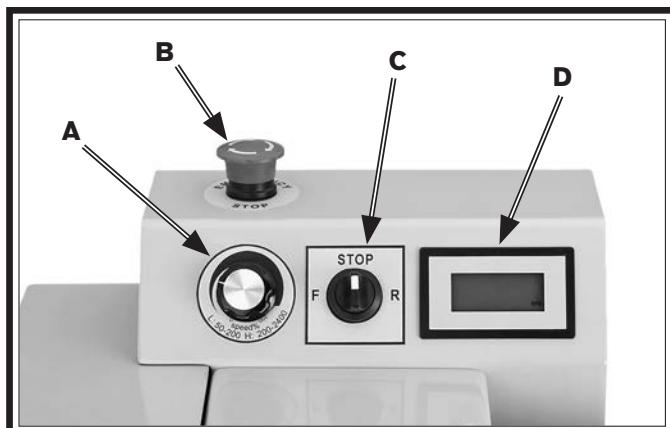


Figure 2. Control panel components.

- A. Spindle Speed Dial:** Controls the variable spindle speed.
- B. Emergency STOP Button:** Cuts power to the motor and control panel. Twist clockwise until it pops out to reset.
- C. Spindle Switch:** When the master power switch is ON, starts, stops, and reverses spindle rotation.
- D. Tachometer Display:** Displays a digital readout of the spindle speed.

WARNING

To reduce the risk of serious injury when using this machine, read and understand this entire manual before beginning any lathe operations.

Carriage

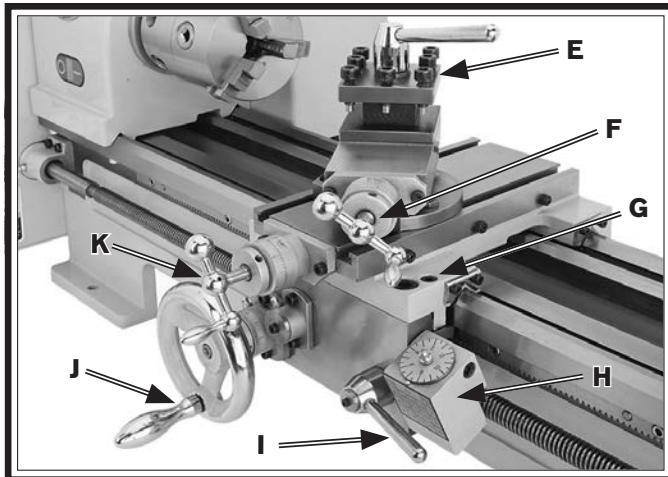


Figure 3. Carriage components.

- E. 4-Way Tool Post:** Mounts up to four cutting tools at once that can be individually indexed to the workpiece.
- F. Compound Rest Ball Handle:** Moves the tool toward and away from the workpiece at the preset angle of the compound rest.
- G. Carriage Lock:** Secures the carriage in place when the carriage should not move.
- H. Thread Dial and Chart:** Dial indicates when to engage the half nut during threading operations. Chart indicates on which thread dial reading to engage the half nut for specific inch thread pitches.
- I. Half Nut Lever:** Engages/disengages the half nut for threading operations.
- J. Carriage Handwheel:** Moves the carriage along the bedway.
- K. Cross Slide Ball Handle:** Moves the cross slide toward and away from the workpiece.

Tailstock

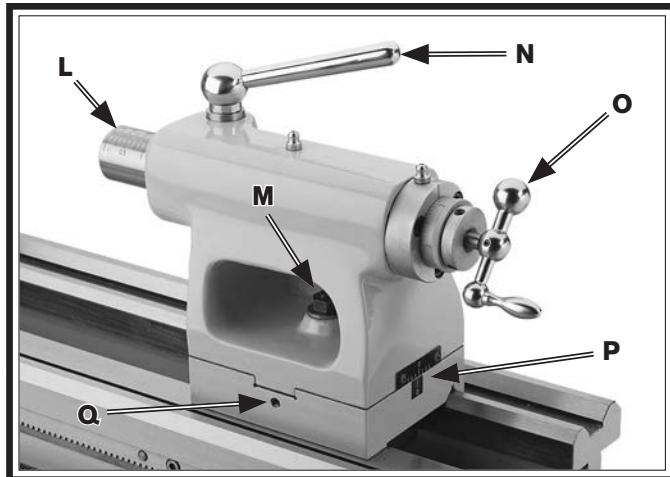


Figure 4. Tailstock components.

- L. Quill:** Moves a tool or center toward or away from the workpiece.
- M. Tailstock Lock Nut:** Secures the tailstock in position along the bedway.
- N. Quill Lock Lever:** Secures the quill in position.
- O. Quill Ball Handle:** Controls the movement of the quill.
- P. Offset Scale:** Indicates the relative distance of tailstock offset from the spindle centerline.
- Q. Tailstock Offset Set Screw (1 of 2):** Adjusts the tailstock offset left or right from the spindle centerline.



Product Specifications

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Model SB1001 8K®, 8" x 18" Lathe

Product Dimensions

Weight.....	268 lbs.
Width (side-to-side) x Depth (front-to-back) x Height.....	40 x 18 x 19 in.
Footprint (Length x Width).....	35-1/2 x 6-1/4 in.

Shipping Dimensions

Type.....	Wood Crate
Content.....	Machine
Weight.....	313 lbs.
Length x Width x Height.....	44 x 21 x 24 in.
Must Ship Upright.....	N/A

Electrical

Power Requirement.....	120V, Single-Phase, 60 Hz
Prewired Voltage.....	120V
Full-Load Current Rating.....	10A
Minimum Circuit Size.....	15A
Connection Type.....	Cord & Plug
Power Cord Included.....	Yes
Power Cord Length.....	5 ft.
Power Cord Gauge.....	14 AWG
Plug Included.....	Yes
Included Plug Type.....	5-15
Switch Type.....	ON/OFF Variable-Speed Dial

Motors

Main

Type.....	Universal
Horsepower.....	1.5 HP
Amps.....	10A
Speed.....	3600 RPM
Power Transfer	Belt Drive
Bearings.....	Shielded & Permanently Lubricated

Main Specifications**Operation Info**

Swing Over Bed.....	8 in.
Distance Between Centers.....	18 in.
Swing Over Cross Slide.....	5 in.
Swing Over Saddle.....	5 in.
Maximum Tool Bit Size.....	5/8 in.
Compound Travel.....	2-5/8 in.
Carriage Travel.....	17-5/8 in.
Cross Slide Travel.....	3-1/4 in.

Headstock Info

Spindle Bore.....	1.125 in.
Spindle Taper.....	MT#4.5
Number of Spindle Speeds.....	Variable
Spindle Speeds.....	50 – 2300 RPM
Spindle Type.....	D1-3 Camlock
Spindle Bearings.....	High-Precision Tapered Roller

Tailstock Info

Tailstock Quill Travel.....	1-3/4 in.
Tailstock Taper.....	MT#2
Tailstock Barrel Diameter.....	1.1875 in.

Threading Info

Number of Longitudinal Feeds.....	9
Range of Longitudinal Feeds.....	0.0030 – 0.0051 in./rev.
Number of Inch Threads.....	12
Range of Inch Threads.....	10 – 32 TPI
Number of Metric Threads.....	12
Range of Metric Threads.....	0.4 – 3.0 mm

Dimensions

Bed Width.....	6 in.
Leadscrew Diameter.....	5/8 in.
Leadscrew TPI.....	8 TPI
Leadscrew Length.....	38-3/4 in.

Construction

Base.....	Cast Iron
Headstock.....	Cast Iron
Headstock Gears.....	Steel
Bed.....	Hardened and Precision-Ground Cast Iron
Body.....	Cast Iron
Paint.....	Epoxy

Fluid Capacities

Headstock Capacity.....	1 – 2 Pumps
Headstock Fluid Type.....	ISO 32 (eg. Grizzly T23963, Mobil DTE Light)

Understanding Risks of Machinery

Operating all machinery and machining equipment can be dangerous or relatively safe depending on how it is installed and maintained, and the operator's experience, common sense, risk awareness, working conditions, and use of personal protective equipment (safety glasses, respirators, etc.).

The owner of this machinery or equipment is ultimately responsible for its safe use. This responsibility includes proper installation in a safe environment, personnel training and usage authorization, regular inspection and maintenance, manual availability and comprehension, application of safety devices, integrity of cutting tools or accessories, and the usage of approved personal protective equipment by all operators and bystanders.

The manufacturer of this machinery or equipment will not be held liable for injury or property damage from negligence, improper training, machine modifications, or misuse. Failure to read, understand, and follow the manual and safety labels may result in serious personal injury, including amputation, broken bones, electrocution, or death.

The signals used in this manual to identify hazard levels are as follows:



DANGER
Death or catastrophic harm WILL occur.



CAUTION
Moderate injury or fire MAY occur.



WARNING
Death or catastrophic harm COULD occur.



NOTICE
Machine or property damage may occur.

Basic Machine Safety

Owner's Manual: All machinery and machining equipment presents serious injury hazards to untrained users. To reduce the risk of injury, anyone who uses THIS item MUST read and understand this entire manual before starting.

Personal Protective Equipment: Operating or servicing this item may expose the user to flying debris, dust, smoke, dangerous chemicals, or loud noises. These hazards can result in eye injury, blindness, long-term respiratory damage, poisoning, cancer, reproductive harm or hearing loss. Reduce your risks from these hazards by wearing approved eye protection, respirator, gloves, or hearing protection.

Trained/Supervised Operators Only: Untrained users can seriously injure themselves or bystanders. Only allow trained and properly supervised personnel to operate this item. Make sure safe operation instructions are clearly understood. If electrically powered, use padlocks and master switches, and remove start switch keys to prevent unauthorized use or accidental starting.

Guards/Covers: Accidental contact with moving parts during operation may cause severe entanglement, impact, cutting, or crushing injuries. Reduce this risk by keeping any included guards/covers/doors installed, fully functional, and positioned for maximum protection.

Entanglement: Loose clothing, gloves, neckties, jewelry or long hair may get caught in moving parts, causing entanglement, amputation, crushing, or strangulation. Reduce this risk by removing/securing these items so they cannot contact moving parts.

Mental Alertness: Operating this item with reduced mental alertness increases the risk of accidental injury. Do not let a temporary influence or distraction lead to a permanent disability! Never operate when under the influence of drugs/alcohol, when tired, or otherwise distracted.

Safe Environment: Operating electrically powered equipment in a wet environment may result in electrocution; operating near highly flammable materials may result in a fire or explosion. Only operate this item in a dry location that is free from flammable materials.

Electrical Connection: With electrically powered equipment, improper connections to the power source may result in electrocution or fire. Always adhere to all electrical requirements and applicable codes when connecting to the power source. Have all work inspected by a qualified electrician to minimize risk.

Disconnect Power: Adjusting or servicing electrically powered equipment while it is connected to the power source greatly increases the risk of injury from accidental startup. Always disconnect power BEFORE any service or adjustments, including changing blades or other tooling.

Secure Workpiece/Tooling: Loose workpieces, cutting tools, or rotating spindles can become dangerous projectiles if not secured or if they hit another object during operation. Reduce the risk of this hazard by verifying that all fastening devices are properly secured and items attached to spindles have enough clearance to safely rotate.

Chuck Keys or Adjusting Tools: Tools used to adjust spindles, chucks, or any moving/rotating parts will become dangerous projectiles if left in place when the machine is started. Reduce this risk by developing the habit of always removing these tools immediately after using them.

Work Area: Clutter and dark shadows increase the risks of accidental injury. Only operate this item in a clean, non-glaring, and well-lighted work area.

Properly Functioning Equipment: Poorly maintained, damaged, or malfunctioning equipment has higher risks of causing serious personal injury compared to those that are properly maintained. To reduce this risk, always maintain this item to the highest standards and promptly repair/service a damaged or malfunctioning component. Always follow the maintenance instructions included in this documentation.

Unattended Operation: Electrically powered equipment that is left unattended while running cannot be controlled and is dangerous to bystanders. Always turn the power **OFF** before walking away.

Health Hazards: Certain cutting fluids and lubricants, or dust/smoke created when cutting, may contain chemicals known to the State of California to cause cancer, respiratory problems, birth defects, or other reproductive harm. Minimize exposure to these chemicals by wearing approved personal protective equipment and operating in a well ventilated area.

Difficult Operations: Attempting difficult operations with which you are unfamiliar increases the risk of injury. If you experience difficulties performing the intended operation, STOP! Seek an alternative method to accomplish the same task, ask a qualified expert how the operation should be performed, or contact our Technical Support for assistance.

Additional Metal Lathe Safety

Clearing Chips. Metal chips can easily cut bare skin—even through a piece of cloth. Avoid clearing chips by hand or with a rag. Use a brush or vacuum to clear metal chips.

Chuck Key Safety. A chuck key left in the chuck can become a deadly projectile when the spindle is started. Always remove the chuck key after using it. Develop a habit of not taking your hand off of a chuck key unless it is away from the machine.

Tool Selection. Cutting with an incorrect or dull tool increases the risk of accidental injury due to the extra force required for the operation, which increases risk of breaking or dislodging components that can cause small shards of metal to become dangerous projectiles. Always select the right cutter for the job and make sure it is sharp. A correct, sharp tool decreases strain and provides a better finish.

Securing Workpiece. An improperly secured workpiece can fly off the lathe spindle with deadly force, which can result in a severe impact injury. Make sure the workpiece is properly secured in the chuck or faceplate before starting the lathe.

Chucks. Chucks are very heavy and difficult to grasp, which can lead to crushed fingers or hands if mishandled. Get assistance when handling chucks to reduce this risk. Protect your hands and the precision-ground ways by using a chuck cradle or piece of plywood over the ways of the lathe when servicing chucks.

Safe Clearances. Workpieces that crash into other components on the lathe may throw dangerous projectiles in all directions, leading to impact injury and damaged equipment. Before starting the spindle, make sure the workpiece has adequate clearance by hand-rotating it through its entire range of motion. Also, check the tool and tool post clearance, chuck clearance, and saddle clearance.

Speed Rates. Operating the lathe at the wrong speed can cause nearby parts to break or the workpiece to come loose, which will result in dangerous projectiles that could cause severe impact injuries. Large or non-concentric workpieces must be turned at slow speeds. Always use the appropriate feed and speed rates.

Stopping Spindle by Hand. Stopping the spindle by putting your hand on the workpiece or chuck creates an extreme risk of entanglement, impact, crushing, friction, or cutting hazards. Never attempt to slow or stop the lathe spindle with your hand. Allow the spindle to come to a stop on its own or use the brake.

Crashes. Aggressively driving the cutting tool or other lathe components into the chuck may cause an explosion of metal fragments, which can result in severe impact injuries and major damage to the lathe. Reduce this risk by releasing automatic feeds after use, not leaving lathe unattended, and checking clearances before starting the lathe. Make sure no part of the tool, tool holder, compound rest, cross slide, or carriage will contact the chuck during operation.

Long Stock Safety. Long stock can whip violently if not properly supported, causing serious impact injury and damage to the lathe. Reduce this risk by supporting any stock that extends from the chuck/headstock more than three times its own diameter. Always turn long stock at slow speeds.

Coolant Safety. Coolant is a very poisonous biohazard that can cause personal injury from skin contact alone. Incorrectly positioned coolant nozzles can splash on the operator or the floor, resulting in an exposure or slipping hazard. To decrease your risk, change coolant regularly and position the nozzle where it will not splash or end up on the floor.

Additional Chuck Safety

Entanglement. Entanglement with a rotating chuck can lead to death, amputation, broken bones, or other serious injury. Never attempt to slow or stop the lathe chuck by hand, and always roll up long sleeves, tie back long hair, and remove any jewelry or loose apparel BEFORE operating.

Chuck Speed Rating. Excessive spindle speeds greatly increase the risk of the workpiece or chuck being thrown from the machine with deadly force. Never use spindle speeds faster than the chuck RPM rating or the safe limits of your workpiece.

Using Correct Equipment. Many workpieces can only be safely turned in a lathe if additional support equipment, such as a tailstock or steady rest, is used. If the operation is too hazardous to be completed with the lathe or existing equipment, the operator must have enough experience to know when to use a different machine or find a safer way.

Trained Operators Only. Using a chuck incorrectly can result in workpieces coming loose at high speeds and striking the operator or bystanders with deadly force. To reduce the risk of this hazard, read and understand this document and seek additional training from an experienced chuck user before using a chuck.

Chuck Capacity. Avoid exceeding the capacity of the chuck by clamping an oversized workpiece. If the workpiece is too large to safely clamp with the chuck, use a faceplate or a larger chuck if possible. Otherwise, the workpiece could be thrown from the lathe during operation, resulting in serious impact injury or death.

Clamping Force. Inadequate clamping force can lead to the workpiece being thrown from the chuck and striking the operator or bystanders. Maximum clamping force is achieved when the chuck is properly maintained and lubricated, all jaws are fully engaged with the workpiece, and the maximum chuck clamping diameter is not exceeded.

Proper Maintenance. All chucks must be properly maintained and lubricated to achieve maximum clamping force and withstand the rigors of centrifugal force. To reduce the risk of a thrown workpiece, follow all maintenance intervals and instructions in this document.

Disconnect Power. Serious entanglement or impact injuries could occur if the lathe is started while you are adjusting, servicing, or installing the chuck. Always disconnect the lathe from power before performing these procedures.

Preparation Overview

The purpose of the preparation section is to help you prepare your machine for operation. The list below outlines this basic process. Specific steps for each of these points will be covered in detail later in this section.

The typical preparation process is as follows:

1. Unpack the lathe and inventory the contents of the box/crate.
2. Clean the lathe and its components.
3. Identify an acceptable location for the lathe and move it to that location.
4. Level the lathe and bolt it to a workbench or stand.
5. Assemble the loose components and make any necessary adjustments or inspections to ensure the lathe is ready for operation.
6. Check/lubricate the lathe.
7. Connect the lathe to the power source.
8. Test run the lathe to make sure it functions properly.
9. Perform the spindle break-in procedure to prepare the lathe for operation.

Required for Setup

To complete the preparation process, you will need the following items:

For Lifting and Moving

- Additional people for lifting the lathe (at least two)

For Power Connection

- A power source that meets the minimum circuit requirements for this machine (review **Power Supply Requirements** on the next page for details)

For Cleaning & Assembly

- Cotton rags
- Mineral spirits
- Quality metal protectant oil
- Safety glasses
- Bench mounting hardware as needed
- Precision level

Power Supply Requirements

Availability

Before installing the machine, consider the availability and proximity of the required power supply circuit. If an existing circuit does not meet the requirements for this machine, a new circuit must be installed.

To minimize the risk of electrocution, fire, or equipment damage, installation work and electrical wiring must be done by an electrician or qualified service personnel in accordance with all applicable codes.

WARNING

Serious injury could occur if you connect the machine to power before completing the setup process. DO NOT connect to power until instructed later in this manual.

Full-Load Current Rating

The full-load current rating is the amperage a machine draws at 100% of the rated output power. On machines with multiple motors, this is the amperage drawn by the largest motor or sum of all motors and electrical devices that might operate at one time during normal operations.

Full-Load Rating..... 10 Amps

The full-load current is not the maximum amount of amps that the machine will draw. If the machine is overloaded, it will draw additional amps beyond the full-load rating.

If the machine is overloaded for a sufficient length of time, damage, overheating, or fire may result—especially if connected to an undersized circuit. To reduce the risk of these hazards, avoid overloading the machine during operation and make sure it is connected to a power supply circuit that meets the requirements in the following section.

CAUTION

For your own safety and protection of property, consult an electrician if you are unsure about wiring practices or applicable electrical codes.

Circuit Requirements

This machine is prewired to operate on a 110V power supply circuit that has a verified ground and meets the following requirements:

Nominal Voltage	110V/120V
Cycle	60 Hz
Phase	Single-Phase
Circuit Rating.....	15 Amps
Plug/Receptacle	NEMA 5-15

A power supply circuit includes all electrical equipment between the main breaker box or fuse panel in your building and the incoming power connections inside the machine. This circuit must be safely sized to handle the full-load current that may be drawn from the machine for an extended period of time. (If this machine is connected to a circuit protected by fuses, use a time delay fuse marked D.)

Note: The circuit requirements in this manual are for a dedicated circuit—where only one machine will be running at a time. If this machine will be connected to a shared circuit where multiple machines will be running at the same time, consult a qualified electrician to ensure the circuit is properly sized.

Grounding Requirements

This machine must be grounded! In the event of certain types of malfunctions or breakdowns, grounding provides a path of least resistance for electric current in order to reduce the risk of electric shock.

This machine is equipped with a power cord that has an equipment-grounding wire and a grounding plug (see **Figure 5**). The plug must only be inserted into a matching receptacle (outlet) that is properly installed and grounded in accordance with all local codes and ordinances.

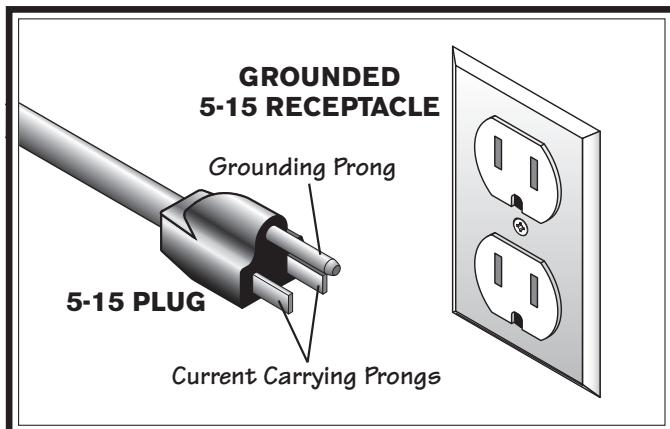
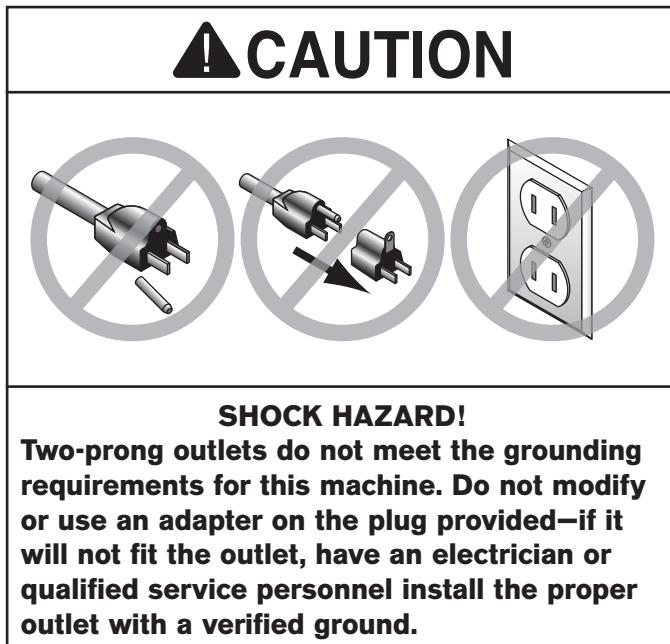


Figure 5. Typical 5-15 plug and receptacle.



Extension Cords

We do not recommend using an extension cord with this machine. If you must use an extension cord, only use it if absolutely necessary and only on a temporary basis.

Extension cords cause voltage drop, which may damage electrical components and shorten motor life. Voltage drop increases as the extension cord size gets longer and the wire gauge size gets smaller (higher gauge numbers indicate smaller sizes).

Any extension cord used with this machine must contain a ground wire, match the required plug and receptacle, and meet the following requirements:

**Minimum Gauge Size.....14 AWG
Maximum Length (Shorter is Better)50 ft.**

Unpacking

This item was carefully packaged to prevent damage during transport. If you discover any damage, please immediately call Customer Service at (360) 734-1540 for advice. You may need to file a freight claim, so save the containers and all packing materials for possible inspection by the carrier or its agent.

Inventory

Tool Box Inventory (Figures 6-7)		Qty
A.	Tool Box	1
B.	Timing-Belt Pulley 28T	1
C.	Timing-Belt Pulley 27T	1
D.	Timing-Belt Pulley 26T	1
E.	Timing-Belt Pulley 24T	1
F.	Timing-Belt Pulley 22T	1
G.	Timing-Belt Pulley 21T	1
H.	Timing-Belt Pulley 20T	1
I.	Timing-Belt Pulley 19T	1
J.	Timing-Belt Pulley 18T	1
K.	Timing-Belt Pulley 16T	1
L.	Timing-Belt Pulley 38T	1
M.	Timing-Belt Pulley 32T	1
N.	Power Cord 16G 3C 72" M/F 5-15	1
O.	3-Jaw Chuck External Jaw Set.....	1
P.	Chuck Key	1
Q.	Wrench 13mm	1
R.	Combo Wrench 14 x 17mm	1
S.	Hex Wrench Set, 2, 3, 4, 5, 6, 8mm.....	1 Each
T.	Tapered Spindle Sleeve MT#4.5-MT#3.....	1
U.	Dead Center MT#2.....	1
V.	Dead Center MT#3.....	1
W.	Grease Gun.....	1
X.	Rubber Mounting Gasket	1
Y.	Timing Belt 140XL.....	1
Z.	Timing Belt 160XL.....	1
AA.	Fuses Time-Delay15A (T15L250V).....	5

Installed & Not Shown		Qty
•	3-Jaw Chuck Assembly 4"	1

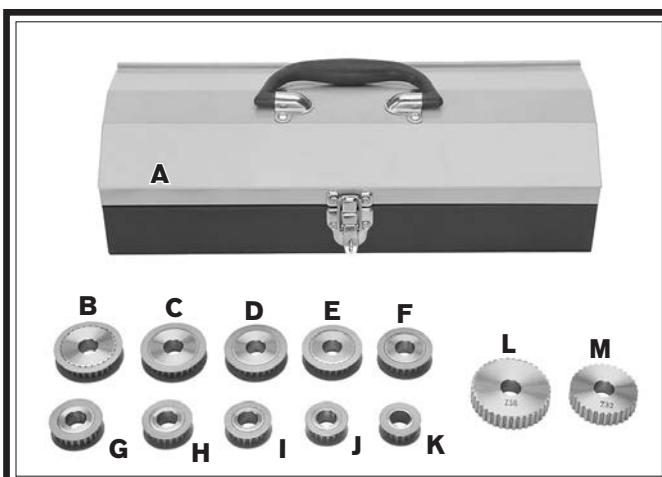


Figure 6. Toolbox and timing-belt pulleys.

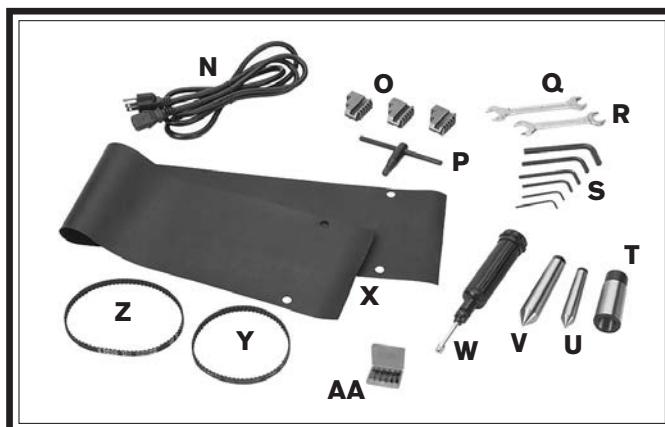


Figure 7. Additional small items.

Cleaning & Protecting

The unpainted surfaces are coated at the factory with a heavy-duty rust preventative that prevents corrosion during shipment and storage. The benefit of this rust preventative is that it works very well. The downside is that it can be time-consuming to thoroughly remove.

Be patient and do a careful job when cleaning and removing the rust preventative. The time you spend doing this will reward you with smooth-sliding parts and a better appreciation for the proper care of the unpainted surfaces.

Although there are many ways to successfully remove the rust preventative, the following process works well in most situations.

Before cleaning, gather the following:

- Disposable rags
- Cleaner/degreaser (certain citrus-based degreasers work extremely well and they have non-toxic fumes)
- Safety glasses & disposable gloves

Note: Automotive degreasers, mineral spirits, or WD•40 can be used to remove rust preventative. Before using these products, though, test them on an inconspicuous area of a painted surface to make sure they will not damage it.

NOTICE

Avoid chlorine-based solvents, such as acetone or brake parts cleaner that may damage painted surfaces. Always follow the manufacturer's instructions when using any type of cleaning product.

Basic steps for removing rust preventative:

1. Put on safety glasses and disposable gloves.
2. Coat all surfaces that have rust preventative with a liberal amount of your cleaner or degreaser and let them soak for a few minutes.
3. Wipe off the surfaces. If your cleaner or degreaser is effective, the rust preventative will wipe off easily.

Note: To clean off thick coats of rust preventative on flat surfaces, such as beds or tables, use a PLASTIC paint scraper to scrape off the majority of the coating before wiping it off with your rag. (Do not use a metal scraper or it may scratch the surface.)

4. Repeat Steps 2-3 as necessary until clean, then coat all unpainted surfaces with a quality metal protectant or light oil to prevent rust.



WARNING

Gasoline and petroleum products have low flash points and can explode or cause fire if used for cleaning. Avoid using these products to remove rust preventative.

Location

Physical Environment

The physical environment where your machine is operated is important for safe operation and longevity of parts. For best results, operate this machine in a dry environment that is free from excessive moisture, hazardous or flammable chemicals, airborne abrasives, or extreme conditions. Extreme conditions for this type of machinery are generally those where the ambient temperature is outside the range of 41°–104°F; the relative humidity is outside the range of 20–95% (non-condensing); or the environment is subject to vibration, shocks, or bumps.

Electrical Installation

Place this machine near an existing power source that meets the minimum circuit requirements. Make sure all power cords are protected from traffic, material handling, moisture, chemicals, or other hazards. Leave access to disconnect the power source or engage a lockout/tagout device.

Lighting

Lighting around the machine must be adequate enough that operations can be performed safely. Shadows, glare, or strobe effects that may distract or impede the operator must be eliminated.

Weight Load

Refer to the **Machine Specifications** for the weight of your machine. Make sure that the surface upon which the machine is placed will bear the weight of the machine, additional equipment that may be installed on the machine, and the heaviest workpiece that will be used. Additionally, consider the weight of the operator and any dynamic loading that may occur when operating the machine.

Space Allocation

Consider the largest size of workpiece that will be processed through this machine and provide enough space around the machine for adequate operator material handling or the installation of auxiliary equipment. With permanent installations, leave enough space around the machine to open or remove doors/covers as required by the maintenance and service described in this manual.

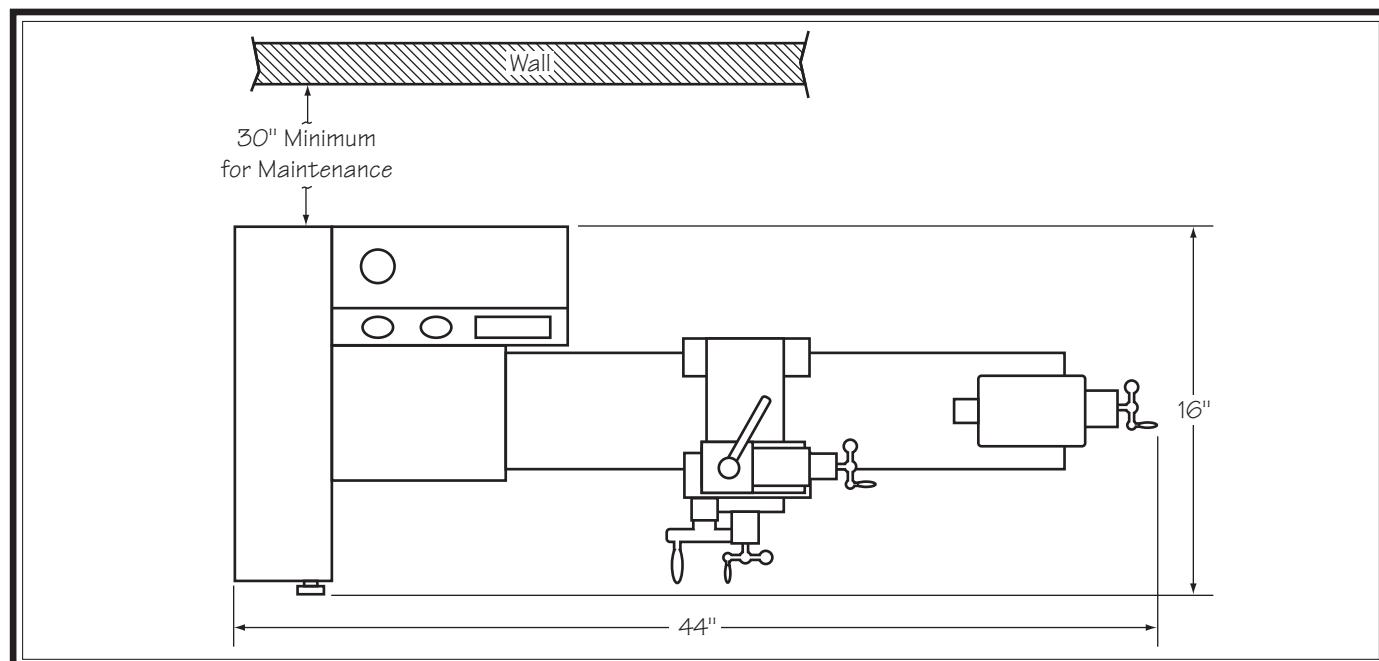
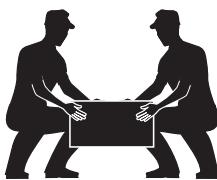


Figure 8. Clearances.

Leveling & Mounting



WARNING

This machine and its parts are heavy! Serious personal injury may occur if safe moving methods are not used. To reduce the risk of a lifting or dropping injury, ask others for help.

Leveling

Leveling machinery helps precision components, such as bed ways, remain straight and flat during the lifespan of the machine. Components on an unleveled machine may slowly twist due to the dynamic loads placed on the machine during operation.

For best results, use a precision level that is at least 12" long and sensitive enough to show a distinct movement when a 0.003" shim (approximately the thickness of one sheet of standard newspaper) is placed under one end of the level.

See the figure below for an example of a high precision level.

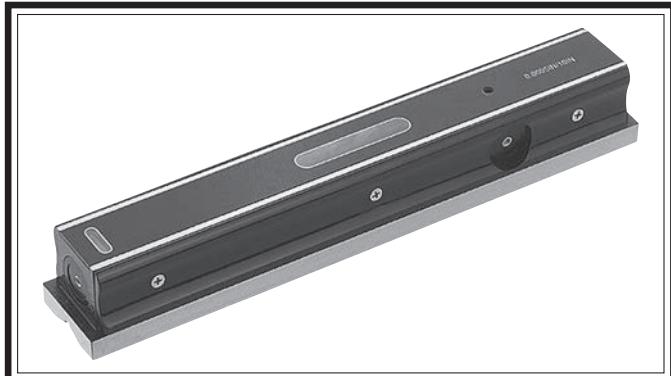


Figure 9. Example of a precision level.

Mounting

The base of this lathe has mounting four holes that allow it to be secured to a workbench or stand to prevent it from moving during operation. The mounting holes are $5\frac{1}{4}'' \times 29\frac{1}{2}''$ apart, center-to-center, and accept $\frac{3}{8}''$ fasteners.

To help dampen vibration, place the rubber mounting gasket between the workbench and the lathe before installing the fasteners.

The strongest mounting option is a "Through Mount" (see example in **Figure 10**) where holes are drilled all the way through the workbench—and hex bolts, washers, and hex nuts are used to secure the machine in place.

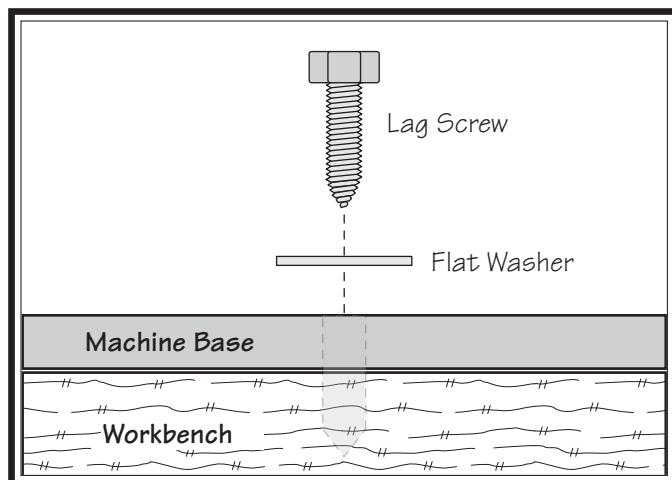


Figure 10. Example of a "Through Mount" setup.

Another option is a "Direct Mount" (see example in **Figure 11**) where the machine is secured directly to the workbench with lag screws and washers.

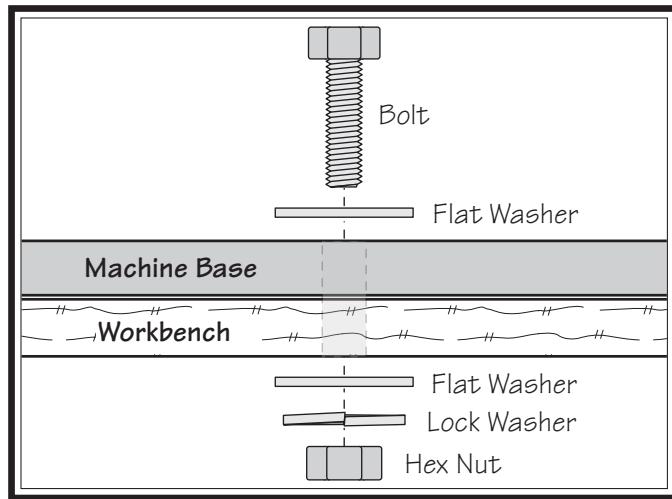
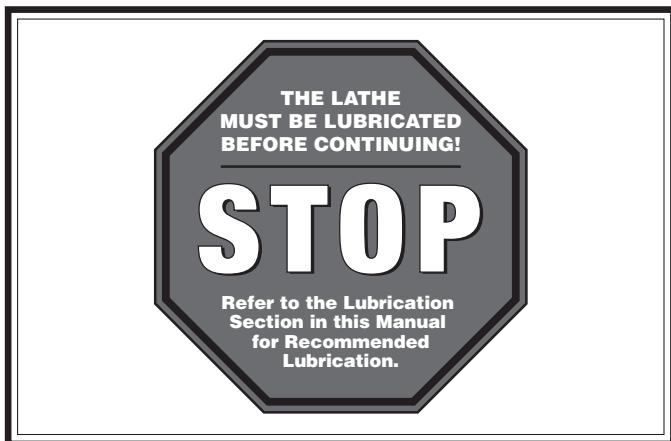


Figure 11. Example of a "Direct Mount" setup.

Lubricating Lathe



The lathe must be properly lubricated before it can be operated for the first time.

Damage caused to the bearings and bushings from running the lathe without lubrication will not be covered under warranty. Refer to **Lubrication**, beginning on **Page 51**, for details on how to lubricate the lathe.

Power Connection

After you have completed all previous preparation instructions and power supply requirements, the machine is ready to be connected to the power supply.

To avoid unexpected startups or property damage, use the following steps whenever connecting or disconnecting the machine.

Connecting Power

1. Turn the master power switch on the front of the headstock **OFF**.
2. Insert the power cord plug into the matching power supply receptacle. The machine is now connected to the power source.

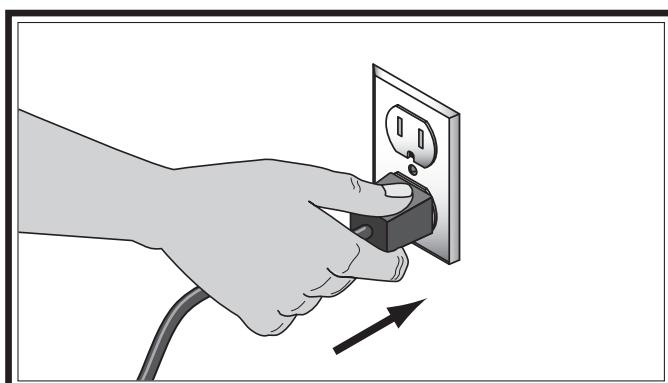


Figure 12. Connecting power.

Disconnecting Power

1. Turn the master power switch on the front of the headstock **OFF**.
2. Grasp the molded plug and pull it completely out of the receptacle. Do not pull by the cord as this may damage the wires inside.

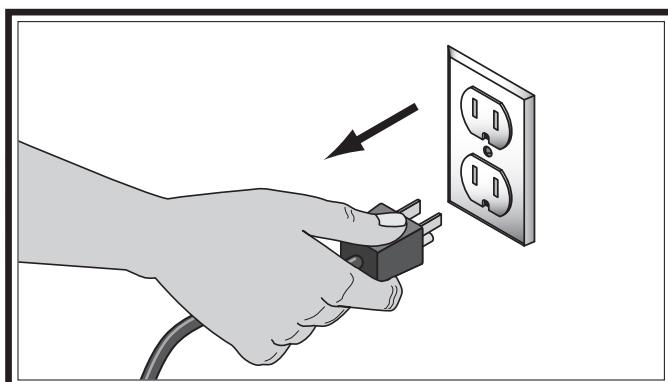


Figure 13. Disconnecting power.

Test Run

After all preparation steps have been completed, the machine and its safety features must be tested to ensure correct operation. If you discover a problem with the operation of the machine or its safety components, stop the motor, disconnect the machine from power, and do not operate it further until you have resolved the problem.

A **Troubleshooting** section is provided, starting on **Page 57**, to assist you with solutions if a problem occurs or if the lathe does not function as described in this section.

If you need additional help after reviewing the troubleshooting section, or you are not confident troubleshooting the machine on your own, contact our Tech Support at (360) 734-1540.

To test run your machine:

1. Make sure the master power switch (see **Figure 14**) on the front of the machine is turned **OFF**.



Figure 14. Master power switch location.

2. Read and follow the safety instructions at the beginning of the manual, take all required safety precautions, and make sure all previous preparation steps discussed in this manual have been followed and completed.

3. Clear away all tools and objects used during assembly, lubrication, and preparation.
4. Make sure that the chuck and jaws, if installed, are secure (refer to **Chuck Installation on Page 25**).
5. Push the emergency STOP button on the control panel (see **Figure 15**).

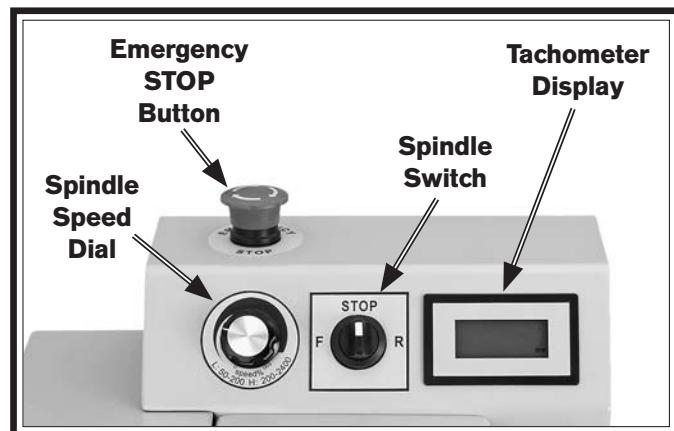


Figure 15. Control panel.

6. Turn the spindle speed dial all the way counterclockwise to set the spindle to its slowest speed for start-up.
7. Move the spindle switch to the OFF (middle) position.
8. Make sure the end cover is closed, as shown in **Figure 16**.

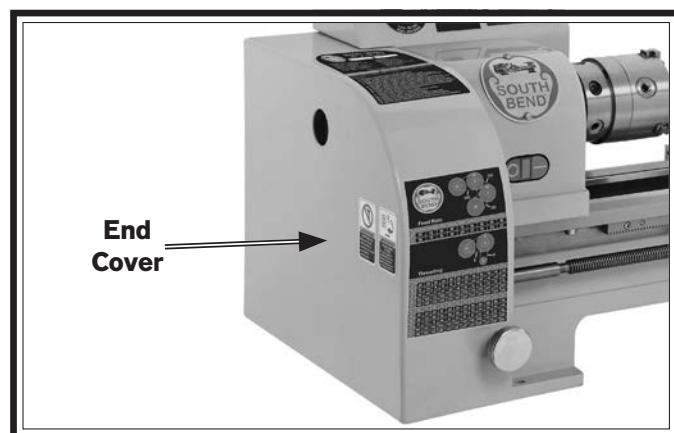


Figure 16. End cover closed.

- 9.** To prevent the carriage from unexpectedly moving during further steps, move the half nut lever up to disengage the carriage from the leadscrew (see **Figure 17**).

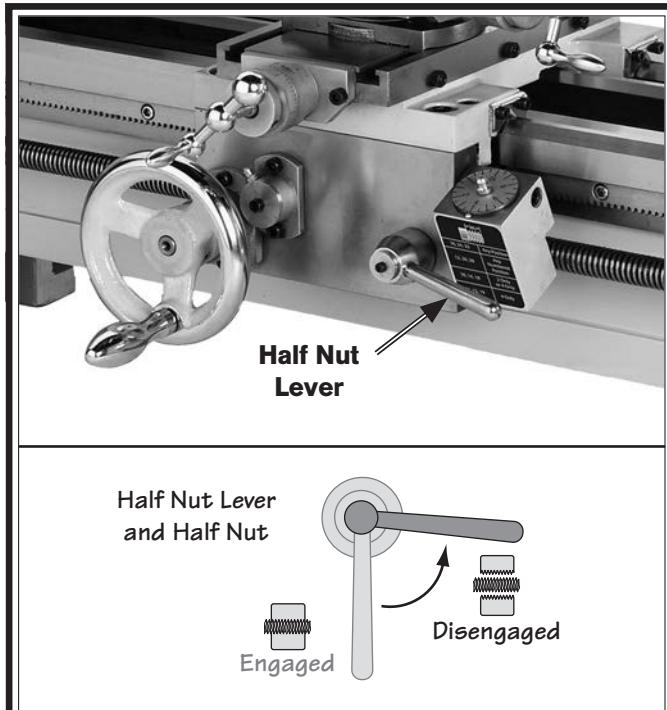


Figure 17. Half nut lever in the disengaged position.

- 10.** Reset the STOP button by twisting it clockwise until it pops out, then turn the master power switch **ON**.
- 11.** Move the spindle switch to the forward (left) position, then slowly turn the spindle speed dial clockwise to begin spindle rotation at a low speed.
- When operating correctly, the machine runs smoothly with little or no vibration or rubbing noises.
 - Investigate and correct strange or unusual noises or vibrations before operating the machine further. Always disconnect the machine from power when investigating or correcting potential problems.
- 12.** Use the spindle speed dial to increase and decrease spindle speed to verify the operation of the dial.

- 13.** Move the spindle switch to the OFF position, let the spindle come to a complete stop, then move the switch to the right position to reverse spindle rotation.

- 14.** Push the emergency STOP button. The spindle should come to a slow stop.

- 15.** With the emergency STOP button pushed in, attempt to re-start spindle rotation—the spindle should not start.

- If the spindle *does not* start, the emergency STOP button is working properly. Proceed to **Step 16**.

- If the spindle *does* start, the emergency STOP button is not working properly. This safety feature must operate properly before continuing. Turn the master power switch **OFF**, disconnect the lathe from power, then call Tech Support for help.

- 16.** Move the spindle switch to the OFF position and turn the spindle speed dial all the way counterclockwise for a minimum spindle rotation on the next start-up.

Congratulations! The test run is complete. Perform the following **Spindle Break-In** procedure.

Spindle Break-In

Before subjecting the lathe to full loads, you must break it in so that bearings will fully seat, gear teeth will find their normal wear pattern, and lubricant will be worked into the required areas. Otherwise, the moving components of the lathe may suffer from excessive wear.

The break-in procedure must be performed in succession with the **Test Run** procedure described in this manual, because many of the test run steps prepare the lathe controls for the break-in process.

NOTICE

Do not leave the lathe unattended during the Spindle Break-In procedure. If your attention is needed elsewhere during this procedure, stop the lathe and restart the procedure later from the beginning.

To perform the spindle break-in:

1. Successfully complete the **Test Run** procedure beginning on **Page 21**.
2. Move the spindle switch to the left position, then run the lathe for ten minutes at each of the following approximate speeds: 50, 500, 900, 1800, and 2300 RPM.
3. Turn the spindle speed dial all the way counterclockwise to the minimum and move the spindle switch to the middle OFF position.

NOTICE

The maximum recommended spindle speed is 2300 RPM. DO NOT exceed this for more than a brief period of time or machine damage may occur.

4. When the spindle has come to a complete stop, move the spindle switch to the right position and run the spindle in reverse at 2300 RPM for another ten minutes.
5. Turn the spindle speed dial all the way counterclockwise to the minimum, move the spindle switch to the OFF position, and turn the master power switch **OFF**.
6. Check, and if necessary, re-tension the drive belts (refer to **Adjusting Drive Belts** on **Page 55** for detailed instructions).

Congratulations! The spindle break-in is complete. Continue with the following **Recommended Adjustments** subsection.

Recommended Adjustments

For your convenience, the adjustments listed below have been performed at the factory. However, because of the many variables involved with transporting the machine during shipping, we recommend that you at least verify the following adjustments to ensure the best possible operational results from your new machine.

Step-by-step instructions for these adjustments can be found on the pages referenced below.

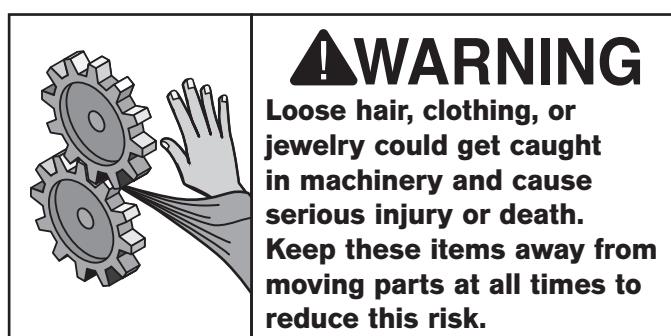
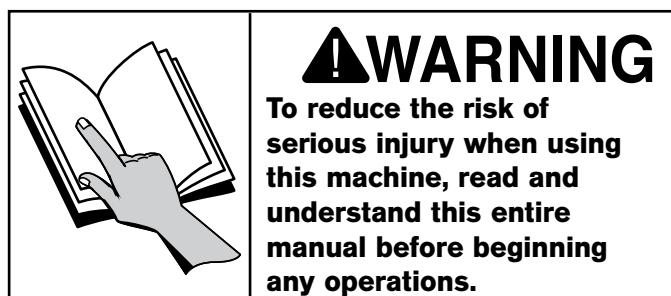
Factory adjustments that should be verified:

- Tailstock alignment to the spindle centerline (**Page 31**).
- Gib adjustments (**Page 54**).

Operation Overview

The purpose of this overview is to provide the novice machine operator with a basic understanding of how the machine is used during operation, so they can more easily understand the controls discussed later in this manual.

Note: Due to the generic nature of this overview, it is not intended to be an instructional guide for performing actual machine operations. To learn more about specific operations and machining techniques, seek training from people experienced with this type of machine, and do additional research outside of this manual by reading "how-to" books, trade magazines, or websites.



To complete a typical operation, the operator does the following:

1. Puts on safety glasses, rolls up sleeves, removes jewelry, and secures any clothing, jewelry, or hair that could get entangled in moving parts.
2. Examines the workpiece to make sure it is suitable for turning, mounts the workpiece in the chuck, and removes the chuck key from the machine.
3. Mounts the tooling, aligns it with the workpiece, then backs it away to establish a safe startup clearance.
4. Removes all setup tools from the lathe.
5. Checks for safe clearances by rotating the workpiece by hand at least one full revolution.
6. Uses the master power switch to enable power to the motor, then rotates the spindle switch to the forward (left) position to start spindle rotation.
7. Rotates the spindle speed dial to select the correct spindle speed for the operation.
8. Uses the handwheel/ball handles or power feed options to move the tooling into the workpiece.
9. When finished cutting, moves the spindle switch to the OFF (middle) position, waits until the spindle is completely stopped, then removes the workpiece.

Chuck & Faceplate Mounting

This lathe is equipped with a D1-type spindle nose. This type of spindle uses camlocks that are adjusted with an 8mm hex wrench to securely mount a chuck or faceplate with repeatable precision and ease.

!WARNING

Never use spindle speeds faster than the chuck RPM rating or the safe limits of your workpiece. Excessive spindle speeds greatly increase the risk of the workpiece or chuck being thrown from the machine with deadly force!

This lathe is shipped with the 3-jaw chuck installed. This is a D1-3 scroll-type chuck where all three jaws move in unison when the chuck key is used.

A 4-jaw chuck generally features independent jaws, which are used for square or unevenly-shaped stock, and to mount work that needs to be adjusted to near zero total indicated runout.

If neither chuck can hold your workpiece, use a faceplate which has slots for T-bolts that hold standard or custom clamping hardware. With the correct clamping hardware, a faceplate offers a wide range of uses, including machining non-concentric workpieces, straight turning between centers, off-center turning, and boring.

See **Accessories on Page 46** for available 4-jaw chuck and faceplate options from South Bend.

Chuck Installation

To ensure accurate work, it is extremely important to make sure the spindle nose and chuck mating surfaces/tapers are clean. Even a small amount of lint or debris can affect accuracy.

The chuck is properly installed when all camlocks are tight, the spindle and chuck tapers firmly lock together, and the back of chuck is firmly seated against the face of the spindle all the way around—without any gaps.

To install the chuck:

1. DISCONNECT LATHE FROM POWER!
2. Place a sturdy piece of plywood under the spindle to protect the bed ways during the installation process (see **Figure 18**).

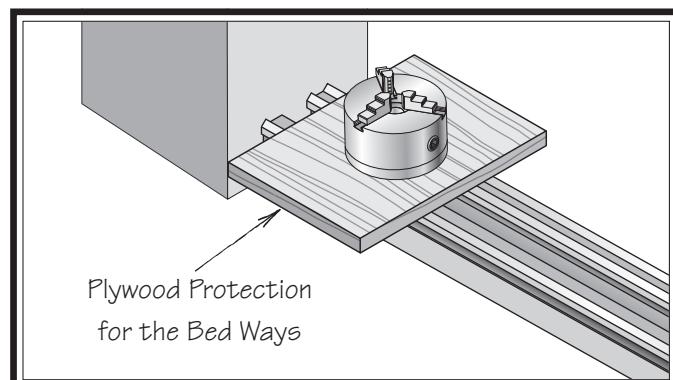


Figure 18. Plywood used to protect bed ways.

3. Clean and lightly oil the camlock studs, then thoroughly clean the mating surfaces of the spindle and chuck.

- 4.** Align the registration mark on the chuck (see **Figure 19**) with the one on the spindle.

Note: The camlock studs were adjusted at the factory to correctly fit the corresponding spindle cam hole, then the registration marks were made so that the chuck can be mounted with the same alignment each time.



Figure 19. Chuck and spindle registration marks.

- 5.** Install the chuck by inserting the camlock studs straight into the spindle cam holes.

Important: Avoid inserting the studs at an angle—this can damage studs or spindle cam holes.

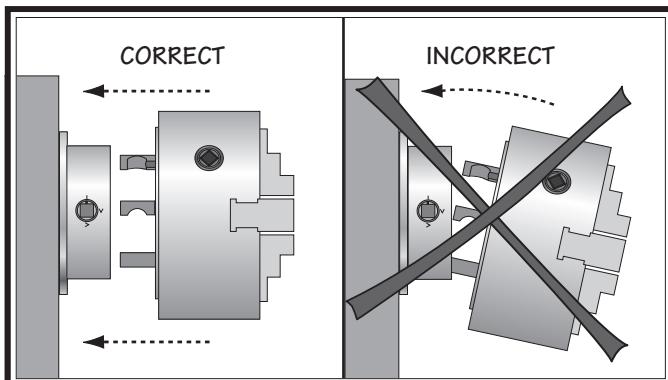


Figure 20. Inserting camlock studs into spindle cam holes.

- 6.** Incrementally tighten the camlocks in a criss-cross or star pattern to ensure that the chuck seats evenly against the spindle.

- 7.** When the chuck is fully seated and all the camlocks are tight, verify that the chuck fits the spindle properly by checking for any gaps between the mating surfaces.

- If there are no gaps, proceed to **Step 8**.
- If there is a gap, remove the chuck, re-clean the mating surfaces carefully, and re-install. If the problem persists, contact our Tech Support.

- 8.** Verify that the chuck/spindle tapers are seated firmly together by removing the chuck, per the **Chuck Removal** instructions on the next page, and pay close attention to how easily the tapers release.

- If it was necessary to bump the chuck or use a mallet to release the tapers, then they are seating together properly.
- If the tapers released easily with little intervention, they are not seated together firmly as required. Remove the chuck, re-clean the mating surfaces carefully, and re-install. If the problem persists, contact our Tech Support.

Chuck Removal

To remove the chuck:

1. DISCONNECT LATHE FROM POWER!
2. Place a sturdy piece of plywood under the spindle to protect the bed ways during the removal process.
3. Loosen the camlocks by turning the key counterclockwise until each of the cam lines are aligned with its corresponding spindle mark (see **Figure 21**).

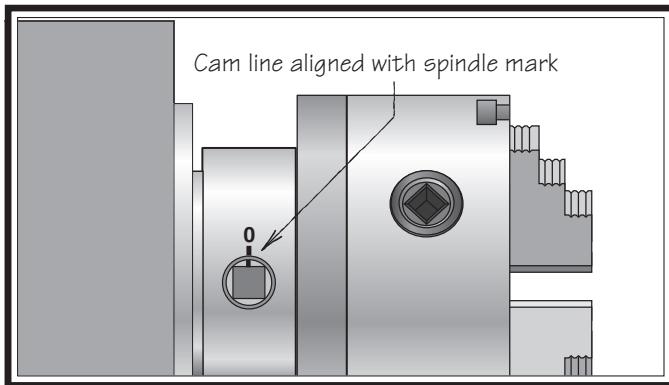


Figure 21. Camlock is fully loosened when the cam line is aligned with the spindle mark.

Tip: Camlocks can become very tight. A cheater pipe may be used as a last resort to add leverage when loosening. After loosening, you may need to wiggle the chuck key in the camlock to fully disengage the stud.

4. Using a dead blow hammer or other soft mallet, lightly tap around the outer circumference of the chuck body to loosen it from the spindle.
5. Remove the chuck from the spindle, using a light rocking motion to carefully slide the studs out of the cam holes.
 - If the chuck does not immediately come off, rotate it approximately 60° and tap it again. Make sure all the marks on the cams and spindle are in proper alignment for removal.

Scroll Chuck Clamping

This scroll-type chuck has an internal scroll-gear that moves all jaws in unison when adjusted with the chuck key. This chuck will hold cylindrical parts on-center with the axis of spindle rotation and can be rotated at high speeds if the workpiece is properly clamped and balanced.

Never mix jaw types or positions to accommodate an odd-shaped workpiece. The chuck will spin out of balance and may throw the workpiece! Instead, use an independent jaw chuck or a faceplate.

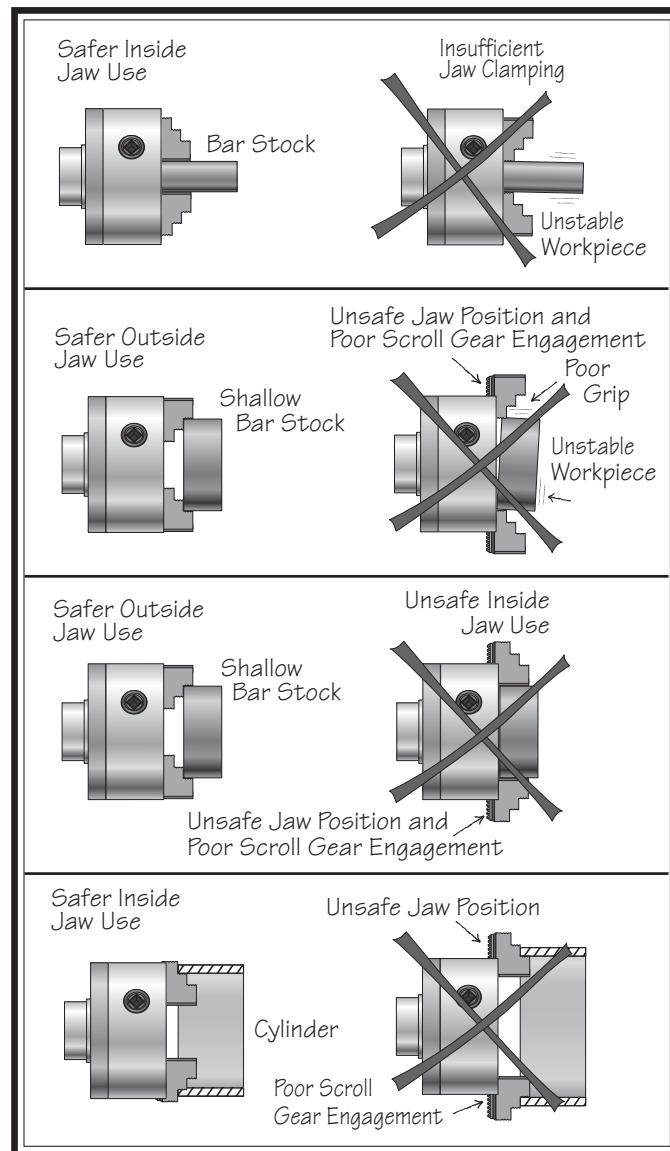


Figure 22. Jaw selection and workpiece holding.

4-Jaw Chuck

Refer to the **Chuck Installation** (see **Page 25**) and **Chuck Removal** (see **Page 27**) instructions to install or remove a 4-jaw chuck.

The optional Model SB1468 4-jaw chuck features independently adjustable jaws for holding non-concentric or off-center workpieces. Each jaw can be independently removed from the chuck body and reversed for a wide range of work holding versatility.

!WARNING

Because of the dynamic forces involved in machining a non-concentric or off-center workpiece, always use a low spindle speed to reduce risk of the workpiece coming loose and being thrown from the lathe, which could cause serious personal injury.

Mounting Workpiece

1. DISCONNECT LATHE FROM POWER!
2. Place a sturdy piece of plywood under the spindle to protect the bed ways during the installation process.
3. Use the chuck key to open each jaw so the workpiece will lay flat against the chuck face, jaw steps, or into the spindle opening.
4. Position the workpiece so it is centered in the chuck.

5. Tighten each jaw in small increments. After you have adjusted the first jaw, continue tightening the remaining jaws in an opposing sequence, as shown by the sequential order in **Figure 23**.

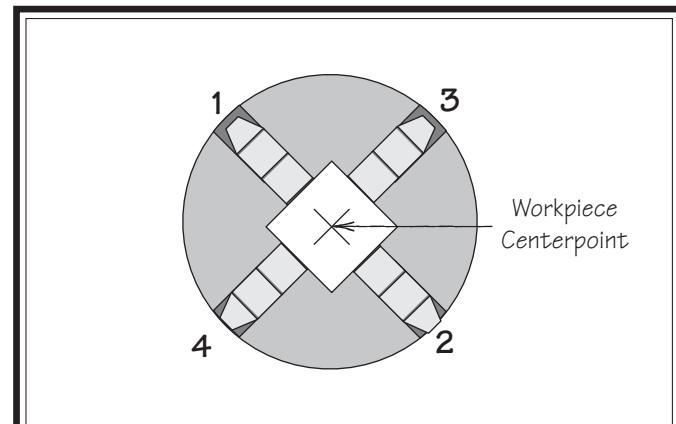


Figure 23. 4-jaw tightening sequence.

6. After the workpiece is held in place by the jaws, use a dial indicator to make sure the workpiece is centered in the chuck.
 - If the workpiece is not correctly centered, make fine adjustments by slightly loosening one jaw and tightening the opposing jaw until the workpiece is correctly positioned (see **Figure 24** for an example).

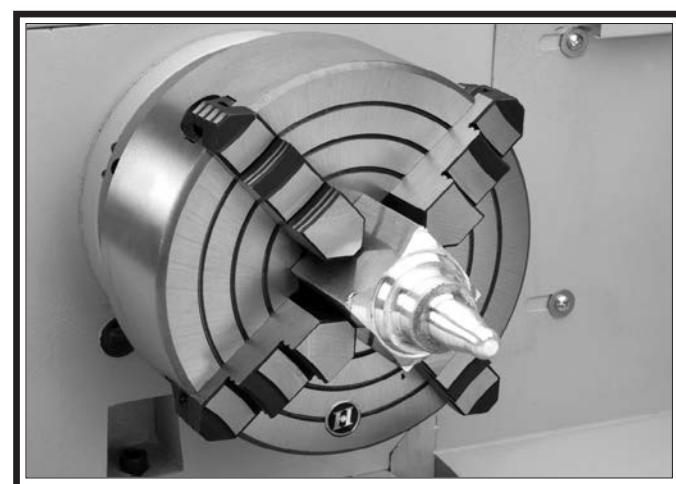


Figure 24. Example photo of non-cylindrical workpiece correctly mounted on the 4-jaw chuck.

Faceplate

Refer to the **Chuck Installation (Page 25)** and **Chuck Removal (Page 27)** instructions to install or remove the faceplate.

The optional Model SB1469 cast-iron faceplate can be used for a wide range of operations, including machining non-concentric workpieces, straight turning between centers, off-center turning, and boring.

The tools needed for mounting a workpiece will vary depending on the type of setup you have.

⚠ WARNING

Only machine a non-concentric workpiece at low speeds and clamp counter-weights to the faceplate to balance it. Machining a non-concentric workpiece at a high speed could cause it to be thrown from the spindle with deadly force at the operator or bystanders.

⚠ WARNING

Use a minimum of THREE independent clamping devices to hold the workpiece onto the faceplate. Failure to properly secure a workpiece to the faceplate could cause it to be thrown from the lathe with deadly force at the operator or bystanders.

To mount a non-concentric workpiece to the faceplate:

- 1. DISCONNECT LATHE FROM POWER!**
- 2. Place a sturdy piece of plywood under the spindle to protect the bed ways during the installation process.**
- 3. Position the workpiece onto the faceplate and clamp it in place with a minimum of three independent clamping devices (see **Figure 25** for an example).**

Be sure to take into account the rotational and cutting forces that will be applied to the workpiece when clamping it to the faceplate. If necessary, use counter-weights to balance the assembly and use a dial indicator to make sure that the workpiece is properly positioned for your operation.

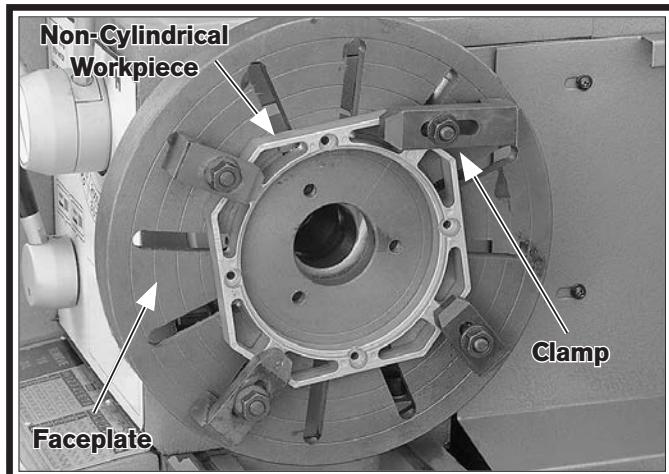


Figure 25. Example photo of workpiece clamped in a faceplate.

Tailstock

The tailstock (see **Figure 26**) can be used to support workpieces with the use of centers. It can also be used to drill or bore holes, or cut shallow tapers by using the offset set screws.

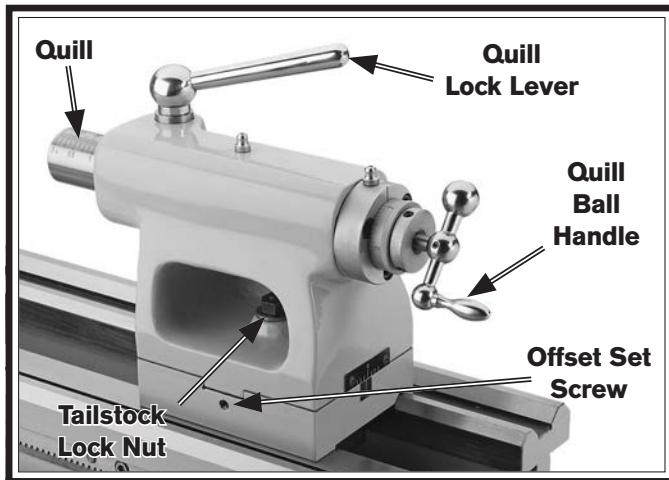


Figure 26. Tailstock components.

Graduated Dial

Increments.....0.001"
One Full Revolution.....0.050"

Increments on Quill

Inch 0"-1³/₄" in ¹/₈" Increments
Metric 0-45mm in 1mm Increments

Tool Needed	Qty
Wrench 13mm	1

Positioning Tailstock

1. Loosen the tailstock lock nut.
2. Slide the tailstock by hand to the desired position.
3. Re-tighten the tailstock lock nut.

Using Quill

1. Rotate the quill lock counterclockwise to allow for quill adjustment.
2. Turn the quill ball handle clockwise to move the quill toward the workpiece or counterclockwise to move it away from the workpiece.
3. Re-tighten the quill lock to secure the quill.

Installing Tooling

This tailstock quill accepts tooling arbors and drill bits with an MT#2 taper (see **Figures 27** for examples).

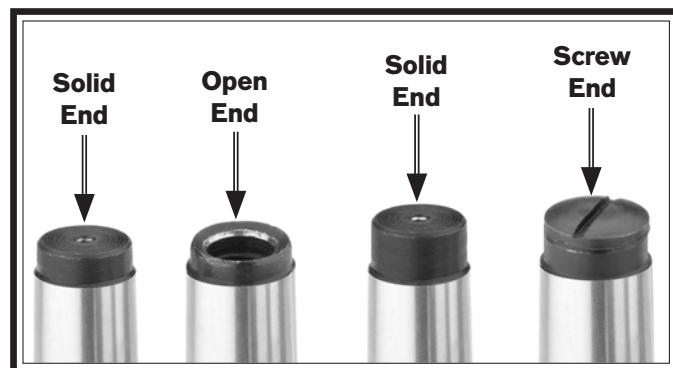


Figure 27. Types of tapered arbors and tooling.

If the arbor has an open hole in the end, a screw can be threaded into the end of it to provide a solid surface for the quill pin to push against when the quill is retracted for tool removal.

To install tooling in the tailstock:

1. With the tailstock locked in place, unlock the quill, then use the quill ball handle to extend the quill approximately $\frac{1}{2}$ ".
2. Thoroughly clean and dry the tapered mating surfaces of the quill and the center, making sure that no lint or oil remains on the tapers.

Note: This helps ensure that the tool seats properly and has minimal runout.

3. With a firm and quick motion, insert the tool into the quill. Check to see if it is properly seated by attempting to twist it by hand—it should not twist.
4. Unlock the tailstock and move it until the tip of the tool is close to, but not touching, the workpiece, then re-lock the tailstock.

Note: The tool may seat further when it is pushed against the workpiece.

Offsetting Tailstock

The tailstock can be offset from the spindle centerline for turning tapers. Move the tailstock top casting toward the front of the lathe to machine a taper at the tailstock end. Conversely, position the tailstock top casting toward the back of the lathe to machine a taper at the spindle end.

Note: The marks on the offset indicator are arbitrary. For a precise offset, use a dial indicator to check quill movement while adjusting the screws.

Tools Needed	Qty
Hex Wrench 3mm	1
Wrench 13mm	1

To offset the tailstock:

1. Loosen the tailstock lock nut to release the clamping pressure between the top and bottom castings (see **Figure 28**).

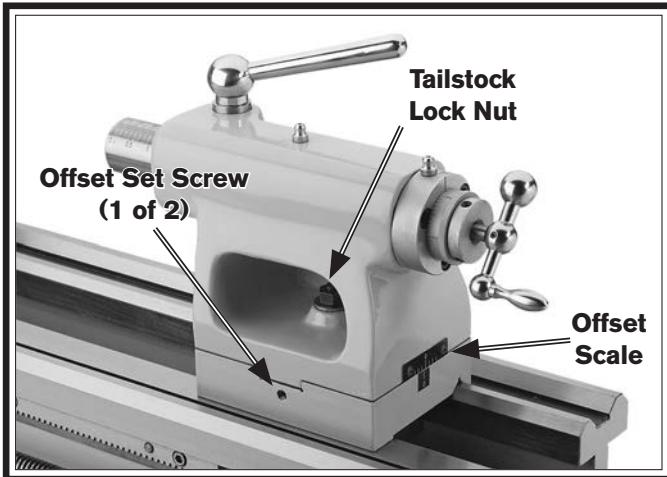


Figure 28. Tailstock offset controls.

2. Loosen one offset set screw, then tighten the other to move the tailstock top casting in the desired direction (see the illustration in **Figure 29**).

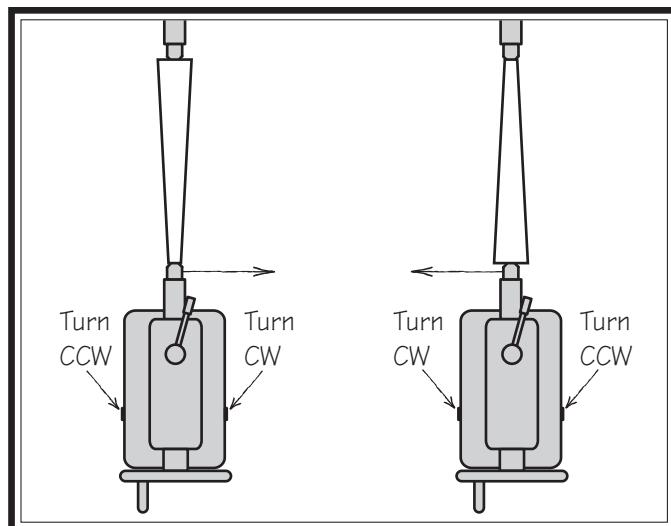


Figure 29. Set screw adjustment in relation to tailstock movement for desired taper.

3. Make sure both offset set screws are snug, then re-tighten the tailstock lock nut to secure the offset.

Aligning Tailstock to Spindle Centerline

This is an essential adjustment that should be verified or performed each time the tailstock is used to turn concentric workpieces between centers. If the tailstock is not aligned with the spindle centerline when it is supposed to be, turning results will be inaccurate along the length of the workpiece.

Items Needed	Qty
Hex Wrench 3mm	1
Wrench 13mm	1
Round Stock 2" x 6"	2
Dial Indicator w/Magnetic Base	1
Precision Calipers	1
Precision Level	1

To align the tailstock to the spindle centerline:

1. Use the precision level to make sure the bedway is level from side-to-side and from front-to-back.
 - If the bedway is not level, correct this condition before continuing with this procedure (refer to **Leveling & Mounting** on **Page 19** for additional information).

2. Center drill both ends of one piece of round stock, then set it aside for use in **Step 5**.
3. Use the other piece of round stock to make a dead center, and turn it to a 60° point, as illustrated in **Figure 30**.

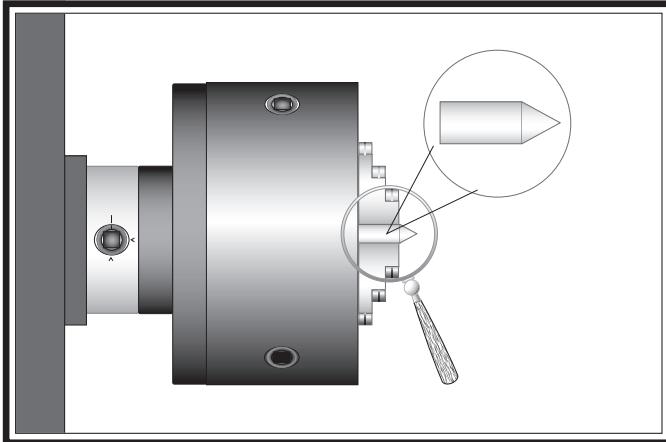


Figure 30. Turning a dead center.

Note: As long as this dead center remains in the chuck, the point of the center will remain true to the spindle centerline. The point will have to be refinished whenever the center is removed and then returned to the chuck.

4. Install centers in the spindle and tailstock.
5. Attach a lathe dog to the test stock from **Step 2**, then mount it between the centers (see **Figure 31** for an example photo).



Figure 31. Example photo of stock mounted between the centers.

6. Turn 0.010" off the stock diameter.
7. Mount a dial indicator so that the plunger is on the tailstock quill.
8. Use calipers to measure both ends of the workpiece.
 - If the test stock is *thicker* at the tailstock end, move the tailstock top casting toward the *front* of the lathe $\frac{1}{2}$ the distance of the amount of taper (see **Figure 32**).

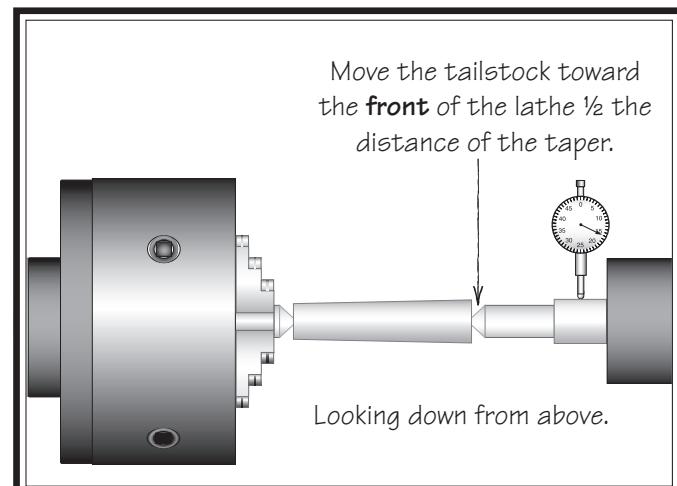


Figure 32. Adjust tailstock toward the operator.

- If the test stock is *thinner* at the tailstock end, move the tailstock top casting toward the *back* of the lathe $\frac{1}{2}$ the distance of the amount of taper (see **Figure 33**).

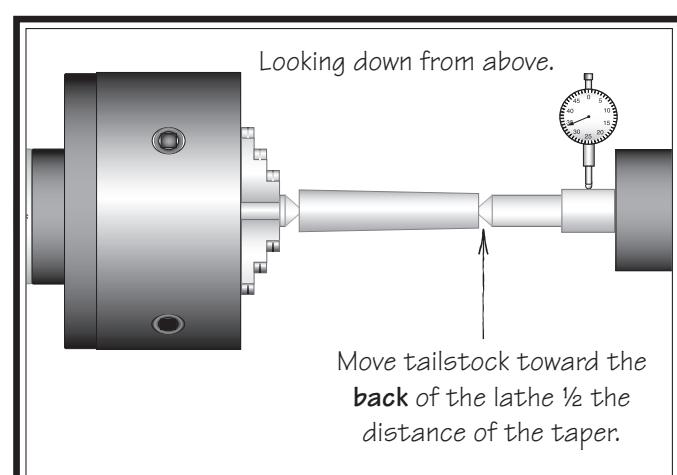


Figure 33. Adjust tailstock away from the operator.

9. Repeat **Steps 6–8** until the desired accuracy is achieved.

Centers

Figure 34 shows the MT#3 and MT#2 dead centers included with the lathe. In addition, an MT#3–MT#2 tapered spindle sleeve is included for mounting the MT#3 center in the spindle.

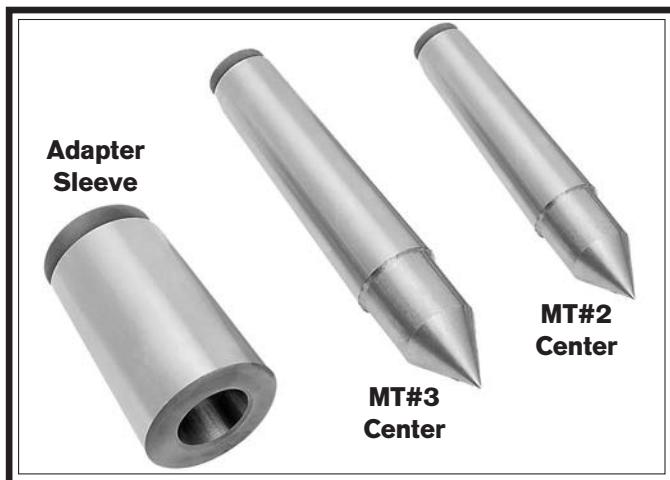


Figure 34. Tapered spindle sleeve and dead centers.

Dead Centers

A dead center is a one-piece center that does not rotate with the workpiece and is used to support long, slender workpieces

Use the dead center in the spindle for operations where the workpiece rotates with the center and does not generate friction.

When the dead center is used in the tailstock, the workpiece pivots on the tip of the center. The tip must be generously lubricated during the operation to avoid premature wear and maximize smooth operation. Using low spindle speeds will also reduce the heat and wear from friction.

Live Centers

A live center (see **Figure 35** for an example) has bearings that allow the center tip and the workpiece to rotate together—it can be installed in the tailstock quill for higher speeds. However, a live center typically does not provide the same level of rigidity as a dead center, and final workpiece accuracy can suffer as a result.



Figure 35. Example of a live center (SB1241 MT#2 Live Center shown).

Mounting Center in Spindle

1. DISCONNECT LATHE FROM POWER!
2. If mounted, remove the chuck, then mount the optional SB1469 faceplate onto the spindle.
2. Thoroughly clean and dry the tapered mating surfaces of the spindle bore, tapered spindle sleeve, and the MT#3 center, making sure that no lint or oil remains on the tapers.
3. Insert the MT#3 dead center into the tapered spindle sleeve, then insert the sleeve into the spindle bore through the faceplate.

Figure 36 shows an example photo of a dead center installed in the spindle, using a lathe dog and faceplate for turning between centers.

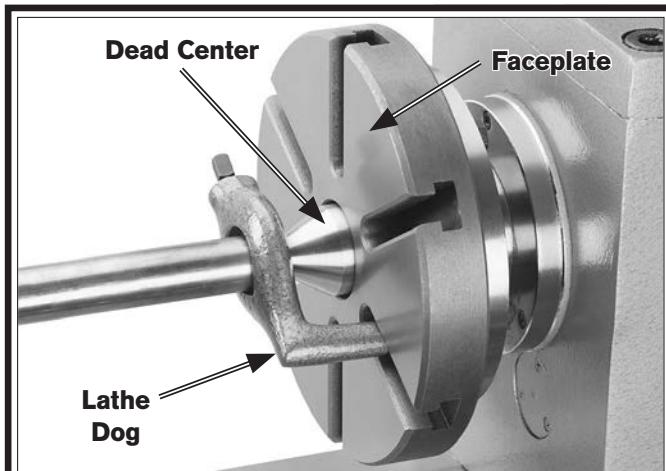


Figure 36. Example photo of using a dead center with a faceplate and lathe dog.

Removing Center from Spindle

To remove the sleeve and center from the spindle, insert a piece of round bar stock or similar tool through the outboard end (on the left side of the headstock). Hold onto the sleeve and center with a gloved hand or shop rag, then tap the sleeve loose.

NOTICE

To avoid premature wear of the dead center or damage to the workpiece, use low spindle speeds and keep the tip of the dead center mounted in the tailstock well lubricated.

Mounting Center in Tailstock

Either a carbide-tipped dead center or live center can be used in the tailstock. Mounting instructions are the same for both. **Figure 37** shows an example photo of a dead center mounted in the tailstock.

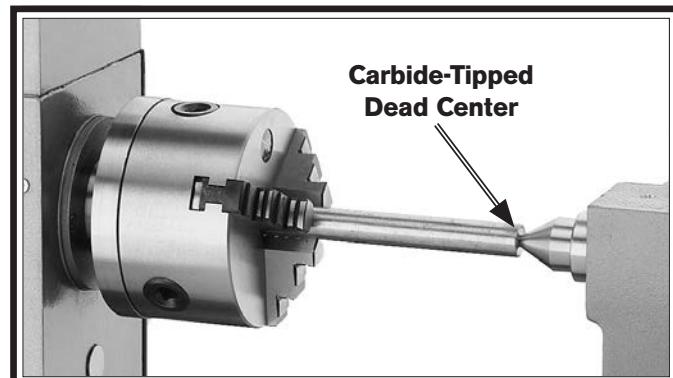


Figure 37. Example photo of using a dead center in the tailstock.

To mount a center in the tailstock:

1. DISCONNECT LATHE FROM POWER!
2. Thoroughly clean and dry the tapered mating surfaces of the quill and the center, making sure that no lint or oil remains on the tapers.
- Note:** This helps ensure that the tool seats properly and has minimal runout.
3. With a firm and quick motion, insert the tool into the quill. Check to see if it is firmly seated by attempting to twist it—a firmly seated tool will not twist.
4. Seat the center firmly into the quill during workpiece installation by rotating the quill handwheel clockwise to apply pressure, with the center engaged in the center hole in the workpiece.

Note: Only apply enough pressure with the tailstock quill to securely mount the workpiece between centers. Avoid overtightening the center against the workpiece, or the center may become difficult to remove later, and the excess pressure will result in unnecessary friction and heat, which may damage the workpiece and center.

Mounting Workpiece Between Centers

1. DISCONNECT LATHE FROM POWER!
2. Center drill both ends of the workpiece.
3. Install the MT#3 dead center in the spindle with a lathe dog and faceplate, then install the MT#2 dead center in the tailstock.
4. Generously lubricate the workpiece center holes, then mount the workpiece on the centers and hold it in place with light pressure from the tailstock center.
5. Seat the center firmly into the quill by rotating the tailstock handwheel clockwise to apply pressure against the workpiece (see the example photo in **Figure 38**).

Note: Only apply enough pressure with the tailstock quill to securely mount the workpiece between centers. Avoid overtightening the center against the workpiece, or the center may become difficult to remove later, and the excess pressure will result in unnecessary friction and heat, which may damage the workpiece and center.



Figure 38. Example photo of a workpiece mounted between the centers.

Carriage & Slide Locks

The carriage, cross slide, and compound rest can be locked into position to provide additional rigidity during operation, especially during heavy cuts.

To lock the carriage, use a 5mm hex wrench to tighten the carriage lock cap screw shown in **Figure 39**.

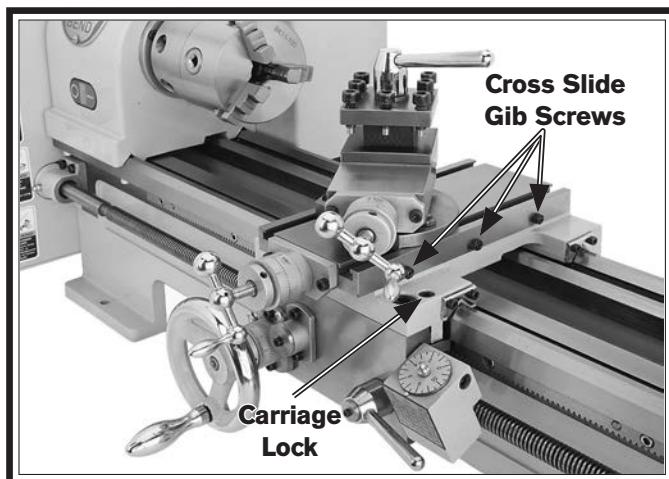


Figure 39. Location of carriage lock and cross slide gib screws.

To lock the cross slide or compound rest, use an 8mm wrench to loosen the hex nuts and a 2.5mm hex wrench to fully tighten the two end gib adjustment set screws on both sides.

Note: When it is no longer necessary to lock these components, make sure to loosen/re-adjust the lock fasteners to allow the components to freely move (see **Figures 39–40**).

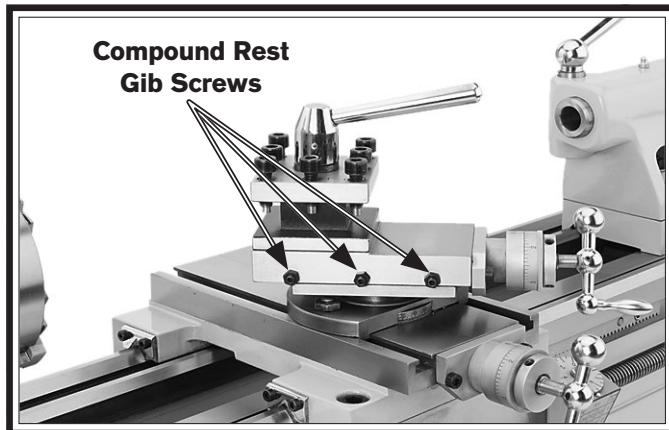


Figure 40. Location of compound rest gib screws.

Compound Rest

The compound rest ball handle has an indirect-read graduated scale. This means that the distance shown on the scale represents the actual distance the cutting tool moves. The base of the compound rest has another graduated scale used for setting the cutting tool to a specific angle.

Graduated Dial

Increments 0.001"
One Full Revolution 0.050"

Tool Needed for Adjusting Angle	Qty
Wrench 14mm	1

To set the compound rest at a certain angle:

1. Loosen the two hex nuts at the base of the compound rest (1 of 2 shown in **Figure 41**).

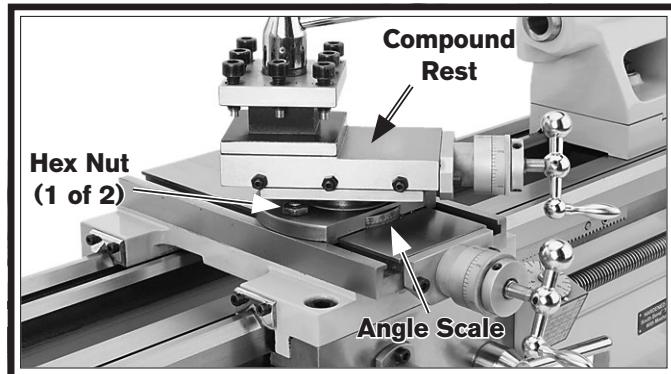


Figure 41. Compound rest.

2. Rotate the rest to the desired angle, as indicated by the scale at the base, then retighten the two hex nuts.

Tip: If setting up to cut external right-hand inch or metric threads, or internal left-hand threads for the first time, set the compound rest so its travel is perfectly parallel with the cross slide. Then, using a protractor, rotate the compound 29.5° counterclockwise and mark the new location on the cross slide. This mark will be the quick reference point for setting the offset angle. To mark for internal right-hand threads or external left-hand threads, repeat this process, but rotate the rest 29.5° clockwise and mark the cross slide accordingly.

Four-Way Tool Post

The four-way tool post is mounted on top of the compound rest and allows a maximum of four tools to be loaded simultaneously.

Each tool can be quickly indexed to the workpiece by loosening the top handle, rotating the tool post to the desired position, then re-tightening the handle to lock the tool into position.

Installing Tool

Tool Needed	Qty
Hex Wrench 6mm	1

To install a tool in the tool post:

1. Adjust the tool post cap screws so that the cutting tool can fit underneath them (see **Figure 42** for an example).

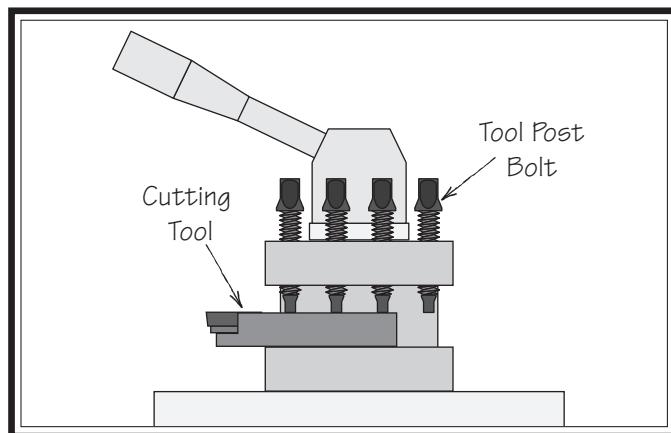


Figure 42. Example of tool mounted in tool post.

WARNING

Over-extending a cutting tool from the post will increase the risk of tool chatter, breakage, or tool loosening during operation, which could cause metal pieces to be thrown at the operator or bystanders with great force. DO NOT extend a cutting tool more than 2.5 times the width of its cross-section (e.g., $2.5 \times 0.5" = 1.25"$).

2. Firmly secure the cutting tool with at least two tool post cap screws.
3. Check and adjust the cutting tool to the spindle centerline, as instructed in the next subsection.

Aligning Cutting Tool with Spindle Centerline

For most operations, the cutting tool tip should be aligned with the spindle centerline, as illustrated in **Figure 43**.

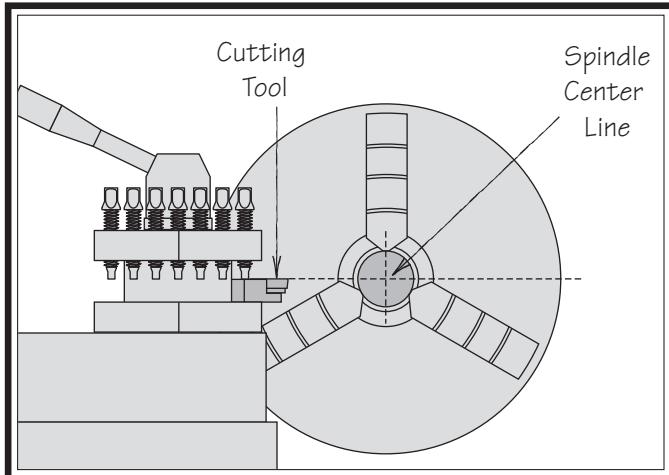


Figure 43. Cutting tool aligned with spindle centerline (viewed from tailstock).

There are a number of ways to check and align the cutting tool to the spindle centerline. If necessary, you can raise the cutting tool by placing steel shims underneath it. The shims should be as long and as wide as the cutting tool to properly support it.

Below are two common methods:

- Align the tip of the cutting tool with a center installed in the tailstock, as instructed on the next page. For this to work, the tailstock must be aligned to the spindle centerline (refer to **Aligning Tailstock To Spindle Centerline on Page 31** for detailed instructions).
- Make a facing cut on a piece of round bar stock. If the tool is above or below the spindle centerline, a nub will be left in the center of the workpiece. Adjust the height of the tool, then repeat the facing cut to check the adjustment. Repeat as necessary until the center of the workpiece face is smooth.

Tools Needed	Qty
Hex Wrench 6mm	1
Steel Shims.....	As Needed
Cutting Tool.....	1
Fine Ruler.....	1
Tailstock Center.....	1

To align the cutting tool with the tailstock center:

1. Mount the cutting tool in the tool post, then secure the post so the tool faces the tailstock.
2. Install a center in the tailstock, and position the center tip near the cutting tool tip.
3. Lock the tailstock and quill in place.
4. Adjust the height of the cutting tool so that the tool tip is aligned vertically and horizontally with the center tip, as illustrated in **Figure 44**.

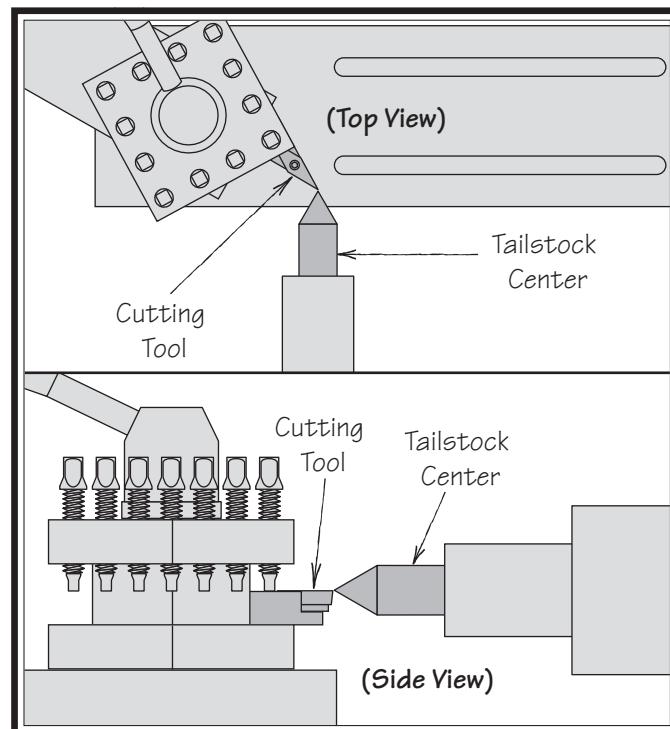


Figure 44. Cutting tool tip aligned with tailstock center.

Manual Feed

The handwheel and ball handles shown in **Figure 45** allow the operator to manually move the cutting tool.

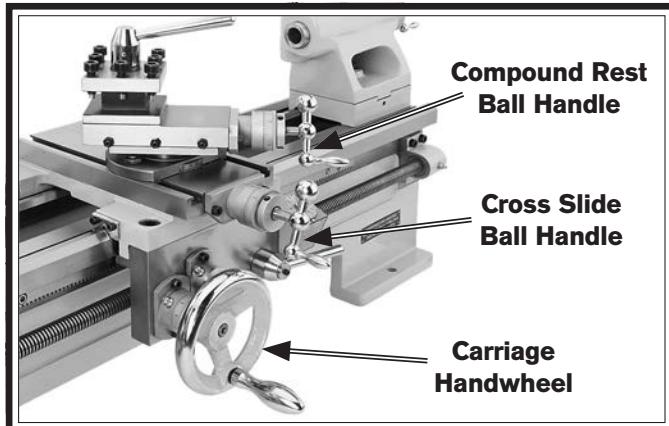


Figure 45. Carriage component manual feed controls.

Carriage Handwheel

Graduated Dial

Increments.....	0.02"
One Full Revolution.....	0.10"

Use the carriage handwheel to move the carriage left or right along the bedway.

Cross Slide Ball Handle

Graduated Dial

Increments.....	0.001"
One Full Revolution.....	0.050"

Use the cross slide ball handle to move the tool toward and away from the work. Adjust the position of the graduated dial by holding the handwheel with one hand and turning the dial with the other.

Compound Rest Ball Handle

Graduated Dial

Increments.....	0.001"
One Full Revolution.....	0.050"

Use the compound rest ball handle to move the cutting tool linearly along the set angle of the compound rest. The compound rest angle is set by hand-rotating it and securing it in place with two hex nuts.

Spindle Speed

Using the correct spindle speed is important for safe and satisfactory results, as well as maximizing tool life.

To set the spindle speed for your operation, you will need to: 1) Determine the best spindle speed for the cutting task, and 2) configure the lathe controls to produce the required spindle speed.

Determining Spindle Speed

Many variables affect the optimum spindle speed to use for any given operation, but the two most important are the recommended cutting speed for the workpiece material and the diameter of the cut, as noted in the formula shown in **Figure 46**.

$$\frac{\text{*Recommended Cutting Speed (FPM)} \times 12}{\text{Dia. of Cut (in inches)} \times 3.14} = \text{SpindleSpeed (RPM)}$$

*Double if using carbide cutting tool

Figure 46. Spindle speed formula for lathes.

Cutting speed, typically defined in feet per minute (FPM), is the speed at which the edge of a tool moves across the material surface.

A recommended cutting speed is an ideal speed for cutting a type of material in order to produce the desired finish and optimize tool life.

The books **Machinery's Handbook** or **Machine Shop Practice**, and some internet sites, provide excellent recommendations for which cutting speeds to use when calculating the spindle speed. These sources also provide a wealth of additional information about the variables that affect cutting speed and they are a good educational resource.

Also, there are a large number of easy-to-use spindle speed calculators that can be found on the internet. These sources will help you take into account the applicable variables in order to determine the best spindle speed for the operation.

Selecting Spindle Speed Range

There are two ranges of available spindle speeds that are selected by repositioning the drive belt between the idler and spindle pulleys (see **Figures 47–48**).

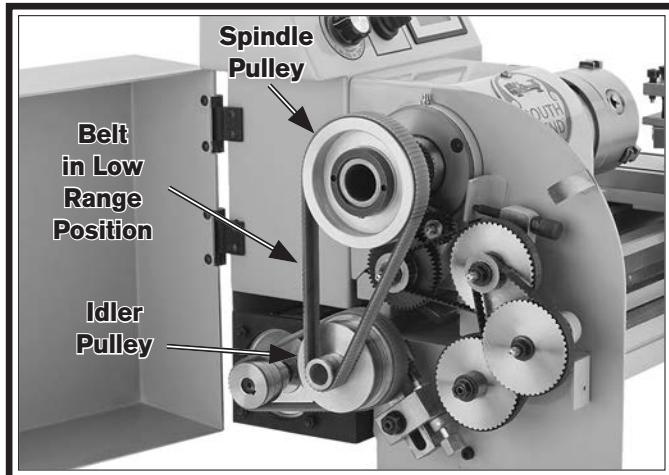


Figure 47. Drive belt between idler and spindle pulleys in the low range position.

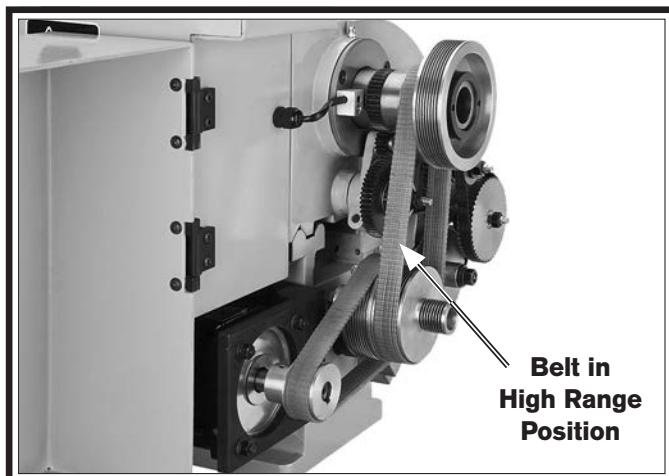


Figure 48. Drive belt between idler and spindle pulleys in the high range position.

When the drive belt is in the outside position, as shown in **Figure 47**, the low range of spindle speeds (50–200 RPM) are available.

When the drive belt is in the inside position, as shown in **Figure 48**, the high range (200–2400 RPM) of spindle speeds is available.

Tools Needed

	Qty
Wrench 16mm	1
Wrench 17mm	1

To Change the Drive Belt Position:

1. DISCONNECT LATHE FROM POWER!
2. Open the end cover.
3. Loosen the pivot block hex nut (see **Figure 49**). This will allow the tensioning bolt to change the position of the idler pulley in the next step.

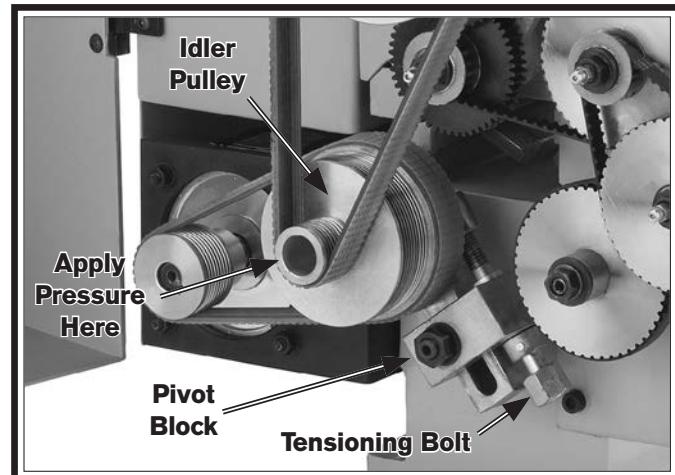


Figure 49. Drive belt tensioning controls.

4. Turn the tensioning bolt counterclockwise to raise the idler pulley and release the belt tension.
5. Roll the belt from the current position on the idler and spindle pulleys to other position (outside for the low range and inside for the high range).

Important: Make sure the belt is positioned across the full width of the pulleys and the ribs of the belt are fully seated in the pulley grooves.

6. Apply moderate pressure on the idler pulley toward the front of the lathe (see **Figure 49**) while tightening the tensioning bolt clockwise.

Note: As you tighten the tensioning bolt, the shafts will straighten and apply more tension to the belts. The correct amount of belt tension is when there is approximately $\frac{1}{4}''$ – $\frac{3}{8}''$ deflection with moderate pressure applied to the belt between the pulleys (see **Figure 50**).

Important: Do not overtighten the belts—this could cause the machine to run hot and cause damage to the motor and bearings.

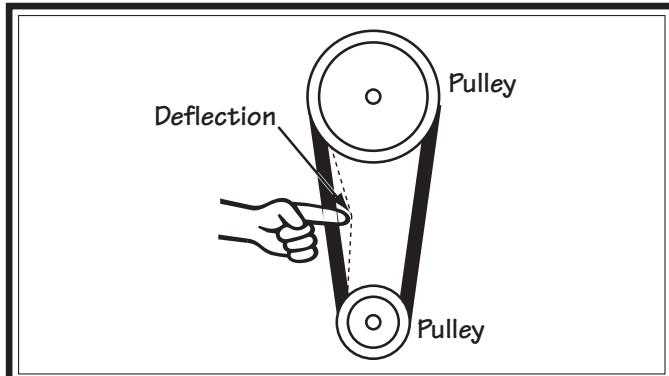


Figure 50. Testing for correct drive belt tension.

Selecting Spindle Speed

When spindle rotation is started with the spindle switch, the spindle speed is selected by rotating the spindle speed dial (see **Figure 51**) until the tachometer display shows the desired spindle speed.

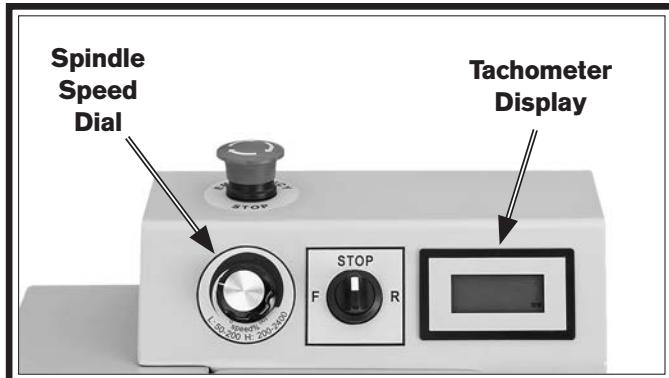


Figure 51. Spindle speed controls.

NOTICE

The maximum recommended spindle speed is 2300 RPM. DO NOT exceed this for more than a brief period of time or machine damage may occur.

Power Feed & Threading Setup

Timing Belts & Pulleys

The rate that the carriage moves when engaged with the longitudinal leadscrew for power feed or threading operations is controlled by the configuration of the timing belts and pulleys (see **Figure 52**).

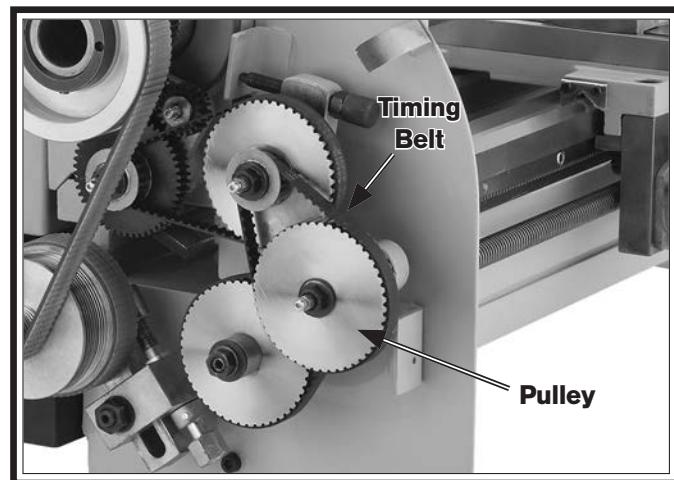


Figure 52. Timing belt and pulley.

The timing belt and pulley configurations for the available feed rate and threading options are displayed in the chart on the front of the end cover (see **Figure 53**).



Figure 53. Feed rate and threading chart.

Setting Power Feed Rate

Working at the lathe, follow along with the example below to better understand how to set up the lathe for the desired power feed rate.

Tools Needed

Wrench 13mm 2

Setting Power Feed Rate of 0.0041"/rev.:

1. DISCONNECT LATHE FROM POWER!

2. Open the end cover.

3. Loosen the pulley shaft hex nuts and tensioning thumb screw shown in **Figure 54**.

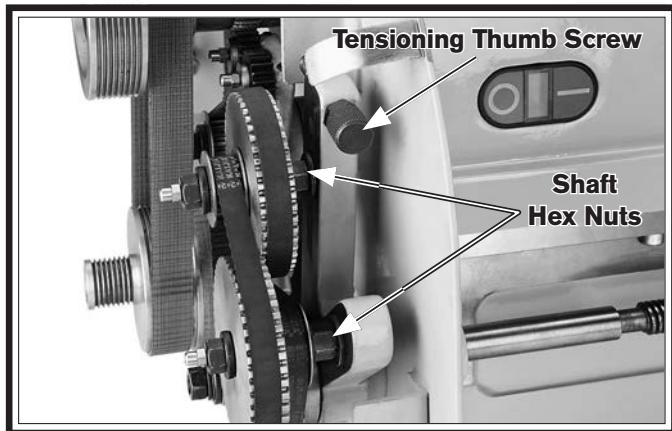


Figure 54. End pulley shaft hex nuts and tensioning thumb screw.

4. Position the pulley shafts so that the timing belts are loose.
5. Locate the column in the feed rate chart for a feed rate of 0.0041"/rev. (see **Figure 55**).

Pulley Identification		Feed Rate of 0.0041"/rev.						
in/in	C	0.0030	0.0033	0.0037	0.0039	0.0041	0.0043	0.00
B	15	15	15	15	15	15	15	18
C	15	16	18	19	20	21	19	19

Figure 55. Feed rate chart column for a rate of 0.0041"/rev.

6. Arrange the timing belts and pulleys as indicated in the illustration above the feed rate chart (see **Figures 56–57**) and the pulley identification column in the chart.

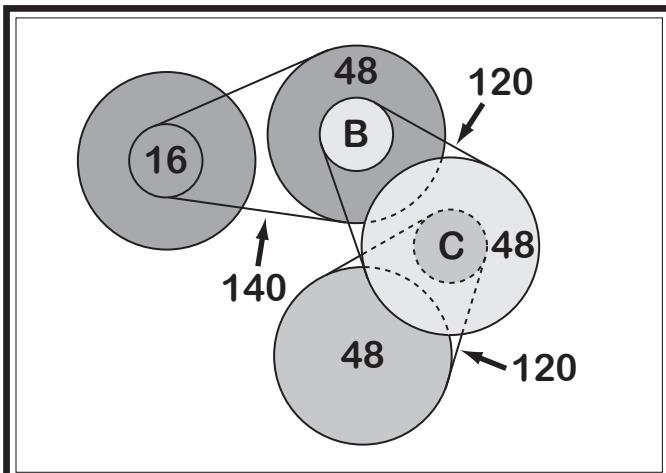


Figure 56. Feed rate pulley and timing belt configuration.

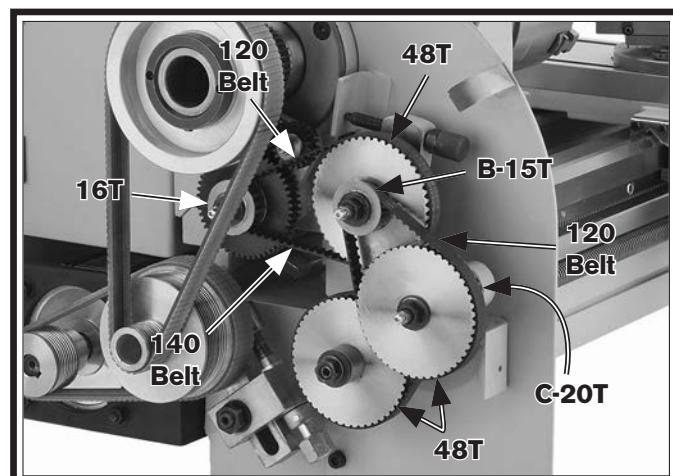


Figure 57. Feed rate pulley and timing belt identification.

- a. Make sure the 16T pulley is on the upper left pulley shaft.

Note: To remove a pulley, remove the hex nut from the pulley shaft, then remove the pulley. Take care not to displace the shaft key. When re-installing the pulley, align the pulley keyway with the shaft key, then secure it in the reverse order.

Important: Only tighten the hex nut until it is slightly snug—enough to keep the pulley on the shaft. Overtightening it may damage the shaft and bushings.

- b.** Install 48T pulleys on the upper right (**B** pulley shaft) and the lower right pulley shaft.
 - c.** Install the 15T pulley on the **B** pulley shaft (upper right).
 - d.** Install the 20T pulley on the **C** pulley shaft, then place the 120XL timing belt between this pulley and the 48T pulley on the lower right.
 - e.** Place the 140XL timing belt on the upper left 16T and 48T pulley on the **B** pulley shaft.
 - f.** Install the 48T pulley on the **C** pulley shaft, then place the 120XL timing belt between this pulley and the 15T on the **B** pulley shaft.
- 7.** Apply upward and forward pressure to the upper right and middle right pulleys (see **Figure 58**) as you re-tighten the shaft hex nuts you loosened in **Step 3**.

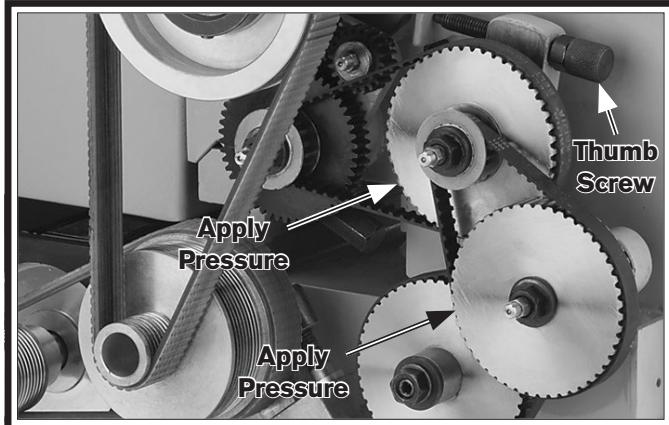


Figure 58. Locations to apply pressure on pulleys.

- 8.** Continue to apply pressure on the pulleys as you re-tighten the thumb screw to tension the timing belts.

Important: Leave a slight amount of slack in the timing belts when securing the pulleys. Adjusting the tension too tightly will cause excessive wear and stretching. Adjusting the tension too loosely could cause the belt to slip during operation.

- 9.** Close the end cover before re-connecting the lathe to power.

Setting Threading Controls

Using the controls on the lathe, follow along with the example below to better understand how to set up the lathe for the desired threading setup.

Tools Needed	Qty
Wrench 13mm	2

Setting Thread Pitch of 12 TPI

- 1.** DISCONNECT LATHE FROM POWER!

- 2.** Open the end cover.

- 3.** Loosen the pulley shaft hex nuts and tensioning thumb screw shown in **Figure 59**.

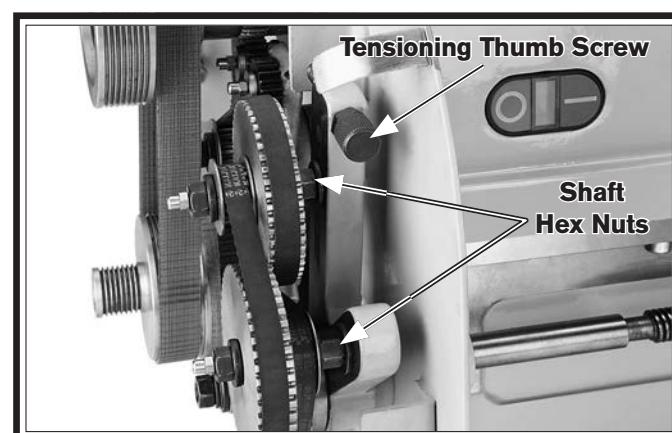


Figure 59. Pulley shaft hex nuts and tensioning thumb screw.

- 4.** Position the pulley shafts so that the timing belts are loose.
- 5.** Locate the column in the inch thread chart for 12 TPI (see **Figure 60**).

Pulley & Belt Identification	12 TPI Thread Pitch									
	in.	10	11	12	13	14	16	18	19	20
A	48	24	48	18	48	48	48	48	48	48
B	48	32	48	24	48	48	32	32	32	24
D	15	22	18	26	21	24	18	19	19	15
E	140	120	140	120	140	140	140	140	140	14
F	140	120	140	140	140	140	120	120	120	12

Figure 60. Thread chart example for 12 TPI.

6. Arrange the timing belts and pulleys as indicated in the illustration above the threading chart (see **Figures 61–62**) and the pulley and belt identification column in the chart.

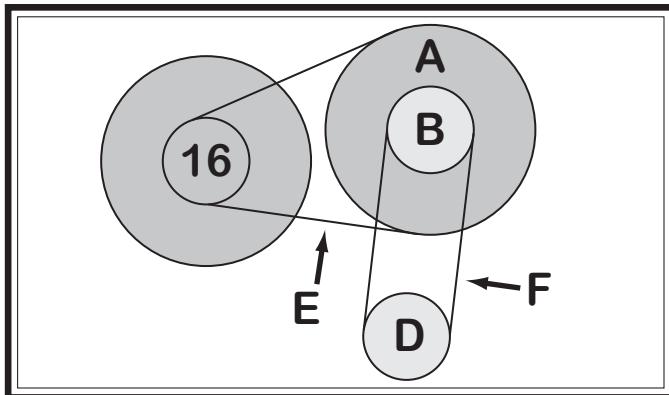


Figure 61. Threading timing belt and pulley configuration.

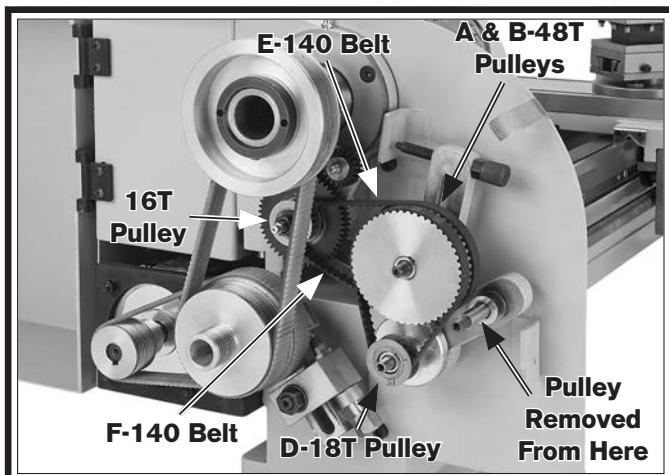


Figure 62. Threading timing belt and pulley identification.

- Make sure the 16T pulley is on the upper left pulley shaft.
- Remove the pulley and bushing from the **A–B** pulley shaft (see **Figure 62**).

Note: To remove a pulley, remove the hex nut from the pulley shaft, then remove the pulley. Take care not to displace the shaft key. When re-installing the pulleys, align the pulley keyway with the shaft key, then secure it in the reverse order. Only tighten the hex nut until it is slightly snug—enough to keep the pulley on the shaft. Overtightening it may damage the shaft and bushings.

- c. Install two 48T pulleys on the upper right pulley shaft (positions **A** and **B**).

- d. Install the 18T pulley on the **D** pulley shaft (bottom right).

- e. Install two 140XL timing belts in positions **E** and **F**.

7. Apply pressure to the upper right pulley as you re-tighten the shaft hex nut on that pulley shaft.
8. Continue to apply pressure on the pulley as you re-tighten the thumb screw to tension the timing belts.

Important: Leave a slight amount of slack in the timing belts when securing the pulleys. Adjusting the tension too tightly will cause excessive wear and stretching. Adjusting the tension too loosely could cause the belt to slip during operation.

9. Close the end cover before re-connecting the lathe to power.

Thread Dial

The numbers on the thread dial show when to engage the half nut during inch threading (refer to thread dial chart for number usage). The thread dial gear must be engaged with the leadscrew for this to work. Use a 5mm hex wrench to loosen the cap screw shown in **Figure 63**, pivot the dial gear toward the leadscrew so that it properly meshes with the leadscrew threads, then re-tighten the cap screw to hold it in place.

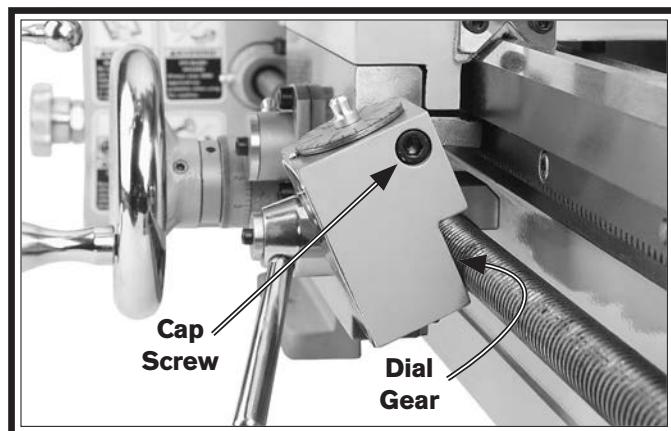


Figure 63. Thread dial gear engaged with leadscrew.

Thread Dial Chart

Find the TPI (threads per inch) that you want to cut in the left column of the thread dial chart (see **Figure 64**), then reference the dial number to the right of it. The dial numbers indicate when to engage the half nut for a specific thread pitch. The thread dial chart can also be found on the front of the thread dial body.

		in.
		16, 24, 32
		Any Position
	12, 20, 28	Any Numbered Position
	10, 14, 18	2 Only or 4 Only
	11, 13, 19	4 Only

Figure 64. Thread dial chart.

Note: The thread dial is not used for metric threads—you must leave the half nut engaged from the beginning of the cut until the threads are complete for metric threading.

The following examples explain how to use the thread dial chart for inch threads.

16, 24, or 32 TPI

For each of these thread pitches, use any line on the thread dial (see **Figure 65**).

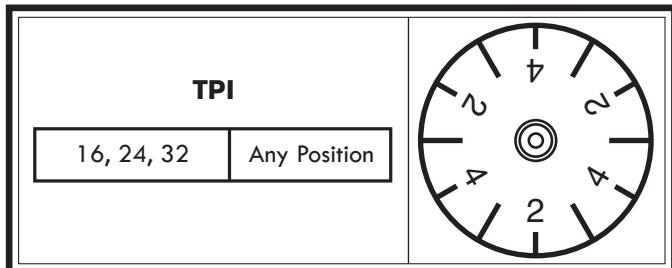


Figure 65. Any line on the dial for threading 16, 24, or 32 TPI.

NOTICE

When threading, we recommend using the slowest speed possible and avoiding deep cuts, so you can more easily disengage the half nut to prevent an apron crash!

12, 20, or 28 TPI

For each of these thread pitches, use any numbered position (2 or 4) on the thread dial (see **Figure 66**).

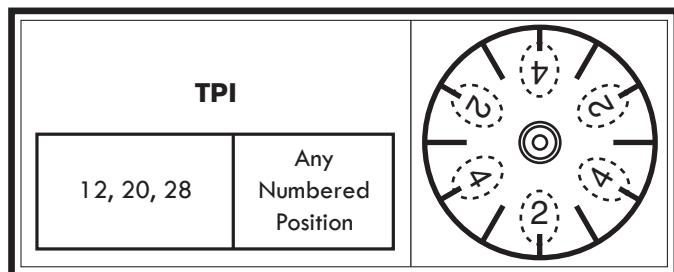


Figure 66. Any numbered position on the dial for threading 12, 20, or 28 TPI.

10, 14, or 18 TPI

For each of these thread pitches, use only the 2 positions *or* only the 4 positions (see **Figure 67**).

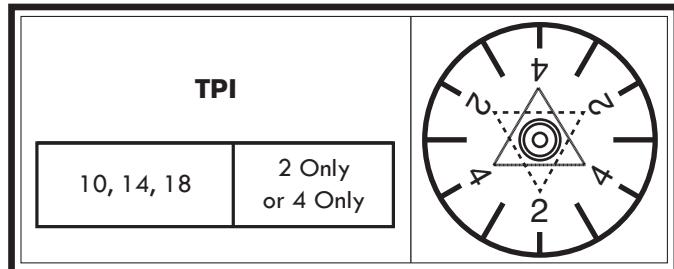


Figure 67. Only the 2 positions or only the 4 positions on the dial for threading 10, 14, or 18 TPI.

11, 13, or 19 TPI

For each of these thread pitches, use only the 4 positions on the thread dial (see **Figure 68**).

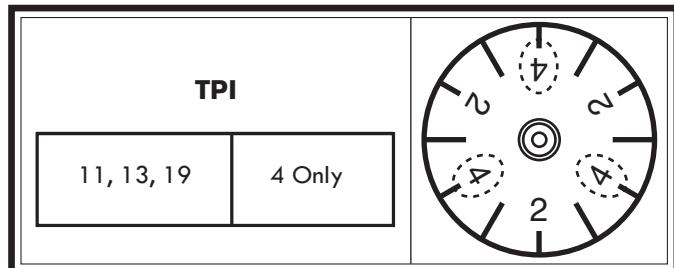


Figure 68. Only the 4 positions on the dial for threading 11, 13, or 19 TPI.

Changing Feed Direction

The position of the feed direction gears controls the rotation of the longitudinal leadscrew as follows:

- **Standard:** Leadscrew rotates in the same direction as the spindle.
- **Reverse:** Leadscrew rotates in the opposite direction as the spindle.
- **Neutral:** Leadscrew and end pulleys are disengaged from the drive train. This configuration can be used to save wear on the end pulleys and timing belts when tool position is manually controlled.

Tool Needed	Qty
Wrench 13mm	1

To change the position of the feed direction gears:

1. DISCONNECT LATHE FROM POWER!
2. Open the end cover and loosen the pivot lock bolt.

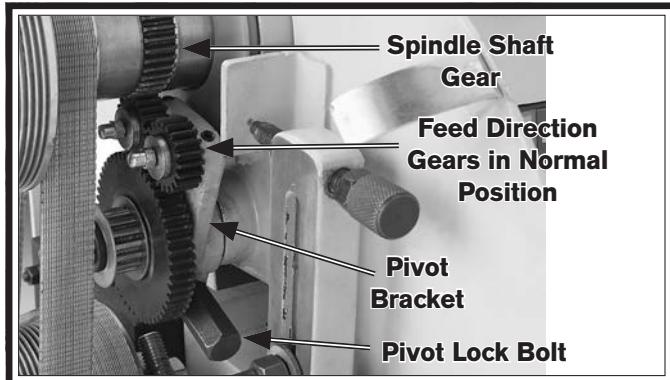


Figure 69. Feed direction gears in the right-hand threading position (belts and pulleys removed for photo clarity).

3. **Standard:** To make the leadscrew and spindle rotate in the same direction, turn the spindle clockwise by hand as you apply pressure on the pivot bracket toward the front of the lathe until the rear direction gear meshes with the spindle shaft gear (see **Figure 69**).

4. **Reverse:** To make the leadscrew and spindle rotate in opposite directions, turn the spindle counterclockwise by hand as you apply pressure on the pivot bracket toward the back of the lathe until the front direction gear meshes with the spindle shaft (see **Figure 70**).



Figure 70. Feed direction gears in the left-hand threading position.

5. **Neutral:** To disengage the leadscrew and end pulleys from the drive train:
 - a. Back out the tensioning thumb screw (see **Figure 71**) all the way, then push the top end pulley toward the back of the lathe to release the tension on the attached timing belt.



Figure 71. Feed direction gears in the neutral position.

6. Turn the spindle counterclockwise by hand and apply pressure on the pivot bracket toward the front of the lathe until the front direction gear is resting on the timing belt (see **Figure 71**).
7. Re-tighten the pivot lock bolt and close the end cover.

Accessories

WARNING

Some aftermarket accessories can be installed on this machine that could cause it to function improperly, increasing the risk of serious personal injury. To minimize this risk, only install accessories recommended for this machine by South Bend.

SB1365—Way Oil for Lathes

Engineered for high pressure exerted on horizontal or vertical ways and slides. Protects against rust and corrosion. Ensures stick-free, smooth motion which maximizes finishes and extends the life of your machine. Will not gum up! (ISO 68 equivalent)



Figure 72. SB1365 Way Oil for Lathes.

SB1470—Steady Rest for SB1001

SB1471—Follow Rest for SB1001



Figure 73. Steady rest and follow rest for SB1001.

SB1281—MT#2 High-Performance Live Center Set

- Shafts are made of alloy steel and vacuum heat-treated to HRC60° ± 1 for high rigidity and durability.
- Centers use a combination of roller bearings, thrust ball bearings, and ball bearings.
- Waterproof design.



Figure 74. SB1281 MT#2 High-Performance Live Center Set.

This section includes the most common accessories available for your lathe, which may be available through your local South Bend Lathe Co. dealer. If you do not have a dealer in your area, please call us at (360) 734-1540 or email us at cs@southbendlathe.com.

SB1468—5" 4-Jaw Chuck D1-3 for SB1001

SB1469—6" Faceplate D1-3 for SB1001



Figure 75. 4-Jaw Chuck and Faceplate for SB1001.

SB1245-MT#2 Bull Nose Center

- Tips are made of Cr-Mo steel and hardened to HRC60° ± 1.
- Centers use a combination of tapered roller bearings and ball bearings.
- Applicable for pipe turning.



Figure 76. SB1245 MT#2 Bull Nose Center.

SB1298-SBL Bench Lathe Shop Clock**SB1299-SBL Toolroom Lathe Shop Clock****SB1300-SBL Lathe with Man**

These fine traditional shop clocks are constructed with a metal antique-finished frame. They are easy to read from a distance and measure 14" in diameter. Pictures just don't do them justice. They are very nice quality clocks and perfect for the South Bend Lathe aficionado.

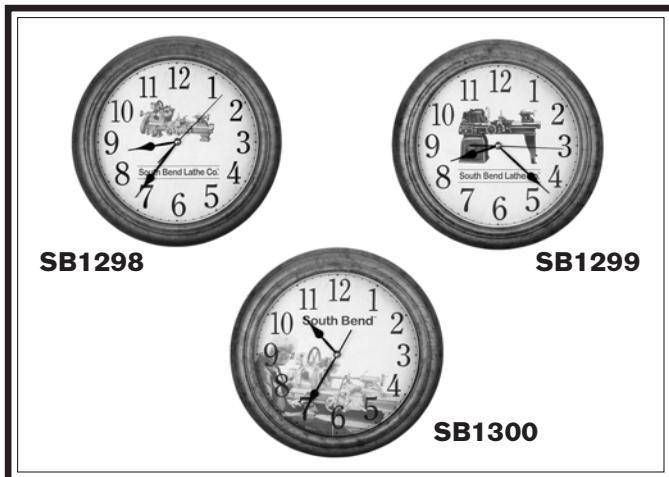


Figure 77. Antique-finished South Bend shop clocks.

SB1391-D1-3 Back Plate

Sized to fit D1-3 chuck mounts, these back plates are precision made and mount to your chuck with minimal modifications.

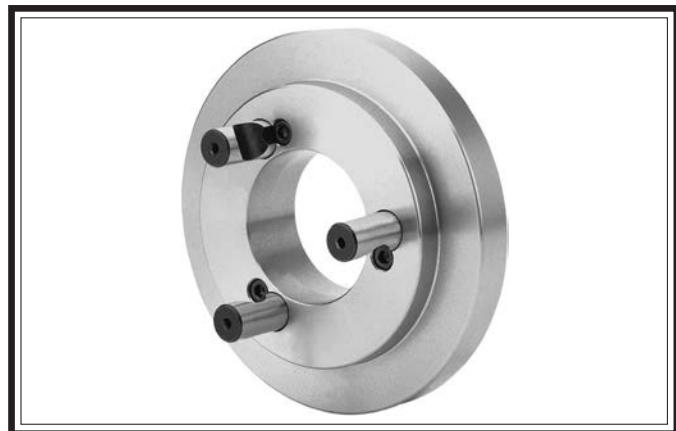


Figure 78. SB1391 D1-3 Back Plate.

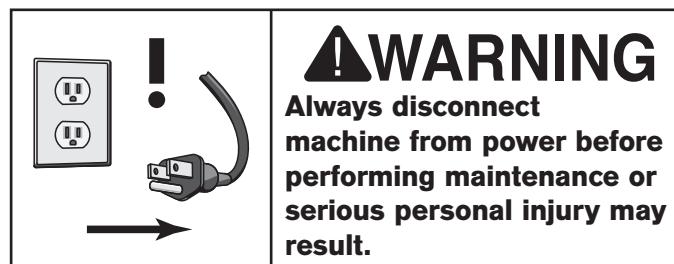
SB1354-South Bend Cast-Iron Workbench Legs, 1 Pair

Designed with smooth flowing lines reminiscent of the early 1900's, these heavy cast-iron legs provide plenty of support and stability for shop-made workbenches or machine stands. Just add your own bench top and bottom shelf to suit your particular needs. Each leg weighs in at 107 pounds and provides plenty of mass to dampen machine operations or provide an extremely stable work surface. The South Bend Lathe logo is also proudly displayed on each leg on a thick brass nameplate as a reminder that these cast-iron legs will stand up to a lifetime of dependable service. Distance from floor to top support: 36½"; distance from floor to shelf support tab: 7½".



Figure 79. South Bend Cast-Iron Workbench Legs

Maintenance Schedule



Ongoing

To maintain a low risk of injury and proper machine operation, if you ever observe any of the items below, shut down the machine immediately and fix the problem before continuing operations.

- Loose mounting bolts or fasteners.
- Worn, frayed, cracked, or damaged wires.
- Emergency STOP button not working correctly or not requiring you to reset it before starting the machine again.
- Loose, worn, or damaged drive belts or timing belts.
- Damaged or malfunctioning components.

Daily, Before Operations

- Lubricate the spindle bearings (**Page 49**).
- Lubricate feed direction gears (**Page 50**).
- Lubricate grease fittings (**Page 51**).
- Clean/lubricate the longitudinal leadscrew (**Page 51**).
- Lubricate 3-jaw chuck (**Page 52**).
- Clean/lubricate the bedways and slides (**Page 52**).
- Check condition and tension of drive belts (**Page 55**) and timing belts.
- Check for loose or damaged timing-belt pulleys.
- Turn the spindle speed dial all the way counterclockwise (to prevent high-speed startup).
- Disengage the half nut lever on the apron (to prevent crashes upon startup).
- Ensure the carriage lock is loose.

Daily, After Operations

- Turn the spindle switch to the OFF position, depress the STOP button, and shut **OFF** the master power switch (to prevent accidental startup).
- Vacuum/clean all chips and swarf from bed, slides, and benchtop or stand.
- Wipe down all unpainted or machined surfaces with an lightly-oiled rag.

Annually

- Check/level bedway (**Page 19**).

Cleaning & Protecting

Regular cleaning is one of the most important steps in taking care of this lathe. We recommend that the cleaning routine be planned into the workflow schedule, so that adequate time is set aside to do the job right.

Typically, the easiest way to clean swarf from the bedways and chip drawer is to use a wet/dry shop vacuum that is dedicated for this purpose. The small chips left over after vacuuming can be wiped up with a lightly-oiled rag. Avoid using compressed air to blow off chips, as it may drive them deeper into moving surfaces and could cause sharp chips to fly into your face or hands.

In addition to the ways, all other unpainted and machined surfaces should be wiped down daily to keep them rust-free and in top condition. This includes any surface that is vulnerable to rust (especially any parts exposed to water soluble cutting fluid). Typically, a thin film of good quality way oil is all that is necessary for protection. (Refer to **Accessories** on **Page 46** for an option from South Bend.)

NOTICE

The timing belts and pulleys should remain free from grease and grime. Clean the pulleys with mineral spirits when changing configurations, then allow them to dry. Wipe the timing belts with a clean, dry shop rag at the same time.

Lubrication

The lathe has numerous metal-to-metal sliding surfaces that require regular lubrication to maintain smooth movement and ensure long-lasting operation.

Other than the lubrication points covered in this section, all other bearings are internally lubricated and sealed at the factory. Simply leave them alone unless they need to be replaced.

Before performing any lubrication task,
DISCONNECT LATHE FROM POWER!

Important: Before adding lubricant, clean away any debris or grime from the entry points with mineral spirits to prevent contamination of the new lubricant.

Oil Gun

Proper lubrication of the spindle bearing and chuck fittings is done with a pump-type oil gun that has a plastic or rubberized cone tip. We do not recommend using metal needle or lance tips as they can push the ball too far into the fitting, break the spring seat, and lodge the ball into the oil galley. Push the rubber or plastic tip of the oil can nozzle against the ball to create a hydraulic seal, then add the lubricant.

Use the schedule and information in the chart below as a daily guide for lubrication tasks.

NOTICE

The following schedule is based on light-to-medium usage. Some components may need to be lubricated more frequently depending on usage.

Lubrication Task	Frequency	Page
Spindle Bearings	Daily	This Page
Feed Direction Gears	Daily	50
Grease Fittings	Daily	51
Longitudinal Leadscrew	Daily	51
3-Jaw Chuck	Daily	52
Bedway & Slides	Daily	52

Spindle Bearings

Oil Type .. Mobil DTE Light or ISO 32 Equivalent Lubricating Device	Pump-Type Oil Gun
Amount	1–2 Pumps
Frequency	Daily

The spindle bearing lubrication fittings are located on either side of the headstock (see **Figure 80**).

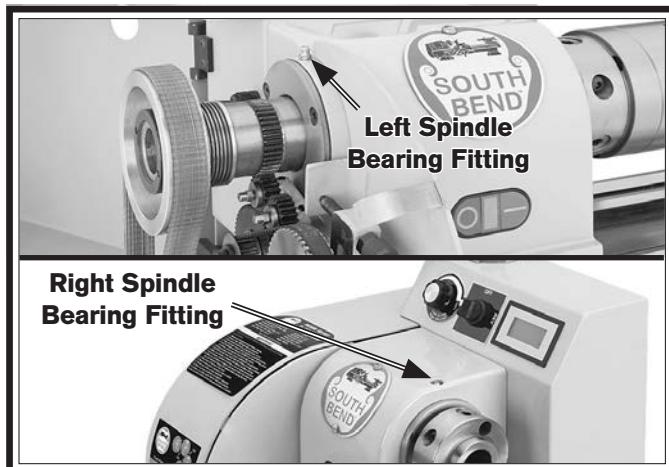


Figure 80. Spindle bearing lubrication fittings.

NOTICE

Use only an ISO 32 equivalent oil to lubricate the spindle bearings. Using a heavier lubricant such as grease will cause the bearing to run hot and cause excessive machine wear.

Feed Direction Gears

Grease Type..... NLGI#2
 Lubricating Device..... Included Grease Gun
 Amount 1-2 Pumps
 Frequency Daily

The grease fittings for the feed direction gears are located behind the spindle pulley. You will need to re-position these gears to access the fittings.

Tool Needed	Qty
Wrench 13mm	1

To lubricate the feed direction gears:

1. DISCONNECT LATHE FROM POWER!
2. Back out the tensioning thumb screw (see **Figure 81**) all the way, then push the top large end pulley toward the back of the lathe to release the tension on the attached timing belt.

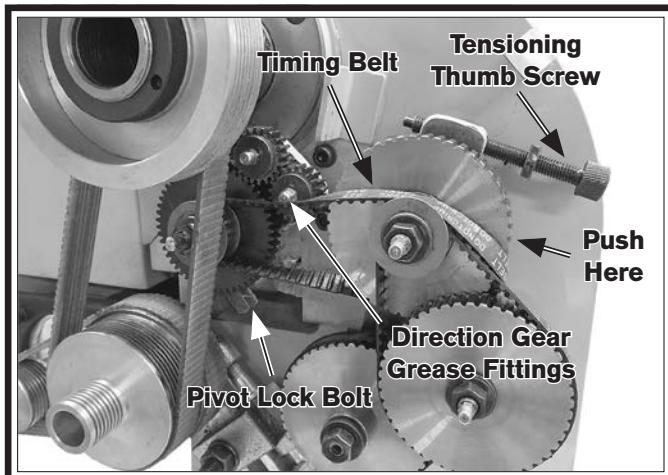


Figure 81. Direction gears positioned for grease fitting access.

3. Roll the timing belt off the top large end pulley and rest it on the smaller pulley, as shown in **Figure 81**.

4. Loosen the pivot lock bolt shown in **Figure 81**, then turn the spindle counterclockwise by hand as you apply pressure to the direction gear pivot bracket until both grease fittings are accessible for lubrication.
5. Add lubricant and wipe off any excess lubricant.
6. Rotate the direction gear pivot bracket so that the direction gears correctly mesh with the spindle shaft gear for your next operation, then re-tighten the pivot bolt.
7. Apply upward and forward pressure to the top end pulley to tension the timing belt as you re-tighten the tensioning thumb screw to secure it in place.

Important: Leave a slight amount of slack in the timing belt. Adjusting the tension too tightly will cause excessive wear and stretching. Adjusting the tension too loosely could cause the timing belt to slip during operation.

8. Close the end cover before re-connecting the lathe to power.

Grease Fittings

Grease Type..... NLGI#2
 Lubricating Device..... Included Grease Gun
 Amount 1–2 Pumps
 Frequency Daily

The exact amount may vary slightly for each fitting on the machine. If excessive grease is seen exiting between the parts, reduce the amount added.

There are 10 grease fittings on the Model SB1001 that require daily lubrication with the included grease gun. Refer to **Figures 82–85** for the locations of these fittings.

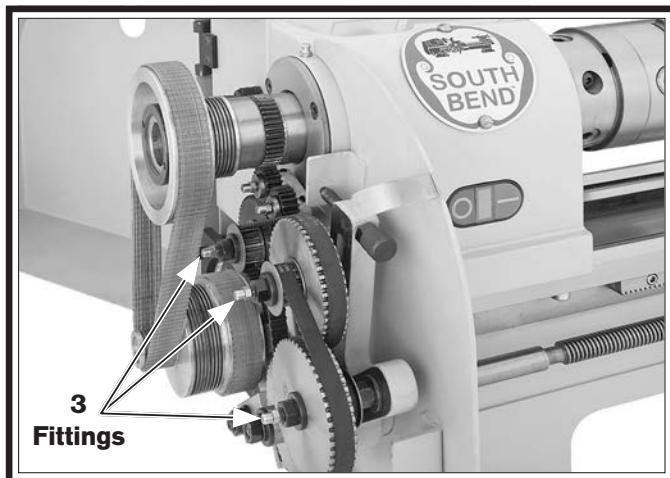


Figure 82. Five grease fittings inside end cover.



Figure 83. Left leadscrew bushing grease fittings.

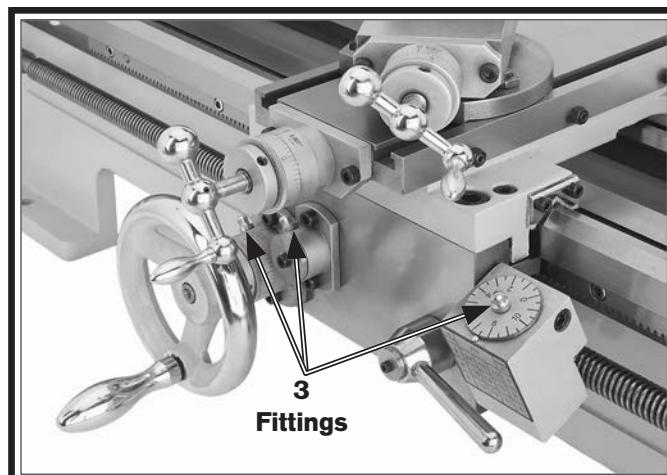


Figure 84. Carriage grease fittings.

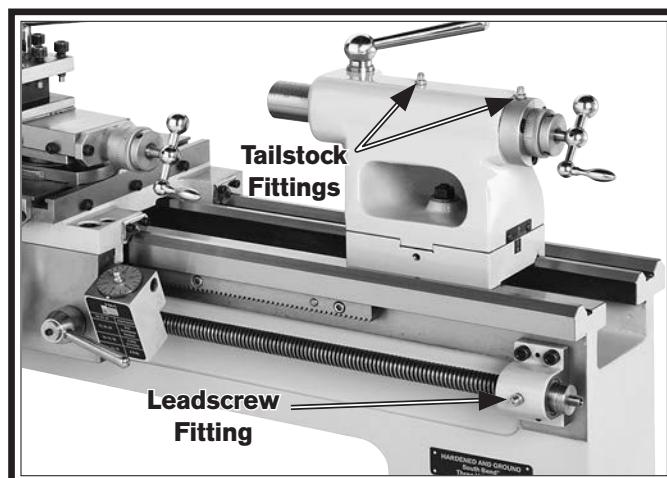


Figure 85. Tailstock and right leadscrew bushing grease fittings.

Longitudinal Leadscrew

Oil Type Mobil Vactra 2 or ISO 68 Equivalent
 Amount As Needed
 Frequency Daily

Before lubricating the leadscrew, clean it first with mineral spirits and a stiff brush. Make sure to move the carriage so that you clean the entire length of the leadscrew.

Apply a thin coat of oil along the length of the leadscrew. Use a clean stiff brush to make sure the oil is applied evenly and down into the threads.

Note: In some environments, abrasive material can become caught in the leadscrew lubricant and drawn into the half nut. In this case, lubricate the leadscrew with a quality dry lubricant.

3-Jaw Chuck

Oil Type Mobil Vactra 2 or ISO 68 Equivalent
Lubrication Device Pump-Type Oil Gun
Oil Amount As Needed
Lubrication Frequency Daily

Proper lubrication of the chuck ball oiler (see **Figure 86**) is done with a pump-type oil gun that has a plastic or rubberized cone tip. We do not recommend using metal needle or lance tips as they can push the ball too far into the oiler, break the spring seat, and lodge the ball into the oil galley.



Figure 86. Chuck ball oiler.

Push the rubber or plastic tip of the oil can nozzle against the ball oiler to create a hydraulic seal, then pump the oil can once or twice. If you see sludge and contaminants coming out of the lubrication area, keep pumping the oil gun until clean oil runs out. When finished, wipe away any excess oil.

Use the chuck key to rotate the chuck scroll gear several times to distribute the oil.

Bedways & Slides

Oil Type Mobil Vactra 2 or ISO 68 Equivalent
Oil Amount As Needed
Lubrication Frequency Daily

Move the carriage, cross slide, and compound rest (see **Figure 87**) to reach all surfaces, and pay special attention to the dovetail ways of the slides. Apply a thin coat of oil to them with a lightly-oiled shop rag to prevent rust and corrosion, and to ensure smooth operation.

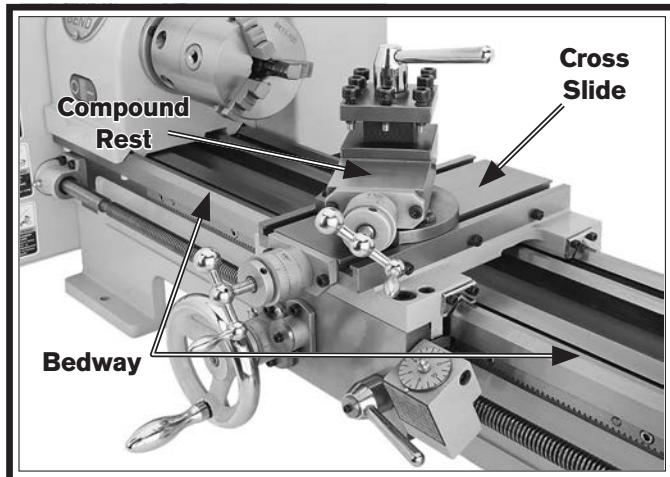


Figure 87. Bedway and slides.

Machine Storage

The lathe must be properly prepared if it will be stored for any period of time. Doing this will help prevent the development of rust and corrosion, and ensure the lathe remains in good condition for later use.

To prepare the lathe for storage:

1. DISCONNECT LATHE FROM POWER!
2. Thoroughly clean all surfaces, then apply a heavy coat of way oil to unpainted and bare metal surfaces.
3. Lubricate the machine as outlined in **Lubrication**, beginning on **Page 51**, then move/rotate the components through the full range of motion several times to distribute the lubricant.
4. Cover the lathe and place it in a dry area that is out of direct sunlight and away from hazardous fumes, paint, solvents, or gas that could damage the surfaces of the lathe.
5. Once or twice a month, move the carriage, tailstock, and other components mounted on the bedway down the bed to make sure that rust is not beginning to occur. If it is, remove it and re-apply a heavy coat of way oil.
6. Every few months, repeat Step 3.

Leadscrew End Play Adjustment

After a long period of time, you may find that the leadscrew develops a small amount of end play. This end play can be removed with an adjustment of the lock collars on the right end of the leadscrew.

Tools Needed:	Qty
Hex Wrench 2.5mm	1

To remove leadscrew end play:

1. DISCONNECT LATHE FROM POWER!
2. Insert the hex wrench or similar tool into a hole on the rim of the outside leadscrew lock collar (see **Figure 88**) to loosen it a couple of turns.

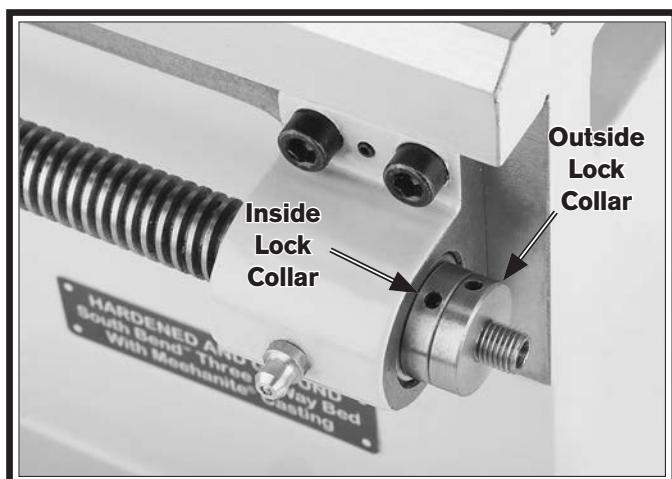


Figure 88. Longitudinal leadscrew lock collars.

3. In the same manner, loosen the inside lock collar a couple of turns.
4. Engage the half nut with the leadscrew, then use the handwheel to move the carriage toward the tailstock with slight pressure.
5. Tighten the inside lock collar until it is just snug, then tighten the outside collar against it to secure the setting.

Gib Adjustment

The goal of adjusting the gib screws is to remove sloppiness or "play" from the ways without over-adjusting them to the point where they become stiff and difficult to move.

In general, loose gib cause poor finishes and tool chatter; however, over-tightened gib cause premature wear and make it difficult to turn the handwheels.

The gib adjustment process usually requires some trial-and-error. Repeat the adjustment process as necessary until you find the best balance between loose and stiff movement. Most machinists find that the ideal gib adjustment is one where a small amount of drag or resistance is present, yet the handwheels are still easy to move.

Before you begin adjusting the gib, make sure the ways are free of chips and grime, and they are well lubricated so they can move smoothly and without interference.

Saddle Gib

The saddle gib is located underneath the rear of the saddle (see **Figure 89**). This gib is a flat bar that is sandwiched between the gib plate and the bedway.

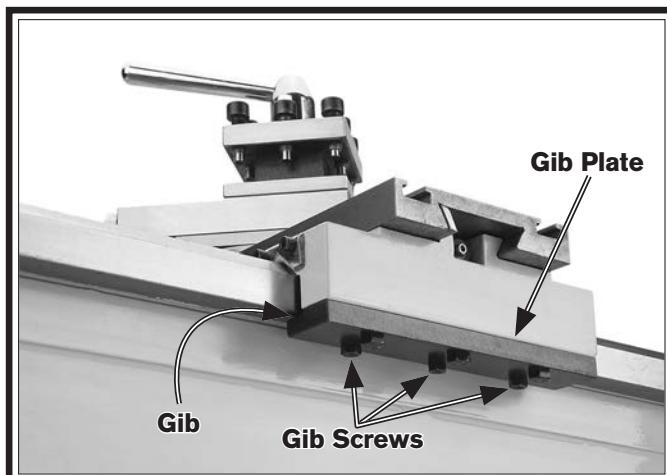


Figure 89. Saddle gib components.

Tools Needed	Qty
Wrench 8mm	1
Hex Wrench 2.5mm	1

To adjust the saddle gib:

1. DISCONNECT LATHE FROM POWER!
2. Make sure the carriage lock is loose and the half nut is disengaged so that the carriage can move freely.
3. Loosen the hex nuts on the gib screws, then loosen the gib screws two or three turns.
4. Use the handwheel to move the carriage back and forth—this will ensure the gib is loose.
5. Re-tighten the gibs screw evenly until a slight resistance is felt, then use the handwheel to test carriage movement.
 - Loosen or tighten the gib screws evenly until you are satisfied with the gib adjustment.
6. Without moving the gib screws, re-tighten the hex nuts to secure the settings.

Cross Slide & Compound Rest Gibbs

The gibbs for the cross slide and compound rest are flat bars that are held between the component and the dovetail way by the gib screws (see **Figures 90–91**).

Adjust these gib screws in the same manner as the carriage gib screws.

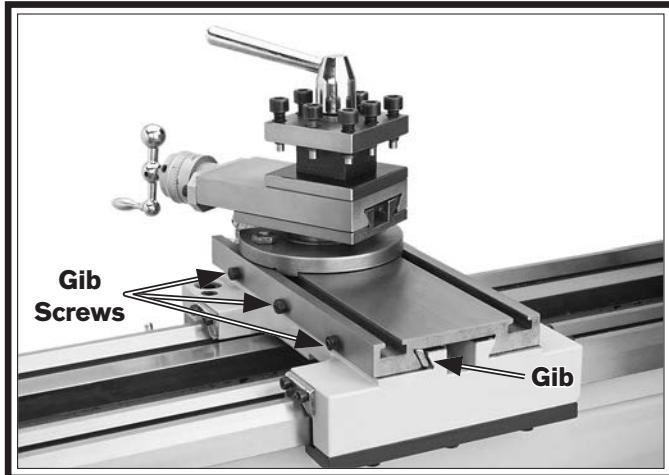


Figure 90. Cross slide gib components.

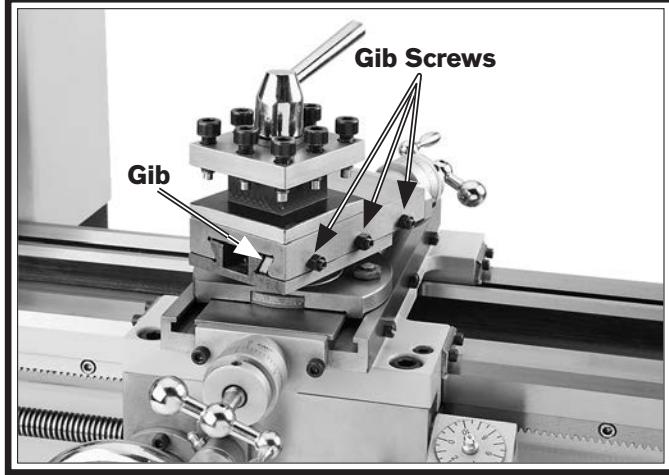


Figure 91. Compound rest gib components.

Adjusting Drive Belts

Drive belts stretch and wear with use, so check the tension on a regular basis to ensure optimal power transmission. Replace the belts if they show signs of glazing, fraying, or cracking.

Tools Needed:	Qty
Wrench 16mm	1
Wrench 17mm	1

To adjust the drive belts:

1. DISCONNECT LATHE FROM POWER!
2. Open the end cover, then loosen the pivot block hex nut (see **Figure 92**). This will allow the tensioning bolt to change the position of the idler pulley in the next step.

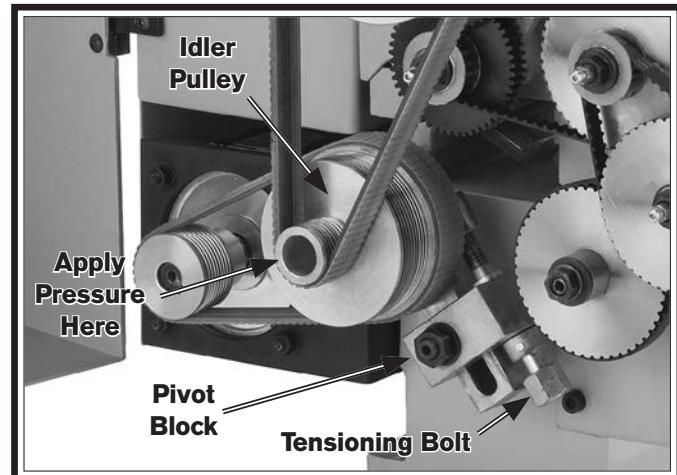


Figure 92. Drive belt tensioning controls.

3. Apply moderate pressure on the idler pulley (see **Figure 92**) toward the front of the lathe while turning the tensioning bolt counterclockwise to lower the idler pulley and increase belt tension.

The correct amount of belt tension is when there is approximately $\frac{1}{4}$ "– $\frac{3}{8}$ " deflection with moderate pressure applied to the belt between the pulleys (see **Figure 93**).

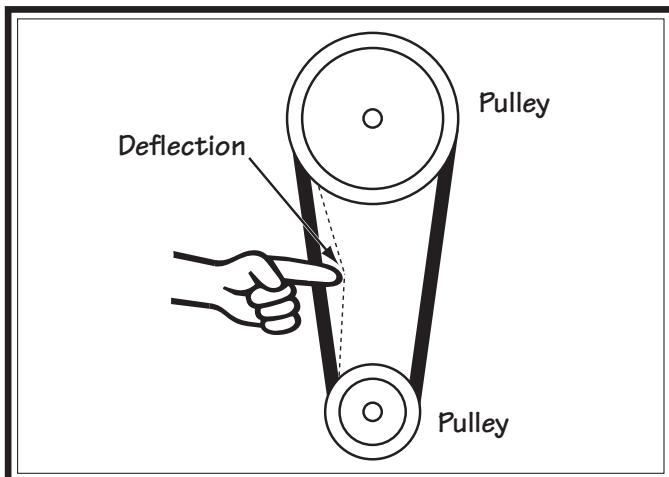


Figure 93. Testing for correct drive belt tension.

4. When the belt tension is correct, continue applying pressure on the idler pulley as you re-tighten the pivot block hex nut to secure the tension setting.
5. Re-check the tension on both belts, and if necessary, repeat this procedure until the correct belt tension is attained.
6. Close the end cover before re-connecting the lathe to power.

NOTICE

DO NOT overtighten belt tension. This could cause the machine to run hot and cause damage to the motor and bearings.

If you need replacement parts, or if you are unsure how to do any of the solutions given here, feel free to call us at (360) 734-1540.

Symptom	Possible Cause	Possible Solution
Machine does not start or a circuit breaker trips.	<ol style="list-style-type: none"> 1. STOP button is engaged or at fault. 2. Power supply is switched OFF at master power switch or breaker. 3. Wall fuse/circuit breaker is blown/tripped; short in electrical system; start-up load too high for circuit. 4. Fuse has blown on circuit board inside electrical cabinet. 5. Wiring is open/has high resistance. 6. Spindle switch is at fault. 7. Spindle speed dial is at fault. 8. Motor is at fault. 	<ol style="list-style-type: none"> 1. Rotate STOP button clockwise until it pops out to reset it for operation; replace if not working properly. 2. Make sure master power switch and circuit breaker are turned ON. 3. Verify circuit is rated for machine amp load; troubleshoot and repair cause of overload; replace weak breaker; find/repair electrical short. 4. Replace fuse; determine if overload is due to heavy operation; ensure power source has high enough voltage and power cord is correctly sized. 5. Check for broken wires or disconnected/corroded connections, and repair/replace as necessary. 6. Replace spindle switch. 7. Replace spindle speed dial. 8. Test/repair/replace.
Loud, repetitious noise coming from inside end cover.	<ol style="list-style-type: none"> 1. Drive or timing belts are loose and slipping. 2. Timing-belt pulleys are loose or missing shaft keys. 	<ol style="list-style-type: none"> 1. Re-tension drive belts (see Page 55); re-position timing-belt pulleys so that the timing belts have only slight deflection between pulleys. 2. Re-tighten pulleys and pulley shafts; check/replace missing shaft keys.
Motor overheats.	<ol style="list-style-type: none"> 1. Motor overloaded. 	<ol style="list-style-type: none"> 1. Reduce load on motor.
Motor is loud when cutting, or bogs down under load.	<ol style="list-style-type: none"> 1. Excessive depth of cut or feed rate. 2. Spindle speed or feed rate wrong for cutting operation. 3. Cutting tool is dull. 	<ol style="list-style-type: none"> 1. Decrease depth of cut or feed rate. 2. Refer to the feeds and speeds charts in Machinery's Handbook or a speeds and feeds calculator on the internet. 3. Sharpen or replace the cutting tool.
Entire machine vibrates upon startup and while running.	<ol style="list-style-type: none"> 1. Workpiece is unbalanced. 2. Workpiece is hitting stationary object. 3. Loose or damaged drive belt(s). 4. Drive belt pulleys are not properly aligned. 5. Chuck or faceplate is unbalanced. 6. Spindle bearings at fault. 	<ol style="list-style-type: none"> 1. Re-install workpiece centered with the spindle bore. 2. Stop lathe immediately and correct interference problem. 3. Re-tension/replace the drive belt(s) as necessary (see Page 55). 4. Align the drive belt pulleys. 5. Re-balance chuck or faceplate; contact a local machine shop for help. 6. Replace worn spindle bearings.
Bad surface finish.	<ol style="list-style-type: none"> 1. Wrong spindle speed or feed rate. 2. Cutting tool is dull or incorrect for operation. 3. Tool height incorrect. 4. Too much play in gibs. 	<ol style="list-style-type: none"> 1. Adjust for appropriate spindle speed and feed rate. 2. Sharpen or replace the cutting tool; use correct tool for operation. 3. Adjust tool height to centerline (see Page 37). 4. Tighten gibs (see Page 54).

Symptom	Possible Cause	Possible Solution
Tapered tool difficult to remove from tailstock quill.	<ol style="list-style-type: none"> 1. Quill is not retracted all the way back into the tailstock. 2. Contaminants not removed from taper before inserting into quill. 	<ol style="list-style-type: none"> 1. Turn the tailstock handwheel until it forces the tapered tool out of quill. 2. Clean the taper and bore and re-install tapered tool.
Cross slide, compound, or carriage feed has sloppy operation.	<ol style="list-style-type: none"> 1. Gibs are out of adjustment. 2. Ways are loaded with grime or chips. 3. Leadscrew mechanism worn or out of adjustment. 	<ol style="list-style-type: none"> 1. Adjust gib screws (see Page 54). 2. Clean the ways and re-lubricate. 3. Replace leadscrew and nut.
Cross slide, or compound rest ball handle is hard to move.	<ol style="list-style-type: none"> 1. Dovetail slides loaded with shavings, dust, or grime. 2. Gib screws are too tight. 3. Bedways are dry. 	<ol style="list-style-type: none"> 1. Remove gibbs, clean ways/dovetails, lubricate, and re-adjust gibbs. 2. Loosen gib screws slightly (see Page 54). 3. Lubricate bedways (see Page 52).
Carriage will not feed or is hard to move.	<ol style="list-style-type: none"> 1. Carriage lock is tight. 2. Chips have loaded up on bedways. 3. Bedways are dry and in need of lubrication. 4. Gibs are too tight. 5. Gears broken. 	<ol style="list-style-type: none"> 1. Check to make sure the carriage lock is loose. 2. Frequently clean away chips that load up during turning operations. 3. Lubricate bedways and handles. 4. Loosen gib screw(s) slightly (see Page 54). 5. Replace gears.
Cutting tool or machine components vibrate excessively during cutting.	<ol style="list-style-type: none"> 1. Tool holder not tight enough. 2. Cutting tool sticks too far out of tool holder; lack of support. 3. Gibs are out of adjustment. 4. Dull cutting tool. 5. Incorrect spindle speed or feed rate. 	<ol style="list-style-type: none"> 1. Check for debris, clean, and retighten. 2. Re-install cutting tool so no more than $\frac{1}{3}$ of the total length is sticking out of tool holder. 3. Adjust gib screws at affected component (see Page 54) 4. Replace or resharpen cutting tool. 5. Use the recommended spindle speed.
Workpiece is tapered.	<ol style="list-style-type: none"> 1. Spindle and tailstock centerlines are not properly aligned with each other. 	<ol style="list-style-type: none"> 1. Realign the tailstock to the headstock spindle bore centerline (see Page 31).
Chuck jaws will not move or do not move easily.	<ol style="list-style-type: none"> 1. Chuck needs lubrication. 2. Chips lodged in the jaws or scroll plate. 	<ol style="list-style-type: none"> 1. Remove jaws, then clean and lubricate all surfaces. 2. Remove jaws, clean and lubricate scroll plate, then replace jaws.
Gearbox change levers will not shift into position.	<ol style="list-style-type: none"> 1. Gears not aligned inside headstock. 	<ol style="list-style-type: none"> 1. Rotate spindle by hand with light pressure on the lever until gear falls into place.

Electrical Safety Instructions

These pages are accurate at the time of printing. In the constant effort to improve, however, we may make changes to the electrical systems of future machines. Study this section carefully. If you see differences between your machine and what is shown in this section, call Technical Support at (360) 734-1540 for assistance BEFORE making any changes to the wiring on your machine.

Shock Hazard: It is extremely dangerous to perform electrical or wiring tasks while the machine is connected to the power source. Touching electrified parts will result in personal injury including but not limited to severe burns, electrocution, or death. For your own safety, disconnect machine from the power source before servicing electrical components or performing any wiring tasks!

Wire Connections: All connections must be tight to prevent wires from loosening during machine operation. Double-check all wires disconnected or connected during any wiring task to ensure tight connections.

Modifications: Using aftermarket parts or modifying the wiring beyond what is shown in the diagram may lead to unpredictable results, including serious injury or fire.

Motor Wiring: The motor wiring shown in these diagrams is current at the time of printing, but it may not match your machine. Always use the wiring diagram inside the motor junction box.

Circuit Requirements: Connecting the machine to an improperly sized circuit will greatly increase the risk of fire. To minimize this risk, only connect the machine to a power circuit that meets the minimum requirements given in this manual.

Capacitors/Inverters: Some capacitors and power inverters store an electrical charge for up to 10 minutes after being disconnected from the power source. To reduce the risk of being shocked, wait at least this long before working on capacitors.

Wire/Component Damage: Damaged wires or components increase the risk of serious personal injury, fire, or machine damage. If you notice that any wires or components are damaged while performing a wiring task, replace those wires or components before completing the task.

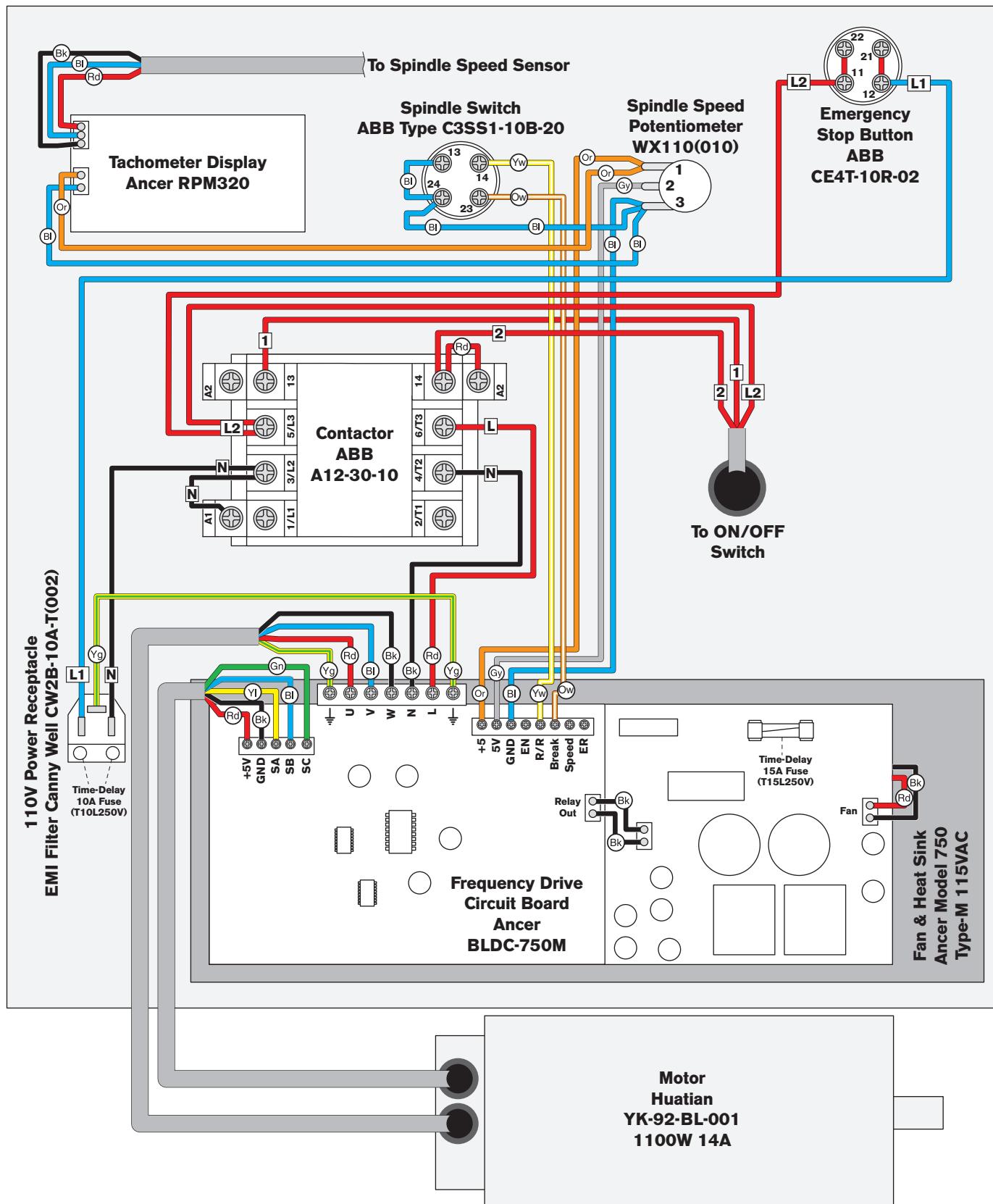
Experiencing Difficulties: If you are experiencing difficulties understanding the information included in this section, contact our Technical Support at (360) 734-1540.

WIRING DIAGRAM COLOR KEY

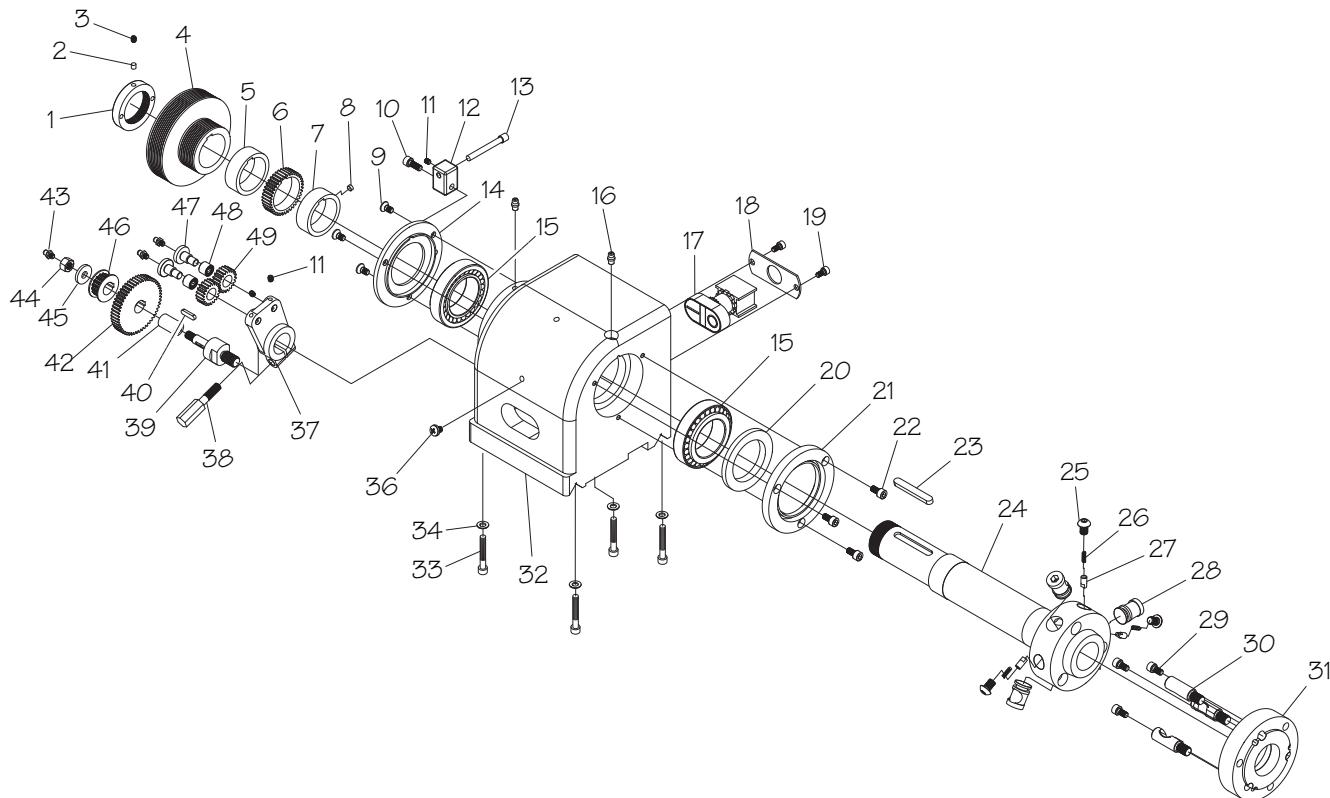
BLACK	Bk	BLUE	Bw	YELLOW	Yw	PINK	Pk	WHITE	Wt
BLUE	Bl	WHITE	W	WHITE	W	WHITE	Pk	WHITE	Wt
BROWN	Br	GREEN	Gn	ORANGE	Ow	PURPLE	Pu	YELLOW	Yg
GRAY	Gy	GRAY	Gy	WHITE	W	TURQUOISE	Tu	GREEN	G
				ORANGE	Or			YELLOW	YI

NOTICE: The photos and diagrams included in this section are best viewed in color. You can see them in color at www.southbendlathe.com.

Electrical Cabinet Wiring Diagram



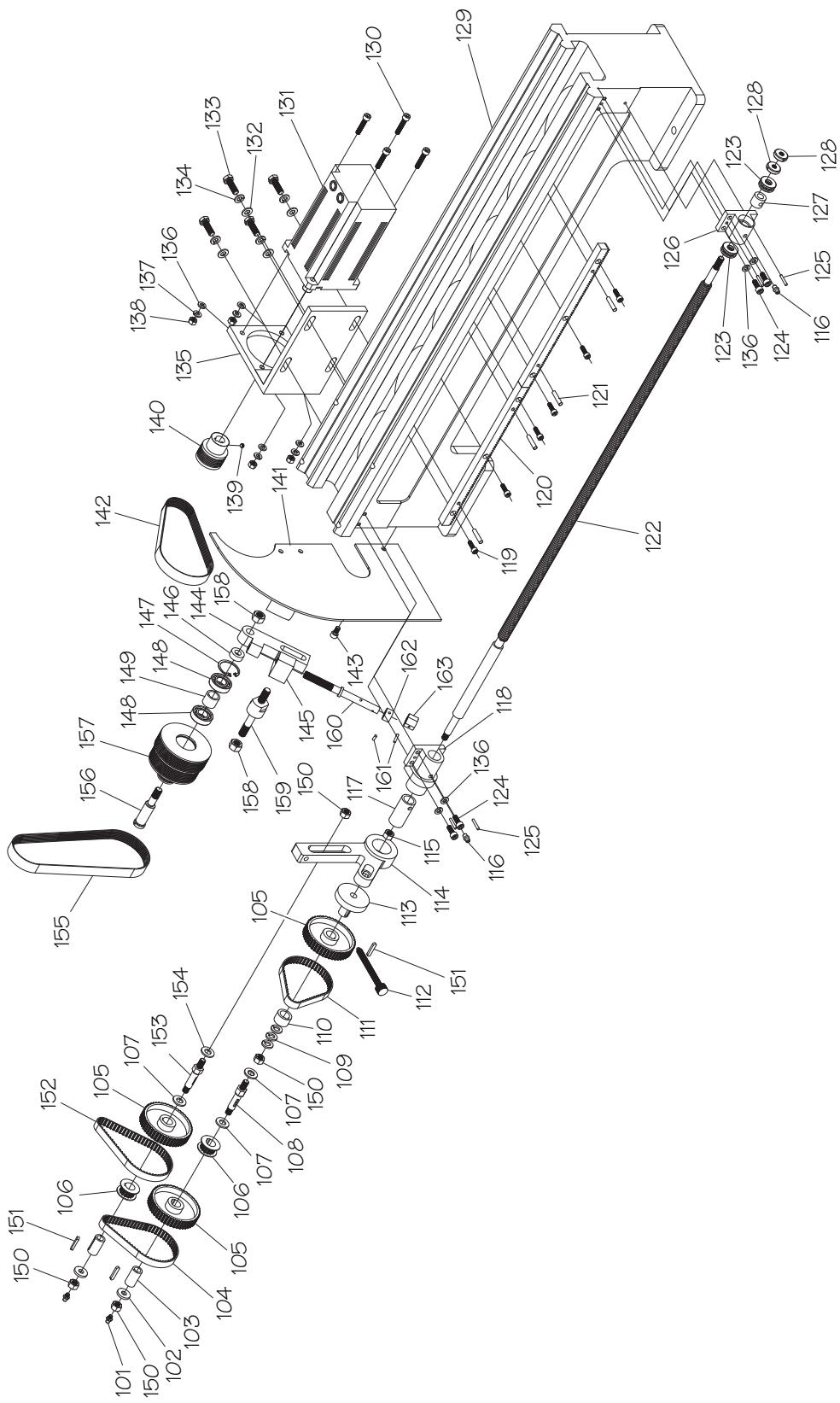
Headstock



REF	PART #	DESCRIPTION
1	PSB1001001	SPINDLE LOCK COLLAR
2	PSB1001002	PLUNGER
3	PSS02M	SET SCREW M6-1 X 6
4	PSB1001004	SPINDLE PULLEY
5	PSB1001005	SPACER
6	PSB1001006	GEAR 39T
7	PSB1001007	SPEED SENSOR RING
8	PSB1001008	SPEED SENSOR MAGNET
9	PFH73M	FLAT HD CAP SCR M6-1 X 16
10	PCAP23M	CAP SCREW M4-.7 X 12
11	PSS26M	SET SCREW M5-.8 X 6
12	PSB1001012	SPEED SENSOR BRACKET
13	PSB1001013	SPEED SENSOR
14	PSB1001014	OUTBOARD SPINDLE BEARING FLANGE
15	P32009	TAPERED ROLLER BEARING 32009
16	PSB1001016	TAP-IN GREASE FITTING 6MM STRT BRASS
17	PSB1001017	MASTER POWER SWITCH ASSEMBLY
18	PSB1001018	SWITCH PLATE
19	PCAP17M	CAP SCREW M4-.7 X 10
20	PSB1001020	BEARING GASKET
21	PSB1001021	INBOARD SPINDLE BEARING FLANGE
22	PCAP26M	CAP SCREW M6-1 X 12
23	PSB1001023	KEY 8 X 5 X 56
24	PSB1001024	SPINDLE D1-3

REF	PART #	DESCRIPTION
25	PCAP52M	CAP SCREW M8-1.25 X 10
26	PSB1001026	COMPRESSION SPRING
27	PSB1001027	PLUNGER
28	PSB1001028	CAMLOCK
29	PCAP04M	CAP SCREW M6-1 X 10
30	PSB1001030	CAMLOCK STUD
31	PSB1001031	BACKPLATE
32	PSB1001032	HEADSTOCK HOUSING
33	PCAP26M	CAP SCREW M6-1 X 12
34	PW03M	FLAT WASHER 6MM
36	PS118M	PHLP HD SCR M6-1 X 10 BRASS
37	PSB1001037	DIRECTION PIVOT BRACKET
38	PSB1001038	PIVOT BRACKET BOLT
39	PSB1001039	GEAR SHAFT
40	PSB1001040	KEY 5 X 3 X 20
41	PSB1001041	GEAR BUSHING
42	PSB1001042	GEAR 52T
43	PZERK006	GREASE FITTING M5-.8 X 5.5 STRT BRASS
44	PNO6M	HEX NUT M5-.8
45	PSB1001045	PULLEY FLAT WASHER
46	PSB1001046	TIMING-BELT PULLEY XL 16T
47	PSB1001047	GEAR SHAFT
48	P607ZZ	BALL BEARING 607ZZ
49	PSB1001049	GEAR 20T

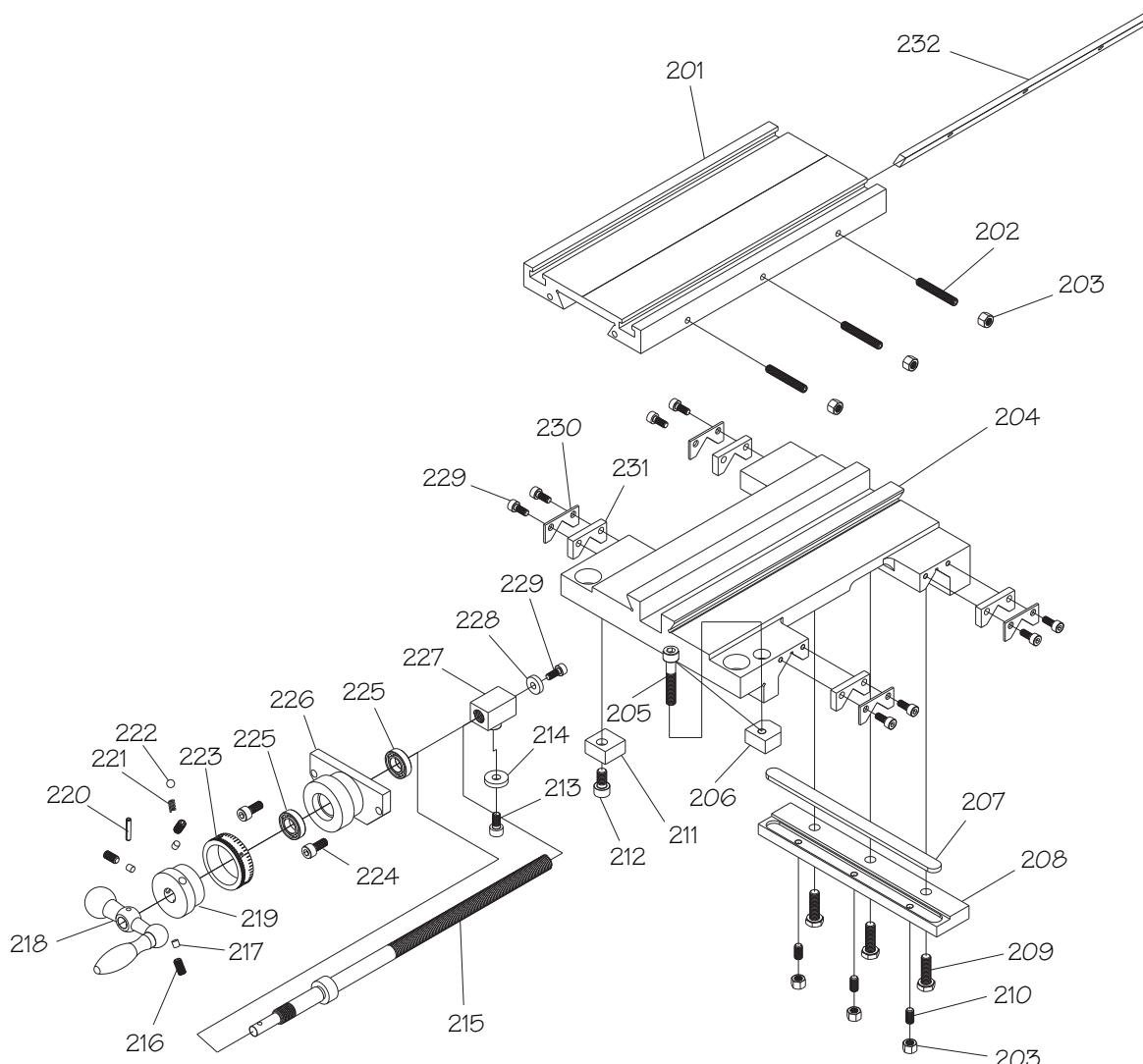
Bed & Timing-Belt Pulleys



Bed & Timing-Belt Pulleys Parts List

REF	PART #	DESCRIPTION	REF	PART #	DESCRIPTION
101	PZERK006	GREASE FITTING M5-.8 X 5.5 STRT BRASS	133	PB26M	HEX BOLT M8-1.25 X 30
102	PSB1001044	PULLEY FLAT WASHER	134	PLW04M	LOCK WASHER 8MM
103	PSB1001103	PULLEY BUSHING	135	PSB1001135	MOTOR MOUNT BRACKET
104	PSB1001104	TIMING BELT 120XL	136	PW03M	FLAT WASHER 6MM
105	PSB1001105	TIMING-BELT PULLEY XL 48T	137	PLW03M	LOCK WASHER 6MM
106	PSB1001106	TIMING-BELT PULLEY XL 15T	138	PN01M	HEX NUT M6-1
107	PW01M	FLAT WASHER 8MM	139	PSS26M	SET SCREW M5-.8 X 6
108	PSB1001108	PULLEY SHAFT	140	PSB1001140	MOTOR PULLEY
109	PLW10M	LOCK WASHER 16MM	141	PSB1001141	END PULLEY BACK PLATE
110	PSB1001110	SPACER	142	PSB1001142	RIBBED V-BELT 8PJ406
111	PSB1001104	TIMING BELT 120XL	143	PCAP04M	CAP SCREW M6-1 X 10
112	PSB1001112	TENSION ADJUSTMENT SCREW	144	PSB1001144	PIVOT BRACKET
113	PSB1001113	PULLEY FLANGE	145	PSB1001145	PIVOT BLOCK
114	PSB1001114	PIVOT BRACKET	146	PSB1001146	SPACER
115	PN03M	HEX NUT M8-1.25	147	PR29M	INT RETAINING RING 32MM
116	PSB1001016	TAP-IN GREASE FITTING 6MM STRT BRASS	148	P6002ZZ	BALL BEARING 6002ZZ
117	PSB1001117	PIVOT BRACKET BUSHING	149	PSB1001149	SPACER
118	PSB1001118	LEFT LEADSCREW BRACKET	150	PN03M	HEX NUT M8-1.25
119	PCAP15M	CAP SCREW M5-.8 X 20	151	PSB1001151	KEY 5 X 3 X 25
120	PSB1001120	RACK	152	PSB1001152	TIMING BELT 140XL
121	PSB1001121	DOWEL PIN 5 X 25	153	PSB1001153	PULLY SHAFT
122	PSB1001122	LONGITUDINAL LEADSCREW	154	PW01M	FLAT WASHER 8MM
123	P51100	THRUST BEARING 51100	155	PSB1001155	RIBBED V-BELT 8PJ550
124	PCAP01M	CAP SCREW M6-1 X 16	156	PSB1001156	PULLEY SHAFT
125	PSB1001125	DOWEL PIN 4 X 20	157	PSB1001157	IDLER PULLEY
126	PSB1001126	RIGHT LEADSCREW BRACKET	158	PN02M	HEX NUT M10-1.5
127	PSB1001127	DRILLED BUSHING	159	PSB1001159	THREADED LOCK SHAFT
128	PSB1001128	LOCK COLLAR W/SET SCREW	160	PSB1001160	TENSION ADJUSTMENT BOLT
129	PSB1001129	BED	161	PSB1001161	DOWEL PIN 3 X 16
130	PCAP07M	CAP SCREW M6-1 X 30	162	PSB1001162	LOCK COLLAR
131	PSB1001131	MOTOR 1-1/2HP 120VDC 60HZ	163	PSB1001163	SHAFT LOCK NUT
132	PW01M	FLAT WASHER 8MM			

Saddle & Cross Slide

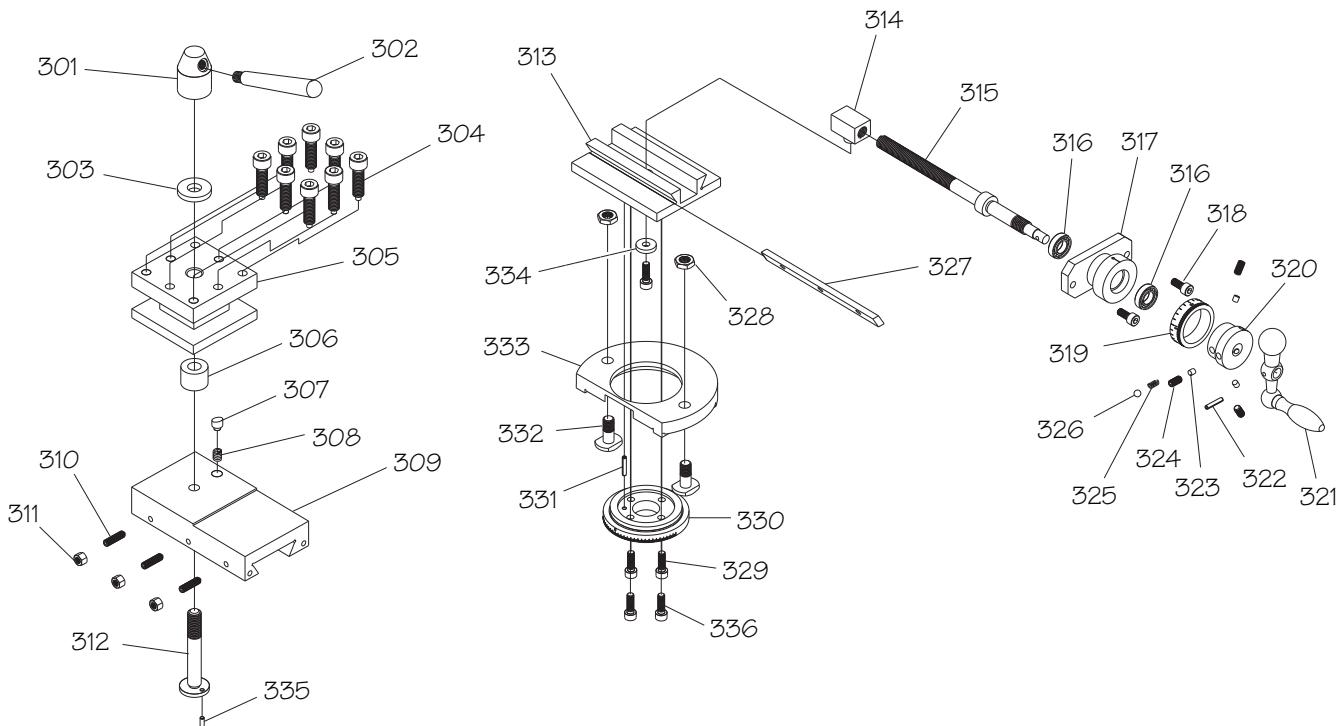

REF PART # DESCRIPTION

201	PSB1001201	CROSS SLIDE
202	PSS114M	SET SCREW M5-.8 X 35
203	PN06M	HEX NUT M5-.8
204	PSB1001204	SADDLE
205	PCAP48M	CAP SCREW M6-1 X 35
206	PSB1001206	CARRIAGE CLAMP BLOCK
207	PSB1001207	SADDLE GIB
208	PSB1001208	GIB CLAMP PLATE
209	PCAP02M	CAP SCREW M6-1 X 20
210	PSS53M	SET SCREW M5-.8 X 12
211	PSB1001211	ALIGNMENT BLOCK
212	PCAP26M	CAP SCREW M6-1 X 12
213	PCAP50M	CAP SCREW M5-.8 X 10
214	PW02M	FLAT WASHER 5MM
215	PSB1001215	CROSS SLIDE LEADSCREW
216	PSS26M	SET SCREW M5-.8 X 6

REF PART # DESCRIPTION

217	PSB1001217	PLUNGER
218	PSB1001218	BALL HANDLE ASSEMBLY
219	PSB1001219	HANDLE HUB
220	PRP02M	ROLL PIN 3 X 16
221	PSB1001221	COMPRESSION SPRING 0.5 X 4 X 7
222	PSTB004M	STEEL BALL 5MM
223	PSB1001223	GRADUATED DIAL
224	PCAP33M	CAP SCREW M5-.8 X 12
225	P6800ZZ	BALL BEARING 6800ZZ
226	PSB1001226	BEARING HOUSING
227	PSB1001227	LEADScrew NUT
228	PW05M	FLAT WASHER 4MM
229	PCAP17M	CAP SCREW M4-.7 X 10
230	PSB1001230	WAY WIPER PLATE
231	PSB1001231	WAY WIPER
232	PSB1001232	CROSS SLIDE GIB

Compound Rest & Tool Post

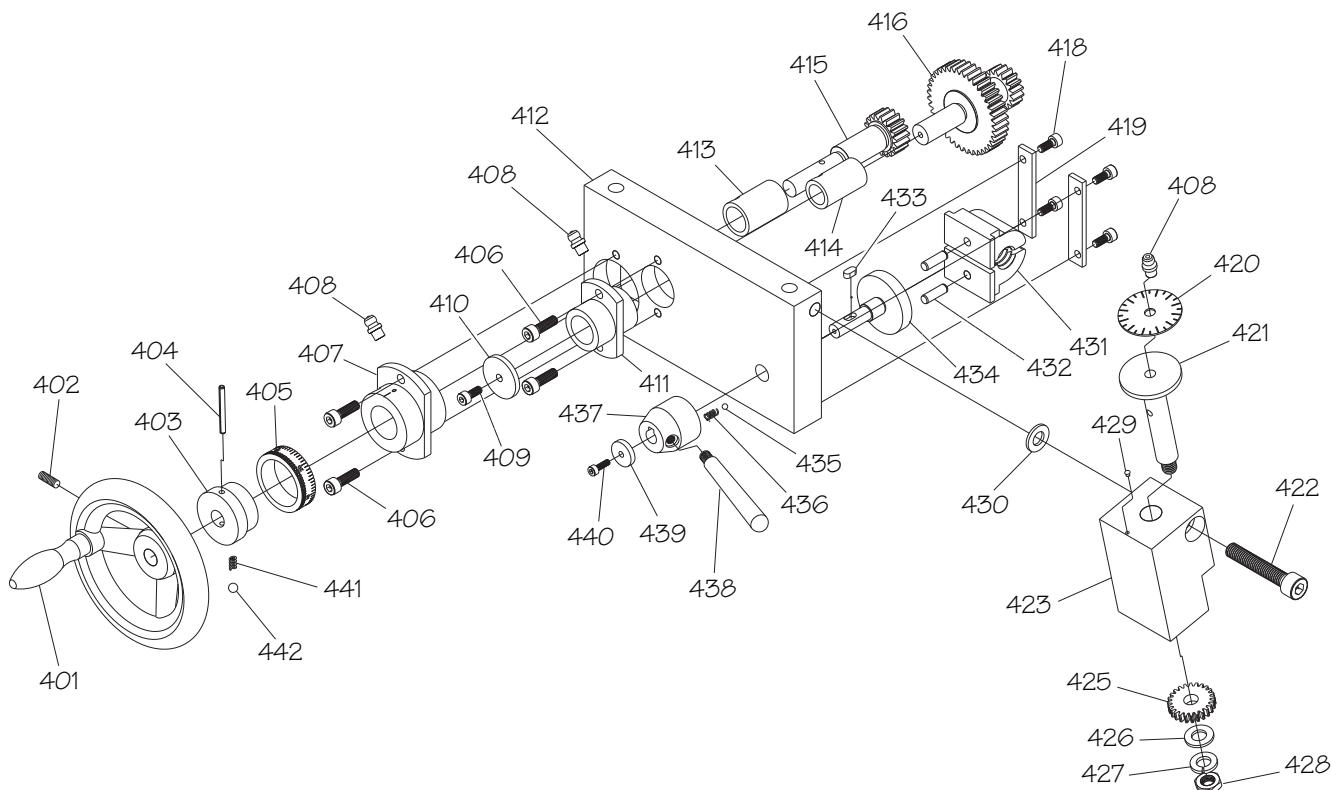

REF PART # DESCRIPTION

301	PSB1001301	TOOL POST NUT
302	PSB1001302	TOOL POST LEVER
303	PSB1001303	TOOL POST BODY FLAT WASHER
304	PSB1001304	TOOL POST CAP SCREW M8-1.25 X 30
305	PSB1001305	TOOL POST BODY
306	PSB1001306	TOOL POST BUSHING
307	PSB1001307	PLUNGER
308	PSB1001308	COMPRESSION SPRING
309	PSB1001309	COMPOUND REST
310	PS557M	SET SCREW M5-.8 X 20
311	PN06M	HEX NUT M5-.8
312	PSB1001312	TOOL POST BOLT
313	PSB1001313	COMPOUND REST WAY
314	PSB1001314	LEADSCREW NUT
315	PSB1001315	COMPOUND REST LEADScrew
316	P6800ZZ	BALL BEARING 6800ZZ
317	PSB1001317	BEARING HOUSING
318	PCAP10M	CAP SCREW M5-.8 X 15

REF PART # DESCRIPTION

319	PSB1001319	GRADUATED DIAL
320	PSB1001219	HANDLE HUB
321	PSB1001218	BALL HANDLE ASSEMBLY
322	PRP02M	ROLL PIN 3 X 16
323	PSB1001307	PLUNGER
324	PSS26M	SET SCREW M5-.8 X 6
325	PSB1001221	COMPRESSION SPRING 0.5 X 4 X 7
326	PSTB004M	STEEL BALL 5MM
327	PSB1001327	COMPOUND REST GIB
328	PN46M	HEX NUT M8-1.25 THIN
329	PCAP10M	CAP SCREW M5-.8 X 15
330	PSB1001330	CLAMP BASE
331	PSB1001331	DOWEL PIN 3 X 18
332	PSB1001332	T-BOLT M8-1.25
333	PSB1001333	CLAMP RING
334	PW02M	FLAT WASHER 5MM
335	PSB1001335	DOWEL PIN 3 X 12
336	PCAP33M	CAP SCREW M5-.8 X 12

Apron

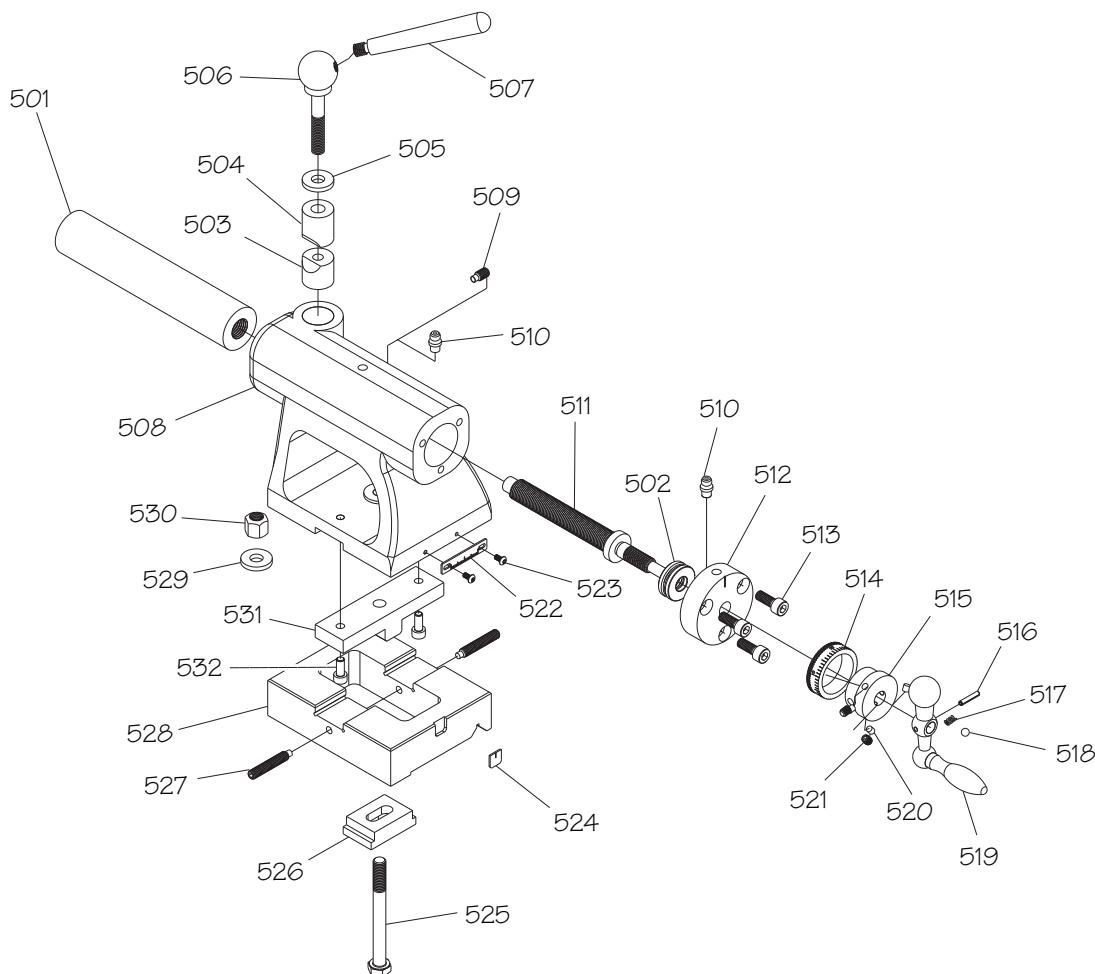

REF PART # DESCRIPTION

401	PSB1001401	HANDWHEEL ASSEMBLY
402	PS501M	SET SCREW M6-1 X 10
403	PSB1001403	HANDWHEEL HUB
404	PRP97M	ROLL PIN 3 X 30
405	PSB1001405	GRADUATED DIAL
406	PCAP10M	CAP SCREW M5.8 X 15
407	PSB1001407	GEAR SHAFT BRACKET
408	PSB1001016	TAP-IN GREASE FITTING 6MM STRT BRASS
409	PCAP17M	CAP SCREW M4-.7 X 10
410	PSB1001410	PINION SHAFT END CAP BRASS
411	PSB1001411	GEAR SHAFT BRACKET
412	PSB1001412	APRON
413	PSB1001413	PINION SHAFT BUSHING BRASS
414	PSB1001414	GEAR SHAFT BUSHING BRASS
415	PSB1001415	PINION SHAFT 16T
416	PSB1001416	COMBO GEAR 17T/42T
418	PCAP17M	CAP SCREW M4-.7 X 10
419	PSB1001419	CLAMP PLATE
420	PSB1001420	THREAD DIAL
421	PSB1001421	THREAD DIAL SHAFT

REF PART # DESCRIPTION

422	PCAP29M	CAP SCREW M6-1 X 40
423	PSB1001423	THREAD DIAL BODY
425	PSB1001425	THREAD DIAL GEAR
426	PW01M	FLAT WASHER 8MM
427	PLW04M	LOCK WASHER 8MM
428	PNO3M	HEX NUT M8-1.25
429	PRIVO15M	BRASS BLIND RIVET 2 X 6MM
430	PW03M	FLAT WASHER 6MM
431	PSB1001431	HALF NUT ASSEMBLY 2PC
432	PSB1001432	DOWEL PIN 5 X 16
433	PK69M	KEY 4 X 4 X 12
434	PSB1001434	HALF NUT BRACKET
435	PSTB006M	STEEL BALL 4MM
436	PSB1001436	COMPRESSION SPRING 0.5 X 3 X 6
437	PSB1001437	HALF NUT LEVER HUB
438	PSB1001438	HALF NUT LEVER
439	PSB1001439	LEVER HUB FLAT WASHER BRASS
440	PCAP56M	CAP SCREW M3.5 X 10
441	PSB1001221	COMPRESSION SPRING 0.5 X 4 X 7
442	PSTB004M	STEEL BALL 5MM

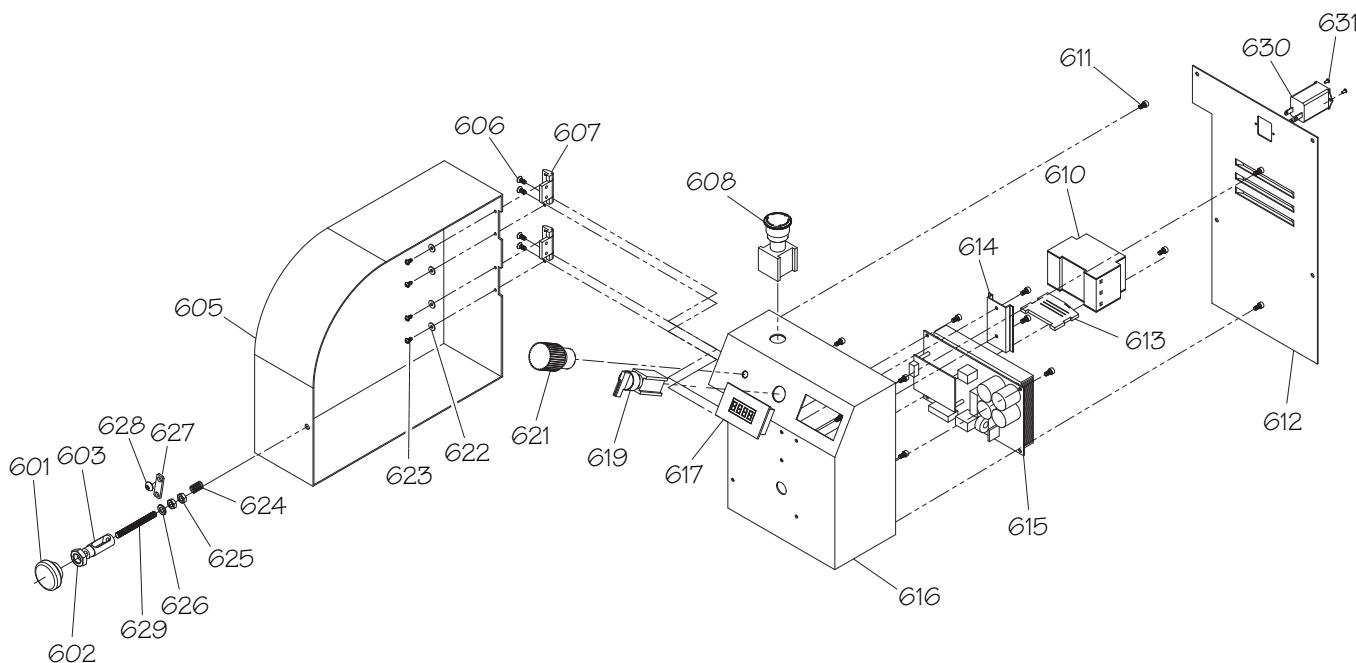
Tailstock



REF	PART #	DESCRIPTION
501	PSB1001501	QUILL
502	P51100	THRUST BEARING 51100
503	PSB1001503	LOWER LOCK SLEEVE
504	PSB1001504	UPPER LOCK SLEEVE
505	PSB1001505	LOCK LEVER FLAT WASHER
506	PSB1001506	LOCK LEVER HUB
507	PSB1001507	QUILL LOCK LEVER
508	PSB1001508	TAILSTOCK CASTING
509	PSB1001509	SET SCREW M6-1 X 10 PILOT
510	PSB1001016	TAP-IN GREASE FITTING 6MM STRT BRASS
511	PSB1001511	TAILSTOCK LEADSCREW
512	PSB1001512	BEARING HOUSING
513	PCAP28M	CAP SCREW M6-1 X 15
514	PSB1001514	GRADUATED DIAL
515	PSB1001515	HANDLE HUB
516	PSB1001516	DOWEL PIN 3 X 14

REF	PART #	DESCRIPTION
517	PSB1001221	COMPRESSION SPRING 0.5 X 4 X 7
518	PSTB004M	STEEL BALL 5MM
519	PSB1001519	BALL HANDLE
520	PSB1001520	PLUNGER
521	PSS26M	SET SCREW M5-.8 X 6
522	PSB1001522	TAILSTOCK OFFSET SCALE
523	PS12M	PHLP HD SCR M3-.5 X 6
524	PSB1001524	OFFSET INDICATOR
525	PB82M	HEX BOLT M8-1.25 X 80
526	PSB1001526	TAILSTOCK CLAMP PLATE
527	PSB1001527	SET SCREW M6-1 X 25 PILOT
528	PSB1001528	TAILSTOCK BASE
529	PW01M	FLAT WASHER 8MM
530	PNO3M	HEX NUT M8-1.25
531	PSB1001531	ALIGNMENT PLATE
532	PCAP33M	CAP SCREW M5-.8 X 12

Electrical & End Cover


REF PART # DESCRIPTION

601	PSB1001601	KNOB M16-2
602	PSB1001602	HEX NUT M16-2 THIN
603	PSB1001603	SLEEVE
605	PSB1001605	END COVER
606	PCAP33M	CAP SCREW M5-.8 X 12
607	PSB1001607	HINGE
608	PSB1001608	EMERGENCY STOP BUTTON ASSY
610	PSB1001610	CONTACTOR ABB A12-30-10 110V
611	PCAP50M	CAP SCREW M5-.8 X 10
612	PSB1001612	ELECTRICAL CABINET COVER
613	PSB1001613	CONTACTOR SUPPORT PLATE
614	PSB1001614	CONTACTOR MOUNTING BRACKET
615	PSB1001615	CIRCUIT BOARD ASSEMBLY
616	PSB1001616	ELECTRICAL CABINET

REF PART # DESCRIPTION

617	PSB1001617	TACHOMETER DIGITAL DISPLAY
619	PSB1001619	SPINDLE SWITCH
621	PSB1001621	VARIABLE SPEED DIAL
622	PW02M	FLAT WASHER 5MM
623	PCAP03M	CAP SCREW M5-.8 X 8
624	PSB1001624	COMPRESSION SPRING
625	PN46M	HEX NUT M8-1.25 THIN
626	PW01M	FLAT WASHER 8MM
627	PSB1001627	LATCH PLATE
628	PBH940M	BUTTON HD CAP SCR M8-1.25 X 6
629	PSB1001629	STUD-FT M8-1.25 X 90
630	PSB1001630	POWER RECEPTACLE 5-15
631	PS12M	PHLP HD SCR M3-.5 X 6

Accessories

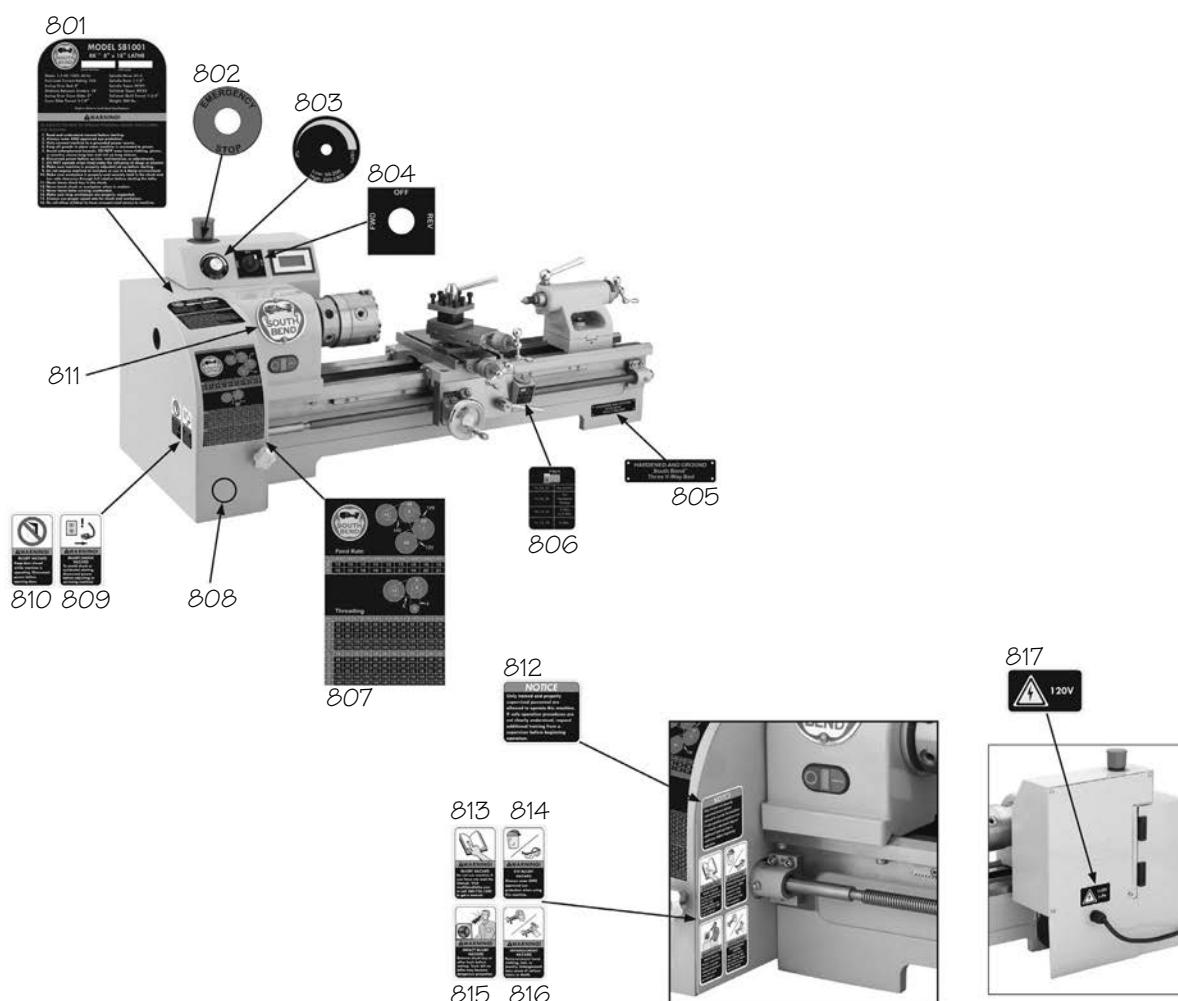

REF PART # DESCRIPTION

701	PSB1001701	TOOLBOX
702	PSB1001702	TIMING-BELT PULLEY XL 28T
703	PSB1001703	TIMING-BELT PULLEY XL 27T
704	PSB1001704	TIMING-BELT PULLEY XL 26T
705	PSB1001705	TIMING-BELT PULLEY XL 24T
706	PSB1001706	TIMING-BELT PULLEY XL 22T
707	PSB1001707	TIMING-BELT PULLEY XL 21T
708	PSB1001708	TIMING-BELT PULLEY XL 20T
709	PSB1001709	TIMING-BELT PULLEY XL 19T
710	PSB1001710	TIMING-BELT PULLEY XL 18T
711	PSB1001711	TIMING-BELT PULLEY XL 16T
712	PSB1001712	TIMING-BELT PULLEY XL 38T
713	PSB1001713	TIMING-BELT PULLEY XL 32T
714	PSB1001714	GREASE GUN
715	PAW08M	HEX WRENCH 8MM
716	PAW06M	HEX WRENCH 6MM
717	PAW05M	HEX WRENCH 5MM

REF PART # DESCRIPTION

718	PAW03M	HEX WRENCH 3MM
719	PSB1001719	CHUCK KEY
720	PSB1001720	TIMING BELT 160XL
721	PWR13	WRENCH 13MM
722	PSB1001722	MOUNTING GASKET RUBBER
723	PSB1001723	3-JAW CHUCK EXTERNAL JAW SET
724	PSB1001724	DEAD CENTER MT#3
725	PSB1001725	DEAD CENTER MT#2
726	PSB1001726	TAPERED SPINDLE SLEEVE MT#4.5-MT#3
727	PSB1001727	POWER CORD 16A 3W 72" L 5-15 M/F
728	PSB1001728	3-JAW CHUCK 4" W/JAWS
729	PSB1001152	TIMING BELT 140XL
730	PWR1417	COMBO WRENCH 14 X 17
731	PAW05M	HEX WRENCH 5MM
732	PAW02M	HEX WRENCH 2MM
733	PSB1001733	FUSE TIME DELAY 15A T25L250V 5PK

Labels



REF	PART #	DESCRIPTION
801	PSB1001801	MACHINE ID LABEL
802	PSB1001802	EMERGENCY STOP LABEL
803	PSB1001803	SPINDLE SPEED DIAL LABEL
804	PSB1001804	SPINDLE SWITCH LABEL
805	PSB1001805	THREE V-WAY DESCRIPTION LABEL
806	PSB1001806	THREAD DIAL CHART LABEL
807	PSB1001807	FEED-THREAD CHART LABEL
808	PSBPAINT-01	SB GRAY TOUCH-UP PAINT
809	PSBLABEL02VS	DISCONNECT POWER LABEL

REF	PART #	DESCRIPTION
810	PSBLABEL13VS	DOOR CLOSED LABEL
811	PSB1001811	SB NAMEPLATE CURVED BRASS
812	PSB1001812	TRAINED PERSONNEL NOTICE LABEL
813	PSBLABEL01VS	READ MANUAL LABEL
814	PSBLABEL03VS	FACESHIELD/GLASSES LABEL
815	PSB1001815	CHUCK KEY HAZARD LABEL
816	PSBLABLE08VS	ENTANGLEMENT LABEL
817	PSB1001817	120V ELECTRICITY LABEL

WARNING

The safety labels provided with your machine are used to make the operator aware of the machine hazards and ways to prevent injury. The owner of this machine **MUST** maintain the original location and readability of these safety labels. If any label is removed or becomes unreadable, **REPLACE** that label before using the machine again. Contact South Bend Lathe Co. at (360) 734-1540 or www.southbendlathe.com to order new labels.





Warranty

This quality product is warranted by South Bend Lathe Company to the original buyer for one year from the date of purchase. This warranty does not apply to consumable parts, or defects due to any kind of misuse, abuse, negligence, accidents, repairs, alterations or lack of maintenance. We do not reimburse for third party repairs. In no event shall we be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our products.

We do not warrant or represent that this machine complies with the provisions of any law, act, code, regulation, or standard of any domestic or foreign government, industry, or authority. In no event shall South Bend's liability under this warranty exceed the original purchase price paid for this machine. Any legal actions brought against South Bend Lathe Company shall be tried in the State of Washington, County of Whatcom.

This is the sole written warranty for this machine. Any and all warranties that may be implied by law, including any merchantability or fitness, for any purpose, are hereby limited to the duration of this warranty. To take advantage of this warranty, contact us by mail or phone to give us the details of the problem you are having.

Thank you for your business and continued support.



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