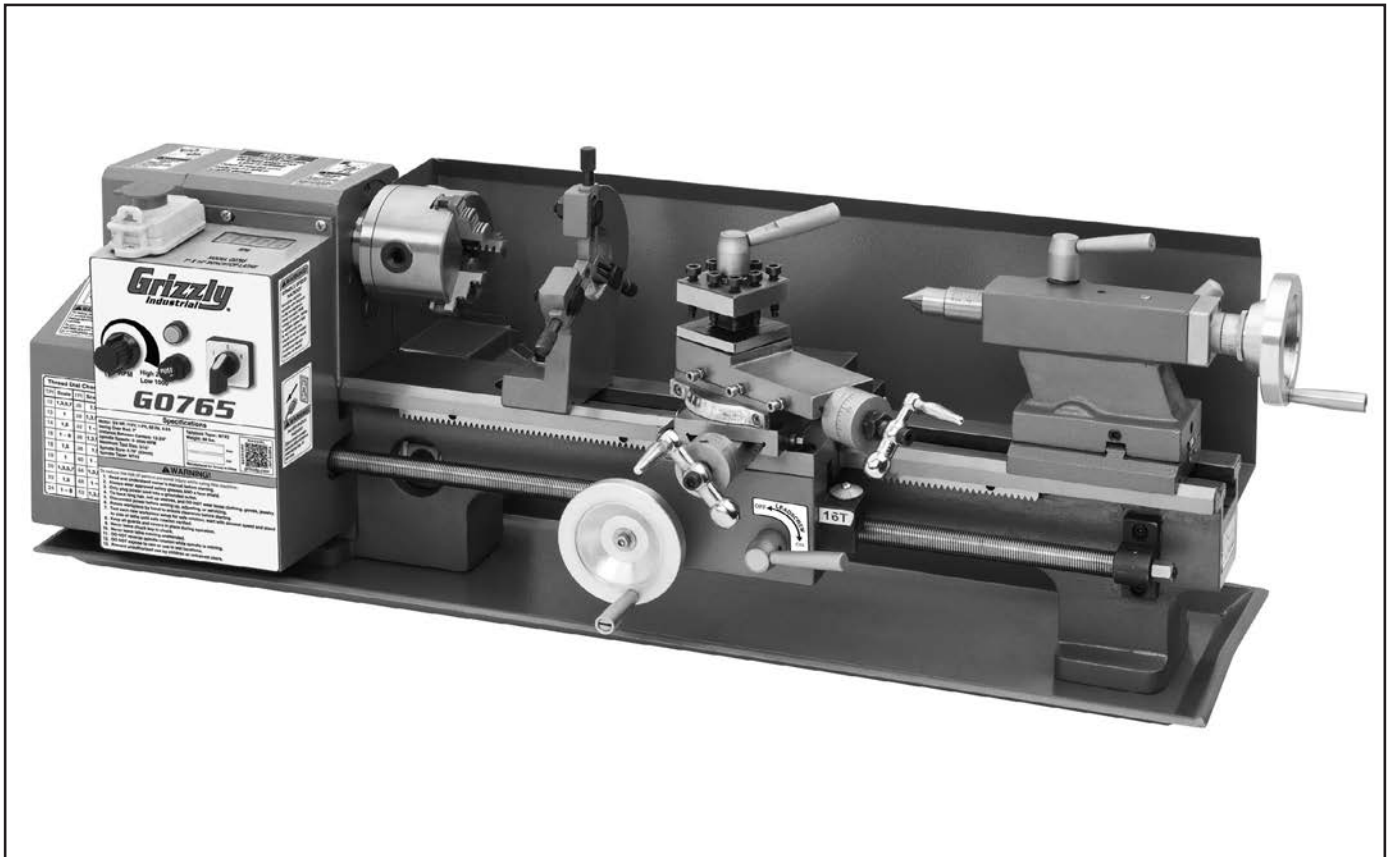


# *Grizzly* **Industrial, Inc.**®

## **MODEL G0765** **7" X 14" BENCHTOP LATHE** **OWNER'S MANUAL** *(For models manufactured since 5/15)*



COPYRIGHT © MARCH, 2014 BY GRIZZLY INDUSTRIAL, INC. REVISED JULY, 2015 (BL)  
**WARNING: NO PORTION OF THIS MANUAL MAY BE REPRODUCED IN ANY SHAPE  
OR FORM WITHOUT THE WRITTEN APPROVAL OF GRIZZLY INDUSTRIAL, INC.**  
#BLTSDM16229 PRINTED IN CHINA

V2.07.15

 **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

<b>INTRODUCTION</b> .....	<b>2</b>	<b>SECTION 6: MAINTENANCE</b> .....	<b>48</b>
Machine Description .....	2	Schedule .....	48
Contact Info.....	2	Cleaning/Protecting.....	48
Manual Accuracy .....	2	Lubrication .....	49
Identification.....	3	Machine Storage.....	51
Controls & Components.....	4	<b>SECTION 7: SERVICE</b> .....	<b>52</b>
G0765 Data Sheet.....	6	Troubleshooting .....	52
<b>SECTION 1: SAFETY</b> .....	<b>8</b>	Backlash Adjustment .....	54
Safety Instructions for Machinery .....	8	Leadscrew End-Play Adjustment.....	54
Additional Safety for Metal Lathes.....	10	Gib Adjustment .....	55
Additional Chuck Safety.....	11	Half Nut Adjustment.....	56
<b>SECTION 2: POWER SUPPLY</b> .....	<b>12</b>	Fuse Replacement.....	56
<b>SECTION 3: SETUP</b> .....	<b>14</b>	Brush Replacement .....	57
Preparation .....	14	Timing Belt Tension & Replacement .....	58
Unpacking.....	14	<b>SECTION 8: WIRING</b> .....	<b>60</b>
Needed for Setup.....	14	Wiring Safety Instructions .....	60
Inventory .....	15	Control Panel Wiring.....	61
Cleanup.....	16	Control Panel Wiring Photos.....	62
Site Considerations.....	17	Motor/Speed Sensor/ Plug Wiring .....	63
Lifting & Placing .....	18	<b>SECTION 9: PARTS</b> .....	<b>64</b>
Assembly .....	18	Main .....	64
Power Connection.....	18	Steady Rest .....	67
Test Run .....	19	Labels & Cosmetics (Front) .....	68
Spindle Break-In .....	21	Labels & Cosmetics (Rear).....	69
Recommended Adjustments.....	21	<b>SECTION 10: APPENDIX</b> .....	<b>70</b>
<b>SECTION 4: OPERATIONS</b> .....	<b>22</b>	Threading Charts .....	70
Operation Overview .....	22	<b>WARRANTY &amp; RETURNS</b> .....	<b>73</b>
Chuck & Faceplate Mounting.....	23		
Installation & Removal Device.....	23		
Chuck Installation.....	24		
Scroll Chuck Clamping .....	25		
Changing Jaw Set.....	25		
Faceplate .....	27		
Tailstock.....	28		
Centers .....	32		
Steady Rest .....	34		
Compound Rest.....	35		
Four-Way Tool Post.....	35		
Manual Feed.....	37		
Spindle Speed.....	37		
Power Feed.....	39		
End Gears.....	41		
Threading.....	44		
<b>SECTION 5: ACCESSORIES</b> .....	<b>47</b>		

# INTRODUCTION

## Machine Description

The metal lathe is used to remove material from a workpiece that is mounted to the spindle and rotated over the bed. The cutting tool is mounted alongside the bed and moved against the spinning workpiece to cut it.

Typical metal lathe cutting operations include facing, turning, parting, drilling, reaming, grooving, knurling, and threading. There are a wide variety of tools and workpiece holding devices available for each of these operations.

The G0765 features an electronic variable-speed control and digital RPM display that make it possible to select speeds within the selected range while the machine is running.

## 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  
1203 Lycoming Mall Circle  
Muncy, PA 17756  
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](http://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.

**Grizzly Industrial** MODEL GXXXX MACHINE NAME

**WARNING!**

To reduce risk of serious injury when using this machine:

1. Read manual before operation.
2. Wear safety glasses and respirator.
3. Make sure safety devices are properly adjusted/setup and working.
4. Make sure the motor has stopped and disconnect power before adjustments, maintenance, or service.
5. DO NOT expose to rain or dampness.
6. DO NOT modify this machine in any way.
- 7.
- 8.
9. Do not drink or use alcohol while operating.
10. Maintain machine carefully to prevent accidents.

**Manufacture Date**

**Serial Number**

Manufactured for Grizzly in Taiwan



# Identification

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

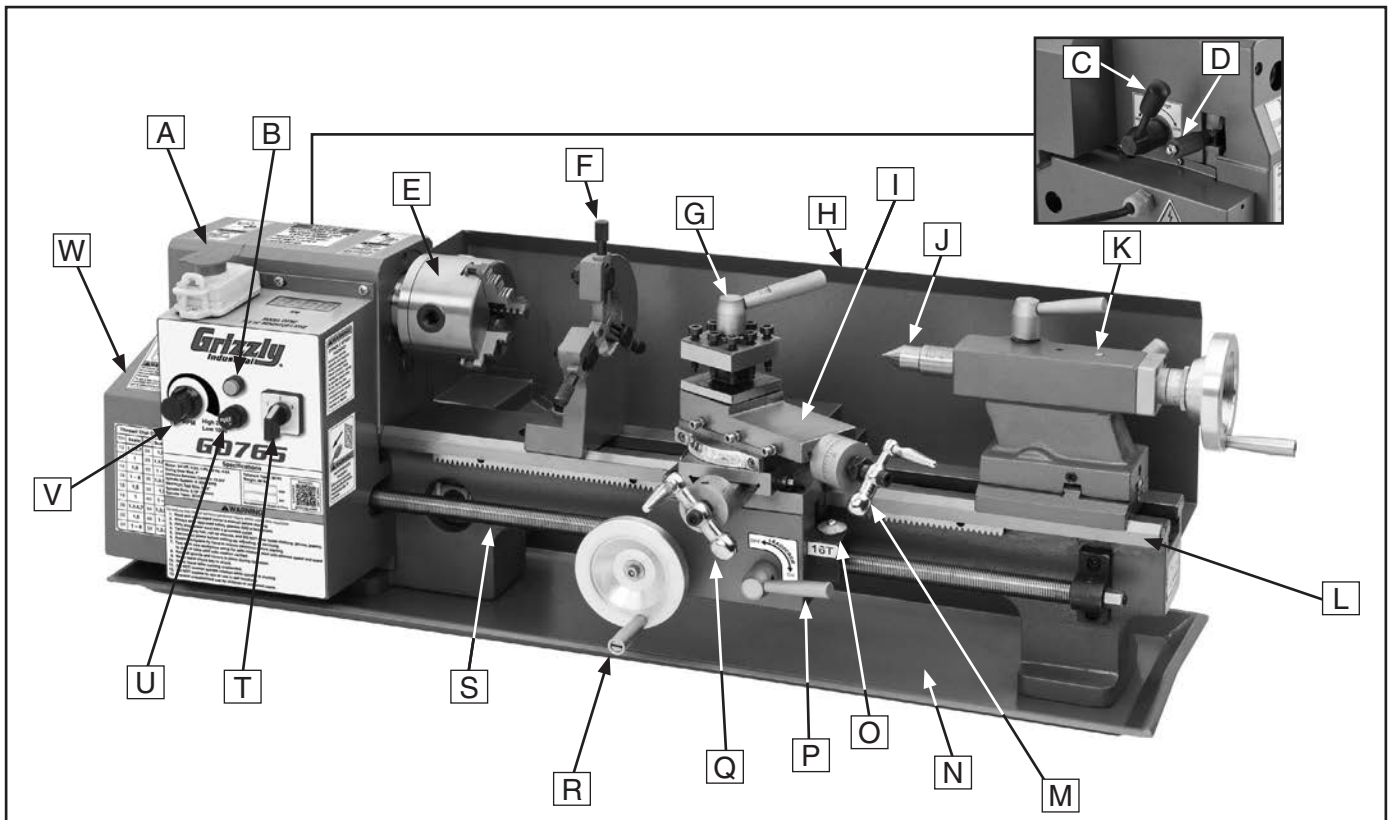


Figure 1. Model G0765 identification.

- |  |                             |
|--|-----------------------------|
| A. On/Off Switch w/Emergency Stop Button     | M. Compound Rest Handwheel  |
| B. Power Light                               | N. Chip Pan                 |
| C. High/Low Range Lever                      | O. Thread Dial              |
| D. Feed Direction Lever                      | P. Half Nut Lever           |
| E. 3-Jaw Chuck                               | Q. Cross Slide Handwheel    |
| F. Steady Rest                               | R. Carriage Handwheel       |
| G. 4-Way Tool Post                           | S. Leadscrew                |
| H. Backsplash                                | T. Spindle Direction Switch |
| I. Compound Rest                             | U. Fuse                     |
| J. MT#2 Dead Center                          | V. Variable Speed Dial      |
| K. Tailstock (see <b>Page 6</b> for details) | W. End Cover                |
| L. Bedway                                    |                             |

## **!WARNING**

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

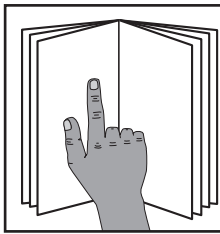
## **!WARNING**

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





# Controls & Components

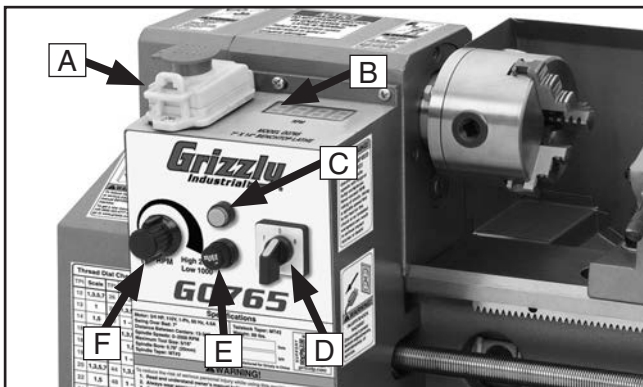


## **!WARNING**

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

Refer to **Figures 2–6** and the following descriptions to become familiar with the basic controls of this lathe.

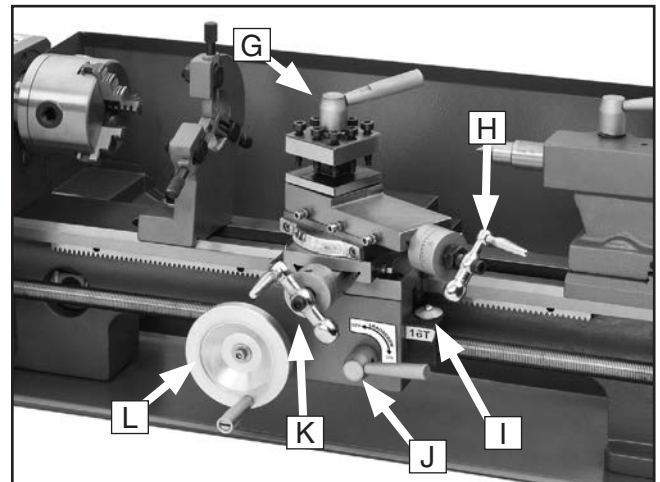
## Control Panel



**Figure 2.** Control panel.

- A. On/Off Switch w/Emergency Stop Button:** When pressed, cuts power to motor and control panel. To reset, press in side tab, lift switch cover, and press On button.
- B. Spindle Speed RPM Display:** Shows a digital readout of the spindle speed.
- C. Power Light:** Illuminates when machine is connected to power source, Emergency Stop Button is reset, and On button is pressed.
- D. Spindle Switch:** Starts, stops, and reverses spindle rotation.
- E. Fuse:** Protects control panel in case of an electrical overload.
- F. Variable Speed Dial:** Controls the variable speed of the spindle.

## Carriage



**Figure 3.** Carriage controls.

- G. 4-Way Tool Post:** Holds up to four cutting tools at once that can be individually indexed to the workpiece.
- H. Compound Rest Handwheel:** Moves the tool toward and away from the workpiece at the preset angle of the compound rest.
- I. Thread Dial:** Indicates when to engage the half nut during threading operations.
- J. Half Nut Lever:** Engages/disengages half nut for power feed and threading operations.
- K. Cross Slide Handwheel:** Moves the cross slide toward and away from the workpiece.
- L. Carriage Handwheel:** Moves the carriage along the bedway.

*Continued on next page* →



## Tailstock

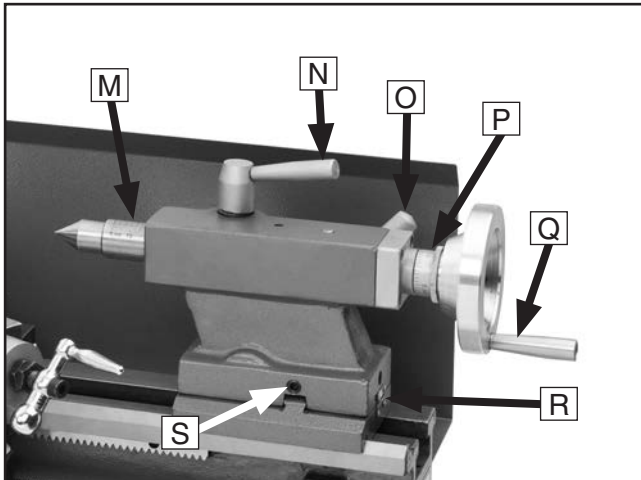


Figure 4. Tailstock controls.

- M. Tailstock Quill:** Moves a tool or center mounted in the tailstock toward or away from the workpiece.
- N. Tailstock Quill Lock Lever:** Secures the quill position.
- O. Tailstock Lock Lever:** Secures tailstock in position along the bedway.
- P. Graduated Scale:** Indicates quill movement in increments of 0.001", with one full revolution equaling 0.04" of quill travel.
- Q. Quill Handwheel:** Moves quill toward or away from spindle.
- R. Offset Scale:** Indicates relative distance of tailstock offset from spindle centerline.
- S. Tailstock Offset Screws:** Adjusts tailstock offset left or right from spindle centerline (1 of 2).

## Rear Controls

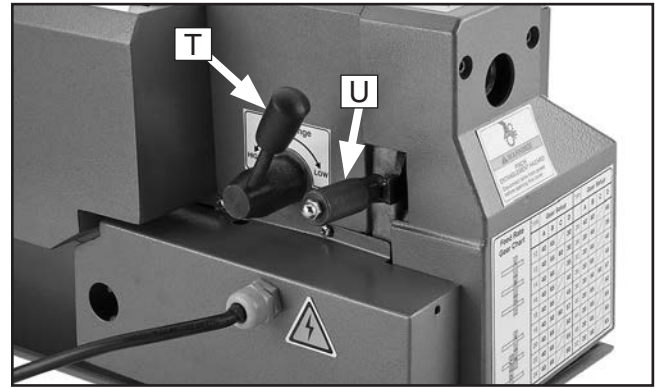


Figure 5. Rear controls.

- T. High/Low Range Lever:** Sets the spindle speed range to LOW (100–1000 RPM) or HIGH (100–2000 RPM). Do NOT shift while lathe is running or damage to machine may occur!
- U. Feed Direction Lever:** Used to select leadscrew rotation direction. Up is for clockwise rotation and leftward carriage movement. Center is neutral. Down is for counter-clockwise leadscrew rotation and rightward carriage movement.

## End Gears

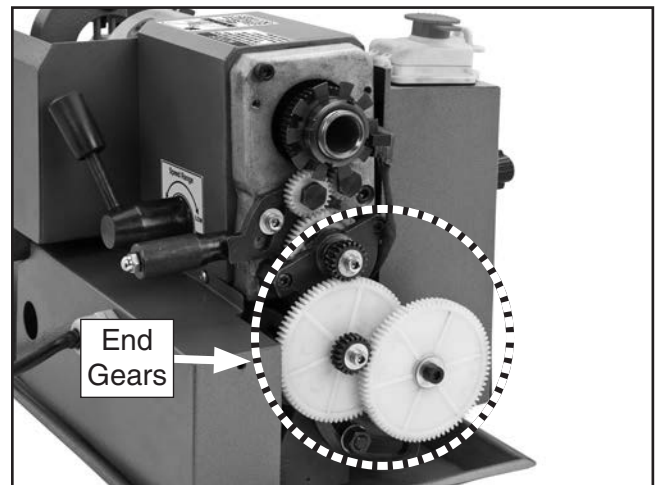


Figure 6. End gear components.

Configuring the end gears (shown in **Figure 6**) controls the speed of the leadscrew for threading or power feed operations.





# MACHINE DATA SHEET

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

## MODEL G0765 7" X 14" VARIABLE-SPEED BENCHTOP LATHE

### Product Dimensions:

Weight..... 88 lbs.  
 Width (side-to-side) x Depth (front-to-back) x Height..... 30 x 9 x 10 in.  
 Footprint (Length x Width)..... 29-3/4 x 8-1/2 in.

### Shipping Dimensions:

Type..... Cardboard  
 Content..... Machine  
 Weight..... 100 lbs.  
 Length x Width x Height..... 32 x 13 x 13 in.  
 Must Ship Upright..... Yes

### Electrical:

Power Requirement..... 110V, Single-Phase, 60 Hz  
 Full-Load Current Rating..... 10A  
 Minimum Circuit Size..... 15A  
 Connection Type..... Cord & Plug  
 Power Cord Included..... Yes  
 Power Cord Length..... 6 ft.  
 Power Cord Gauge..... 18 AWG  
 Plug Included..... Yes  
 Included Plug Type..... NEMA 5-15  
 Switch Type..... ON/OFF Push Button Switch w/Safety Cover

### Motors:

#### Main

Type..... Universal Brush Type  
 Horsepower..... 3/4 HP  
 Phase..... Single-Phase  
 Amps..... 10A  
 Speed..... 5000 RPM  
 Power Transfer ..... Belt Drive  
 Bearings..... Shielded & Permanently Sealed

### Main Specifications:

#### Operation Info

Swing Over Bed..... 7 in.  
 Distance Between Centers..... 13-3/4 in.  
 Swing Over Cross Slide..... 2-1/8 in.  
 Swing Over Saddle..... 5 in.  
 Maximum Tool Bit Size..... 5/16 in.  
 Compound Travel..... 2-3/4 in.  
 Carriage Travel..... 12-1/2 in.  
 Cross Slide Travel..... 2-3/4 in.





### Headstock Info

Spindle Bore.....	0.78 in.
Spindle Size.....	3 in.
Spindle Taper.....	MT#3
Number of Spindle Speeds.....	Variable
Spindle Speeds.....	100 – 2000 RPM
Spindle Type.....	Intrinsic Back Plate
Spindle Bearings.....	Sealed & Permanently Lubricated Ball Bearing
Spindle Length.....	7-1/4 in.
Spindle Length with 3-Jaw Chuck.....	9-1/8 in.

### Tailstock Info

Tailstock Quill Travel.....	2 in.
Tailstock Taper.....	MT#2
Tailstock Barrel Diameter.....	0.870 in.

### Threading Info

Number of Longitudinal Feeds.....	1
Range of Longitudinal Feeds.....	0.04 in./rev.
Number of Inch Threads.....	18
Range of Inch Threads.....	12 – 52 TPI
Number of Metric Threads.....	10
Range of Metric Threads.....	0.4 – 2 mm

### Dimensions

Bed Width.....	3-1/4 in.
Carriage Leadscrew Diameter.....	5/8 in.
Leadscrew TPI.....	16 TPI
Carriage Leadscrew Length.....	19-3/4 in.
Steady Rest Capacity.....	2 in.

### Other

Optional Stand.....	D3640
---------------------	-------

### Construction

Base.....	Cast Iron
Headstock.....	Cast Iron
End Gears.....	Machine-Cut Plastic (Polyoxymethylene)
Bed.....	Precision-Ground Cast Iron
Body.....	Cast Iron
Paint Type/Finish.....	Epoxy

### Other Specifications:

Country of Origin .....	China
Warranty .....	1 Year
Approximate Assembly & Setup Time .....	45 Minutes
Serial Number Location .....	ID Label
Sound Rating .....	76 dB
ISO 9001 Factory .....	Yes
CSA, ETL, or UL Certified/Listed .....	No



# 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.



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



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



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 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 attached to 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.

**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.

**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.

**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.

**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.

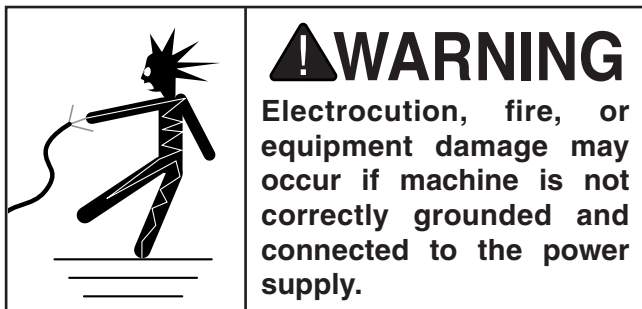




# SECTION 2: POWER SUPPLY

## 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.



## Full-Load Current Rating

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

**Full-Load Rating ..... 10A**

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.

## **! 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.**

## 110V Circuit Requirements

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

**Nominal Voltage ..... 110V, 115V, 120V**  
**Cycle ..... 60 Hz**  
**Phase ..... Single-Phase**  
**Power Supply Circuit ..... 15 Amps**

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 & Plug Requirements

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.

This machine is equipped with a power cord that has an equipment-grounding wire and a grounding plug. Only insert plug into a matching receptacle (outlet) that is properly installed and grounded in accordance with all local codes and ordinances. **DO NOT** modify the provided plug!

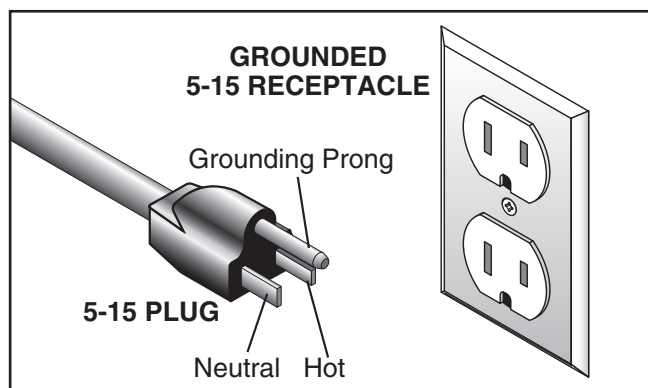


Figure 7. Typical 5-15 plug and receptacle.

**⚠ CAUTION**

**SHOCK HAZARD!**

**Two-prong outlets do not meet the grounding requirements for this machine. Do not modify or use an adapter on the plug provided—if it will not fit the outlet, have a qualified electrician install the proper outlet with a verified ground.**

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 of box/ crate.
2. Clean lathe and its components.
3. Identify an acceptable location for lathe and move it to that location.
4. Assemble loose components and make any necessary adjustments or inspections to ensure lathe is ready for operation.
5. Connect lathe to power source.
6. Test run lathe to ensure it functions properly.
7. Perform spindle break-in procedure to prepare lathe for operation.

## Unpacking

Your machine was carefully packaged for safe transportation. Remove the packaging materials from around your machine and inspect it. If you discover any damage, *please call us immediately at (570) 546-9663 for advice.*

Save the containers and all packing materials for possible inspection by the carrier or its agent. *Otherwise, filing a freight claim can be difficult.*

When you are completely satisfied with the condition of your shipment, inventory the contents.



## Needed for Setup

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

Description	Qty
• Additional People .....	1
• Safety Glasses .....	1 For Each Person
• Cleaner/Degreaser ( <b>Page 18</b> ) ....	As Needed
• Quality Metal Protectant.....	As Needed
• Disposable Shop Rags.....	As Needed



# 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.

Installed Components (Figure 8)	Qty.
A. 3" Three-Jaw Chuck w/Internal Jaw Set ....	1
B. Steady Rest.....	1
C. 4-Way Tool Post .....	1
D. Compound Rest .....	1
E. Tailstock.....	1
F. Chip Tray .....	1
G. Feet (not shown).....	4

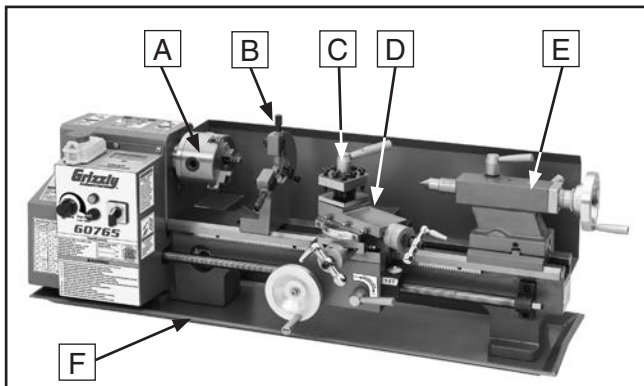


Figure 8. Installed components.

Packaged Components (Figures 9–11)	Qty.
H. Hex Wrench Set (2.5, 3, 4, 5, 6mm).....	1 Ea
I. Wrench Set (6/7, 8/10, 13/16mm) .....	1 Ea
J. Bottle for Oil .....	1
K. 3-Jaw Chuck External Jaw Set .....	1
L. Dead Center MT#3 .....	1
M. Dead Center MT#2 .....	1
N. Fuse.....	1
O. Cross Slide Handwheel Handle .....	1
P. Carriage Handwheel Handle .....	1
Q. 3-Jaw Chuck Key .....	1
R. Change Gear Set .....	1
— Change Gear (20-tooth, Installed) .....	1
— Change Gear (30-tooth).....	1
— Change Gear (35-tooth).....	1
— Change Gear (40-tooth).....	2
— Change Gear (45-tooth).....	1
— Change Gear (50-tooth).....	1
— Change Gear (55-tooth).....	1

— Change Gear (57-tooth) .....	1
— Change Gear (60-tooth).....	1
— Change Gear (65-tooth).....	1
— Change Gear (80-tooth, Installed) .....	2
S. 6¼" Faceplate.....	1

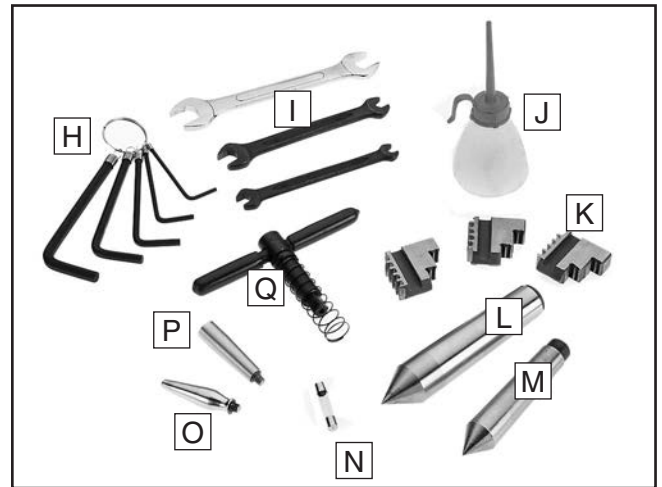


Figure 9. Packaged components.

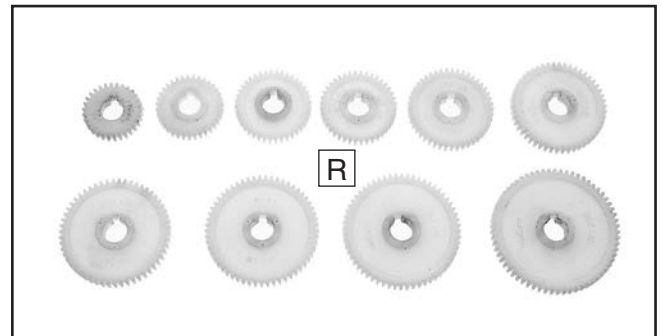


Figure 10. Change gears.



Figure 11. Faceplate.

## 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.



# 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.

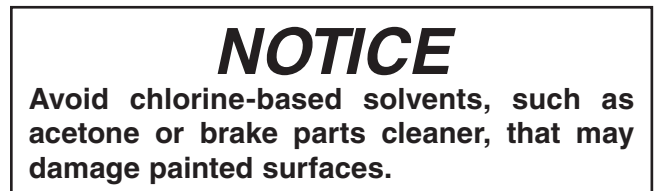
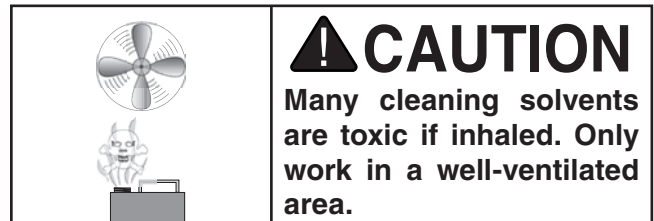
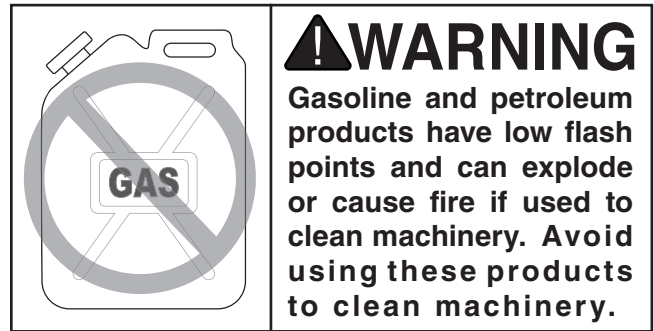
There are many ways to remove this rust preventative, but the following steps work well in a wide variety of situations. Always follow the manufacturer's instructions with any cleaning product you use and make sure you work in a well-ventilated area to minimize exposure to toxic fumes.

## 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.



## T23692—Orange Power Degreaser

A great product for removing the waxy shipping grease from your machine during clean up.



Figure 12. T23692 Orange Power Degreaser.





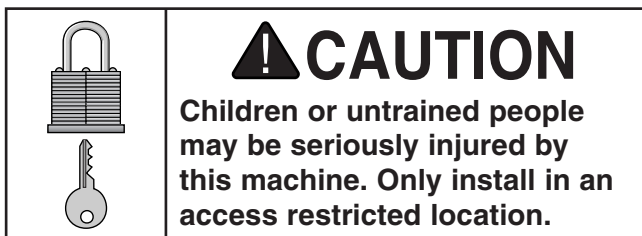
# Site Considerations

## 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.**



## Physical Environment

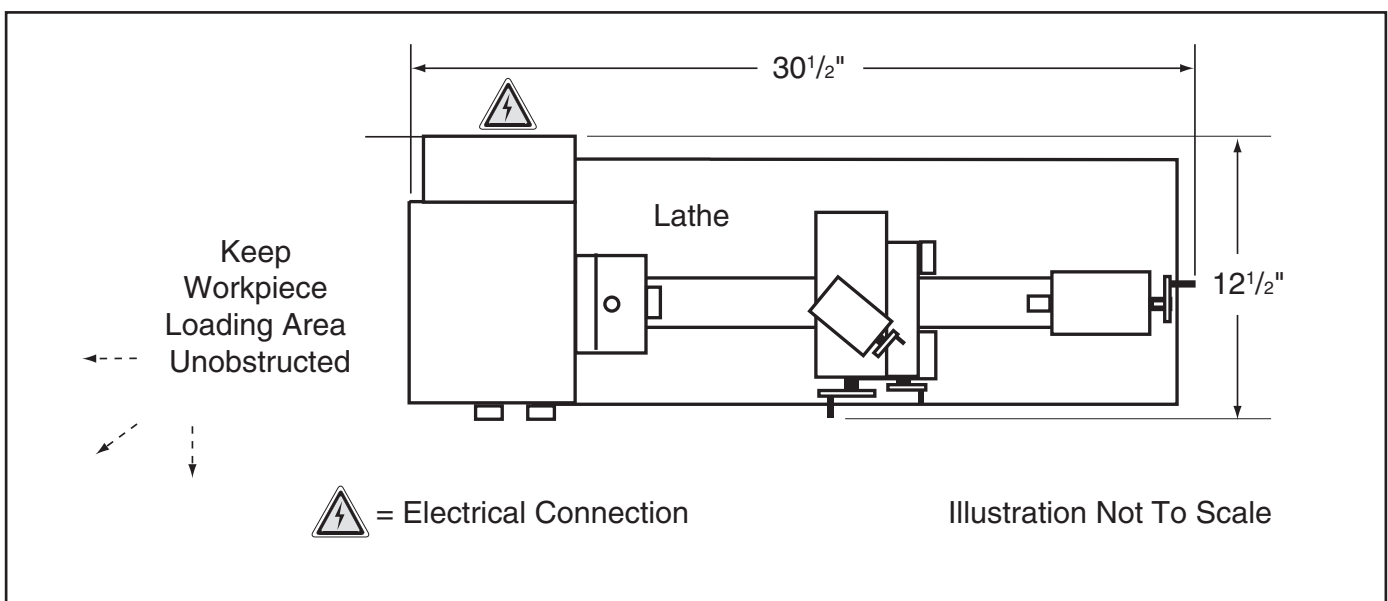
The physical environment where the machine is operated is important for safe operation and longevity of machine components. For best results, operate this machine in a dry environment that is free from excessive moisture, hazardous chemicals, airborne abrasives, or extreme conditions. Extreme conditions 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

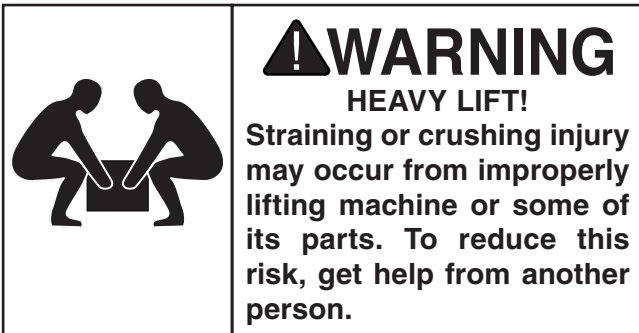
Lighting around the machine must be adequate enough that operations can be performed safely. Shadows, glare, or strobe effects that may distract or impede the operator must be eliminated.



**Figure 13.** Minimum working clearances.



## Lifting & Placing

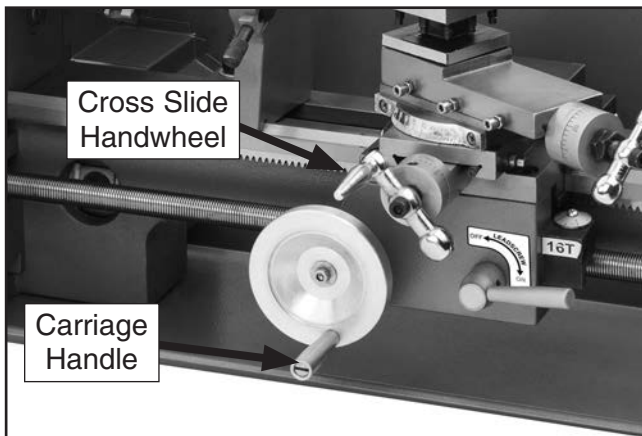


With the help of another person, lift the machine to a suitable location.

## Assembly

With the exception of the handwheel handles, the lathe is shipped fully assembled.

Thread the handles into the cross slide handwheel and carriage handwheel, (see **Figure 14**).



**Figure 14.** Handwheel handles installed.

## Power Connection

Before the machine can be connected to the power source, all previous setup instructions in this manual must be completed to ensure that the machine has been assembled and installed properly.

### Connecting Power

Always make sure the spindle dial on the headstock is turned to "0" (rotated fully counterclockwise) before connecting power.

Insert the power cord plug into a matching power supply receptacle.

### Disconnecting Power

If you need to disconnect the machine from power for maintenance, service, or adjustments, turn the machine **OFF** and pull the plug completely out of the receptacle.



# Test Run

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

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.

### To test run machine:

1. Set spindle direction switch to neutral ("0" position), and turn variable speed dial all the way counterclockwise to "0".

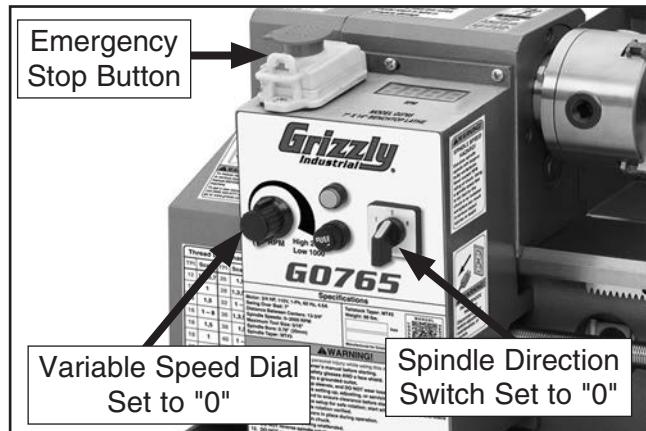


Figure 15. Headstock controls.

2. Shift high/low range lever on back of lathe to LOW, and feed direction lever to neutral (see Figure 16).

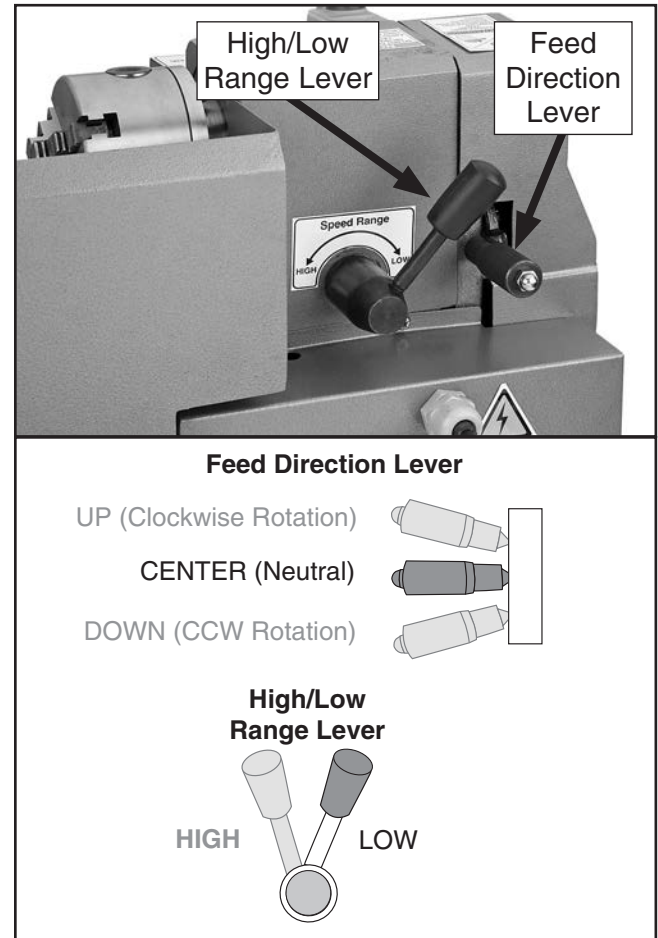


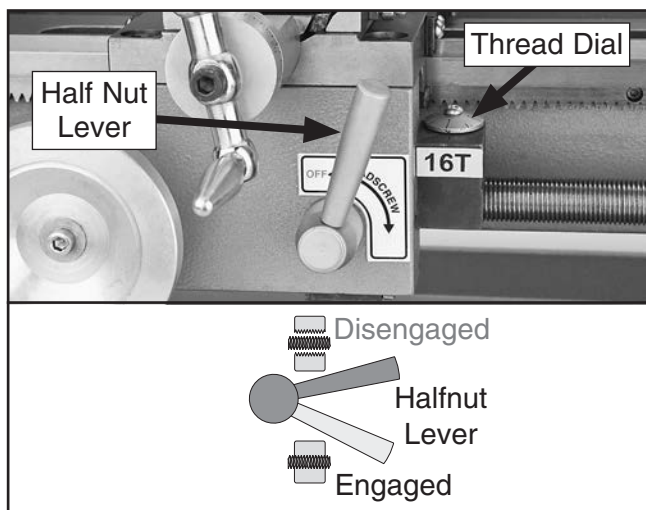
Figure 16. Lever settings.

3. Make sure chuck and jaws, if installed, are secure (see **Chuck Installation** on Page 26).

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



4. Disengage half nut with lever shown in **Figure 17**.



**Figure 17.** Half nut lever disengaged.

5. Press tab in on side of Emergency Stop button, lift switch cover, and press green ON button to reset Emergency Stop button. The spindle speed display and power button *should* illuminate to indicate that lathe is connected to power supply.
6. Verify lathe is operating correctly by turning spindle direction switch to "F" position. Slowly turn variable speed dial clockwise until spindle speed display shows 100 RPM. The spindle *should* rotate counterclockwise—down and toward the front of the lathe.
7. Push Emergency Stop button to turn lathe **OFF**. Then, without resetting Emergency Stop button, try to restart spindle rotation by turning variable speed dial all the way counterclockwise to "0" and then clockwise. The spindle *should not* start.  
  
—If spindle *does* start with Emergency Stop button pressed in, the button is not operating correctly. This safety feature must operate properly before continuing operation. Turn variable speed dial counterclockwise to "0" to stop lathe, disconnect it from power, and call Tech Support for help.

Congratulations! The test run is complete. Turn lathe **OFF** and perform the following **Spindle Break-In** procedure.



# Spindle Break-In

---

Before subjecting the spindle to operational loads, it is essential to complete the break-in process. This helps maximize the life of spindle bearings and other precision components by thoroughly lubricating them before placing them under load.

The break-in must be performed in succession with the **Test Run** procedure described in this manual, as the steps in that procedure prepare the lathe controls for the break-in process.

## **NOTICE**

**DO NOT perform this procedure independently of the Test Run section. The lathe could be seriously damaged if the controls are set differently than instructed in that section.**

### **To perform the spindle break-in:**

1. Successfully complete the **Test Run** procedure beginning on **Page 21**.
2. Set spindle direction switch to "F" (forward), ensure range lever is in LOW, and operate lathe for 10 minutes at 100 RPM.
3. Operate lathe at 1000 RPM for 10 minutes, then turn variable speed dial to "0" to stop spindle.
4. Shift range control lever to HIGH, then operate lathe at 2000 RPM for 10 minutes, then stop spindle.
5. Run lathe in reverse at 2000 RPM for 10 minutes, then turn speed dial to "0", turn spindle direction switch to "0", and press Emergency Stop button.

Congratulations! Spindle break-in is complete.

# 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 (**Page 32**).
- Cross slide backlash adjustment (**Page 56**).
- Gib adjustments (**Page 57**).



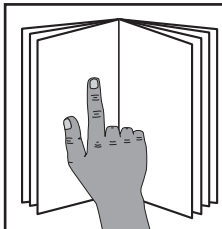


# SECTION 4: OPERATIONS

## Operation Overview

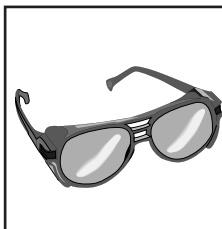
The purpose of this overview is to provide the novice machine operator with a basic understanding of how the machine is used during operation, so the machine controls/components discussed later in this manual are easier to understand.

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 and 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 the risk of eye injury from flying chips always wear safety glasses.

### **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. Puts on safety glasses, rolls up sleeves, removes jewelry, and secures any clothing or hair that could get entangled in moving parts.
2. Examines workpiece to make sure it is suitable for turning, then securely mounts it in lathe.
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. Moves slides to where they will be used during operation.
7. If using power feed, selects appropriate feed rate and direction.
8. Resets Emergency Stop button and turns spindle direction switch to "F".
9. Rotates variable speed dial to set correct spindle speed.
10. Uses carriage handwheels or power feed options to move the tooling into workpiece for operations.
11. When finished turning, rotates variable speed dial to "0" to stop spindle, presses Emergency Stop button, then removes workpiece.



# Chuck & Faceplate Mounting

This lathe is equipped with an intrinsic backplate spindle nose. With this type of spindle, a chuck or faceplate is mounted directly to the backplate with hex nuts.

## **! WARNING**

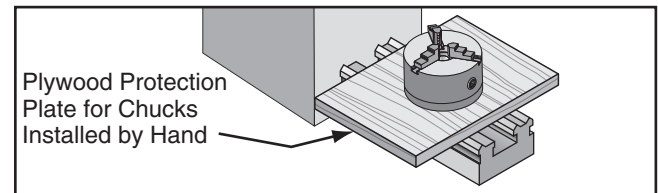
**Never use spindle speeds faster than chuck RPM rating or safe limits of your workpiece. Excessive spindle speeds greatly increase risk of workpiece or chuck being thrown from machine with deadly force!**

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 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.

# Installation & Removal Device

Place a piece of plywood over the bedways to protect them from damage if a chuck or other tooling is dropped (see below).



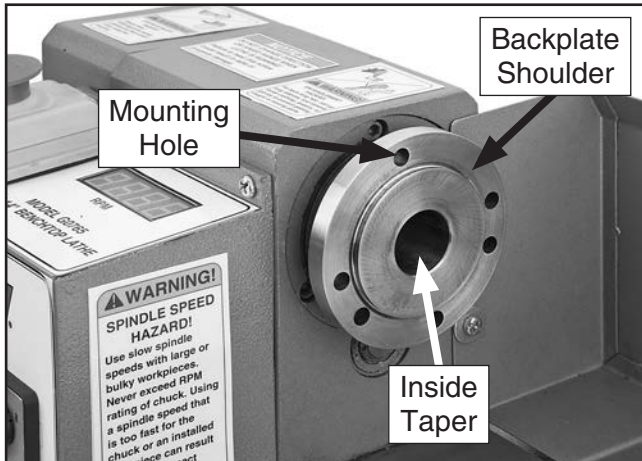
**Figure 18.** Example of common device used during chuck installation and removal.



# Chuck Installation

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

The chuck is properly installed when it is seated against the backplate shoulder (see **Figure 19** below).



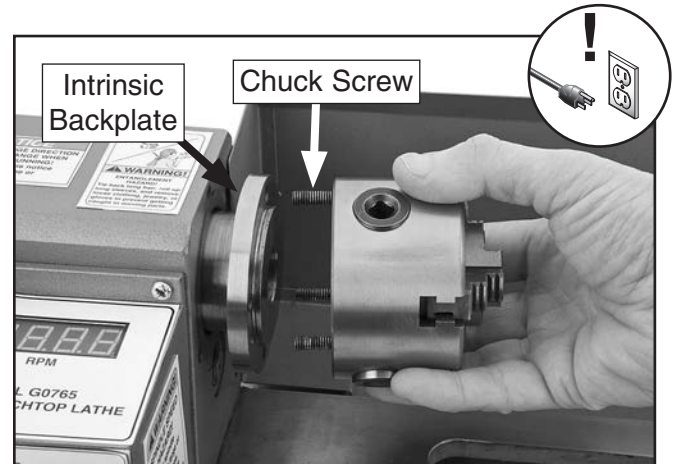
**Figure 19.** Spindle backplate.

**Tools Needed:** Qty  
Open-End Wrench 10mm..... 1

## To install the chuck:

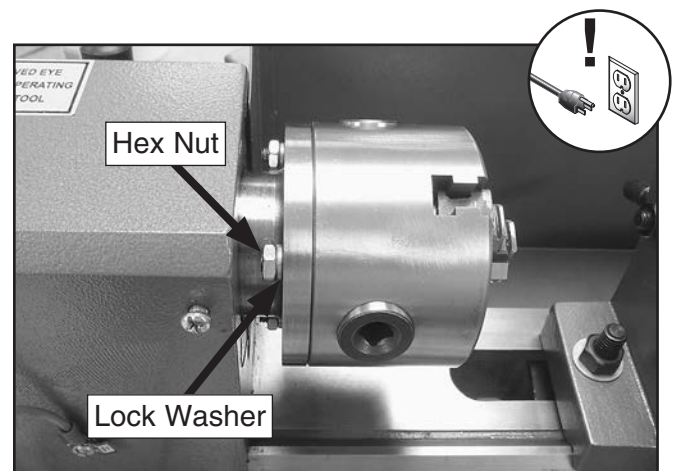
1. DISCONNECT LATHE FROM POWER!
2. Use an appropriate device to protect ways during installation process (refer to **Installation & Removal Device** on **Page 25**).
3. Thoroughly clean and wipe-down all mating surfaces with a lightly-oiled, lint-free rag.

4. Insert chuck screws through mounting holes in spindle backplate, as shown in **Figure 20**. Make sure chuck seats firmly and evenly against backplate shoulder.



**Figure 20.** Inserting chuck into backplate.

5. Use a lock washer and hex nut on each chuck screw to secure chuck (see **Figure 21**). Tighten hex nuts evenly a small amount at a time in multiple steps.



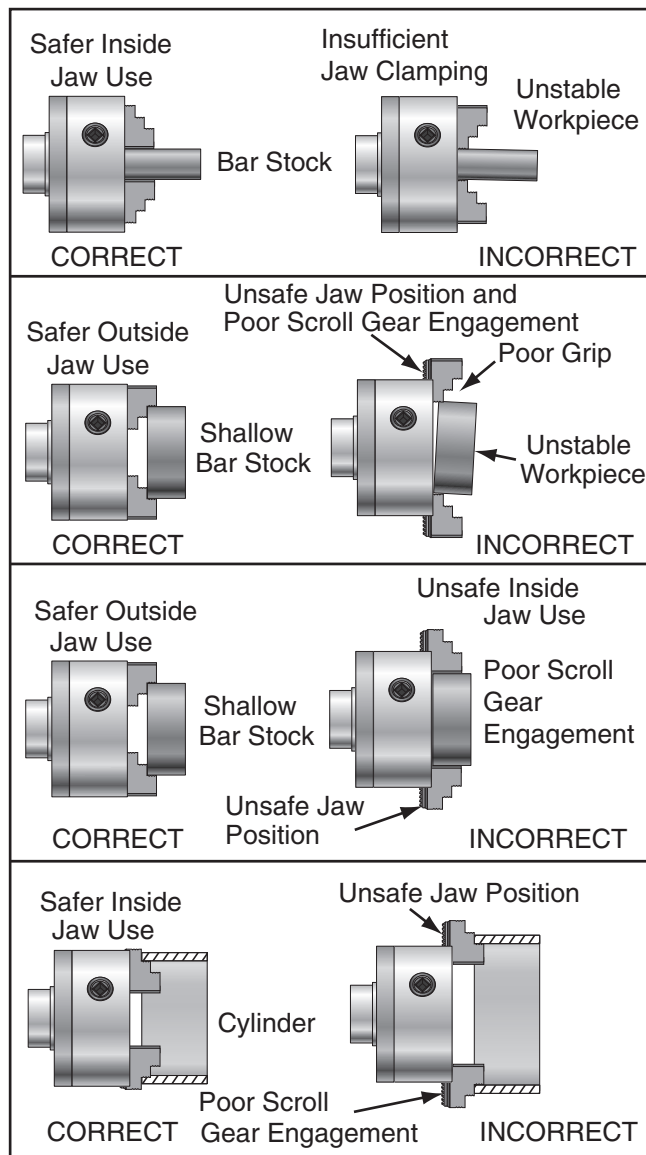
**Figure 21.** Chuck secured against backplate.



# 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.

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

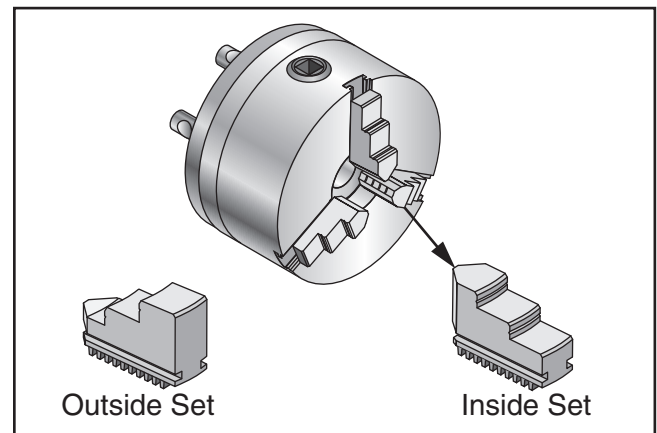


**Figure 22.** Jaw selection and workpiece holding.

# Changing Jaw Set

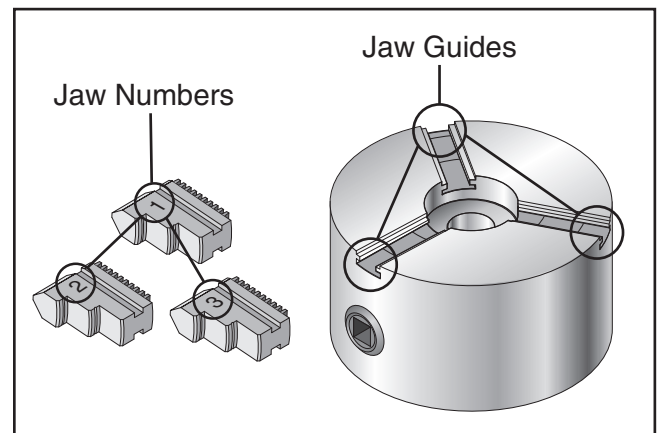
The 3-jaw scroll chuck included with the lathe features inside and outside hardened steel jaw sets (see **Figure** below), which move in unison to center a concentric workpiece.

When installing the jaws, it is important to make sure they are installed correctly. Incorrect installation will result in jaws that do not converge evenly and are unable to securely clamp a workpiece.



**Figure 23.** Chuck and jaw selection.

Jaws are numbered from 1–3 (see **Figure** below). The number is typically stamped on the side or bottom. Jaws are designed to be installed counterclockwise in numerical order in the jaw guides, so they will hold a concentric workpiece evenly.



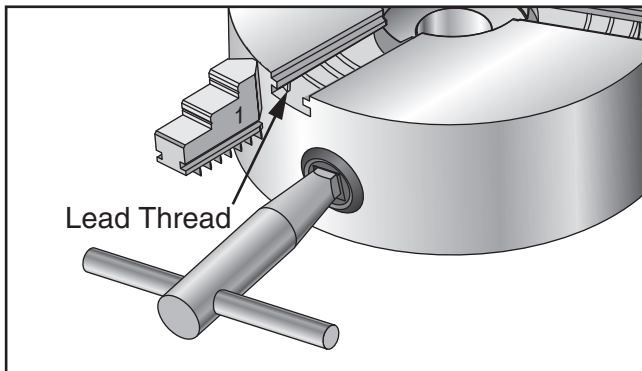
**Figure 24.** Jaw guide and jaw numbers.



### To change jaw set:

1. DISCONNECT MACHINE FROM POWER!
2. Use appropriate device to protect ways (refer to **Installation & Removal Device** subsection).
3. Insert chuck key and turn it counterclockwise to back jaws out and remove them individually in descending order (i.e., 3, 2, 1).
4. Use mineral spirits to clean debris and grime from jaws and chuck jaw guides.
5. Apply thin coat of NLGI #2 grease to surfaces of removed jaw set. Store in safe place free from moisture and abrasives.
6. Rotate chuck key clockwise until you see tip of outer scroll-gear lead thread about to enter a jaw guide (see below).
7. Insert jaw #1 into jaw guide and hold jaw against scroll-gear.
8. Rotate chuck key clockwise one turn to engage tip of scroll-gear lead thread into jaw. Pull jaw; it should be locked into jaw guide.
9. Install remaining jaws in numerical order, in same manner. The jaws should converge evenly at center of chuck.

—If jaws do not converge evenly, remove them. Re-install jaws sequentially 1–3, and make sure each one engages with scroll-gear lead thread during its first rotation.



**Figure 25.** Lead thread on scroll gear.



# Faceplate

Refer to the prior **Chuck Installation** subsection for instructions on installing 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.**

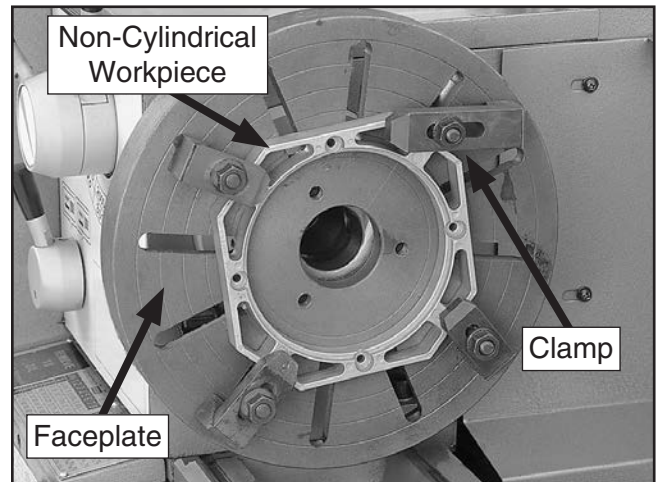
## **!WARNING**

**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 non-concentric workpiece to faceplate:**

1. **DISCONNECT MACHINE FROM POWER!**
2. Use appropriate device to protect ways (refer to **Installation & Removal Device** subsection).
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 26.** Example of a workpiece clamped in a faceplate.



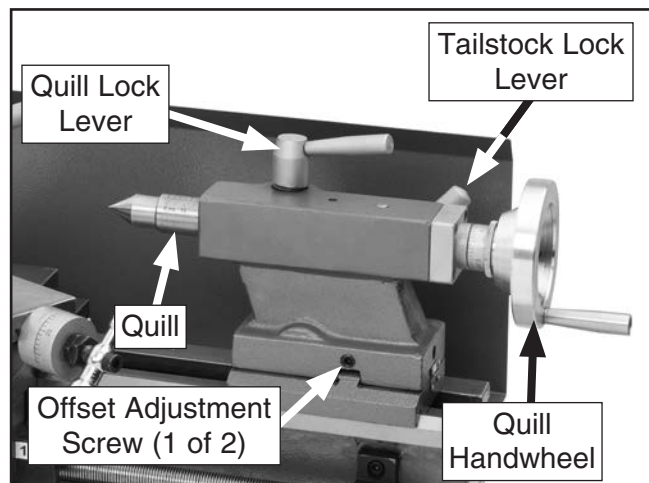


# Tailstock

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 27.** Tailstock controls and features.

## Tailstock Quill Specs

### Graduated Dial on Handwheel

Increments.....	0.001"
One Full Revolution.....	0.200"

### Increments on Quill Scale

Inch .....	0"-2" in 1/8" Increments
Metric .....	0-50mm 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.

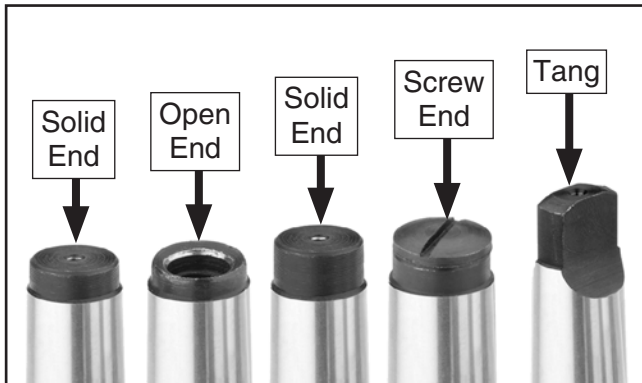
## Using Quill

1. Loosen quill lock lever.
2. Turn quill handwheel clockwise to move quill toward spindle or counterclockwise to move it away from it.
3. Tighten quill lock lever.

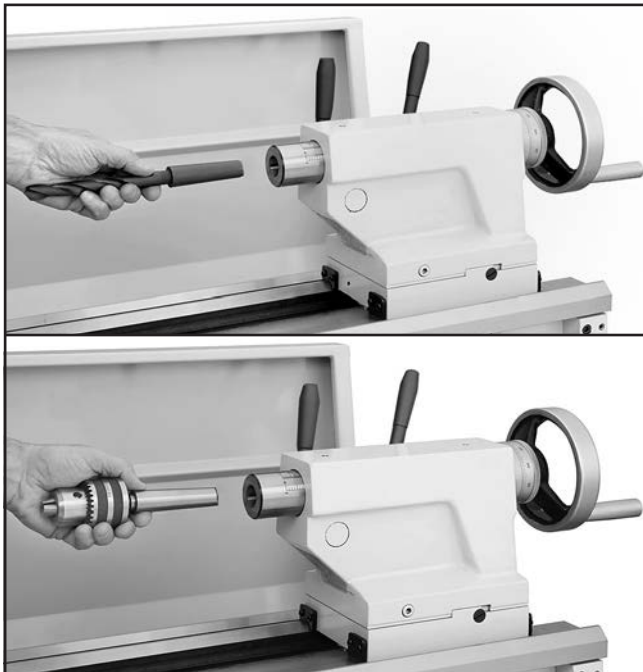


## Installing Tooling

The tailstock quill accepts MT#2 tapered arbors (see the **Figures** below for examples).



**Figure 28.** Types of tapered arbors and tooling.



**Figure 29.** 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

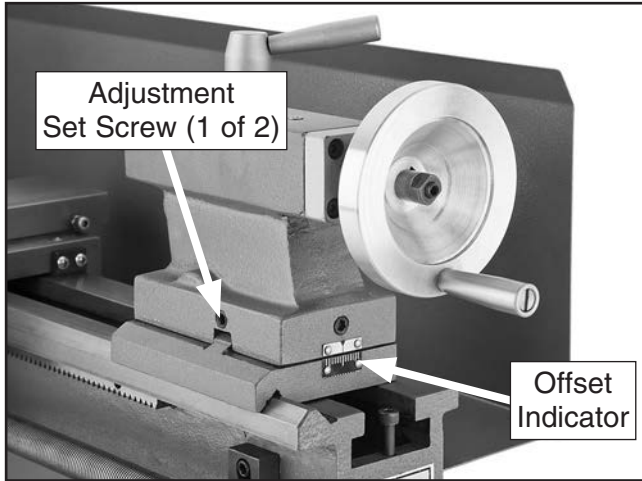
1. Use shop rag to hold tool.
2. Rotate quill handwheel counterclockwise to fully retract quill into tailstock until tool is forced out of quill.

### Offsetting Tailstock

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

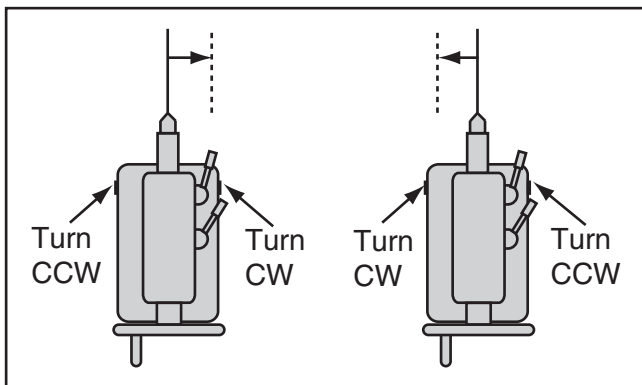


**Figure 30.** Left offset adjustment.

**Tools Needed** **Qty**  
 Hex Wrench 4mm..... 1

**To offset the tailstock:**

1. Loosen tailstock lock to release clamping pressure on top and bottom castings.
2. Rotate adjustment set screws in opposite directions for desired offset (see **Figure** below).



**Figure 31.** Example of set screw adjustment in relation to tailstock movement.

3. Tighten tailstock lock to secure the offset.

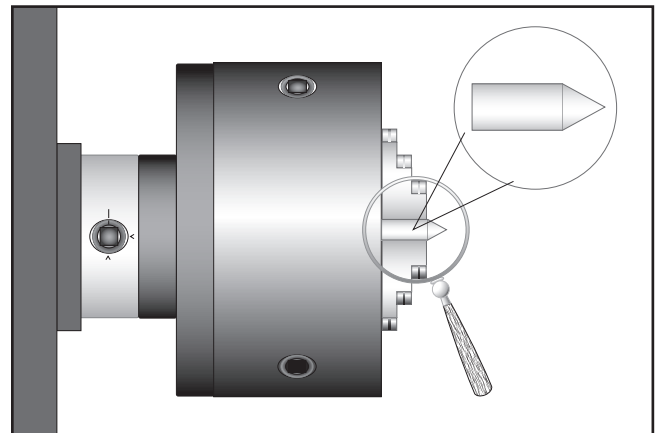
## Aligning Tailstock to Spindle Centerline

This is an essential adjustment that should be verified or performed each time the tailstock is used to turn concentric workpieces between centers 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 4mm..... 1  
 Round Stock 2" x 6" ..... 2

**To align the tailstock to the spindle centerline:**

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



**Figure 32.** Turning a dead center.



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

3. Install center in tailstock.
4. Attach lathe dog to test stock from **Step 1**, then mount it between centers, as shown in **Figure** below.

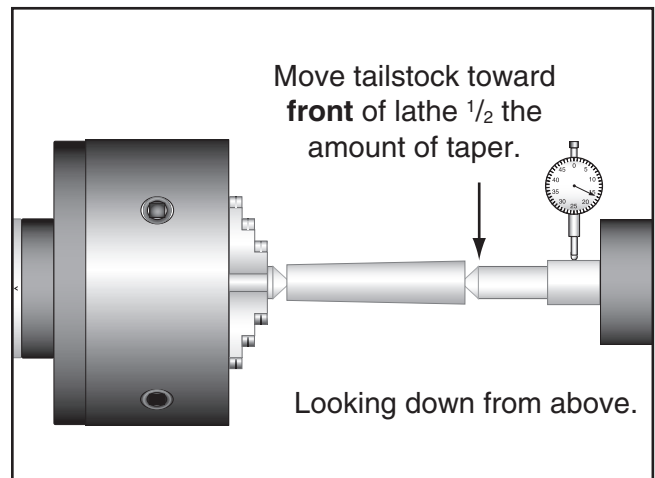


**Figure 33.** Example of stock mounted between the centers.

5. Turn 0.010" off stock diameter.
6. Mount test or dial indicator so plunger is on tailstock quill.

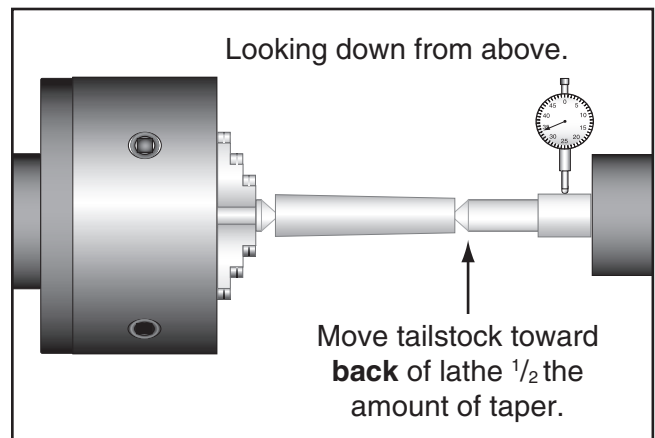
7. Use calipers to measure both ends of workpiece.

—If test stock is *thicker* at tailstock end, move tailstock toward *front* of lathe  $\frac{1}{2}$  the distance of the amount of taper, as shown in the **Figure** below.



**Figure 34.** Adjust tailstock toward the operator.

—If test stock is *thinner* at tailstock end, move tailstock toward *back* of lathe  $\frac{1}{2}$  the distance of taper amount, as shown below.



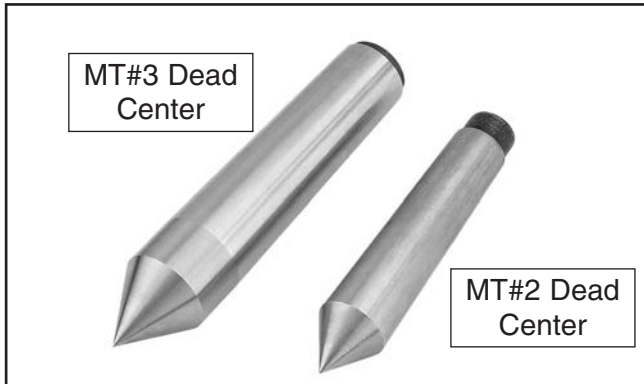
**Figure 35.** Adjust tailstock away from the operator.

8. Repeat **Steps 5–7** until desired accuracy is achieved.



# Centers

**Figure 36** shows the MT#2 and MT#3 dead centers included with the lathe.



**Figure 36.** Dead centers.

## Dead Centers

Dead centers are one-piece high-speed steel centers that require low spindle speeds and a small amount of oil to reduce friction heat that may damage the workpiece.

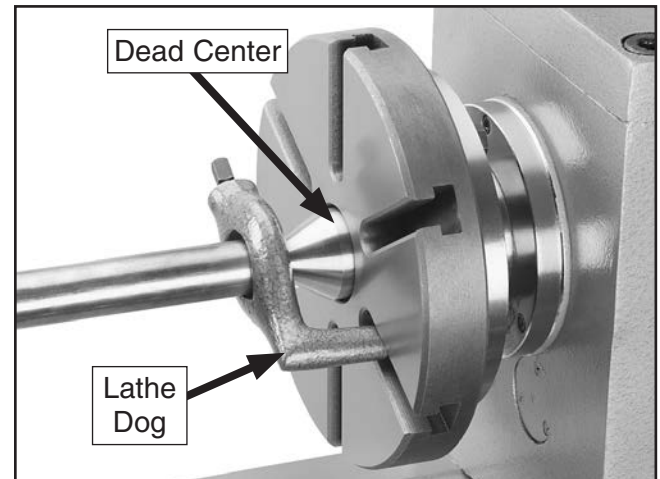
Mount the MT#2 dead center (see **Figure 36**) in the tailstock. Since the workpiece will rotate against the center and generate friction, the tip of the center must be lubricated to avoid premature wear and maximize smooth operation.

Mount the MT#3 dead center (see **Figure 36**) in the spindle for operations where the workpiece rotates with the center and does not generate friction.

## Mounting Dead Center in Spindle

1. DISCONNECT LATHE FROM POWER!
2. Thoroughly clean and dry all mating surfaces of spindle bore and center, making sure that no lint or oil remains on these surfaces.
3. Mount chuck or faceplate onto spindle, whichever is correct for your operation.
4. Insert MT#3 center into spindle bore through chuck or faceplate.

Below is an example photo of a dead center installed in spindle, using a lathe dog and faceplate for turning between centers.



**Figure 37.** Example of using dead center with a faceplate and lathe dog.

## Removing Center from Spindle

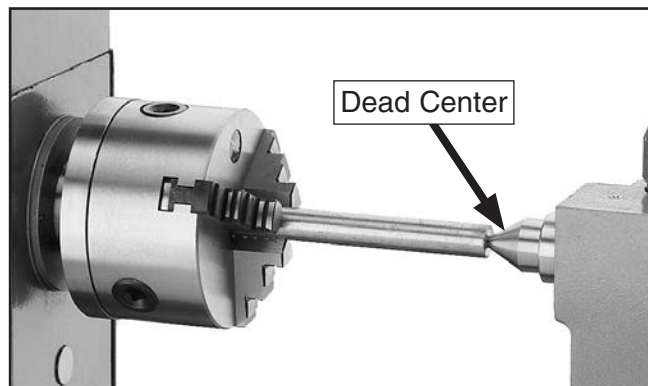
To remove center from the spindle, insert a piece of round bar stock (or similar tool) through outside end of spindle. Hold onto center with gloved hand or shop rag, then tap bar stock to knock center loose.





## Mounting Center in Tailstock

The included MT#2 dead center or a live center (not included) can be used in tailstock. Mounting instructions are the same for both. **Figure** below shows an example photo of a dead center mounted in a tailstock.



**Figure 38.** Example of using dead center installed in the tailstock.

### To mount 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 2", but we do not recommend extending quill more than 1" 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 LATHE FROM POWER!
2. Drill center holes in both ends of the workpiece.
3. Install MT#3 dead center in spindle with lathe dog and chuck or faceplate, then install live center or MT#2 dead center in tailstock.
4. Lubricate MT#2 dead center point and workpiece center holes, then mount workpiece between centers and hold it in place with light pressure from tailstock center.

## 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.**

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



**Figure 39.** Example photo of a workpiece mounted between two 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/Removal	Qty
Open-End Wrench 14mm.....	1
Open-End Wrench 16mm.....	1

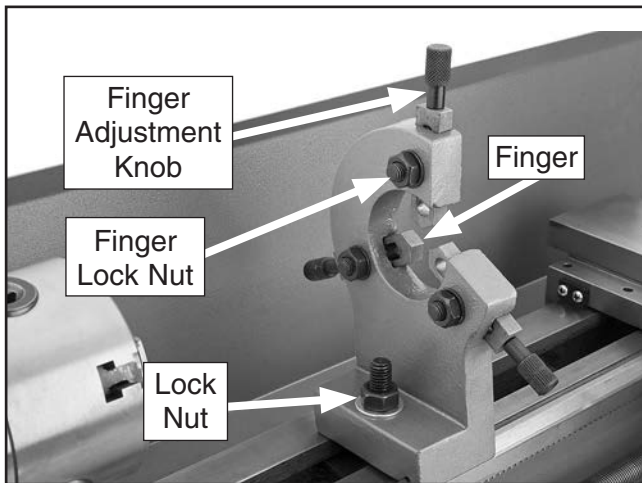


Figure 40. Steady rest components.

## To install and use the steady rest:

1. DISCONNECT LATHE FROM POWER!
2. Thoroughly clean all mating surfaces, then place steady rest base on bedways.
3. Loosen finger lock nuts (see **Figure 40**), turn finger adjustment knobs, and adjust fingers as required for workpiece.
4. Loosen steady rest lock nut, position steady rest where required to properly support workpiece, then secure lock nut.
5. Turn finger adjustment knobs so fingers barely touch workpiece, then tighten finger lock nuts.
6. Lubricate finger tips with an anti-seize lubricant during operation.

**Note:** Mill or file tips if they show wear.



# 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.

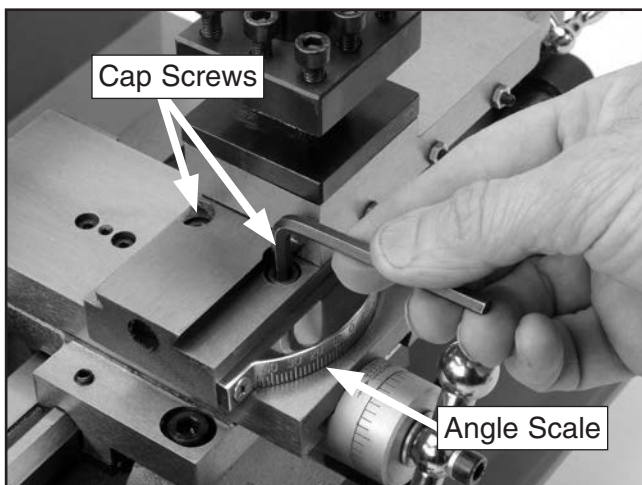
## Graduated Dial

Increments..... 0.001" (0.025mm)  
 One Full Revolution..... 0.04" (1.02mm)

Tool Needed	Qty
Hex Wrench 5mm.....	1

## To set compound rest angle:

1. Loosen cap screws shown in **Figure 41**.



**Figure 41.** Compound rest angle adjustments.

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

**Tip:** *The first time you set the compound rest angle 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.

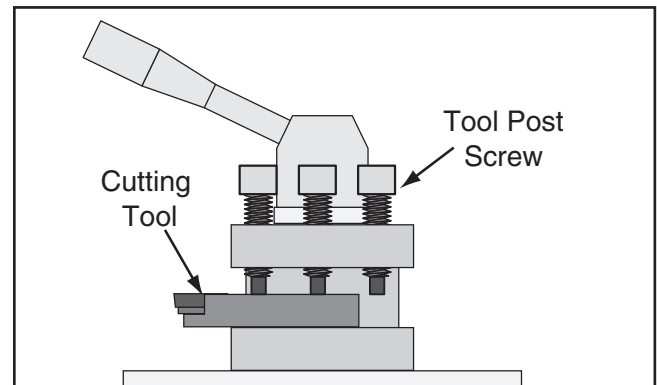
Each tool can be quickly indexed to the workpiece by loosening the top handle, rotating the tool post to the desired position, then retightening the handle to lock the tool into position.

## Installing Tool

Tool Needed	Qty
Hex Wrench 5mm.....	1

## To install a tool in the tool post:

1. Adjust tool post screws so cutting tool can fit underneath them (see **Figure** below).



**Figure 42.** Example of tool mounted in tool post.

## **!WARNING**

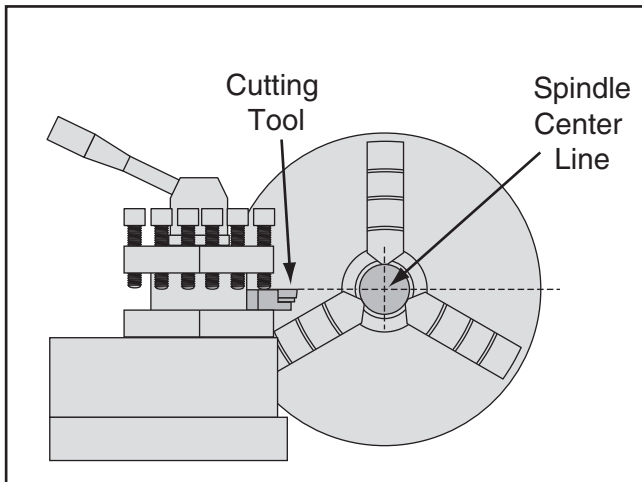
**Over-extending a cutting tool from the post will increase risk of tool chatter, breakage, or tool loosening during operation, which could cause metal pieces to be thrown at the operator or bystanders with great force. DO NOT extend a cutting tool more than 2.5 times the width of its cross-section (e.g.,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

2. Firmly secure cutting tool with at least two tool post screws.
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 43.** Cutting tool aligned with spindle centerline (viewed from tailstock).

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

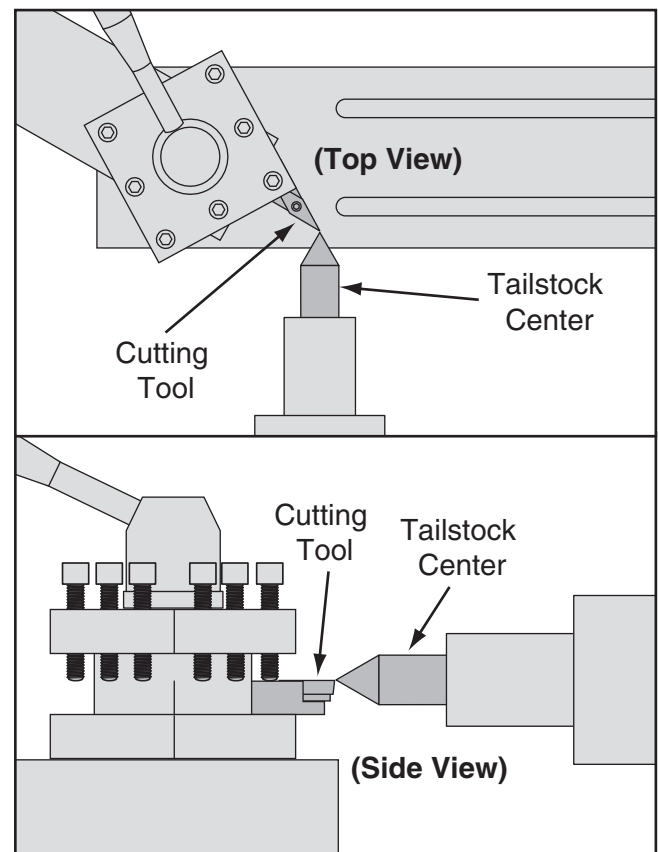
### Below are two common methods:

- 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** in this manual for detailed instructions).

Tools Needed	Qty
Hex Wrench 6mm.....	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 44.** 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.

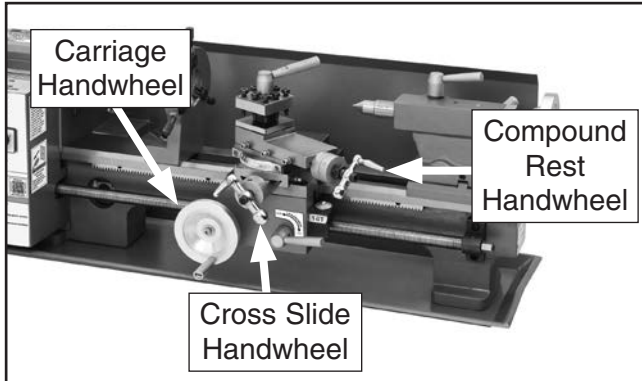


Figure 45. Manual feeding controls.

## Carriage Handwheel

### Graduated Dial

Increments..... 0.01" (0.25mm)  
 One Full Revolution..... 1.0" (25.4mm)

The carriage handwheel moves the carriage left or right along the bed. Adjust the position of the graduated scale by holding the handwheel with one hand and turning the dial with the other.

## Cross Slide Handwheel

### Graduated Dial

Increments..... 0.001" (0.025mm)  
 One Full Revolution..... 0.04" (1.02mm)

Use this handwheel to move the tool toward and away from the work. The cross slide handwheel has an indirect-read graduated dial. This means the distance shown on the scale represents the actual distance the tool moves.

## Compound Rest Handwheel

### Graduated Dial

Increments ..... 0.001" (0.025mm)  
 One Full Revolution..... 0.04" (1.02mm)

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 in place with two cap screws. The compound rest has an indirect-read graduated dial.

Model G0765 (Mfd. Since 5/15)

# 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 46. Spindle speed formula for lathes.

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

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

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

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



## Setting Spindle Speed Range

The high/low range lever shown in **Figure 47**, is used to select one of the two spindle speed ranges.

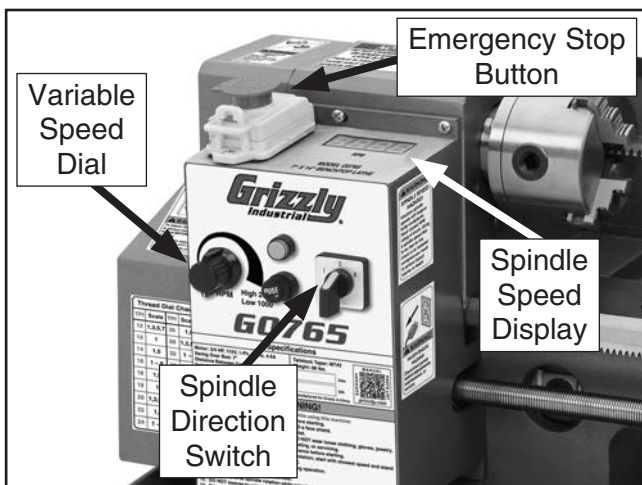


**Figure 47.** High/low range lever set to low.

When the lever is moved to the right, as shown in **Figure 47**, the low spindle speed range (100–1000 RPM) is selected. When the lever is moved to the left, the high spindle speed range (100–2000) RPM is selected.

## Setting Spindle Direction & Speed

Set the spindle rotation direction to forward or reverse with the spindle direction switch, shown in **Figure 48**. Reset the Emergency Stop button, press the ON button, then turn the variable speed dial clockwise until the desired spindle speed displays on the spindle speed display.



**Figure 48.** Spindle speed and direction controls.

## Configuration Example

Follow this example to gain a better understanding of how to set the spindle speed.

### To set spindle speed to 100 RPM:

1. Make sure spindle is completely stopped, and shift high/low range lever to LOW, as shown in **Figure 47**.

**Note:** *If high/low range lever does not easily adjust into position, rotate chuck by hand while you apply pressure to lever. When gears align, the lever will easily move into place.*

2. Turn variable speed dial to "0".
3. Turn spindle direction switch to "F", and press ON button.
4. Adjust variable speed dial until spindle speed display reads 100 RPM.





# Power Feed

The carriage has power feed options for either threading or non-threading operations. However, this subsection only covers using the power feed option for non-threading operations. To learn how to power the carriage for threading operations, refer to **Threading** on **Page 46**.

## NOTICE

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

## Power Feed Controls

Use the following descriptions and figures to understand the power feed controls.

Before using power feed, you may have to reconfigure the end gears, depending on how they are set up. The lathe comes from the factory with the end gears setup in the standard configuration (refer to **End Gears** on **Page 43**). This end gear configuration achieves a fixed feed rate of 0.04 in/rev. Refer to **End Gears** on **Page 43** for detailed instructions on how to configure the end gears.

**A. Spindle Switch:** Starts, stops, and reverses carriage travel when feed direction lever and half nut lever are engaged.



Figure 49. Spindle switch.

**B. Feed Direction Lever:** Selects carriage travel direction. The carriage moves left when feed direction lever is up, half nut lever is engaged, and spindle switch is set to "F".

The carriage moves right when the feed direction lever is all the way down. The carriage will not move when the lever is in the center position.

Carriage travel direction reverses when the spindle switch is set to "R".

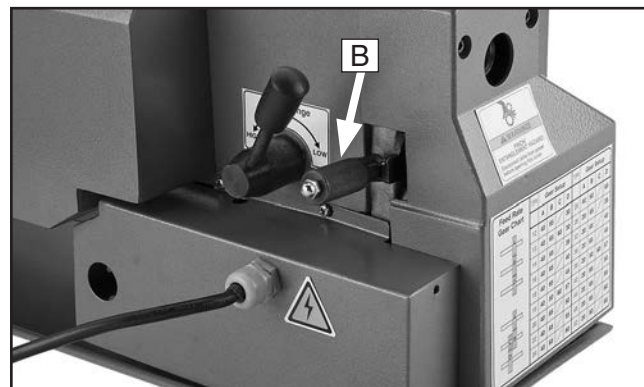


Figure 50. Feed direction lever.

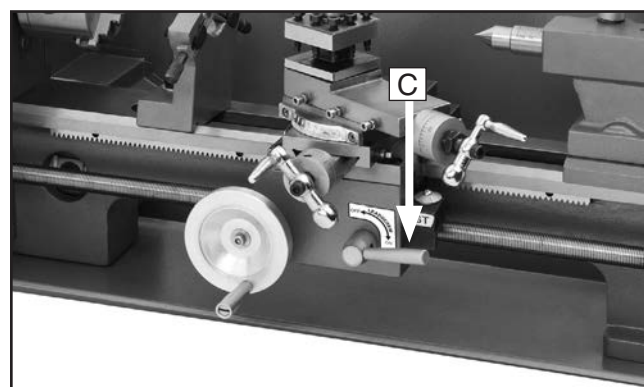


Figure 51. Half nut lever.

**C. Half Nut Lever:** Engages/disengages half nut for power feed operations.

## NOTICE

To avoid potential carriage/chuck crash, disengage half-nut lever immediately after completing power feeding operations.





## Setting Power Feed Rate

Follow the example below to better understand how to set the lathe power feed.

### Tools Needed:

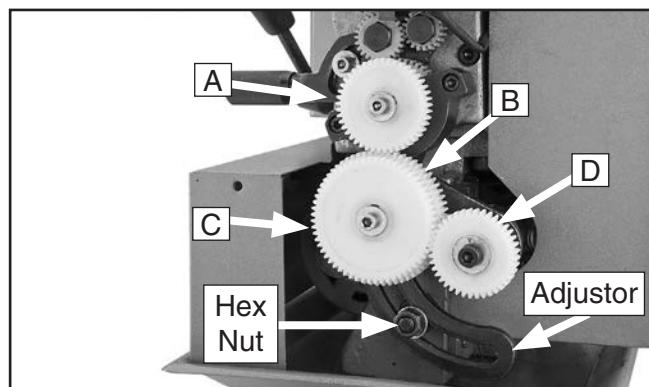
Hex Wrenches 4 & 5mm ..... 1 Ea  
Open-End Wrenches 13 & 14mm..... 1 Ea

### To set power feed for 0.04 in./rev.:

1. DISCONNECT LATHE FROM POWER!
2. Gather two 80T and two 20T gears.

**Note:** All change gears are stamped with the number of teeth they have except the 20T gears, which are black.

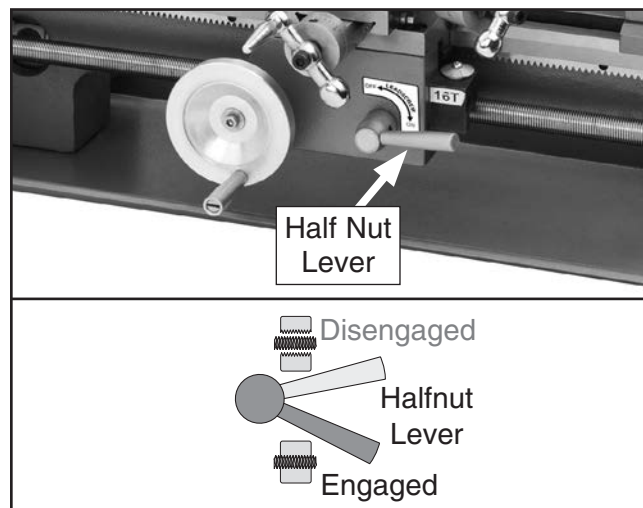
3. Remove end cover.
4. Remove cap screws and flat washers that secure existing gears.
5. Loosen hex nut shown in **Figure 52**, and pivot adjuster down to disengage gears from each other.



**Figure 52.** Adjuster and change gears.

6. Remove existing A, B, C and D change gears (see **Figure 52**). **Note:** Some gears may be difficult to remove due to excess grease and debris. Once they are removed, clean gears with mineral spirits and wipe them down with a clean rag.
7. Replace A and C gears with 20T gears, and B and D gears with 80T gears (see **Figure 55** on **Page 43**). The printed gear letters should face outward.

8. Reposition adjuster so gears mesh, tighten adjuster hex nut, then secure gears with cap screws and flat washers removed earlier.
9. Re-install end cover.
10. Push half nut lever down to engage power feed (see **Figure 53**).



**Figure 53.** Half nut lever engaged.

The lathe is now set for a power feed rate of 0.04 in./rev.



# End Gears

The end gears must be correctly setup for power feed and threading. Use the photo below to identify the A, B, C, and D change gears, which are also referenced on the headstock feed rate gear chart.

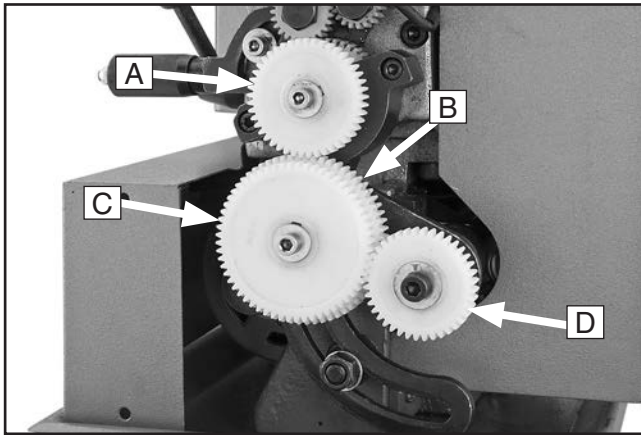


Figure 54. Change gear identification.

The following subsections explain how to configure the end gears, which are accessed by removing the end cover.

## Power Feed Configuration

The end gears are preset by the factory in this configuration, which is only used for power feeding. Mesh the top 20T A gear with the 80T B gear, and mesh the 20T C gear with the 80T D gear (see Figure 55).

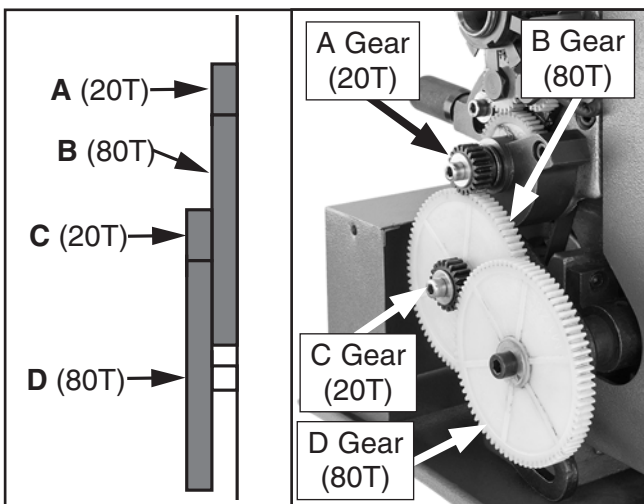


Figure 55. Power feed end gear configuration.

## Primary Threading Configuration

This threading configuration is used for inch and metric threading. Mesh the A, B, and D gears, as shown in Figure 56. The C gear does not mesh with any other gears in this configuration, so it is not important which gear is installed in the C position. The B and C gears share a keyed bushing.

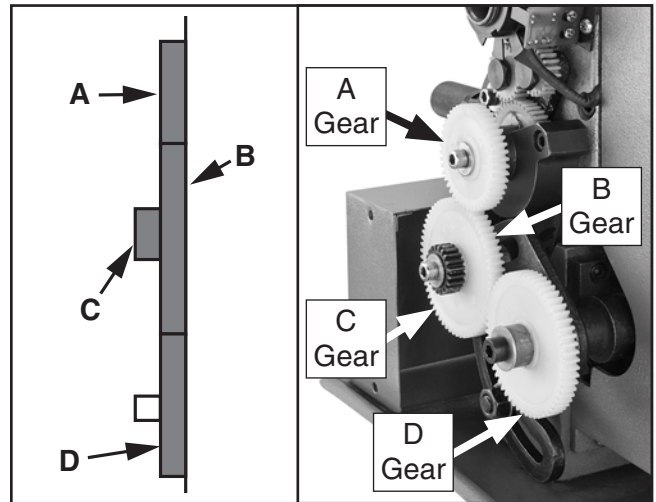


Figure 56. Primary threading configuration.

## Secondary Threading Configuration

This threading configuration is used for a different range of threads and feed rates than the primary threading configuration. Mesh the A and B gears, and mesh the C and D gears, as shown in Figure 57. The B and C gears share a keyed bushing.

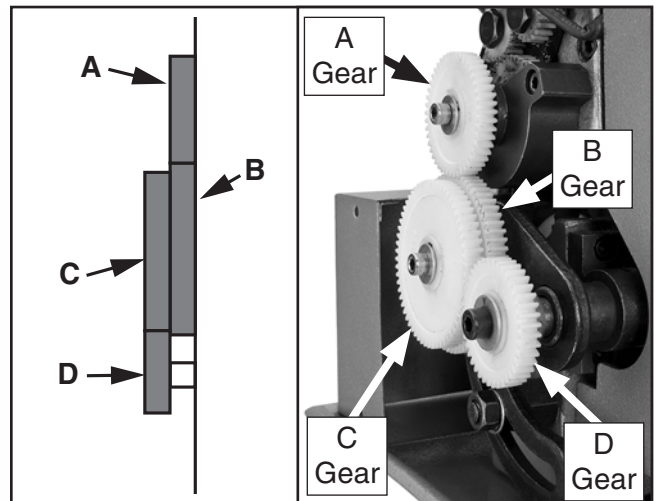


Figure 57. Secondary threading configuration.



## End Gear Configuration Example

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

Tools Needed	Qty
Hex Wrench 4 & 5mm .....	1 Ea
Open-End Wrenches 13 & 14mm.....	1 Ea

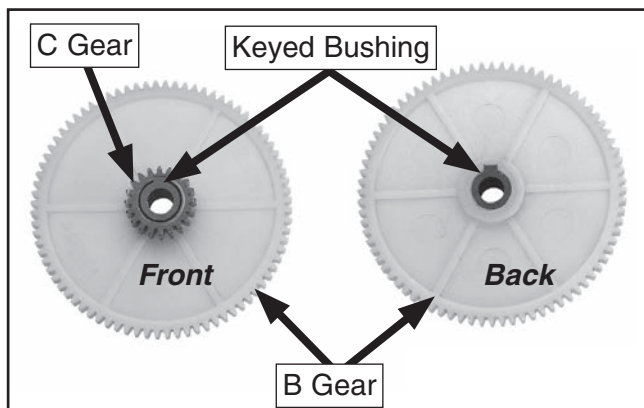
### To configure end gears for threading 20 TPI:

1. DISCONNECT LATHE FROM POWER!
2. Locate 20 TPI on gear chart shown in **Figure 58**.

TPI	Gear Setup				TPI	Gear Setup			
	A	B	C	D		A	B	C	D
12	40	65	/	30	26	40	60	/	65
13	40	65	/	30	26	40	60	/	35
14	40	65	/	30	26	40	60	/	40
16	40	65	/	40	36	20	60	/	45
18	40	65	/	45	38	20	50	60	57
19	40	50	60	57	45	20	65	/	50
20	40	65	/	50	44	20	65	/	55
22	40	65	/	55	48	20	65	/	60
24	40	65	/	60	52	20	60	/	65

**Figure 58.** Locating change gears for 20 TPI.

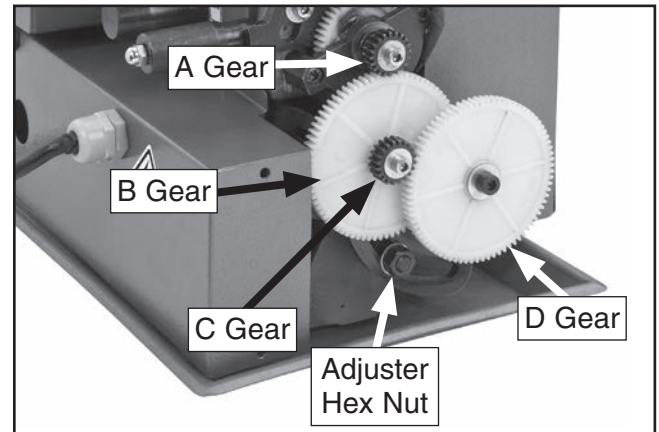
3. Gather 40T, 65T, and 50T gears per change gear chart. The C gear, which is indicated by a "/", is installed on existing B/C change gear keyed bushing (see **Figure 59**).



**Figure 59.** B/C change gear and keyed bushing (gears removed for clarity).

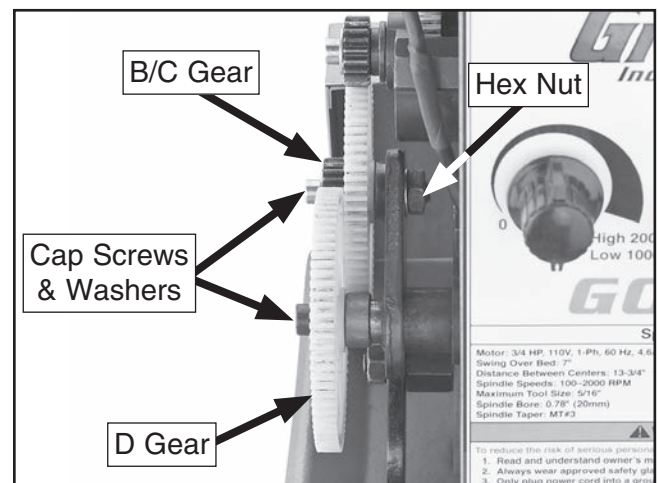
**Note:** Depending upon configuration, C gear may not be 20T, as shown in **Figure 59**.

4. Remove end cover.
5. Loosen adjuster hex nut shown in **Figure 60**, pivot adjuster down, and disengage gears.



**Figure 60.** Adjuster hex nut location.

6. Loosen hex nut behind B/C change gear shaft shown in **Figure 61**, then slide B/C gear away from D gear.



**Figure 61.** B/C change gear hex nut.

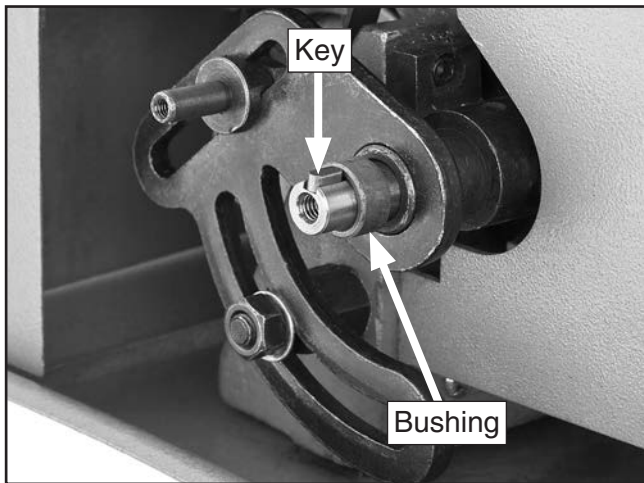
7. Remove cap screws and washers that secure gears, then remove gears.

**Note:** If any gears are difficult to remove, use a large flat head screwdriver to gently wiggle them off.

Leave existing C gear on keyed bushing. The C gear will not mesh with any of the other gears in this 20 TPI threading setup.



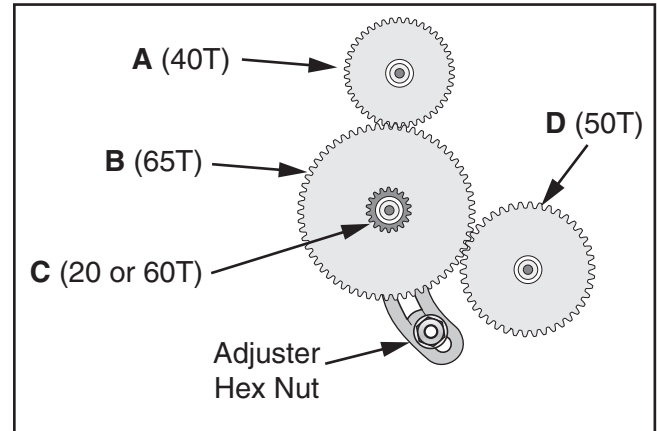
8. Remove key and bushing from D gear shaft (see **Figure 62**).



**Figure 62.** D gear shaft key and bushing.

9. Remove existing B gear from keyed bushing shared with C gear.
10. Slide 65T B gear onto keyed bushing and firmly against C gear.

11. Slide 40T, 65T, and 50T gears onto gear shafts (see **Figure 63**), making sure to re-install key with 50T gear.



**Figure 63.** End gear placement.

12. Slide bushing removed in **Step 8** onto 50T gear.
13. Position adjuster so gears mesh. Then tighten adjuster hex nut and B/C gear shaft hex nut.
14. Secure gears with cap screws and washers removed earlier.
15. Re-install end 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 how to cut threads on a lathe, we strongly recommend that you read books, review industry trade magazines, or get formal training before attempting any threading projects.

## Headstock Threading Controls

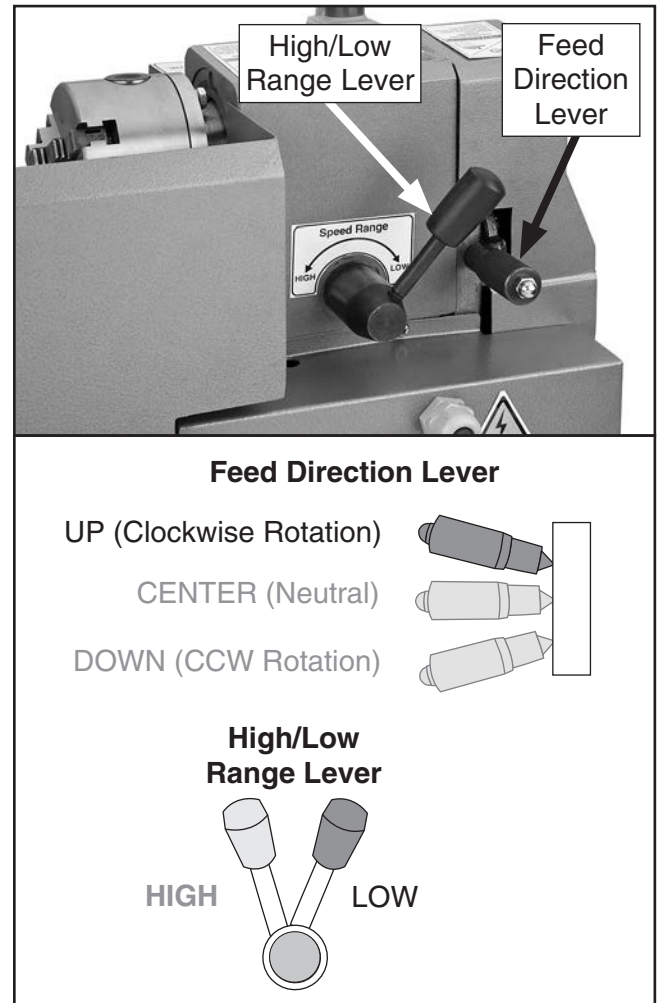
The threading chart on the headstock face displays the settings for inch threading; a metric thread chart is provided on **Page 70**.

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

### To set the lathe to thread 20 TPI:

1. Configure gears as instructed in **End Gear Configuration Example** on **Page 44**.
2. Move high/low range lever to low, and move feed direction lever all the way up, as shown in **Figure 64**.

The lathe is now set up to cut 20 TPI threads.



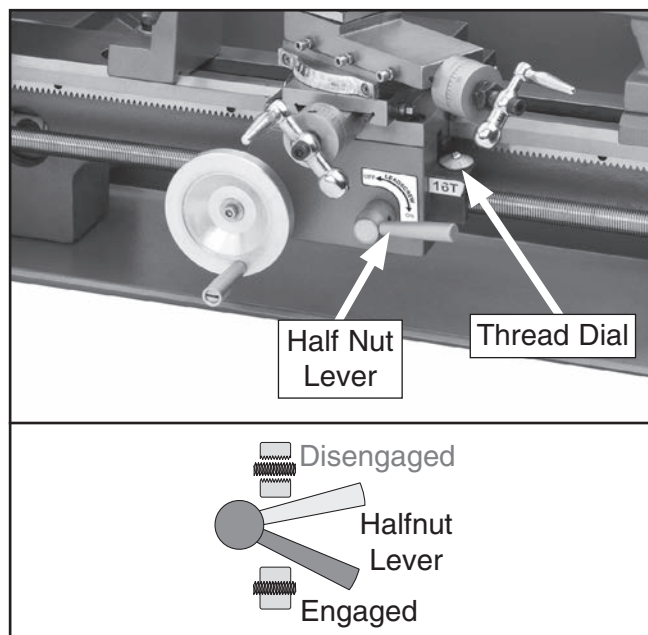
**Figure 64.** Lever and dial settings for 20TPI.





## 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 65**).



**Figure 65.** Apron threading controls.

## Thread Dial

The numbers on the thread dial (**Figure 65**) are used with the thread dial chart to show when to engage the half nut during inch threading.

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

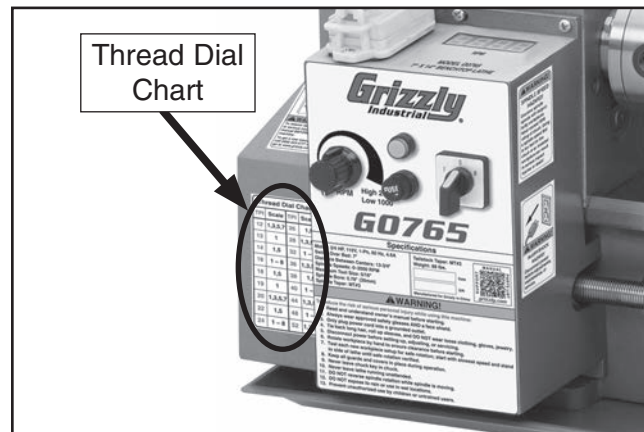
### **NOTICE**

**When threading, we recommend using the slowest speed possible and avoiding deep cuts, so you are able to disengage the half nut when required to prevent a carriage crash!**

When the first 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.

## Thread Dial Chart

The thread dial chart is located on the headstock, as shown in **Figure 66**.



**Figure 66.** Thread dial chart location.

Find the TPI (threads per inch) that you want to cut on the thread dial chart (see **Figure 67**), then reference the scale number to the right. The scale numbers indicate when to engage the half nut for a specific thread pitch as indicated by the thread dial.

Thread Dial Chart			
TPI	Scale	TPI	Scale
12	1,3,5,7	26	1,5
13	1	28	1,3,5,7
14	1,5	32	1 – 8
16	1 – 8	36	1,3,5,7
18	1,5	38	1,5
19	1	40	1 – 8
20	1,3,5,7	44	1,3,5,7
22	1,5	48	1 – 8
24	1 – 8	52	1,3,5,7


**Figure 67.** Thread dial chart.





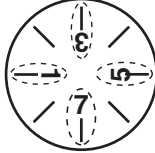
The following examples explain how to use the thread dial and the thread dial chart.

**TPI Divisible by 8:** Use any line on the thread dial (see example in **Figure 68**).

TPI	Dial Number	Thread Dial
16, 24, 32, 40, 48	1-8	

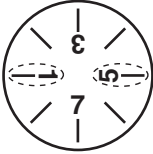
**Figure 68.** Any position on dial for threading TPI divisible by 8.

**Even TPI Divisible by 4:** Use any numbered line on thread dial (see example in **Figure 69**).

TPI	Dial Number	Thread Dial
12, 20, 28, 36, 44, 52	1, 3, 5, 7	

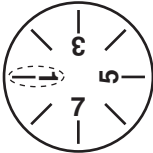
**Figure 69.** Example of inch thread pitch divisible by 4.

**Even TPI Not Divisible by 4 or 8:** Use opposing number pairs 1 and 5 on thread dial (see example in **Figure 70**).

TPI	Dial Number	Thread Dial
14, 18, 22, 26, 38	1, 5	

**Figure 70.** Example of even numbered inch thread pitch.

**Odd TPI:** Use line 1 on thread dial (**Figure 71**).

TPI	Dial Number	Thread Dial
13, 19	1	

**Figure 71.** Example of odd numbered inch thread pitch.



# 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.

**H2987—1/2" Bent Lathe Dog**

**H2988—1" Bent Lathe Dog**

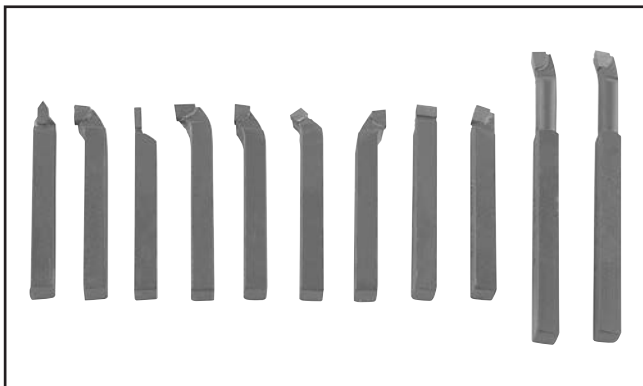
**H2989—1 1/2" Bent Lathe Dog**

**H2990—2" Bent Lathe Dog**

**H2991—3" Bent Lathe Dog**

**T25206—11 Pc. Carbide Bit Set 5/16"**

This 11-Pc. Carbide-Tipped Tool Bit Set includes a wide variety of tool types for just about any machining operation. This set also includes two boring bars. Boring bars measure 4 7/8" long. Shank size for all is 5/16".



**Figure 72.** 11-Pc. Carbide-Tipped Tool Set.

**D3640—Shop Fox Tool Table Plus**

This new, tool table plus was designed to answer customer requests for a slightly wider and taller table than our D2056 to accommodate a variety of bench-top machines.



**Figure 73.** D3640 Shop Fox Tool Table Plus.

**SB1365—South Bend Way Oil for Lathes**

Engineered for the high pressure exerted on horizontal or vertical ways and slides. Protects against rust and corrosion. Ensures stick-free, smooth motion which maximizes finishes and extends the life of your machine. Won't gum up! 12 oz. AMGA#2 (ISO 68 Equivalent).



**Figure 74.** Way Oil.

**order online at [www.grizzly.com](http://www.grizzly.com) or call 1-800-523-4777**



# SECTION 6: MAINTENANCE

---



## Schedule

---

### Ongoing

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

- Loose mounting bolts or fasteners.
- Worn, frayed, cracked, or damaged wires.
- Guards or covers removed.
- Emergency Stop button not working correctly.
- Damaged or malfunctioning components.

### Daily, Before Operations

- Add oil to the ball oilers (**Page 51**).
- Lubricate the leadscrew and carriage rack (**Page 52**).
- Lubricate the bedways (**Page 52**).
- Clean/lubricate the cross slide and compound slide (**Page 52**).
- Disengage the half nut on the carriage (to prevent crashes upon startup).

### Daily, After Operations

- Press the Emergency Stop 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.

### Annually

- Lubricate change gear bushing and tumbler gears (**Page 53**).

## 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. Use a quality ISO 68 way oil (see **Page 49** for offerings from Grizzly) to prevent corrosion.



# Lubrication

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

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

Before performing any lubrication task, **DISCONNECT LATHE FROM POWER!**

We recommend using Model SB1365 Way Oil or equivalent (see **Page 49**) for most of the lubrication tasks.

## Lubrication Frequency

Lubrication Task	Frequency	Page Ref.
Ball Oilers	Daily	<b>This Page</b>
Leadscrew & Carriage Rack	Daily	<b>52</b>
Bedways	Daily	<b>52</b>
Cross Slide & Compound Slide	Daily	<b>52</b>
Change Gear Bushing	Annually	<b>53</b>
Tumbler Gears	Annually	<b>53</b>

## 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.

## Items Needed

Items Needed	Qty
Clean Rag .....	As Needed
Mineral Spirits.....	As Needed
Stiff Brush.....	1
Wrench 4mm .....	1
Pump-Type Oil Can w/Plastic Cone Tip .....	1

## Ball Oilers

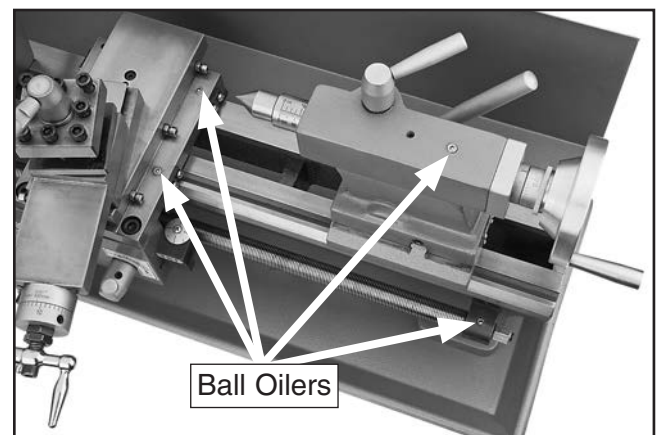
Oil Type .....	ISO 32 or Equivalent
Amount .....	1 or 2 Squirts/Fill
Lubrication Frequency.....	Daily

This lathe has four ball oilers that should be oiled on a daily basis before beginning operation.

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 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.

Refer to **Figure 75** to identify the location of each ball oiler.



**Figure 75.** Ball oilers.

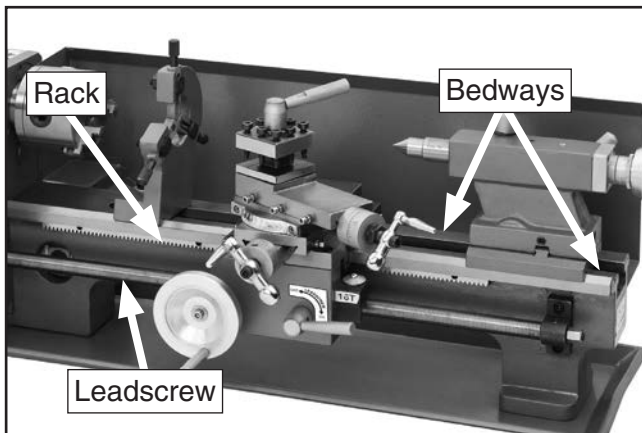


## Leadscrew & Carriage Rack

Oil Type ....Grizzly SB1365 or ISO 68 Equivalent  
Amount ..... As Needed  
Lubrication Frequency ..... Daily

Before lubricating the leadscrew and carriage rack (see **Figure 76**), clean them first with mineral spirits. Use a stiff brush to help remove any debris or grime. Apply a thin coat of oil along the entire length of the carriage rack. Use a stiff brush to make sure oil is applied into the leadscrew 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.*



**Figure 76.** Leadscrew, rack and bedways.

## Bedways

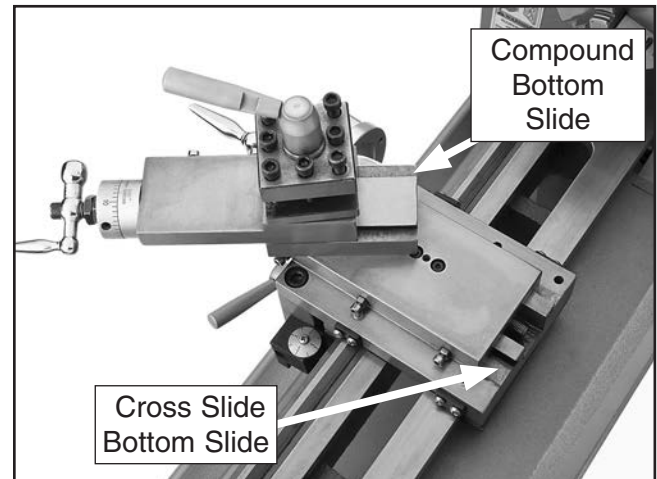
Oil Type ....Grizzly SB1365 or ISO 68 Equivalent  
Amount ..... As Needed  
Lubrication Frequency ..... Daily

Before lubricating the bedways (see **Figure 76**), clean them with mineral spirits. Apply a thin coat of oil along the length of the bedways. Move the steady rest, carriage, and tailstock to access the entire length of the bedways.

## Cross Slide & Compound Slide

Oil Type ....Grizzly SB1365 or ISO 68 Equivalent  
Amount .....Thin Coat  
Lubrication Frequency ..... Daily

Use the handwheels to separately move the cross slide and compound slide as far forward as possible (see **Figure 77**). Clean the slides with mineral spirits and wipe down with a rag. Apply lubricant and move the slides back and forth to distribute the oil.



**Figure 77.** Location of bottom slides.

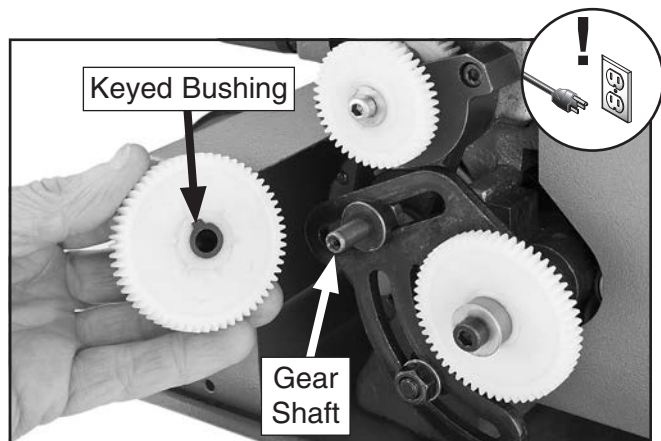




## Change Gear Bushing

Grease Type.....White Lithium NLGI#2  
Frequency..... Annually  
Amount.....Thin Coat

The plastic end gears do not need to be lubricated. However, we recommend lightly lubricating the B/C change gear keyed bushing with white lithium grease.



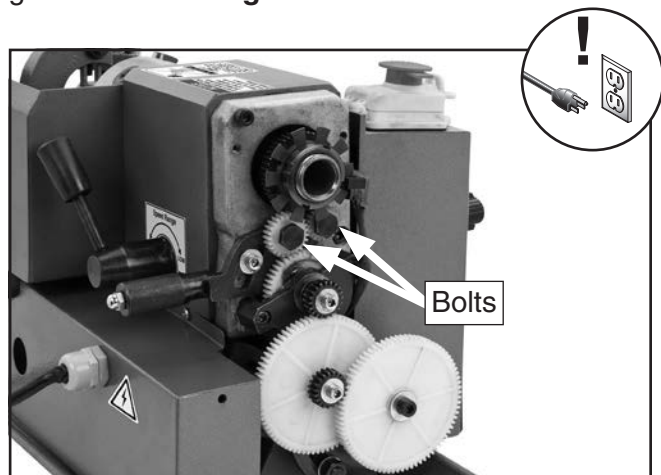
**Figure 78.** B/C change gear removed to access keyed bushing.

Remove the end cover and B/C change gear, clean the shaft and keyed bushing with mineral spirits and dry. Apply a thin coat of white lithium grease to the inside of the bushing shaft, then re-install it.

## Tumbler Gears

Oil Type....Grizzly SB1365 or ISO 68 Equivalent  
Amount..... 2-3 Drops  
Lubrication Frequency..... Annually

Add lubricant between the bolt heads and tumbler gears shown in **Figure 79**.



**Figure 79.** Tumbler gear lubrication points.

# Machine Storage

## Preparing Lathe for Storage

1. DISCONNECT LATHE FROM POWER!
2. 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.
3. Lubricate machine as outlined in lubrication section. Be sure to use an oil can to purge all ball oilers and oil passages with fresh oil.
4. Place a few moisture absorbing desiccant packs inside of the electrical box.
5. 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.
6. Every few months, rotate by hand all gear-driven components a few times in several gear selections. This will keep bearings, bushings, gears, and shafts well lubricated and protected from corrosion—especially during winter months.

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

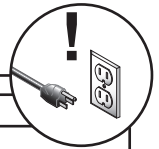
1. Remove moisture-absorbing desiccant packs from electrical box.
2. Repeat **Test Run** and **Spindle Break-In** procedures, beginning on **Page 21**.



# SECTION 7: SERVICE

Review the troubleshooting and 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 circuit breaker trips.	<ol style="list-style-type: none"> <li>Emergency stop button engaged or at fault.</li> <li>Variable speed dial in OFF position or at fault.</li> <li>Spindle direction switch turned to "0" or at fault.</li> <li>Blown fuse.</li> <li>Incorrect power supply voltage.</li> <li>Power supply circuit breaker tripped or fuse blown.</li> <li>Wiring open/has high resistance.</li> <li>Motor brushes at fault.</li> <li>On/Off switch at fault.</li> <li>Motor at fault.</li> </ol>	<ol style="list-style-type: none"> <li>Press side tab in and lift switch cover. Press On button to reset; replace if not working properly.</li> <li>Turn variable speed dial past "0". Ensure dial has correct voltage. Replace if faulty.</li> <li>Turn spindle direction switch to "F" or "R". Ensure dial has correct voltage. Replace if faulty.</li> <li>Replace fuse/ensure no shorts (<b>Page 58</b>).</li> <li>Ensure correct power supply voltage.</li> <li>Ensure circuit is sized correctly and free of shorts. Reset circuit breaker or replace fuse.</li> <li>Check/fix broken, disconnected, or corroded wires.</li> <li>Remove/replace brushes (<b>Page 59</b>).</li> <li>Replace switch.</li> <li>Test/repair/replace.</li> </ol>
Machine stalls or is underpowered.	<ol style="list-style-type: none"> <li>Feed rate/cutting speed too fast.</li> <li>Wrong workpiece material.</li> <li>Machine undersized for task.</li> <li>Motor overheated.</li> <li>Computer board at fault.</li> <li>Motor speed dial at fault.</li> <li>Timing belt slipping.</li> <li>Motor brushes at fault.</li> <li>Pulley/sprocket slipping on shaft.</li> <li>Motor bearings at fault.</li> <li>Motor at fault.</li> </ol>	<ol style="list-style-type: none"> <li>Decrease feed rate/cutting speed.</li> <li>Use correct type/size of metal.</li> <li>Inspect and replace if at fault.</li> <li>Use sharp bits; reduce feed rate/depth of cut.</li> <li>Clean motor, let cool, and reduce workload.</li> <li>Test and replace if at fault.</li> <li>Tension/replace belt; ensure pulleys are aligned.</li> <li>Remove/replace brushes (<b>Page 59</b>).</li> <li>Replace loose pulley/shaft.</li> <li>Test/repair/replace.</li> <li>Test/repair/replace.</li> </ol>
Machine has vibration or noisy operation.	<ol style="list-style-type: none"> <li>Motor or component loose.</li> <li>Pulley loose.</li> <li>Motor fan rubbing on fan cover.</li> <li>Motor bearings at fault.</li> <li>Cutting tool chattering.</li> <li>Workpiece or chuck at fault.</li> </ol>	<ol style="list-style-type: none"> <li>Inspect/replace damaged bolts/nuts, and retighten with thread locking fluid.</li> <li>Realign/replace shaft, pulley, setscrew, and key.</li> <li>Fix/replace fan cover; replace loose/damaged fan.</li> <li>Test by rotating shaft; rotational grinding/loose shaft requires bearing replacement.</li> <li>Replace/sharpen cutting tool; index tool to spindle centerline; use correct feed rate and cutting RPM.</li> <li>Properly secure or center workpiece in chuck or faceplate; replace defective chuck.</li> </ol>



## Lathe Operation

Symptom	Possible Cause	Possible Solution
Bad surface finish.	<ol style="list-style-type: none"> <li>1. Wrong spindle speed or feed rate.</li> <li>2. Dull tooling or wrong tool selection.</li> <li>3. Tool height not at spindle centerline.</li> <li>4. Too much play in gibs.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust for appropriate spindle speed and feed rate.</li> <li>2. Sharpen tooling or select a better tool for the intended operation.</li> <li>3. Adjust tool height to spindle centerline (see <b>Page 38</b>).</li> <li>4. Tighten gibs (see <b>Page 57</b>).</li> </ol>
Tapered tool difficult to remove from tailstock quill.	<ol style="list-style-type: none"> <li>1. Quill not fully retracted into tailstock.</li> <li>2. Contaminants not removed from taper before inserting into quill.</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn quill handwheel until tapered tool is forced out of quill.</li> <li>2. Clean taper and bore, then re-install tool.</li> </ol>
Cross slide, compound rest, or carriage feed has sloppy operation.	<ol style="list-style-type: none"> <li>1. Ways loaded with shavings, dust, or grime.</li> <li>2. Gibs are out of adjustment.</li> <li>3. Handwheel loose or excessive backlash.</li> <li>4. Leadscrew mechanism worn or out of adjustment.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean ways and relubricate.</li> <li>2. Adjust gibs (see <b>Page 57</b>).</li> <li>3. Tighten handwheel fasteners, adjust handwheel backlash to a minimum (see <b>Page 56</b>).</li> <li>4. Adjust leadscrew to remove end play (see <b>Page 56</b>).</li> </ol>
Cross slide, compound, or carriage handwheels hard to move.	<ol style="list-style-type: none"> <li>1. Ways loaded with chips, dust, or grime.</li> <li>2. Gibs are too tight.</li> <li>3. Backlash setting too tight.</li> <li>4. Bedways are dry.</li> <li>5. Half nut lever engaged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean ways and lubricate.</li> <li>2. Loosen gibs slightly (see <b>Page 57</b>).</li> <li>3. Slightly loosen backlash setting (see <b>Page 56</b>).</li> <li>4. Lubricate bedways.</li> <li>5. Disengage half nut lever for manual feeding.</li> </ol>
Cutting tool or machine components vibrate excessively during cutting.	<ol style="list-style-type: none"> <li>1. Tool holder not tight enough.</li> <li>2. Cutting tool sticks too far out of tool holder; lack of support.</li> <li>3. Gibs are out of adjustment.</li> <li>4. Dull cutting tool.</li> <li>5. Incorrect spindle speed or feed rate.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check for debris, clean, and retighten.</li> <li>2. Re-install cutting tool so no more than <math>\frac{1}{3}</math> of the total length is sticking out of tool holder.</li> <li>3. Adjust gibs at affected component (see <b>Page 57</b>).</li> <li>4. Replace or resharpen cutting tool.</li> <li>5. Use the recommended spindle speed and feed rate.</li> </ol>
Workpiece is tapered.	<ol style="list-style-type: none"> <li>1. Headstock and tailstock not properly aligned.</li> </ol>	<ol style="list-style-type: none"> <li>1. Re-align tailstock to headstock spindle centerline (see <b>Page 32</b>).</li> </ol>
Chuck jaws will not move or do not move easily.	<ol style="list-style-type: none"> <li>1. Chips lodged in jaws or scroll plate.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove jaws, clean and lubricate scroll plate, then replace jaws.</li> </ol>



# Backlash Adjustment

Backlash is the amount of free play felt while changing rotation directions with the handwheel. This can be adjusted on the cross slide leadscrew. Before beginning any adjustment, make sure all associated components are cleaned and lubricated and locks are loose.

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.

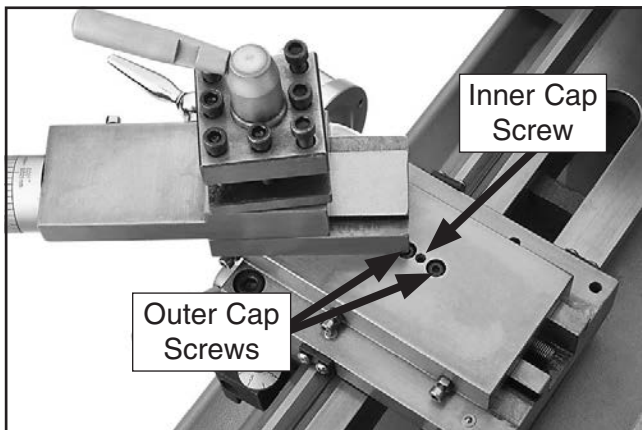
## NOTICE

Reducing backlash to less than 0.002" is impractical and can lead to accelerated wear in the leadscrew and other components. Avoid the temptation to overtighten the backlash nut or screw while adjusting.

### Cross Slide

Tools Needed:	Qty
Hex Wrench 2.5mm.....	1
Hex Wrench 3mm .....	1

The cross slide backlash is adjusted by tightening and loosening the inner and outer cap screws shown in **Figure 80**. The inner screw adjusts the height of the leadscrew nut, taking up lash between the nut and leadscrew.



**Figure 80.** Cross slide backlash adjustment cap screw.

Angle the compound rest so you can access the cap screws shown in **Figure 80**. Loosen the outer cap screws, adjust the inner cap screw, then tighten the outer cap screws. Move the cross slide handwheel back and forth and adjust backlash until it is approximately 0.002"–0.003", as indicated on the graduated dial. Re-adjust the compound rest angle when you are finished.

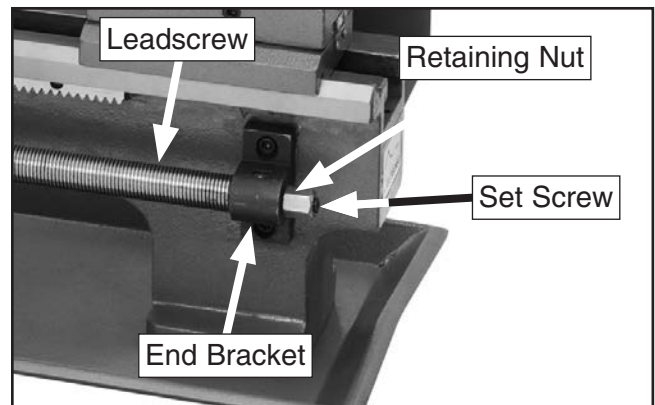
# Leadscrew End-Play Adjustment

After a long period of time, you may find that the leadscrew develops excessive end-play or lateral movement. This lathe is designed so that end-play can be removed with a simple adjustment.

Tools Needed	Qty
Hex Wrench.....	4mm
Open-End Wrench 12mm.....	1

To remove leadscrew end play:

1. DISCONNECT LATHE FROM POWER.
2. Loosen set screw shown in **Figure 81** several turns.



**Figure 81.** Leadscrew end-play adjustments.

3. Tighten retaining nut with your fingers so it just contacts end bracket, then back nut off  $\frac{1}{8}$  turn.
4. Hold nut in position and tighten set screw against leadscrew until snug.



# Gib Adjustment

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

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

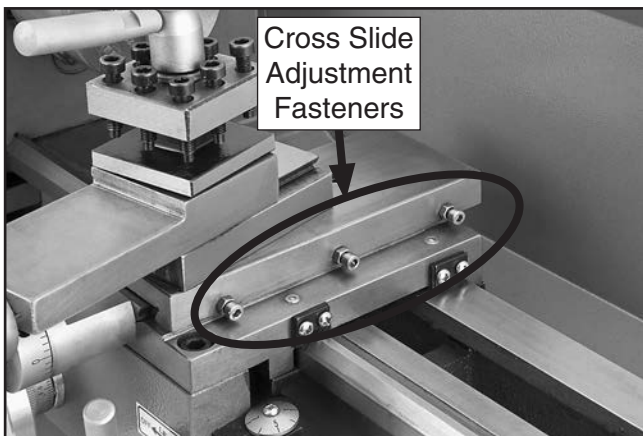
The gib adjustment process usually requires some trial-and-error. Repeat the process as necessary until you find the best balance between loose and stiff movement. Most machinists find that the ideal gib adjustment is one where a small amount of drag or resistance is present, yet the handwheels are still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

Clean and lubricate the ways before beginning any adjustments. Refer to **Lubrication** on **Page 51** for instructions and lubricant specifications.

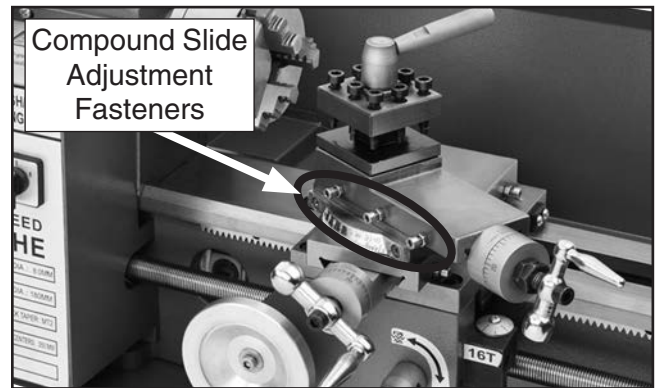
Tools Needed	Qty
Open-End Wrench 7mm.....	1
Hex Wrench 3mm.....	1

## To adjust cross slide and compound slide gibs:

1. DISCONNECT LATHE FROM POWER!
2. Loosen three hex nuts on side of cross slide or compound slide (see **Figures 82–83**).



**Figure 82.** Cross slide gib adjustment hex nuts and cap screws.



**Figure 83.** Compound slide gib adjustment hex nuts and cap screws.

3. Adjust all three cap screws in small and equal increments, then test movement of slide by rotating handwheel.

**Note:** Turning cap screws clockwise tightens the gib, and turning them counterclockwise loosens the gib.

4. When satisfied with gib adjustment, use hex wrench to prevent cap screws from moving, then retighten hex nuts to secure the settings.
5. Recheck movement of slide and, if necessary, repeat **Steps 2–4**.





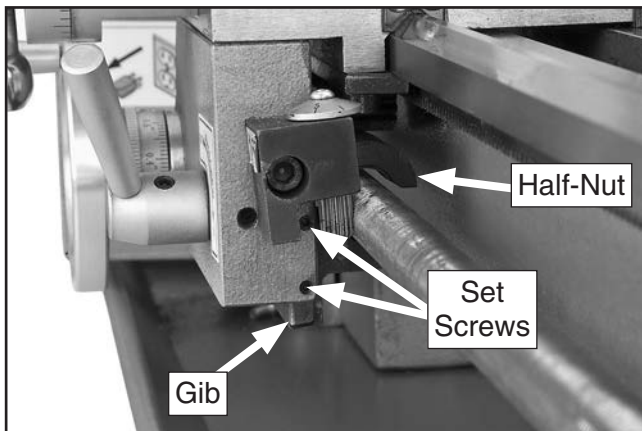
# Half Nut Adjustment

The rigidity of the half nut engagement is adjusted by tightening or loosening the half nut gib screws. Adjust the half nut if it feels too loose or too tight when being engaged. Movement that is too stiff will accelerate wear. Movement that is too sloppy will produce inaccurate turning or threading results.

Tool Needed	Qty
Hex Wrench 2mm.....	1

## To adjust half nut:

1. DISCONNECT LATHE FROM POWER!
2. Disengage half nut.
3. Adjust gib set screws (see **Figure 84**) in small, even increments so one end of gib does not become tighter than the other.



**Figure 84.** Half nut gib adjustment set screws.

4. Engage/disengage half nut several times and notice how it feels. The adjustment is correct when half nut firmly and easily engages leadscrew while opening and closing.
5. Repeat **Steps 3–4**, if necessary, until satisfied with feel of half nut engagement.

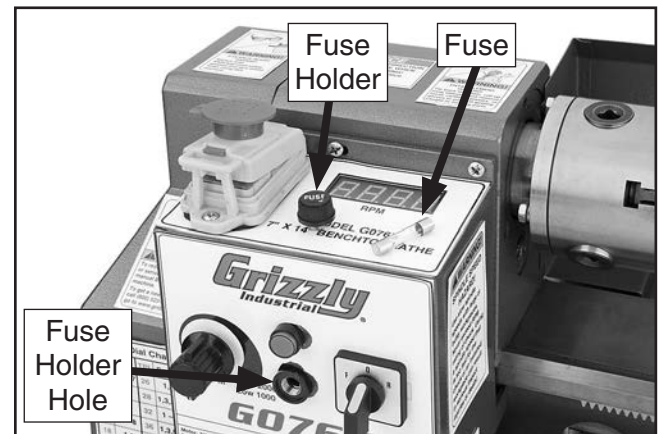
# Fuse Replacement

This lathe features an on-board fuse designed to blow to protect sensitive electrical parts from thermal damage in the event of an overload. If the spindle does not start, replace the fuse.

Replacement fuse part number: P0765166.

## To replace fuse:

1. DISCONNECT LATHE FROM POWER!
2. Unthread fuse holder by rotating counter-clockwise (see **Figure 85**) and remove fuse.



**Figure 85.** Fuse holder and fuse.

3. Insert new fuse into fuse holder.
4. Re-install fuse holder.



# Brush Replacement

This lathe is equipped with a universal motor that uses two carbon brushes to transmit electrical current inside the motor. These brushes are considered to be regular "wear items" or "consumables" that will need to be replaced during the life of the motor. The frequency of required replacement is often related to how much the motor is used and how hard it is pushed.

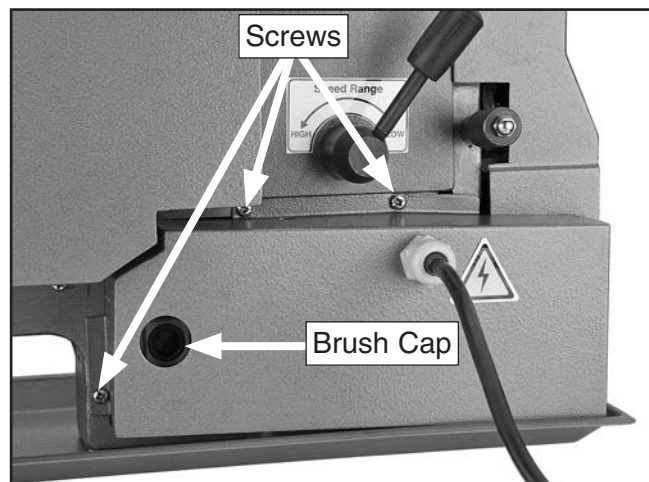
Replace the carbon brushes when the motor no longer reaches full power, or when the brushes measure less than 1/4" long (new brushes are 5/8" long).

Tools Needed	Qty
Flat Head Screwdriver #2.....	1
Phillips Head Screwdriver #2 .....	1

Replacement brush part number: P0765150-1

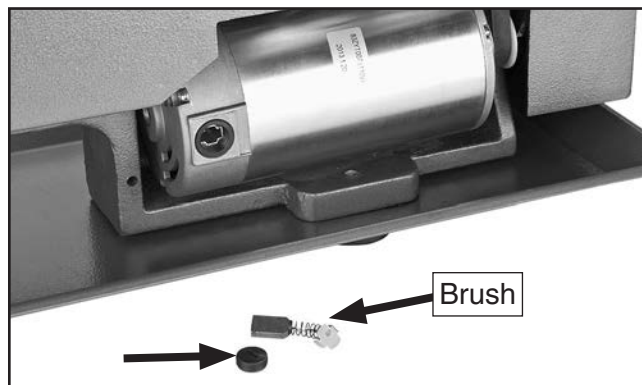
## To replace motor brushes:

1. DISCONNECT LATHE FROM POWER!
2. Remove the three screws that secure rear motor cover, then remove cover to gain access to rear brush (see **Figure 86**).



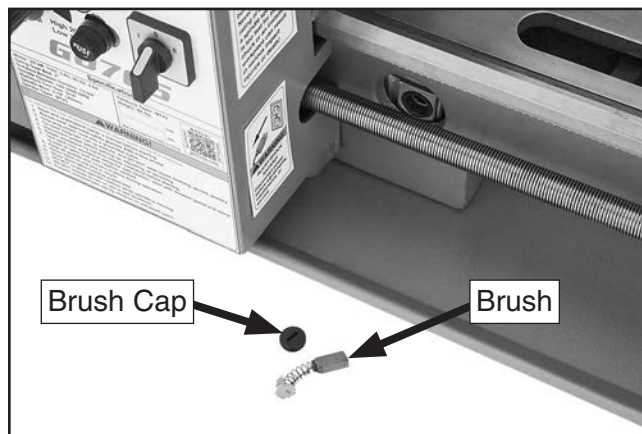
**Figure 86.** Location of rear motor brush cap.

3. Unscrew rear brush cap and carefully remove brush from motor (see **Figure 87**).



**Figure 87.** Rear motor brush components removed.

4. Unscrew front brush cap and remove brush from motor (see **Figure 88**).



**Figure 88.** Front brush components removed.

5. Install new brushes.
6. Re-install brush caps.
7. Replace rear motor cover.



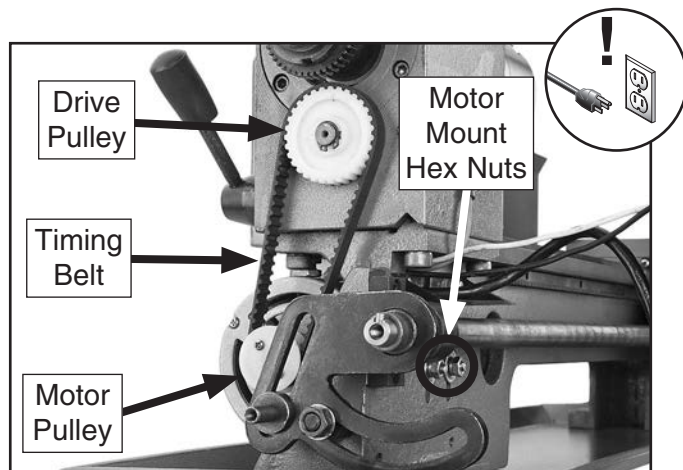
# Timing Belt Tension & Replacement

The timing belt transfers power from the motor to the drive pulley (see **Figure 89**).

Because the molded teeth in the belt fit together with matching teeth in the pulley, the timing belt will not slip unless the belt teeth become overly worn or belt tension is overly loose.

An improperly tensioned timing belt will slip, which quickly causes it to become damaged and unsuitable for further use. Therefore, it is essential to maintain belt tension properly to prevent slippage.

Once a timing belt begins to slip, it must be replaced in order to regain proper power transmission.



**Figure 89.** Timing belt and motor mount hex nuts (components removed for clarity).

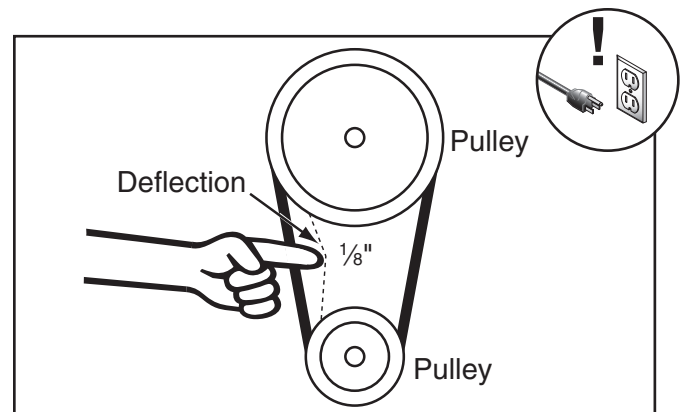
Tools Needed	Qty
Hex Wrench 4mm.....	1
Hex Wrench 5mm.....	1
Open-End Wrench/Socket 10mm.....	1
Phillips Head Screwdriver.....	1
Punch & Hammer or Adjustable Spanner Wrench.....	1
Black Fine-Tip Felt Marker .....	1

## Tensioning Timing Belt

1. DISCONNECT LATHE FROM POWER!
2. Perform **Steps 2–5** on **Page 61** to remove components to access timing belt.
3. Verify belt is centered on drive pulley (see **Figure 89**) by hand-rotating chuck. The belt should be seated so it does not contact head-stock or hang out at end of pulley.
  - If belt is not centered, loosen motor mount hex nuts (see **Figure 89**), re-adjust motor position and re-tension belt.
4. Loosen both motor mount hex nuts.
5. Ensure belt teeth are properly engaged in pulley notches, push down on motor with light/moderate pressure, and tighten motor mount hex nuts.

**Note:** Position motor so you can access brush cap through hole in bed.

The timing belt is correctly tensioned when there is approximately 1/8" deflection when it is pushed with moderate pressure, as shown in **Figure 90**.



**Figure 90.** Correct timing-belt deflection.

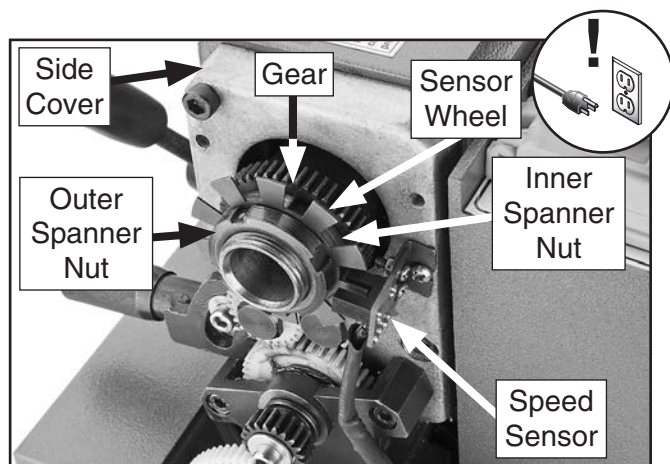
—If there is more than 1/8" deflection when timing belt is pushed with moderate pressure, loosen motor mount hex nuts, and adjust tension until it is correct.

6. Perform **Steps 9–11** on **Page 61** to re-install components you removed earlier.



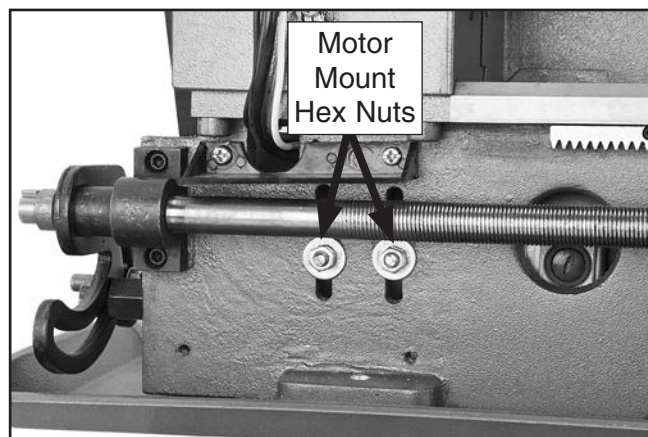
## Replacing Timing Belt

1. DISCONNECT LATHE FROM POWER!
2. Remove end cover, rear motor cover, and electrical cabinet.



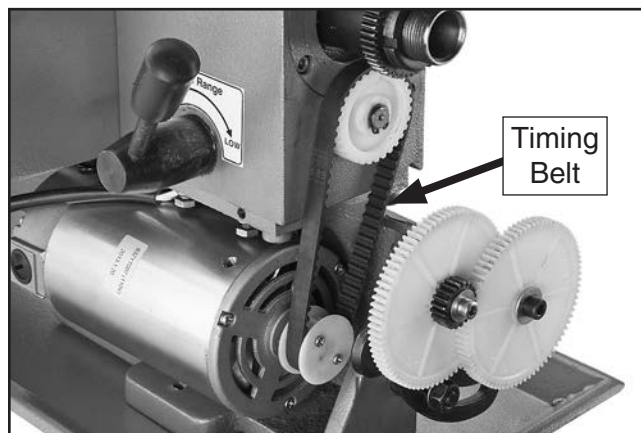
**Figure 91.** Components to be removed to replace timing belt.

3. Using a fine-tip felt marker, place alignment marks on inner spanner nut and gear shown in **Figure 91**. The purpose of these marks is to help re-install the outer spanner nut.
4. Carefully remove outer spanner nut, speed sensor, and sensor wheel.
5. Remove side cover assembly.
6. Loosen motor mount hex nuts shown in **Figure 92**.



**Figure 92.** Location of motor mount hex nuts.

7. Slide off old timing belt and install the new one, making sure that belt teeth are seated together with pulley teeth (see **Figure 93**).



**Figure 93.** Timing belt installed.

8. Tension timing belt. (Refer to **Tensioning Timing Belt** on **Page 60** for detailed instructions.)
9. Check alignment marks you made on inner spanner nut and gear in **Step 3**. The marks should still be aligned.  
—If marks are not aligned, adjust inner spanner nut as needed to align them.
10. Re-install side cover, sensor wheel, speed sensor, and outer spanner nut.
11. Re-install electrical cabinet, rear motor cover, and end cover.



# 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 after-market 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](http://www.grizzly.com).

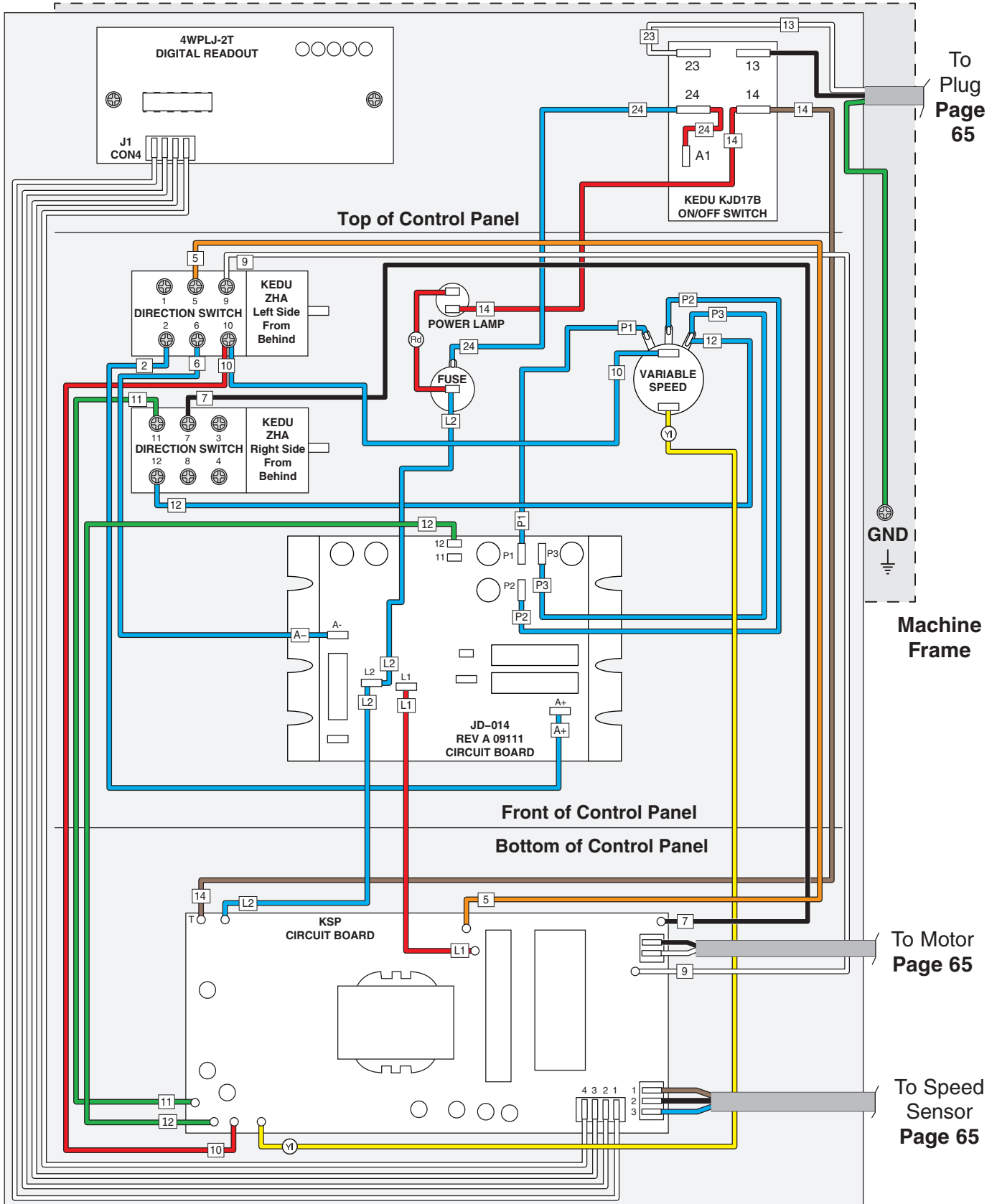
#### COLOR KEY

BLACK		BLUE		YELLOW		LIGHT BLUE	
WHITE		BROWN		YELLOW GREEN		BLUE WHITE	
GREEN		GRAY		PURPLE		TURQUOISE	
RED		ORANGE		PINK			





# Control Panel Wiring



# Control Panel Wiring Photos

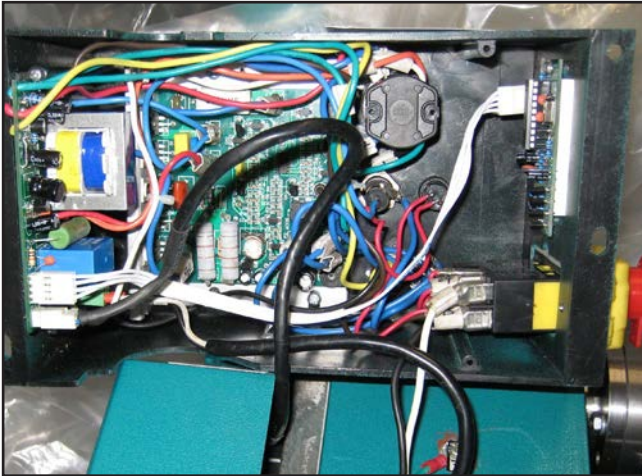


Figure 94. G0765 wiring overview.



Figure 96. Control panel wiring (top).

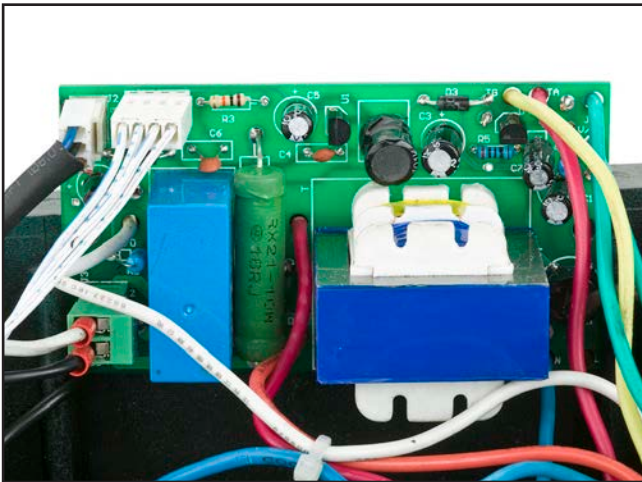


Figure 95. Control panel wiring (bottom).

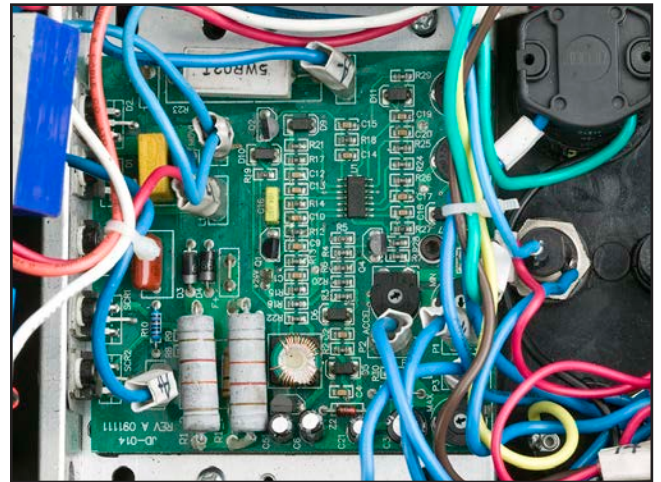


Figure 97. Control panel wiring (front).



# Motor/Speed Sensor/ Plug Wiring



Figure 98. Motor wiring.

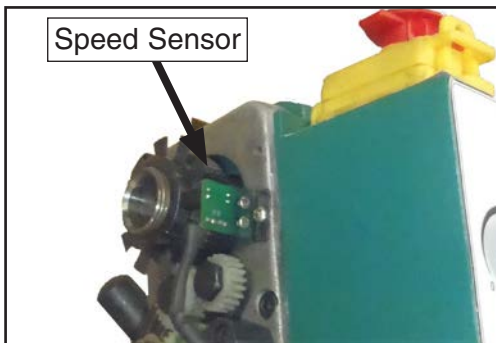
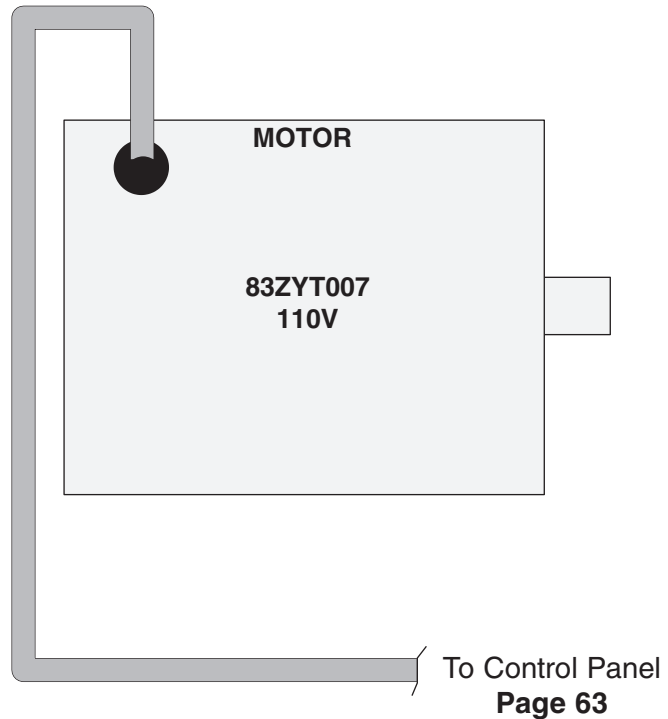


Figure 99. Speed sensor location.

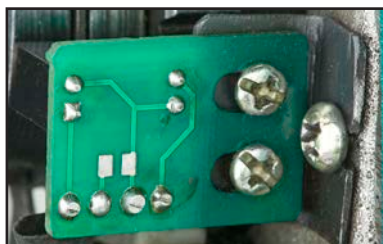
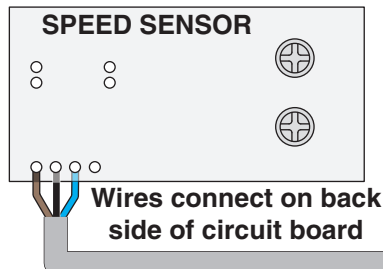
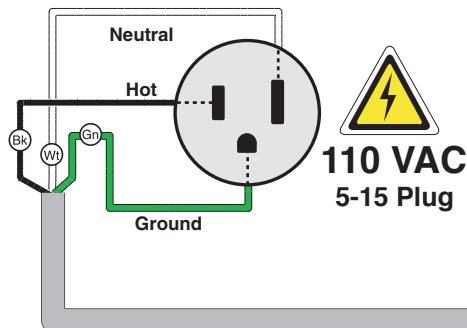


Figure 100. Speed sensor wiring.



To Control Panel  
Page 63

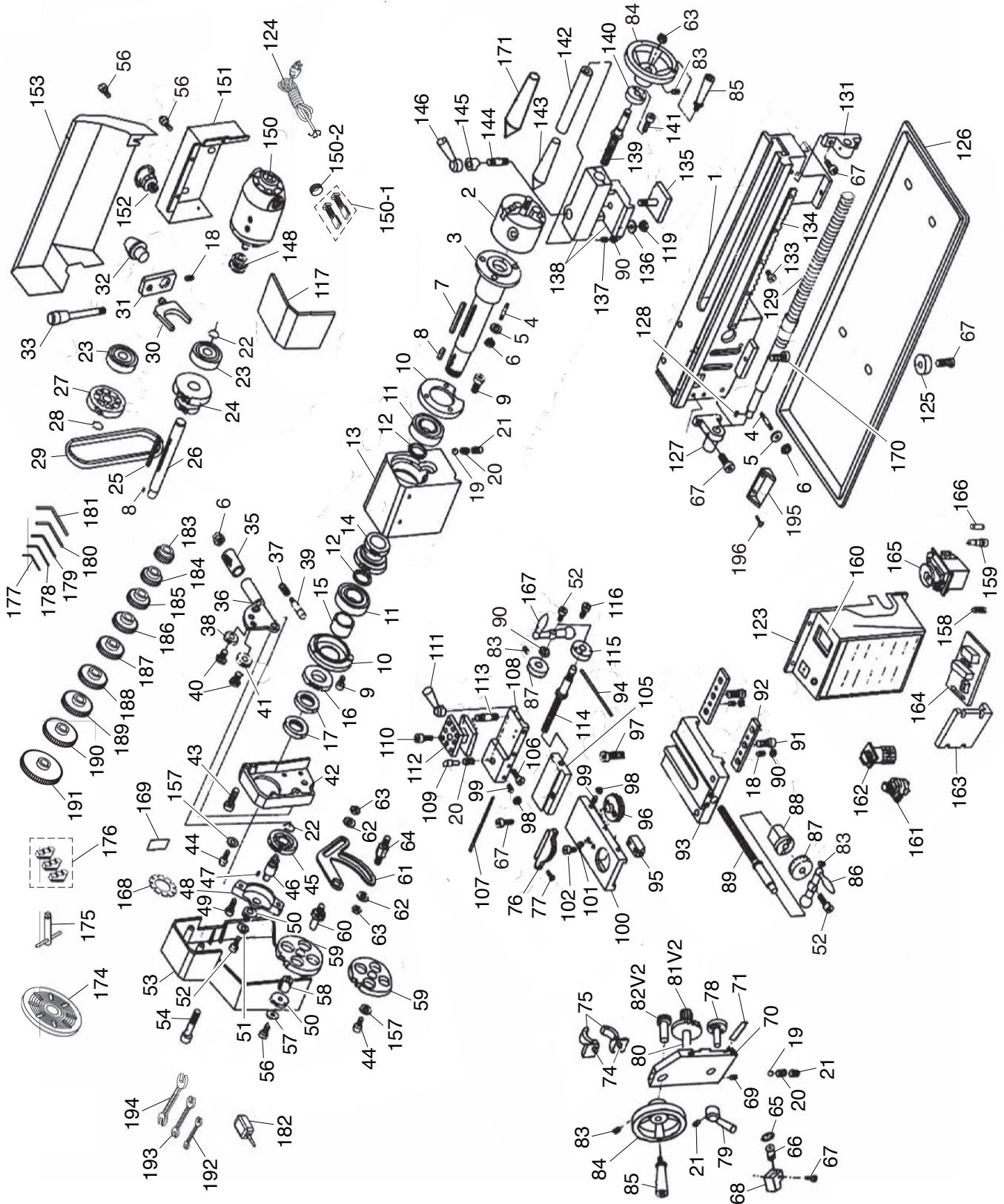
To Control Panel  
Page 63





# SECTION 9: PARTS

## Main



# Main

REF	PART #	DESCRIPTION
1	P0765001	BED
2	P0765002	3-JAW CHUCK 3" W/INTERNAL JAWS
3	P0765003	SPINDLE MT#3
4	P0765004	STUD-DE M6-1 X 60, 15
5	P0765005	FLAT WASHER 6MM
6	P0765006	HEX NUT M6-1
7	P0765007	KEY 5 X 5 X 40
8	P0765008	KEY 4 X 4 X 8
9	P0765009	CAP SCREW M5-.8 X 10
10	P0765010	BEARING COVER
11	P0765011	BALL BEARING 6206ZZ
12	P0765012	SPACER
13	P0765013	HEADSTOCK CASTING
14	P0765014	COMBO GEAR 21T/29T
15	P0765015	SPACER
16	P0765016	GEAR 45T
17	P0765017	SPANNER NUT
18	P0765018	SET SCREW M5-.8 X 8
19	P0765019	STEEL BALL 5MM
20	P0765020	COMPRESSION SPRING 4 X 9
21	P0765021	SET SCREW M6-1 X 6
22	P0765022	EXT RETAINING RING 12MM
23	P0765023	BALL BEARING 6201ZZ
24	P0765024	COMBO GEAR 12T/20T
25	P0765025	KEY 4 X 4 X 45
26	P0765026	H/L SHAFT
27	P0765027	SPINDLE PULLEY
28	P0765028	EXT RETAINING RING 10MM
29	P0765029	TIMING BELT 1.5M-70-9.5
30	P0765030	SHIFTING FORK
31	P0765031	SHIFTING ARM
32	P0765032	H/L LEVER HUB
33	P0765033	H/L LEVER M8-1.25 X 10
35	P0765035	HANDLE
36	P0765036	HANDLE MOUNT
37	P0765037	COMPRESSION SPRING
38	P0765038	PINION GEAR 25T
39	P0765039	INDICATOR
40	P0765040	GEAR SHOULDER BOLT M8-1.25 X 5
41	P0765041	PINION GEAR 20T
42	P0765042	HEADSTOCK SIDE COVER
43	P0765043	CAP SCREW M6-1 X 20
44	P0765044	CAP SCREW M5-.8 X 10
45	P0765045	GEAR 45T
46	P0765046	SHAFT
47	P0765047	KEY 4 X 4 X 8
48	P0765048	GEAR MOUNT
49	P0765049	CAP SCREW M5-.8 X 15
50	P0765050	PINION GEAR 20T
51	P0765051	FLAT WASHER 5MM
52	P0765052	CAP SCREW M5-.8 X 10
53	P0765053	END GEAR COVER
54	P0765054	CAP SCREW M5-.8 X 40

REF	PART #	DESCRIPTION
56	P0765056	CAP SCREW M6-1 X 6
57	P0765057	FLAT WASHER 6MM
58	P0765058	BUSHING W/KEYWAY
59	P0765059	GEAR 80T
60	P0765060	SHAFT
61	P0765061	PIVOT ARM
62	P0765062	FLAT WASHER 8MM
63	P0765063	HEX NUT M8-1.25
64	P0765064	SHAFT
65	P0765065	THREAD DIAL
66	P0765066	GEAR SHAFT 16T
67	P0765067	CAP SCREW M6-1 X 16
68	P0765068	THREAD DIAL BODY
69	P0765069	SET SCREW M4-.7 X 10
70	P0765070	APRON
71	P0765071	HALF NUT GIB
74	P0765074	HALF NUT SHAFT
75	P0765075	HALF NUT 2-PC SET
76	P0765076	COMPOUND REST ANGLE SCALE
77	P0765077	FLAT HD SCR M4-.7 X 10
78	P0765078	CAM
79	P0765079	HALF NUT LEVER
80	P0765080	SHAFT
81V2	P0765081V2	COMBO GEAR 11T/49T V2.05.15
82V2	P0765082V2	GEAR SHAFT 29T V2.05.15
83	P0765083	SET SCREW M6-1 X 12
84	P0765084	HANDWHEEL
85	P0765085	HANDWHEEL HANDLE M5-.8 X 6
86	P0765086	CROSS BALL HANDLE
87	P0765087	GRADUATED DIAL
88	P0765088	CROSS LEADSCREW BRACKET
89	P0765089	CROSS LEADSCREW
90	P0765090	HEX NUT M5-.8
91	P0765091	CAP SCREW M6-1 X 12
92	P0765092	SADDLE CLAMP PLATE
93	P0765093	SADDLE
94	P0765094	CROSS SLIDE GIB
95	P0765095	CROSS LEADSCREW NUT
96	P0765096	COMPOUND REST SWIVEL BASE
97	P0765097	CAP SCREW M8-1.25 X 20
98	P0765098	HEX NUT M4-.7
99	P0765099	SET SCREW M4-.7 X 16
100	P0765100	CROSS SLIDE
101	P0765101	SET SCREW M5-.8 X 10
102	P0765102	CAP SCREW M4-.7 X 10
105	P0765105	COMPOUND REST SLIDE BASE
106	P0765106	CAP SCREW M4-.7 X 14
107	P0765107	COMPOUND REST GIB
108	P0765108	COMPOUND REST
109	P0765109	INDENT PIN
110	P0765110	TOOL POST CAP SCREW M8-1.25 X 25
111	P0765111	TOOL POST LOCK LEVER
112	P0765112	TOOL POST BODY





# Main

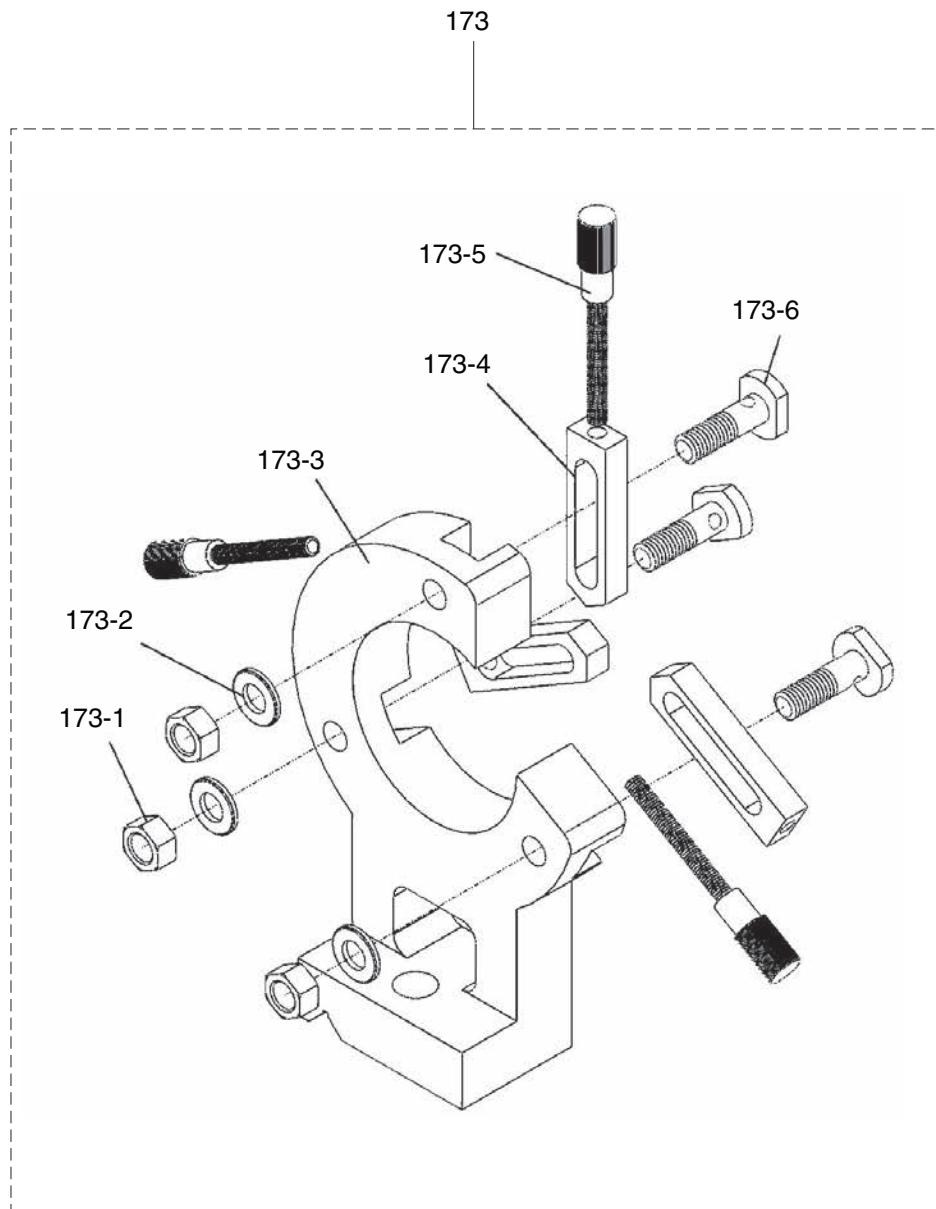
REF	PART #	DESCRIPTION
113	P0765113	STUD-DE M10-1.5 X 50, 15
114	P0765114	COMPOUND LEADSCREW
115	P0765115	COMPOUND LEADSCREW BRACKET
116	P0765116	CAP SCREW M4-.7 X 14
117	P0765117	MOTOR COVER (FRONT)
119	P0765119	HEX NUT M10-1.5
123	P0765123	ELECTRICAL CABINET
124	P0765124	POWER CORD 18G 3W 60" 5-15
125	P0765125	FOOT (RUBBER)
126	P0765126	CHIP TRAY
127	P0765127	LEADSCREW OUTBOARD BRACKET
128	P0765128	KEY 4 X 4 X 8
129	P0765129	LONGITUDINAL LEADSCREW 16TPI
131	P0765131	LEADSCREW END BRACKET
133	P0765133	CAP SCREW M3-.5 X 10
134	P0765134	RACK
135	P0765135	TAILSTOCK CLAMP PLATE
136	P0765136	FLAT WASHER 10MM
137	P0765137	SET SCREW M5-.8 X 16
138	P0765138	TAILSTOCK CASTING (UPPER/LOWER)
139	P0765139	TAILSTOCK LEADSCREW
140	P0765140	TAILSTOCK LEADSCREW BRACKET
141	P0765141	CAP SCREW M4-.7 X 10
142	P0765142	TAILSTOCK QUILL
143	P0765143	DEAD CENTER MT#2
144	P0765144	STUD-DE M8-1.25 X 60, 25
145	P0765145	CLAMP SLEEVE
146	P0765146	QUILL LOCK LEVER
148	P0765148	MOTOR PULLEY
150	P0765150	MOTOR 600W 110VDC
150-1	P0765150-1	MOTOR CARBON BRUSH 2-PC SET
150-2	P0765150-2	CARBON BRUSH CAP
151	P0765151	MOTOR COVER (REAR)
152	P0765152	STRAIN RELIEF 3/4" NPT LT STRAIGHT
153	P0765153	SPLASH GUARD
157	P0765157	FLAT WASHER 5MM
158	P0765158	POWER LIGHT

REF	PART #	DESCRIPTION
159	P0765159	FUSE HOLDER
160	P0765160	SPINDLE SPEED DIGITAL READOUT 4WPLJ-2T
161	P0765161	POTENTIOMETER B4K7 4.7KOHM
162	P0765162	F/O/R ROTARY SWITCH TUV ZH-A
163	P0765163	CIRCUIT BOARD KSP (SMALL)
164	P0765164	CIRCUIT BOARD KBHC (LARGE)
165	P0765165	E-STOP KEDU KJD17B/120V
166	P0765166	FUSE 10A 250V FAST-ACTING GLASS
167	P0765167	COMPOUND REST BALL HANDLE
168	P0765168	SPEED SENSOR WHEEL
169	P0765169	SPEED SENSOR H12A5
170	P0765170	CAP SCREW M8-1.25 X 25
171	P0765172	DEAD CENTER MT#3
174	P0765174	FACEPLATE 6-1/4"
175	P0765175	LATHE CHUCK KEY 3/8" STD
176	P0765176	EXTERNAL JAWS 3-PC SET
177	P0765177	HEX WRENCH 2.5MM
178	P0765178	HEX WRENCH 3MM
179	P0765179	HEX WRENCH 4MM
180	P0765180	HEX WRENCH 5MM
181	P0765181	HEX WRENCH 6MM
182	P0765182	BOTTLE FOR OIL
183	P0765183	GEAR 30T
184	P0765184	GEAR 35T
185	P0765185	GEAR 40T
186	P0765186	GEAR 45T
187	P0765187	GEAR 50T
188	P0765188	GEAR 55T
189	P0765189	GEAR 57T
190	P0765190	GEAR 57T
191	P0765191	GEAR 60T
192	P0765192	WRENCH 6 X 7MM OPEN-ENDS
193	P0765193	WRENCH 8 X 10MM OPEN-ENDS
194	P0765194	WRENCH 13 X 16MM OPEN-ENDS
195	P0765195	ELECTRICAL BARRIER
196	P0765196	PHLP HD SCR M5-.8 X 12

**Please Note:** We do our best to stock replacement parts whenever possible, but we cannot guarantee that all parts shown here are available for purchase. Call (800) 523-4777 or visit our online parts store at [www.grizzly.com](http://www.grizzly.com) to check for availability.



# Steady Rest

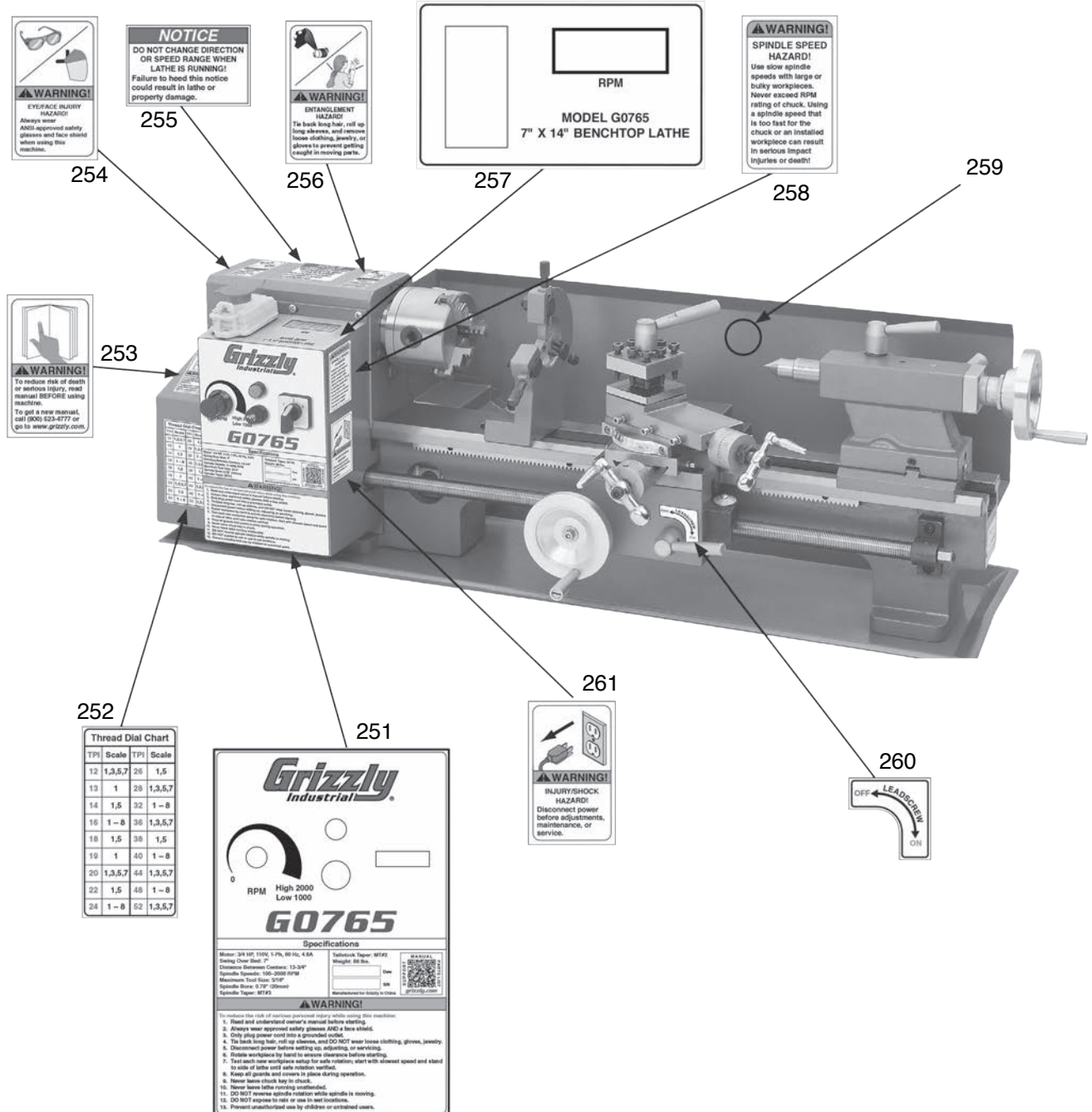


REF	PART #	DESCRIPTION
173	P0765173	STEADY REST ASSEMBLY
173-1	P0765173-1	HEX NUT M8-1.25
173-2	P0765173-2	LOCK WASHER 8MM
173-3	P0765173-3	STEADY REST CASTING

REF	PART #	DESCRIPTION
173-4	P0765173-4	STEADY REST FINGER
173-5	P0765173-5	ADJUSTING SCREW
173-6	P0765173-6	T-BOLT M8-1.25 X 26



# Labels & Cosmetics (Front)

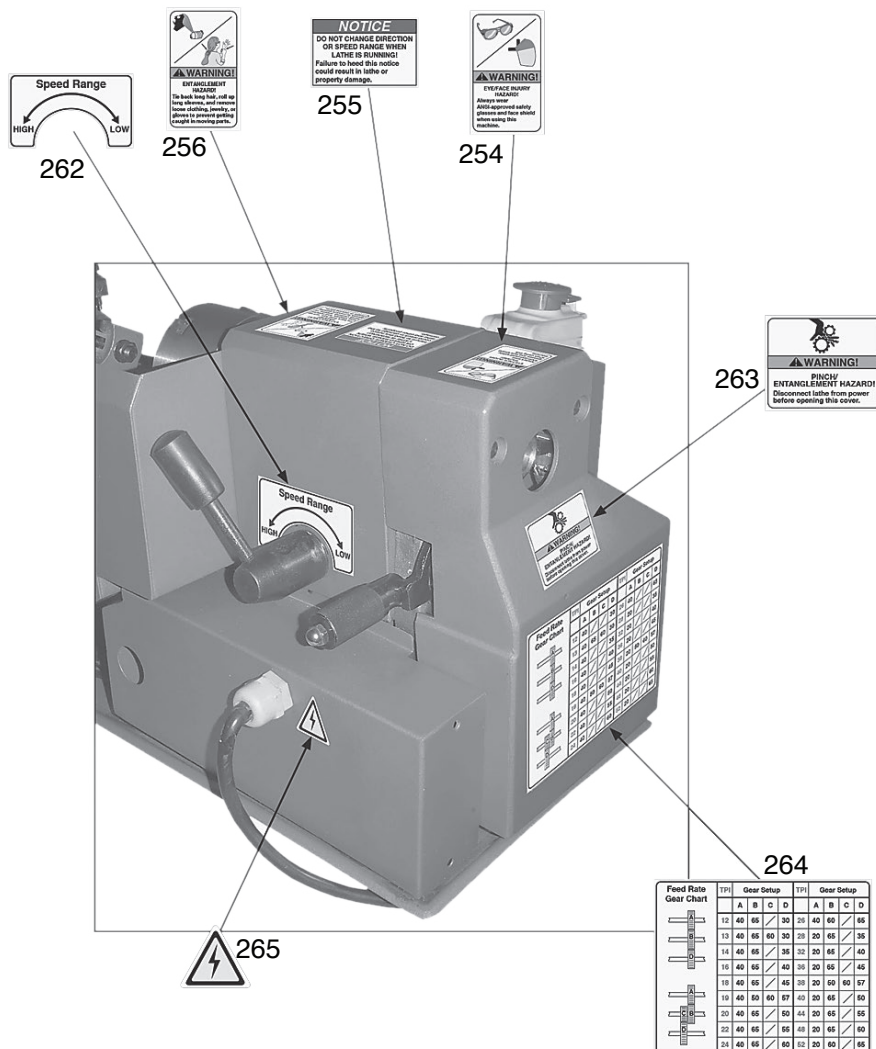


REF	PART #	DESCRIPTION
251	P0765251	MACHINE ID LABEL
252	P0765252	THREAD DIAL CHART LABEL
253	P0765253	READ MANUAL LABEL
254	P0765254	GLASSES/FACE SHIELD WARNING LABEL
255	P0765255	CHANGE DIRECTION NOTICE LABEL
256	P0765256	ENTANGLEMENT WARNING LABEL

REF	PART #	DESCRIPTION
257	P0765257	DRO LABEL
258	P0765258	SPINDLE SPEED WARNING LABEL
259	P0765259	GRIZZLY GREEN TOUCH-UP PAINT
260	P0765260	HALF NUT LEVER LABEL
261	P0765261	DISCONNECT POWER WARNING LABEL



# Labels & Cosmetics (Rear)



REF	PART #	DESCRIPTION
254	P0765254	GLASSES/FACE SHIELD WARNING LABEL
255	P0765255	CHANGE DIRECTION NOTICE LABEL
256	P0765256	ENTANGLEMENT WARNING LABEL
262	P0765262	SPEED RANGE LABEL

REF	PART #	DESCRIPTION
263	P0765263	OUTBOARD ENTANGLE WARNING LABEL
264	P0765264	THREAD CHART LABEL
265	P0765265	ELECTRICITY LABEL

## **⚠️ 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](http://www.grizzly.com).



# SECTION 10: APPENDIX

## Threading Charts

Inch and metric thread charts for the Model G0765 are provided below for your reference. An inch thread chart is provided on the headstock, but a metric chart is not.

TPI	GEARS				TPI	GEARS			
	A	B	C	D		A	B	C	D
12	40	65	/	30	26	40	60	/	65
13	40	65	60	30	28	20	65	/	35
14	40	65	/	35	32	20	65	/	40
16	40	65	/	40	36	20	65	/	45
18	40	65	/	45	38	20	50	60	57
19	40	50	60	57	40	20	65	/	50
20	40	65	/	50	44	20	65	/	55
22	40	65	/	55	48	20	65	/	60
24	40	65	/	60	52	20	60	/	65

Figure 101. Threads per inch chart (TPI).

mm/ pitch	Gear			
	A	B	C	D
0.4	20	57	40	55
0.5	20	57	45	50
0.6	20	60	57	50
0.7	30	45	40	60
0.8	40	55	35	50
1.0	30	60	57	45
1.25	45	40	35	50
1.5	65	40	35	60
1.75	35	60	57	30
2.0	35	45	65	40

Figure 102. Metric thread pitch chart.







# 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?

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

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 & 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.

# *grizzly.com*<sup>®</sup>

**TOOL WEBSITE**

Buy Direct and Save with Grizzly<sup>®</sup> – Trusted, Proven and a Great Value!  
~Since 1983~

*Visit Our Website Today For  
Current Specials!*

**ORDER  
24 HOURS A DAY!  
1-800-523-4777**



## Free Manuals Download Website

<http://myh66.com>

<http://usermanuals.us>

<http://www.somanuals.com>

<http://www.4manuals.cc>

<http://www.manual-lib.com>

<http://www.404manual.com>

<http://www.luxmanual.com>

<http://aubethermostatmanual.com>

Golf course search by state

<http://golfingnear.com>

Email search by domain

<http://emailbydomain.com>

Auto manuals search

<http://auto.somanuals.com>

TV manuals search

<http://tv.somanuals.com>