MODEL G0782
13" X 40" GEARHEAD FLOOR LATHE
OWNER'S MANUAL
(For models manufactured since 10/15)

#WK17494 PRINTED IN CHINA V2.05.18

⚠ WARNING!

This manual provides critical safety instructions on the proper setup, operation, maintenance, and service of this machine/tool. Save this document, refer to it often, and use it to instruct other operators.

Failure to read, understand and follow the instructions in this manual may result in fire or serious personal injury—including amputation, electrocution, or death.

The owner of this machine/tool is solely responsible for its safe use. This responsibility includes but is not limited to proper installation in a safe environment, personnel training and usage authorization, proper inspection and maintenance, manual availability and comprehension, application of safety devices, cutting/sanding/grinding tool integrity, and the usage of personal protective equipment.

The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.

⚠ WARNING!

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- **Lead from lead-based paints.**
- **Crystalline silica from bricks, cement and other masonry products.**
- **Arsenic and chromium from chemically-treated lumber.**

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: Work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

Table of Contents

INTRODUCTION

Contact Info

We stand behind our machines! If you have questions or need help, contact us with the information below. Before contacting, make sure you get the **serial number** and **manufacture date** from the machine ID label. This will help us help you faster.

Grizzly Technical Support
1815 W. Battlefield
Springfield, MO 65807
Phone: (570) 546-9663
Email: techsupport@grizzly.com

We want your feedback on this manual. What did you like about it? Where could it be improved? Please take a few minutes to give us feedback.

Grizzly Documentation Manager
P.O. Box 2069
Bellingham, WA 98227-2069
Email: manuals@grizzly.com

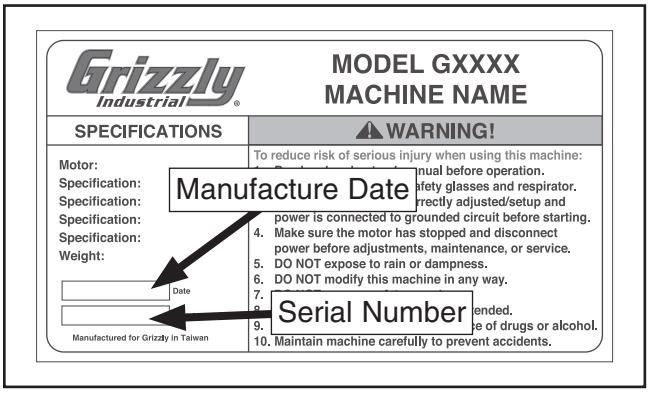
Manual Accuracy

We are proud to provide a high-quality owner's manual with your new machine!

We made every effort to be exact with the instructions, specifications, drawings, and photographs in this manual. Sometimes we make mistakes, but our policy of continuous improvement also means that **sometimes the machine you receive is slightly different than shown in the manual**.

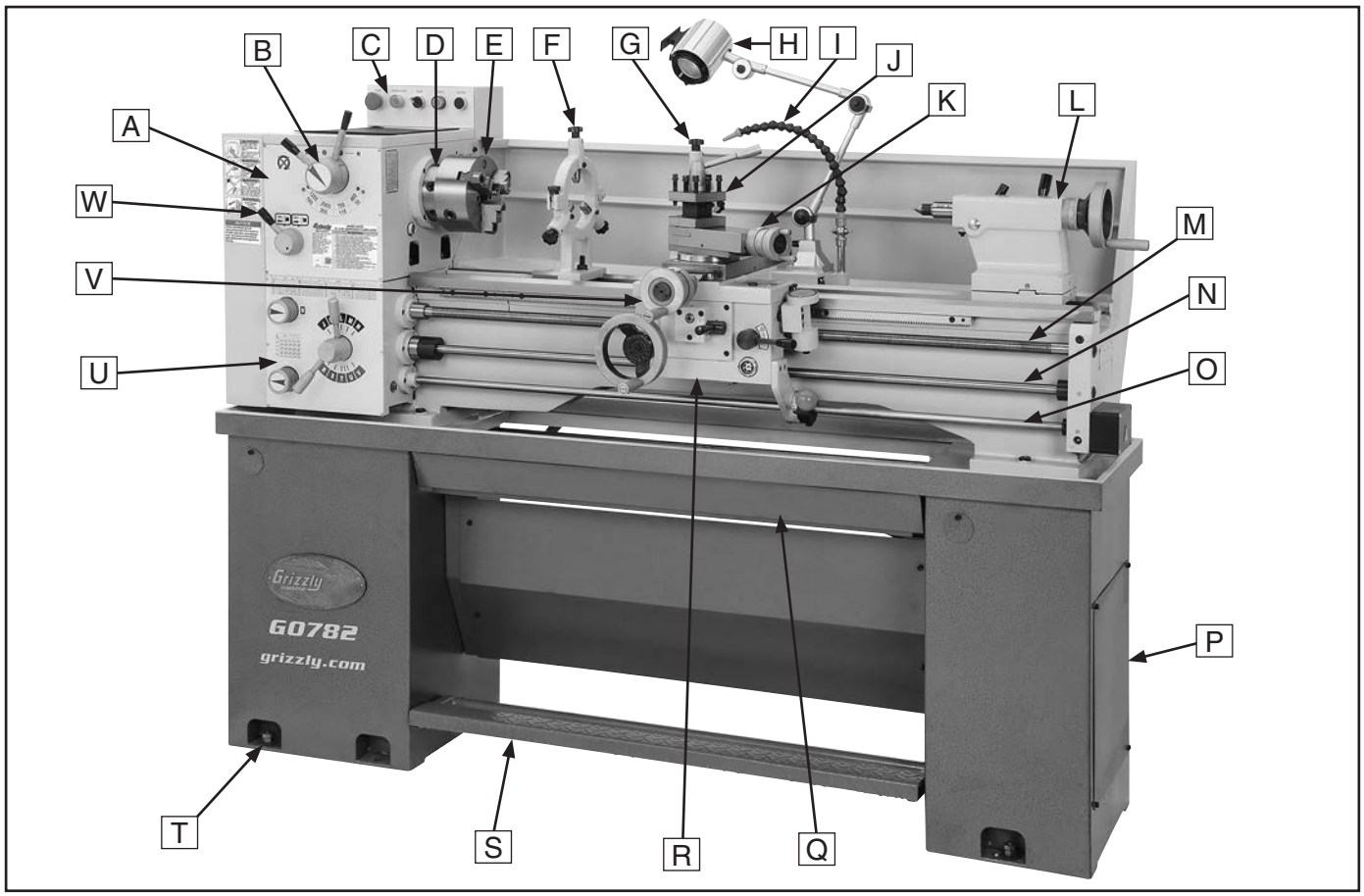
If you find this to be the case, and the difference between the manual and machine leaves you confused or unsure about something, check our website for an updated version. We post current manuals and manual updates for free on our website at **www.grizzly.com**.

Alternatively, you can call our Technical Support for help. Before calling, make sure you write down the **Manufacture Date** and **Serial Number** from the machine ID label (see below). This information is required for us to provide proper tech support, and it helps us determine if updated documentation is available for your machine.

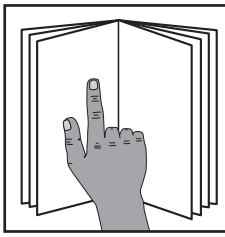


Identification

Become familiar with the names and locations of the controls and features shown below to better understand the instructions in this manual.



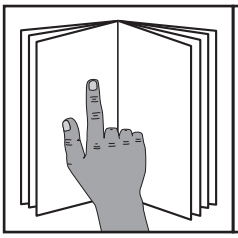
A. Headstock
B. Spindle Speed Levers
C. Control Panel (see **Page 4** for details)
D. D1-4 Camlock MT#5 Spindle
E. 3-Jaw Chuck 6"
F. Steady Rest
G. Follow Rest
H. LED Work Lamp
I. Cutting Fluid Valve and Nozzle
J. Tool Post
K. Compound Rest
L. Tailstock (see **Page 5** for details)
M. Longitudinal Leadscrew
N. Feed Rod
O. Control Rod
P. Coolant Reservoir and Pump Access
Q. Chip Tray
R. Carriage (see **Page 5** for details)
S. Foot Brake
T. Stand Mounting Points
U. Quick-Change Gearbox Controls (see **Page 4** for details)
V. Cross Slide
W. Feed Direction Lever



⚠WARNING

To reduce your risk of serious injury, read this entire manual BEFORE using machine.

Controls & Components



⚠WARNING

To reduce your risk of serious injury, read this entire manual BEFORE using machine.

Refer to **Figures 1–6** and the following descriptions to become familiar with the basic controls of this lathe.

Many of the controls will be explained in greater detail later in this manual.

Control Panel & Headstock

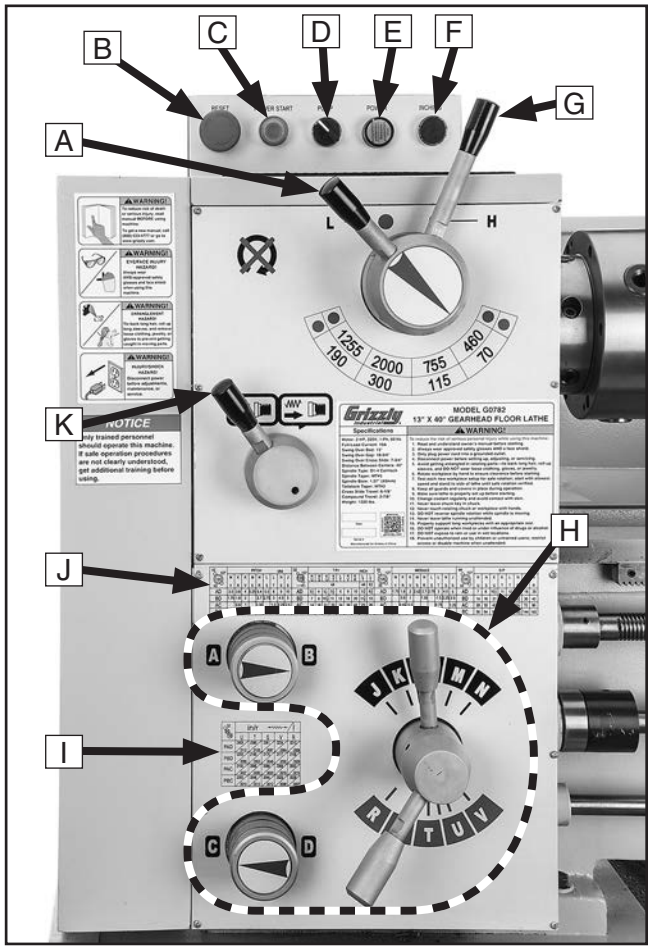


Figure 1. Control panel and headstock controls and components.

A. Spindle Speed Lever: Selects one of four different spindle speeds within the selected speed range.

B. Emergency Stop/RESET Button: Stops all machine functions. Twist clockwise to reset.

C. Power Start Button: Enables power to spindle lever (see **Figure 2** on **Page 5**).

D. Cutting Fluid Pump Switch: Turns cutting fluid pump ***ON***, enabling flow to cutting fluid valve and nozzle (see **Identification** on **Page 3**).

E. Power Lamp: Illuminates when main power switch is turned ON and Emergency Stop/RESET button is reset.

F. Jog/Inching Button: Powers forward spindle rotation as long as it is pressed.

G. Spindle Speed Range Lever: Selects between high and low spindle speed ranges.

H. Quick-Change Gearbox Levers and Dials: Control leadscrew and feed rod speed for threading and feeding operations.

I. Spindle Speed Chart: Indicates different lever positions for various spindle speeds.

J. Thread and Feed Chart: Shows how to arrange gearbox controls for different threading or feeding options.

K. Feed Direction Lever: Controls direction of leadscrew and feed rod rotation when spindle lever is used.

Carriage

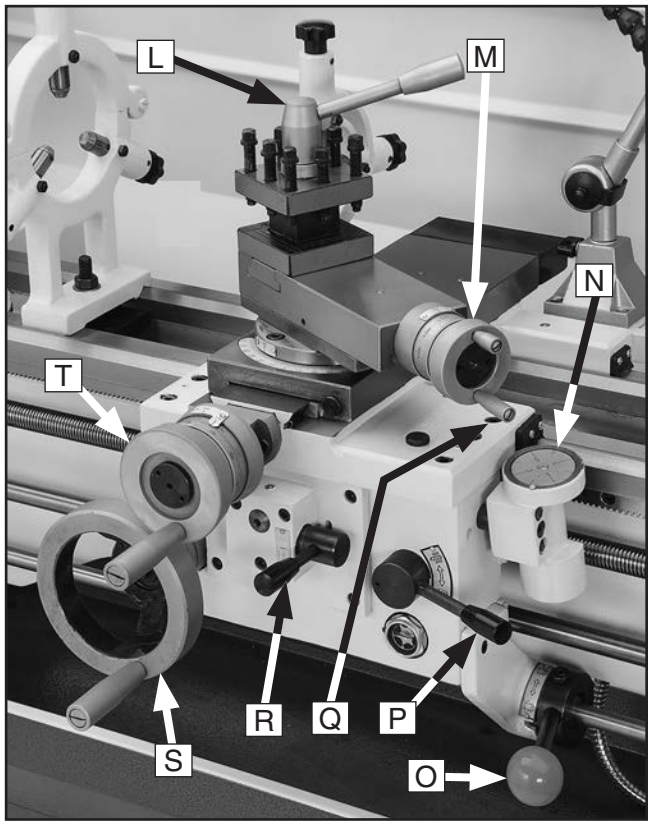


Figure 2. Carriage controls.

L. Four-Way Tool Post: Allows a maximum of four tools to be loaded simultaneously.

M. Compound Rest Handwheel: Moves tool toward and away from workpiece at preset angle.

N. Thread Dial: Indicates when to engage the half nut during inch threading operations.

O. Spindle Lever: Starts, stops, and reverses direction of spindle rotation.

P. Half Nut Lever: Engages/disengages half nut for threading operations.

Q. Carriage Lock: Secures carriage in place for greater rigidity when it should not move.

R. Feed Selection Lever: Selects power feed for carriage or cross slide.

S. Carriage Handwheel: Moves carriage along the bed.

T. Cross Slide Handwheel: Moves cross slide toward and away from workpiece.

Tailstock

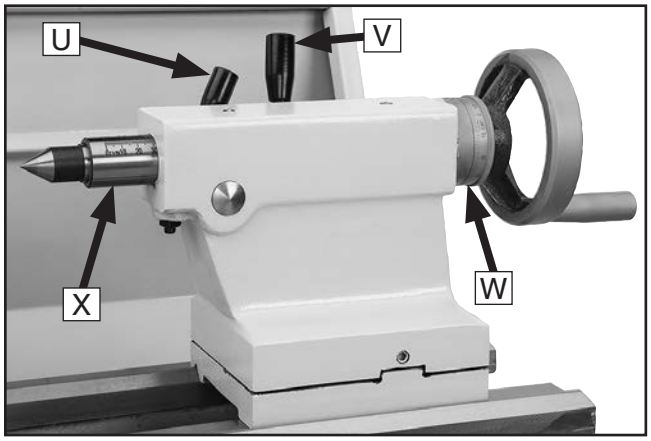


Figure 3. Tailstock controls.

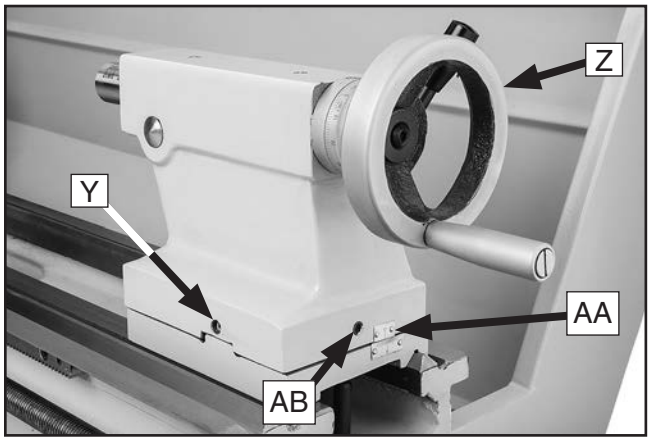


Figure 4. Additional tailstock controls.

U. Quill Lock Lever: Secures quill in position.

V. Tailstock Lock Lever: Secures tailstock in position along the bedway.

W. Graduated Scale: Indicates quill movement in increments of 0.001" with one full revolution equaling 0.125" of quill travel.

X. Quill: Holds centers and tooling.

Y. Tailstock Offset Screws: Adjusts tailstock offset left or right from spindle centerline (1 of 2).

Z. Quill Handwheel: Moves quill toward or away from spindle.

AA. Offset Scale: Indicates relative distance of tailstock offset from spindle centerline.

AB. Offset Locking Set Screw: Locks tailstock in position left or right of spindle centerline.

End Gears

Configuring the end gears (shown in **Figure 5**) controls the speed of the leadscrew for threading, or the feed rod for power feed operations.

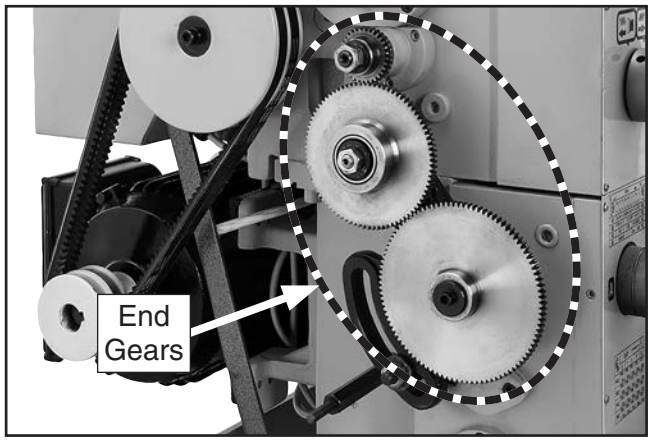


Figure 5. End gear components.

Safety Foot Brake

This lathe is equipped with a foot brake (see **Figure 6**) to quickly stop the spindle instead of allowing the spindle to coast to a stop on its own. Pushing the foot brake while the spindle is ***ON*** cuts power to the motor and stops the spindle. After the foot brake is used, the spindle lever must be returned to the OFF (middle) position to reset the spindle switches before re-starting spindle rotation.

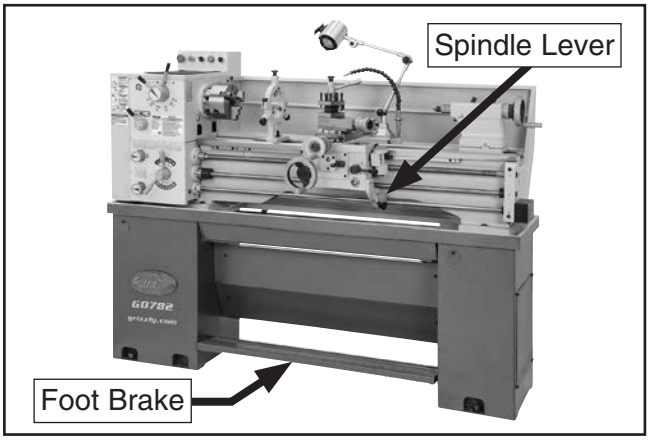


Figure 6. Foot brake and spindle lever.

MACHINE DATA SHEET

Customer Service #: (570) 546-9663 · To Order Call: (800) 523-4777 · Fax #: (800) 438-5901

MODEL G0782 13" X 40" GEARHEAD FLOOR LATHE

Product Dimensions:

Weight	1320 lbs.
Width (side-to-side) x Depth (front-to-back) x Height	71-1/2 x 30 x 53-1/2 in.
Footprint (Length x Width)	69-1/2 x 15-3/4 in.

Shipping Dimensions:

Type	Wood Crate
Content	Machine
Weight	1448 lbs.
Length x Width x Height	76 x 30 x 60 in.
Must Ship Upright	Yes

Electrical:

Power Requirement	220V, Single-Phase, 60 Hz
Prewired Voltage	220V
Full-Load Current Rating	10A
Minimum Circuit Size	15A
Connection Type	Cord & Plug
Power Cord Included	No
Recommended Power Cord	"S"-Type, 3-Wire, 14 AWG, 300 VAC
Plug Included	No
Recommended Plug Type	NEMA 6-15
Switch Type	Magnetic Switch w/Thermal Overload Protection

Motors:

Main

Horsepower	2 HP
Phase	Single-Phase
Amps	10A
Speed	1725 RPM
Type	TEFC Capacitor-Start Induction
Power Transfer	Belt Drive
Bearings	Shielded & Permanently Sealed
Centrifugal Switch/Contacts Type	External

Main Specifications:

Operation Info

Swing Over Bed	13 in.
Distance Between Centers	40 in.
Swing Over Cross Slide	7-3/4 in.
Swing Over Saddle	7-3/4 in.
Swing Over Gap	18-3/4 in.
Maximum Tool Bit Size	5/8 in.
Compound Travel	2-7/8 in.
Carriage Travel	35 in.
Cross Slide Travel	6-1/8 in.

Headstock Info

Spindle Bore	1.5 in.
Spindle Taper	MT#5
Number of Spindle Speeds	8
Spindle Speeds	70 – 2000 RPM
Spindle Type	D1-4 Camlock
Spindle Bearings	Tapered Roller
Spindle Length	16 in.
Spindle Length with 3-Jaw Chuck	20 in.
Spindle Length with 4-Jaw Chuck	20-3/8 in

Tailstock Info

Tailstock Quill Travel	3-3/8 in.
Tailstock Taper	MT#3
Tailstock Barrel Diameter	1.25 in.

Threading Info

Number of Longitudinal Feeds	20
Range of Longitudinal Feeds	0.0026 – 0.04 in./rev.
Number of Cross Feeds	20
Range of Cross Feeds	0.0007 – 0.011 in./rev.
Number of Inch Threads	36
Range of Inch Threads	3-1/2 – 80 TPI
Number of Metric Threads	27
Range of Metric Threads	0.45 – 10 mm
Number of Modular Pitches	20
Range of Modular Pitches	0.25 – 5 MP
Number of Diametral Pitches	32
Range of Diametral Pitches	7 – 160 DP

Dimensions

Bed Width	7-3/8 in.
Carriage Leadscrew Diameter	7/8 in.
Leadscrew TPI	8 TPI
Carriage Leadscrew Length	52 in.
Faceplate Size	12 in.
Feed Rod Diameter	3/4 in.
Floor to Center Height	46-1/2 in.

Construction

Base	Cast Iron
Headstock	Cast Iron
End Gears	Flame-Hardened Steel
Bed	Induction-Hardened, Precision-Ground Cast Iron
Body	Cast Iron
Stand	Cast Iron
Paint Type/Finish	Epoxy

Fluid Capacities

Headstock Capacity	4.2 qt.
Headstock Fluid Type	ISO 32 (eg. Grizzly T23963, Mobil DTE Light)
Gearbox Capacity	2.1 qt.
Gearbox Fluid Type	ISO 68 (eg. Grizzly T23962, Mobil Vactra 2)
Apron Capacity	1 qt.

Other Specifications:

Country of Origin	China
Warranty	1 Year
Serial Number Location	ID Label on Front Lower Right of Headstock
ISO 9001 Factory	Yes

SECTION 1: SAFETY

For Your Own Safety, Read Instruction Manual Before Operating This Machine

The purpose of safety symbols is to attract your attention to possible hazardous conditions. This manual uses a series of symbols and signal words intended to convey the level of importance of the safety messages. The progression of symbols is described below. Remember that safety messages by themselves do not eliminate danger and are not a substitute for proper accident prevention measures. Always use common sense and good judgment.

⚠DANGER **Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.**

⚠WARNING **Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.**

⚠CAUTION **Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.**

NOTICE **This symbol is used to alert the user to useful information about proper operation of the machine.**

Safety Instructions for Machinery

⚠WARNING

OWNER'S MANUAL. Read and understand this owner's manual BEFORE using machine.

TRAINED OPERATORS ONLY. Untrained operators have a higher risk of being hurt or killed. Only allow trained/supervised people to use this machine. When machine is not being used, disconnect power, remove switch keys, or lock-out machine to prevent unauthorized use—especially around children. Make your workshop kid proof!

DANGEROUS ENVIRONMENTS. Do not use machinery in areas that are wet, cluttered, or have poor lighting. Operating machinery in these areas greatly increases the risk of accidents and injury.

MENTAL ALERTNESS REQUIRED. Full mental alertness is required for safe operation of machinery. Never operate under the influence of drugs or alcohol, when tired, or when distracted.

ELECTRICAL EQUIPMENT INJURY RISKS. You can be shocked, burned, or killed by touching live electrical components or improperly grounded machinery. To reduce this risk, only allow qualified service personnel to do electrical installation or repair work, and always disconnect power before accessing or exposing electrical equipment.

DISCONNECT POWER FIRST. Always disconnect machine from power supply BEFORE making adjustments, changing tooling, or servicing machine. This prevents an injury risk from unintended startup or contact with live electrical components.

EYE PROTECTION. Always wear ANSI-approved safety glasses or a face shield when operating or observing machinery to reduce the risk of eye injury or blindness from flying particles. Everyday eyeglasses are NOT approved safety glasses.

⚠WARNING

WEARING PROPER APPAREL. Do not wear clothing, apparel or jewelry that can become entangled in moving parts. Always tie back or cover long hair. Wear non-slip footwear to reduce risk of slipping and losing control or accidentally contacting cutting tool or moving parts.

HAZARDOUS DUST. Dust created by machinery operations may cause cancer, birth defects, or long-term respiratory damage. Be aware of dust hazards associated with each workpiece material. Always wear a NIOSH-approved respirator to reduce your risk.

HEARING PROTECTION. Always wear hearing protection when operating or observing loud machinery. Extended exposure to this noise without hearing protection can cause permanent hearing loss.

REMOVE ADJUSTING TOOLS. Tools left on machinery can become dangerous projectiles upon startup. Never leave chuck keys, wrenches, or any other tools on machine. Always verify removal before starting!

USE CORRECT TOOL FOR THE JOB. Only use this tool for its intended purpose—do not force it or an attachment to do a job for which it was not designed. Never make unapproved modifications—modifying tool or using it differently than intended may result in malfunction or mechanical failure that can lead to personal injury or death!

AWKWARD POSITIONS. Keep proper footing and balance at all times when operating machine. Do not overreach! Avoid awkward hand positions that make workpiece control difficult or increase the risk of accidental injury.

CHILDREN & BYSTANDERS. Keep children and bystanders at a safe distance from the work area. Stop using machine if they become a distraction.

GUARDS & COVERS. Guards and covers reduce accidental contact with moving parts or flying debris. Make sure they are properly installed, undamaged, and working correctly BEFORE operating machine.

FORCING MACHINERY. Do not force machine. It will do the job safer and better at the rate for which it was designed.

NEVER STAND ON MACHINE. Serious injury may occur if machine is tipped or if the cutting tool is unintentionally contacted.

STABLE MACHINE. Unexpected movement during operation greatly increases risk of injury or loss of control. Before starting, verify machine is stable and mobile base (if used) is locked.

USE RECOMMENDED ACCESSORIES. Consult this owner's manual or the manufacturer for recommended accessories. Using improper accessories will increase the risk of serious injury.

UNATTENDED OPERATION. To reduce the risk of accidental injury, turn machine ***OFF*** and ensure all moving parts completely stop before walking away. Never leave machine running while unattended.

MAINTAIN WITH CARE. Follow all maintenance instructions and lubrication schedules to keep machine in good working condition. A machine that is improperly maintained could malfunction, leading to serious personal injury or death.

DAMAGED PARTS. Regularly inspect machine for damaged, loose, or mis-adjusted parts—or any condition that could affect safe operation. Immediately repair/replace BEFORE operating machine. For your own safety, DO NOT operate machine with damaged parts!

MAINTAIN POWER CORDS. When disconnecting cord-connected machines from power, grab and pull the plug—NOT the cord. Pulling the cord may damage the wires inside. Do not handle cord/plug with wet hands. Avoid cord damage by keeping it away from heated surfaces, high traffic areas, harsh chemicals, and wet/damp locations.

EXPERIENCING DIFFICULTIES. If at any time you experience difficulties performing the intended operation, stop using the machine! Contact our Technical Support at (570) 546-9663.

Additional Safety for Metal Lathes

⚠WARNING

Serious injury or death can occur from getting entangled in, crushed between, or struck by rotating parts on a lathe! Unsecured tools or workpieces that fly loose from rotating objects can also strike nearby operators with deadly force. To minimize the risk of getting hurt or killed, anyone operating this machine MUST completely heed the hazards and warnings below.

CLOTHING, JEWELRY & LONG HAIR. Tie back long hair, remove jewelry, and do not wear loose clothing or gloves. These can easily get caught on rotating parts and pull you into lathe.

ROTATING PARTS. Always keep hands and body at a safe distance from rotating parts—especially those with projecting surfaces. Never hold anything against rotating workpiece, such as emery cloth, that can pull you into lathe.

GUARDING. Guards and covers protect against entanglement or flying objects. Always ensure they are properly installed while machine is running.

ADJUSTMENT TOOLS. Remove all chuck keys, wrenches, and adjustment tools before turning lathe ***ON***. A tool left on the lathe can become a deadly projectile when spindle is started.

SAFE CLEARANCES. Before starting spindle, verify workpiece has adequate clearance by hand-rotating it through its entire range of motion.

NEW SETUPS. Test each new setup by starting spindle rotation at the lowest speed and standing to the side of the lathe until workpiece reaches full speed and you can verify safe rotation.

SPINDLE SPEEDS. Using spindle speeds that are too fast for the workpiece or clamping equipment can cause rotating parts to come loose and strike nearby people with deadly force. Always use slow spindle speeds with large or non-concentric workpieces. Never exceed rated RPM of the chuck.

LONG STOCK SAFETY. Long stock can whip violently if not properly supported. Always support any stock that extends from the chuck/headstock more than three times its own diameter.

CLEARING CHIPS. Metal chips can be razor sharp. Avoid clearing them by hand or with a rag. Use a brush or vacuum instead.

SECURE WORKPIECE. An improperly secured workpiece can fly off spindle with deadly force. Make sure workpiece is properly secured before starting the lathe.

CHUCKS. Chucks can be heavy and difficult to hold. During installation and removal, protect your hands and precision bed ways by using a chuck cradle or piece of plywood over the bed ways. Use lifting equipment, as necessary, for large chucks.

STOPPING SPINDLE. Always allow spindle to completely stop on its own, or use a brake, if provided. Never put hands or another object on a spinning workpiece to make it stop faster.

CRASHING. A serious explosion of metal parts can occur if cutting tool or other lathe component hits rotating chuck or a projecting part of workpiece. Resulting metal fragments can strike nearby people and lathe will be seriously damaged. To reduce risk of crashing, ALWAYS release automatic feeds after use, NEVER leave lathe unattended, and CHECK all clearances before starting lathe.

COOLANT SAFETY. Coolant can become very toxic through prolonged use and aging. To minimize toxicity, change coolant regularly. When using, position nozzle properly to avoid splashing operator or causing a slipping hazard on floor.

TOOL SELECTION. Cutting with incorrect or dull tooling increases risk of injury from broken or dislodged components, or as a result of extra force required for operation. Always use sharp tooling that is right for the job.

SANDING/POLISHING. To reduce risk of entanglement, never wrap emery cloth around rotating workpiece. Instead, use emery cloth with the aid of a tool or backing board.

MEASURING WORKPIECE. To reduce risk of entanglement, never measure rotating workpieces.

Additional Chuck Safety

⚠WARNING

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/follow 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.

Glossary of Terms

The following is a list of common definitions, terms and phrases used throughout this manual as they relate to this lathe and metalworking in general. Become familiar with these terms for assembling, adjusting or operating this machine. Your safety is **VERY** important to us at Grizzly!

Arbor: A machine shaft that supports a cutting tool.

Backlash: Wear in a screw or gear mechanism that may result in slippage, vibration, and loss of tolerance.

Carriage: A main housing that consists of the apron and the saddle.

Cross Slide: A fixture attached to the lathe carriage that holds the compound rest and can be moved in and out.

Compound Rest: A fixture attached to the cross slide that holds the tool holder and can be moved in and out.

Cutting Speed: The distance the point on a cutter moves in one minute, expressed in meters or feet per minute.

Dial Indicator: An instrument used in setup and inspection work that shows on a dial the amount of error in size or alignment of a part.

Facing: In lathe work, cutting across the end of a workpiece, usually to machine a flat surface.

Feed: The movement of a cutting tool into a workpiece.

Fixture: A device that securely holds the workpiece in place during cutting operation as opposed to a jig, which is used to hold and guide a workpiece through an operation.

Gib: A tapered wedge located along a sliding component to take up wear and to ensure a proper fit.

Headstock: The major lathe component that houses the spindle and motor drive system to turn the workpiece.

Lathe Center: A lathe accessory with a 60° point which is inserted into the headstock or tailstock of the lathe and is used to support the workpiece.

Leadscrew: The long screw that is driven by the change gears and supplies power to the carriage. Also, screws driven by handwheels and supply power to the cross slide, compound rest, and tailstock.

Saddle: The upper portion of carriage that rides on the lathe ways and supports the cross feed and the follow rest.

Spindle: The revolving shaft that holds and drives the workpiece or cutting tool.

Tailstock: A moveable fixture opposite of the headstock on a lathe that has a spindle used to support one end of a workpiece and for holding tools.

Tool Post: The part of the compound rest that holds the tool holder.

Ways: The precision machined and flat tracks on a lathe on which the carriage and tailstock slide.

SECTION 2: POWER SUPPLY

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 and standards.

⚠WARNING

Electrocution, fire, shock, or equipment damage may occur if machine is not properly grounded and connected to power supply.

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 Current Rating at 220V ..... 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 specified circuit requirements.

Circuit Requirements for 220V

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

Nominal Voltage 208V, 220V, 230V, 240V
Cycle ..... 60 Hz
Phase ..... Single Phase
Circuit Rating ..... 15 Amps
Plug/Receptacle ..... NEMA 6-15
Cord ..... "S"-Type , 3-Wire, 14 AWG, 300VAC

A power supply circuit includes all electrical equipment between the breaker box or fuse panel in the building and the machine. The power supply circuit used for this machine must be sized to safely handle the full-load current 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.)

⚠CAUTION

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

Note: *Circuit requirements in this manual apply to a dedicated circuit—where only one machine will be running on the circuit at a time. If machine will be connected to a shared circuit where multiple machines may be running at the same time, consult an electrician or qualified service personnel to ensure circuit is properly sized for safe operation.*

Grounding Instructions

This machine MUST be grounded. In the event of certain malfunctions or breakdowns, grounding reduces the risk of electric shock by providing a path of least resistance for electric current.

The power cord and plug specified under "Circuit Requirements for 220V" on the previous page has an equipment-grounding wire and a grounding prong. 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 (see figure below).

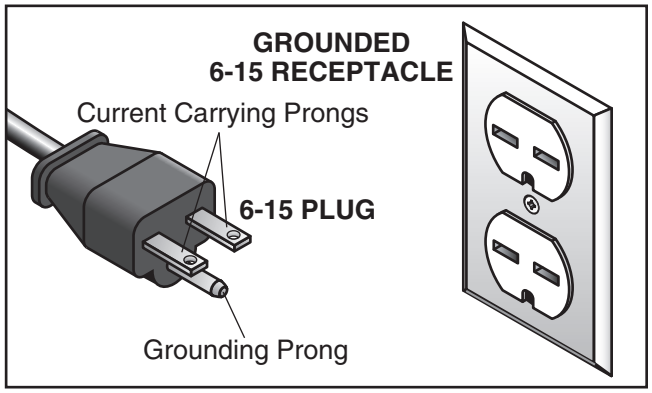
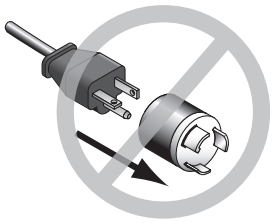


Figure 7. NEMA 6-15 plug and receptacle.

⚠CAUTION



No adapter should be used with plug. If plug does not fit available receptacle, or if machine must be reconnected for use on a different type of circuit, reconnection must be performed by an electrician or qualified service personnel, and it must comply with all local codes and ordinances.

⚠WARNING

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

Improper connection of the equipment-grounding wire can result in a risk of electric shock. The wire with green insulation (with or without yellow stripes) is the equipment-grounding wire. If repair or replacement of the power cord or plug is necessary, do not connect the equipment-grounding wire to a live (current carrying) terminal.

Check with a qualified electrician or service personnel if you do not understand these grounding requirements, or if you are in doubt about whether the tool is properly grounded. If you ever notice that a cord or plug is damaged or worn, disconnect it from power, and immediately replace it with a new one.

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 can damage electrical components and shorten motor life. Voltage drop increases as the extension cord size gets longer and the gauge size gets smaller (higher gauge numbers indicate smaller sizes).

Any extension cord used with this machine must be in good condition and contain a ground wire and matching plug/receptacle. Additionally, it must meet the following size requirements:

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

SECTION 3: SETUP

Preparation

The list below outlines the basic process of preparing your machine for operation. Specific steps are covered later in this section.

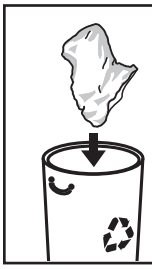
The typical preparation process is as follows:

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

Unpacking

This machine was carefully packaged for safe transport. When unpacking, separate all enclosed items from packaging materials and inspect them for shipping damage. ***If items are damaged, please call us immediately at (570) 546-9663.***

IMPORTANT: Save all packaging materials until you are completely satisfied with the machine and have resolved any issues between Grizzly or the shipping agent. *You MUST have the original packaging to file a freight claim. It is also extremely helpful if you need to return your machine later.*



⚠WARNING

SUFFOCATION HAZARD!
Keep children and pets away from plastic bags or packing materials shipped with this machine. Discard immediately.

Needed for Setup

The following are needed to complete the setup process, but are not included with your machine.

- **For Lifting and Moving:**
  —A forklift or other power lifting device rated for at least 2000 lbs.
  —Two lifting straps rated for at least 2000 lbs. each
  —Two lengths of 1¼" diameter x 44" long steel barstock
  —Two people to guide machine

- **For Power Connection:**
  —A power source that meets the minimum circuit requirements for this machine (review **Power Supply** on **Page 14** for details)
  —An electrician or qualified service personnel to ensure a safe and code-compliant connection to the power source

- **For Assembly:**
  —Shop rags
  —Cleaner/degreaser (see **Page 18**)
  —Quality metal protectant lubricant
  —Safety glasses for each person
  —Floor mounting hardware as needed (see **Page 21**)
  —Precision level at least 12" long

Inventory

The following is a list of items shipped with your machine. Before beginning setup, lay these items out and inventory them.

If any non-proprietary parts are missing (e.g. a nut or a washer), we will gladly replace them; or for the sake of expediency, replacements can be obtained at your local hardware store.

Mounted Inventory Components	Qty
A. Three-Jaw Chuck 6"	1
B. Steady Rest	1
C. Follow Rest	1
D. Tool Post	1
E. Change Gears 32T, 85T, 100T	1 Ea.

Loose Inventory Components	Qty
F. Faceplate w/Driveplate	1
G. Four-Jaw Chuck Kit	1
H. Toolbox	1

Toolbox Inventory Components	Qty
I. Camlock Key 10mm	1
J. Drill Chuck Arbor MT#3/B16	1
K. Drill Chuck B16 1.5–13mm	1
L. Tool Post T-Wrench	1
M. Hex Wrenches 2.5, 3, 4, 5, 6, 8mm	1 Ea.
N. Change Gears 35T, 42T, 44T, 46T, 48T, 52T, 55T, 120/127T	1 Ea.
O. Bottle for Oil	1
P. Live Center MT#3	1
Q. Dead Center MT#3 HSS Tip	1
R. Dead Center MT#3 Carbide Tip	1
S. Spindle Sleeve MT#5 x MT#3	1
T. Open-End Wrenches 9/11, 10/12, 12/14, 17/19mm	1 Ea.
U. Flat Head Screwdriver 3"	1
V. Phillips Screwdriver 3"	1
W. Handwheel Handles	2

NOTICE

If you cannot find an item on this list, carefully check around/inside the machine and packaging materials. Often, these items get lost in packaging materials while unpacking or they are pre-installed at the factory.

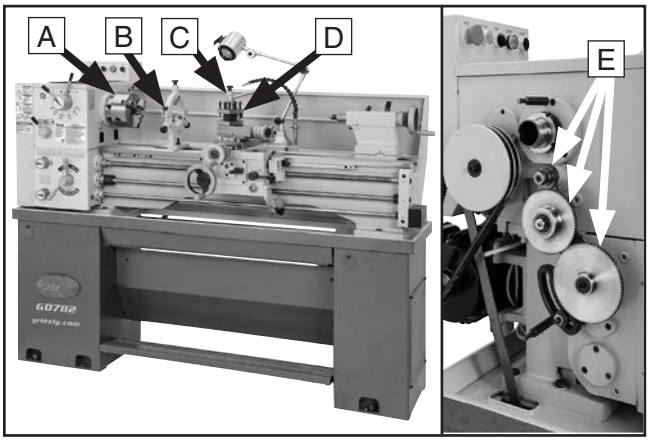


Figure 8. Mounted inventory components.

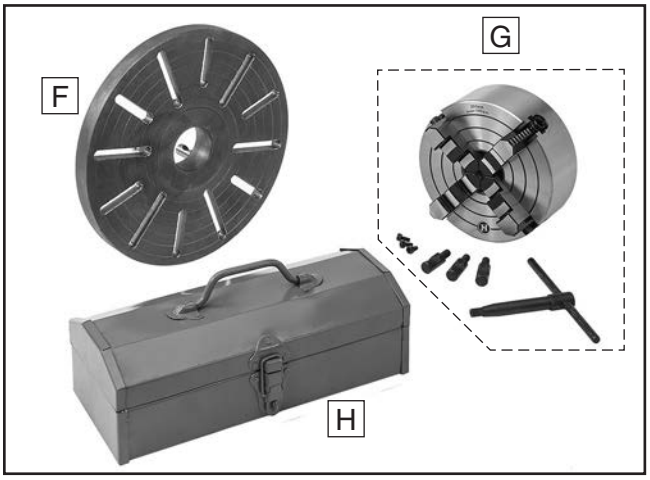


Figure 9. Loose inventory components.

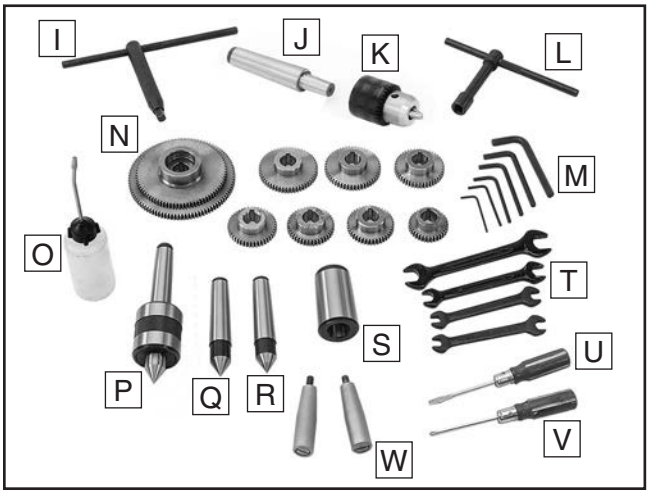


Figure 10. Toolbox inventory.

Cleanup

The unpainted surfaces of your machine are coated with a heavy-duty rust preventative that prevents corrosion during shipment and storage. This rust preventative works extremely well, but it will take a little time to clean.

Be patient and do a thorough job cleaning your machine. The time you spend doing this now will give you a better appreciation for the proper care of your machine's unpainted surfaces.

There are many ways to remove this rust preventative, but the following steps work well in a wide variety of situations. Always follow the manufacturer's instructions with any cleaning product you use and make sure you work in a well-ventilated area to minimize exposure to toxic fumes.

Before cleaning, gather the following:
- Disposable rags
- Cleaner/degreaser (WD•40 works well)
- Safety glasses & disposable gloves
- Plastic paint scraper (optional)

Basic steps for removing rust preventative:

1. Put on safety glasses.

2. Coat the rust preventative with a liberal amount of cleaner/degreaser, then let it soak for 5–10 minutes.

3. Wipe off the surfaces. If your cleaner/degreaser is effective, the rust preventative will wipe off easily. If you have a plastic paint scraper, scrape off as much as you can first, then wipe off the rest with the rag.

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

⚠WARNING

Gasoline and petroleum products have low flash points and can explode or cause fire if used to clean machinery. Avoid using these products to clean machinery.

⚠CAUTION

Many cleaning solvents are toxic if inhaled. Only work in a well-ventilated area.

NOTICE

Avoid chlorine-based solvents, such as acetone or brake parts cleaner, that may damage painted surfaces.

T23692—Orange Power Degreaser
A great product for removing the waxy shipping grease from your machine during clean up.

Figure 11. T23692 Orange Power Degreaser.

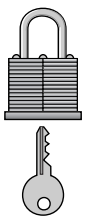
Site Considerations

Weight Load

Refer to the **Machine Data Sheet** 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. **See below for required space allocation.**



⚠CAUTION

Children or untrained people may be seriously injured by this machine. Only install in an access restricted location.

Physical Environment

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

Electrical Installation

Place this machine near an existing power source. Make sure all power cords are protected from traffic, material handling, moisture, chemicals, or other hazards. Make sure to leave enough space around machine to disconnect power supply or apply a lockout/tagout device, if required.

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.

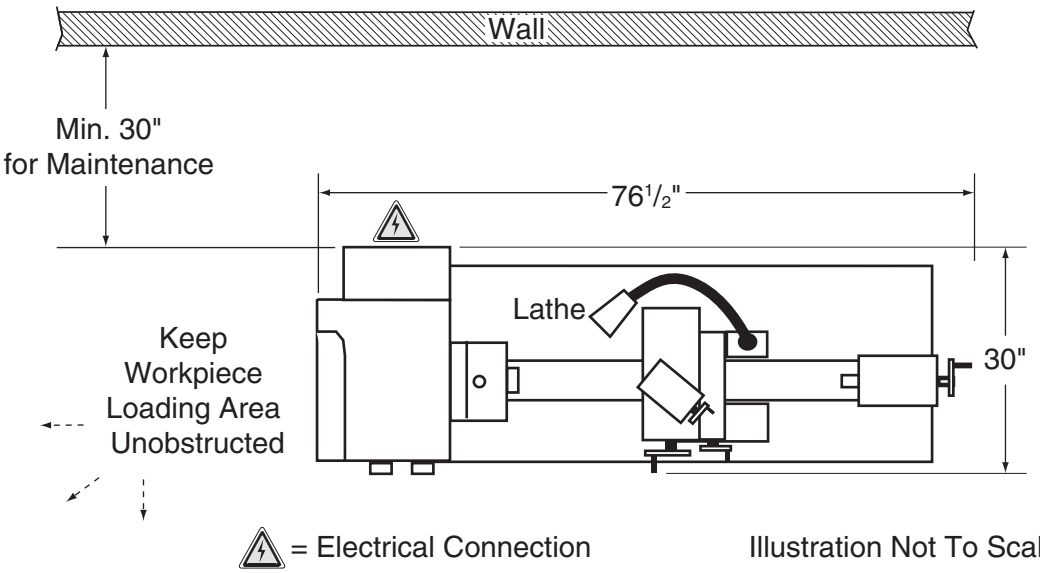


Figure 12. Minimum working clearances.

Lifting & Placing

⚠WARNING

HEAVY LIFT!

Straining or crushing injury may occur from improperly lifting machine or some of its parts. To reduce this risk, get help from other people and use a forklift (or other lifting equipment) rated for weight of this machine.

Do not attempt to lift or move this lathe without using the proper lifting equipment (such as forklift or crane) or the necessary assistance from other people. Each piece of lifting equipment must be rated for at least 2000 lbs. to support dynamic loads that may be applied while lifting. Refer to **Needed for Setup** on **Page 16** for details.

To lift and move lathe:

1. Remove shipping crate top and sides, then remove small components from shipping pallet.

2. Move lathe to its prepared location while it is still attached to shipping pallet.

3. Unbolt lathe from shipping pallet.

4. To balance load for lifting, move tailstock and carriage to extreme right end of bedway, then lock them in place.

   Note: *Before attempting to move the carriage, make sure the carriage lock is loose, the half nut is disengaged, and the power feed is disengaged, using the feed selection lever (see **Page 5** for reference).*

5. Remove back splash so it does not get damaged when lathe is raised.

6. Insert round steel bar stock through four lifting holes (see **Figure 13**).

   Note: *To properly support the lathe and avoid damaging lathe components, bar stock should be at least 1¼" diameter thick and 44" long, so it projects 14" from both sides of the lathe when installed.*

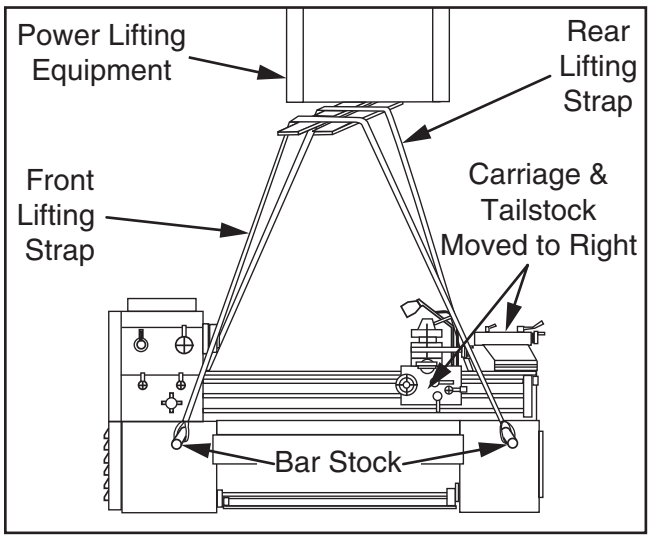


Figure 13. Example of lathe setup for lifting.

7. Attach lifting straps to bar stock and power lifting equipment (see **Figure 13**). Make sure there is enough space between straps and control rod, feed rod, leadscrew and electrical cabinet to prevent putting pressure on these components when lifting.

8. Raise lathe a couple of inches and check balance of load. Have two other people carefully steady lathe to help prevent it from swinging.

   —If load is not safely balanced, immediately lower lathe and resolve issue before attempting to lift it again.

9. Raise lathe enough to clear shipping pallet and carefully remove pallet.

10. Lower lathe into position.

11. Re-install back splash.

Anchoring to Floor

Number of Mounting Holes 6
Diameter of Mounting Hardware..... 5/8"

Anchoring machinery to the floor prevents tipping or shifting and reduces vibration that may occur during operation, resulting in a machine that runs slightly quieter and feels more solid.

If the machine will be installed in a commercial or workplace setting, or if it is permanently connected (hardwired) to the power supply, local codes may require that it be anchored to the floor.

If not required by any local codes, fastening the machine to the floor is an optional step. If you choose not to do this with your machine, we recommend placing it on machine mounts, as these provide an easy method for leveling and they have vibration-absorbing pads.

Anchoring to Concrete Floors

Lag shield anchors with lag screws (see below) are a popular way to anchor machinery to a concrete floor, because the anchors sit flush with the floor surface, making it easy to unbolt and move the machine later, if needed. However, anytime local codes apply, you MUST follow the anchoring methodology specified by the code.

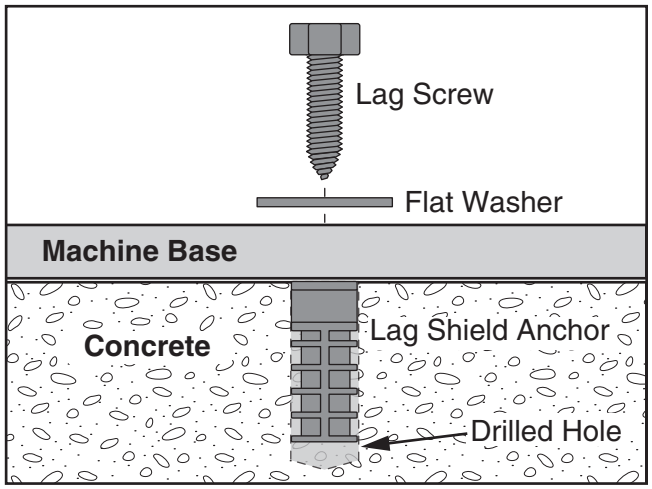


Figure 14. Popular method for anchoring machinery to a concrete floor.

Leveling

NOTICE

For accurate turning results and to prevent warping the cast iron bed and ways, the lathe bedways MUST be leveled from side to side and from front to back on both ends.

Recheck the bedways 24 hours after installation, two weeks after that, and then annually to make sure they remain level.

Leveling machinery helps precision components, such as bedways, remain straight and flat during the lifespan of the machine. Components on a machine that is not level may slowly twist due to the dynamic loads placed on the machine during operation.

If needed, use metal shims between the lathe bed and chip pan when leveling the machine.

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 offered by Grizzly.

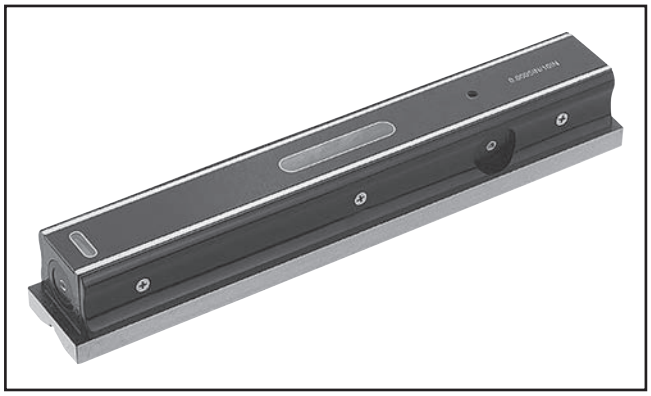


Figure 15. Model H2683 Precision Level.

Lubricating Lathe

The headstock, gearbox, and apron oil reservoirs must have the proper amount of oil in them before the lathe can be operated.

Damage caused to the bearings and gears from running the lathe without oil in the reservoirs will not be covered under warranty. Refer to the **Lubrication** section, beginning on **Page 63**, for checking and adding oil.

In addition to the reservoirs, we also recommend that you lubricate all other points on the machine at this time. To do this, follow the steps provided in the maintenance schedule on **Page 62**.

Note: *If this lathe was shipped with oil in the reservoirs, do not change that oil until after the* ***Test Run*** *and* ***Spindle Break-In*** *procedures.*

Adding Coolant

Add the coolant of your choice now. For detailed instructions on where the coolant tank is located and how to add fluid, refer to **Coolant System Service** on **Page 56**.

Power Connection

⚠WARNING

Electrocution or fire may occur if machine is ungrounded, incorrectly connected to power, or connected to an undersized circuit. Use an electrician or a qualified service personnel to ensure a safe power connection.

Before the machine can be connected to the power supply, there must be an electrical circuit that meets the **Circuit Requirements for 220V** on **Page 14**.

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.

Note About Extension Cords: *Using an incorrectly sized extension cord may decrease the life of electrical components on your machine. Refer to* ***Extension Cords*** *on* ***Page 15*** *for more information.*

To connect power cord to lathe:

1. Press Emergency Stop/RESET button on front of headstock, then remove electrical box cover from back.

2. Thread power cord through strain relief shown in **Figure 16**.

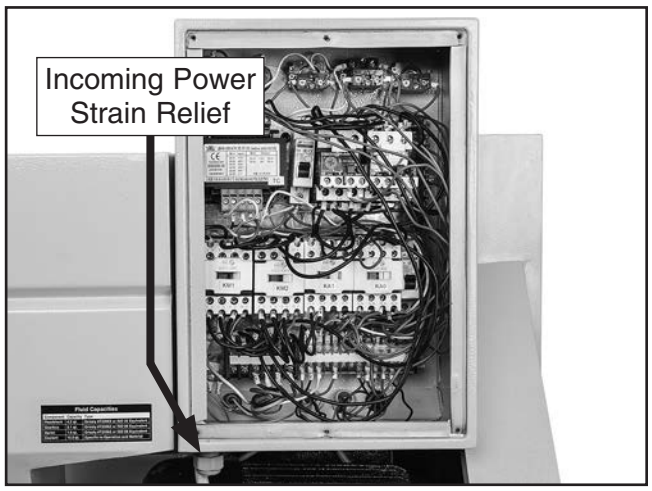


Figure 16. Location of hot wire terminals, ground terminal and strain relief.

3. Identify **L1** and **L2** terminals and grounding plate, shown in **Figure 17**, then connect incoming hot wires and ground wire to those terminals**.**

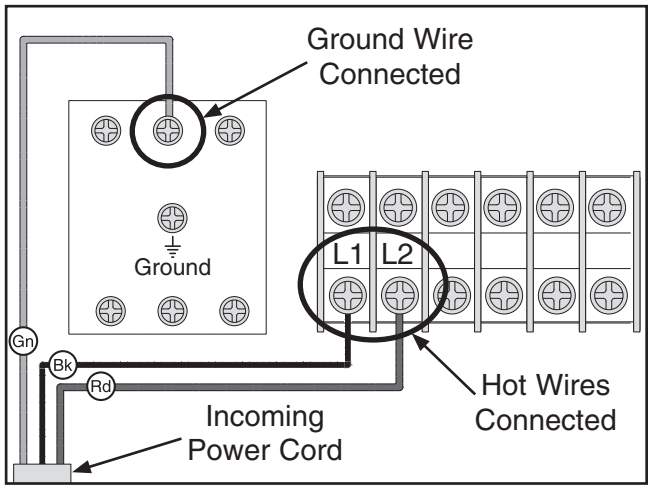


Figure 17. Incoming ground and hot wires connected.

4. Make sure wires have enough slack between strain relief and terminal connections so they are not pulled tight or stretched, then tighten strain relief to secure cord.

   Note: *The strain relief must be tightened against the outer jacket of the cord. Avoid over-tightening the strain relief or it may crush the cord and cause a short.*

5. Test strain relief to ensure it is properly tightened by pulling cord from outside box with light-to-moderate force. When strain relief is properly tightened, cord will not move inside cabinet.

6. Install a NEMA 6-15 plug on other end of power cord per plug manufacturer's instructions.

7. Re-install main electrical box cover.

NOTICE

To avoid unexpected start-up, keep Emergency Stop/RESET button pressed in until instructed otherwise in Test Run.

8. Plug cord into matching power supply receptacle and power source as specified in **Circuit Requirements for 220V** on **Page 14**.

Test Run

Once assembly is complete, test run the machine to ensure it is properly connected to power and safety components are functioning correctly.

If you find an unusual problem during the test run, immediately stop the machine, disconnect it from power, and fix the problem BEFORE operating the machine again. The **Troubleshooting** table in the **SERVICE** section of this manual can help.

⚠WARNING

Serious injury or death can result from using this machine BEFORE understanding its controls and related safety information. DO NOT operate, or allow others to operate, machine until the information is understood.

⚠WARNING

DO NOT start machine until all preceding setup instructions have been performed. Operating an improperly set up machine may result in malfunction or unexpected results that can lead to serious injury, death, or machine/property damage.

The test run consists of verifying:

- The motor powers up and runs correctly
- The safety features work correctly
- The brake system works correctly
- The lamp works correctly
- The coolant system works correctly

To test run machine:

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

2. Clear away all tools and objects used during assembly, lubrication, and preparation.

3. Secure chuck and jaws, if installed (refer to **Chuck Installation** on **Page 29**).

   Note: *If a chuck is not installed on the lathe, you do not need to install one for this test.*

4. Push Emergency Stop/RESET button on control panel (see **Figure 18**), and point coolant nozzle into chip pan.

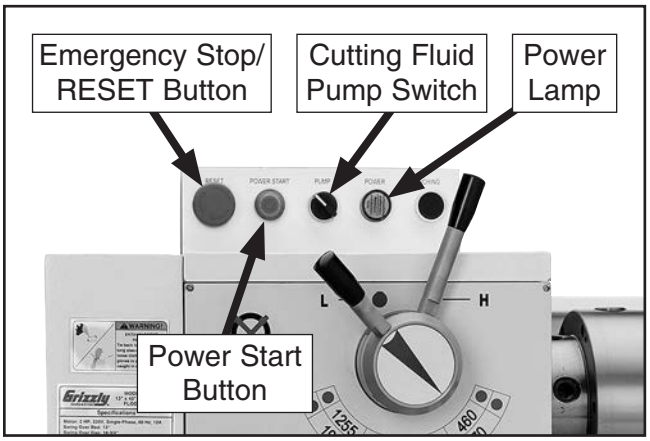


Figure 18. Control panel buttons used in test run.

Note: *In the next step, you may need to rock the chuck back and forth to cause the gears to mesh as you make the adjustments.*

5. Set spindle speed to 70 RPM as follows:

   a. Position spindle range lever all the way to left, so it aligns with "L" on headstock (see **Figure 19**).

   b. Position spindle speed lever so arrow points to "70" on headstock (see **Figure 19**).

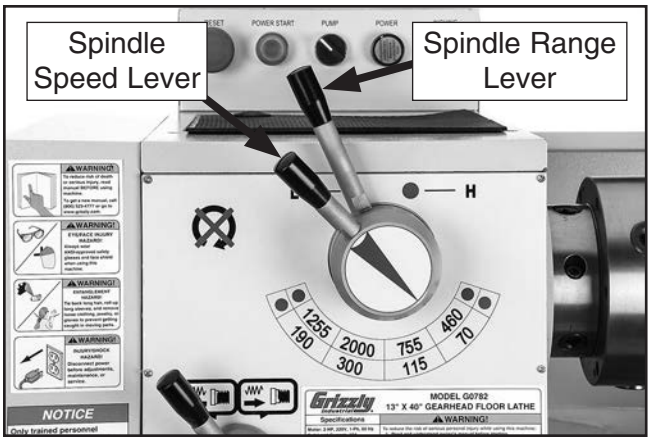


Figure 19. Spindle speed set to 70 RPM.

6. Make sure spindle lever is in middle (OFF) position to prevent unexpected startup when power is enabled (see **Figure 20**).

7. To ensure carriage components do not unexpectedly move during following steps, disengage half nut lever and feed selection lever (see **Figure 20**).

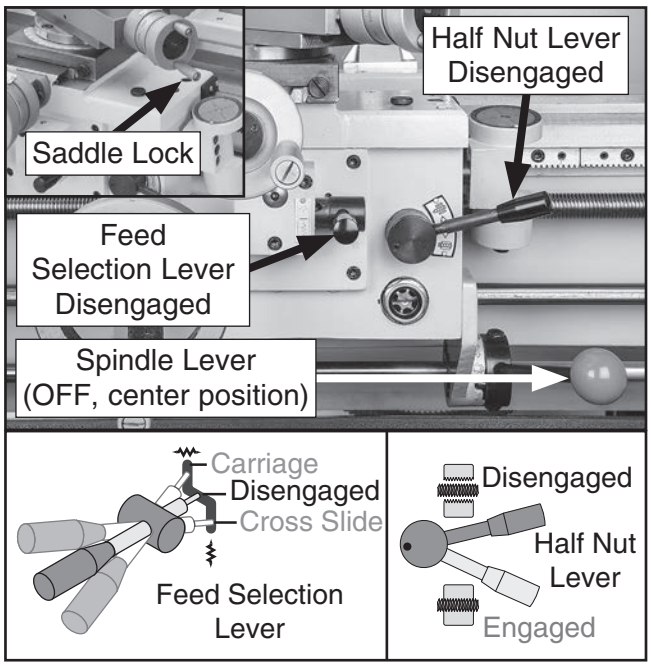


Figure 20. Apron controls.

8. Rotate Emergency Stop/RESET button clockwise until it pops out. The power lamp on the control panel should illuminate (see **Figure 18** on **Page 24**).

9. Push POWER START button shown in **Figure 18** on **Page 24** (it should illuminate), then move spindle lever down to start lathe. Top of chuck should rotate down toward front of lathe. Verify that machine is operating correctly.

   —When operating correctly, the lathe 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. If problem is not readily apparent, refer to **Troubleshooting** on **Page 71**.

10. Press Emergency Stop/RESET button to turn lathe ***OFF***, then, without resetting Emergency Stop/RESET button, try to restart spindle rotation, as instructed in **Step 9**. Spindle should *not* start.

    —If spindle rotation *does* start with the Emergency Stop/RESET button pressed in, Emergency Stop/RESET button is not operating correctly. This safety feature must operate properly before continuing operation. Use the spindle lever to stop the lathe, disconnect it from power, and call Tech Support for help.

11. Move spindle lever to middle (OFF) position, and reset Emergency Stop/RESET button by twisting it clockwise until it pops out.

12. Restart spindle rotation.

13. Step on foot brake. Spindle should come to a quick stop.

    —If the brake pedal has no effect on the lathe, push the Emergency Stop/RESET button and call Tech Support for help.

14. Ensure lamp functions properly.

15. Use cutting fluid pump switch on control panel to start pump (see **Figure 18** on **Page 24**), then open valve. Verify that cutting fluid flows from nozzle, then turn pump ***OFF***.

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

Spindle Break-In

The spindle break-in procedure distributes lubrication throughout the bearings to reduce the risk of early bearing failure if there are any "dry" spots or areas where lubrication has settled in the bearings. You ***must*** complete this procedure ***before*** placing operational loads on the spindle for the first time when the machine is new or if it has been sitting idle for longer than 6 months.

Always start the spindle break-in at the lowest speed to minimize wear if there *are* dry spots. Allow the spindle to run long enough to warm up and distribute the bearing grease, then incrementally increase spindle speeds and repeat this process at each speed until reaching the maximum spindle speed. Following the break-in procedure in this progressive manner helps minimize any potential wear that could occur before lubrication is fully distributed.

NOTICE

You must complete this procedure to maintain the warranty. Failure to do this could cause rapid wear-and-tear of spindle bearings once they are placed under load.

To perform spindle break-in:

1. Successfully complete the **Test Run** procedure beginning on **Page 24**.

2. Disengage half nut lever and feed selection lever.

3. Run spindle at 70 RPM for 10 minutes in each direction (first forward, then reverse).

4. Turn lathe ***OFF***. Set spindle speed and range levers for 115 RPM (see **Setting Spindle Speed** on **Page 45** for more information), then run lathe for 5 minutes in each direction.

5. Repeat **Step 4** for following speeds, progressing from lower to higher RPMs:

    - 300 RPM
    - 755 RPM
    - 1255 RPM
    - 2000 RPM

6. Press Emergency Stop/RESET button to turn lathe ***OFF***. Reset switch.

Congratulations! Spindle break-in is complete. We recommend changing the headstock and gearbox oil before operating the machine further (refer to **Lubrication** on **Page 63**).

Recommended Adjustments

The following adjustments have been made at the factory. However, because of the many variables involved with shipping, we recommend you verify these adjustments to ensure the best results.

Factory adjustments that should be verified:

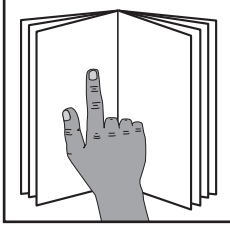
- Tailstock alignment (see **Page 36**).
- Cross slide and compound slide backlash adjustment (see **Page 74**).
- Gib adjustments (see **Page 75**).

SECTION 4: OPERATIONS

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 the machine controls/components discussed later in this manual are easier to understand.

Due to the generic nature of this overview, it is **not** intended to be an instructional guide. To learn more about specific operations, read this entire manual, seek additional training from experienced machine operators, and do additional research outside of this manual by reading "how-to" books, trade magazines, or websites.

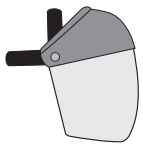


⚠WARNING

To reduce your risk of serious injury, read this entire manual BEFORE using machine.

⚠WARNING

To reduce risk of eye or face injury from flying chips, always wear approved safety glasses and face shield when operating this machine.



NOTICE

If you are not experienced with this type of machine, WE STRONGLY RECOMMEND that you seek additional training outside of this manual. Read books/magazines or get formal training before beginning any projects. Regardless of the content in this section, Grizzly Industrial will not be held liable for accidents caused by lack of training.

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

1. Securely mounts workpiece in lathe.
2. Puts on safety glasses and a face shield, rolls up sleeves, removes jewelry, and secures any clothing, jewelry, or hair that could get entangled in moving parts.
3. Installs tooling, aligns it with workpiece, then backs it away to establish a safe startup clearance.
4. Removes all setup tools from lathe.
5. Checks for safe clearances by rotating workpiece by hand at least one full revolution.
6. Sets correct spindle speed for operation.
7. If using power feed, selects proper feed rate for operation.
8. Resets Emergency Stop/RESET button.
9. Uses spindle lever to start spindle rotation.
10. Uses carriage handwheels or power feed options to move tooling into workpiece for operations.
11. When finished cutting, moves spindle lever to OFF position, presses foot pedal brake to completely stop spindle, presses Emergency Stop/RESET button, then removes workpiece.

Chuck & Faceplate Mounting

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

⚠WARNING

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

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

The included 4-jaw chuck 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.

The included faceplate 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.

Camlock Stud Installation

Follow this procedure to install camlock studs in chucks, faceplates, or drive plates so they can be mounted to the spindle.

Note: *Skip this section if camlock studs are already installed.*

To install camlock studs:

1. Lightly oil threads of each stud.

2. Thread studs until datum line is flush with (or just above) surface and alignment groove is positioned over hole.

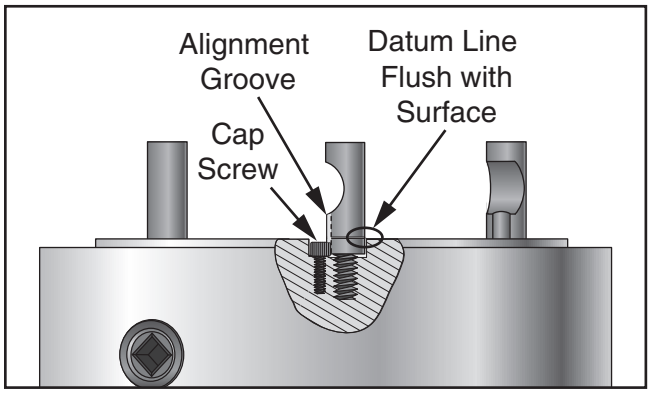


Figure 21. Camlock stud installation.

3. Install a cap screw in hole next to each stud. These cap screws prevent studs from rotating so they properly engage with camlock during installation.

   Note: *It is normal for studs to have a small amount of play or looseness after installing and tightening the cap screws.*

Chuck Safety & Support Devices

Because chucks are heavy and often awkward to hold, some kind of lifting, support, or protective device should be used during installation or removal. The weight and size of the chuck will determine the appropriate device to use (refer to the following figure for examples).

⚠WARNING

Accidentally dropping a chuck can cause amputation, crushing injuries, or property damage. To reduce this risk, always use some kind of lifting, support, or protective device during installation or removal.

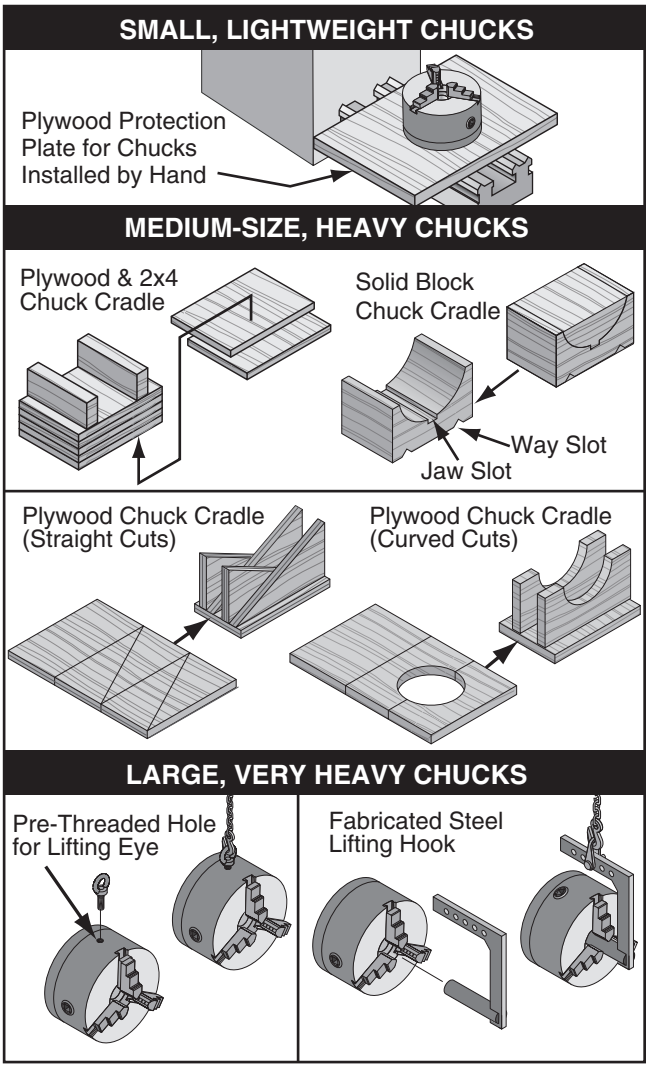


Figure 22. Typical lifting, support, and protective devices used when installing/removing chucks.

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 the chuck is firmly seated against the face of the spindle all the way around—without any gaps.

To install chuck:

1. DISCONNECT MACHINE FROM POWER!

2. Use appropriate lifting, support, or protective device to protect ways and support chuck during installation process (refer to **Chuck Safety & Support Devices**).

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

4. Install chuck by inserting camlock studs straight into spindle cam holes.

   Important: *Avoid inserting the studs by pivoting them in from an angle or rotating the spindle. This can damage studs or spindle cam holes.*

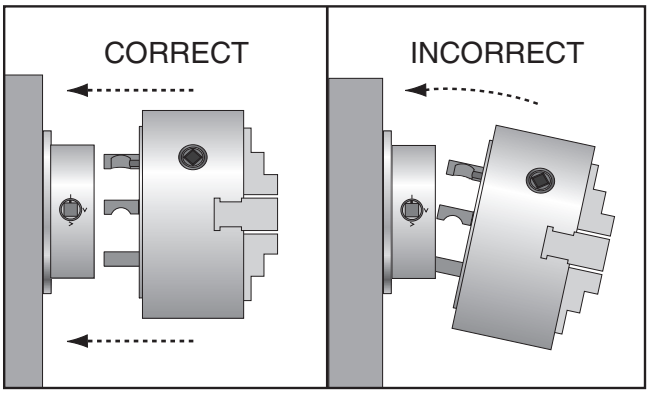


Figure 23. Inserting camlock studs into spindle cam holes.

5. Incrementally tighten camlocks in criss-cross or star pattern to ensure that chuck seats evenly against spindle.

6. When chuck is fully seated and all camlocks are tight, verify that cam line is between the two “V” marks on spindle nose, as shown in following figure.

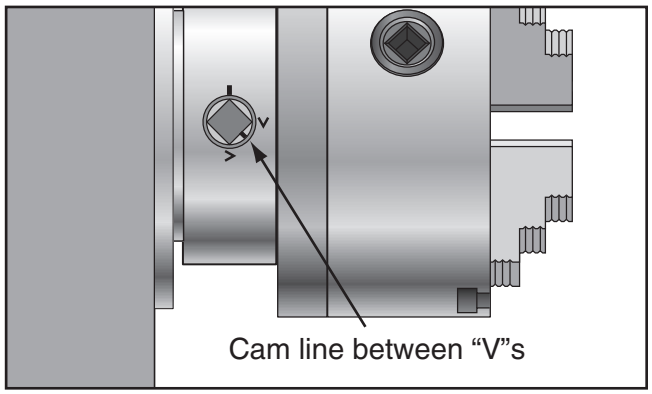


Figure 24. Cam line positioned between the "V" marks after the camlocks are fully tightened.

— If cam line is NOT between "V" marks when camlock is tight, stud may be installed at incorrect height. To fix this, adjust stud height as shown in following figure. Make sure to re-install stud cap screw afterward.

— If adjusting stud height does not correct problem, try swapping stud positions on chuck.

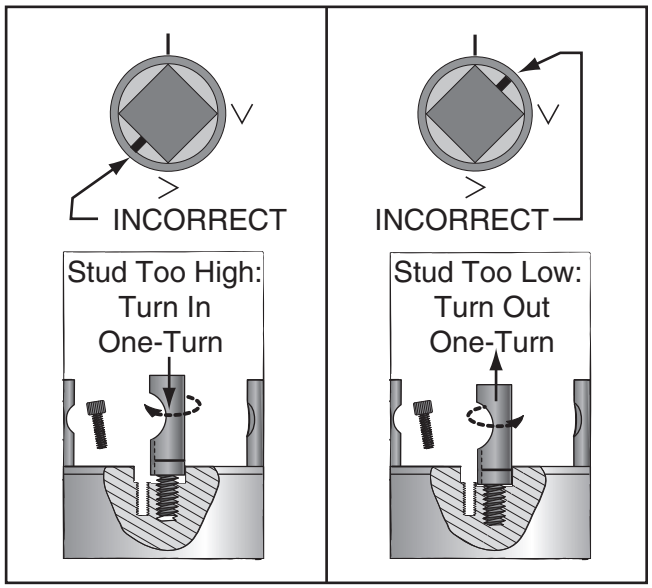


Figure 25. Correcting an improperly installed stud.

7. Verify that chuck fits spindle properly by checking for any gaps between mating surfaces.

— If there is not a gap, proceed to **Step 8**.

— If there *is* a gap, remove chuck, re-clean mating surfaces carefully, and re-install. If problem persists, contact our Tech Support.

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

— If it was necessary to bump chuck or use a mallet to release tapers, then they are seating together properly.

— If tapers released easily with little intervention, they are not seated together firmly as required. Remove chuck, re-clean mating

Registration Marks

Lightly stamp registration marks across the mating seams of chuck components. These marks will help you re-install the chuck in the same position after removal, which ensures consistent chuck balance and turning results, and allows the same camlocks and studs to operate together for consistent locking and unlocking.

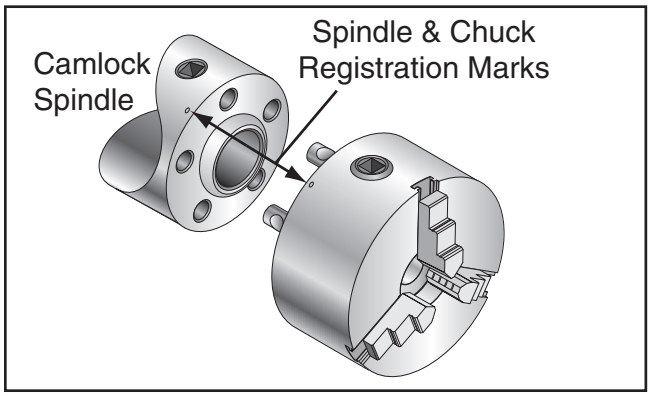


Figure 26. Registration mark locations.

Chuck Removal

To remove chuck:

1. DISCONNECT MACHINE FROM POWER!

2. Use appropriate lifting, support, or protective device to protect ways and support chuck (refer to **Chuck Safety & Support Devices** section for more details).

3. Loosen camlocks by turning key counter-clockwise until each cam line is aligned with its corresponding spindle mark, as shown below.

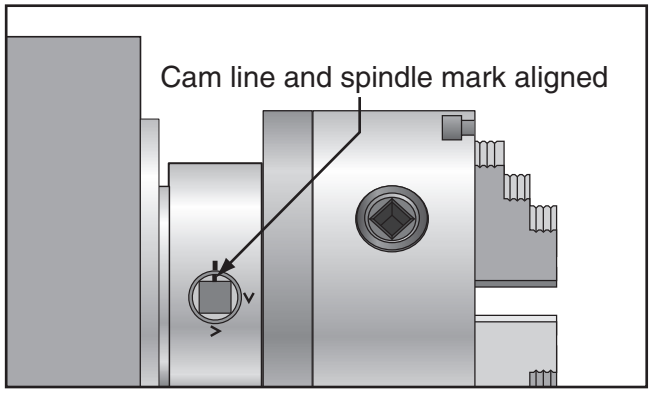


Figure 27. Camlock is fully loosened when the cam line is aligned with the spindle mark.

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 dead blow hammer or other soft mallet, lightly tap around outer circumference of chuck body to loosen it from spindle.

5. Remove chuck from spindle, using light rocking motion to carefully slide studs out of cam holes.

   — If chuck does not immediately come off, rotate it approximately 60° and tap it again. Make sure all marks on cams and spindle are properly aligned for removal.

Scroll Chuck Clamping

This 3-jaw, scroll-type chuck has an internal scroll-gear that moves all jaws in unison when adjusted with the chuck key. This chuck holds 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.

IMPORTANT: 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.

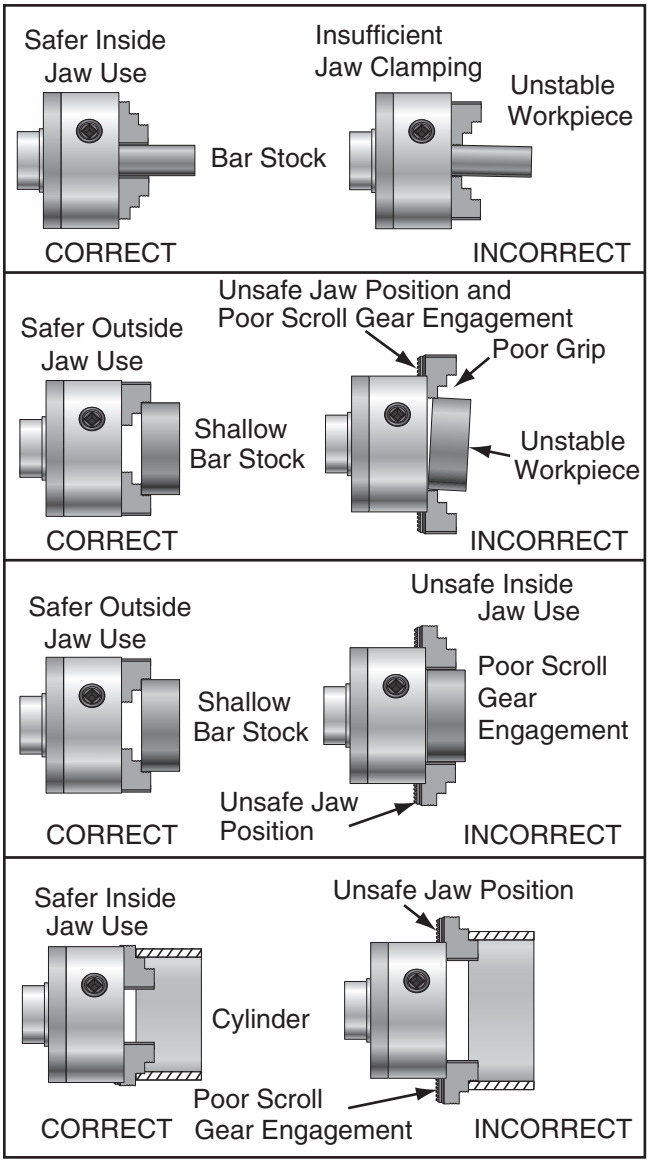


Figure 28. Jaw selection and workpiece holding.

Chuck Jaw Reversal

This chuck has 2-piece jaws that consist of a reversible top jaw and a master jaw. The top jaw can be removed, rotated 180°, and re-installed in the reverse position for additional work-holding options. When reversing the top jaws, always keep them matched with their original master jaw to ensure the best fit.

To reverse 2-piece jaws:

1. DISCONNECT MACHINE FROM POWER!
2. Remove cap screws that secure top jaw to master (bottom) jaw.
3. Remove top jaw, rotate it 180°, then re-install it with longest cap screw in tallest portion of jaw.
4. Repeat **Steps 2–3** with each remaining jaw (we recommend only reversing one jaw at a time to keep all original parts together).

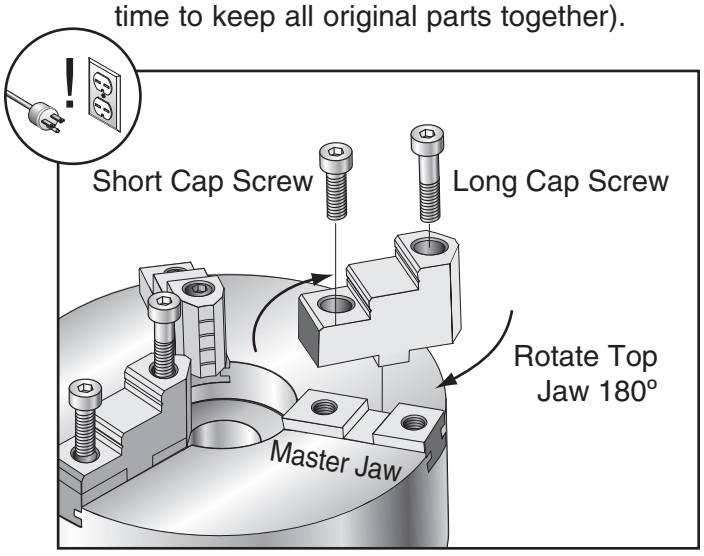


Figure 29. Reversing the chuck jaws.

4-Jaw Chuck

Refer to the **Chuck Installation** or **Chuck Removal** sections for instructions on installing or removing the 4-jaw chuck.

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

Mounting Workpiece

1. DISCONNECT MACHINE FROM POWER!
2. Use an appropriate device to protect ways (refer to **Chuck Safety & Support Devices** section for more details).
3. Use chuck key to open each jaw so workpiece will fit into spindle opening and lay flat against chuck face and jaw steps.
4. With help from another person or a holding device, position workpiece so it is centered in chuck.

5. Tighten each jaw in small increments. After tightening first jaw, continue tightening remaining jaws in an opposing sequence, similar to sequential order shown below.

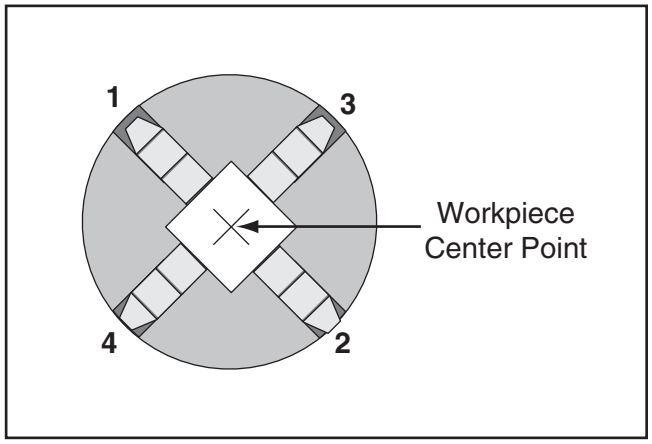


Figure 30. 4-jaw chuck tightening sequence.

6. After workpiece is secured by jaws, use dial indicator to make sure workpiece is centered in chuck.

   — If workpiece is not correctly centered, make fine adjustments by slightly loosening one jaw and tightening opposing jaw until workpiece is correctly positioned (see below for an example).

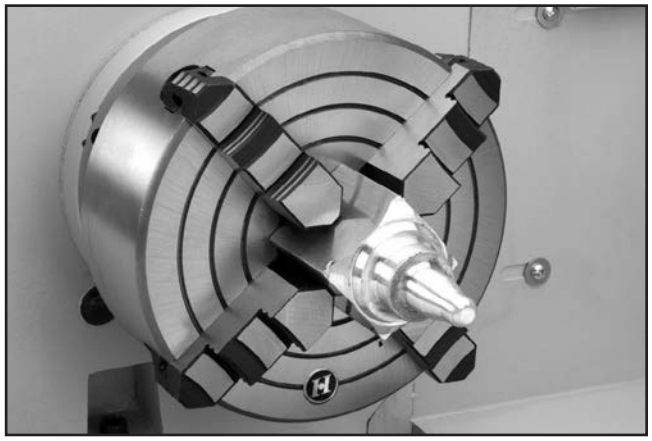


Figure 31. Example of a non-cylindrical workpiece mounted on a 4-jaw chuck.

Faceplate

Refer to the prior **Chuck Installation** and **Chuck Removal** subsections for instructions on installing or removing the faceplate.

The faceplate included with your lathe 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

Machining non-concentric workpieces at high speeds could cause workpiece to be thrown from lathe with deadly force. To reduce this risk, use a low RPM, and use counter-weights to balance faceplate or workpiece.

⚠WARNING

Failure to properly secure workpiece to faceplate could cause workpiece to be thrown from lathe with deadly force. To reduce this risk, use a minimum of THREE independent clamping devices to hold workpiece onto faceplate.

To mount a non-concentric workpiece to a faceplate:

1. DISCONNECT MACHINE FROM POWER!

2. Position appropriate device across bed ways to protect them from any potential damage from workpiece contact during installation.

3. With help from another person or holding device to support workpiece, position it onto faceplate and clamp it in place with a minimum of three independent clamping devices (see below for an example).

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

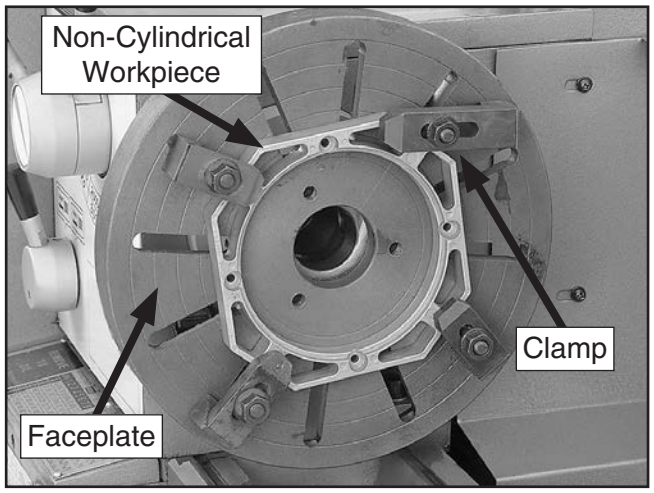


Figure 32. Example of a workpiece clamped in a faceplate.

Tailstock

The tailstock is typically used to support long workpieces at the side opposite the spindle, using a live or dead center. It can also hold a tapered drill bit (or a drill chuck with a regular drill bit) for boring holes. Unlike boring done with a drill press where the workpiece is fixed and the drill bit rotates, the drill bit in a tailstock remains stationary while the workpiece is rotated by the spindle.

The entire tailstock can be repositioned and locked in place along the length of the bed. An independently controlled offset adjustment allows the upper part of the tailstock to move perpendicular to the bedways so it can be aligned with the spindle center (for concentric turning) or offset from the spindle center (for tapered turning).

The tailstock quill also features independent adjustment controls that allow it to be advanced toward the spindle or locked firmly in position.

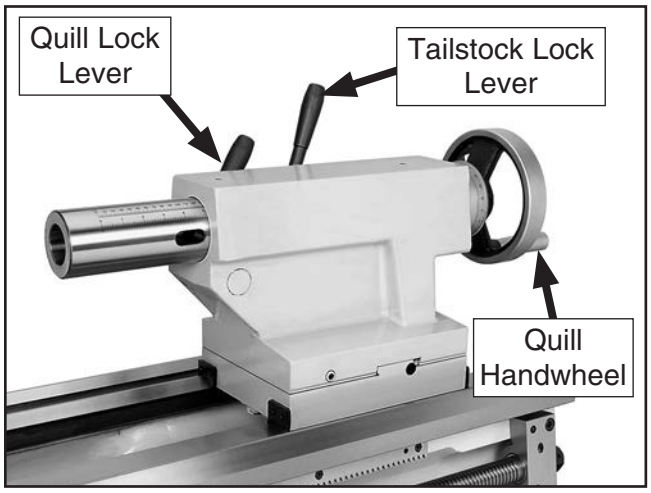


Figure 33. Example of tailstock and quill lock levers in locked position.

Tailstock Quill Specs

Graduated Dial

Increments ..... 0.001"
One Full Revolution ..... 0.125"

Increments on Quill

Inch ..... 0"–4" in 1/16" Increments
Metric ..... 0–100mm in 1mm Increments

Positioning Tailstock

1. Rotate tailstock lock lever clockwise (facing machine) to unlock tailstock from bedways.

2. Slide tailstock to desired position by pushing it along the bedways.

3. Rotate tailstock lock lever counterclockwise to lock tailstock against bedways.

Using Quill

1. Rotate quill lock lever clockwise to loosen quill.

2. Turn quill handwheel clockwise to move quill toward spindle or counterclockwise to move it away from spindle.

3. Rotate quill lock lever counterclockwise to secure quill.

Installing Tooling

This tailstock uses a quill that accepts tapered arbors and drill bits (see **Figures 34–35** for examples).

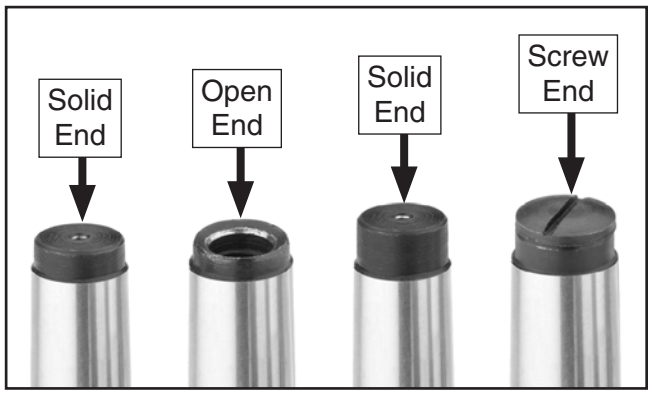


Figure 34. Types of tapered arbors and tooling.

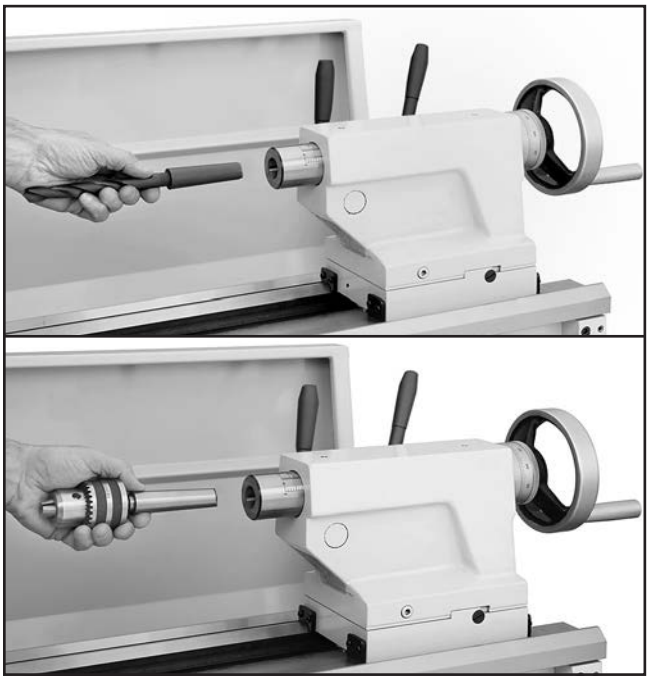


Figure 35. Example photos of inserting tools into the tailstock.

Note: *If the tooling has an open hole in the end, then a screw can be threaded into the end of the tool to provide a solid surface for the quill pin to push against when the quill is retracted for tool removal. Otherwise, removal of such tooling may be difficult.*

To install tooling in tailstock:

1. With tailstock locked in place, unlock quill, then use handwheel to extend it approximately 1".

2. Thoroughly clean and dry tapered mating surfaces of quill and center, making sure no lint or oil remains on tapers.

3. With a firm and quick motion, insert tool into quill. Check to see if it is firmly seated by attempting to twist it—a firmly seated tool will not twist.

4. Unlock tailstock and move it until tip of tool is close to, but not touching, workpiece, then lock tailstock.

5. Start spindle rotation, unlock quill lock lever, then turn quill handwheel clockwise to feed tool into workpiece.

Removing Tooling

1. Use shop rag to hold tool.

2. Rotate quill handwheel counterclockwise to fully retract quill into tailstock until tool is forced out of quill.

Offsetting Tailstock

The tailstock quill can be offset from the spindle centerline for turning tapers. Offsetting the quill toward the front of the lathe results in a taper at the tailstock end. Conversely, offsetting the quill toward the back of the lathe results in 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.*

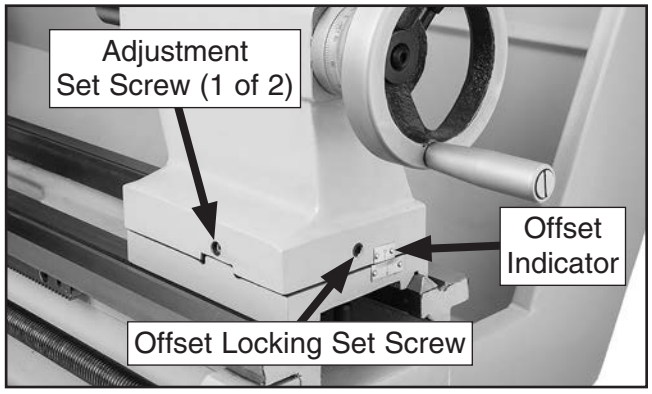


Figure 36. Left offset adjustment.

Tool Needed	Qty
Hex Wrench 5mm	1

1. Loosen offset locking set screw to allow lateral movement of tailstock.

2. Loosen tailstock lock lever to release clamping pressure.

3. Rotate adjustment set screws in opposite directions for desired offset (see **Figure 37**).

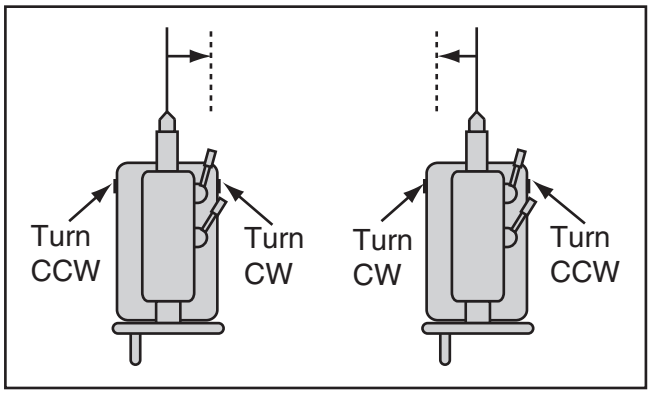


Figure 37. Example of set screw adjustment in relation to tailstock movement.

4. Retighten offset locking set screw to secure 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 or immediately after offsetting the tailstock when turning a taper. 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 5mm	1
Round Stock 2" x 6"	2
Precision Level	1

To align tailstock to spindle centerline:

1. Use precision level to make sure bedway is level from side to side and from front to back.

   — If bedway is not level, correct this condition before continuing with this procedure (refer to **Leveling** section in this manual).

2. Center drill both ends of a piece of round stock, then set it aside for use in **Step 5**.

3. Use another piece of round stock to make a dead center. Turn it to a 60° point, as illustrated below.

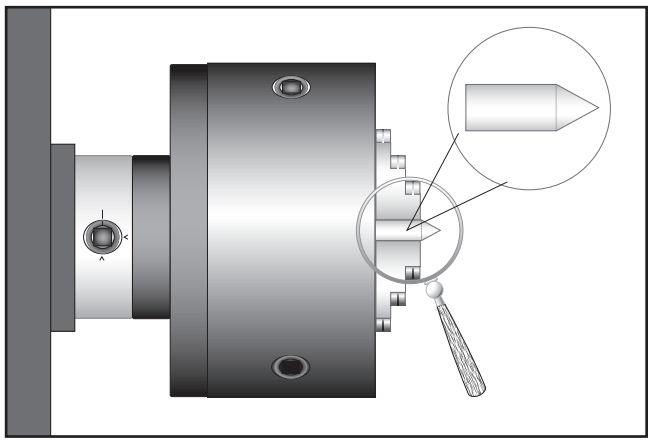


Figure 38. Turning a dead center.

4. Install center in tailstock.

5. Attach lathe dog to test stock from **Step 2**, then mount it between centers, as shown below.

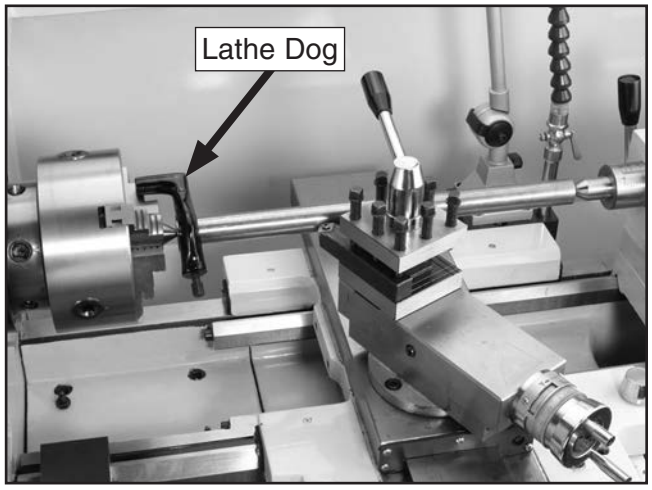


Figure 39. Example of stock mounted between the centers.

6. Turn 0.010" off stock diameter.

7. Mount test or dial indicator so that plunger is on tailstock quill.

   Note: *If necessary in the following step, refer to the* ***Offsetting Tailstock*** *subsection for detailed instructions.*

8. Use calipers to measure both ends of workpiece.

   —If test stock is *thicker* at tailstock end, move tailstock toward *front* of lathe ½ the distance of taper amount, as shown below.

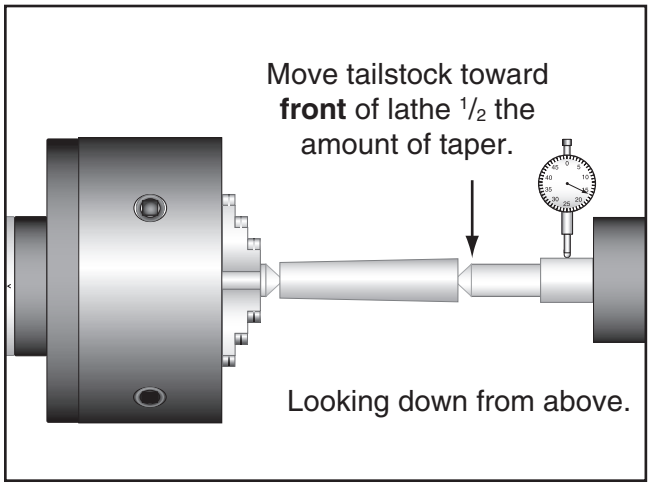


Figure 40. Adjust tailstock toward the operator.

   —If test stock is *thinner* at tailstock end, move tailstock toward *back* of lathe ½ the distance of taper amount, as shown below.

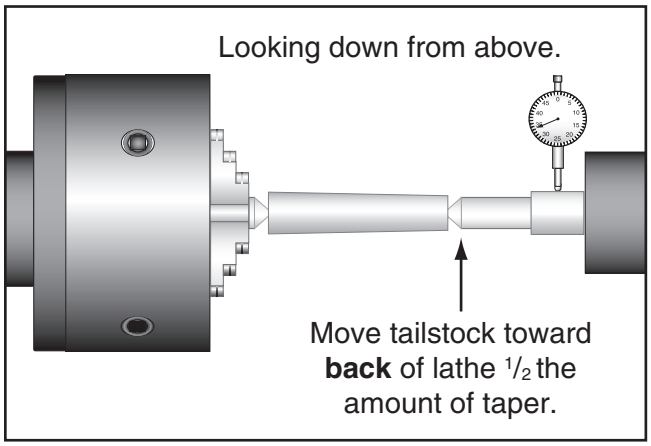


Figure 41. Adjust tailstock away from the operator.

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

Centers

Figure 42 shows the MT#3 dead centers included with the lathe. In addition, an MT#5–MT#3 tapered spindle sleeve is included for mounting in the spindle.

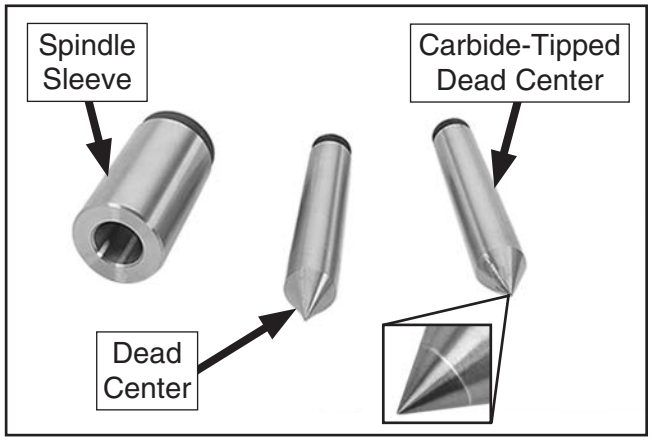


Figure 42. Spindle sleeve and centers.

Dead Centers

A dead center is a one-piece center that, when mounted in the tailstock, 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.

The carbide-tipped dead center can better withstand the effects of friction and is best used in the tailstock where the workpiece will rotate against it. The tip of the center 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.

Mounting Dead Center in Spindle

1. DISCONNECT MACHINE FROM POWER!

2. Thoroughly clean and dry all threads and mating surfaces of spindle bore and center, making sure that no lint or oil remains on these surfaces.

   Note: *This will prevent the tapered surfaces from seizing due to operational pressures, which could make it very difficult to remove the center.*

3. Mount chuck or faceplate onto spindle, whichever is correct for your operation.

4. Insert center into tapered spindle sleeve, then insert center into spindle bore.

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

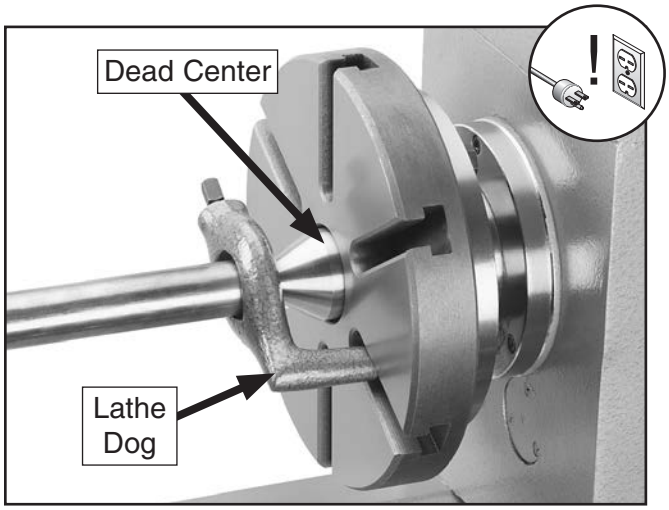


Figure 43. Example of using a dead center with a faceplate and lathe dog.

Removing Center from Spindle

To remove the sleeve and center from the spindle, insert a piece of round bar stock (or similar) through the outside end of the spindle. Have another person hold onto the sleeve and center with a gloved hand or shop rag, then tap the bar stock to knock the sleeve loose.

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. The **Figure** below shows an example photo of a dead center mounted in a tailstock.

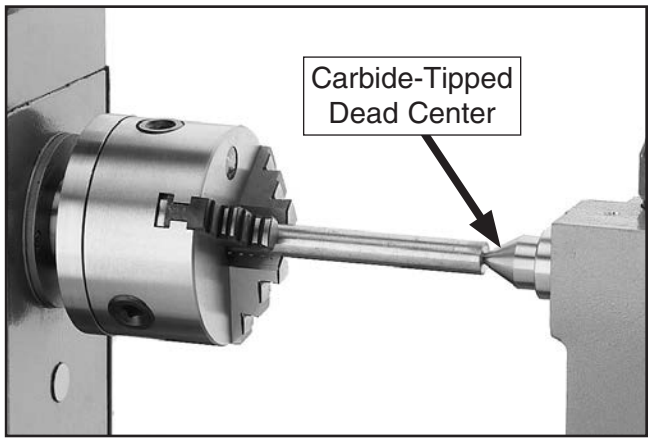


Figure 44. Example of using a carbide-tipped dead center installed in the tailstock.

NOTICE

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

To mount a center in tailstock:

1. DISCONNECT MACHINE FROM POWER!

2. Thoroughly clean and dry tapered mating surfaces of tailstock quill bore and center, making sure no lint or oil remains on tapers.

3. Use quill handwheel to feed quill out from casting approximately 1".

   Note: *The maximum quill travel is 4", but we do not recommend extending the quill more than 2" or stability and accuracy will be reduced.*

4. Insert center into tailstock quill.

5. Seat center firmly into quill during workpiece installation by rotating quill handwheel clockwise to apply pressure with center engaged in center hole of workpiece.

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

Removing Center from Tailstock

To remove the center from the quill, hold onto it with a gloved hand or shop rag, then rotate the quill handwheel counterclockwise to draw the quill back into the casting until the center releases.

Mounting Workpiece Between Centers

1. DISCONNECT MACHINE FROM POWER!

2. Drill center holes in both ends of workpiece.

3. Install dead center in spindle with lathe dog and chuck, faceplate or drive plate, then install live center or carbide-tipped dead center in tailstock.

4. Lubricate dead center point and workpiece center holes, then mount workpiece between centers and hold it in place with light pressure from tailstock center.

5. Seat center firmly into quill by rotating quill handwheel clockwise to apply pressure against workpiece (see example below).

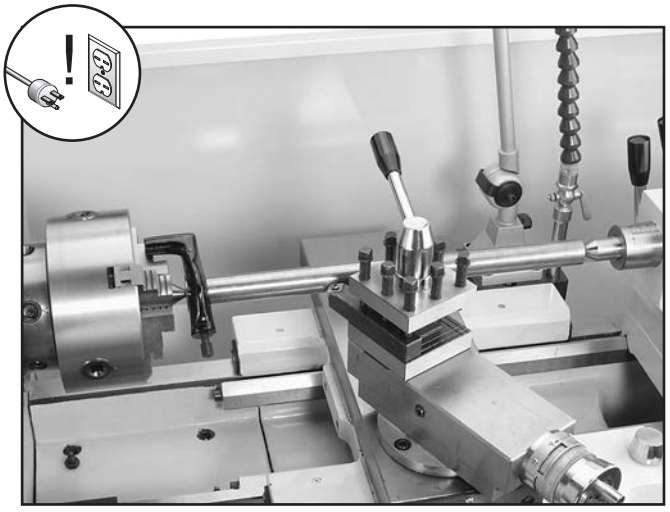


Figure 45. Example photo of a workpiece mounted between the centers.

Note: *Only apply enough pressure to securely mount the workpiece between centers. Avoid over-tightening the center against the workpiece, or it may become difficult to remove later. Also, over-tightening will result in excessive friction and heat, which may damage the workpiece or center.*

Steady Rest

The steady rest supports long shafts and can be mounted anywhere along the length of the bedway. Familiarize yourself with the steady rest components shown below to better understand the controls before using it.

Tools Needed for Installation & Use	Qty
Open-End Wrench 19mm	1
Open-End Wrench 10mm	1
Hex Wrench 3mm	1

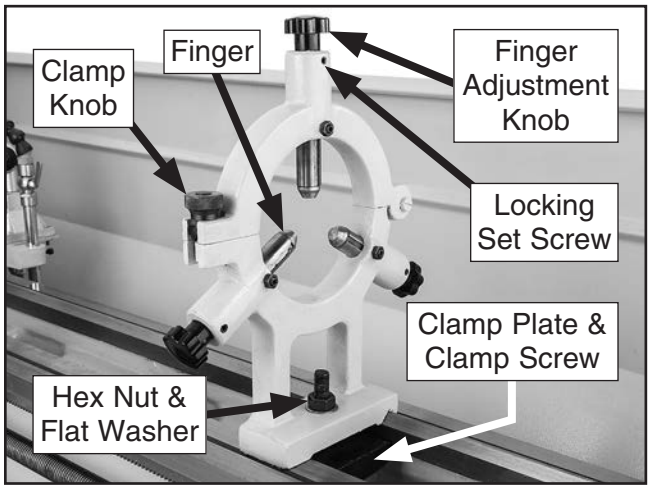


Figure 46. Steady rest components.

To install and use steady rest:

1. DISCONNECT MACHINE FROM POWER!

2. Thoroughly clean all mating surfaces, then place steady rest base on bedways and secure to clamp plate with hex nut, flat washer, and clamp screw (see **Figure 46**).

3. Loosen three locking set screws so finger positions can be adjusted (see **Figure 46**).

4. Loosen clamp knob that secures top half of steady rest, and open top, as shown in **Figure 47**.

5. Use finger adjustment knobs to position bottom two fingers so they barely touch workpiece, as shown in **Figure 47**.

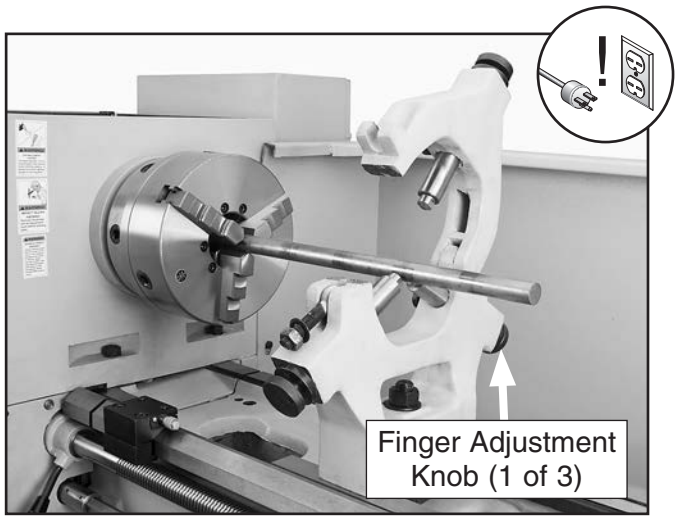


Figure 47. Example of workpiece mounted in steady rest.

6. Close steady rest, secure with clamp knob, and then use finger adjustment knobs to adjust all finger tips so they just touch workpiece without causing deflection.

   Note: *The finger tips should properly support the workpiece along the spindle centerline while still allowing it to freely rotate.*

7. Tighten locking set screws to secure settings.

   Note: *To reduce the effects of friction, lubricate the fingers with anti-seize lubricant, such as Grizzly Model T23962 ISO Moly-D Way Oil (see **Accessories** on **Page 57** for more information) during operation.*

Follow Rest

The follow rest mounts to the saddle and supports the workpiece near the cutting tool to prevent deflection from the pressure of the cutting tool. The follow rest fingers adjust in the same manner as the fingers on the steady rest.

Tip: *To reduce the effects of friction, lubricate the finger tips with generous amounts of anti-sieze lubricant during operation.*

Tools Needed for Installation & Use	**Qty**
Hex Wrench 6mm	1
Hex Wrench 3mm	1
Open-End Wrench 10mm	1

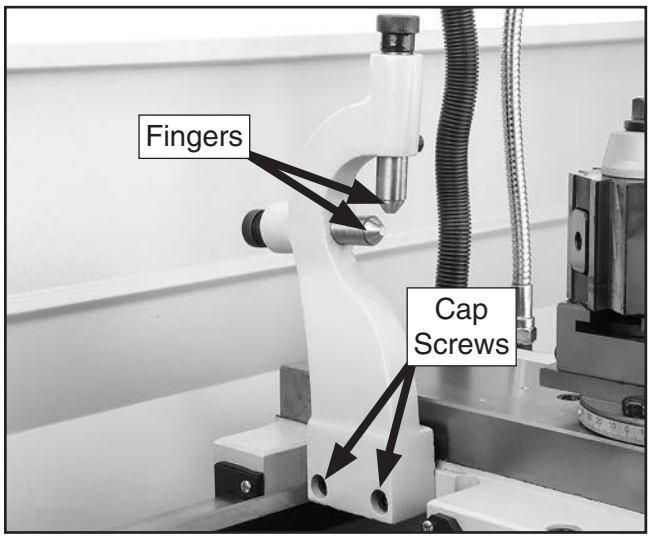


Figure 48. Follow rest attachment.

Carriage & Slide Locks

The carriage, cross slide, and compound rest have locks that can be tightened to provide additional rigidity during operation, especially during heavy cuts.

See **Figures 49–50** to identify the locks for each device.

Tools Needed	**Qty**
Hex Wrench 6mm	1
Hex Wrench 3mm	1

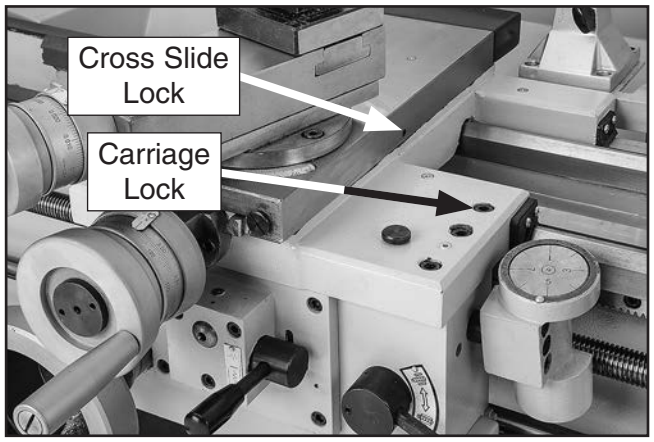


Figure 49. Location of carriage lock.

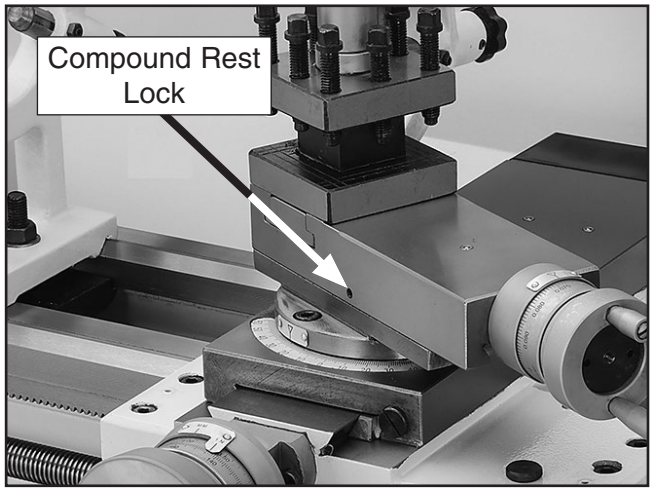


Figure 50. Location of compound rest lock.

Compound Rest

The compound rest handwheel 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" (0.03mm)
One Full Revolution	0.100" (2.54mm)

Tool Needed	**Qty**
Hex Wrench 6mm	1

To set compound rest at a certain angle:

1. Loosen two cap screws at base of compound rest (1 of 2 shown in **Figure 51**).

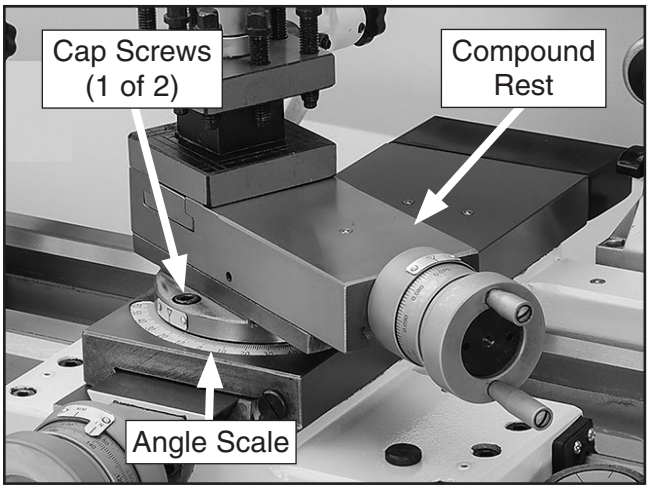


Figure 51. Compound rest angle adjustments.

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

   Tip: *The first time you set the angle of the compound rest for cutting threads, mark the location on the cross slide as a quick reference point. This will allow you to quickly return the compound rest to that exact angle the next time you need to cut threads.*

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 retightening the handle to lock the tool into position.

Installing Tool

Tool Needed	Qty
Tool Post T-Wrench	1

To install tool in tool post:

1. Adjust tool post bolts so cutting tool can fit underneath them (see below).

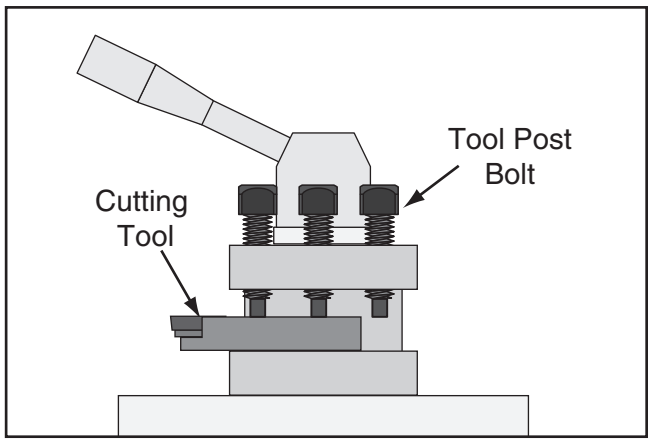


Figure 52. Example of tool mounted in tool post.

⚠WARNING

Over-extending a cutting tool from the post will increase 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 x 0.5" = 1.25").

2. Firmly secure cutting tool with at least two tool post bolts.

3. Check and adjust cutting tool to spindle centerline, as instructed in next subsection.

Aligning Cutting Tool with Spindle Centerline

For most operations, the cutting tool tip should be aligned with the spindle centerline, as illustrated below.

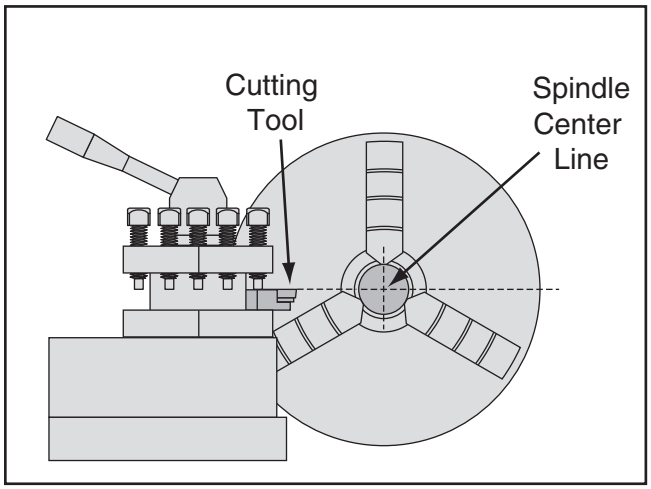


Figure 53. Cutting tool aligned with spindle centerline (viewed from tailstock).

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:

- Move the tailstock center over the cross slide and use a fine ruler to measure the distance from the surface of the cross slide to the tip of the center. Adjust the cutting tool height so it is the same distance above the cross slide as the tailstock center.

- Align the tip of the cutting tool with a tailstock center, as instructed in the following procedure. For this to work, the tailstock must be aligned to the spindle centerline (refer to **Aligning Tailstock To Spindle Centerline** for detailed instructions).

Items Needed	Qty
Tool Post T-Wrench	1
Steel Shims	As Needed
Cutting Tool	1
Tailstock Center	1

To align cutting tool with tailstock center:

1. Mount cutting tool in tool post, then secure post so tool faces tailstock.

2. Install center in tailstock, and position center tip near cutting tool tip.

3. Lock tailstock and quill in place.

4. Adjust height of cutting tool so tool tip is aligned vertically with center tip, as illustrated below.

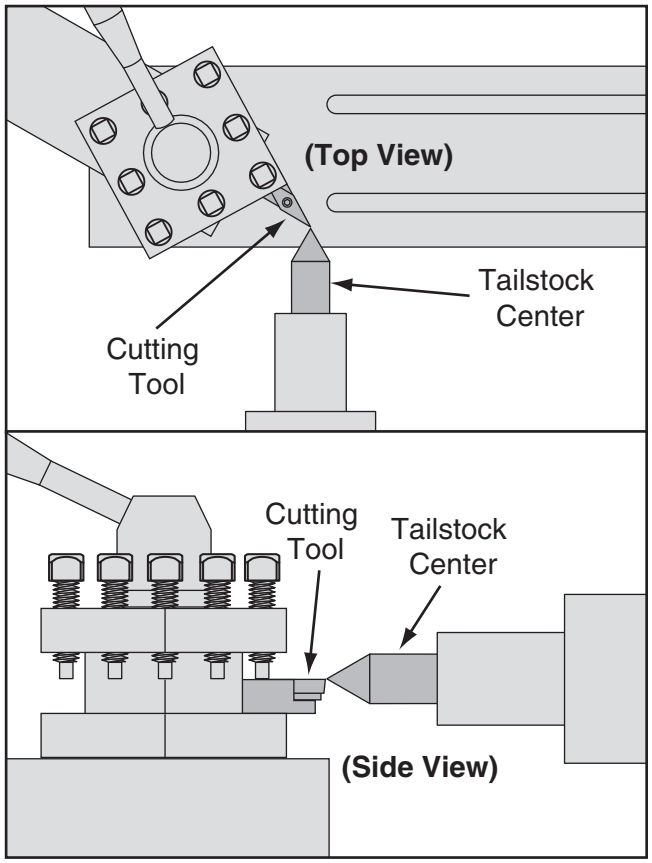


Figure 54. Cutting tool aligned to the tailstock center.

Manual Feed

The cutting tool can be manually fed into the workpiece using the carriage, cross slide, and compound rest handwheels shown below.

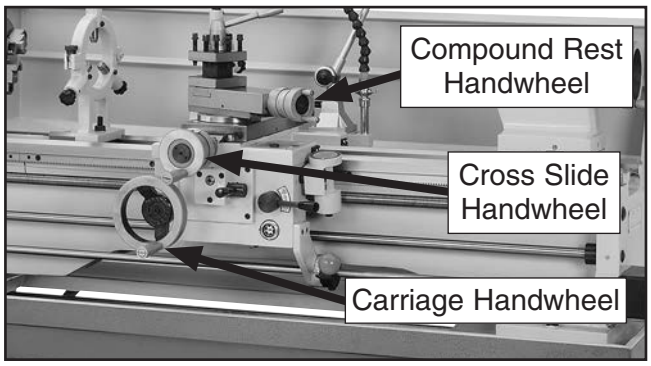


Figure 55. Manual feed controls.

Carriage Handwheel

Graduated Dial

Increments ..... 0.01" (0.25mm)
One Full Revolution ..... 0.56" (14.22mm)

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

Cross Slide Handwheel

Graduated Dial (Inch and Metric)

Increments ..... 0.001"/0.02mm
One Full Revolution ..... 0.2"/5.08mm

Adjust the position of the graduated scale by holding the handwheel with one hand and turning the dial with the other. The cross slide handwheel has a direct-read graduated dial (inch and metric), which shows the total amount of material removed from the diameter of the workpiece.

Compound Rest Handwheel

Graduated Dial

Increments ..... 0.001" (0.03mm)
One Full Revolution ..... 0.1" (2.54mm)

Use this handwheel to move the cutting tool linearly along the set angle of the compound rest. Set the compound rest angle by hand-rotating it and securing it with the two cap screws (see **Figure 51** on **Page 42**). The compound rest has an indirect-read graduated dial, which shows the actual distance the tool moves.

Spindle Speed

Using the correct spindle speed is important for getting 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 workpiece, as noted in the formula shown below.

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

*Double if using carbide cutting tool

Figure 56. 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.

Setting Spindle Speed

The spindle speed lever and spindle speed range lever, shown in **Figure 57**, are used to select one of the eight spindle speeds.

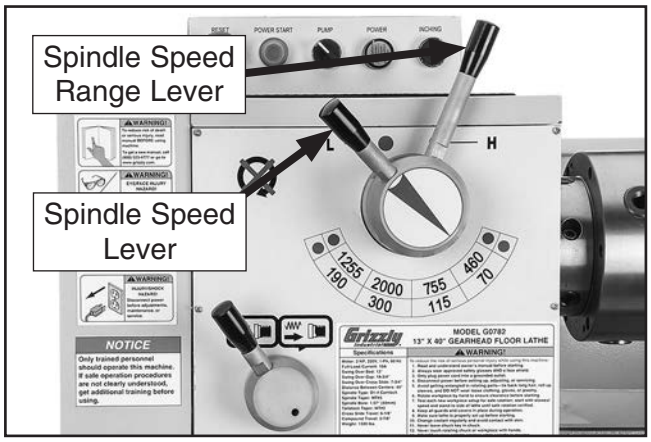


Figure 57. Location of spindle speed and spindle speed range levers.

The spindle speed and range levers control the gear configuration in the headstock to produce the selected spindle speed.

NOTICE

To avoid damaging gears, ALWAYS make sure the spindle is completely stopped BEFORE moving the spindle speed levers.

The chart below shows the various combinations of lever positions for achieving a desired speed.

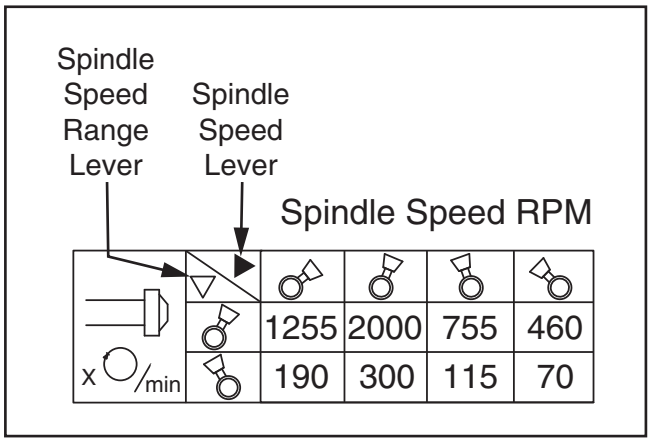


Figure 58. Spindle speed chart and applicable spindle speed and range lever positions.

Configuration Example

Figure 59 shows the levers positioned for a spindle speed of 70 RPM.

Note: *If the spindle speed levers do not easily adjust into position, rotate the spindle by hand while you apply pressure to the lever. When the gears align, the lever will easily move into place. If you have trouble rotating the spindle by hand, you can use the spindle key or a chuck key to get additional leverage—be sure to remove the key when you are done.*

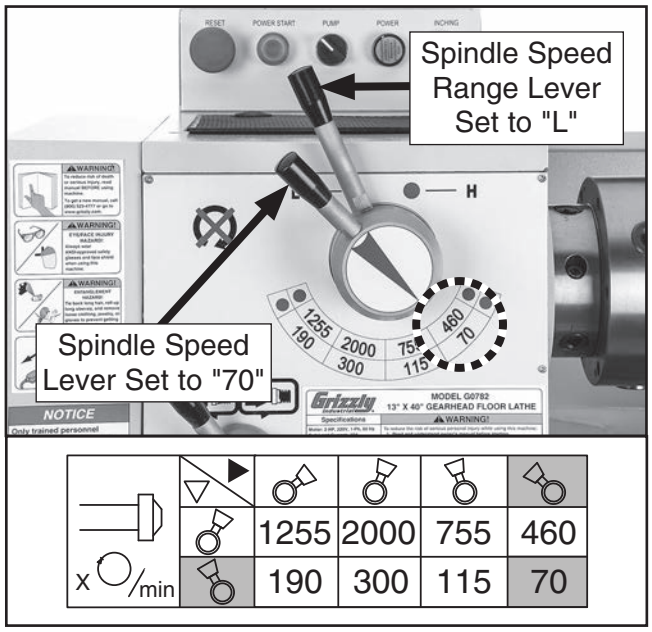


Figure 59. Spindle speed set to 70 RPM.

Power Feed

Both the carriage and cross slide have power feed capability when the carriage is engaged with the feed rod. The rate that these components move per revolution of the feed rod is controlled by the quick-change gearbox lever and dial positions and the end gear configuration.

The feed per revolution and the spindle speed must be considered together—this is the feed rate. The sources you use to determine the optimum spindle speed for an operation will also provide the optimal feed to use with that spindle speed.

Often, the experienced machinist will use the feeds and speeds given in their reference charts or web calculators as a starting point, then make minor adjustments to the feed rate (and sometimes spindle speed) to achieve the best results.

The carriage can alternately be driven by the leadscrew for threading operations. However, this section only covers the use of the power feed option for the carriage and cross slide components for non-threading operations. To learn how to power the carriage for threading operations, refer to **Threading** on **Page 52**.

NOTICE

If the feed selection lever and the half nut are engaged at the same time, machine damage could occur. Even though there is a lock-out device to prevent this, it could break if forced.

NOTICE

To avoid damaging the lathe, ALWAYS make sure the spindle is completely stopped BEFORE using the headstock controls to make changes.

Power Feed Controls

Use **Figures 60–61** and the following descriptions to understand the power feed controls.

Note: *Before using power feed, you may have to reconfigure the end gears, depending on how they are set up. Refer to* ***End Gears*** *on* ***Page 49*** *for detailed instructions.*

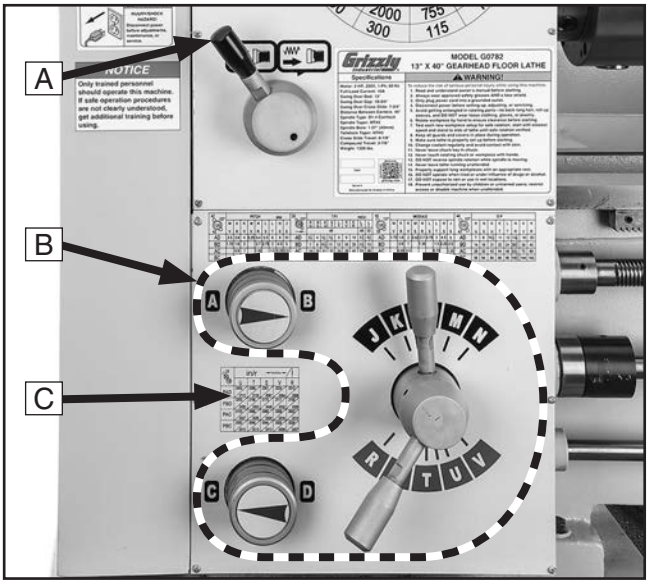


Figure 60. Power feed controls on the headstock.

A. Feed Direction Lever: Selects the direction for power feed. When the lever is positioned as shown in **Figure 60**, the carriage will move to the left along the bed, or the cross feed will travel toward the front of the lathe.

B. Quick-Change Gearbox Dials & Levers: Position these as indicated on the charts to choose different feed rates.

C. Feed Rate Chart: Displays the settings of the quick-change gearbox levers and dials for the selected feed rate. Refer to **Setting Power Feed Rate** subsection, beginning on this page, for detailed instructions.

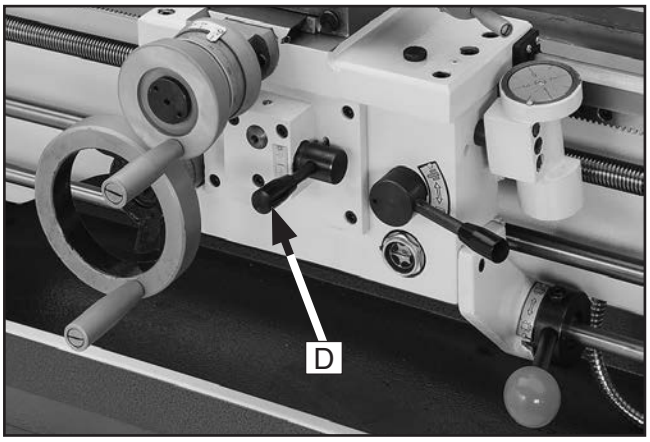


Figure 61. Apron power feed controls.

D. Feed Selection Lever: Changes the power feed to either the cross slide or the carriage.

When the lever is up, the cross slide is selected. When the lever is down, the carriage is selected. In the middle position neither the cross slide nor the carriage will move.

Note: *The feed selection lever must slide to the right before it can move downward. This is a safety feature designed to prevent the lever from engaging the cross feed when lifted to disengage the longitudinal feed.*

Note: *When using this lever, you may need to slightly rotate the handwheel of the component you are trying to engage, so that the apron gears can mesh.*

Setting Power Feed Rate

The feed-rate chart (see **Figure 60** for location) displays the settings of the end-gears and headstock feed controls for feed rates.

Examining the chart, you will see the end-gear settings for power feeding, various combinations of dial and lever settings, and their corresponding feed rates (see **Figure 62**).

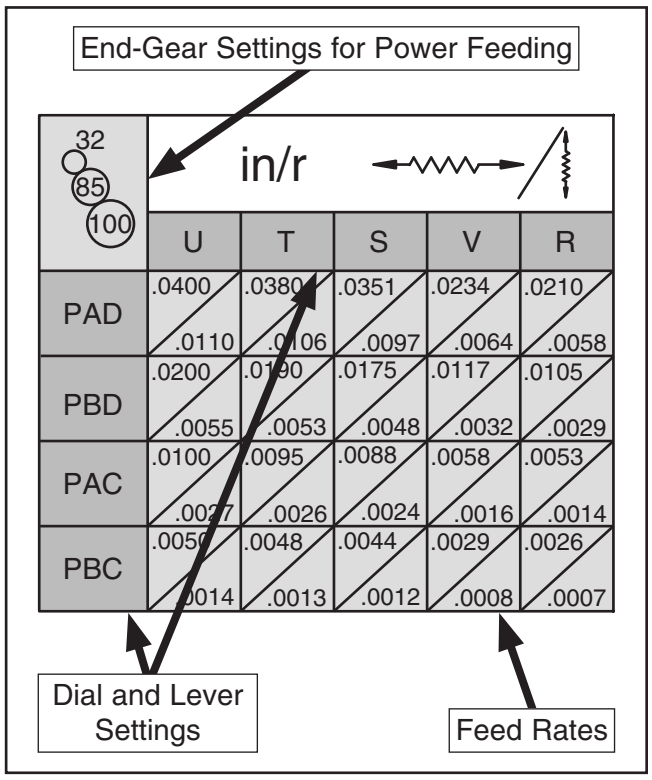


Figure 62. Feed rate chart indicating settings for available longitudinal and cross feed rates.

This symbol indicates longitudinal feed rates.
This symbol indicates cross feed rates.

Using the controls on the lathe, follow along with the example below to better understand how to set the lathe for the desired power feed rate.

Setting Power Feed Rate of 0.0105 in./rev.

1. DISCONNECT MACHINE FROM POWER!

2. Install 100T gear in lower position and 85T gear in middle position (refer to **Power Feed Configuration** on **Page 49** for details).

3. Locate box on feed rate chart that lists 0.0105 in./rev., as shown in **Figure 63**.

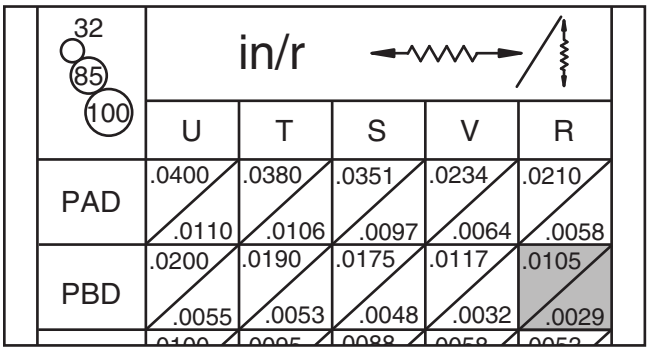


Figure 63. 0.0105 in./rev. location on feed chart.

4. Rotate spindle by hand to verify no binding exists.

5. Move feed dials and levers to positions **PBDR**, as shown in **Figure 64**.

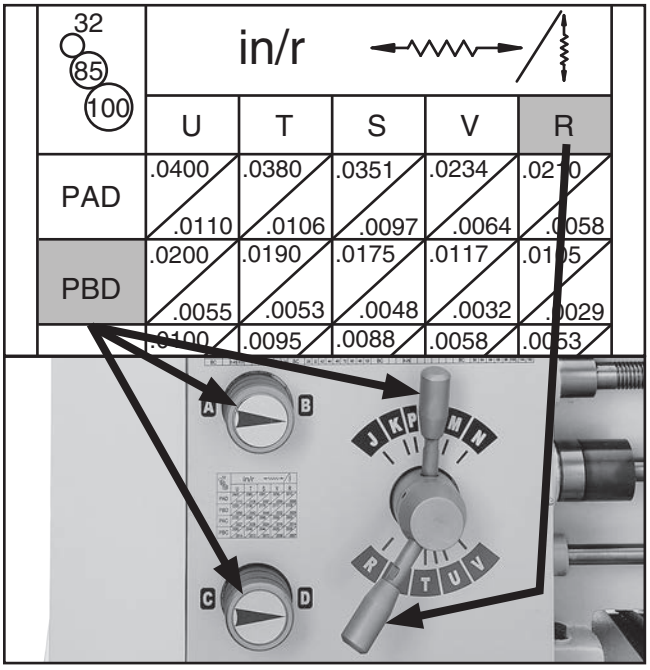


Figure 64. Feed settings for 0.0105" feed rate.

—"**PBD**" indicates that the lever marked **J-K-P-L-M-N** must be set to position "**P**", the dial marked **A–B** must be set to position "**B**", and the dial marked **C–D** must be set to position "**D**".

—"**R**" indicates the lever marked **R-S-T-U-V** must be set to the "**R**".

The carriage is now set up for a power feed rate of 0.0105 in./rev.

End Gears

The end gears must be correctly setup for power feed, threading, and pitch turning operations. Use the photo below to identify the upper, middle, and lower change gears, which are also referenced on the headstock feed and threading charts.

The following subsections explain how to configure the end gears.

Note: *When configuring end gears, make sure they mesh with 0.002–0.004" backlash, or "play".*

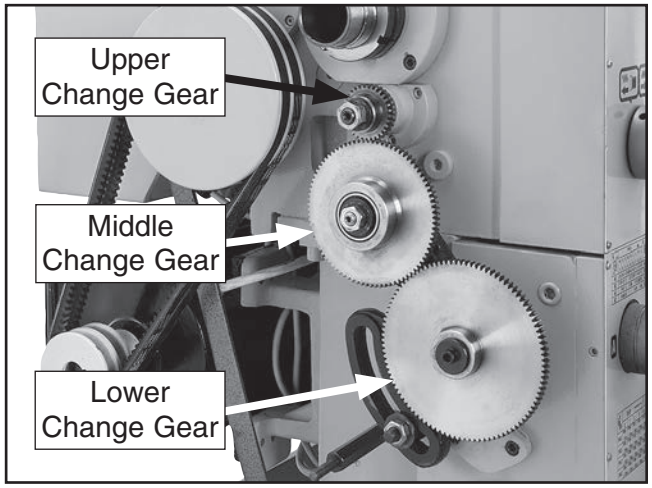


Figure 65. Change gear identification.

Power Feed Configuration

Install the 32T gear in the upper position, the 85T gear in the middle position, and the 100T gear in the lower position (see **Figure 66**).

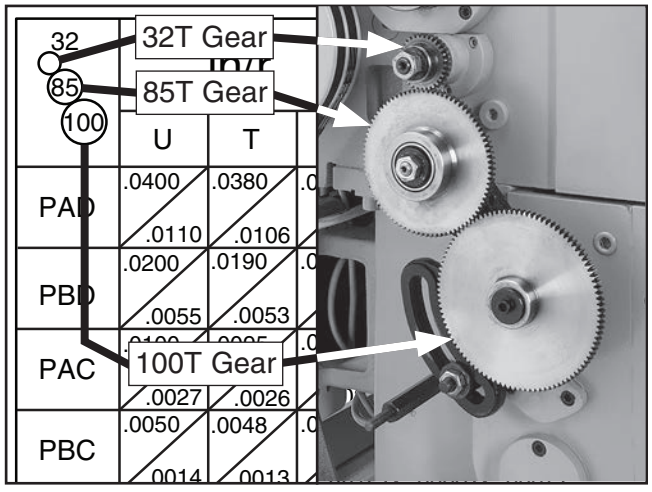


Figure 66. Power feed change gears.

Inch Threading Configuration

Install the 120/127T combo gear in the middle position with the 127T gear facing the headstock. Install the 32T gear in the upper position and mesh with the 127T gear. Install either the 48T, 46T, or 52T gear in the lower position and mesh with the 127T gear (see **Figure 67**).

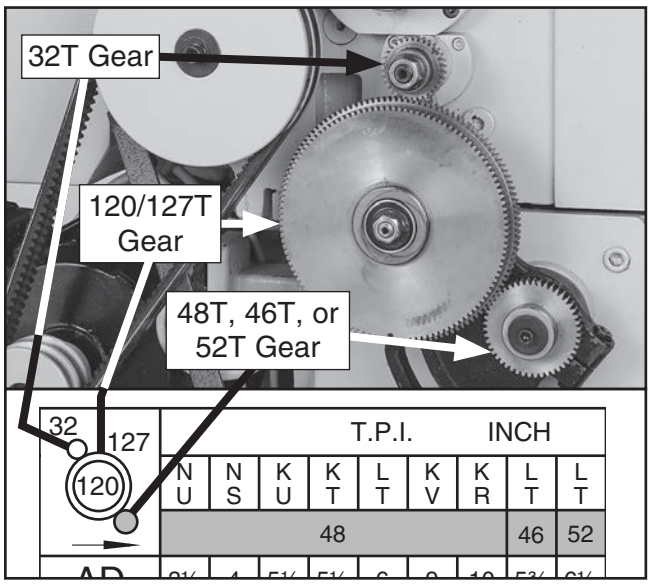


Figure 67. Inch threading change gears.

Metric Threading Configuration

Install the 120/127T combo gear in the middle position with the 127T gear facing the headstock. Install a 42T gear in the upper position and mesh with the 127T gear. Install a 42T gear in the lower position and mesh with the 120T gear (see **Figure 68**).

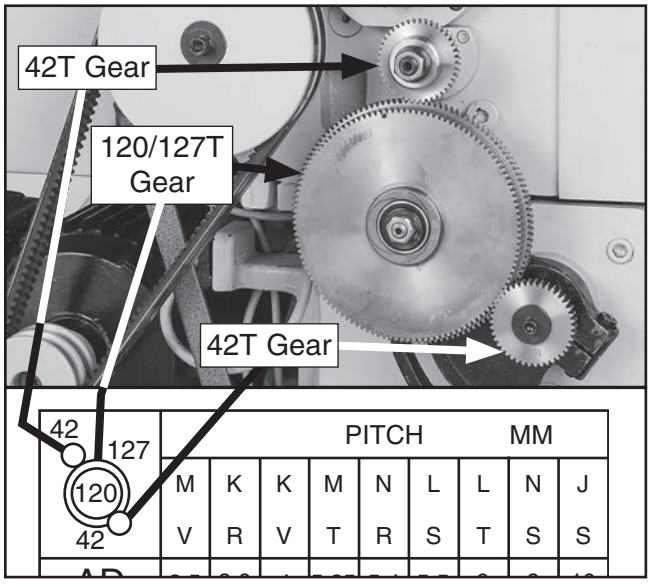


Figure 68. Metric threading change gears.

Modular Threading Configuration

Install the 120/127T combo gear in the middle position with the 127T gear facing the headstock. Install a 55T gear in the upper position and mesh with the 127T gear. Install a 35T gear in the lower position and mesh with the 120T gear (see **Figure 69**).

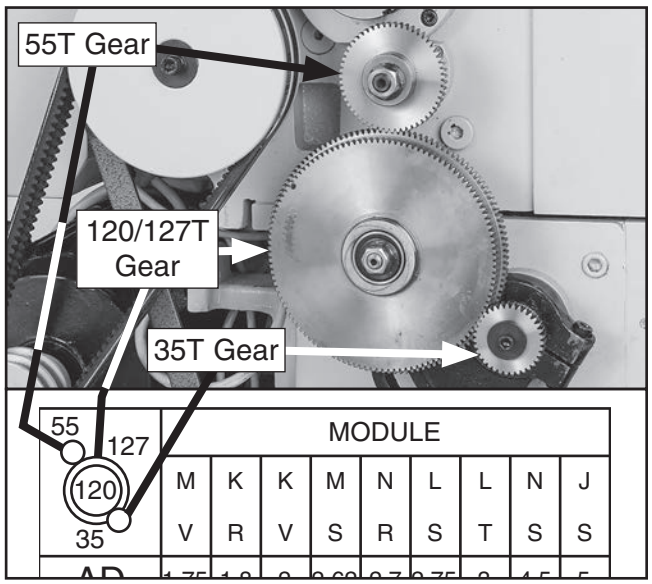


Figure 69. Modular threading change gears.

Diametral Threading Configuration

Install the 120/127T combo gear in the middle position with the 127T gear facing the headstock. Install a 44T gear in the upper position and mesh with the 127T gear. Install a 42T gear in the lower position and mesh with the 120T gear (see **Figure 70**).

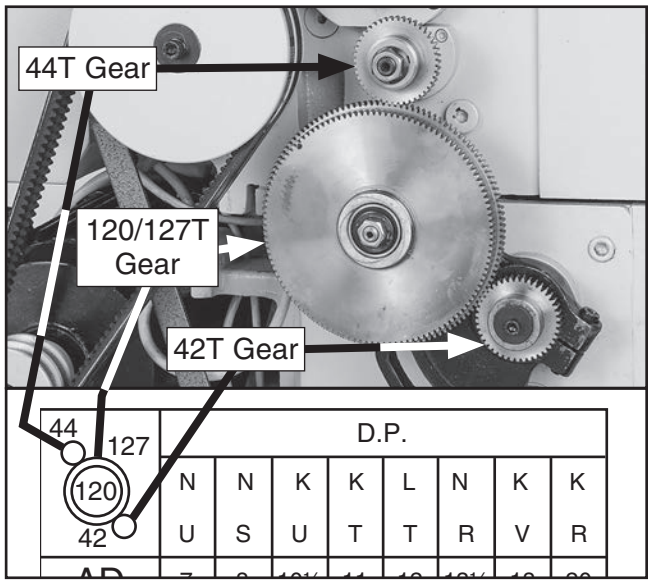


Figure 70. Diametral threading change gears.

End Gear Configuration Example

Follow the example below to better understand how to configure the end gears for inch threading.

Tools Needed	**Qty**
Hex Wrenches 5, 6mm	1 Ea
Open-End Wrench 17mm	1
Open-End Wrench 19mm	1

To configure end gears for threading 22 TPI:

1. Locate **22 TPI** on inch thread chart, then locate **32T** upper position gear, **120/127T** middle position combo gear, and **48T** bottom position gear (see **Figure 71**).

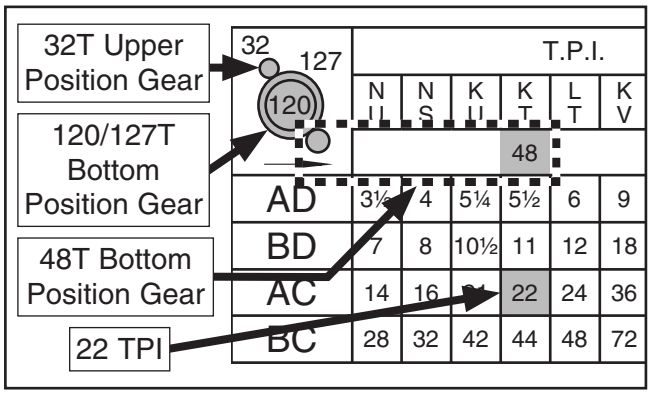


Figure 71. Locating change gears for 22 TPI.

2. DISCONNECT MACHINE FROM POWER!

3. Remove headstock end gear cover.

4. While holding middle position gears, loosen arm support hex nut and cap screw (see **Figure 72**) and slowly let gears pivot down and away from upper position gear.

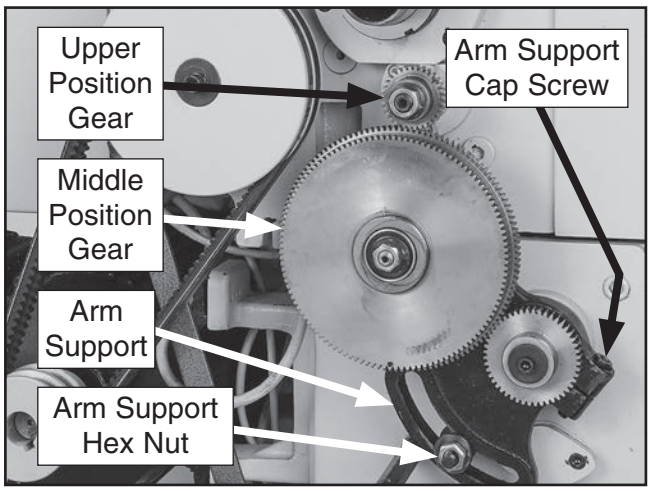


Figure 72. Arm support and end gears.

5. Loosen gear support hex nut and slide middle gear away from lower position gear, as shown in **Figure 73**.

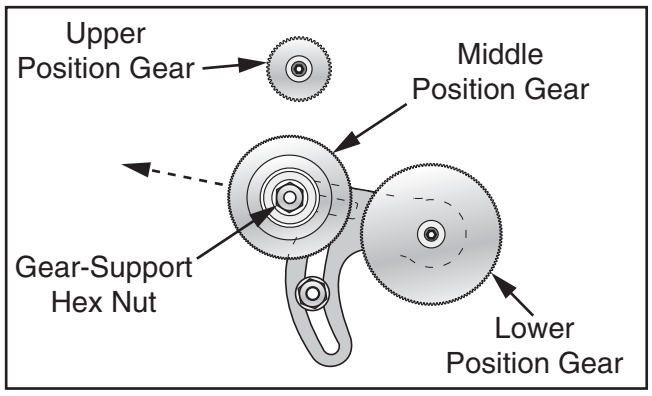


Figure 73. Sliding middle position gear away from lower position gear.

6. Remove hex nut, washer, and middle position gear.

7. Slide **120/127T** combo gear onto middle position shaft, with 127T side closest to lathe. Make sure to align keys and keyways, then re-install washer and hex nut from **Step 6**.

8. Remove hex nut and spacer from upper position gear, and cap screw and spacer from lower position gear, then slide gears off of shafts.

9. Slide **32T** gear onto upper position shaft and **48T** gear onto lower position shaft, making sure to align keys and keyways.

Note: *Position flat, non-stepped face of gears toward headstock so they will mesh with 127T gear in* ***Steps 9–10****.*

10. Secure **32T** and **48T** gears with spacers, hex nut, and cap screw removed in **Step 8**.

11. Slide **127T** gear against lower **48T** gear (see **Figure 74**) until they mesh with 0.002" to 0.004" backlash, then tighten gear support hex nut.

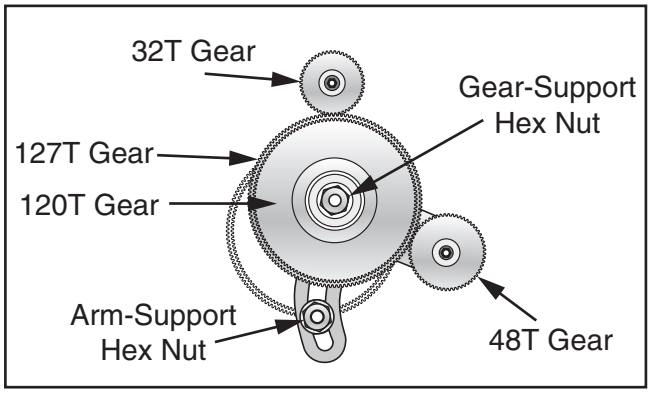


Figure 74. Gears installed for threading 22TPI.

12. Rotate **127T** gear against **32T** gear until they mesh with 0.002" to 0.004" backlash.

13. Tighten arm support hex nut.

14. Re-install end gear cover.

Threading

The following subsections describe how to use the threading controls and charts to set up the lathe for a threading operation. If you are unfamiliar with the process of cutting threads on a lathe, we strongly recommend that you read books, review industry trade magazines, or get formal training before attempting any threading projects.

Gearbox Threading Controls

The threading charts on the headstock face display the settings for inch and metric threading.

Using the controls on the lathe, follow the example below to understand how to set up the lathe for the desired threading operation.

To set dials for 22 TPI:

1. DISCONNECT MACHINE FROM POWER!

2. Install 32T and 48T gears, as instructed in **End Gear Configuration Example** on **Page 50**.

3. Locate **22 TPI**, **AC**, and **KT** in chart below.

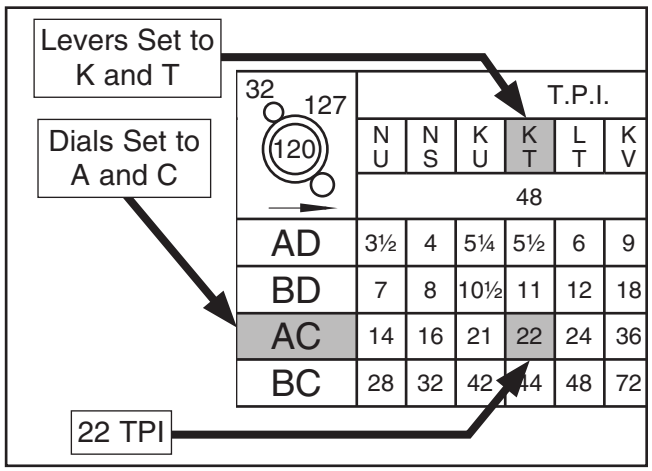


Figure 75. 22 TPI and corresponding dial and lever positions.

—"**AC**" indicates that the dials marked **A-B** and **C-D** must be moved to positions "**A**" and **"C"** (see **Figure 76**).

—"**KT**" indicates that the upper and lower levers must be moved to positions "**K**" and **"T"** (see **Figure 76**).

4. Move quick-change gearbox dials and levers to positions **ACKT**, as shown in **Figure 76.**

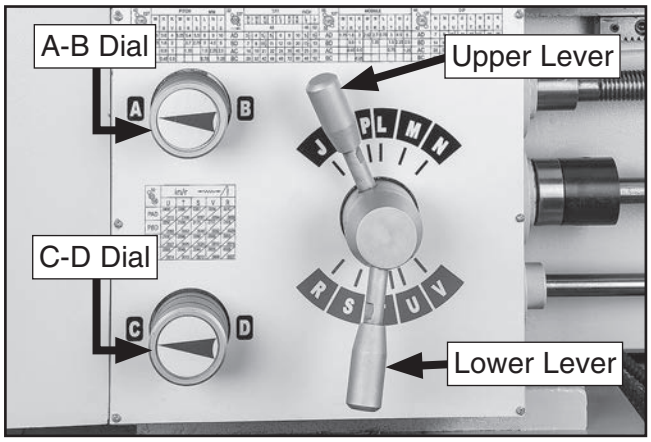


Figure 76. Gearbox dial settings for 22 TPI.

The lathe is now set up to cut 22 TPI threads.

Feed Direction Lever

When the lathe is set up as shown on the threading charts, the leadscrew is engaged with the gears in the headstock and will automatically turn when engaged by the feed direction lever (see **Figure 77**). The leadscrew will not turn when the feed direction lever is in the neutral position.

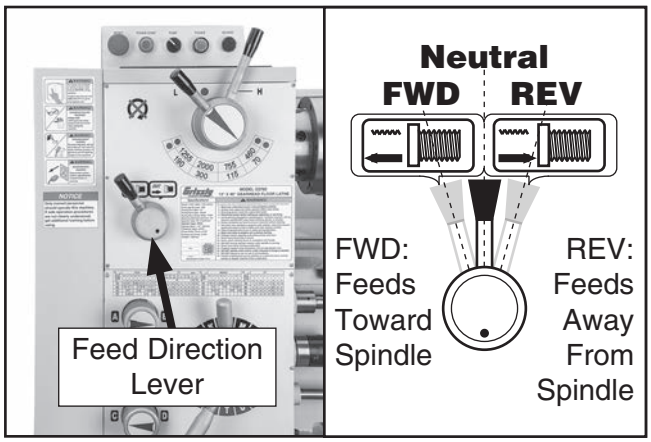


Figure 77. Feed direction controls for threading.

Apron Threading Controls

The half nut lever engages the carriage with the leadscrew, which moves the carriage and cutting tool along the length of the workpiece for threading operations (see **Figure 78**).

Important: *Be sure the feed selection lever is disengaged before attempting to engage the half nut.*

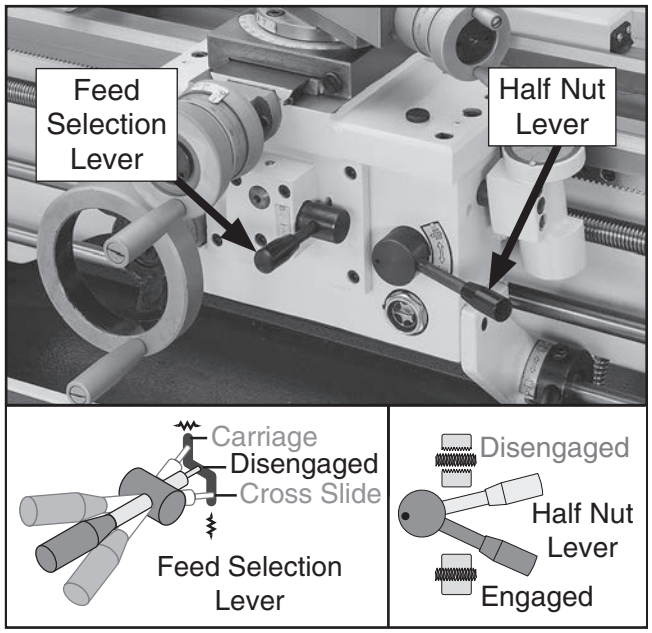


Figure 78. Apron threading controls.

Thread Dial

Tools Needed **Qty**
Hex Wrench 6mm..... 1

The numbers on the thread dial are used with the thread dial chart to show when to engage the half nut during inch threading. Loosen the cap screw on the thread dial (see **Figure 79**), pivot the gear teeth so they mesh with the leadscrew threads, then re-tighten the cap screw.

Note: *The thread dial is not used for metric threading or pitch turning. You must leave the half nut engaged from the beginning until the turning is complete for this type of operation.*

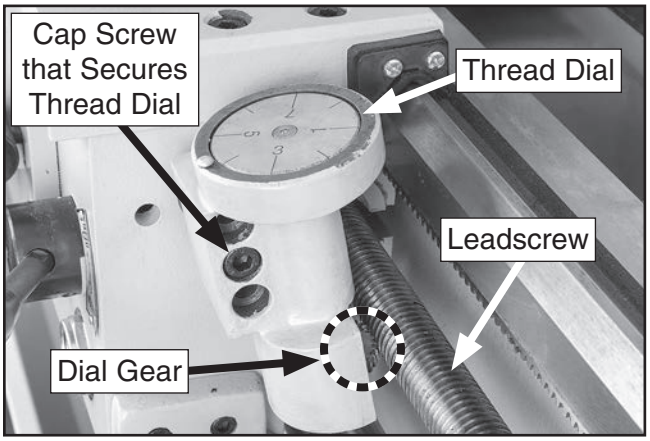


Figure 79. Thread dial engaged.

When the first thread cutting pass is complete, the operator disengages the carriage from the leadscrew using the half nut lever. The operator returns the carriage for the next pass and re-engages the half nut using the same thread dial setting to resume the cut in the previous pass.

NOTICE

When threading, we recommend using slowest speed possible and avoiding deep cuts, so you are able to disengage half nut when required and prevent apron from crashing into other components!

Thread Dial Chart

The thread dial chart is located on the headstock in front of the chuck, as shown in **Figure 80**.

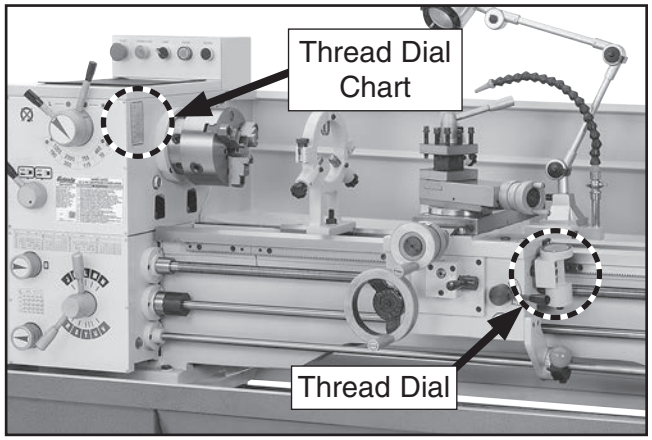


Figure 80. Locations of thread dial chart and thread dial

To use the thread chart, find the TPI that you want to cut and reference the "Scale" number(s) next to it. The scale number(s) indicate when to engage the half nut when cutting that TPI.

For Example: If you are cutting 13 TPI threads, the chart shows "1, 3, 5, 7" next to the 13 (see the shaded boxes in **Figure 81**).

Indicator Table					
T.P.I.	Scale	T.P.I.	Scale	T.P.I.	Scale
3-½	1,5 / 3,7	11-½	1,5 / 3,7	32	ALL
4	ALL	12	ALL	36	ALL
5-¼	1	13	1,3,5,7	40	ALL
5-½	1,5 / 3,7	14	ALL	42	ALL
5-¾	1	16	ALL	44	ALL
6	ALL	18	ALL	46	ALL
6-½	1,5 / 3,7	20	ALL	48	ALL
7	1,3,5,7	21	1,3,5,7	52	ALL
8	ALL	22	ALL	72	ALL
9	1,3,5,7	23	1,3,5,7	80	ALL
10	ALL	24	ALL		
10-½	1,5 / 3,7	26	ALL		
11	1,3,5,7	28	ALL		

Figure 81. Thread dial chart.

Note: *If you want to cut a thread not found on the chart or you do not want to use the chart, you can cut any thread by starting and stopping on the "1" on the thread dial.*

The following examples explain how to use the thread dial and the thread dial chart.

Even TPI: For threading even numbered TPI, use any mark on the thread dial (see the example in **Figure 82**).

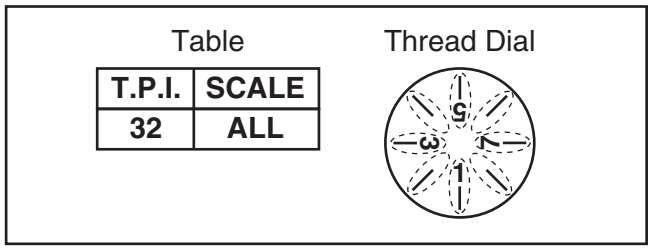


Figure 82. Any mark on dial for threading even numbered TPI.

Odd TPI: For threading odd numbered TPI, use any numbered line on the thread dial (see the example in **Figure 83**).

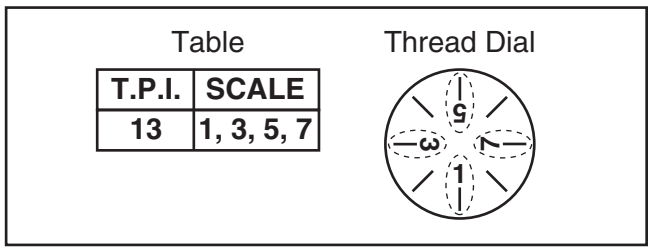


Figure 83. Any number on dial for threading odd numbered TPI.

Fractional TPI Ending in ½: For threading fractional TPI ending in ½, use any pair of opposite numbers on the thread dial (see the example in **Figure 84**).

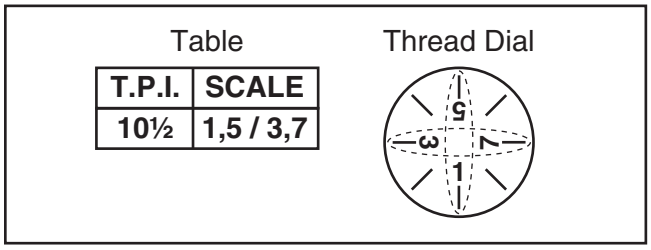


Figure 84. Thread dial positions for fractional TPI ending in ½.

Important: *Once a number has been selected, continue using that number or its opposite on the dial.*

For example:

- If you make the first threading pass and select "1", then for all following passes you must select the 1 or its opposite, number 5.
- If you make the first threading pass and select "3", then for all following passes you must select either the 3 or its opposite, number 7.

Any Other TPI: For threading any other TPI, use only the number 1 on the thread dial (see the example in **Figure 85**).

Note: *You can also choose to use only the number 1 to cut any thread if you do not want to use the chart, or if you forget any of the above rules.*

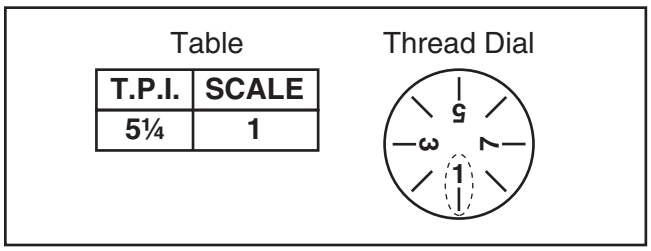


Figure 85. Thread dial position for any numbered TPI.

Coolant System

When the coolant pump is turned ***ON***, fluid is delivered through the nozzle attached to the carriage.

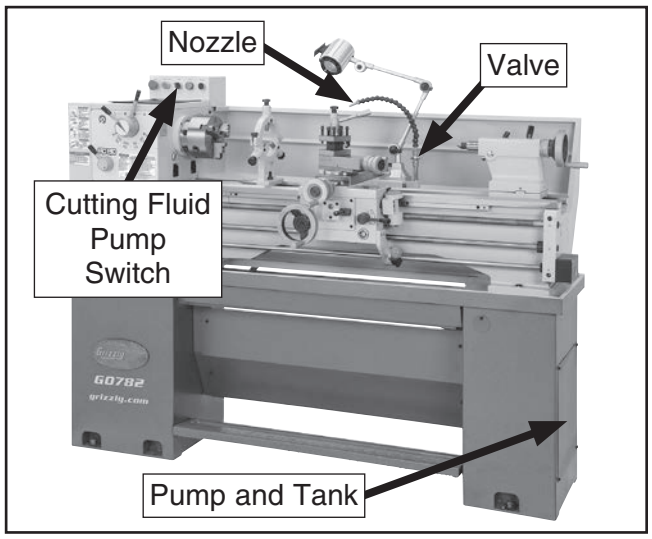
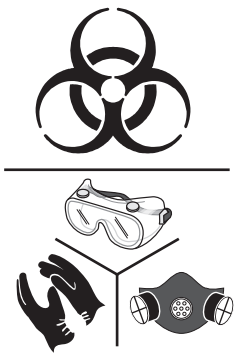


Figure 86. Cutting fluid system controls.

Always use high quality coolant and follow the manufacturer's instructions for diluting. The quick reference table shown in **Figure 87** can help you select the appropriate fluid.

Refer to **Coolant System Service** on **Page 68** for detailed instructions on how to add or change fluid. Check the coolant regularly and promptly change it when it becomes overly dirty or rancid, or as recommended by the fluid manufacturer.



⚠WARNING

BIOLOGICAL & POISON HAZARD!

Use the correct personal protection equipment when handling coolant. Follow federal, state, and fluid manufacturer requirements for proper disposal.

NOTICE

Running the pump without adequate fluid in the coolant tank may permanently damage it, which will not be covered under warranty.

To use coolant system on your lathe:

1. Make sure coolant tank is properly serviced and filled with appropriate fluid, and that you are wearing necessary personal protection equipment.

2. Position coolant nozzle for your operation.

3. Use coolant pump switch on control panel to turn pump ***ON***.

4. Adjust flow of coolant at nozzle.

   Important: *Promptly clean any splashed fluid from the floor to avoid a slipping hazard.*

Workpiece	Dry	Water Soluble Oil	Synthetic Fluids	Sulferized Oil	Mineral Oil
Aluminum		X	X		
Brass	X	X	X		
Bronze	X	X	X		X
Cast Iron	X				
Low Carbon Steel		X	X		
Alloy Metals		X	X	X	X
Stainless Steel		X	X	X	X

General Note: *Cutting fluids are used for heavy-duty lathe operations and production turning. Oil-water emulsions and synthetic cutting fluids are the most common for typical lathe operations. Sulferized oils often are used for threading. For small projects, spot lubrications can be done with an oil can or brush, or omitted completely.*

Figure 87. Coolant selection table.

SECTION 5: ACCESSORIES

⚠WARNING

Installing unapproved accessories may cause machine to malfunction, resulting in serious personal injury or machine damage. To reduce this risk, only install accessories recommended for this machine by Grizzly.

NOTICE

Refer to our website or latest catalog for additional recommended accessories.

T23962—ISO 68 Moly-D Way Oil, 5 gal.
T23963—ISO 32 Moly-D Machine Oil, 5 gal.
T26685—ISO 32 Moly-D Machine Oil, 1 gal.
T23964—Armor Plate with Moly-D Multi-Purpose Grease, 14.5 oz. (NLGI#2 Equivalent)
Moly-D oils are some of the best we've found for maintaining the critical components of machinery because they tend to resist run-off and maintain their lubricity under a variety of conditions—as well as reduce chatter or slip. Buy in bulk and save with 5-gallon quantities.

Figure 88. ISO 68 and ISO 32 machine oil and multi-purpose grease.

T10295—7-Pc. Indexable Carbide Set 5/8"
This turning tool set is ideal for a wide variety of projects. Supplied with right- and left-hand turning/facing tool holders, and one threading and cut-off tool. Indexable inserts ensure cutting surfaces stay sharp.

Figure 89. T10295 7-Pc. Indexable Carbide Set 5/8".

T27400—Tool Post Grinder
Every lathe owner should have a tool post grinder as part of their tooling arsenal. Grinding allows you to produce a super finish on hardened materials, and hold extremely tight tolerances on long shafts (such as ten thousandths of an inch). Mounts directly onto the tool post of your lathe. Maximum lathe swing compatibility: 12"–22". An excellent quality unit!

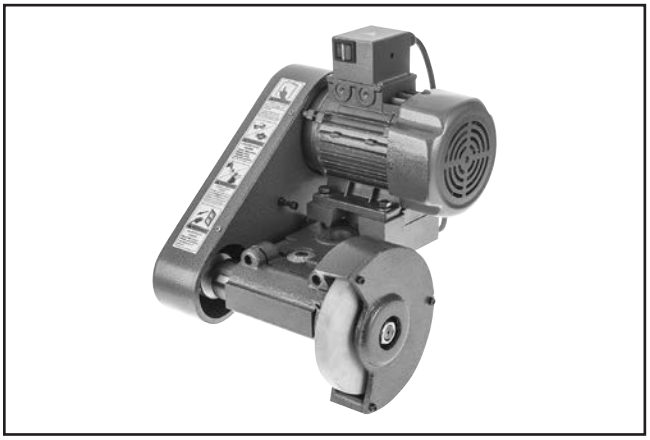


Figure 90. T27400 Tool Post Grinder.

H6095—Digital Readout (DRO)
We had these DROs made specially for us and are proud to claim that they are some of the finest DROs on the market today. You will be amazed at the list of features, including: selectable resolution down to 5µm, absolute/incremental coordinate display, arc function, line of holes function, angled cuts function, 199 user-defined datum points, centering/cutter offset, double-sealed scales, inches/millimeters, calculator with trig functions (mills only), and linear error compensation. Our low prices are a reflection of the absence of any 'middlemen' in the marketing structure. Without a doubt, these feature-packed DROs will fit just about any budget!

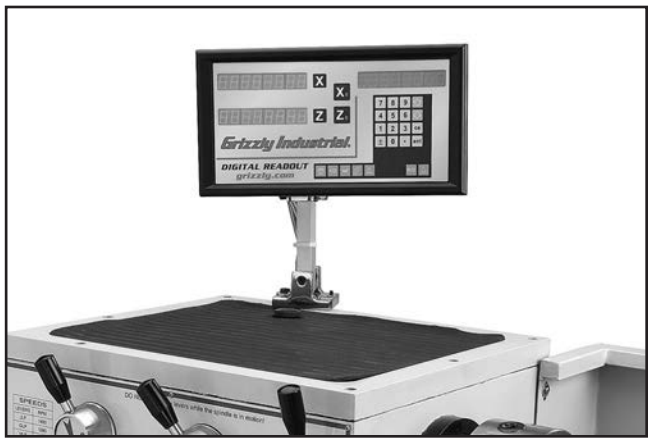


Figure 91. H6095 Digital Readout.

H5786—MT#3 x 4" Bull Nose Rolling Center
H5902—MT#3 x 2" Bull Nose Rolling Center
Built with precision-sealed bearings, designed for heavy-duty use on hollow workpieces.

Figure 92. MT#3 bull nose rolling centers.

T10118—Tailstock Digital Readout
Manage the exact depth of cut with your tailstock! Both the scale and remote displays come with a 0.0005" (five ten-thousandths of an inch) resolution, inch or millimeter display, zero keys and ON/OFF keys. The scale has an 8" range and its display features ABS or INC mode and Hold key. Displays read independently of each other, too!

Figure 93. T10118 Tailstock Digital Readout.

T10303—5-Pc. Quick-Change Tool Post Set
Aloris Tool Posts are well known for their lasting repetitive accuracy and time-saving setup. Rugged construction means there's no chatter or vibration. A patented locking device assembly and sliding tapered gib eliminates tool post indexing, so there's no indexing balls and shims, and there's no need to disturb the basic set-up.

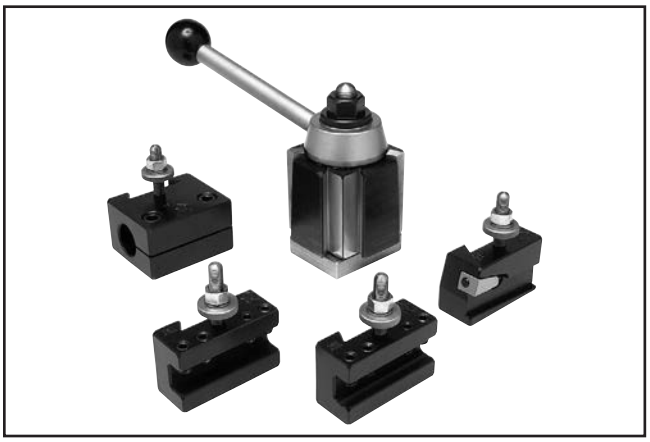


Figure 94. Model T10303 Quick-Change 5-Pc. Tool Post Set.

T20501—Face Shield Crown Protector 4"
T20502—Face Shield Crown Protector 7"
T20503—Face Shield Window
T20452—"Kirova" Anti-Reflective S. Glasses
T20451—"Kirova" Clear Safety Glasses
H7194—Bifocal Safety Glasses 1.5
H7195—Bifocal Safety Glasses 2.0
H7196—Bifocal Safety Glasses 2.5

Figure 95. Eye protection assortment.

G9849—Magnetic Base/Dial Indicator Combo
Magnetic base engages with the turn of a switch and allows pinpoint adjustment. The dial indicator features 0–1" travel and has a resolution of 0.001". Set includes a molded case for protection and convenience.

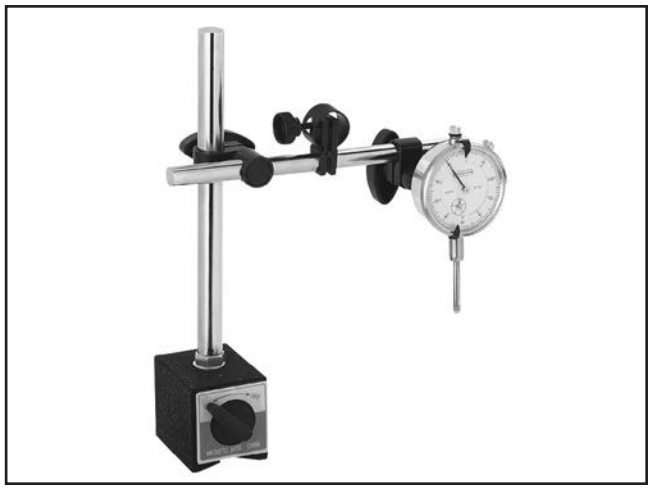


Figure 96. G9849 Magnetic base/dial indicator combo.

G7038Z—Boring Bar
G7040—Carbide Inserts for Steel (5 Pk.)
G7048—Carbide Inserts for Cast Iron (5 Pk.)

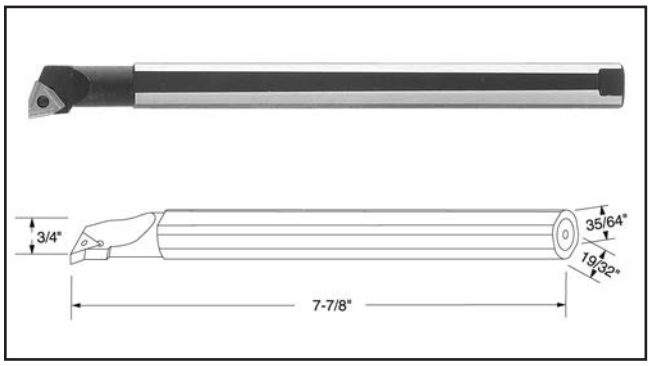


Figure 97. G7038Z Boring Bar.

G7033—Internal Threading Tool Holder
G7042—Carbide Inserts for Steel (5 Pk.)
G7050—Carbide Inserts for Cast Iron (5 Pk.)

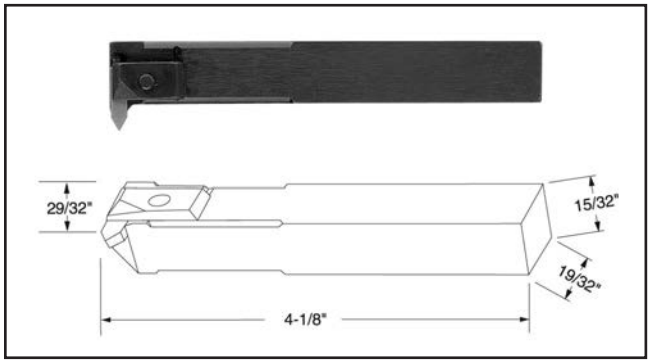


Figure 98. G7033 Internal Threading Tool Holder.

G7030—Threading Tool Holder
G7041—Carbide Inserts for Steel (5 Pk.)
G7049—Carbide Inserts for Cast Iron (5 Pk.)

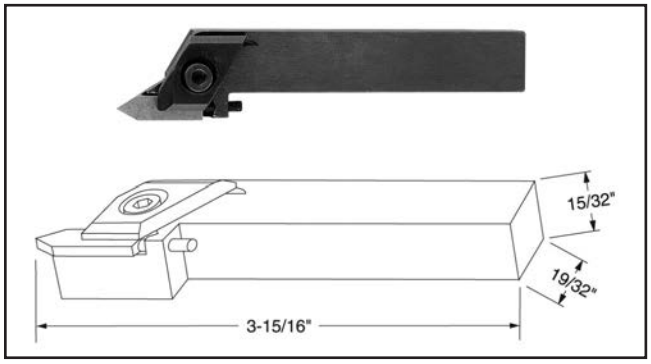


Figure 99. G7030 Threading Tool Holder.

H5930—4-Pc. Center Drill Set 60°
H5931—4-Pc. Center Drill Set 82°
Double-ended HSS Center Drills are precision ground. Each set includes sizes 1–4.

SIZE	BODY Ø	DRILL Ø	OL LENGTH
1	1/8"	3/64"	1 1/4"
2	3/16"	5/64"	1 7/8"
3	1/4"	7/64"	2"
4	5/16"	1/8"	2 1/8"

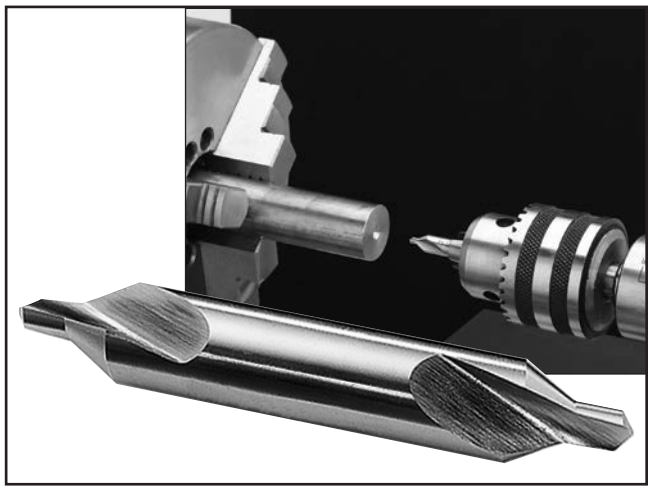


Figure 100. HSS precision-ground center-drill sets.

H2987—½" Bent Lathe Dog
H2988—1" Bent Lathe Dog
H2989—1½" Bent Lathe Dog
H2990—2" Bent Lathe Dog
H2991—3" Bent Lathe Dog
Just the thing for precision machining between centers! These bent tail lathe dogs are made of durable cast iron and feature square head bolts.

Figure 101. H2987-91 lathe dogs.

T10459—5-C Quick-Change Collet Chuck
Mount this 5-C Quick Change Collet Chuck to your D1-4 lathe and you'll be turning, facing, boring, grinding and milling in no time. Accepts all 5-C collets. T-handle chuck key ensures uniform holding power and quick collet changes.

G1238—15 Pc. Precision 5-C Collet Set
Made from high grade collet steel and precision ground to exacting tolerances. Complete 15 Pc. set. Includes: 1/8"–1" in 1/16" increments.

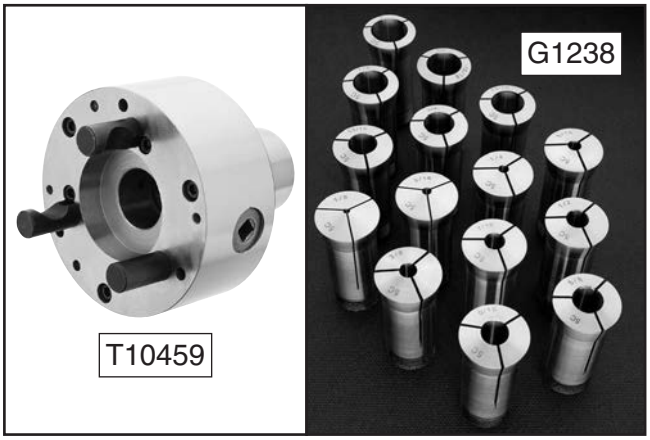


Figure 102. 5-C quick-change collet chuck and 15 Pc. 5-C collet set.

G9788—4-Pc. Measuring Tool Set
This is the set you need for accurate measurements. Includes a stainless steel 6" dial caliper, a 6" scale with inch scale on one side and a metric scale on the other, a 1" carbide tipped micrometer with vernier scale, and a 4" precision square with beveled edge. Comes with molded case and micrometer adjustment wrench.

Figure 103. G9788 4-Pc. Measuring Tool Set.

G1070—MT#3 Live Center Set
This live center set offers seven interchangeable tips. High-quality needle bearings prolong tool life and special tool steel body and tips are precision ground. Supplied in wooden box.

Figure 104. G1070 Live Center Set.

G1677—Drill Chuck Arbor MT#3/JT#3
H6202—1/32"-1/2" x JT#3 Precision Drill Chuck
H8261—1/32"-1/2" x MT#3 Keyless Drill Chuck

Figure 105. Accessory drill chucks and arbor.

T25613—Metal Lathe for Home Machinists
This project-based course provides a complete introduction to the lathe and lathe metalworking. It assumes no prior knowledge and works through the process of using a lathe from beginning to end. The reader advances through a series of practice projects that teach how to use the lathe and develop essential skills through practical application.

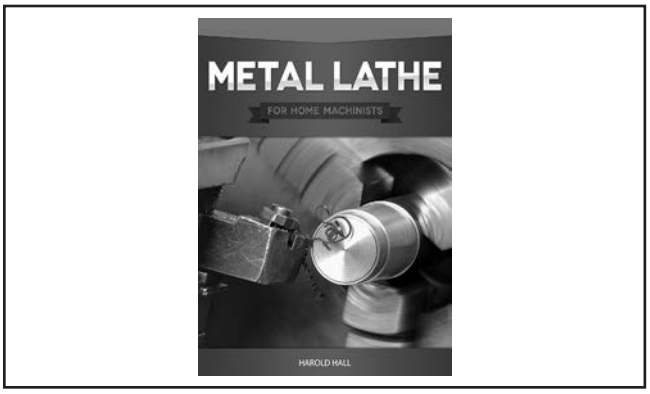


Figure 106. Model T25613 Metal Lathe for Home Machinists.

T24869—Machine Shop Know-How
T24871—Machine Shop Essentials
Must-have reference books for machinists, engineers, gunsmiths, model makers and product designers. Machine Shop Essentials offers comprehensive and detailed presentations of manual machine tools and methods, machine shop basics, and practical shop tips; while Machine Shop Know-How is the next best thing to interning with a master, including practical tips, imaginative short cuts, and problem solving insights that normally take years of hands-on shop experience to learn.

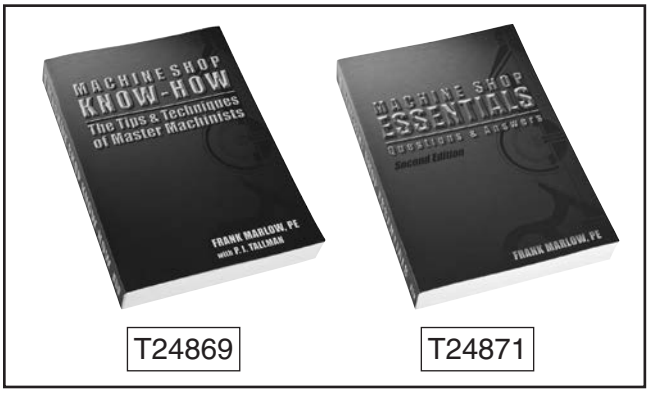
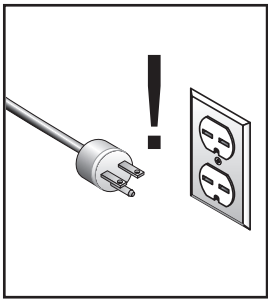


Figure 107. Machine shop reference books.

SECTION 6: MAINTENANCE



⚠WARNING

Always disconnect power to the machine before performing maintenance. Failure to do this may result in serious personal injury.

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.
- Guards or covers removed.
- Emergency Stop/RESET button not working correctly or not requiring you to reset it before starting the machine again.
- Oil level not visible in the sight glasses.
- Damaged or malfunctioning components.

Daily, Before Operations

- Check/add coolant (**Page 68**).
- Check/add headstock oil (**Page 63**).
- Check/add gearbox oil (**Page 64**).
- Check/add apron oil (**Page 65**).
- Add oil to the ball oilers (**Page 65**).
- Lubricate the bedways (**Page 67**).
- Clean/lubricate the leadscrew (**Page 67**).
- Disengage the feed lever and feed selection lever on the apron (to prevent crashes upon startup).
- Ensure carriage lock handle is loose.

Daily, After Operations

- Press the Emergency Stop/RESET button (to prevent accidental startup).
- Vacuum/clean all chips and swarf from bed, slides.
- Wipe down all unpainted or machined surfaces with an oiled rag.

Every 50 Hours

- Lubricate end gears (**Page 66**).

Every 1000 Operating Hours

- Change the headstock oil (**Page 63**).
- Change the gearbox oil (**Page 64**).
- Change the apron oil (**Page 65**).

Annually

- Check/level bedway (**Page 21**).

Cleaning/Protecting

Because of its importance, we recommend that the cleaning routine be planned into the workflow schedule.

Typically, the easiest way to clean swarf from the machine 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 slightly oiled rag. Avoid using compressed air to blow off chips, as this may drive them deeper into the moving surfaces or cause sharp chips to fly into your face or hands.

All 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 if left unprotected (especially parts that are exposed to water soluble cutting fluid). Use a quality ISO 68 way oil (see **Page 57** for offerings from Grizzly) to prevent corrosion.

Lubrication

Use the information in the charts below as a daily guide for lubrication tasks. We recommend using Grizzly T23962 (ISO 68) or T23963 (ISO 32) lubricants (see **Accessories** on, **Page 57**) for most of the lubrication tasks.

Lubrication Frequency

Lubrication Task	Frequency	Page Ref.
Headstock	Daily	**This Page**
Quick-Change Gearbox	Daily	**64**
Apron	Daily	**65**
Bedways	Daily	**67**
Longitudinal Leadscrew	Daily	**67**
Ball Oilers	Daily	**65**
End Gears	Every 50 Hours	**66**

Lubrication Amount & Type

Lubrication Task	Oil Type	Amount
Headstock	ISO 32	**4.2 Qt.**
Quick-Change Gearbox	ISO 68	**2.1 Qt.**
Apron	ISO 68	**1.0 Qt.**
Bedways	ISO 68	**As Needed**
Longitudinal Leadscrew	ISO 68	**As Needed**
Ball Oilers	ISO 32	**1–2 Squirts**
End Gears	NLGI #2	**Dab**

Items Needed **Qty**
Hex Wrench 6mm 1
Hex Wrench 8mm 1
2-Gallon Catch Pan 1
Pump-Type Oil Can w/Plastic Cone Tip 1
Mineral Spirits ..... As Needed
Small Brushes 2

NOTICE

The recommended lubrication is based on light-to-medium usage. Keeping in mind that lubrication helps to protect the value and operation of the lathe, these lubrication tasks may need to be performed more frequently than recommended here, depending on usage.

Failure to follow reasonable lubrication practices as instructed in this manual could lead to premature failure of lathe components and will void the warranty.

Headstock

Oil Type .... Grizzly T23963 or ISO 32 Equivalent
Oil Amount ..... 4.2 Quarts
Check/Add Frequency ..... Daily
Change ..... Every 1000 Operating Hours

The headstock gearing is lubricated by an oil bath that distributes the lubricant with the motion of the gears, much like an automotive manual transmission. Change the oil after the first 300 hours of use, then after every 1000 hours of use.

Checking Oil Level

The headstock reservoir has the proper amount of oil when the oil level in the sight glass is approximately halfway. The oil sight glass is located on the right side of the headstock, as shown in **Figure 108**.

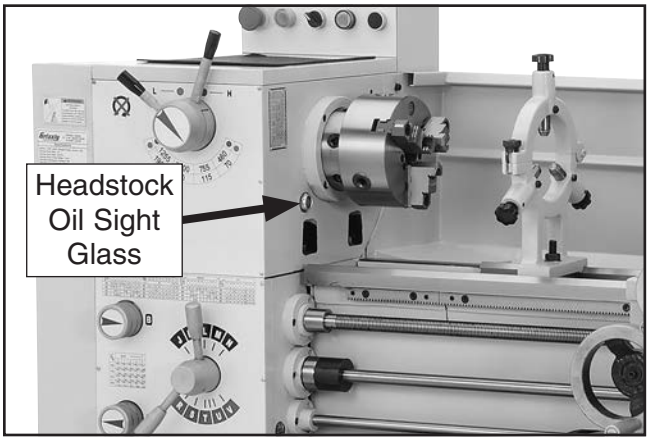


Figure 108. Location of headstock oil sight glass.

Adding Oil
The oil fill plug is located on top of the headstock, as shown in **Figure 109**.

Figure 109. Location of headstock fill plug.

To change headstock oil:

1. DISCONNECT MACHINE FROM POWER!
2. Open end gear cover.
3. Remove V-belts so that oil does not get on them, which may necessitate their replacement (refer to **Replacing V-Belts** on **Page 79** for detailed instructions).
4. Remove fill plug from top of headstock.
5. Place 2-gallon catch pan under headstock drain plug (see **Figure 110**), then remove drain plug with 8mm hex wrench.

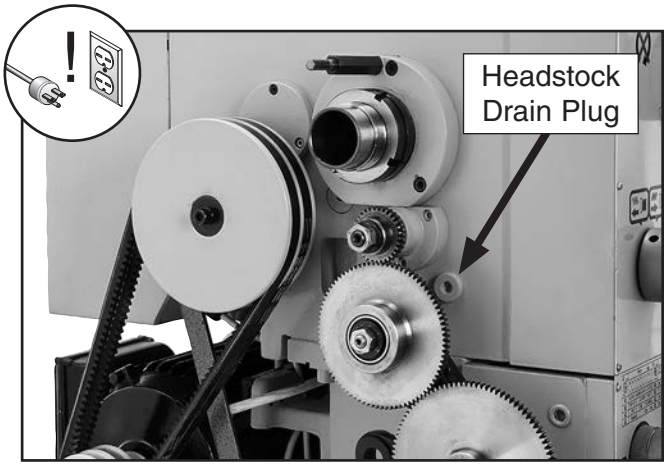


Figure 110. Location of headstock drain plug.

6. When headstock reservoir is empty, replace drain plug and clean away any spilled oil.
7. Fill headstock reservoir until oil level is approximately halfway in sight glass.
8. Replace and re-tension the V-belts (refer to **Replacing V-Belts** on **Page 79**), then close end gear cover before re-connecting lathe to power.

Quick-Change Gearbox

Oil Type .... Grizzly T23962 or ISO 68 Equivalent
Oil Amount..... 2.1 Quarts
Check/Add Frequency..... Daily
Change..... Every 1000 Operating Hours

Checking Oil Level
The gearbox reservoir has the proper amount of oil when the oil level in the sight glass is approximately halfway. The oil sight glass is located below the end gears, as shown in **Figure 111**.

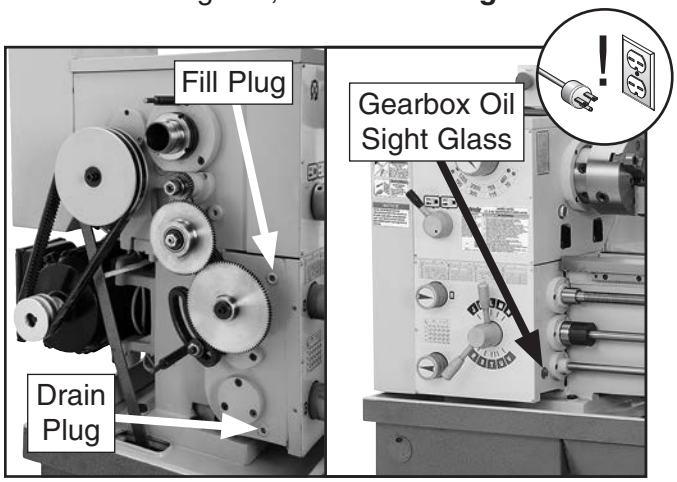


Figure 111. Location of gearbox fill and drain plugs and oil sight glass.

Changing Oil
Change the quick-change gearbox oil after the first 300 hours of use, then after every 1000 hours of use. Place a catch pan under the quick-change gearbox drain plug (see **Figure 111**). Use a 8mm hex wrench to remove the gearbox fill plug (see **Figure 111**), then remove the drain plug and allow the gearbox reservoir to empty. Re-install the drain plug and add oil until the level is approximately halfway in the gearbox oil sight glass, then re-install the fill plug.

Apron

Oil Type .... Grizzly T23962 or ISO 68 Equivalent
Oil Amount..... 1.0 Quart
Check/Add Frequency..... Daily
Change..... Every 1000 Operating Hours

Checking Oil Level

The apron oil sight glass is located on the front of the apron, as shown in **Figure 112**. Maintain the oil volume so that the level is approximately halfway in the sight glass.

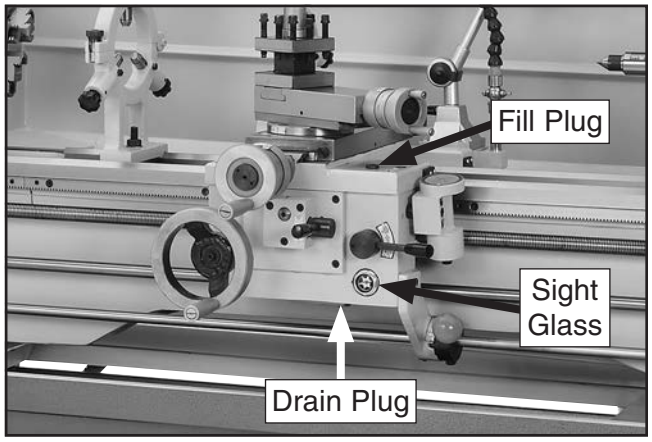


Figure 112. Location of apron oil sight glass.

Changing Oil & Flushing Reservoir

Small metal particles may accumulate at the bottom of the reservoir with normal use. Therefore, to keep the reservoir clean, drain and flush it after the first 300 hours of use, then after every 1000 hours of use.

Place a catch pan under the apron drain plug shown in **Figure 112**, remove the fill plug, then use a 6mm hex wrench to remove the drain plug, and empty the reservoir.

Flush the reservoir by pouring a small amount of clean oil into the fill hole and allowing it to drain out the bottom. Replace the drain plug, add oil as previously described, then re-install the fill plug.

Ball Oilers

Oil Type .... Grizzly T23963 or ISO 32 Equivalent
Oil Amount.....1 or 2 Squirts
Lubrication Frequency..... Daily

This lathe has 16 ball oilers that should be oiled on a daily basis before beginning operation. Refer to **Figures 113–116** for their locations.

Ball Oilers

Proper lubrication of ball oilers is done with a pump-type oil can 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 in the oil galley.

Lubricate the ball oilers before and after machine use, and more frequently under heavy use. When lubricating ball oilers, first clean the outside surface to remove any dust or grime. 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 can until the oil runs clear. When finished, wipe away any excess oil.

Below is a list of the ball oilers:

A. Cross-slide handwheel oiler
B. Compound rest leadscrew & slide oiler
C. Cross-slide leadscrew & slide oilers
D. Saddle slide oilers
E. Thread dial indicator oiler
F. Feed selection oiler
G. Carriage handwheel oiler
H. Tailstock oilers
I. Leadscrew end bearing oilers

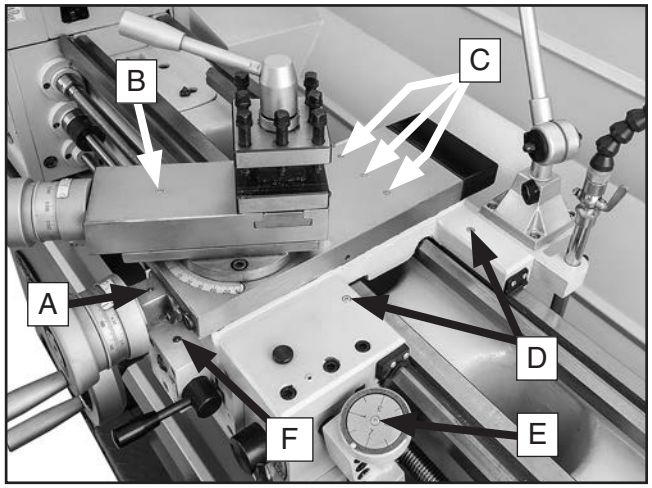


Figure 113. Saddle and slide ball oilers.

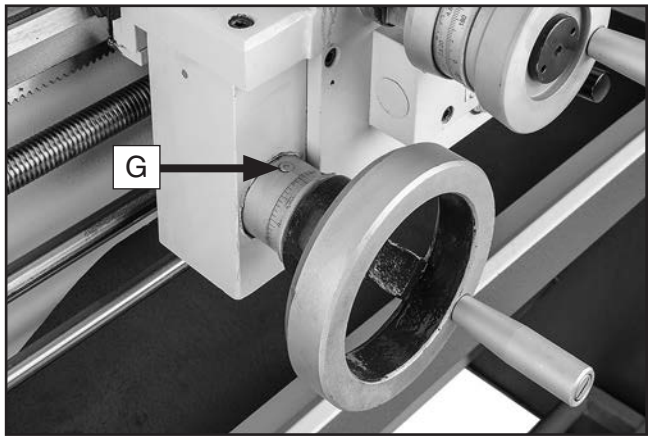


Figure 114. Carriage handwheel ball oiler.

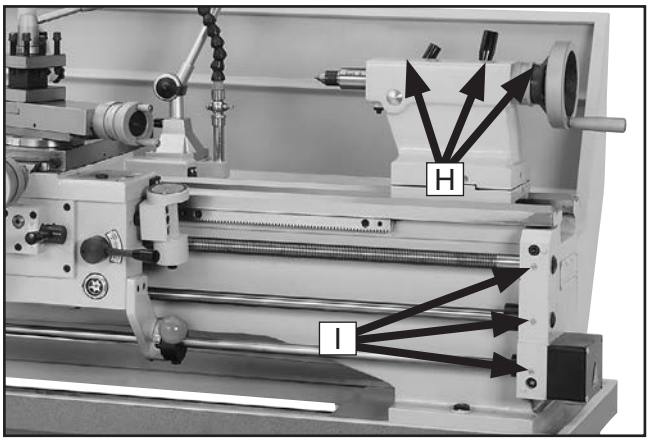


Figure 115. Tailstock and leadscrew end bearing ball oilers.

End Gears

Grease Type..... T23964 or NLGI#2 Equivalent
Lubrication..... Every 50 Operating Hours

The end gears, shown in **Figure 116**, should always have a thin coat of heavy grease to minimize corrosion, noise, and wear. Wipe away excess grease that could be thrown onto the V-belts and reduce optimal power transmission from the motor.

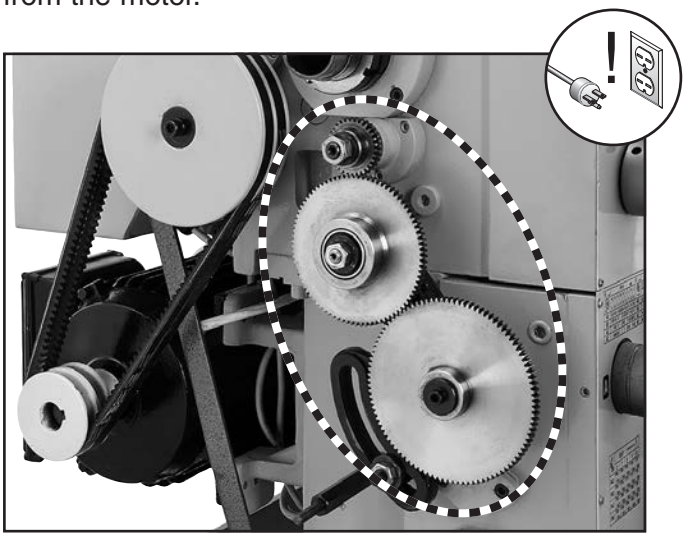


Figure 116. Location of end gears for lubrication.

Handling & Care

Make sure to clean and lubricate any gears you install or change. Be very careful during handling and storage—the grease coating on the gears will easily pickup dirt or debris, which can then spread to the other gears and increase the rate of wear.

Make sure the end gear cover remains closed whenever possible to keep the gears free of dust or debris from the outside environment.

Lubricating

1. DISCONNECT MACHINE FROM POWER!

2. Open end gear cover and remove all end gears shown in **Figure 116**.

3. Clean end gears thoroughly with mineral spirits to remove old grease. Use a small brush if necessary to clean between teeth.

4. Clean shafts, and wipe away any grease splatters in vicinity and on inside of end gear cover.

5. Using a clean brush, apply a thin layer of grease on gears. Make sure to get grease between gear teeth, but do not fill teeth valleys.

6. Install end gears and mesh them together with an approximate 0.002"–0.004" backlash. Once gears are meshed together, apply a small dab of grease between them where they mesh together—this grease will be distributed when gears rotate and recoat any areas scraped off during installation.

7. Close end gear cover before reconnecting lathe to power.

Bedways

Oil Type .... Grizzly T23962 or ISO 68 Equivalent
Oil Amount..... As Needed
Lubrication Frequency..... Daily

Before lubricating the bedways (see **Figure 117**), clean them with mineral spirits. Apply a thin coat of oil along the length of the bedway. Move the steady rest, carriage, and tailstock to access the entire length of the bedways. If the lathe is in a moist or dirty environment, increase the lubrication interval.

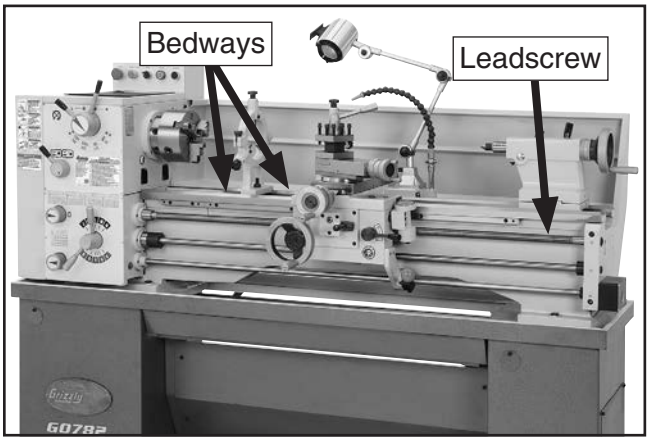


Figure 117. Bedway lubrication points.

Longitudinal Leadscrew

Oil Type .... Grizzly T23962 or ISO 68 Equivalent
Oil Amount..... As Needed
Lubrication Frequency..... Daily

Before lubricating the leadscrew (see **Figure 117**), clean it first with mineral spirits. A stiff brush works well to help clean out the threads. Make sure to move the carriage out of the way, so you can clean the entire length of the leadscrew.

Apply a thin coat of oil along the length of the leadscrew. Use a 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.*

Coolant System Service

The coolant system consists of a fluid tank, pump, and flexible nozzle. The pump pulls fluid from the tank and sends it to the nozzle, which controls the flow of coolant. As the fluid leaves the work area, it drains from the chip drawer, where the swarf and metal chips are screened out, through the drain chute, and back into the tank. The chip drawer slides open and is removable for cleaning.

Use **Figures 118–119** to identify the locations of the coolant system controls and components.

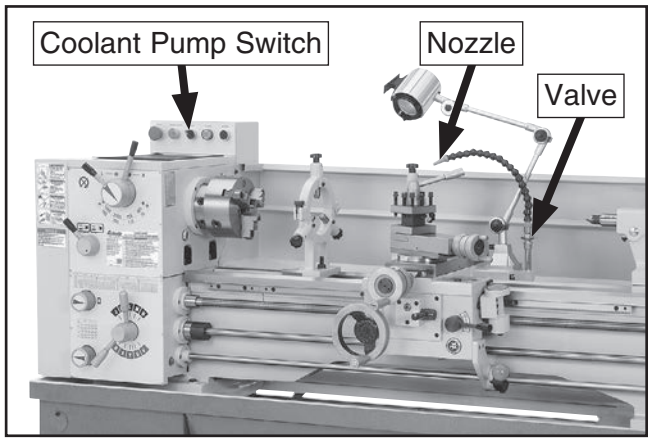


Figure 118. Coolant controls.

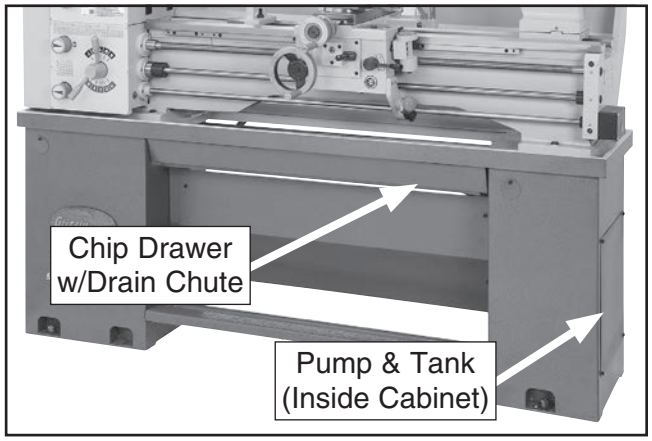


Figure 119. Additional coolant components.

⚠CAUTION

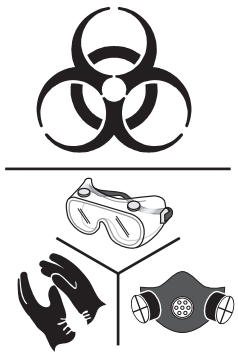
Chip drawer is very heavy. Unless removing chip drawer for cleaning, pull it out less than halfway to prevent it from falling and causing impact injuries. If removing drawer for cleaning, get assistance!

Although most swarf from machining operations is screened out of the coolant before it returns to the tank, small particles will accumulate in the bottom of the tank in the form of sludge. To prevent this sludge from being pulled into the pump and damaging it, the pump's intake is positioned several inches from the bottom of the tank. This works well when the tank is regularly cleaned; however, if excess sludge is allowed to accumulate, the pump will inevitably begin sucking it up.

Hazards

As coolant ages and gets used, dangerous microbes can proliferate and create a biological hazard. The risk of exposure to this hazard can be greatly reduced by replacing the old fluid on a monthly basis, or as indicated by the fluid manufacturer.

When working with the coolant, minimize exposure to your skin, eyes, and lungs by wearing the proper PPE (Personal Protective Equipment), such as long-sleeve waterproof gloves, protective clothing, splash-resistant safety goggles, and a NIOSH-approved respirator.



⚠WARNING

BIOLOGICAL & POISON HAZARD!

Use correct personal protection equipment when handling coolant. Follow federal, state, and fluid manufacturer requirements for proper disposal.

Adding Coolant

Items Needed **Qty**
Safety Wear.....See **Hazards** on **Page 68**
New Coolant..... 10.0 Quarts
Hex Wrench 5mm..... 1
Disposable Shop Rags..... As Needed

To add coolant:

1. DISCONNECT MACHINE FROM POWER!

2. Remove access cover from side of right stand, then lift tank out, as shown in **Figure 120**.

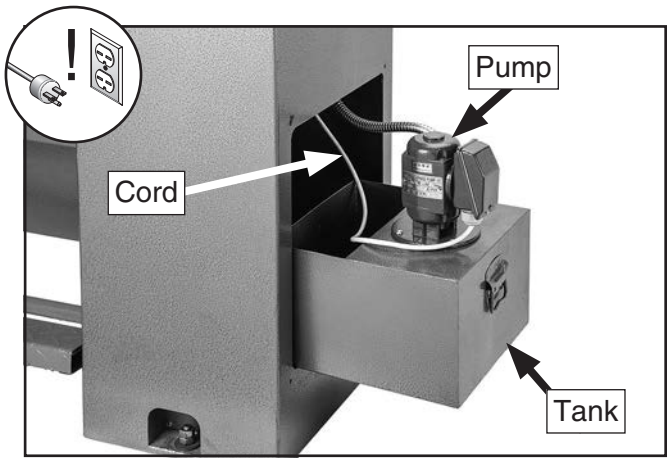


Figure 120. Location of coolant tank and pump.

3. Pour coolant into tank until it is approximately 1" from top.

4. Slide tank back into cabinet and replace access cover.

Changing Coolant

When you replace the old coolant, take the time to thoroughly clean out the chip drawer and fluid tank. The entire job only takes about a ½ hour when you are prepared with the proper materials and tools. Make sure to dispose of old fluid according to federal, state, and fluid manufacturer's requirements.

Items Needed **Qty**
Safety Wear.....See **Hazards** on **Page 68**
New Coolant..... 10.0 Quarts
Empty 2-Gallon Buckets w/Lids 2
Hex Wrench 5mm..... 1
Disposable Shop Rags..... As Needed
Magnets (Optional)..... As Many As Desired

To change coolant:

1. Position coolant nozzle over back splash so that it is pointing behind lathe.

2. Have another person hold bucket up to nozzle to prevent coolant from splashing out.

3. Turn coolant pump ***ON*** and open valve (see **Figure 118** on **Page 68**) to pump old fluid out of reservoir. Turn pump ***OFF*** immediately after fluid stops flowing.

NOTICE

Running coolant pump longer than necessary for this procedure without adequate fluid in tank may permanently damage it, which will not be covered under warranty.

4. DISCONNECT MACHINE FROM POWER!

5. Remove access cover from side of right stand, then lift tank out.

   Note: *The fluid hose and pump cord (see **Figure 120**) were purposely left long, so the tank can be removed and dumped out without disconnecting them from the tank.*

6. Pour remaining coolant into 2-gallon bucket and close lid.

7. Clean all sludge from bottom of tank and then flush it clean. Use second bucket to hold waste and make sure to seal lid closed when done.

   Dispose of old coolant and swarf according to federal, state, and fluid manufacturer's requirements.

8. Replace tank in cabinet, making sure tank opening is situated under coolant drain chute.

9. Add coolant as instructed on this page.

Machine Storage

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

Preparing Lathe for Storage

1. Run lathe and bring all reservoirs to operating temperature, then drain and refill them with clean oil.

2. Pump out old coolant, then add a few drops of way oil and blow out the lines with compressed air.

3. DISCONNECT MACHINE FROM POWER!

4. Thoroughly clean all unpainted, bare metal surfaces, then apply a liberal coat of way oil, heavy grease, or rust preventative. Take care to ensure these surfaces are completely covered but that the rust preventative or grease is kept off of painted surfaces.

5. Lubricate machine as outlined in **Lubrication**, on **Page 63**. Be sure to use an oil can to purge all ball oilers and oil passages with fresh oil.

6. Loosen or remove V-belts so they do not become stretched during storage period.

   Note: *Be sure to place a maintenance note near power button as a reminder that belts have been loosened or removed.*

7. Place a few moisture-absorbing desiccant packs inside of electrical box.

8. Cover lathe and place it in a dry area that is out of direct sunlight and away from hazardous fumes, paint, solvents, or gas. Fumes and sunlight can bleach or discolor paint.

9. Every few months, rotate by hand all gear-driven components a few times in several gear settings. This will keep bearings, bushings, gears, and shafts well lubricated and protected from corrosion—especially during winter months.

10. Slide carriage, tailstock, and steady rest down lathe bed to make sure that way spotting is not beginning to occur.

Bringing Lathe Out of Storage

1. Re-install V-belts and re-tension them (refer to **Page 79**) if you removed them for storage purposes.

2. Remove moisture-absorbing desiccant packs from electrical box.

3. Repeat **Test Run** and **Spindle Break-In** procedures, beginning on **Page 24**.

4. Add coolant, as described in **Coolant System Service** on **Page 68**.

SECTION 7: SERVICE

Review the troubleshooting procedures in this section if a problem develops with your machine. If you need replacement parts or additional help with a procedure, call our Technical Support. **Note:** *Please gather the serial number and manufacture date of your machine before calling.*

Troubleshooting

Symptom	Possible Cause	Possible Solution
Machine does not start or a breaker trips.	1. Emergency Stop/RESET button depressed/at fault. 2. Plug/receptacle at fault/wired wrong. 3. Incorrect power supply voltage or circuit size. 4. Power supply circuit breaker tripped or fuse blown. 5. Wiring open/has high resistance. 6. Thermal overload relay tripped/at fault. 7. Motor wires connected incorrectly. 8. ON/OFF switch at fault. 9. Start capacitor at fault. 10. Contactor not energized/has poor contacts. 11. Centrifugal switch at fault. 12. Spindle rotation switch at fault. 13. Motor at fault.	1. Rotate button head to reset; replace. 2. Test for good contacts; correct the wiring. 3. Ensure correct power supply voltage and circuit size. 4. Ensure circuit is sized correctly and free of shorts. Reset circuit breaker or replace fuse. 5. Check/fix broken, disconnected, or corroded wires. 6. Reduce load on motor if overheated; reset; replace. 7. Correct motor wiring connections. 8. Replace switch. 9. Test/replace. 10. Test all legs for power/replace. 11. Adjust/replace centrifugal switch if available. 12. Test/replace switch. 13. Test/repair/replace.
Machine stalls or is underpowered.	1. Machine undersized for task. 2. Feed rate/cutting speed too fast. 3. Wrong workpiece material. 4. Belt slipping due to oil/grease contamination, improper tension or excessive wear. 5. Motor wired incorrectly. 6. Motor overheated. 7. Run capacitor at fault. 8. Pulley/sprocket slipping on shaft. 9. Gearbox at fault.	1. Use sharp tools at correct angle; reduce feed rate/depth of cut; use coolant if possible. 2. Decrease feed rate/cutting speed. 3. Use correct type/size of metal. 4. Tension/replace belt(s) (**Page 79**); clean belt(s) of any oil/grease. 5. Wire motor correctly. 6. Clean motor, let cool, and reduce workload. 7. Test/repair/replace. 8. Replace loose pulley/shaft. 9. Replace broken or slipping gears.
Machine has vibration or noisy operation.	1. Motor or component loose. 2. Bit chattering. 3. V-belt(s) worn or loose. 4. Motor fan rubbing on fan cover. 5. Pulley loose or misaligned. 6. Motor mount loose/broken. 7. Machine incorrectly installed. 8. Motor bearings at fault.	1. Inspect/replace damaged bolts/nuts, and retighten with thread locking fluid. 2. Replace/sharpen bit; index bit to workpiece; use correct feed rate and cutting RPM. 3. Inspect/replace belts with a new matched set (**Page 79**). 4. Fix/replace fan cover; replace loose/damaged fan. 5. Re-align/replace pulley/shaft, pulley set screw, and key. 6. Tighten/replace. 7. Tighten mounting bolts; relocate/shim machine. 8. Test by rotating shaft; rotational grinding/loose shaft requires bearing replacement.

Symptom	Possible Cause	Possible Solution
Entire machine vibrates upon startup and while running.	1. Workpiece is unbalanced. 2. Workpiece is hitting stationary object. 3. Loose or damaged V-belt(s). 4. V-belt pulleys not properly aligned. 5. Chuck or faceplate is unbalanced. 6. Gears not aligned in headstock or no backlash. 7. Worn/broken gear or bad bearing. 8. Spindle bearings at fault.	1. Re-install workpiece as centered with the spindle bore as possible. 2. Stop lathe immediately and correct interference problem. 3. Re-tension/replace the V-belt(s) as necessary (**Page 79**). 4. Align the V-belt pulleys. 5. Rebalance chuck or faceplate; contact a local machine shop for help. 6. Adjust change gears and establish backlash (**Page 50**). 7. Replace broken gear or bearing. 8. Reset spindle bearing preload (**Page 80**) or replace worn spindle bearings.
Bad surface finish.	1. Incorrect spindle speed or feed rate. 2. Dull tooling or wrong tool selection. 3. Workpiece is flexing. 4. Excessive play in gibs. 5. Bearing preload needs to be adjusted. 6. Belts are bad. 7. Spindle bearings are bad.	1. Use correct spindle speed (**Page 45**) and feed rate (**Page 47**). 2. Sharpen tooling; use correct tool for operation. 3. Change setup to properly support workpiece. 4. Tighten gibs (**Page 75**). 5. Adjust bearing preload (**Page 80**). 6. Replace belts (**Page 79)**. 7. Change spindle bearings.
Tapered tool difficult to remove from tailstock quill.	1. Quill not fully retracted into tailstock. 2. Debris not removed from tool taper before inserting into quill.	1. Rotate quill handwheel until it forces tapered tool out of quill. 2. Remove quill from tailstock and drive tool out with a punch. Carefully deburr bore of quill.
Cross slide, compound rest, or carriage feed has sloppy operation.	1. Gibs are out of adjustment. 2. Handwheel has excessive backlash. 3. Leadscrew mechanism is worn or out of adjustment.	1. Adjust gibs (**Page 75**). 2. Tighten handwheel fasteners or adjust handwheel backlash to a minimum (**Page 74**). 3. Adjust leadscrew to remove end play.
Cross slide, compound, or carriage handwheels hard to move.	1. Bedways are dry and in need of lubricant. 2. Ways are loaded with shavings, dust, or grime. 3. Gibs are too tight. 4. Backlash setting is too tight.	1. Lubricate bedways/ball oilers (**Page 67**). 2. Remove gibs, clean ways, lubricate, re-install, and re-adjust. 3. Loosen gibs slightly (**Page 75**), and lubricate bedways. 4. Slightly loosen backlash setting (**Page 74**).
Cutting tool or machine components vibrate excessively during cutting.	1. Tool holder is not tight enough. 2. Cutting tool sticks too far out of tool holder; lacks support. 3. Workpiece is deflecting. 4. Workpiece is unbalanced. 5. Gibs are out of adjustment. 6. Cutting tool is dull. 7. Spindle speed or feed rate is incorrect.	1. Tighten tool holder. 2. Re-install cutting tool so no more than ⅓ of total length is sticking out of tool holder. 3. Use steady or follow rest (**Page 40**). 4. Balance workpiece. 5. Adjust gibs (**Page 75**). 6. Replace or resharpen cutting tool. 7. Use recommended spindle speed (**Page 45**) and feed rate (**Page 47**).

Symptom	Possible Cause	Possible Solution
Workpiece is tapered.	1. Spindle and tailstock centers are not properly aligned with each other. 2. Lathe bed is twisted.	1. Re-align tailstock to headstock spindle centerline (**Page 36**). 2. Level lathe (**Page 21**).
Chuck jaws will not move or do not move easily.	1. Chips are lodged in jaws or scroll plate. 2. Dent/ridge in jaw slot of chuck body.	1. Remove jaws, clean and lubricate scroll plate, then re-install jaws. 2. Stone or file off high spot in jaw slots.
Spindle lacks turning power or starts up slowly.	1. Belts are slipping.	1. Tighten belts (**Page 79**); inspect for oil/grease on belts and clean/replace as necessary.
Gear change dials will not shift into position.	1. Gears not aligned inside headstock/quick-change gearbox.	1. Rotate spindle by hand with light pressure on the dial until gears fall into place.
Workpiece slips in chuck.	1. Chuck jaws do not match workpiece diameter. 2. Cutting force is too high. 3. Speed is too high. 4. Jaws are worn or not installed properly.	1. Reposition or mold workpiece so that diameter matches chuck jaw dimensions. 2. Reduce cutting force. 3. Reduce spindle speed (**Page 45**). 4. Remove/re-install properly; turn jaws with cutting tool so they are concentric; replace jaws or chuck.
Carriage will not feed or is hard to move.	1. Gears are not all engaged. 2. Half nut lever is engaged. 3. Carriage lock is tightened down. 4. Screw is loose on feed handle. 5. Chips have loaded up on ways. 6. Ways are dry and in need of lubrication. 7. Gibs are too tight. 8. Gears broken. 9. Feed clutch is slipping.	1. Engage gears using gear dials. 2. Disengage half nut lever. 3. Check to make sure carriage lock is fully released. 4. Tighten. 5. Frequently clear away chips that load up during turning operations. 6. Lubricate bedways/ball oilers (**Page 67**). 7. Loosen gib screw(s) slightly (**Page 75**). 8. Replace gears. 9. Increase clutch spring pressure (**Page 78**).

Adjusting Backlash

Backlash is the amount of play in a leadscrew and can be felt as the free play in a handwheel when changing direction of rotation. The amount of the backlash can be viewed on the handwheel micrometer-collar graduated dial.

When adjusting backlash, tighten the components enough to remove backlash, but not so much that the components bind the leadscrew, making it hard to turn. Overtightening will cause excessive wear to the sliding block and leadscrew.

Tools Needed	**Qty**
Hex Wrench 5mm	1
Hex Wrench 6mm	1

To adjust cross slide backlash:

1. Feed cross slide toward back of machine until it reaches end of its travel.

2. Remove back splash, then remove cap screws and leadscrew cover to access leadscrew nut (see **Figure 121**).

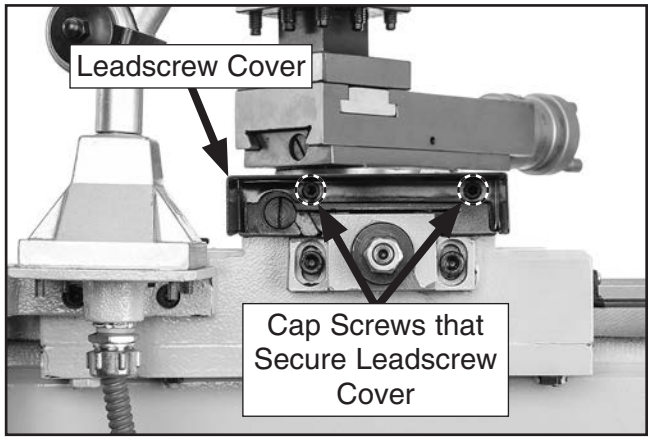


Figure 121. Back splash removed to access cross slide leadscrew cover.

3. Remove cap screw that secures cross slide leadscrew nut (see **Figure 122**).

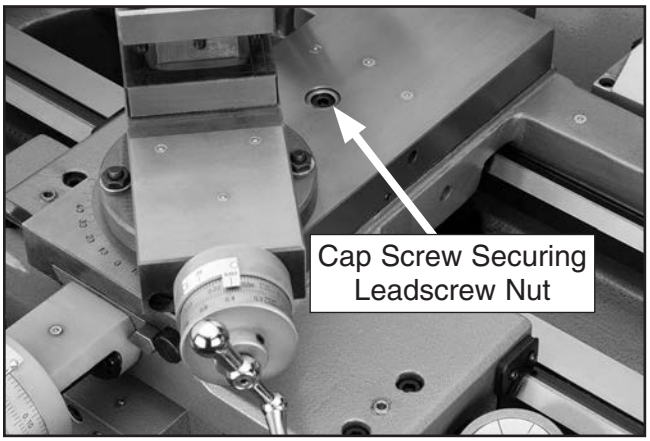


Figure 122. Location of cap screw on typical cross slide that secures leadscrew nut.

4. Rotate cross slide handwheel to feed leadscrew nut out from under cross slide, as shown in **Figure 123**.

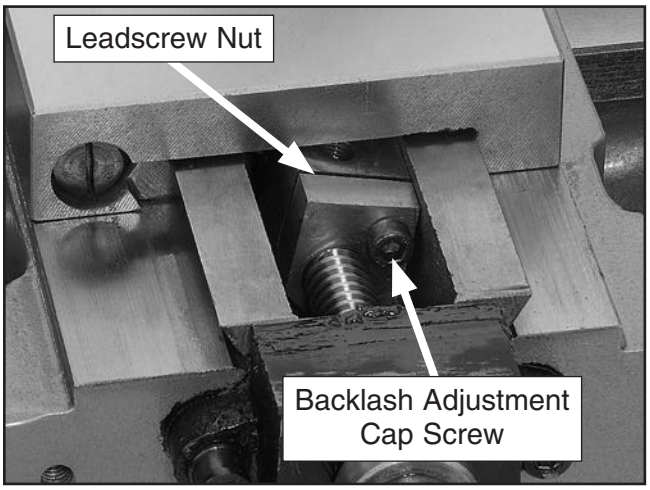


Figure 123. Leadscrew nut access.

5. Tighten backlash adjustment cap screw shown in **Figure 123** in small increments.

6. Test after each adjustment by rotating handwheel back-and-forth until backlash amount is acceptable.

7. Feed leadscrew nut back under cross slide and replace cap screw removed in **Step 3**.

8. Re-install leadscrew cover and back splash.

Adjusting Gib

The cross-slide and compound slide on this lathe each use a long steel wedge called a gib that is positioned between the component and its dovetailed-ways. Gib screws at each end move the gib. Depending upon which direction the gib moves, the space between the sliding ways increases or decreases to control the rigidity of the cross slide and compound slide.

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

Before adjusting the gibs, loosen the gib locks so the gibs can slide freely during adjustment, then lubricate the ways.

The gib adjustment process usually requires some trial-and-error. Repeat the 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.

Cross Slide Gib

Make sure the ways and leadscrew have been cleaned and re-lubricated before beginning any adjustments. Refer to **Ball Oiler Lubrication** on **Page 65** for instructions and lubricant specifications.

Tools Needed	**Qty**
Standard Screwdriver #2	1
Hex Wrench 3mm	1

To adjust cross slide gib:

1. DISCONNECT MACHINE FROM POWER!

2. Remove back splash to access rear gib screw.

3. Loosen cross slide gib lock (see **Figure 124**).

4. Loosen gib screws (see **Figure 124**) and adjust as required.

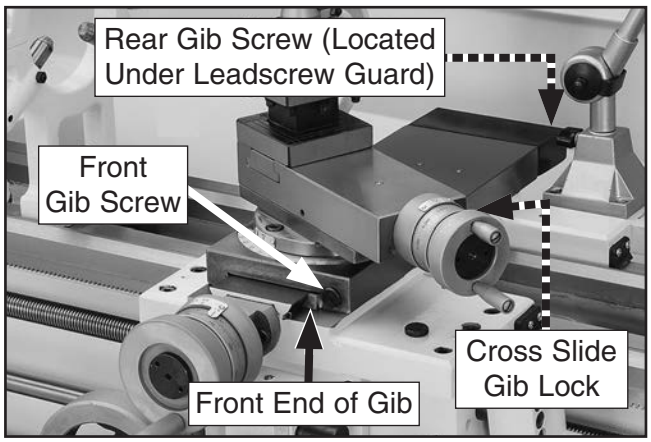


Figure 124. Cross slide gib components.

—To *increase* slide tension, loosen rear gib screw 1/8-turn, and tighten front gib screw 1/8-turn.

—To *decrease* slide tension, loosen front gib screw 1/8-turn, and tighten rear gib screw 1/8-turn.

5. Repeat adjustments as necessary until gib screw drag is acceptable.

6. Re-install back splash.

Compound Slide Gib

Figure 125 shows the gib arrangement for the compound slide. The compound slide gib adjusts in the same manner and with the same tools as the cross slide gib. However, in this case, to increase or decrease tension, the gib adjustment screw directions are reversed.

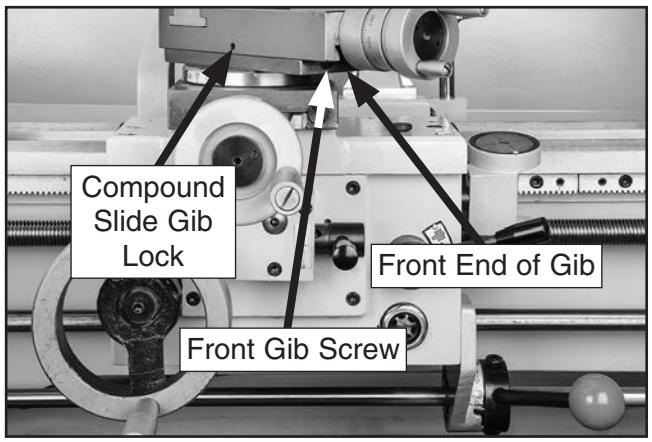


Figure 125. Compound slide gib components.

Saddle Gib

The saddle is supplied with a carriage lock cap screw on the front right-hand side of the slide (see **Figure 126**). This lock secures the saddle for increased rigidity when making face cuts. Before making adjustments to the saddle gib, make sure that this lock is loose by turning it counterclockwise one full turn.

IMPORTANT: *Do not loosen the carriage lock more than a couple of turns or the components inside will come apart. Re-installing these components is difficult and time consuming.*

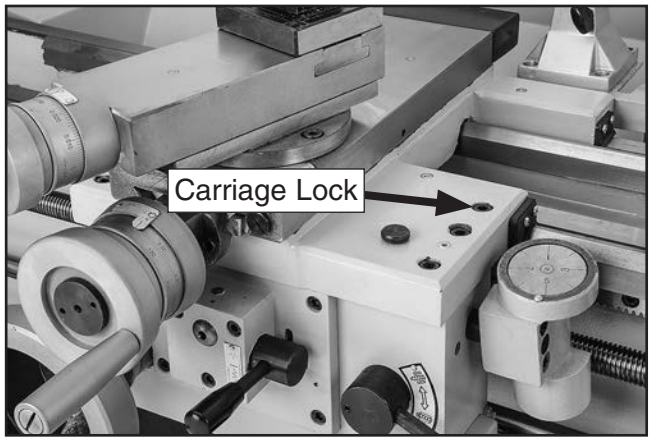


Figure 126. Location of carriage lock.

The saddle gib is located on the bottom of the back edge of the slide (see **Figure 127**). This gib is designed differently than the cross or compound slide gibs. Instead of being a wedge-shaped plate, it is a flat bar. The gib pressure is applied by four set screws. Hex nuts secure these set screws in place, so they will not loosen during operation.

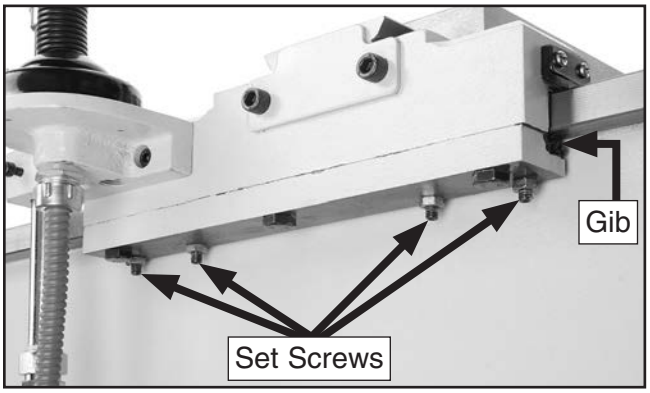


Figure 127. Typical saddle gib components.

Tools Needed	Qty
Open-End Wrench 10mm	1
Hex Wrench 3mm	1

To adjust saddle slide gib:

1. DISCONNECT MACHINE FROM POWER!

2. Clean and lubricate lathe ways, slide, and leadscrew (refer to **Ball Oiler Lubrication** on **Page 65** for instructions and lubricant specifications).

3. If carriage lock (see **Figure 126**) is tight, loosen it two turns.

4. Loosen hex nuts on four set screws shown in **Figure 127**, and adjust set screws as follows:

   —To *tighten* the carriage gib, tighten the set screws.

   —To *loosen* the gib, loosen the set screws.

5. Repeat adjustments as necessary until carriage adjustment is acceptable.

6. Hold set screws in place and tighten hex nuts.

Adjusting Half Nut

The half nut mechanism can be adjusted if it becomes loose from wear. The half nut is mounted in ways with a gib exerting pressure between components to reduce sloppy movement. The half nut gib is a flat bar-type gib, similar to the saddle gib, and is tensioned with three set screws.

Tools Needed	Qty
Hex Wrenches 2.5, 6mm	1 Ea
Open-End Wrench 8mm	1

To adjust half nut:

1. DISCONNECT MACHINE FROM POWER!

2. Open half nut and remove thread dial (see **Figure 79** on **Page 53**).

3. Loosen hex nuts on set screws shown in **Figure 128**.

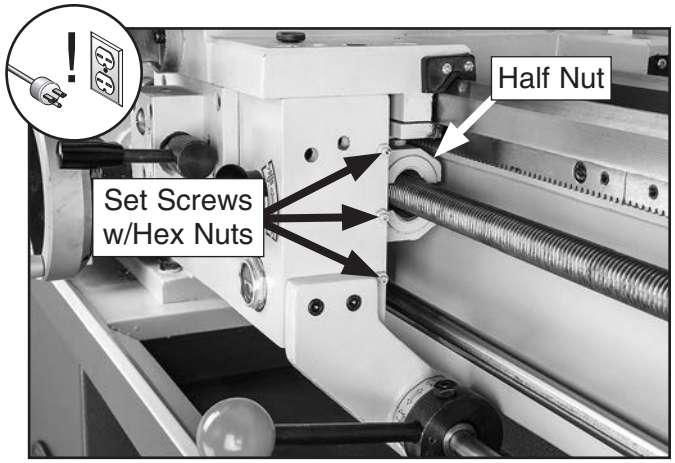


Figure 128. Location of half nut gib set screws.

4. Tighten each set screw approximately ⅛ turn, then retighten hex nuts without moving set screws.

5. Move carriage handwheel until half nut can fully close, then open/close half nut several times and notice how it feels. Half nut is correctly adjusted when you feel a slight drag while opening and closing it. It should not feel too stiff or too loose.

6. Repeat **Steps 3–5**, if necessary, until you are satisfied with half nut adjustment, then re-install thread dial.

Adjusting Feed Clutch

This lathe is equipped with a feed rod clutch, shown in **Figure 129**, which connects the feed drive hub with the feed rod through a set of spring-loaded internal steel balls. This clutch helps protect the apron feed system from overload. The feed rod clutch comes set from the factory, and unless there is a problem, it needs no adjustment.

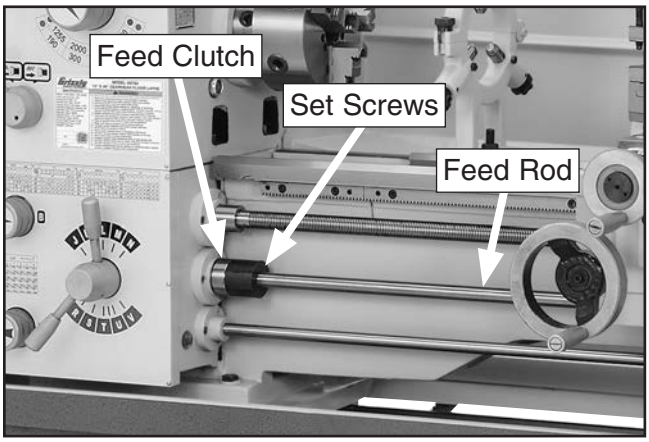


Figure 129. Feed rod clutch.

The clutch may slip if the path for the carriage or the cross feed is obstructed during turning or facing operations, the tool bit crashes into a workpiece shoulder, the carriage lock is left applied when the feed selection lever is engaged, or if too deep of a cut is taken, causing a sudden binding of the tool and workpiece.

Note: *The clutch is not a foolproof way of protecting your lathe from damage if an operational mistake is made, a chuck-carriage crash occurs, or general machine overloading occur on a regular basis.*

NOTICE

Never completely tighten feed clutch set screws past normal setting outlined in this procedure in an attempt to completely eliminate clutch slip. Doing so will void the warranty, and can lead to a non-slipping clutch, resulting in catastrophic gearbox damage.

Tool Needed	Qty
Hex Wrench 4mm	1

To adjust feed rod clutch:

1. DISCONNECT MACHINE FROM POWER!

2. Engage apron longitudinal feed selection lever and gearbox and headstock levers so feed rod does not move.

   —If the clutch slips during normal work loads and no problem exists with the feed system, the clutch spring pressure must be increased. Using the 4mm hex wrench, tighten the (4) set screws ⅛-turn and recheck for slippage.

   —If for any reason the clutch is bound up or locked, and does not slip when it should, the clutch spring pressure must be reduced. Using the 4mm hex wrench, loosen the (4) set screws ⅛-turn, and recheck for slippage.

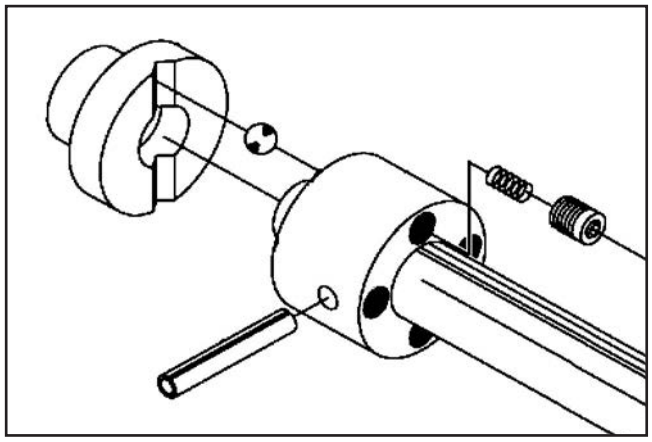


Figure 130. Feed clutch details.

Adjusting Tailstock Lock

When pushed toward the spindle, the tailstock lock holds the tailstock firmly in place on the bedway with a locking plate underneath. The lock lever position can be adjusted for the best leverage.

Tool Needed	Qty
Open-End Wrench 19mm	1

To adjust tailstock lock:

1. Unthread stop screw (see **Figure 131**), and carefully slide tailstock from lathe.

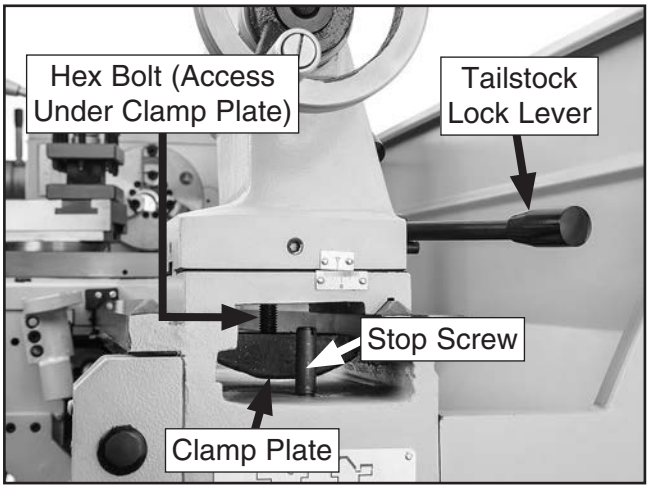


Figure 131. Tailstock lock adjustment components.

2. Tighten hex bolt ¼-turn and re-install tailstock.

3. Apply tailstock lock lever and verify tailstock is locked and lever is where desired. Re-adjust as necessary.

Tensioning/ Replacing V-Belts

V-belts stretch and wear with use, so check the tension after the first three months and then every six months to ensure optimal power transmission. Replace all of the V-belts as a matched set if any of them show signs of glazing, fraying, or cracking.

Tensioning V-Belts

Tools Needed: **Qty**
Phillips Head Screwdriver #2 1
Open-End Wrench 17mm 1

To tension V-Belts:

1. DISCONNECT MACHINE FROM POWER!

2. Remove end gear cover.

3. Loosen motor mount bolts (see **Figure 132**) .

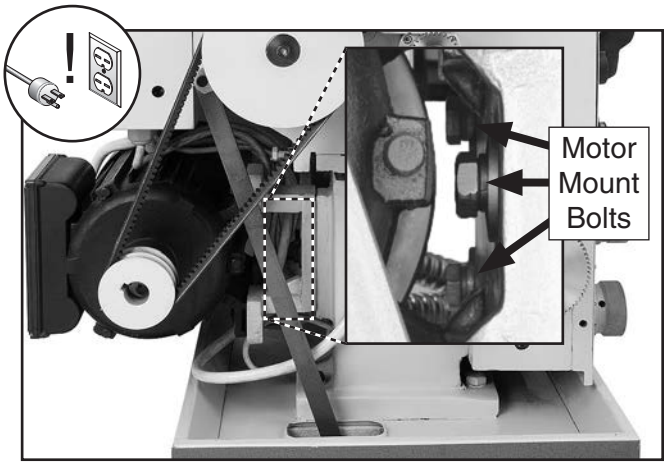


Figure 132. Location of motor mount bolts.

4. Push down on motor and re-tighten motor mount bolts.

5. Check belt tension: Each belt is correctly tensioned when there is approximately ¾" deflection when it is pushed with moderate pressure, as shown in **Figure 133**.

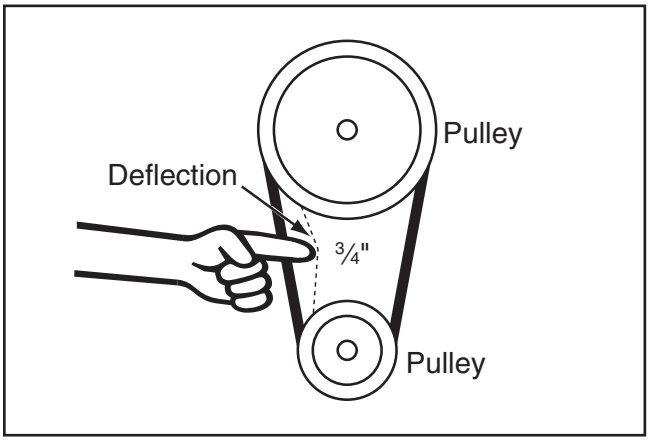


Figure 133. Checking V-belt deflection.

—If there is more than ¾" deflection when each belt is pushed with moderate pressure, loosen motor mount bolts, lower motor, adjust belt tension as required, then tighten bolts.

6. Re-install end gear cover.

Replacing V-Belts

1. DISCONNECT MACHINE FROM POWER!

2. Remove end gear cover.

3. Loosen motor mount bolts (see **Figure 132**), slide motor up, and remove V-belts.

Note: *It may be more convenient to access the motor mount bolts if you first remove the back splash.*

4. Install new V-belts as a matched set so they equally share the load.

5. Tension belts (refer to **Tensioning V-Belts** on this page).

6. Re-install and secure end gear cover.

Adjusting Spindle Bearing Preload

This lathe is shipped from the factory with the spindle bearing preload set. If the spindle ever develops end-play and the workpiece finish suffers, you can re-establish the bearing preload, remove the end-play, and correct the workpiece finish issue.

Items Needed	Qty
Hook-Style Spanner Wrench 68-75mm	1
Dial Indicator w/Magnetic Base	1
Heavy Dead Blow Hammer	1
Wooden Block	1

Adjusting Preload

1. Run lathe for 20 minutes on high speed to bring lathe to normal operating temperature.

2. DISCONNECT MACHINE FROM POWER!

3. Remove chuck (refer to **Chuck Removal** on **Page 31**), then use feed direction lever to shift spindle to neutral (see **Figure 77** on **Page 52**) and remove end gear cover to access outboard end of spindle (see **Figure 134**).

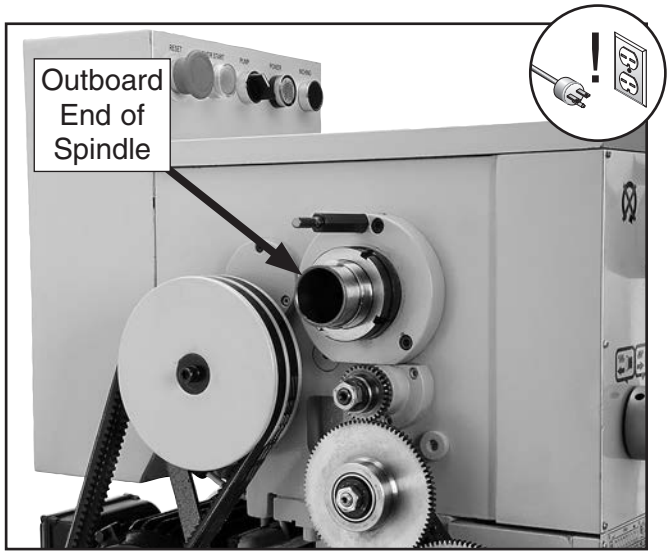


Figure 134. End gear cover removed to access outboard end of spindle.

4. Place chuck wrench in camlock socket to keep spindle from rotating, and loosen outer spanner nut two turns (see **Figure 135**).

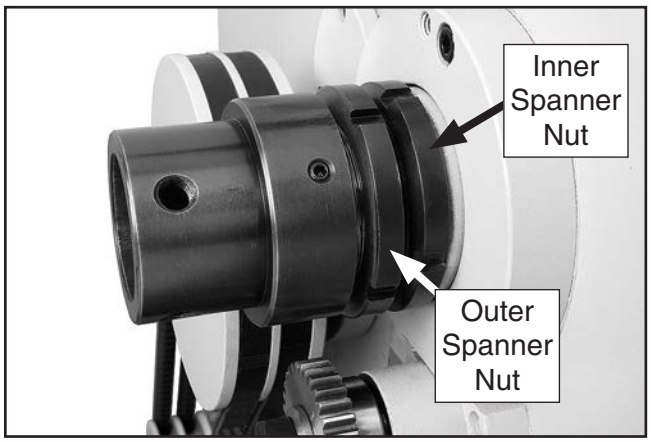


Figure 135. Example of spindle spanner nuts.

5. Loosen inner spanner nut one turn.

   Note: *You may have to tap outboard end of spindle as explained in **Step 6**, to help unload spindle and break spanner nut loose.*

NOTICE

For the next step, DO NOT strike wood block with excessive force. If you do, you can cause tapered roller bearings to indent mating races. If this damage occurs, one or more spindle bearings will have to be replaced, as this damage will generate vibration at higher spindle speeds.

6. Place wood block over outboard end of spindle. Tap it a few times with dead blow hammer (see **Figure 136**). Your goal is to slide spindle forward just enough to introduce spindle end-play that you can feel by hand.

Figure 136. Example of unseating spindle bearings to introduce spindle end-play.

7. Place dial indicator on cross slide and move carriage toward headstock until contact point of indicator touches spindle face (see **Figure 137**).

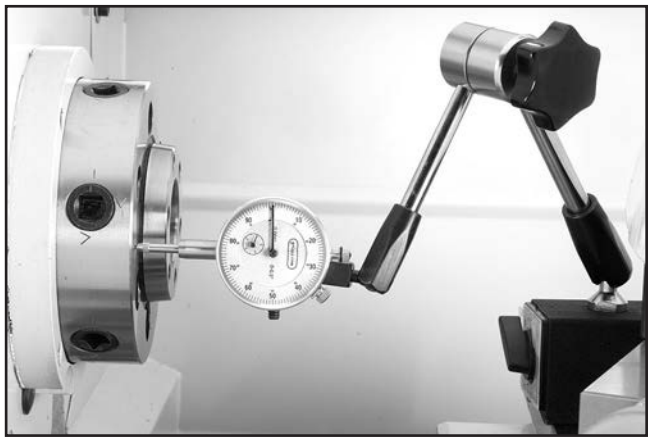


Figure 137. Dial indicator setup.

8. Move carriage an additional 0.100" toward headstock, and zero dial indicator.

9. Insert chuck wrench into a cam socket to prevent spindle from turning, then tighten inner spanner nut only until dial indicator needle stops moving (see **Figure 138**).

   Note: *For convenience and accuracy, we recommend having another person watch the dial while you tighten the inner spanner nut.*

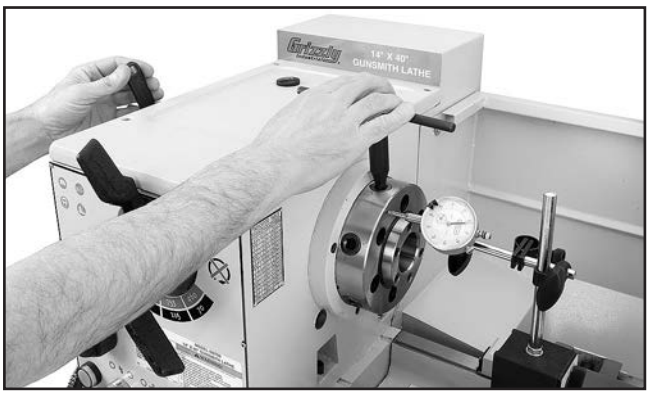


Figure 138. Example of adjusting spindle bearing preload.

   While tightening spanner nuts, rock spindle back and forth slightly with cam key to make sure spindle tapered roller bearings seat properly in their races.

   When dial indicator needle stops moving, there will be zero spindle end-play and no bearing preload. It is essential that you find this point without tightening spanner nut too much and inadvertently pre-load spindle bearings.

   If you think you have gone past the zero end-play point, unload bearings by repeating **Steps 5–6**, then re-tighten inner spanner nut until it reaches zero end-play position.

10. Tighten inner nut an additional 1/16-turn.

11. Without allowing inner spanner nut to tighten any farther, tighten outer spanner nut against inner nut.

    Do not overtighten outer spanner nut because additional preload can force bearings even tighter against races in headstock and cause headstock to compress or crack, or bearing may quickly fail.

12. Re-install end gear cover.

Confirming Bearing Preload

1. Re-attach all removed lathe components and prepare it for operation.

2. Install chuck (refer to **Chuck Installation** on **Page 29**) and tighten jaws.

3. Set spindle speed to its highest setting.

4. Connect lathe to power and turn lathe spindle ***ON***.

5. Run lathe for 20 minutes, while periodically shutting down machine several times and checking temperature.

6. Turn spindle ***OFF***, disconnect lathe from power, and check temperature of spindle.

   —If the spindle nose is slightly warm to the touch, you have correct bearing preload.

   —If the spindle nose is hotter than you can comfortably keep your hand on, the preload is too tight and you must repeat the bearing preload adjustment procedure. When repeating the procedure, rotate the inner spanner nut a little less during **Step 10** in the preceding instructions.

Removing/Installing Gap Insert

This lathe is equipped with a removable gap insert that will allow for turning large diameter workpieces. The gap was seated, pre-loaded, and then ground for precise mating and alignment at the factory. Removing the gap can cause the lathe insert to slightly spring out of shape. When re-installed, there is no guarantee that original alignment and flush mating will be the same. For this reason, removing the gap is considered a permanent alteration to the lathe, even if it is later re-installed.

Items Needed	Qty
Open-End Wrench 14mm	1
Hex Wrench 8mm	1
Heavy Dead Blow Hammer	1
Miscellaneous C-Clamps	As Required
Wooden Blocks	As Required

Removing Gap Insert

1. DISCONNECT MACHINE FROM POWER!

2. Remove four cap screws that secure gap insert to bed (see **Figure 139**).

3. Tighten dowel-pin jack nuts (see **Figure 139**) to draw pins from gap insert.

4. Loosen preload cap screw (see **Figure 139**) a few turns until it no longer contacts headstock.

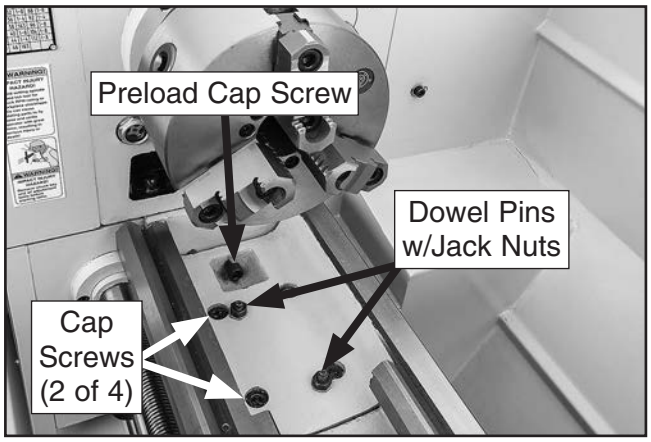


Figure 139. Gap insert retaining fasteners.

5. Tap outside of gap insert with a dead blow hammer to loosen it, and with the help of another person, remove insert.

Re-installing Gap Insert

1. Clean all mating surfaces completely with mineral spirits and inspect and remove any burrs. ALL MATING SURFACES MUST BE ABSOLUTELY CLEAN!

2. Lightly oil a lint-free cloth with way oil and rub a thin film into pores of freshly cleaned mating surfaces. Next, place gap insert in position on lathe bed.

3. Back off dowel pin jack nuts (see **Figure 139** on **Page 82**) until they are flush with ends of pins, then drop pins into pin holes in gap insert.

4. Jostle gap closer to its final alignment until pins seat naturally.

5. Install and lightly snug four cap screws in a sequence that will draw gap closer into alignment. Use blocks of wood and clamps to get mating surfaces into alignment if necessary.

6. When alignment and flush-mating is acceptable, tighten four cap screws in a pattern that will maintain or improve the alignment.

7. Wait 24 hours, and check for quality of mating. If unacceptable, use clamps and blocks of wood, and loosen and tighten appropriate cap screws to draw-in and release certain areas of gap insert to achieve the required alignment.

8. When satisfied with alignment, tap dowel pins the rest of the way into the gap insert until they are in fully seated positions, and thread jack nuts down until they just contact insert.

9. Tighten preload cap screw until it contacts headstock and resistance can be felt, then tighten it an additional ¾-turn.

Checking/Replacing Brake Shoes

If the brake responds poorly, verify that all linkage is tight and that the belts are tight and free of oil or grease. Replace the brake shoe set if the lining thickness is 3/16" or less. When inspecting amount of brake wear, measure from the following locations:

- If riveted linings are used, the measurement is taken from the rivet heads to the lining surface as viewed from the brake pad surface.

- If bonded linings are used, the measurement is taken from the metal shoe surface to the surface of the lining as viewed from the side of the brake shoe.

If the drum pulley is bell-mouthed, cracked, or shows deep groves, replace it immediately. For minor scoring, the drum pulley can be dressed with sandpaper or turned on a lathe.

Tools Needed	**Qty**
Hex Wrench 6mm	1
Open-End Wrench 17mm	1
Needle-Nose Pliers	1
Basic Caliper	1

To check/replace brake linings:

1. DISCONNECT MACHINE FROM POWER!

2. Remove end gear cover.

3. Loosen motor mount bolts (see **Figure 140**), slide motor up, and remove belts.

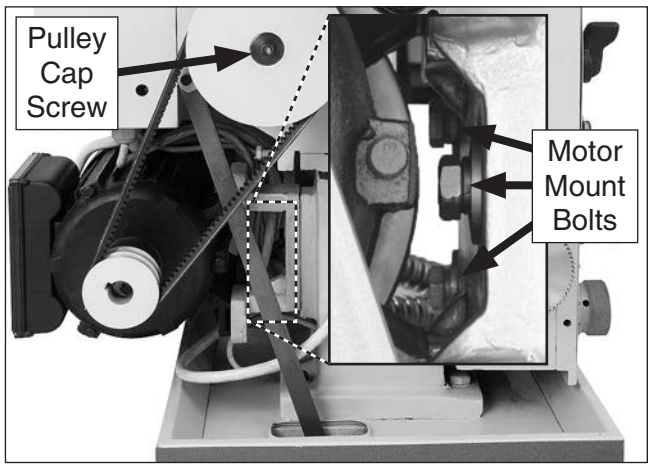


Figure 140. Location of pulley cap screw and motor mount bolts.

4. Have another person step on brake pedal to lock pulley in place, and remove pulley cap screw shown in **Figure 140**.

5. Step off brake pedal and remove pulley. **Figure 141** shows pulley removed and brake shoes exposed.

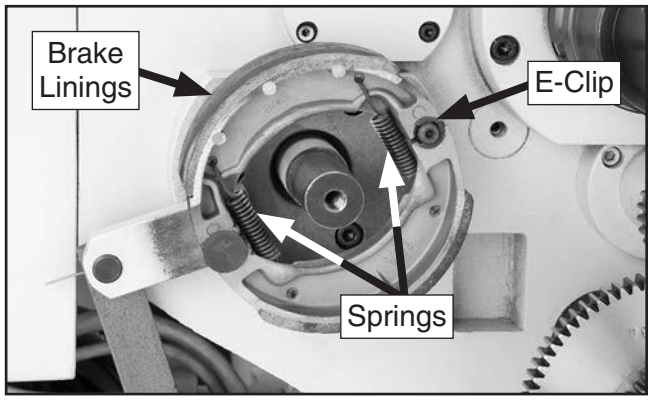


Figure 141. Brake assembly.

6. Using your calipers, measure thickness of brake linings.

   —If linings are thicker than 3/16" as described earlier, then replacement is not required. Re-assemble lathe in the opposite manner as outlined in **Steps 2–5**.

   —If linings are oil-soaked from over lubrication of adjacent gearing, clean and properly lubricate gears (see **End Gears** in **Lubrication** section on **Page 66**), then proceed to **Step 7**.

   —If brakes linings are 3/16" or thinner, proceed to **Step 7**.

7. Put on safety glasses and remove E-clip, springs, and brake shoes shown in **Figure 141**.

8. Replace or dress drum pulley as required.

9. Install brake shoes, springs, and E-clip.

10. Install pulley and re-assemble in opposite manner that you disassembled it in **Steps 2–5**.

11. Start lathe and test brake operation.

SECTION 8: WIRING

These pages are current at the time of printing. However, in the spirit of improvement, we may make changes to the electrical systems of future machines. Compare the manufacture date of your machine to the one stated in this manual, and study this section carefully.

If there are differences between your machine and what is shown in this section, call Technical Support at (570) 546-9663 for assistance BEFORE making any changes to the wiring on your machine. An updated wiring diagram may be available. **Note:** *Please gather the serial number and manufacture date of your machine before calling. This information can be found on the main machine label.*

⚠WARNING
Wiring Safety Instructions

SHOCK HAZARD. Working on wiring that is connected to a power source is extremely dangerous. Touching electrified parts will result in personal injury including but not limited to severe burns, electrocution, or death. Disconnect the power from the machine before servicing electrical components!

MODIFICATIONS. Modifying the wiring beyond what is shown in the diagram may lead to unpredictable results, including serious injury or fire. This includes the installation of unapproved aftermarket parts.

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.

CIRCUIT REQUIREMENTS. You MUST follow the requirements at the beginning of this manual when connecting your machine to a power source.

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.

MOTOR WIRING. The motor wiring shown in these diagrams is current at the time of printing but may not match your machine. If you find this to be the case, use the wiring diagram inside the motor junction box.

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.

EXPERIENCING DIFFICULTIES. If you are experiencing difficulties understanding the information included in this section, contact our Technical Support at (570) 546-9663.

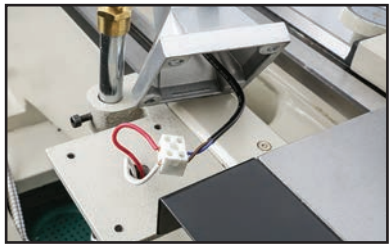
NOTICE

The photos and diagrams included in this section are best viewed in color. You can view these pages in color at www.grizzly.com.

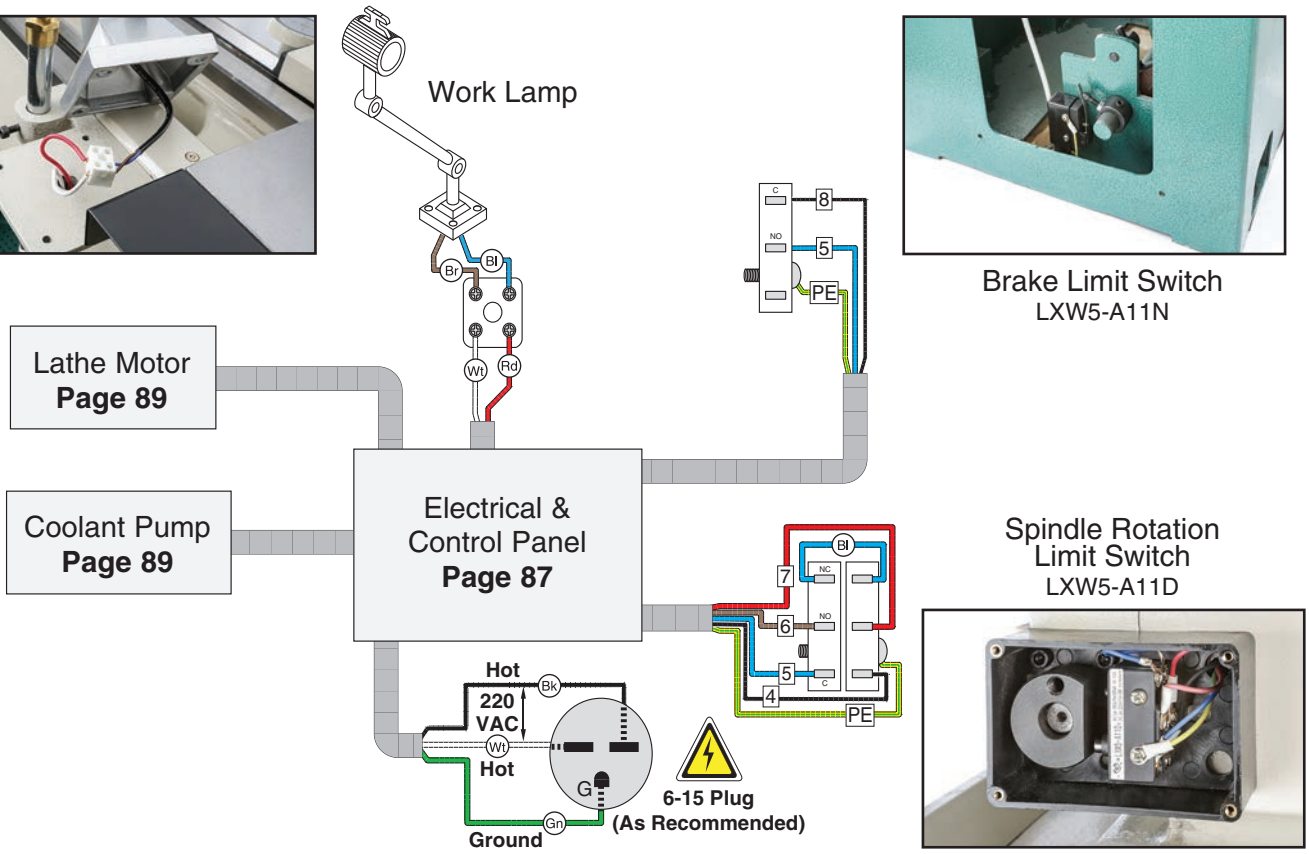
COLOR KEY

BLACK	Bk	BLUE	Bl	YELLOW	Yl	LIGHT BLUE	Lb
WHITE	Wt	BROWN	Br	YELLOW GREEN	Yg	BLUE WHITE	Bw
GREEN	Gn	GRAY	Gy	PURPLE	Pu	TURQUOISE	Tu
RED	Rd	ORANGE	Or	PINK	Pk		

Electrical Overview

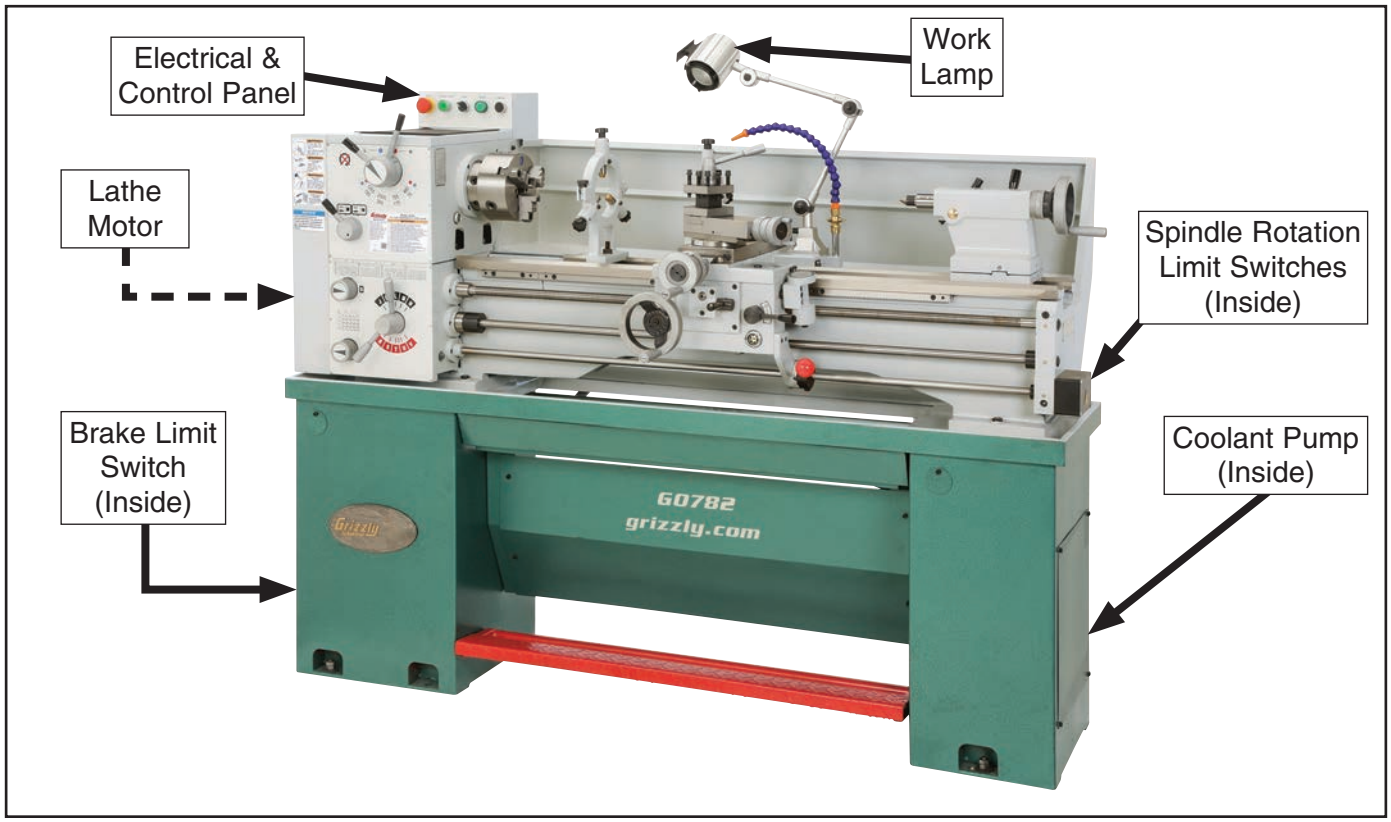


Brake Limit Switch
LXW5-A11N



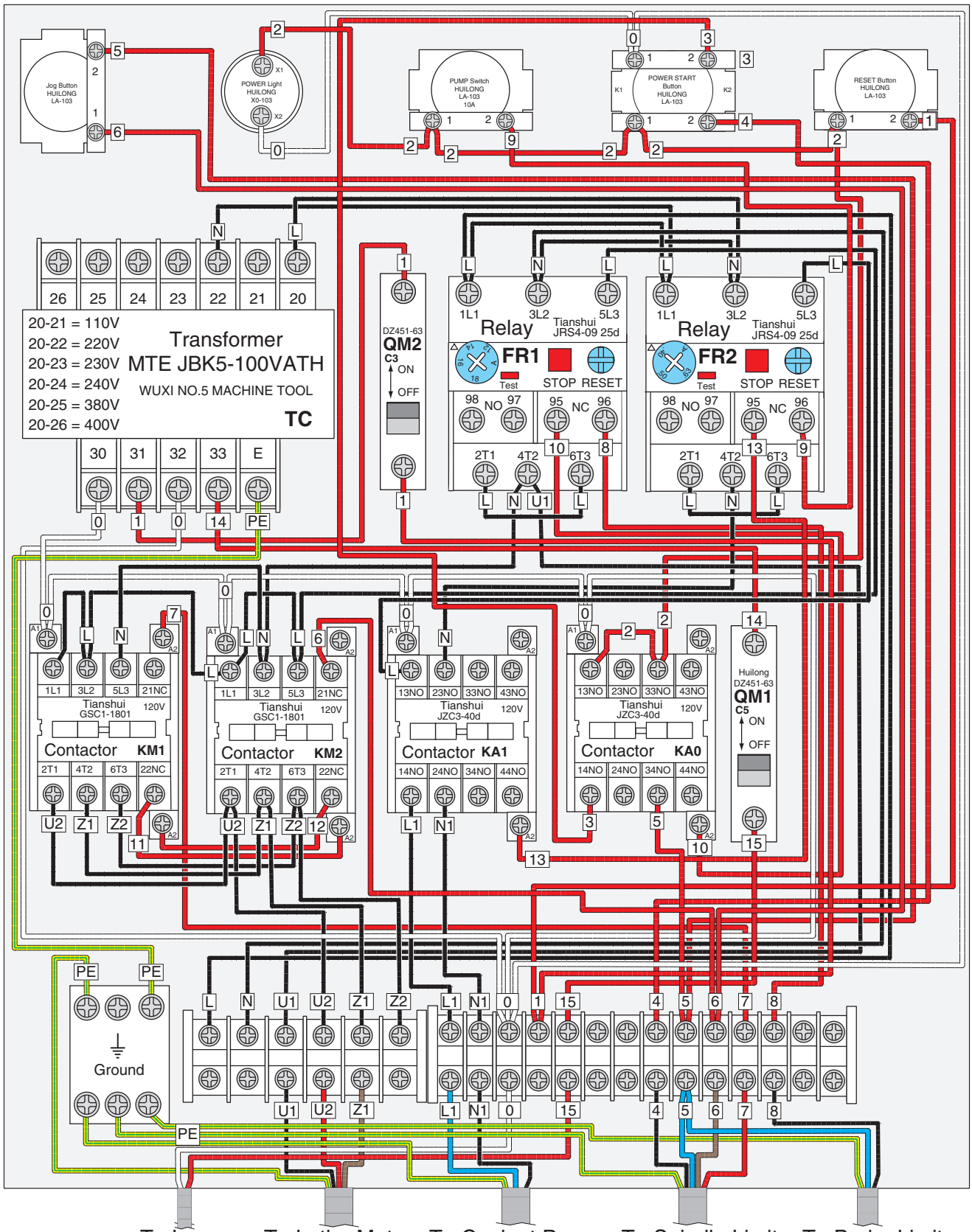
Spindle Rotation
Limit Switch
LXW5-A11D

Component Location



STOP ***READ ELECTRICAL SAFETY ON PAGE 85!***

Electrical & Control Panel Diagram



To Lamp **Page 86**

To Lathe Motor **Page 89**

To Coolant Pump **Page 89**

To Spindle Limit Switch **Page 86**

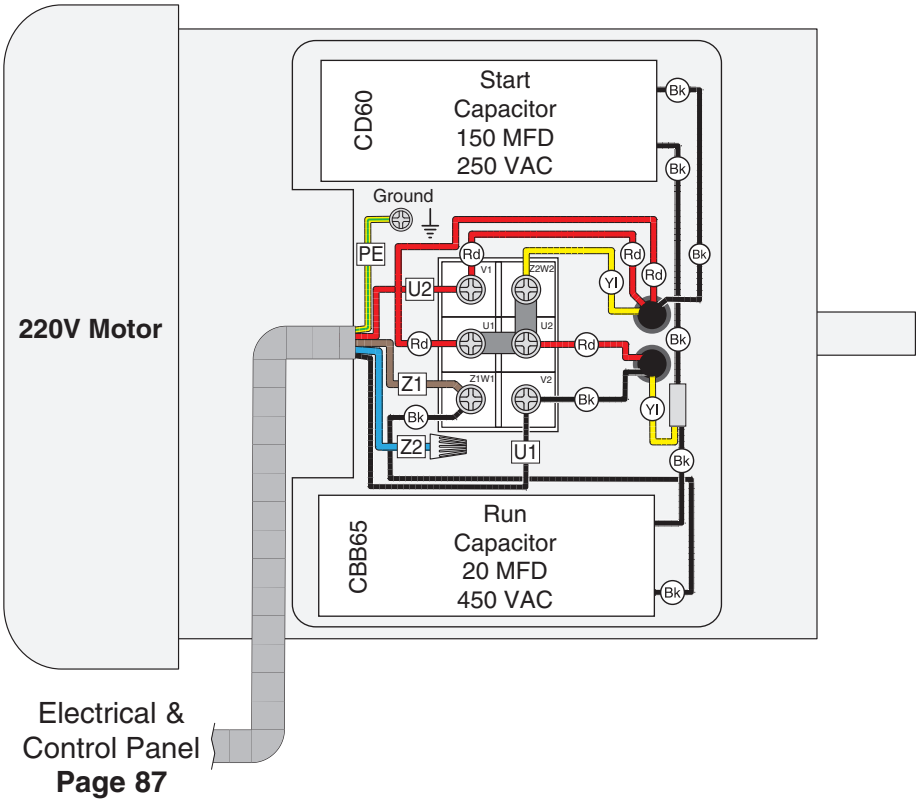
To Brake Limit Switch **Page 86**

Main Wiring Photos

Figure 142. Control panel wiring.

STOP *READ ELECTRICAL SAFETY ON PAGE 85!*

Lathe Motor Wiring Diagram



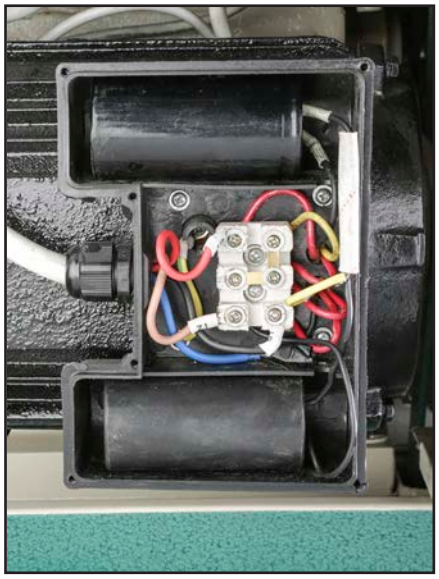


Figure 143. Lathe motor wiring.

Coolant Pump Wiring Diagram

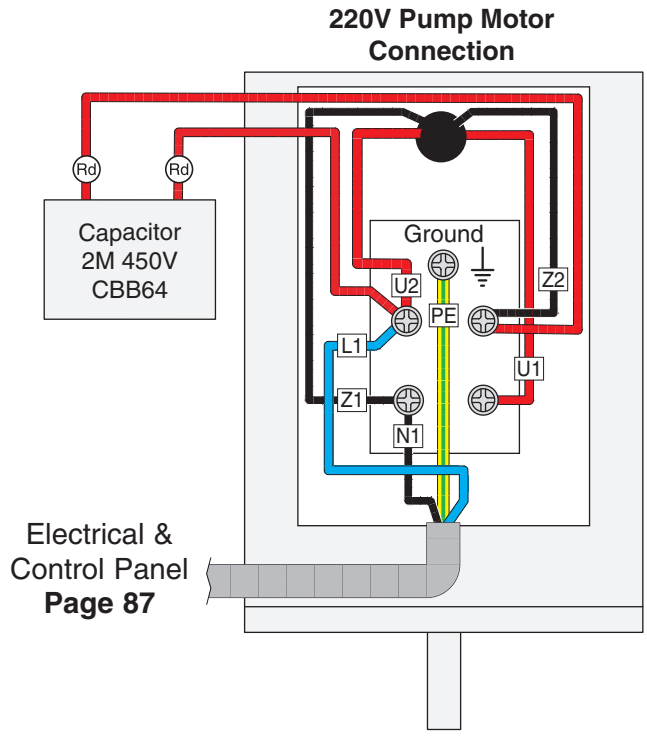
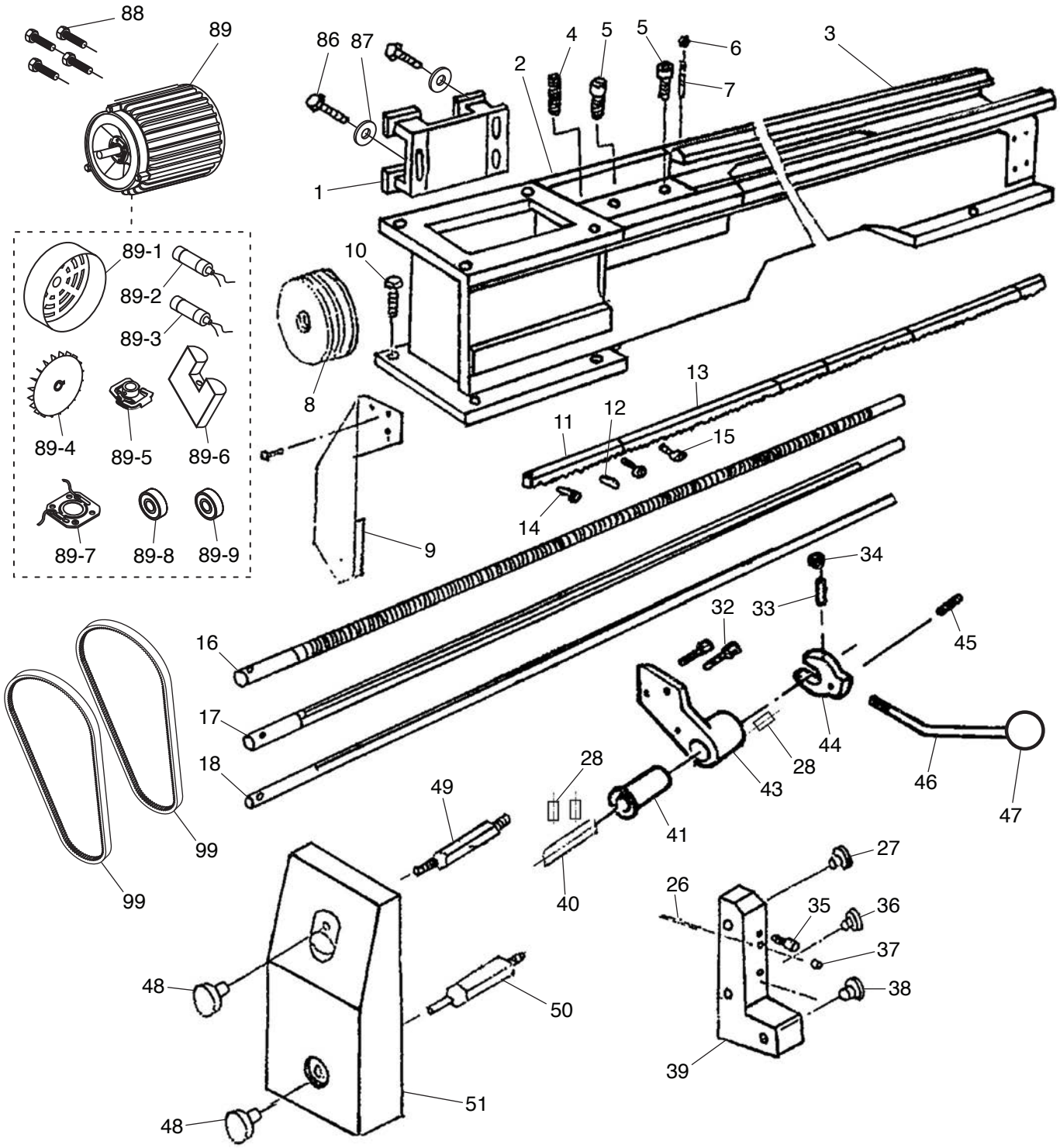


Figure 144. Coolant pump wiring.

SECTION 9: PARTS

We do our best to stock replacement parts when possible, but we cannot guarantee that all parts shown are available for purchase. Call **(800) 523-4777** or visit **www.grizzly.com/parts** to check for availability.

Bed



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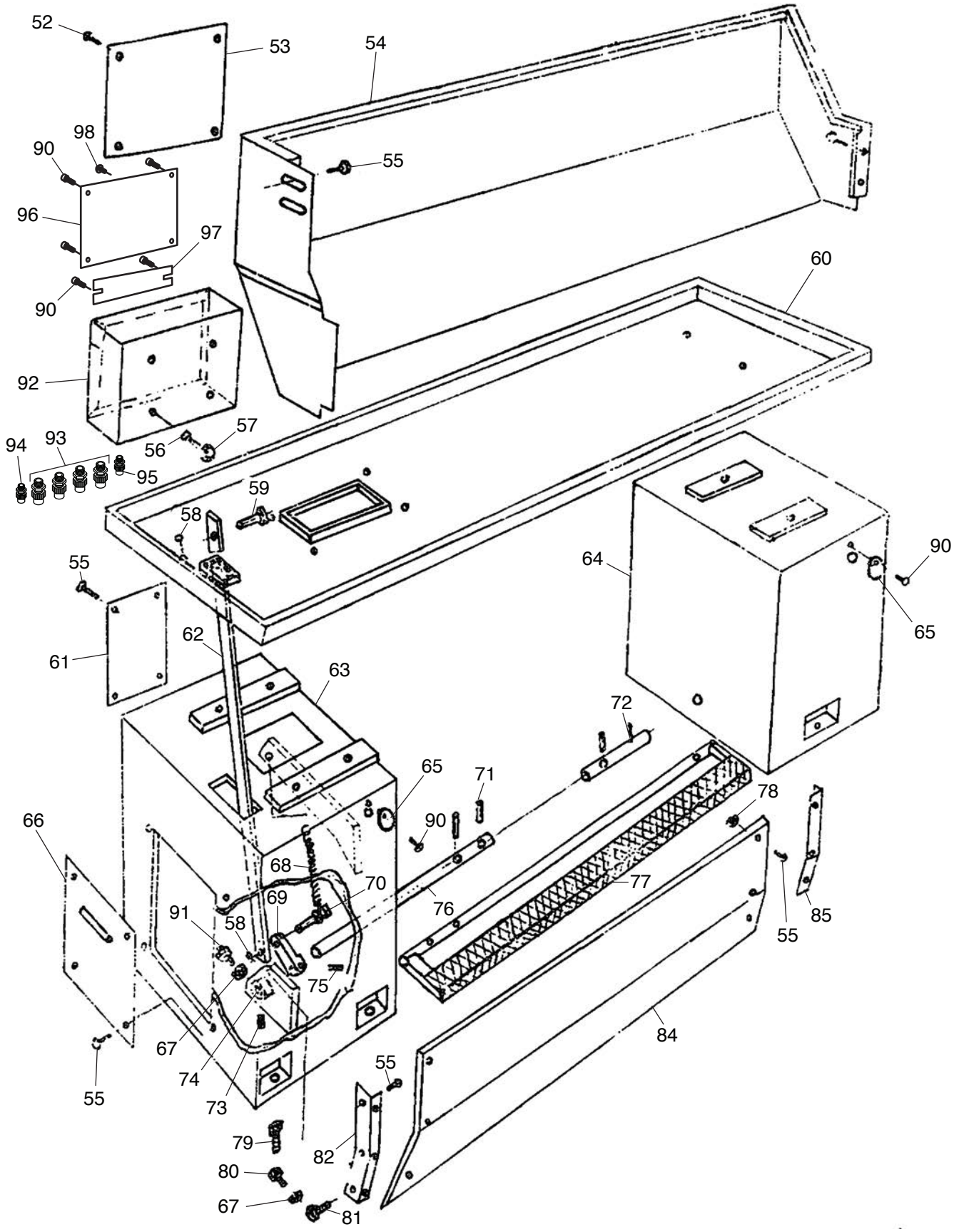
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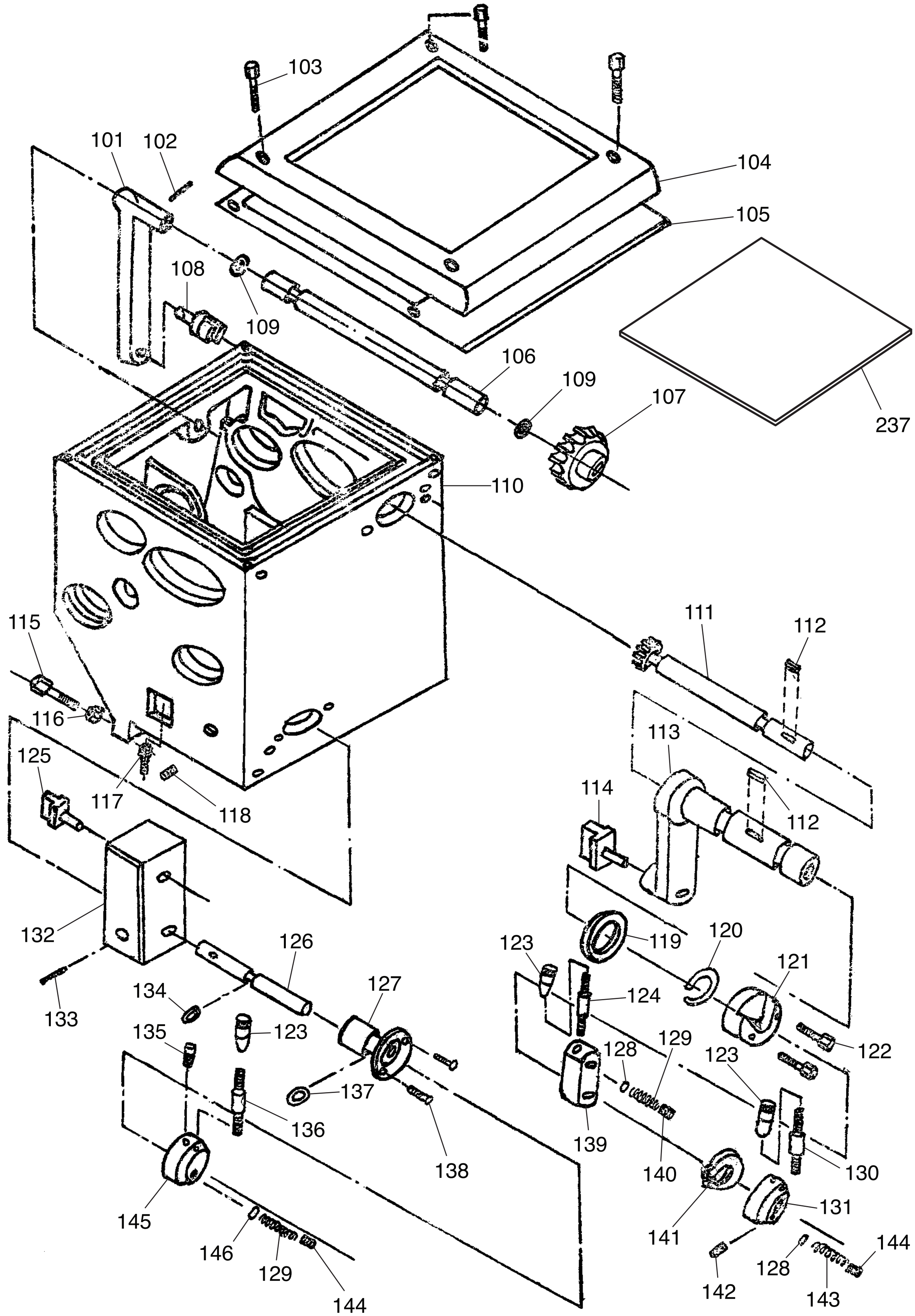
Bed Parts List

REF	PART #	DESCRIPTION
1	P07820001	MOTOR MOUNT PLATE
2	P07820002	LATHE BED
3	P07820003	GAP INSERT
4	P07820004	SET SCREW M6-1 X 16
5	P07820005	CAP SCREW M10-1.5 X 40
6	P07820006	HEX NUT M8-1.25 THIN
7	P07820007	TAPER PIN 8 X 60
8	P07820008	PULLEY
9	P07820009	END COVER
10	P07820010	HEX BOLT M12-1.75 X 60
11	P07820011	RACK (SHORT)
12	P07820012	TAPER PIN 6 X 28
13	P07820013	RACK (LONG)
14	P07820014	CAP SCREW M6-1 X 22
15	P07820015	CAP SCREW M6-1 X 25
16	P07820016	LEADSCREW
17	P07820017	FEED ROD
18	P07820018	CONTROL ROD
26	P07820026	TAPER PIN 6 X 55
27	P07820027	PLUG
28	P07820028	DOWEL PIN
32	P07820032	CAP SCREW M6-1 X 16
33	P07820033	SET SCREW M6-1 X 20 CONE-PT
34	P07820034	HEX NUT M6-1
35	P07820035	CAP SCREW M8-1.25 X 55
36	P07820036	SHAFT END PLUG
37	P07820037	BALL OILER 8MM PRESS-IN
38	P07820038	SHAFT END PLUG
39	P07820039	SHAFT END BRACKET
40	P07820040	TAPERED KEY W/HEAD 4 X 3.5 X 38
41	P07820041	COLLAR
43	P07820043	SPINDLE LEVER BRACKET
44	P07820044	SPINDLE LEVER HUB
45	P07820045	ROLL PIN 4 X 20
46	P07820046	SPINDLE LEVER M12-1.75 X 15
47	P07820047	BALL KNOB M12-1.75 (ORANGE)
48	P07820048	KNURLED THUMB KNOB M8-1.25
49	P07820049	STANDOFF-HEX MM M8-1.25, 104L
50	P07820050	STANDOFF-HEX MM M8-1.25, 140L
51	P07820051	END GEAR COVER
52	P07820052	PHLP HD SCR M5-.8 X 6
53	P07820053	ELECTRICAL BOX COVER
54	P07820054	BACK SPLASH
55	P07820055	PHLP HD SCR M6-1 X 10
56	P07820056	PHLP HD SCR M6-1 X 20
57	P07820057	FLAT WASHER 6MM
58	P07820058	COTTER PIN 2 X 33MM STANDARD
59	P07820059	CLEVIS PIN 8 X 21

REF	PART #	DESCRIPTION
60	P07820060	CHIP PAN
61	P07820061	LEFT CABINET COVER (REAR)
62	P07820062	BRAKE LINKAGE
63	P07820063	BASE PEDESTAL (LEFT)
64	P07820064	BASE PEDESTAL (RIGHT)
65	P07820065	ROUND COVER
66	P07820066	LEFT CABINET COVER (SIDE)
67	P07820067	HEX NUT M10-1.5
68	P07820068	EXTENSION SPRING 3 X 26 X 300
69	P07820069	BRAKE ROCKER
70	P07820070	BRAKE LINKAGE PIN
71	P07820071	ROLL PIN 3 X 25
72	P07820072	BRAKE PEDAL SHAFT (SHORT)
73	P07820073	SET SCREW M8-1.25 X 6 CONE-PT
74	P07820074	SWITCH BLOCK
75	P07820075	ROLL PIN 5 X 40
76	P07820076	BRAKE PEDAL SHAFT (LONG)
77	P07820077	BRAKE PEDAL
78	P07820078	HEX NUT M6-1
79	P07820079	CAP SCREW M12-1.75 X 50
80	P07820080	CAP SCREW M10-1.5 X 60
81	P07820081	CAP SCREW M10-1.5 X 20
82	P07820082	STAND PLATE BRACKET (LEFT)
84	P07820084	STAND PLATE
85	P07820085	STAND PLATE BRACKET (RIGHT)
86	P07820086	HEX BOLT M10-1.5 X 30
87	P07820087	DOCK WASHER 10MM
88	P07820088	HEX BOLT M8-1.25 X 25
89	P07820089	MOTOR 2HP 220V 1-PH
89-1	P07820089-1	MOTOR FAN COVER
89-2	P07820089-2	S CAPACITOR 150M 250V 1-5/8 X 3-3/16
89-3	P07820089-3	R CAPACITOR 20M 450V 1-5/8 X 3-3/16
89-4	P07820089-4	MOTOR FAN
89-5	P07820089-5	CENTRUFUGAL SWITCH
89-6	P07820089-6	MOTOR JUNCTION BOX
89-7	P07820089-7	CONTACT PLATE
89-8	P07820089-8	BALL BEARING 6205ZZ (FRONT)
89-9	P07820089-9	BALL BEARING 6205ZZ (REAR)
90	P07820090	CAP SCREW M6-1 X 8
91	P07820091	HEX BOLT M10-1.5 X 40
92	P07820092	ELECTRICAL BOX
93	P07820093	STRAIN RELIEF M20-1.5 TYPE-3
94	P07820094	STRAIN RELIEF M16-1.5 TYPE-3
95	P07820095	STRAIN RELIEF M20-1.5 TYPE-7
96	P07820096	ELECTRICAL BOX MOUNTING PLATE
97	P07820097	DIN RAIL
98	P07820098	PHLP HD SCR M4-.7 X 6
99	P07820099	V-BELT AX33

Headstock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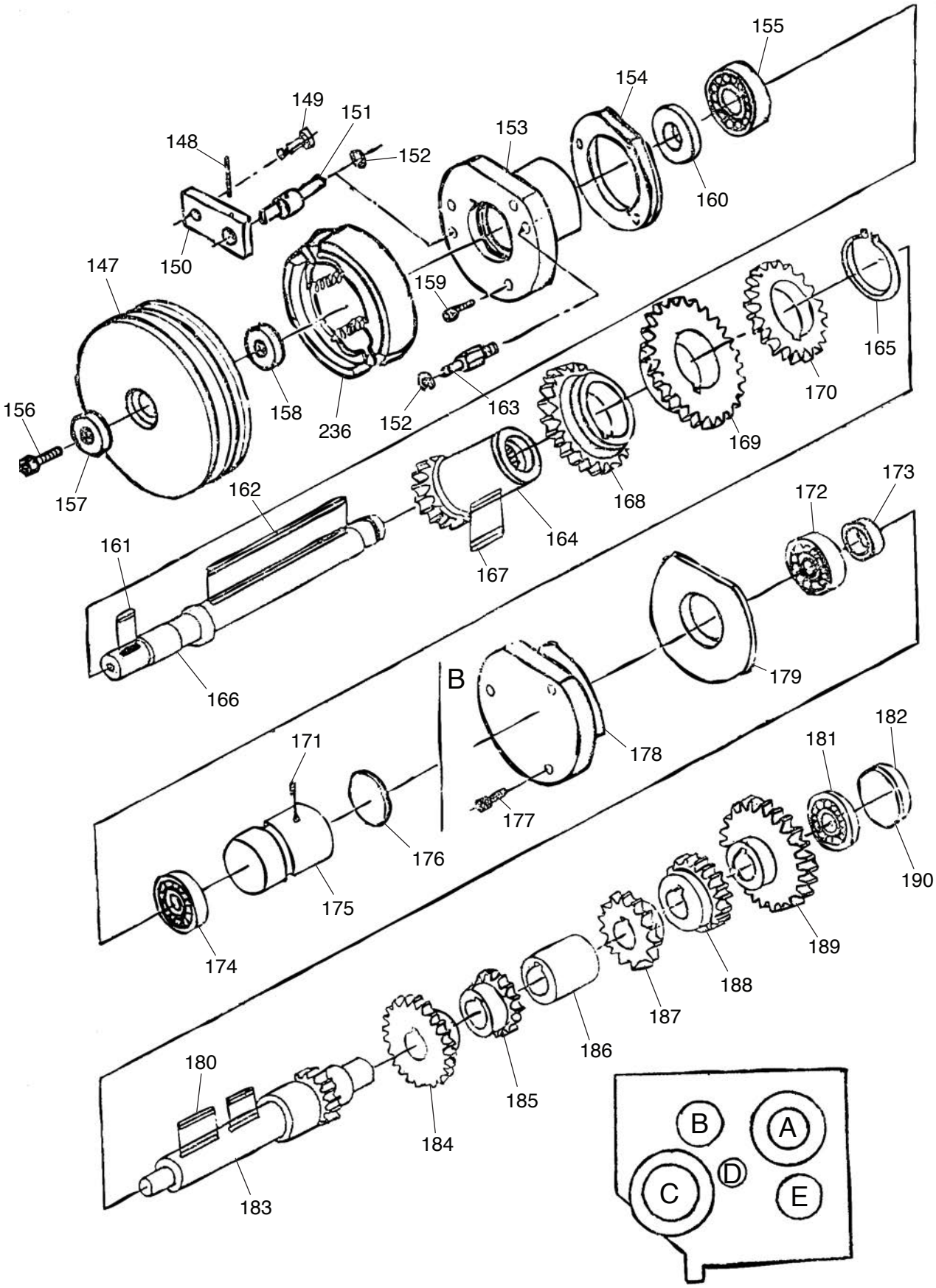

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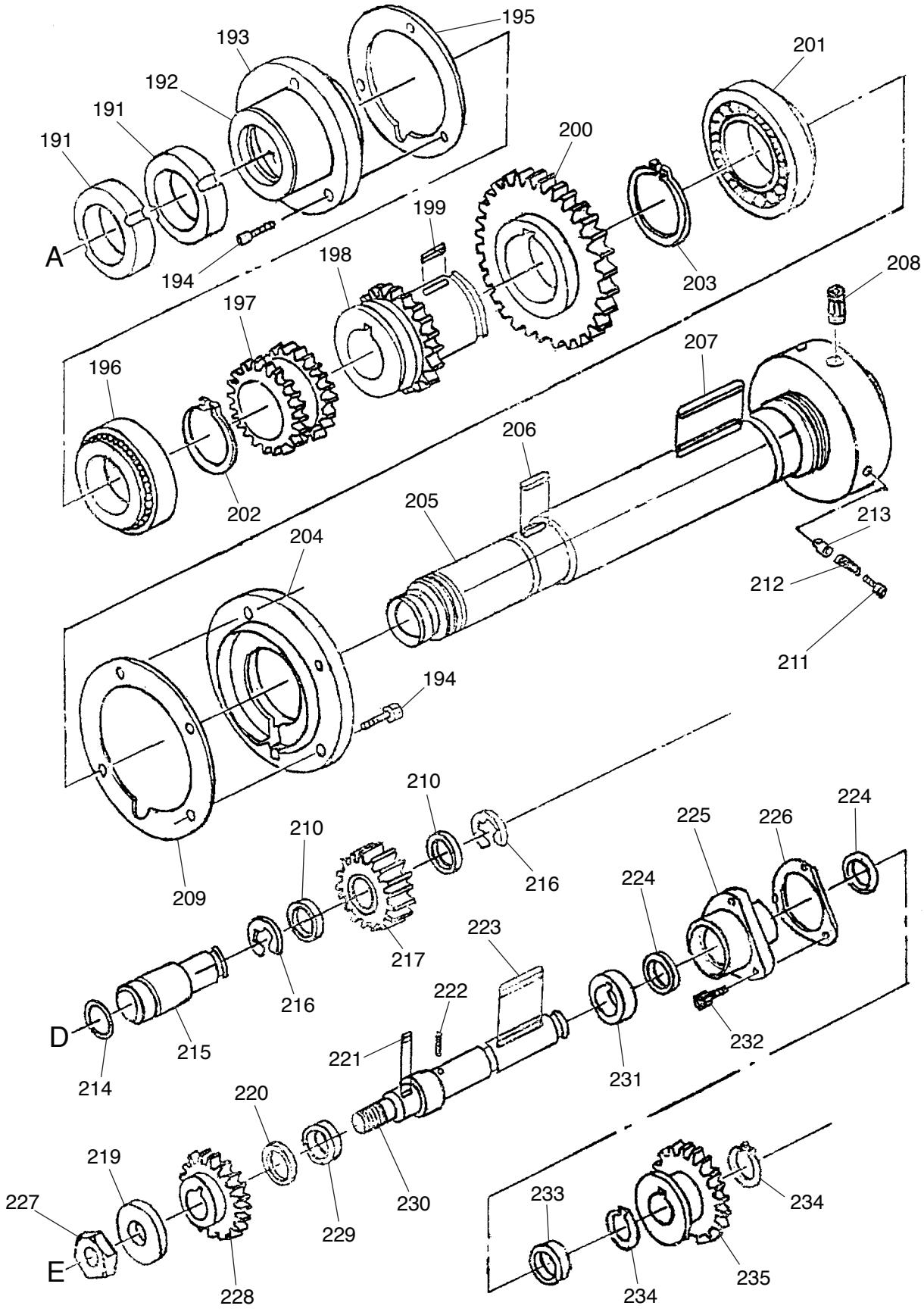


Headstock Parts List

REF	PART #	DESCRIPTION
101	P07820101	SHIFT LEVER
102	P07820102	ROLL PIN 5 X 32
103	P07820103	CAP SCREW M6-1 X 18
104	P07820104	HEADSTOCK COVER
105	P07820105	HEADSTOCK COVER GASKET
106	P07820106	SPINDLE SPEED SHAFT
107	P07820107	GEAR 51T
108	P07820108	SHIFT LEVER
109	P07820109	O-RING 14 X 2.4
110	P07820110	MAIN CASTING
111	P07820111	GEARED SHAFT 17T
112	P07820112	KEY 5 X 5 X 15
113	P07820113	SHIFT COLLAR
114	P07820114	SHIFT FORK
115	P07820115	HEX BOLT M8-1.25 X 45
116	P07820116	HEX NUT M8-1.25 THIN
117	P07820117	CAP SCREW M10-1.5 X 35
118	P07820118	SET SCREW M8-1.25 X 12 CONE-PT
119	P07820119	FLAT WASHER 30MM
120	P07820120	OIL SEAL 3.1 X 30MM
121	P07820121	HANDLE HUB
122	P07820122	CAP SCREW M6-1 X 20
123	P07820123	LEVER HANDLE M8-1.25 X 40
124	P07820124	LEVER SHAFT M8-1.25 X 10, 98L
125	P07820125	SHIFT FORK
126	P07820126	FEED DIRECTION SHAFT
127	P07820127	COLLAR
128	P07820128	STEEL BALL 6MM
129	P07820129	COMPRESSION SPRING 1 X 6 X 7
130	P07820130	LEVER SHAFT M8-1.25 X 10, 66L
131	P07820131	HANDLE HUB
132	P07820132	FEED DIRECTION SHAFT BRACKET
133	P07820133	ROLL PIN 4 X 18
134	P07820134	O-RING 10 X 1.9
135	P07820135	SET SCREW M6-1 X 16 CONE-PT
136	P07820136	LEVER SHAFT M8-1.25 X 10, 56L
137	P07820137	O-RING 9.8 X 1.9 P10
138	P07820138	PHLP HD SCR M4-.7 X 8
139	P07820139	HANDLE BRACKET
140	P07820140	SET SCREW M8-1.25 X 8 CONE-PT
141	P07820141	EXT RETAINING RING 30MM
142	P07820142	SET SCREW M6-1 X 25 CONE-PT
143	P07820143	COMPRESSION SPRING 1 X 6 X 20
144	P07820144	SET SCREW M8-1.25 X 10 CONE-PT
145	P07820145	HANDLE HUB
146	P07820146	STEEL BALL 5MM
147	P07820147	PULLEY
148	P07820148	COTTER PIN M2 X 40 STANDARD
149	P07820149	CLEVIS PIN 8 X 24
150	P07820150	ROCKER

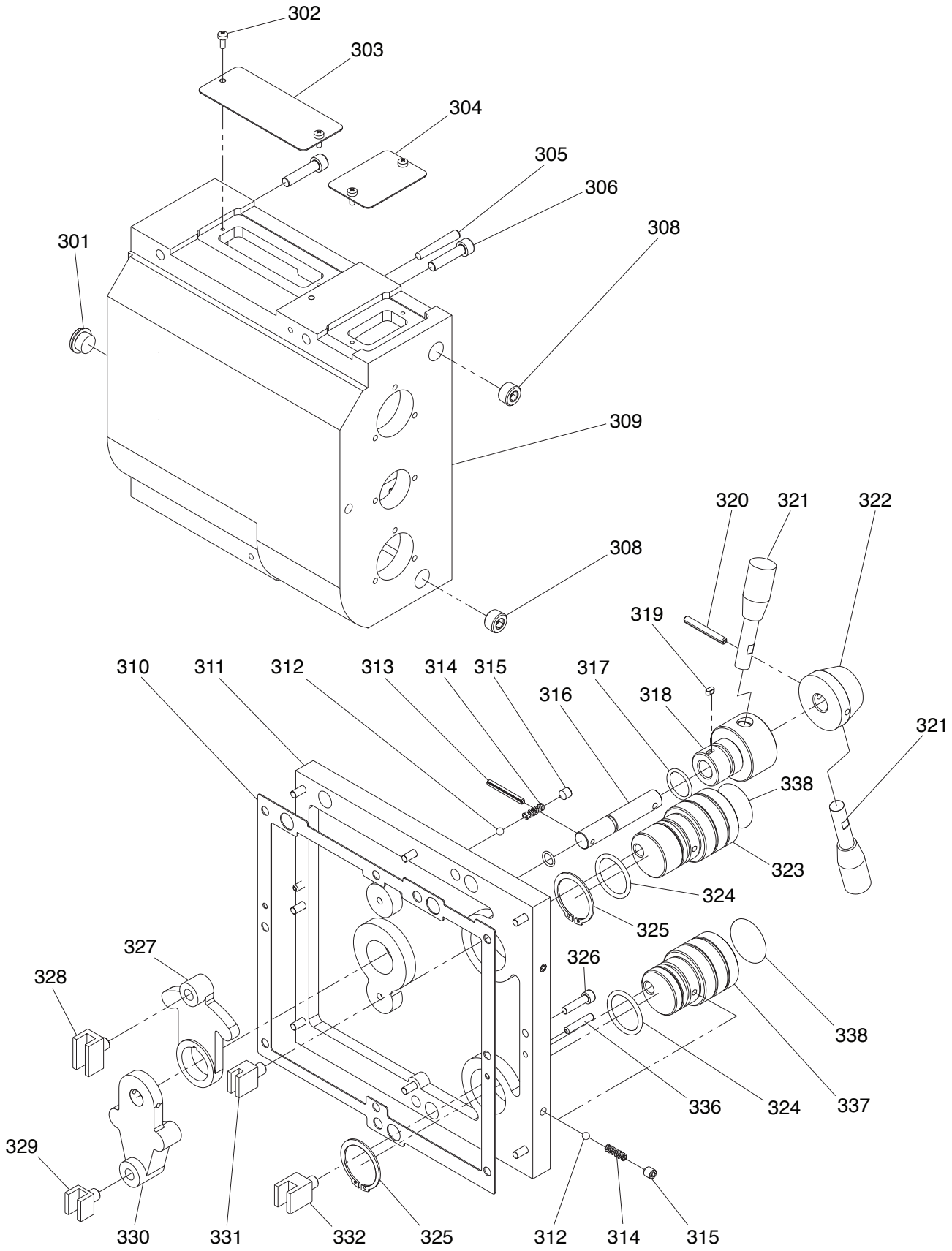
REF	PART #	DESCRIPTION
151	P07820151	ROCKER SHAFT
152	P07820152	EXT RETAINING RING 8MM
153	P07820153	GEAR SHAFT END COVER
154	P07820154	GASKET
155	P07820155	BALL BEARING 6005ZZ
156	P07820156	CAP SCREW M8-1.25 X 15
157	P07820157	SPACER
158	P07820158	SPACER
159	P07820159	CAP SCREW M6-1 X 16
160	P07820160	OIL SEAL 25 X 40 X 10
161	P07820161	KEY 8 X 8 X 20
162	P07820162	KEY 6 X 6 X 120
163	P07820163	SHAFT
164	P07820164	GEARED SLEEVE 21T
165	P07820165	EXT RETAINING RING 20MM
166	P07820166	GEAR SHAFT
167	P07820167	KEY 5 X 5 X 50
168	P07820168	GEAR 29T
169	P07820169	GEAR 46T
170	P07820170	GEAR 38T
171	P07820171	SET SCREW M8-1.25 X 16 CONE-PT
172	P07820172	BALL BEARING 6204ZZ
173	P07820173	BUSHING
174	P07820174	BALL BEARING 6203ZZ
175	P07820175	FRONT PLUG
176	P07820176	O-RING 40 X 3.1
177	P07820177	CAP SCREW M4-.7 X 12
178	P07820178	GEARED SHAFT END COVER
179	P07820179	GASKET
180	P07820180	KEY 6 X 6 X 55
181	P07820181	BALL BEARING 6204ZZ
182	P07820182	O-RING 47 X 3.1
183	P07820183	GEARED SHAFT 16T
184	P07820184	GEAR 51T
185	P07820185	GEAR 43T
186	P07820186	SPACER
187	P07820187	GEAR 26T
188	P07820188	GEAR 34T
189	P07820189	GEAR 53T
190	P07820190	FRONT PLUG
191	P07820191	SPANNER NUT M50 X 1.5
192	P07820192	COLLAR
193	P07820193	OUTBOARD SPINDLE COVER
194	P07820194	CAP SCREW M6-1 X 25
195	P07820195	OUTBOARD SPINDLE COVER GASKET
196	P07820196	TAPERED ROLLER BEARING 30210
197	P07820197	GEAR 37T
198	P07820198	GEARED SLEEVE 37T
199	P07820199	KEY 8 X 8 X 18

Headstock Parts List (Cont.)

REF	PART #	DESCRIPTION
200	P07820200	GEAR 74T
201	P07820201	TAPERED ROLLER BEARING 30212
202	P07820202	EXT RETAINING RING 50MM
203	P07820203	EXT RETAINING RING 72MM
204	P07820204	FRONT COVER
205	P07820205	SPINDLE
206	P07820206	KEY 6 X 6 X 40
207	P07820207	KEY 8 X 8 X 85
208	P07820208	CAM
209	P07820209	GASKET
210	P07820210	BALL BEARING 16001ZZ
211	P07820211	CAP SCREW M8-1.25 X 18
212	P07820212	COMPRESSION SPRING 0.6 X 4.4 X 15.2
213	P07820213	PIN 6.5 X 14.3
214	P07820214	O-RING 25 X 2.4
215	P07820215	SHAFT
216	P07820216	EXT RETAINING RING 42MM
217	P07820217	GEAR 30T
219	P07820219	FLAT WASHER 12MM

REF	PART #	DESCRIPTION
220	P07820220	SPACER 19.5MM
221	P07820221	KEY 5 X 5 X 18
222	P07820222	ROLL PIN 3 X 10
223	P07820223	KEY 6 X 6 X 50
224	P07820224	SPACER
225	P07820225	SHAFT COLLAR
226	P07820226	GASKET
227	P07820227	HEX NUT M12-1.75
228	P07820228	GEAR 40T
229	P07820229	OIL SEAL
230	P07820230	GEAR SHAFT E
231	P07820231	KEYED SPACER
232	P07820232	CAP SCREW M5-.8 X 16
233	P07820233	SPACER
234	P07820234	EXT RETAINING RING 20MM
235	P07820235	GEAR 37T
236	P07820236	BRAKE SHOES
237	P07820237	RUBBER MAT

Gearbox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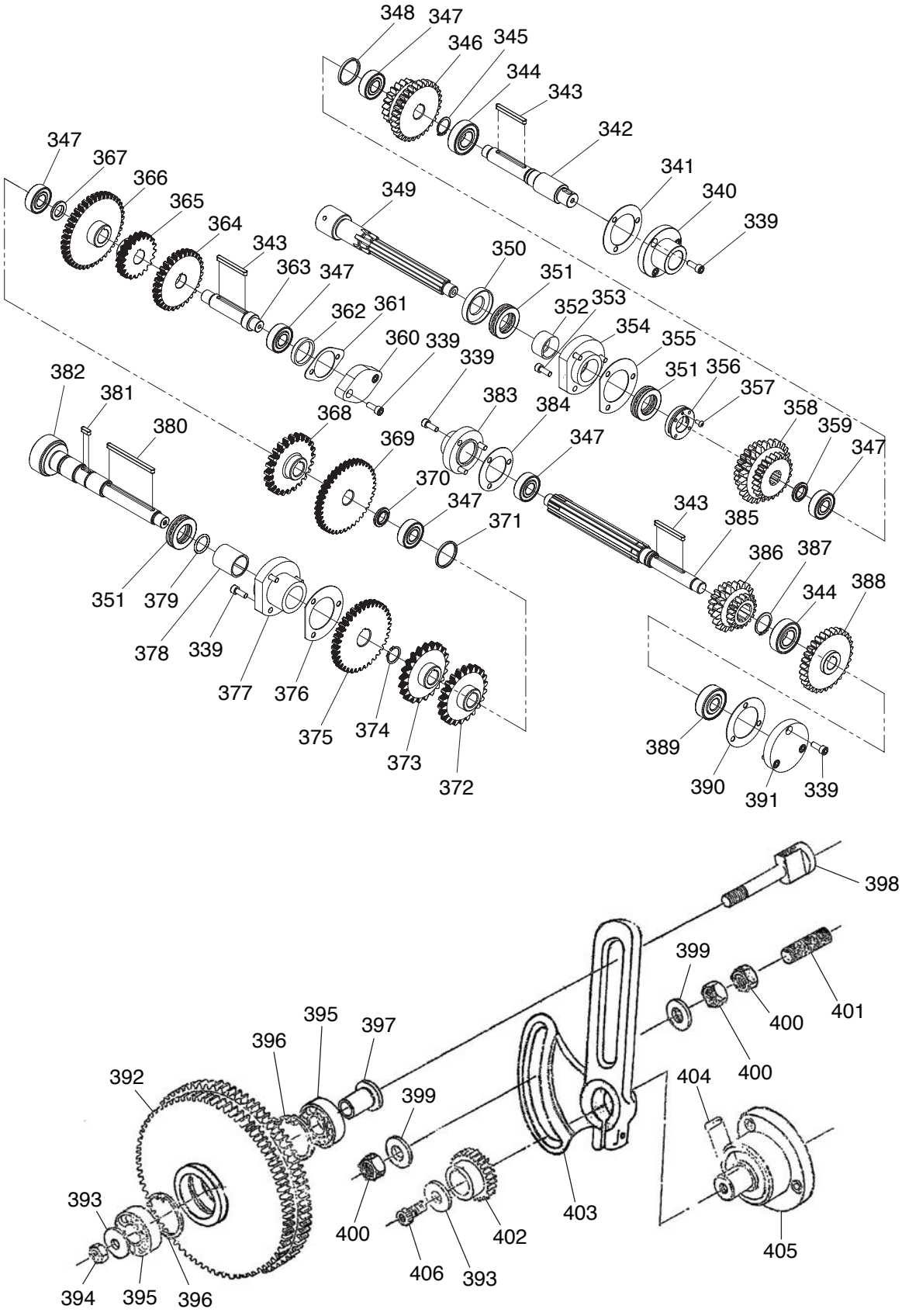
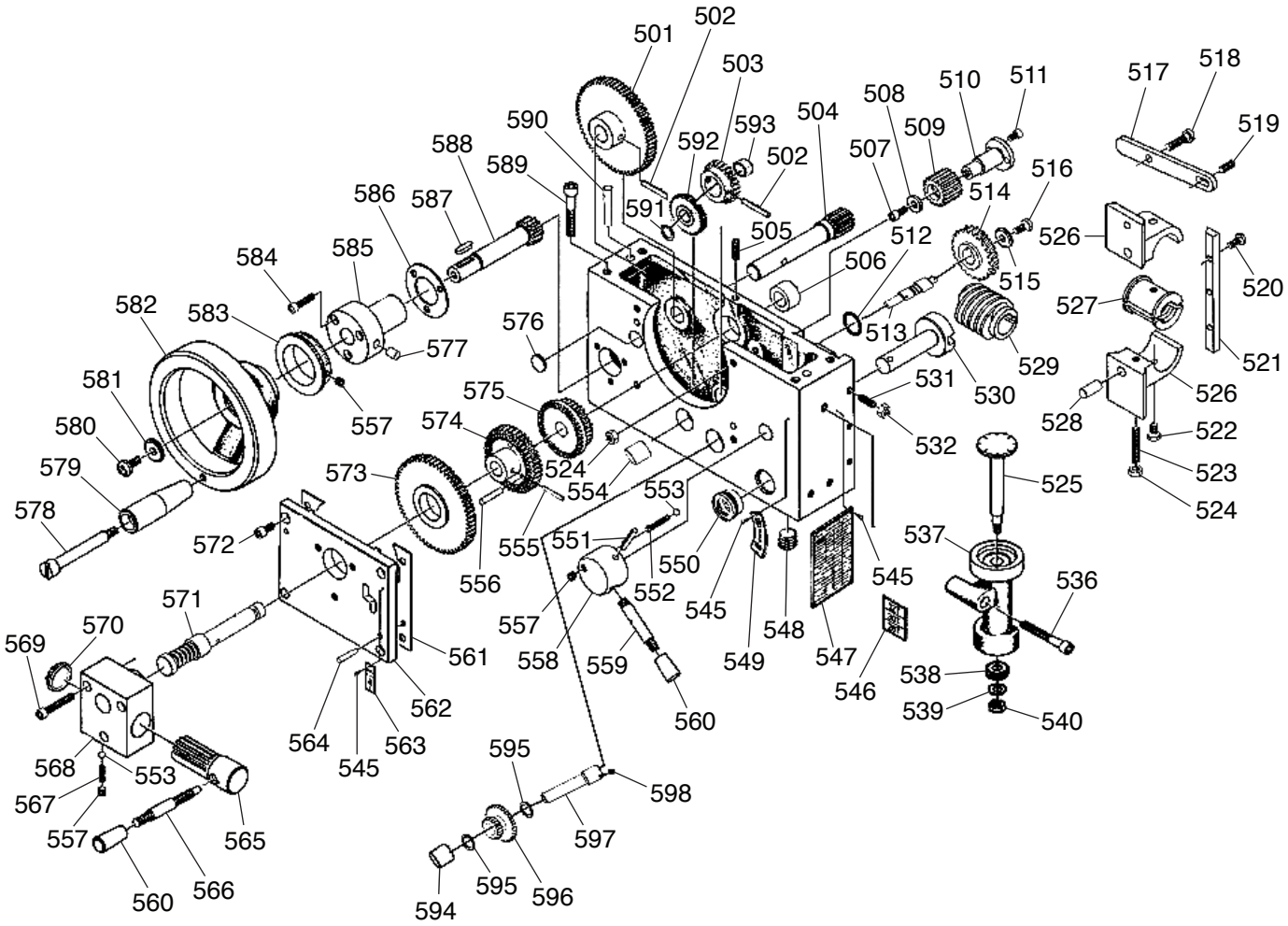


Gearbox Parts List

REF	PART #	DESCRIPTION
301	P07820301	OIL SIGHT GLASS M16-1.5
302	P07820302	PHLP HD SCR M4-.7 X 10
303	P07820303	GEARBOX COVER PLATE (LARGE)
304	P07820304	GEARBOX COVER PLATE (SMALL)
305	P07820305	INT THREADED TAPER PIN 6 X 45
306	P07820306	CAP SCREW M8-1.25 X 35
308	P07820308	DRAIN PLUG 3/8" NPT
309	P07820309	GEARBOX CASE
310	P07820310	GASKET
311	P07820311	COVER
312	P07820312	STEEL BALL 6MM
313	P07820313	ROLL PIN 4 X 20
314	P07820314	COMPRESSION SPRING 1 X 5 X 20
315	P07820315	SET SCREW M8-1.25 X 10 CONE-PT
316	P07820316	SHAFT
317	P07820317	O-RING 25 X 2.65
318	P07820318	SPEED RANGE LEVER HUB
319	P07820319	KEY 4 X 4 X 8
320	P07820320	ROLL PIN 5 X 45
321	P07820321	LEVER HANDLE M12-1.75, 95L
322	P07820322	SPINDLE SPEED LEVER HUB
323	P07820323	GEARBOX DIAL (UPPER)
324	P07820324	O-RING 35.5 X 3.55
325	P07820325	EXT RETAINING RING 40MM
326	P07820326	CAP SCREW M6-1 X 25
327	P07820327	FEED LEVER SHIFTING ARM (UPPER)
328	P07820328	FEED LEVER SHIFTING FORK (UPPER)
329	P07820329	FEED LEVER SHIFTING FORK (LOWER)
330	P07820330	FEED LEVER SHIFTING ARM (LOWER)
331	P07820331	FEED DIAL SHIFTING FORK (UPPER)
332	P07820332	FEED DIAL SHIFTING FORK (LOWER)
336	P07820336	ROLL PIN 5 X 30
337	P07820337	GEARBOX DIAL (LOWER)
338	P07820338	DIAL POSITION INDICATOR PLATE
339	P07820339	CAP SCREW M6-1 X 16
340	P07820340	BEARING COVER
341	P07820341	BEARING COVER GASKET
342	P07820342	LOWER CHANGE GEAR SHAFT
343	P07820343	KEY 5 X 5 X 50
344	P07820344	BALL BEARING 6004ZZ
345	P07820345	EXT RETAINING RING 20MM
346	P07820346	COMBO GEAR 30T/20T
347	P07820347	BALL BEARING 6202ZZ
348	P07820348	SPACER
349	P07820349	LEADSCREW SHAFT
350	P07820350	BEARING COVER
351	P07820351	THRUST BEARING 51105
352	P07820352	BUSHING
353	P07820353	CAP SCREW M6-1 X 16
354	P07820354	BEARING COVER
355	P07820355	BEARING COVER GASKET

REF	PART #	DESCRIPTION
356	P07820356	LOCKING COLLAR
357	P07820357	BUTTON HD CAP SCR M4-.7 X 8
358	P07820358	COMBO GEAR 24T/24T/24T
359	P07820359	SPACER
360	P07820360	BEARING COVER
361	P07820361	BEARING COVER GASKET
362	P07820362	SPACER
363	P07820363	SHAFT
364	P07820364	GEAR 30T
365	P07820365	GEAR 20T
366	P07820366	GEAR 40T
367	P07820367	SPACER
368	P07820368	GEAR 24T
369	P07820369	GEAR 40T
370	P07820370	SPACER
371	P07820371	SPACER
372	P07820372	GEAR 22T
373	P07820373	GEAR 21T
374	P07820374	EXT RETAINING RING 22MM
375	P07820375	GEAR 36T
376	P07820376	BEARING COVER GASKET
377	P07820377	BEARING COVER
378	P07820378	BUSHING
379	P07820379	O-RING 20 X 2.65
380	P07820380	KEY 5 X 5 X 80
381	P07820381	KEY 5 X 5 X 14
382	P07820382	SHAFT
383	P07820383	BEARING COVER
384	P07820384	BEARING COVER GASKET
385	P07820385	SHAFT
386	P07820386	COMBO GEAR 18T/18T/18T
387	P07820387	EXT RETAINING RING 25MM
388	P07820388	GEAR 15T/30T
389	P07820389	BALL BEARING 6302ZZ
390	P07820390	BEARING COVER GASKET
391	P07820391	BEARING COVER
392	P07820392	COMBO GEAR 120T/127T/100T
393	P07820393	FENDER WASHER 6MM
394	P07820394	HEX NUT M10-1.5
395	P07820395	BALL BEARING 6103ZZ
396	P07820396	INT RETAINING RING 35MM
397	P07820397	BUSHING
398	P07820398	GEAR SUPPORT SHAFT M10-1.5 X 46
399	P07820399	FLAT WASHER 10MM
400	P07820400	HEX NUT M10-1.5 THIN
401	P07820401	STUD-FT M10-1.5 X 70
402	P07820402	GEAR 32T
403	P07820403	ARM SUPPORT
404	P07820404	KEY 5 X 5 X 14
405	P07820405	BEARING COVER
406	P07820406	CAP SCREW M6-1 X 14

Apron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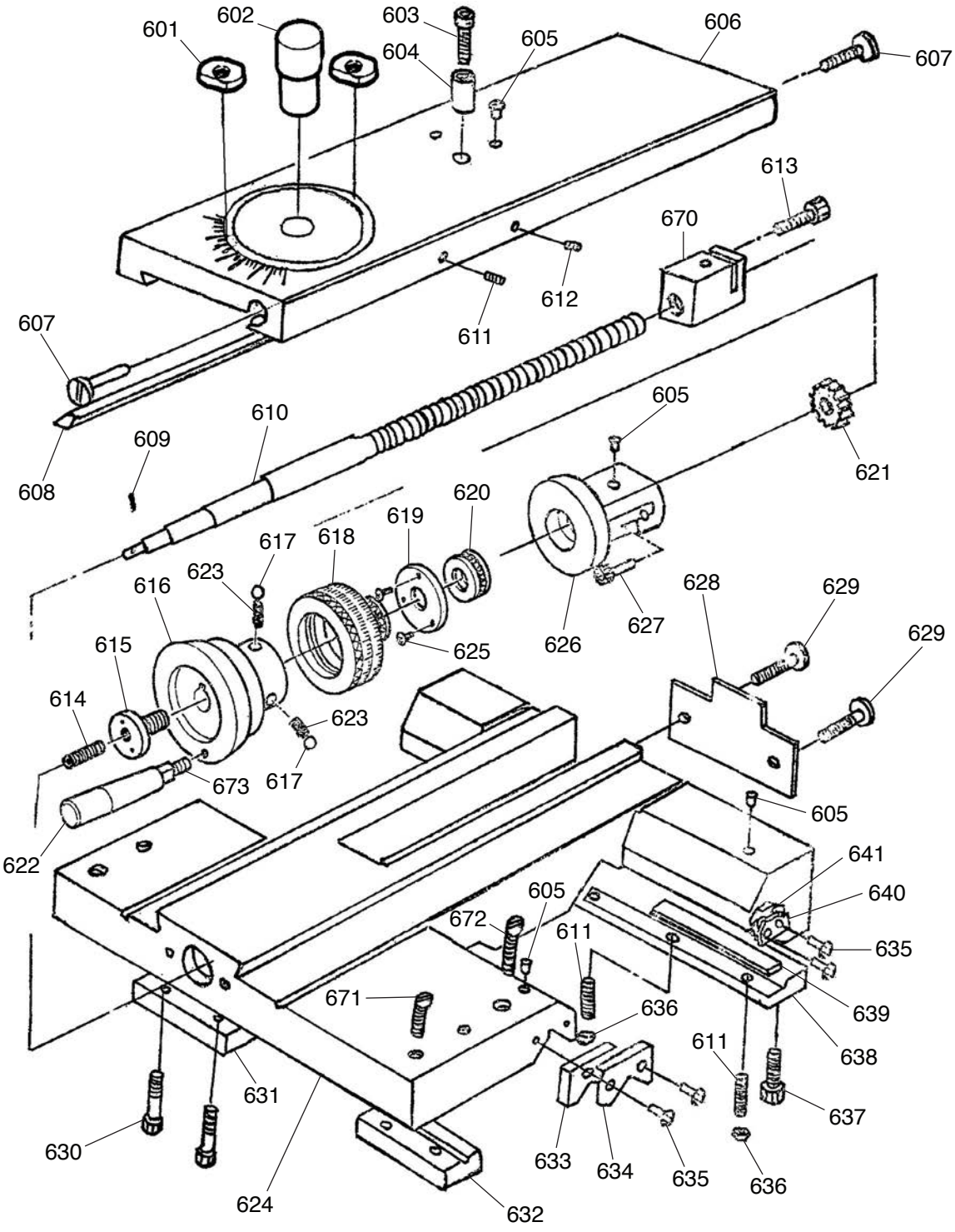
Apron Parts List

REF	PART #	DESCRIPTION
501	P07820501	GEAR 60T
502	P07820502	ROLL PIN 5 X 30
503	P07820503	GEAR 24T
504	P07820504	PINION SHAFT 13T
505	P07820505	SET SCREW M6-1 X 16 DOG-PT
506	P07820506	BUSHING
507	P07820507	CAP SCREW M6-1 X 12
508	P07820508	SPACER
509	P07820509	GEAR 18T
510	P07820510	SHAFT
511	P07820511	CAP SCREW M5-.8 X 12
512	P07820512	O-RING 20 X 2.4
513	P07820513	SHAFT
514	P07820514	WORM GEAR 22T
515	P07820515	SPACER
516	P07820516	HEX BOLT M6-1 X 12
517	P07820517	INTERLOCKING BAR
518	P07820518	CAP SCREW M6-1 X 18
519	P07820519	SET SCREW M6-1 X 12
520	P07820520	HEX BOLT M5-.8 X 20
521	P07820521	HALF NUT GIB
522	P07820522	HEX BOLT M6-1 X 16
523	P07820523	SET SCREW M6-1 X 35
524	P07820524	HEX NUT M6-1
525	P07820525	THREAD DIAL INDICATOR
526	P07820526	HALF NUT BRACKET
527	P07820527	HALF NUT
528	P07820528	DOWEL PIN 8 X 16
529	P07820529	WORM
530	P07820530	CAM SHAFT
531	P07820531	SET SCREW M5-.8 X 16 CUP-PT
532	P07820532	HEX NUT M5-.8
536	P07820536	CAP SCREW M8-1.25 X 50
537	P07820537	THREAD DIAL BODY
538	P07820538	THREAD DIAL GEAR 32T
539	P07820539	FLAT WASHER 8MM
540	P07820540	HEX NUT M8-1.25
545	P07820545	RIVET 2 X 5 NAMEPLATE
546	P07820546	HELICAL GEAR CHART
547	P07820547	THREAD DIAL CHART
548	P07820548	DRAIN PLUG 1/4" NPT
549	P07820549	HALF NUT INDICATOR
550	P07820550	OIL SIGHT GLASS M20-1.5
551	P07820551	ROLL PIN 5 X 35
552	P07820552	COMPRESSION SPRING
553	P07820553	STEEL BALL 5MM

REF	PART #	DESCRIPTION
554	P07820554	BUSHING
555	P07820555	ROLL PIN 3 X 25
556	P07820556	DOWEL PIN 5 X 25
557	P07820557	SET SCREW M6-1 X 6
558	P07820558	LEVER HUB
559	P07820559	STUD-UDE M10-1.5 X 8, M8-1.25 X 12, 90L
560	P07820560	LEVER HANDLE M8-1.25, 40L
561	P07820561	FRONT COVER SPACER
562	P07820562	FRONT COVER
563	P07820563	FEED DIRECTION INDICATOR
564	P07820564	TAPER PIN 5 X 20
565	P07820565	FEED SELECTION CAM SHAFT
566	P07820566	LEVER SHAFT M8-1.25 X 12, M8-1.25 X 18, 92L
567	P07820567	COMPRESSION SPRING
568	P07820568	FEED SELECTION BRACKET
569	P07820569	CAP SCREW M6-1 X 35
570	P07820570	FEED SELECTION BRACKET PLUG
571	P07820571	SHIFTER SHAFT
572	P07820572	CAP SCREW M6-1 X 16
573	P07820573	CLUTCH GEAR 63T/42T
574	P07820574	CLUTCH GEAR 42T/40T/42T
575	P07820575	CLUTCH GEAR 42T/30T
576	P07820576	PLUG
577	P07820577	BALL OILER 8MM PRESS-IN
578	P07820578	SHOULDER SCREW M8-1.25 X 14, 10 X 66
579	P07820579	HANDWHEEL HANDLE 10 X 75
580	P07820580	PHLP HD SCR M6-1 X 15
581	P07820581	SPACER
582	P07820582	HANDWHEEL 140D X 13B X M8-1.25 DISHED
583	P07820583	GRADUATED DIAL
584	P07820584	CAP SCREW M5-.8 X 25
585	P07820585	HANDWHEEL SUPPORT HUB
586	P07820586	SPACER
587	P07820587	KEY 5 X 5 X 20
588	P07820588	GEAR SHAFT
589	P07820589	CAP SCREW M8-1.25 X 30
590	P07820590	TAPER PIN 8 X 40
591	P07820591	SPACER
592	P07820592	GEAR 40T
593	P07820593	SLEEVE
594	P07820594	SLEEVE
595	P07820595	SPACER
596	P07820596	COMBO GEAR 36T/20T
597	P07820597	SHAFT
598	P07820598	SET SCREW M5-.8 X 4 CONE-PT

Cross Slide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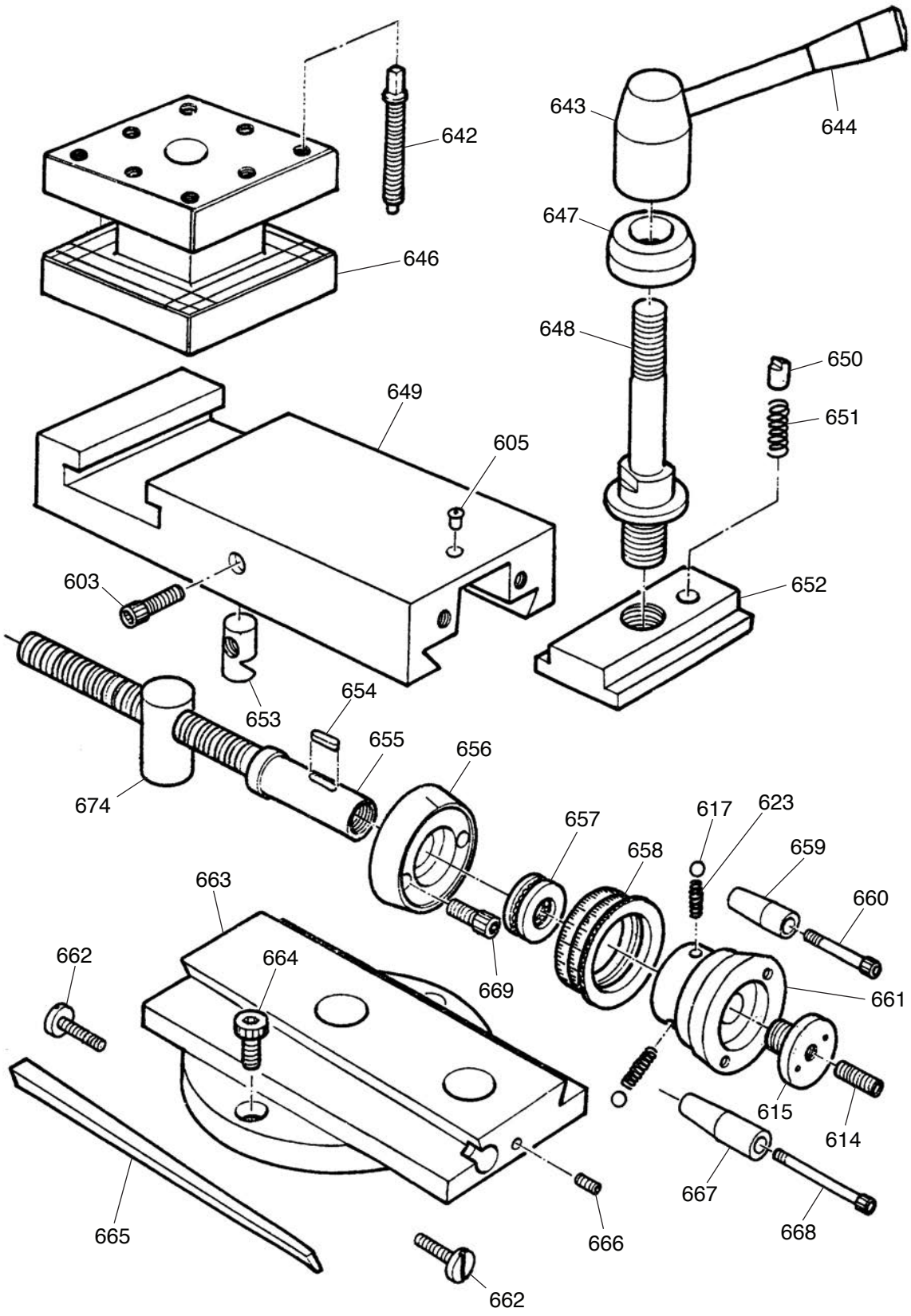
Compound Slide

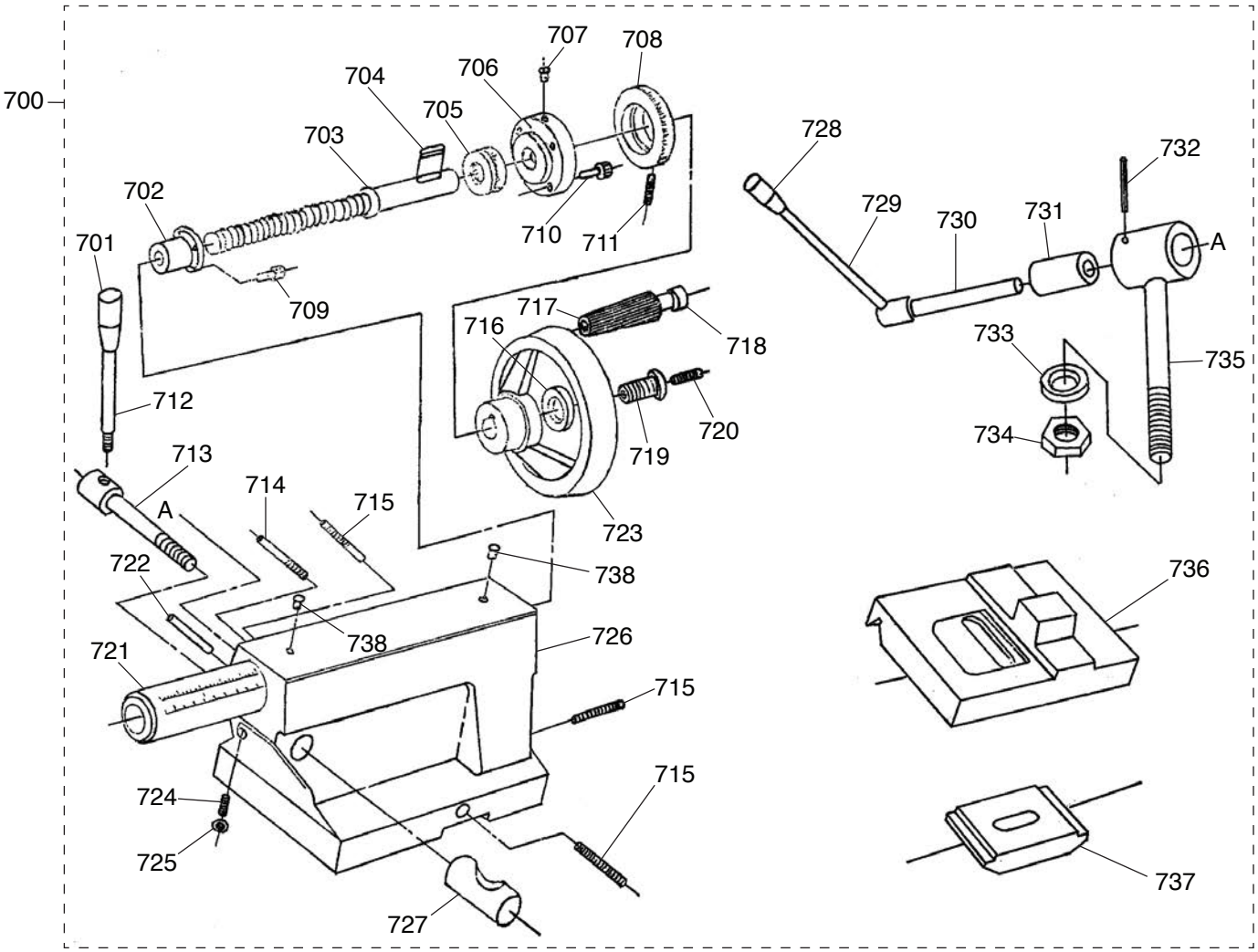


Cross Slide & Compound Slide Parts List

REF	PART #	DESCRIPTION
601	P07820601	SLIDE NUT M8-1.25
602	P07820602	COMPOUND REST AXIS
603	P07820603	CAP SCREW M6-1 X 16
604	P07820604	BUSHING
605	P07820605	BALL OILER 8MM PRESS-IN
606	P07820606	CROSS SLIDE
607	P07820607	GIB ADJUSTING SCREW
608	P07820608	CROSS SLIDE GIB
609	P07820609	ROLL PIN 3 X 16
610	P07820610	LEADSCREW
611	P07820611	SET SCREW M6-1 X 25
612	P07820612	SET SCREW M8-1.25 X 10
613	P07820613	SET SCREW M6-1 X 16 CONE-PT
614	P07820614	SET SCREW M6-1 X 25 CONE-PT
615	P07820615	BACKLASH ADJUSTMENT DISC
616	P07820616	HANDWHEEL 89D X 15B X M8-1.25 FLAT
617	P07820617	STEEL BALL 6MM
618	P07820618	GRADUATED DIAL .02MM/.001" X 5.08MM/.2"
619	P07820619	BEARING COVER
620	P07820620	THRUST BEARING 8102
621	P07820621	GEAR 19T
622	P07820622	HANDWHEEL HANDLE 8 X 75
623	P07820623	COMPRESSION SPRING 0.7 X 5 X 9
624	P07820624	SADDLE CASTING
625	P07820625	PHLP HD SCR M5-.8 X 10
626	P07820626	CROSS SLIDE LEADSCREW HUB
627	P07820627	CAP SCREW M6-1 X 25
628	P07820628	COVER PLATE
629	P07820629	PHLP HD SCR M8-1.25 X 12
630	P07820630	HEX BOLT M8-1.25 X 20
631	P07820631	GIB SLIDE (FRONT LEFT)
632	P07820632	GIB SLIDE (FRONT RIGHT)
633	P07820633	WAY WIPER
634	P07820634	WIPER PLATE
635	P07820635	PHLP HD SCR M4-.7 X 12
636	P07820636	HEX NUT M6-1
637	P07820637	HEX BOLT M8-1.25 X 25

REF	PART #	DESCRIPTION
638	P07820638	GIB SLIDE (REAR)
639	P07820639	GIB STRIP
640	P07820640	WIPER PLATE
641	P07820641	WAY WIPER
642	P07820642	TOOL POST SCREW M10-1.5 X 50
643	P07820643	HANDLE BASE
644	P07820644	LEVER W/HANDLE M10-1.5 X 12, 128L
646	P07820646	4-WAY TOOL HOLDER
647	P07820647	BEVELED COLLAR
648	P07820648	SHAFT M18-1.5 X 16, M16-2 X 28, 112L
649	P07820649	COMPOUND REST BODY
650	P07820650	WIPER 10 X 10
651	P07820651	COMPRESSION SPRING 1 X 8 X 11
652	P07820652	CLAMP PLATE
653	P07820653	WIPER
654	P07820654	KEY 4 X 4 X 14
655	P07820655	LEADSCREW
656	P07820656	BEARING HOUSING
657	P07820657	THRUST BEARING 8103
658	P07820658	GRADUATED DIAL .001"/.2"
659	P07820659	HANDWHEEL HANDLE 6 X 25
660	P07820660	SHOULDER SCREW M5-.8 X 7, 6 X 20
661	P07820661	HANDWHEEL 61D X 17B X M4-.7 (X2) FLAT
662	P07820662	GIB ADJUSTING SCREW
663	P07820663	COMPOUND REST BASE
664	P07820664	CAP SCREW M8-1.25 X 16
665	P07820665	GIB
666	P07820666	SET SCREW M6-1 X 16
667	P07820667	HANDWHEEL HANDLE 6 X 40
668	P07820668	SHOULDER SCREW M5-.8 X 7, 6 X 34
669	P07820669	CAP SCREW M6-1 X 20
670	P07820670	LEADSCREW NUT
671	P07820671	CAP SCREW M8-1.25 X 30
672	P07820672	CAP SCREW M8-1.25 X 50
673	P07820673	SHOULDER SCREW M8-1.25 X 12, 10 X 65
674	P07820674	LEADSCREW NUT

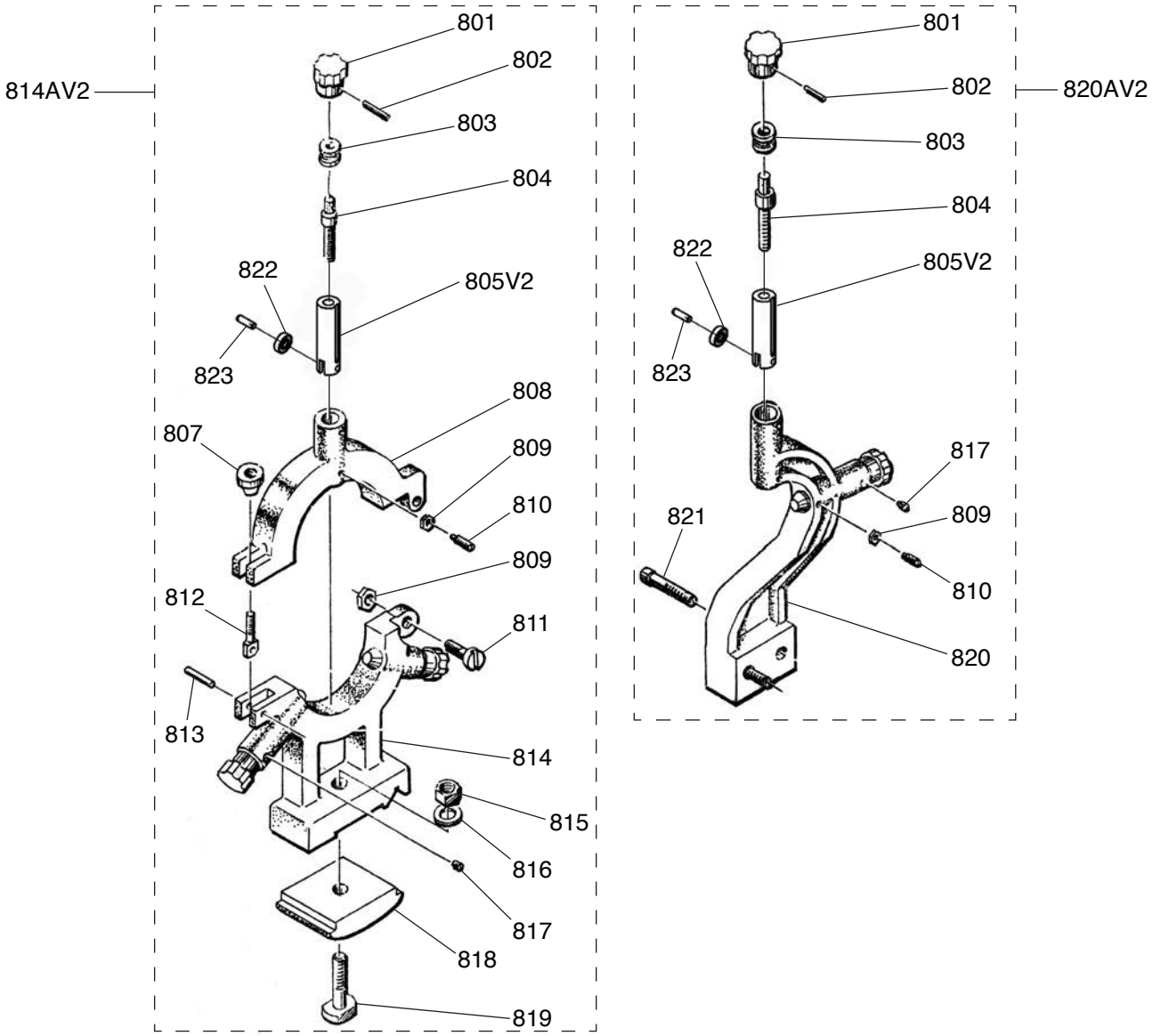
Tailstock



REF	PART #	DESCRIPTION
700	P07820700	COMPLETE TAILSTOCK ASSEMBLY
701	P07820701	LEVER HANDLE M8-1.25, 40L
702	P07820702	LEADSCREW NUT
703	P07820703	LEADSCREW
704	P07820704	KEY 4 X 4 X 15
705	P07820705	THRUST BEARING 8102
706	P07820706	HANDWHEEL SUPPORT HUB
707	P07820707	BALL OILER 8MM PRESS-IN
708	P07820708	GRADUATED DIAL .001"/.125"
709	P07820709	CAP SCREW M4-.7 X 10
710	P07820710	CAP SCREW M6-1 X 16
711	P07820711	SET SCREW M6-1 X 10 CONE-PT
712	P07820712	LEVER SHAFT M8-1.25 X 9, 61L
713	P07820713	QUILL LOCK SHAFT
714	P07820714	LOCK LEVER STOP M8-1.25 X 8, 38L
715	P07820715	SET SCREW M10-1.5 X 45 DOG-PT
716	P07820716	SPACER
717	P07820717	HANDWHEEL HANDLE 10 X 75
718	P07820718	SHOULDER SCREW M8-1.25 X 12, 10 X 65
719	P07820719	INT THREAD CAP SCR M8-1.25 X 20, M5-.8

REF	PART #	DESCRIPTION
720	P07820720	SET SCREW M5-.8 X 30 DOG-PT
721	P07820721	QUILL
722	P07820722	LOCK LEVER STOP M8-1.25 X 8, 38L
723	P07820723	HANDWHEEL 121D X 15B X M8-1.25 DISHED
724	P07820724	SET SCREW M8-1.25 X 35 DOG-PT
725	P07820725	HEX NUT M8-1.25 THIN
726	P07820726	TAILSTOCK CASTING
727	P07820727	QUILL LOCK NUT M8-1.25, 22 X 31
728	P07820728	LEVER HANDLE M10-1.5, 50L
729	P07820729	LEVER SHAFT M10-1.5 X 12, 168L
730	P07820730	TAILSTOCK LOCK LEVER SHAFT
731	P07820731	BUSHING
732	P07820732	ROLL PIN 5 X 24
733	P07820733	FLAT WASHER 12MM
734	P07820734	HEX NUT M12-1.75
735	P07820735	TAILSTOCK CLAMP BOLT M12-1.75 X 65
736	P07820736	TAILSTOCK BASE
737	P07820737	CLAMP PLATE
738	P07820738	BALL OILER 8MM PRESS-IN

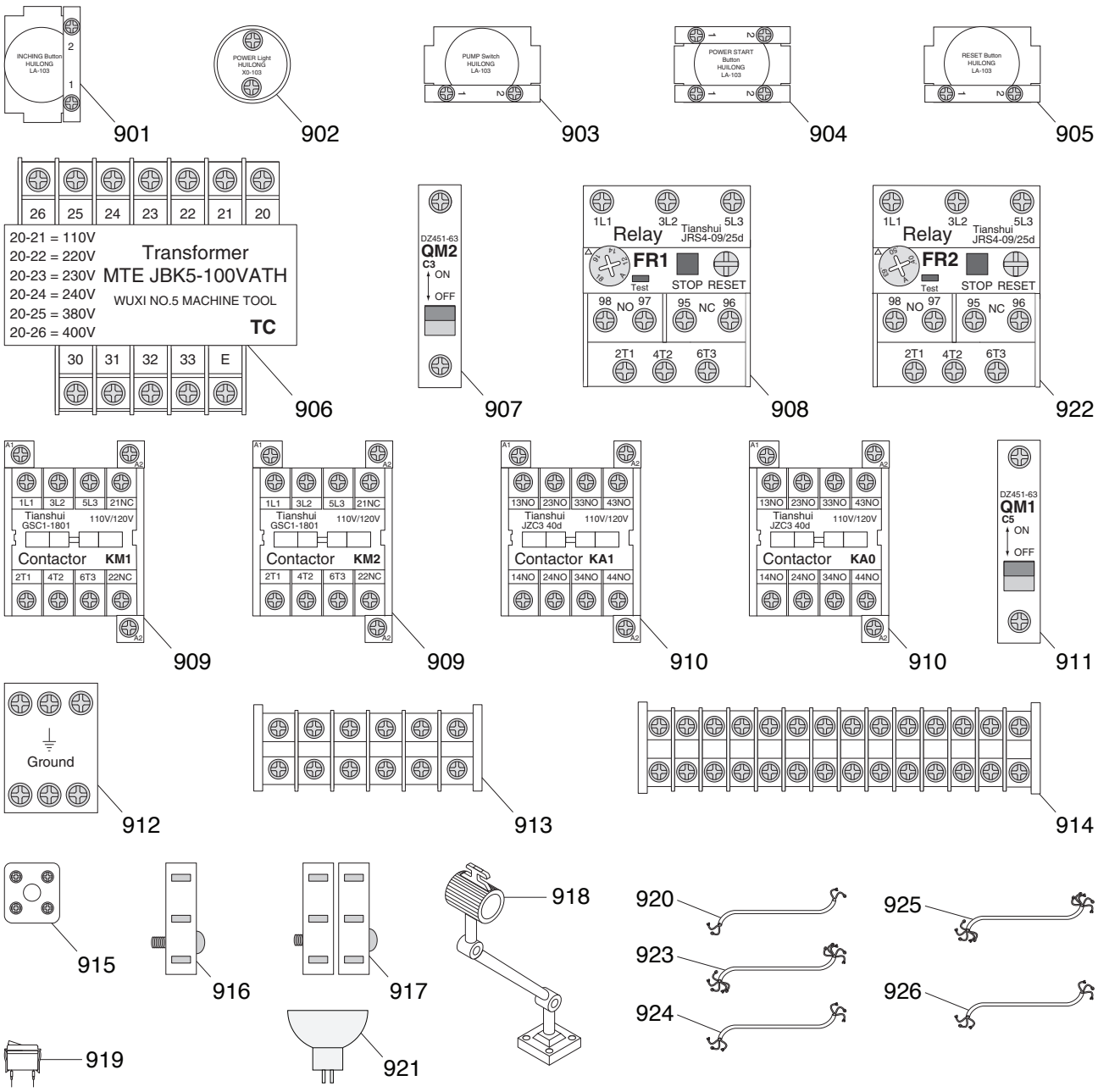
Steady & Follow Rests



REF	PART #	DESCRIPTION
801	P07820801	KNOB M8-1.25 7-LOBE
802	P07820802	DOWEL PIN 3 X 18
803	P07820803	COLLAR
804	P07820804	JACK SCREW
805V2	P07820805V2	SLEEVE V2.10.15
807	P07820807	KNURLED THUMB KNOB M10-1.5
808	P07820808	STEADY REST UPPER BODY
809	P07820809	HEX NUT M6-1
810	P07820810	SET SCREW M6-1 X 18 DOG-PT
811	P07820811	CAP SCREW M6-1 X 30
812	P07820812	PIVOT STUD M10-1.5 X 20
813	P07820813	ROLL PIN 5 X 24

REF	PART #	DESCRIPTION
814	P07820814	STEADY REST LOWER BODY
814AV2	P07820814AV2	STEADY REST ASSEMBLY V2.10.15
815	P07820815	HEX NUT M12-1.75
816	P07820816	FLAT WASHER 12MM
817	P07820817	SET SCREW M6-1 X 6 CONE-PT
818	P07820818	CLAMP PLATE
819	P07820819	CLAMP SCREW M12-1.75 X 65
820	P07820820	FOLLOW REST BODY
820AV2	P07820820AV2	FOLLOW REST ASSEMBLY V2.10.15
821	P07820821	CAP SCREW M8-1.25 X 45
822	P07820822	BALL BEARING 625ZZ
823	P07820823	DOWEL PIN 5 X 16

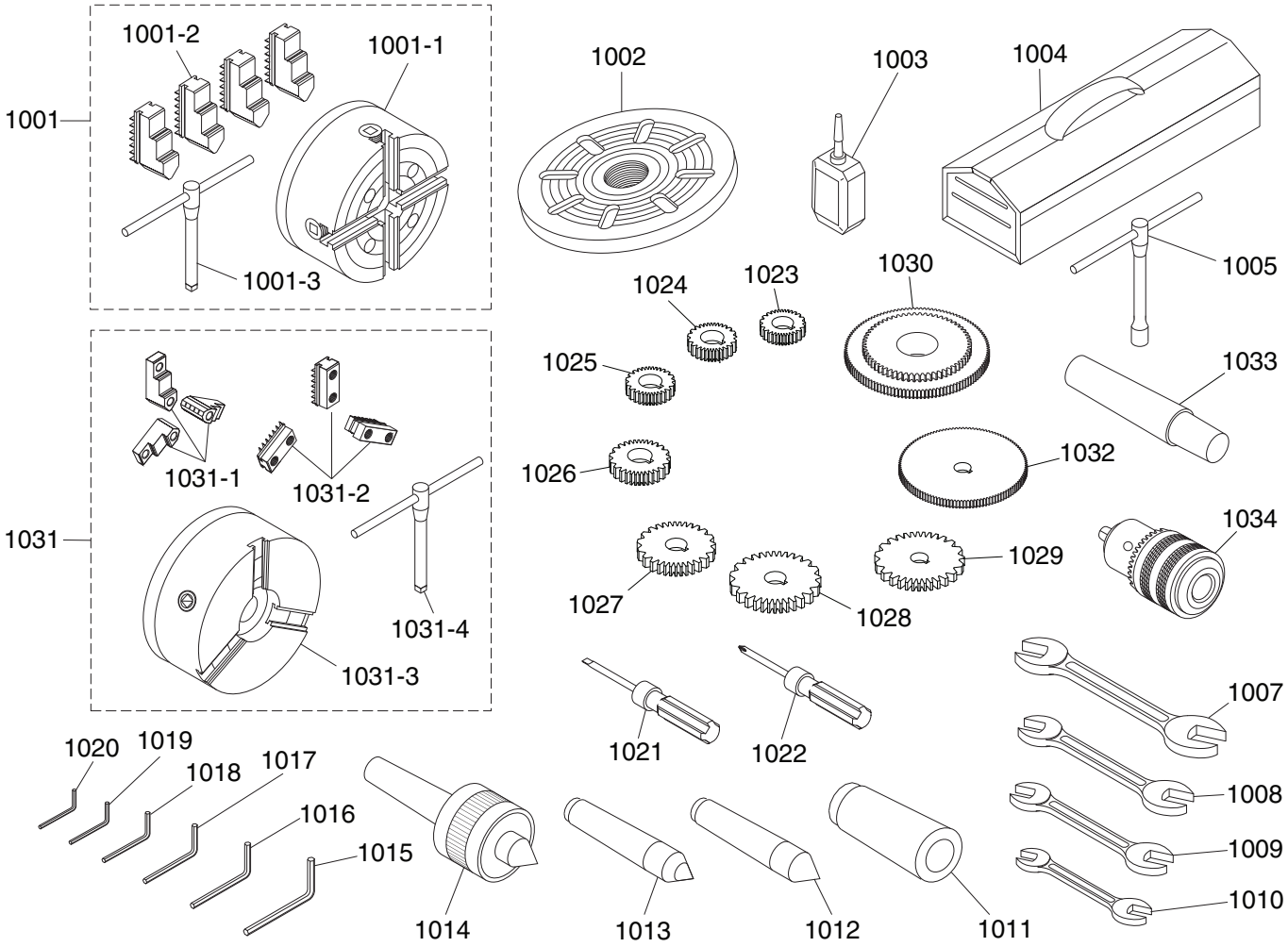
Electrical



REF	PART #	DESCRIPTION
901	P07820901	JOG BUTTON HUILONG LA-103
902	P07820902	POWER LIGHT HUILONG X0-103
903	P07820903	PUMP SWITCH HUILONG LA-103
904	P07820904	POWER START BUTTON HUILONG LA-103
905	P07820905	RESET BUTTON HUILONG LA-103
906	P07820906	TRANSFORMER WUXI JBK5-100VATH 220V
907	P07820907	CIRCUIT BREAKER HUILONG DZ451-63 C3
908	P07820908	OL RELAY TIANSHUI JRS4-09/25D 14-18A
909	P07820909	CONTACTOR TIANSHUI GSC1-1801 120V
910	P07820910	CONTACTOR TIANSHUI JZC3-40D 120V
911	P07820911	CIRCUIT BREAKER HUILONG DZ451-63 C5
912	P07820912	GROUNDING BLOCK 6-TERMINAL
913	P07820913	TERMINAL BAR 6P

REF	PART #	DESCRIPTION
914	P07820914	TERMINAL BAR 14P
915	P07820915	WORKLIGHT TERMINAL BLOCK 2P
916	P07820916	LIMIT SWITCH LXW5-A11N
917	P07820917	LIMIT SWITCH LXW5-A11D
918	P07820918	WORKLIGHT ASSEMBLY
919	P07820919	ROCKER SWITCH KCD1-A 250V
920	P07820920	WORKLIGHT POWER CORD 14G 2W 72"
921	P07820921	BULB LED PUSH-IN
922	P07820922	OL RELAY TIANSHUI JRS4-09/25D 0.4-0.63A
923	P07820923	MOTOR CORD 12G 5W 18"
924	P07820924	COOLANT PUMP CORD 14G 3W 108"
925	P07820925	SPINDLE SWITCH CORD 14G 5W 108"
926	P07820926	BRAKE LIMIT SWITCH CORD 14G 3W 48"

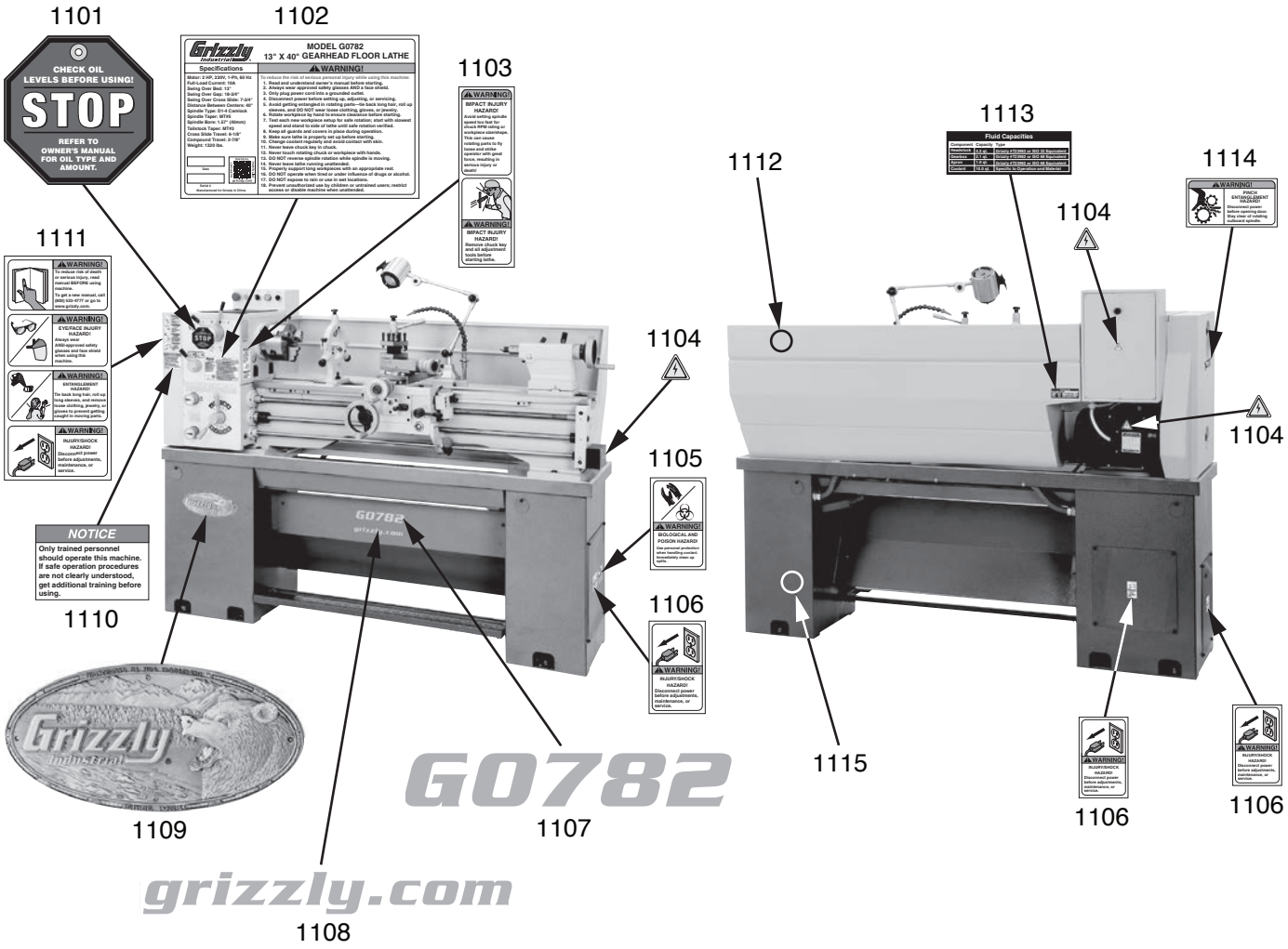
Accessories



REF	PART #	DESCRIPTION
1001	P07821001	4-JAW INDEPENDENT CHUCK ASSY 8"
1001-1	P07821001-1	4-JAW CHUCK BODY 8" D1-4
1001-2	P07821001-2	4-JAW CHUCK REVERSIBLE JAW SET
1001-3	P07821001-3	CAMLOCK KEY 10MM
1002	P07821002	FACEPLATE 12" D1-4
1003	P07821003	BOTTLE FOR OIL
1004	P07821004	TOOLBOX
1005	P07821005	TOOL POST WRENCH 10MM
1007	P07821007	WRENCH 17 X 19MM OPEN-ENDS
1008	P07821008	WRENCH 12 X 14MM OPEN-ENDS
1009	P07821009	WRENCH 10 X 12MM OPEN-ENDS
1010	P07821010	WRENCH 9 X 11MM OPEN-ENDS
1011	P07821011	SPINDLE SLEEVE MT#5-MT#3
1012	P07821012	DEAD CENTER MT#3 HSS
1013	P07821013	DEAD CENTER MT#3 CARBIDE-TIPPED
1014	P07821014	LIVE CENTER MT#3
1015	P07821015	HEX WRENCH 8MM
1016	P07821016	HEX WRENCH 6MM
1017	P07821017	HEX WRENCH 5MM
1018	P07821018	HEX WRENCH 4MM

REF	PART #	DESCRIPTION
1019	P07821019	HEX WRENCH 3MM
1020	P07821020	HEX WRENCH 2.5MM
1021	P07821021	SCREWDRIVER FLAT #2
1022	P07821022	SCREWDRIVER PHILLIPS #2
1023	P07821023	GEAR 35T
1024	P07821024	GEAR 42T
1025	P07821025	GEAR 44T
1026	P07821026	GEAR 46T
1027	P07821027	GEAR 48T
1028	P07821028	GEAR 52T
1029	P07821029	GEAR 55T
1030	P07821030	GEAR 120T/127T
1031	P07821031	3-JAW SCROLL CHUCK ASSY 6"
1031-1	P07821031-1	3-JAW CHUCK TOP JAW SET
1031-2	P07821031-2	3-JAW CHUCK BOTTOM JAW SET
1031-3	P07821031-3	3-JAW CHUCK 6" D1-4
1031-4	P07821031-4	LATHE CHUCK KEY 10MM
1032	P07821032	GEAR 85T
1033	P07821033	DRILL CHUCK ARBOR MT3 X B16
1034	P07821034	DRILL CHUCK B16 1.5-13MM

Labels & Cosmetics



REF	PART #	DESCRIPTION
1101	P07821101	STOP OIL FILL TAG
1102	P07821102	MACHINE ID LABEL
1103	P07821103	IMPACT INJURY HAZARD LABEL
1104	P07821104	ELECTRICITY LABEL
1105	P07821105	BIOLOGICAL/POISON HAZARD LABEL
1106	P07821106	DISCONNECT POWER LABEL
1107	P07821107	MODEL NUMBER LABEL
1108	P07821108	GRIZZLY.COM LABEL

REF	PART #	DESCRIPTION
1109	P07821109	GRIZZLY NAMEPLATE
1110	P07821110	TRAINED PERSONNEL NOTICE
1111	P07821111	WARNING/HAZARD LABEL
1112	P07821112	GRIZZLY BEIGE TOUCH-UP PAINT
1113	P07821113	FLUID CAPACITY LABEL
1114	P07821114	PINCH/ENTANGLEMENT HAZARD LABEL
1115	P07821115	GRIZZLY GREEN TOUCH-UP PAINT

⚠WARNING

Safety labels help reduce the risk of serious injury caused by machine hazards. If any label comes off or becomes unreadable, the owner of this machine MUST replace it in the original location before resuming operations. For replacements, contact (800) 523-4777 or www.grizzly.com.

Grizzly Industrial, Inc. WARRANTY CARD

Name _____

Street _____

City _____ State _____ Zip _____

Phone # _____ Email _____

Model # _____ Order # _____ Serial # _____

The following information is given on a voluntary basis. It will be used for marketing purposes to help us develop better products and services. ***Of course, all information is strictly confidential.***

1. How did you learn about us?

____ Advertisement ____ Friend ____ Catalog
____ Card Deck ____ Website ____ Other:

2. Which of the following magazines do you subscribe to?

____ Cabinetmaker & FDM
____ Family Handyman
____ Hand Loader
____ Handy
____ Home Shop Machinist
____ Journal of Light Cont.
____ Live Steam
____ Model Airplane News
____ Old House Journal
____ Popular Mechanics
____ Popular Science
____ Popular Woodworking
____ Precision Shooter
____ Projects in Metal
____ RC Modeler
____ Rifle
____ Shop Notes
____ Shotgun News
____ Today's Homeowner
____ Wood
____ Wooden Boat
____ Woodshop News
____ Woodsmith
____ Woodwork
____ Woodworker West
____ Woodworker's Journal
____ Other:

3. What is your annual household income?

____ $20,000-$29,000 ____ $30,000-$39,000 ____ $40,000-$49,000
____ $50,000-$59,000 ____ $60,000-$69,000 ____ $70,000+

4. What is your age group?

____ 20-29 ____ 30-39 ____ 40-49
____ 50-59 ____ 60-69 ____ 70+

5. How long have you been a woodworker/metalworker?

____ 0-2 Years ____ 2-8 Years ____ 8-20 Years ____ 20+ Years

6. How many of your machines or tools are Grizzly?

____ 0-2 ____ 3-5 ____ 6-9 ____ 10+

7. Do you think your machine represents a good value? _____Yes _____No

8. Would you recommend Grizzly Industrial to a friend? _____Yes _____No

9. Would you allow us to use your name as a reference for Grizzly customers in your area?
Note: *We never use names more than 3 times.* _____Yes _____No

10. Comments: _____

_____

_____

_____

CUT ALONG DOTTED LINE

FOLD ALONG DOTTED LINE

Place
Stamp
Here

GRIZZLY INDUSTRIAL, INC.
P.O. BOX 2069
BELLINGHAM, WA 98227-2069

FOLD ALONG DOTTED LINE

Send a Grizzly Catalog to a friend:

Name_____

Street_____

City_____State_____Zip_____

TAPE ALONG EDGES--PLEASE DO NOT STAPLE

WARRANTY AND RETURNS

Grizzly Industrial, Inc. warrants every product it sells for a period of **1 year** to the original purchaser from the date of purchase. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence, accidents, repairs or alterations or lack of maintenance. This is Grizzly's sole written warranty and any and all warranties that may be implied by law, including any merchantability or fitness, for any particular purpose, are hereby limited to the duration of this written warranty. We do not warrant or represent that the merchandise complies with the provisions of any law or acts unless the manufacturer so warrants. In no event shall Grizzly's liability under this warranty exceed the purchase price paid for the product and any legal actions brought against Grizzly shall be tried in the State of Washington, County of Whatcom.

We shall in no event be liable for death, injuries to persons or property or for incidental, contingent, special, or consequential damages arising from the use of our products.

To take advantage of this warranty, contact us by mail or phone and give us all the details. We will then issue you a "Return Number,'' which must be clearly posted on the outside as well as the inside of the carton. We will not accept any item back without this number. Proof of purchase must accompany the merchandise.

The manufacturers reserve the right to change specifications at any time because they constantly strive to achieve better quality equipment. We make every effort to ensure that our products meet high quality and durability standards and we hope you never need to use this warranty.

Please feel free to write or call us if you have any questions about the machine or the manual.

Thank you again for your business and continued support. We hope to serve you again soon.