

# *Grizzly* **Industrial, Inc.**®

## **MODELS G0509 & G0509G**

### **16" x 40" LATHE**

#### **OWNER'S MANUAL**

*(For models manufactured since 03/12)*



**MODEL G0509G PROFESSIONAL  
GUNSMITH'S LATHE SHOWN**

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OR FORM WITHOUT THE WRITTEN APPROVAL OF GRIZZLY INDUSTRIAL, INC.**  
#CR9246 PRINTED IN CHINA



## **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.**

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# INTRODUCTION

## Contact Info

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

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

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

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


## Manual Accuracy

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

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

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

		MODEL GXXXX MACHINE NAME	
SPECIFICATIONS		▲ WARNING!	
Motor:		To reduce risk of serious injury when using this machine:	
Specification:		1. Read manual before operation.	
Specification:		2. Wear safety glasses and respirator.	
Specification:		3. Make sure machine is correctly adjusted/setup and	
Specification:		4. power is connected to grounded circuit before starting.	
Weight:		5. Make sure the motor has stopped and disconnect	
		6. power before adjustments, maintenance, or service.	
		7. DO NOT expose to rain or dampness.	
		8. DO NOT modify this machine in any way.	
		9. DO NOT use machine if you are tired, drowsy, or	
		10. affected by drugs or alcohol.	
		11. Maintain machine carefully to prevent accidents.	
Manufactured for Grizzly in Taiwan			





# MACHINE DATA SHEET

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

## MODEL G0509 16" X 40" LATHE

### Product Dimensions:

Weight..... 3100 lbs.  
Width (side-to-side) x Depth (front-to-back) x Height..... 76-3/8 x 33-7/16 x 51-3/16 in.  
Footprint (Length x Width)..... 76 x 21-1/2 in.

### Shipping Dimensions:

Type..... Wood Crate  
Content..... Machine  
Weight..... 3245 lbs.  
Length x Width x Height..... 64 x 81 x 36 in.

### Electrical:

Power Requirement..... 220V, 3-Phase, 60 Hz  
Prewired Voltage..... 220V  
Full-Load Current Rating..... 15.45A  
Minimum Circuit Size..... 20A  
Connection Type..... Cord & Plug  
Power Cord Included..... Yes  
Power Cord Length..... 6 ft.  
Power Cord Gauge..... 12 AWG  
Plug Included..... No  
Switch Type..... Magnetic Switch w/Thermal Overload Protection  
Recommended Phase Converter..... G7978

### Motors:

#### Main

Horsepower..... 4 HP / 3 HP  
Phase..... 3-Phase  
Amps..... 15A/10A  
Speed..... 3450 / 1725 RPM  
Type..... TEFC Induction  
Power Transfer ..... Belt Drive  
Bearings..... Shielded & Permanently Lubricated  
Centrifugal Switch/Contacts Type..... N/A

#### Coolant Pump

Horsepower..... 1/8 HP  
Phase..... 3-Phase  
Amps..... 0.45A  
Speed..... 3450 RPM  
Type..... TEFC Induction  
Power Transfer ..... Direct Drive  
Bearings..... Shielded & Permanently Lubricated  
Centrifugal Switch/Contacts Type..... N/A



## Main Specifications:

### Operation Info

Swing Over Bed.....	16 in.
Distance Between Centers.....	40 in.
Swing Over Cross Slide.....	10 in.
Swing Over Saddle.....	9-7/8 in.
Swing Over Gap.....	22 in.
Maximum Tool Bit Size.....	3/4 in.
Compound Travel.....	5-1/2 in.
Carriage Travel.....	33 in.
Cross Slide Travel.....	8-1/2 in.

### Headstock Info

Spindle Bore.....	2.0625 in.
Spindle Taper.....	MT#6
Number of Spindle Speeds.....	16
Spindle Speeds.....	45 – 1800 RPM
Spindle Type.....	D1-6 Camlock
Spindle Bearings.....	Tapered Roller
Spindle Length.....	20 in.
Spindle Length with 3-Jaw Chuck.....	25 in.
Spindle Length with 4-Jaw Chuck.....	25-1/8 in.

### Tailstock Info

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

### Threading Info

Number of Longitudinal Feeds.....	17
Range of Longitudinal Feeds.....	0.002 – 0.067 in./rev.
Number of Cross Feeds.....	17
Range of Cross Feeds.....	0.0011 – 0.0380 in./rev
Number of Inch Threads.....	45
Range of Inch Threads.....	2 – 72 TPI
Number of Metric Threads.....	39
Range of Metric Threads.....	0.2 – 14.0 mm
Number of Modular Pitches.....	18
Range of Modular Pitches.....	0.3 – 3.5 MP
Number of Diametral Pitches.....	21
Range of Diametral Pitches.....	8 – 44 DP

### Dimensions

Bed Width.....	10 in.
Carriage Leadscrew Diameter.....	1.120 in.
Leadscrew TPI.....	4 TPI
Carriage Leadscrew Length.....	54 in.
Steady Rest Capacity.....	4-7/8 in.
Follow Rest Capacity.....	2-7/8 in.
Faceplate Size.....	14 in.
Feed Rod Diameter.....	3/4 in.
Floor to Center Height.....	45 in.

### Construction

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



**Other Specifications:**

Country of Origin ..... China  
Warranty ..... 1 Year  
Approximate Assembly & Setup Time ..... 2 Hours  
Serial Number Location ..... ID Label on Front of Headstock  
ISO 9001 Factory ..... No  
Certified by a Nationally Recognized Testing Laboratory (NRTL) ..... No

**Features:**

Coolant System  
Foot Brake  
Full Length Splash Guard  
Halogen Light  
Headstock Gears Run in an Oil Bath  
Inch/Metric Dials  
Jog Button and Emergency Stop  
Precision-Ground V-Bed is Made of Meehanite Casting  
Threading Dial  
Totally Enclosed Universal Gearbox Allows Cutting of Inch, Metric, Whitworth, Module, and Diametral Threads

**Accessories Included:**

Center Sleeve  
Centers  
Follow Rest  
Manual  
MT#4 Dead Center  
Quick Change Tool Post  
Service Tools  
Steady Rest  
Toolbox  
#4 to 6 Morse Taper Spindle Nose Sleeve  
12" 4-Jaw Chuck  
14" Face Plate  
8" 3-Jaw Chuck





# MACHINE DATA SHEET

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

## MODEL G0509G 16" X 40" 3-PHASE GUNSMITHING METAL LATHE

### Product Dimensions:

Weight..... 2976 lbs.  
 Width (side-to-side) x Depth (front-to-back) x Height..... 76-3/8 x 33-7/16 x 51-3/16 in.  
 Footprint (Length x Width)..... 76 x 21-1/2 in.

### Shipping Dimensions:

Type..... Wood Crate  
 Content..... Machine  
 Weight..... 3300 lbs.  
 Length x Width x Height..... 33 x 81 x 66 in.  
 Must Ship Upright..... Yes

### Electrical:

Power Requirement..... 220V, 3-Phase, 60 Hz  
 Prewired Voltage..... 220V  
 Full-Load Current Rating..... 17.45A  
 Minimum Circuit Size..... 20A  
 Connection Type..... Cord & Plug  
 Power Cord Included..... No  
 Recommended Power Cord..... "S"-Type, 4-Wire, 12 AWG, 300 VAC  
 Plug Included..... No  
 Recommended Plug Type..... L15-30  
 Switch Type..... Control Panel w/Magnetic Switch Protection  
 Recommended Phase Converter..... G7978

### Motors:

#### Main

Horsepower..... 4 HP / 3 HP  
 Phase..... 3-Phase  
 Amps..... 17A/8.5A  
 Speed..... 1750 / 875 RPM  
 Type..... TEFC Induction  
 Power Transfer ..... Belt Drive  
 Bearings..... Shielded & Permanently Lubricated  
 Centrifugal Switch/Contacts Type..... N/A

#### Coolant Pump

Horsepower..... 1/8 HP  
 Phase..... 3-Phase  
 Amps..... 0.45A  
 Speed..... 3450 RPM  
 Type..... TEFC Induction  
 Power Transfer ..... Direct Drive  
 Bearings..... Shielded & Permanently Lubricated  
 Centrifugal Switch/Contacts Type..... N/A





## Main Specifications:

### Operation Info

Swing Over Bed.....	16 in.
Distance Between Centers.....	40 in.
Swing Over Cross Slide.....	10 in.
Swing Over Saddle.....	14-3/4 in.
Swing Over Gap.....	22 in.
Maximum Tool Bit Size.....	3/4 in.
Compound Travel.....	5-1/2 in.
Carriage Travel.....	33 in.
Cross Slide Travel.....	8-1/2 in.

### Headstock Info

Spindle Bore.....	2.0625 in.
Spindle Taper.....	MT#6
Number of Spindle Speeds.....	16
Spindle Speeds.....	45 – 1800 RPM
Spindle Type.....	D1-6 Camlock
Spindle Bearings.....	High-Precision Tapered Roller
Spindle Length.....	19-1/2 in.
Spindle Length with 3-Jaw Chuck.....	25-5/8 in.
Spindle Length with 4-Jaw Chuck.....	23-3/4 in.
Spindle Length with Faceplate.....	21-3/4 in.

### Tailstock Info

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

### Threading Info

Number of Longitudinal Feeds.....	17
Range of Longitudinal Feeds.....	0.002 – 0.067 in./rev.
Number of Cross Feeds.....	17
Range of Cross Feeds.....	0.0011 – 0.038 in./rev
Number of Inch Threads.....	45
Range of Inch Threads.....	2 – 72 TPI
Number of Metric Threads.....	39
Range of Metric Threads.....	0.2 – 14.0 mm
Number of Modular Pitches.....	18
Range of Modular Pitches.....	0.3 – 3.5 MP
Number of Diametral Pitches.....	21
Range of Diametral Pitches.....	8 – 44 DP

### Dimensions

Bed Width.....	10 in.
Carriage Leadscrew Diameter.....	1.120 in.
Leadscrew TPI.....	4 TPI
Carriage Leadscrew Length.....	54 in.
Steady Rest Capacity.....	1/2 – 4-1/2 in.
Follow Rest Capacity.....	1/2 – 2-1/2 in.
Faceplate Size.....	14 in.
Feed Rod Diameter.....	3/4 in.
Floor to Center Height.....	47 in.
Height With Leveling Jacks.....	53-1/2 in.



**Construction**

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

**Fluid Capacities**

Headstock Capacity..... 6.5 qt.  
Headstock Fluid Type..... ISO 32 (eg. Grizzly T23963, Mobil DTE Light)  
Gearbox Capacity..... 1.9 qt.  
Gearbox Fluid Type..... ISO 68 (eg. Grizzly T23962, Mobil Vactra 2)  
Apron Capacity..... 1.4 qt.  
Apron Fluid Type..... ISO 68 (eg. Grizzly T23962, Mobil Vactra 2)  
Coolant Capacity..... 15.85 qt.

**Other Specifications:**

Country of Origin ..... China  
Warranty ..... 1 Year  
Approximate Assembly & Setup Time ..... 2 Hours  
Serial Number Location ..... ID Label on Front of Headstock  
ISO 9001 Factory ..... No  
Certified by a Nationally Recognized Testing Laboratory (NRTL) ..... No

**Features:**

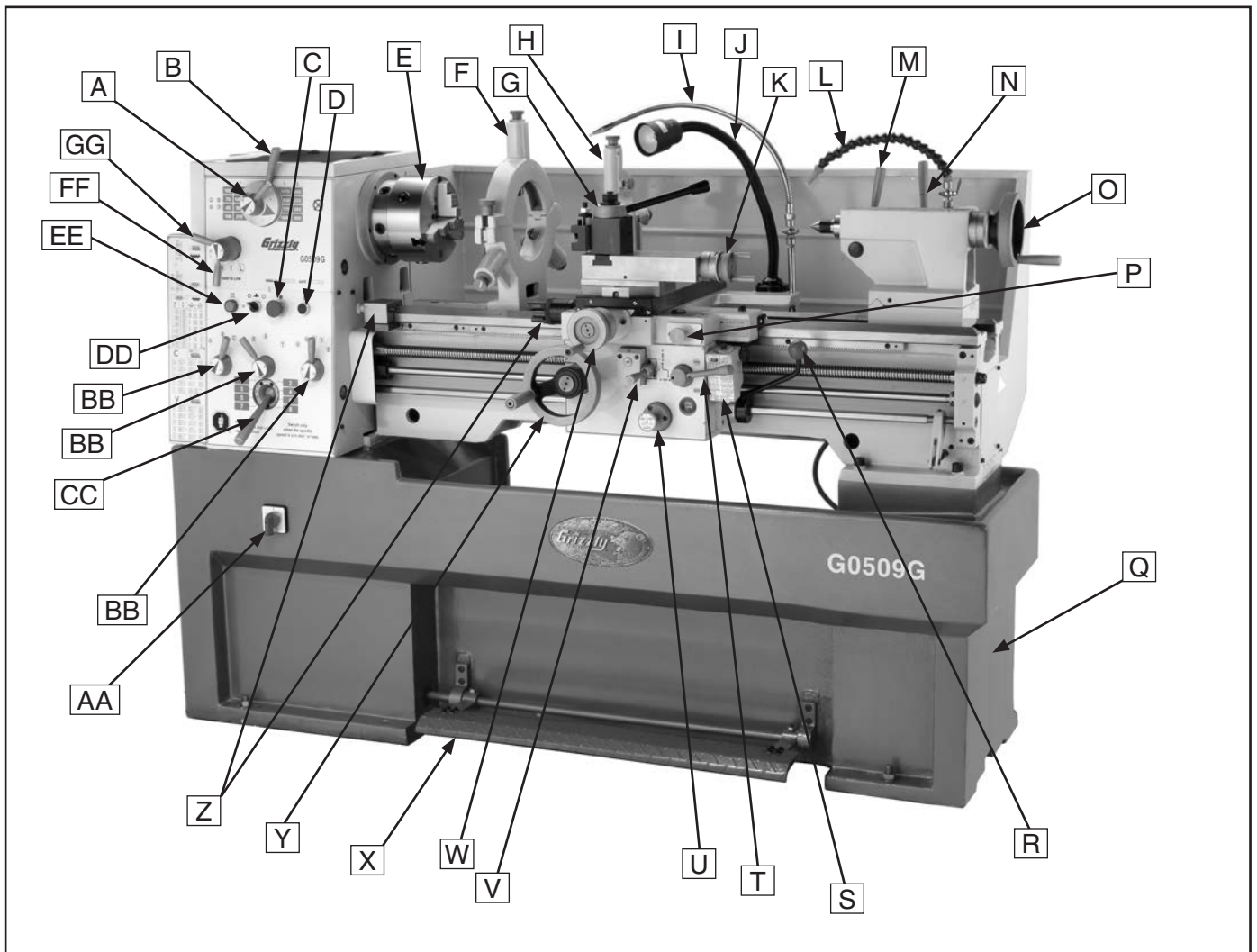
Totally Enclosed Universal Gearbox Allows Cutting of Inch, Metric, Whitworth, Modular and Diametral Threads  
Headstock Gears Run in an Oil Bath and are Hardened and Precision-Ground for Smooth, Quiet and Vibration-Dual Inch/Metric Dials  
Halogen Light  
Coolant System  
Full Length Splash Guard  
Steady Rest and Follow Rest have Roller Tips  
Dual Coolant Nozzles for Chambering Barrels  
Extra Long Tailstock for Support  
Tailstock can be Tightened with a Torque Wrench for Precise Alignment of Centers (1/2" SQ Drive)  
Four Brass Tipper Bolts for Supporting Gun Barrels  
Length Through Spindle with Face Plate Mounted - 21-3/4"  
Length Through Spindle with 4-Jaw Chuck Mounted - 24-7/16"  
Spindle Length - 20-1/2"  
Minimum Gun Barrel Length Through Spindle Using 4-Jaw Chuck 26"  
Precision-Ground and Hardened V-bed

**Accessories Included:**

#4 to 6 Morse Taper Spindle Nose Sleeve  
12" 4-Jaw Chuck  
14" Face Plate  
8" 3-Jaw Chuck  
Center Sleeve  
Centers  
Follow Rest with Roller Tips  
MT#4 Dead Center  
Quick Change Tool Post  
Service Tools  
Steady Rest with Roller Tips  
Toolbox



# Identification



**Figure 1.** Model G0509G identification.


- |  |  |
|--|--|
| <b>A.</b> Headstock Low/High Range Lever               | <b>R.</b> Spindle Rotation ON/OFF Lever              |
| <b>B.</b> Headstock Speed Lever                        | <b>S.</b> Threading Dial Assembly                    |
| <b>C.</b> Emergency Stop/RESET Button                  | <b>T.</b> Halfnut Lever                              |
| <b>D.</b> Inching/Jog Button                           | <b>U.</b> Apron Feed Direction Knob                  |
| <b>E.</b> 3-Jaw Chuck                                  | <b>V.</b> Feed Selector Lever                        |
| <b>F.</b> Steady Rest                                  | <b>W.</b> Cross Slide Handwheel & Inch/Metric Sleeve |
| <b>G.</b> Quick Change Tool Holder and Post            | <b>X.</b> Foot Brake                                 |
| <b>H.</b> Follow Rest                                  | <b>Y.</b> Apron Handwheel                            |
| <b>I.</b> Coolant Nozzle A                             | <b>Z.</b> Manual Micrometer Stop                     |
| <b>J.</b> Halogen Work Lamp                            | <b>AA.</b> Motor High/Low Range Switch               |
| <b>K.</b> Compound Rest Handwheel & Inch/Metric Sleeve | <b>BB.</b> Gearbox Ratio Levers                      |
| <b>L.</b> Coolant Nozzle B                             | <b>CC.</b> Gearbox speed range lever                 |
| <b>M.</b> Tailstock Barrel Lock Lever                  | <b>DD.</b> Pump ON/OFF Switch                        |
| <b>N.</b> Tailstock Lock Lever                         | <b>EE.</b> Power ON Lamp                             |
| <b>O.</b> Tailstock Handwheel                          | <b>FF.</b> Gearbox High/Low Range Lever              |
| <b>P.</b> Apron Hand Pump                              | <b>GG.</b> Leadscrew/Feed Rod Direction Lever        |
| <b>Q.</b> Coolant Pump and Tank Access Panel           |  |




# SECTION 1: SAFETY

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

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

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

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

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

**NOTICE** Alerts the user to useful information about proper operation of the machine to avoid machine damage.

### **WARNING**

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

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

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

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

#### **ELECTRICAL EQUIPMENT INJURY RISKS.**

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

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

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



# WARNING

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



# Additional Safety for Metal Lathes

## WARNING

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



# Glossary of Terms

---

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

**Arbor:** A machine shaft that supports a cutting tool.

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

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

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

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

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

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

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

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

**Gib:** A tapered wedge located along a sliding member to take up wear or to ensure a proper fit.

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

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

**Leadscrew:** The long screw that is driven by the end gears and supplies power to the carriage.

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

**Spindle:** The revolving shaft that holds and drives the workpiece.

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

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

**Turret:** A machine fixture that holds multiple tools and can be revolved and indexed to position.

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



# SECTION 2: CIRCUIT REQUIREMENTS

## 220V 3-Phase Operation

### **⚠️ WARNING**

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

### Full Load Amperage Draw w/Pump

G0509 Low-Sp: 3HP 220V 3-Ph ..... 11 Amps  
High-Sp: 4HP 220V 3-Ph ..... 16 Amps

G0509G Low-Sp: 3.8HP 220V 3-Ph .... 9.5 Amps  
High-Sp: 4.5HP 220V 3-Ph..... 18 Amps

### Circuit Requirements

We recommend connecting your machine to a dedicated and grounded circuit that is rated for the amperage given below. Never replace a circuit breaker on an existing circuit with one of higher amperage without consulting a qualified electrician to ensure compliance with wiring codes. **If you are unsure about the wiring codes in your area or you plan to connect your machine to a shared circuit, consult a qualified electrician.**

Minimum Circuit.....20 Amp

### 220V Connection Type

For 220V 3-phase connection of this lathe, we recommend wiring your machine with a L15-30 plug and receptacle. A qualified electrician should determine the best cord to use in your environment.

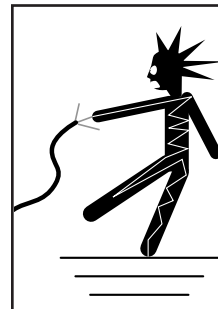
G0509 & G0509G 220V 3-Phase ..... L15-30

### Grounding

In the event of an electrical short, grounding reduces the risk of electric shock. The grounding wire in the power cord must be properly connected to the grounding prong on the plug; likewise, the outlet must be properly installed and grounded. All electrical connections must be made in accordance with local codes and ordinances.

### Extension Cords

We do not recommend the use of extension cords. Instead, arrange the placement of your equipment and the installed wiring to eliminate the need for extension cords.



### **⚠️ WARNING**

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

## Phase Converter

If your lathe is connected to a phase converter for 3-phase power, the power from the manufactured power leg (sometimes called the wild wire or manufactured leg) can fluctuate.

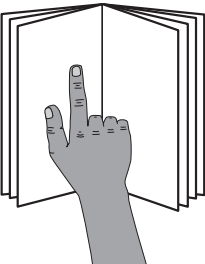
Make sure that when you connect the lathe to the phase converter that you connect the "Wild Wire" or the "Manufactured Leg" from the phase converter to the lathe input lead **L2**. Otherwise, your lathe may not start properly, and magnetic switch chatter and transformer damage will occur. If swapping motor rotation direction, swap **L1** & **L3**, but do not touch **L2**.



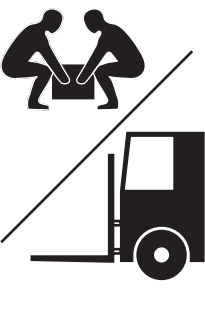


# SECTION 3: SETUP

## Setup Safety

	<p><b>⚠️ WARNING</b>            This machine presents serious injury hazards to untrained users. Read through this entire manual to become familiar with the controls and operations before starting the machine!</p>
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	<p><b>⚠️ WARNING</b>            Wear safety glasses during the entire setup process!</p>
---	--

	<p><b>⚠️ WARNING</b>  <b>HEAVY LIFT!</b>            Straining or crushing injury may occur from improperly lifting machine or some of its parts. To reduce this risk, get help from other people and use a forklift (or other lifting equipment) rated for weight of this machine.</p>
---	--

## Items Needed for Setup

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

Description	Qty
• Fork Lift or Hoist (Rated 5000 lbs.....)	1
• Lifting Straps (Rated 5000 lbs.....)	1
• Lifting Hooks (Rated 5000 lbs.....)	1
• Machinist's Level.....	1

## Unpacking

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

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

	<p><b>⚠️ WARNING</b>  <b>SUFFOCATION HAZARD!</b>            Keep children and pets away from plastic bags or packing materials shipped with this machine.</p>
---	---



# 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 2)	Qty.
A. 8" Three-Jaw Chuck w/External Jaws.....	1
B. Steady Rest.....	1
C. Quick Change Tool Post w/Tool Holder.....	1
D. Follow Rest.....	1

## Loose Components (Figure 3)

E. 12" Four-Jaw Universal Chuck.....	1
F. 14" Faceplate .....	1
G. Little Red Tool Box.....	1
H. Tool Holder (1 Installed).....	2
I. Wrench Set 6/7, 8/10, 9/11, 11/13, 12/14, 17/19, 22/24, and 27/30mm .....	1 ea
J. Camlock T-Wrench.....	1
K. Tool Holder/Apron Lock T-Wrench.....	1
L. 4-Jaw Chuck T-Wrench.....	1
M. 3-Jaw Chuck T-Wrench.....	1
N. 4-Jaw Chuck Camlock Studs .....	6
O. Oil Bottle.....	1
P. MT#6 to MT#4 Spindle Sleeve Adapter ....	1
Q. Cast-Iron Feet .....	6
R. Jacking Studs W/Nuts .....	6
S. Hex Wrench Set 2, 2.5, 3, 4, 5, 6, 8, 10, and 12mm .....	1 ea
T. Spider Screws .....	4
U. #2 Phillips Screwdriver.....	1
V. #2 Standard Screwdriver.....	1
W. Tailstock Lock Lever .....	1
X. Handwheel Handle Set .....	1 ea
Y. Carbide Tip Dead Center MT#4.....	1
Z. Standard Tip Dead Center MT#4.....	1
AA. Internal Jaws for Three-Jaw Chuck .....	3

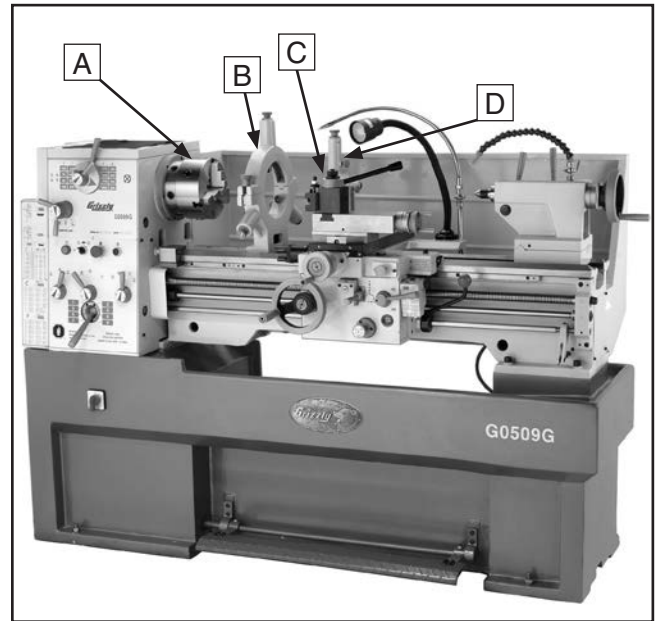


Figure 2. Installed components.

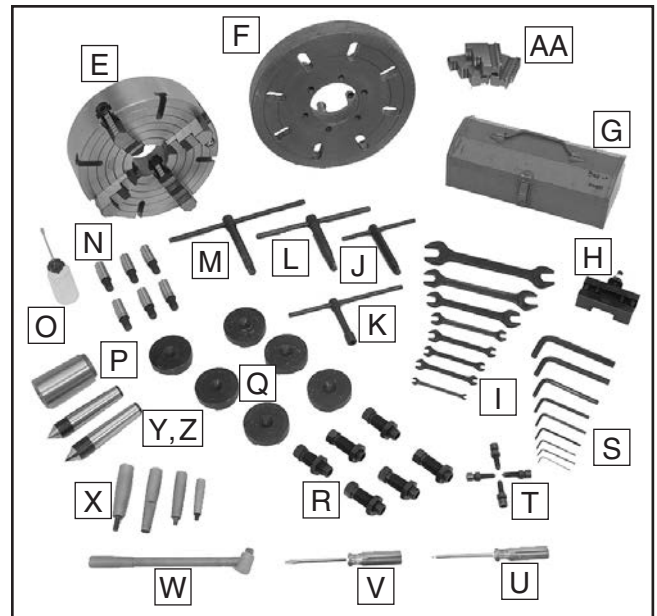


Figure 3. Packaged components.

## 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.



# Site Considerations

## Floor Load

Your lathe is a heavy load distributed in a small footprint. Place this machine on concrete floors only. The floor **MUST** be level, or the lathe frame and ways may distort over time.

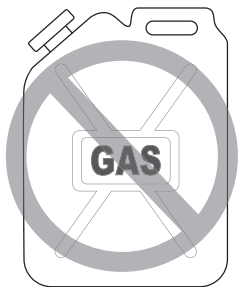
## Placement Location

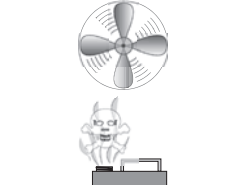
Consider existing and anticipated needs, service panel access, length of material to be loaded into the lathe, and space for auxiliary stands, work tables or other machinery when establishing a location for your lathe (see **Figure 4** for minimum wall clearances).

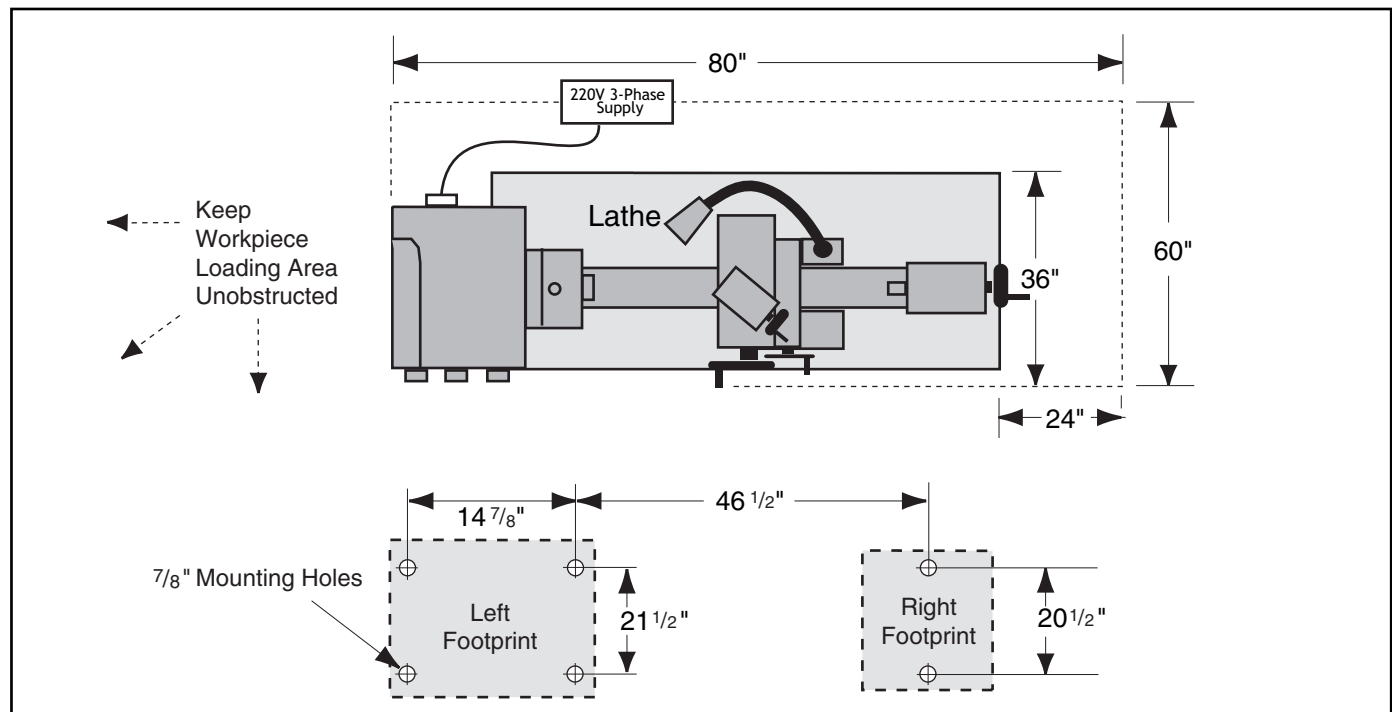
	<p><b>⚠ CAUTION</b></p> <p>Children and visitors may be seriously injured if unsupervised around this machine. Lock entrances to the shop or disable start switch or power connection to prevent unsupervised use.</p>
--	--

# Cleanup

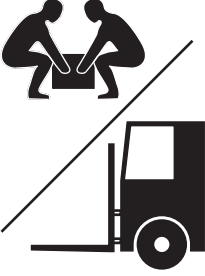
The unpainted surfaces are coated with a waxy oil to prevent corrosion during shipment. Remove this protective coating with a solvent cleaner or citrus-based degreaser such as Grizzly's G7895 Citrus Degreaser. To clean thoroughly, some parts must be removed.

	<p><b>⚠ WARNING</b></p> <p>Gasoline and petroleum products have low flash points and can explode or cause fire if used to clean machinery. Avoid using these products to clean machinery.</p>
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	<p><b>⚠ CAUTION</b></p> <p>Many cleaning solvents are toxic if inhaled. Only work in a well-ventilated area.</p>
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# Lifting & Moving the Lathe



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

This lathe can be placed on the included leveling studs and cast-iron feet. If the lathe must be secured to the floor, refer to a professional machine installer for options. In either case, the lathe must be sitting flat at each mounting point, and the ways must be perfectly level. The bed cannot be twisted or bent. If a misalignment condition arises, shim the lathe where it mounts to the floor, or adjust the feet studs until the bed and ways are in alignment as shown by precision machinist's levels.

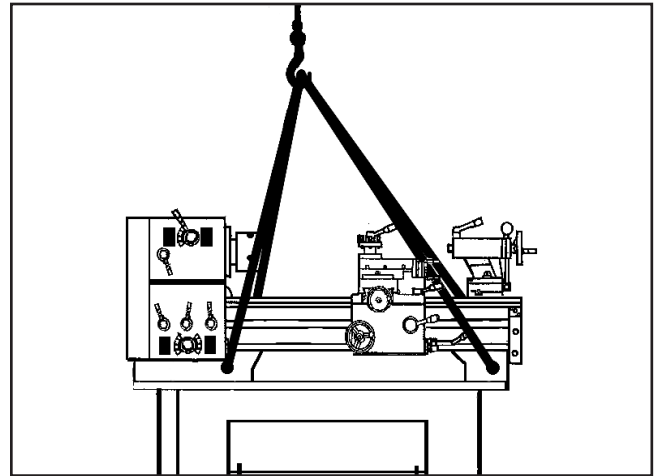
Make sure the slings or chains are routed so when the lathe is lifted and the chains or straps are tight, the control rod, leadscrew, or feed rod are not bent. Remember, the headstock carries most of the weight of this machine (see **Figure 5**) for safe chain or strap routing and connection.



**Figure 5.** Lifting rod setup for the lathe.

Double check weight ratings and connections of the lifting system, cables, chains pins, and clevis links before lifting and moving the lathe to your prepared location. Do not attempt to lift or move this lathe if you are unsure about any aspect. Seek assistance from a professional rigger if required.

When lifting, you must move the carriage and tailstock to the right and lock into place as shown in **Figure 6** to provide counter-balance.



**Figure 6.** Lifting strap locations.



# Mounting to Shop Floor

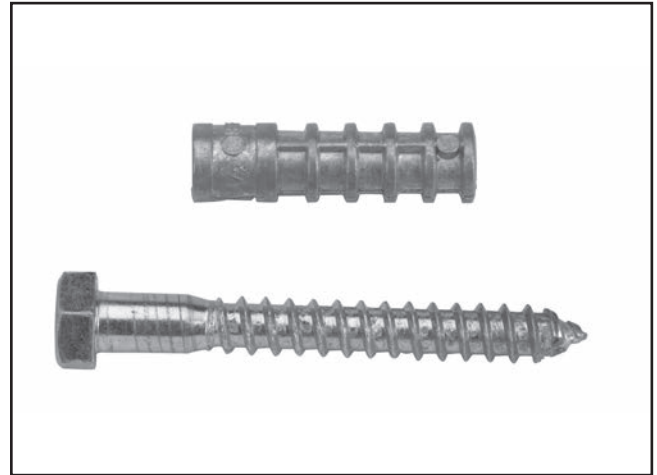
Anchoring machinery to the floor prevents tipping or shifting and reduces vibration that may occur during operation, resulting in a machine that runs slightly quieter and feels more solid.

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

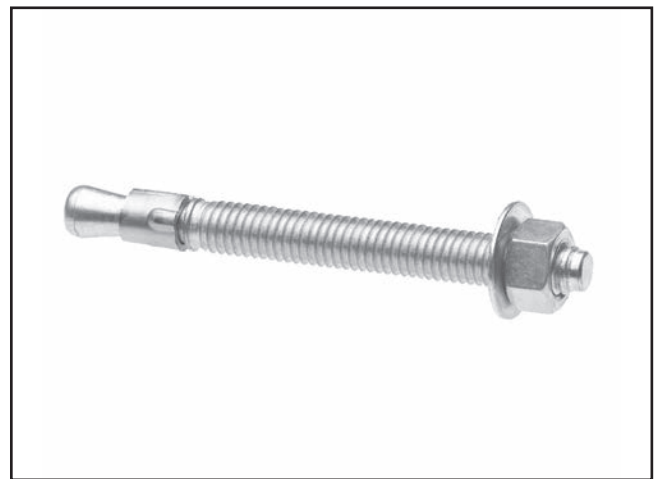
If not required by any local codes, fastening the machine to the floor is an optional step. If you choose not to do this with your machine, we recommend placing it on machine mounts, as these provide an easy method for leveling and they have vibration-absorbing pads.

## Anchoring to Concrete Floors

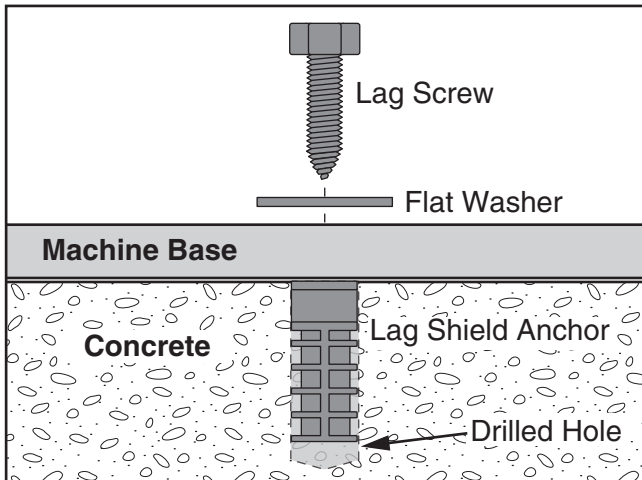
Lag shield anchors with lag screws (see below) are a popular way to anchor machinery to a concrete floor, because the anchors sit flush with the floor surface, making it easy to unbolt and move the machine later, if needed. However, anytime local codes apply, you **MUST** follow the anchoring methodology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



**Figure 8.** Typical lag shield anchor and lag bolt.



**Figure 9.** Typical anchor stud.



**Figure 7.** Popular method for anchoring machinery to a concrete floor.



# Test Run & Break-In

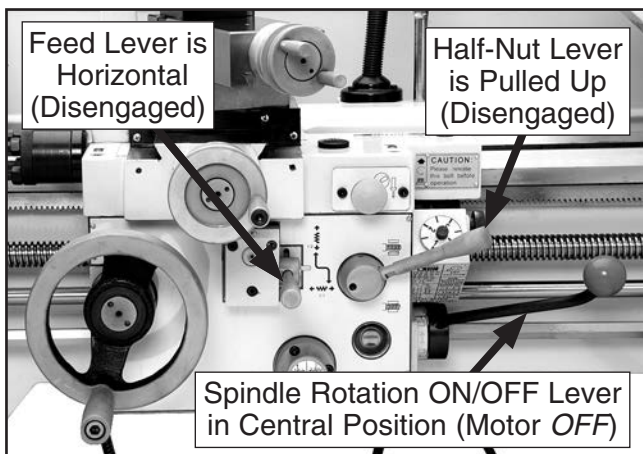
## NOTICE

**NEVER** shift lathe gears when lathe is operating, and make sure both the half-nut lever and the feed lever are disengaged before you start the lathe! Otherwise the lathe will feed the apron into the chuck or tailstock, causing severe lathe damage.

The purpose of the test run is to make sure the lathe and its safety features operate correctly. If you encounter any problems, stop the lathe and refer to **Troubleshooting** on **Page 43** for corrections.

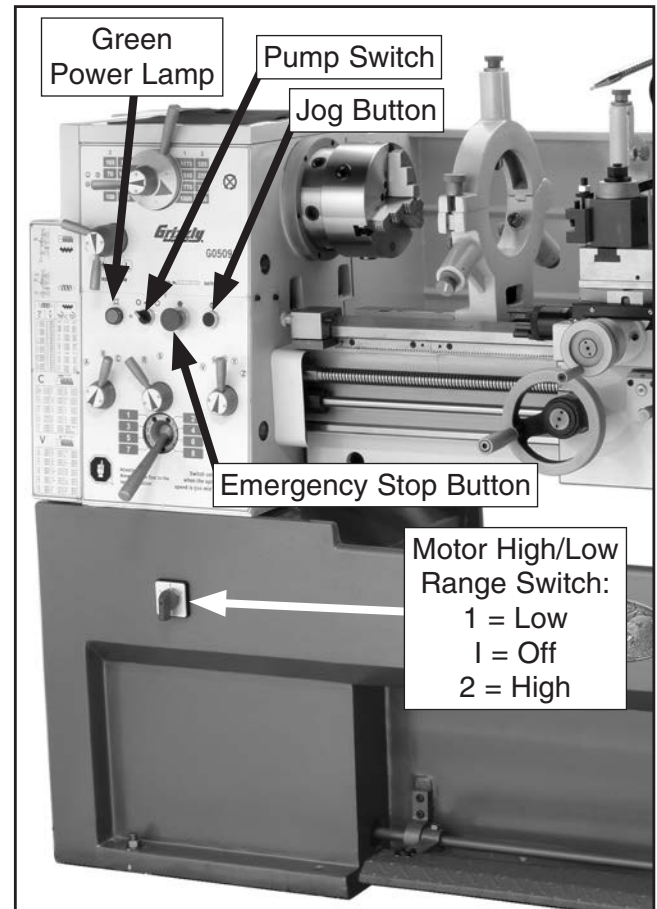
### To begin the test run & break-in procedure:

1. Make sure the lathe is lubricated and the headstock oil level is full. Refer to **Lubrication** on **Page 40**.
2. Make sure the chuck is correctly secured to the spindle. Refer to **Chuck & Faceplate Mounting** on **Page 35** for details.
3. Disengage the feed and half-nut levers, and move the spindle ON/OFF lever to the neutral position, as shown in **Figure 10**.



**Figure 10.** Apron controls positioned for test run.

4. Twist the red emergency stop button (**Figure 11**) clockwise so it pops out.

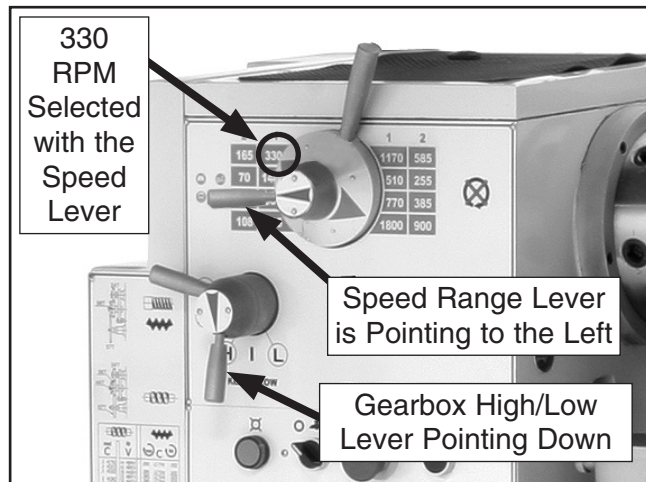


**Figure 11.** Motor high/low range switch.

5. On the G0509G lathe, make sure the four spider bolts are either removed or they are tight in the spindle so they will not rattle out and contact the lathe end cover, causing damage when the lathe is running.
6. Make sure the pump switch (**Figure 11**) is in the OFF position, then turn the motor high/low range switch to "1". The green power lamp will glow.
7. Put on safety glasses, and tie back long hair, sleeves, and loose clothing.
8. Turn the work lamp **ON** and **OFF** to ensure it works correctly.
9. Point the coolant nozzles into the chip pan, turn the pump switch **ON**, make sure coolant flows, and then turn the pump switch **OFF**.



10. Push the jog button (**Figure 11**). The spindle motor will turn **ON** and the chuck will rotate.
11. Move the three headstock levers so they are positioned as shown in **Figure 12**. This will select a spindle speed of 330 RPM.



**Figure 12.** Headstock controls.

12. Move the spindle rotation ON/OFF lever (**Figure 10**) down until the chuck begins to turn. The top of the chuck should turn toward you.

—If the chuck is rotating away from you, then you must complete the **Changing Motor Rotation** procedure on **Page 22**, and repeat the entire **Test Run** procedure.

13. Push the emergency stop button.

—If the lathe *does not* stop, move the spindle rotation ON/OFF lever to the central position (OFF), and disconnect the lathe from power. Refer to **Troubleshooting** on **Page 43** for correction.

14. Return the spindle rotation ON/OFF lever to the central position (OFF), reset the emergency stop button, and restart the lathe.
15. Press down on the foot brake, and the lathe should come to a quick stop.

—If the lathe *does not* stop, push the emergency stop button, and disconnect the lathe from power. Refer to **Troubleshooting** on **Page 43** for correction.

16. Return the spindle rotation ON/OFF lever to the center position, restart the lathe, and let the lathe run for a minimum of 10 minutes at 330 RPM in both directions. **DO NOT LEAVE THE LATHE RUNNING UNATTENDED!**

17. After 10 minutes, stop the lathe, and move the headstock speed levers to select the next highest RPM. Run the lathe in both directions for 10 minutes.

18. Repeat for the remaining RPM ranges progressively increasing in RPM. When these steps are complete, the lathe is broken in.

19. Drain and refill the lubricant in the headstock. Refer to **Lubrication** on **Page 40** for the procedure and apron oil change interval.



# Changing Motor Rotation

If the chuck turns up and away from you when the spindle lever is in the down position, phase polarity must be reversed. This is done by swapping the position of two of the three incoming power supply wires at the junction box.

## To reverse phase polarity:

1. DISCONNECT LATHE FROM POWER!
2. Remove the junction box cover at the rear of the lathe and swap **L1** and **L3** input wires (see **Figure 13**).
3. Replace the junction box cover.

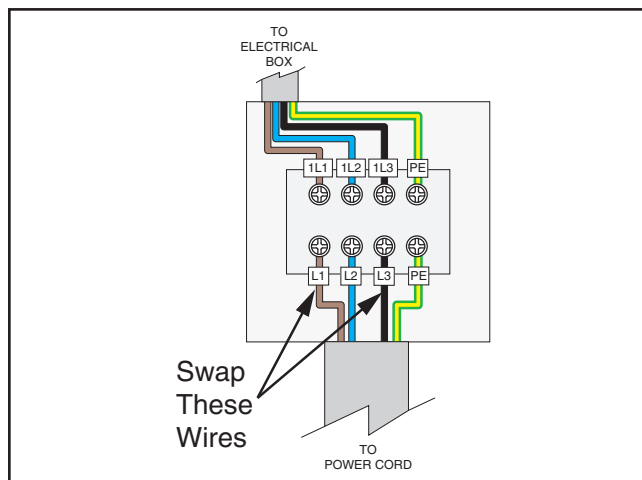
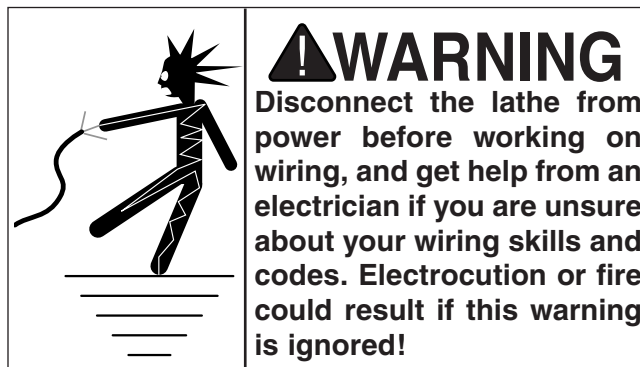


Figure 13. Location of L1 and L3 input wires.





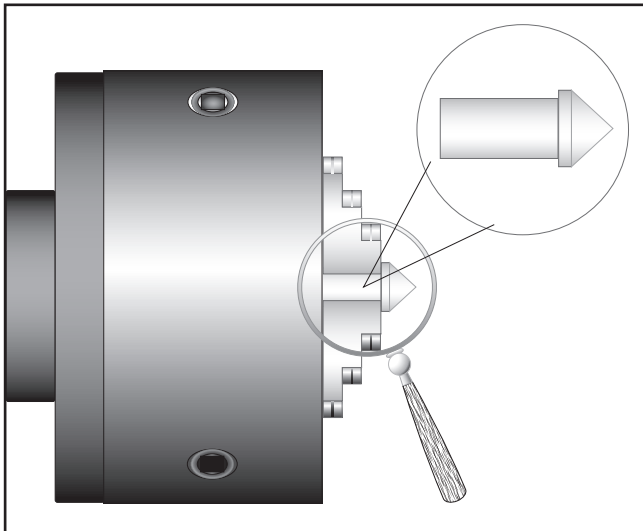
# Tailstock Setup

The tailstock alignment was set at the factory with the headstock. However, we recommend that you take the time to ensure that the tailstock is aligned to your own desired tolerances.

## To align the tailstock:

1. Center drill a 6" long piece of bar stock on both ends. Set it aside for use in **Step 4**.
2. Make a dead center by turning a shoulder to make a shank. Flip the piece over in the chuck and turn a 60° point (**Figure 14**). As long as it remains in the chuck, the point of your center will be accurate to the spindle axis.

**Note:** Keep in mind that the point will have to be refinished whenever it is removed and returned to the chuck.



**Figure 14.** Finished dead center.

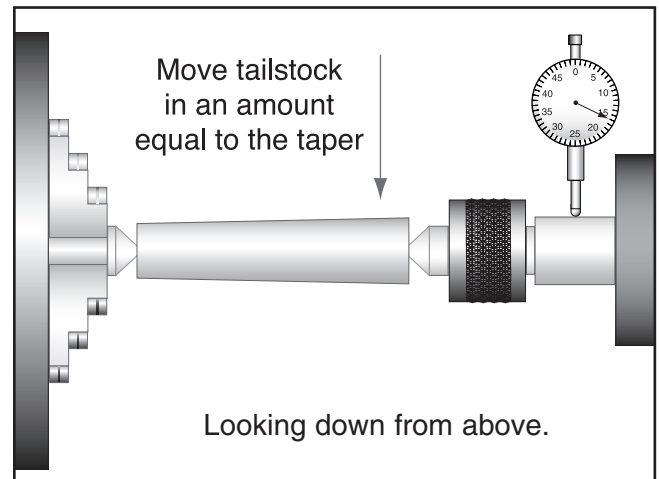
3. Place the dead center in your tailstock.

4. Attach a lathe dog to the bar stock from **Step 1** and mount it between the centers (as shown in **Figure 15**).



**Figure 15.** Bar stock mounted on centers.

5. Turn approximately 0.010" off the diameter.
6. Mount a dial indicator so that the plunger is on the tailstock barrel (**Figure 16**).

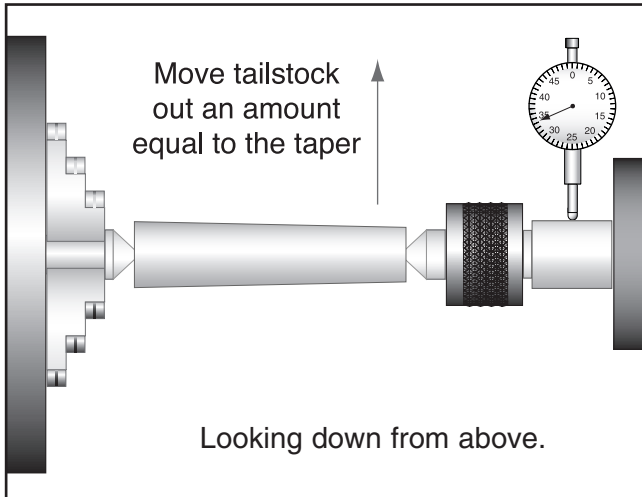


**Figure 16.** Adjusting for headstock end taper.

7. Measure the stock with a micrometer. If the stock is wider at the tailstock end, the tailstock needs to be moved toward the cutter the amount of the taper (**Figure 16**).



- If the stock is thinner at the tailstock end, the tailstock needs to be moved away from the operator by at least the amount of the taper (**Figure 17**).

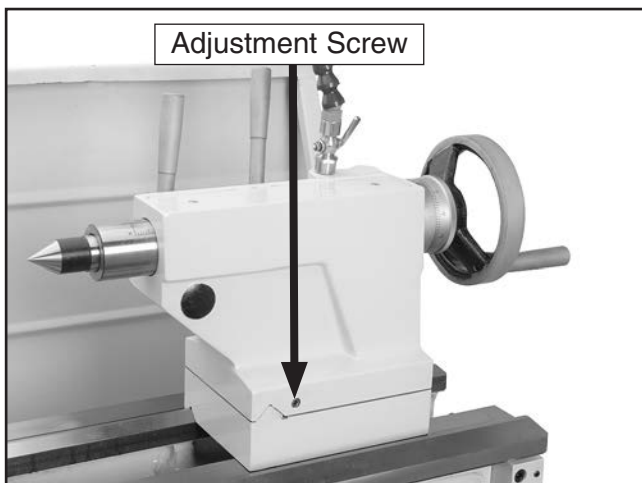


**Figure 17.** Adjusting for tailstock end taper.

## NOTICE

**DO NOT** forget to lock the tailstock to the ways after each adjustment.

8. Loosen the tailstock lock lever and adjust the tailstock offset by the amount of the taper by turning the adjustment set screw (**Figure 18**). Turn another 0.010" off of the stock and check for taper. Repeat as necessary until the desired amount of accuracy is achieved.



**Figure 18.** Tailstock adjustment locations.

# Gap Removal

Your lathe has a gap section below the spindle that can be removed for turning large diameter parts. This gap was installed, then ground at the factory during lathe assembly for precise fit and alignment. Factors during original lathe assembly apply additional forces to the gap; therefore, replacing the gap to the original position will be very difficult. **We don't recommend removing the gap. If removed for turning large diameter parts, reinstallation to exact factory alignment is nearly impossible. The only option is to then leave the gap out and lose carriage travel near the chuck.**

**To remove the gap:**

1. Remove the four cap screws from the bottom of the gap and two from the ends of the ways (see **Figure 19**).



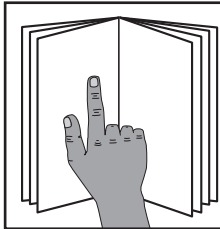
**Figure 19.** Lathe gap and pin arrangement.

2. Using a 14mm wrench, tighten the jack nuts to draw the pins up and out of the gap piece. **Figure 19.**
3. Tap the outside of the gap with a dead blow hammer to loosen, and remove the gap section.



# SECTION 4: OPERATION

## Operation Safety

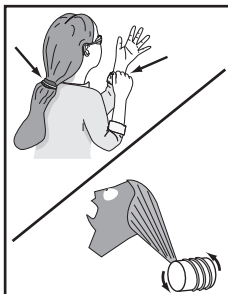
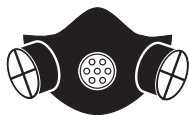


### **!WARNING**

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

### **!WARNING**

Eye injuries, respiratory problems, or hearing loss can occur while operating this tool. Wear personal protective equipment to reduce your risk from these hazards.



### **!WARNING**

Keep hair, clothing, and jewelry away from moving parts at all times. Entanglement can result in death, amputation, or severe crushing injuries!

### **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.

### **NOTICE**

**NEVER** move levers while the lathe is running, and **NEVER** force any lever when shifting.

### **NOTICE**

Complete the Test Run & Break-In procedure on Page 20 before using this lathe for any cutting or threading operations; otherwise, gear box damage will occur.



# Spindle Speeds

The spindle speed or RPM is controlled by two speed control levers at the top of the headstock and the 2-speed motor switch located on the lathe base (Figure 20). The 2-speed motor allows for the low and high range speed options presented in columns 1 and 2 shown in Figure 20. Below is an example how to set the spindle to 1800 RPM.

See Figure 20 for the following example:

1. Move the 2-speed motor switch so it points to position 1.

**Note:** Position "1" on the switch activates both #1 columns on the speed chart.

Position "2" activates both #2 columns on the speed chart.

Position "I", the central position on the switch, cuts power to the motor.

2. Move the spindle orange/blue range lever so it points to the right-hand orange-low range column number 1.

**Note:** The spindle orange/blue range lever must point to which ever range column your RPM is listed in.

3. Move the spindle speed lever so the indicator points to 1800 at the bottom of the orange column number 1.

**Note:** The spindle speed lever must point to one of four speeds within the column in question.

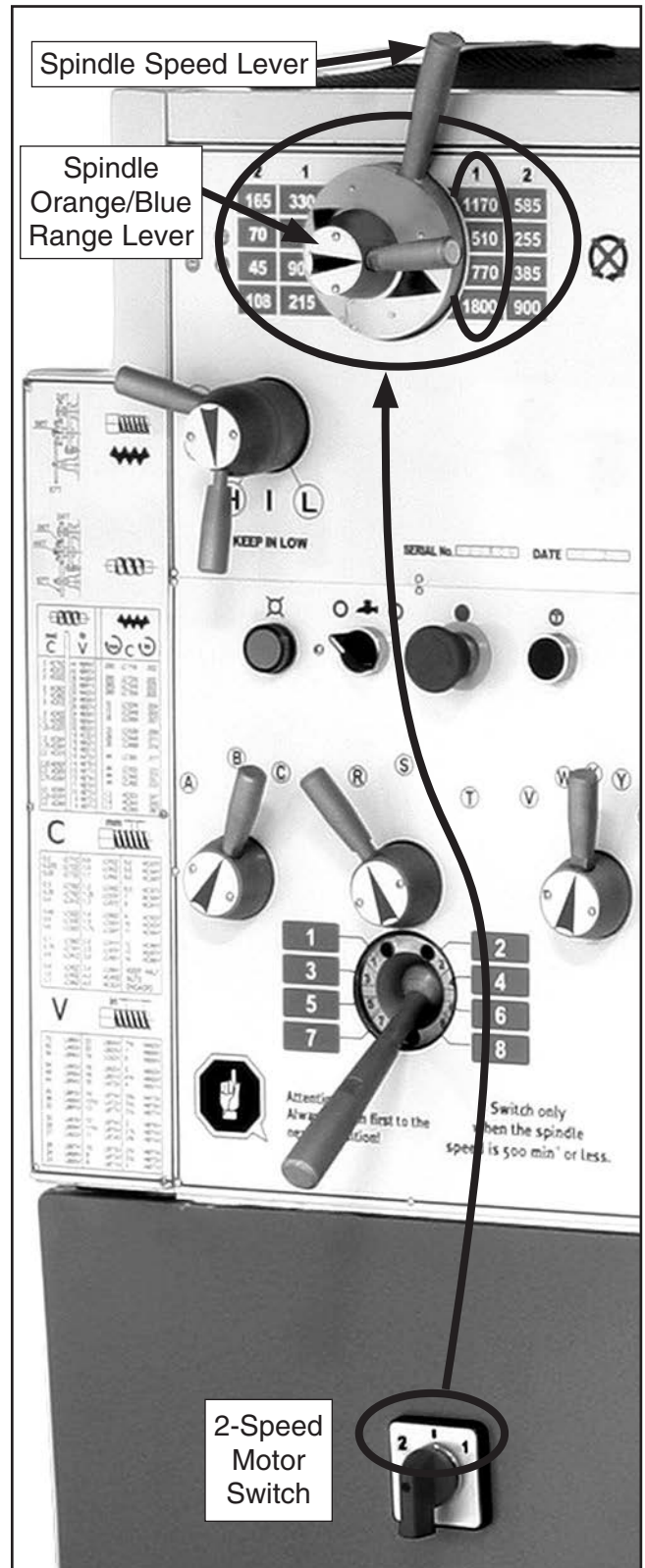


Figure 20. Spindle speed control.



# Gearbox Speed Range lever

## NOTICE

**ONLY** shift the gearbox levers when spindle speed is less than 500 RPM and the gearbox speed range lever is in neutral. **NEVER** force a lever. If the lever will not engage, use the jog button when applicable so the teeth mesh and the lever drops into position.

The gearbox has a series of levers used for controlling the feed rod and leadscrew feed rates in relationship with the spindle speed. Based on the threading and feed rate chart, you can shift the gearbox to accommodate an elaborate array of feed rates.

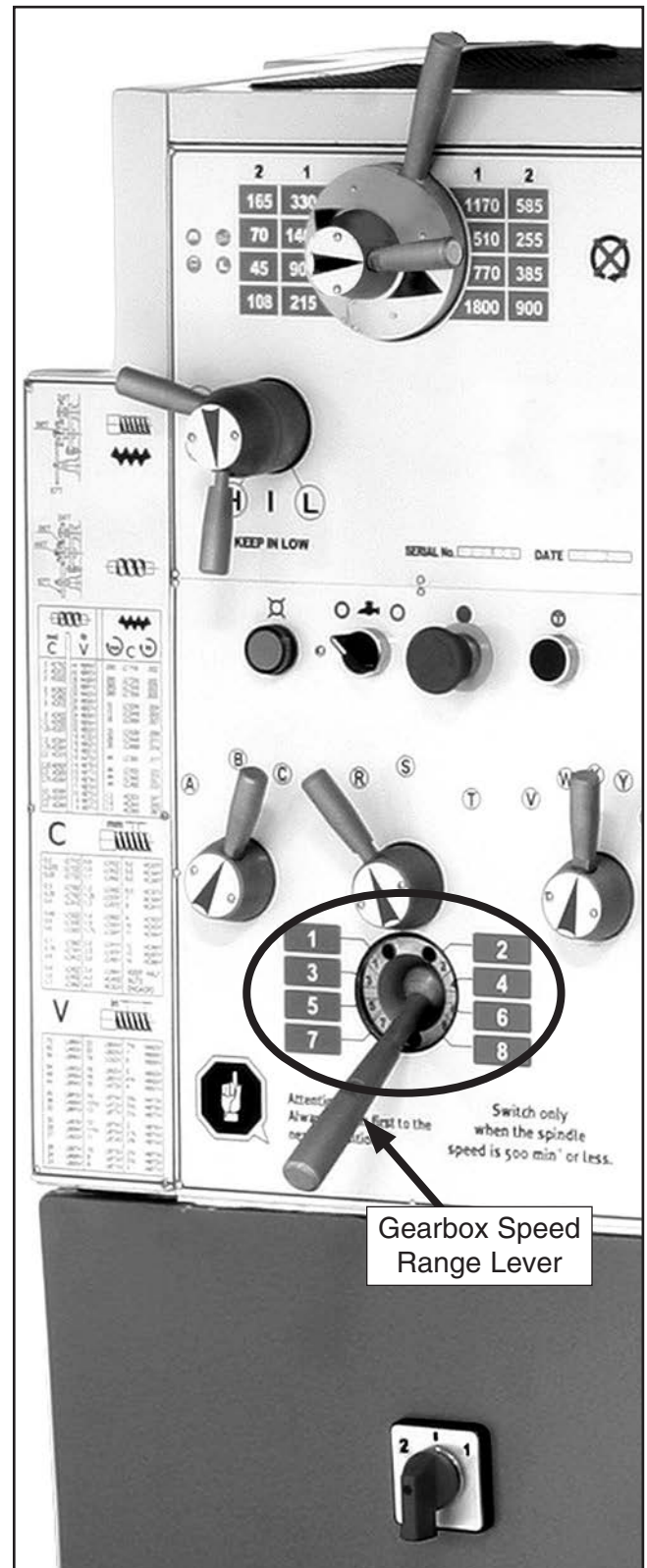


Figure 21. Gearbox controls.



# Feed Rod and Leadscrew

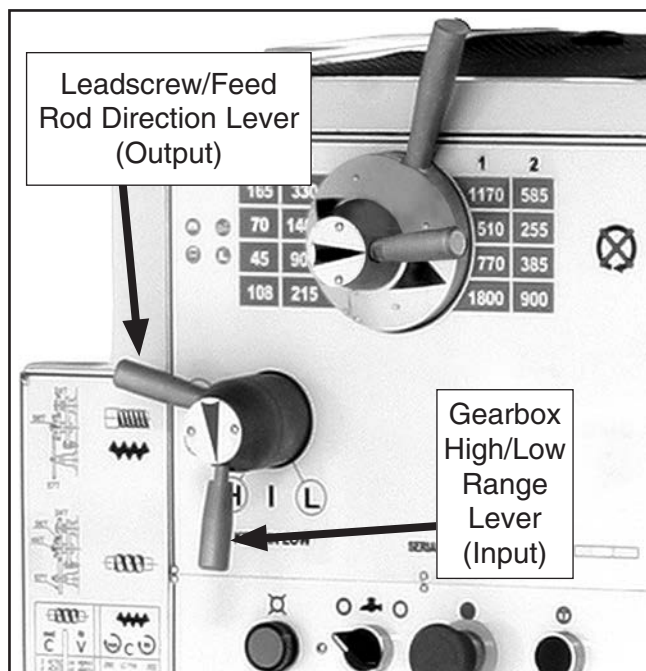
## NOTICE

**ONLY** shift the gearbox levers when spindle speed is less than 500 RPM and the gearbox speed range lever is in neutral. **NEVER** force a lever. If the lever will not engage, use the jog button when applicable so the teeth mesh and the lever drops into position.

The leadscrew/feed rod lever (**Figure 22**) engages and disengages the leadscrew and feed rod simultaneously. When the lever is moved up or down, the rotation of the leadscrew and feed rods are simultaneously reversed.

The three-position gearbox high/low range lever (**Figure 22**) will put the gearbox into high range "H", low range "L", or neutral "I".

**Note:** Make sure to loosen the carriage lock (**Figure 29**) when apron power feed or threading are to be used. The carriage lock is used only to increase carriage stability when facing operations are in process.



**Figure 22.** Gearbox input and output controls.

# Gearbox Ratio Levers

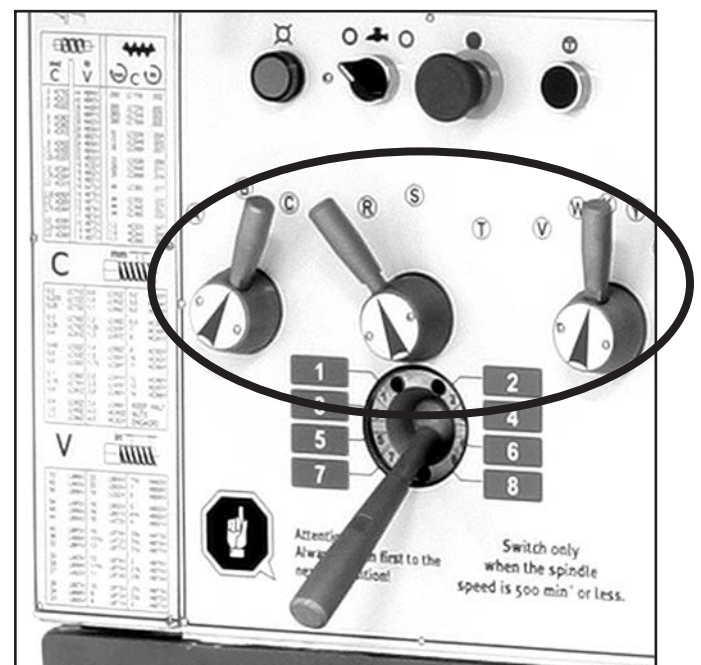
## NOTICE

**ONLY** shift the gearbox levers when spindle speed is less than 500 RPM and the gearbox speed range lever is in neutral. **NEVER** force a lever. If the lever will not engage, use the jog button when applicable so the teeth mesh and the lever drops into position.

The gearbox has a series of levers used for controlling the feed rod and leadscrew feed rates in relationship with the spindle speed.

Based on the threading and feed rate chart, you can shift the gearbox to accommodate an elaborate array of feed rates. The three gearbox range levers (**Figure 23**) have multiple lettered positions (**Figure 25**), and when moved according to the threading chart and example on the next page, you can quickly change the feed rate. The example on the next page shows the lathe setup to cut a "3.5mm" thread using the "LCR8Y" lever combination.

**Note:** The change gear must be in the position shown in **Figure 24**.



**Figure 23.** Gearbox range levers.



mod C	dp V	mm	ins
.3 HCR6Z	44 HBR4V	.050	LCT1W .002
.4 HCS1Z	40 HBR3V		
.5 HCS3Z	36 HAS6V	.055	LCT2W .0022
	32 HBR1V	.065	LCT4W .003
.6 HCS6Z	30 HAS3V	.085	LCT8W .0033
.7 HCS8Z	28 HBS8V		
.8 HCR1Z	26 HBS7V	.10	LCS2W .004
	24 HBS6V	.13	LCS4W .005
.9 HCR2Z	22 HBS4V	.18	LCS8W .007
1.0 HCR3Z	20 HBS3V	.22	LCR2W .009
1.25 HCS3Y	19 HCS2V	.28	LCR4W .011
1.5 HCS6Y	18 HBS2V	.35	LCR8W .014
1.75 HCS8Y	16 HBS1V	.44	LCS8X .017
2.0 HCS1Y	15 HAT3V		
2.25 HCR2Y	14 HBT8V	.44	LCR2X .022
2.5 HCR3Y	13 HBT7V	.44	LCR4X .027
2.75 HCR4Y	12 HBT6V	.44	LCR8X .033
3.0 HCR6Y	11 HBT4V		
3.25 HCR7Y	10 HBT3V	1.2	HCS2X .047
3.5 HCR8Y	9 HBT2V	1.4	HCS4X .055
	8 HBT1V	1.7	HCS8X .067

C		mm			
0.2	LCT1Z	0.9	LCR2Z	5.0	HCS3Y
0.225	LCT2Z	1.0	LCR3Z	5.5	HCS4Y
0.25	LCT3Z	1.1	LCR4Z	6.0	HCS5Y
0.3	LCT6Z	1.2	LCR6Z	6.5	HCS7Y
0.35	LCT8Z	1.25	LCS3Y	7	HCS8Y
0.4	LCS1Z	1.3	LCR7Z	8	HCR1Y
0.45	LCS2Z	1.4	LCR8Z	9	HCR2Y
0.5	LCS3Z	1.5	LCS6Y	10	HCR3Y
0.6	LCS6Z	1.75	LCS8Y	11	HCR4Y
0.7	LCS8Z	2.0	LCR1Y	12	HCR6Y
0.75	LCT6Y	2.5	LCR3Y	13	HCR7Y
0.8	LCR1Z	3.0	LCR7Y	14	HCR8Y
0.9	LCR2Z	3.5	LCR8Y	KEEP HALF	
1.0	LCR3Z	4.0	HCR3Z	NUTS	
1.1	LCR4Z	4.5	HCS2Y	ENGAGR	

V		in			
72	LAR6V	22	LBS4V	7 1/2	HAS3V
60	LAR3V	20	LBS3V	7	HBS8V
56	LBR8V	19	LCS2V	6	HBS6V
54	LAR2V	18	LBS2V	5	HBS3V
48	LBR6V	16	LBS1V	4 1/2	HBS2V
44	LBR4V	15	LAT3V	4	HBS1V
40	LBR3V	14	LBT8V	3 3/4	HAT3V
36	LAS6V	13 1/2	LAT2V	3 1/2	HBT8V
32	LBR1V	13	LBT7V	3 1/4	HBT7V
30	LAS3V	12	LBT6V	3	HBT6V
28	LBS8V	11 1/2	LBT5V	2 7/8	HBT5V
27	LAS2V	11	LBT4V	2 3/4	HBT4V
26	LBS7V	10	LBT3V	2 1/2	HBT3V
24	LBS6V	9	LBT2V	2 1/4	HBT2V
23	LBS5V	8	LBT1V	2	HBT1V

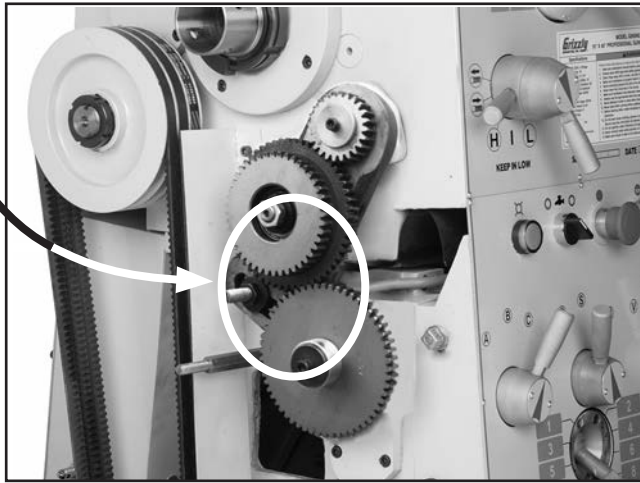


Figure 24. Change gear location.

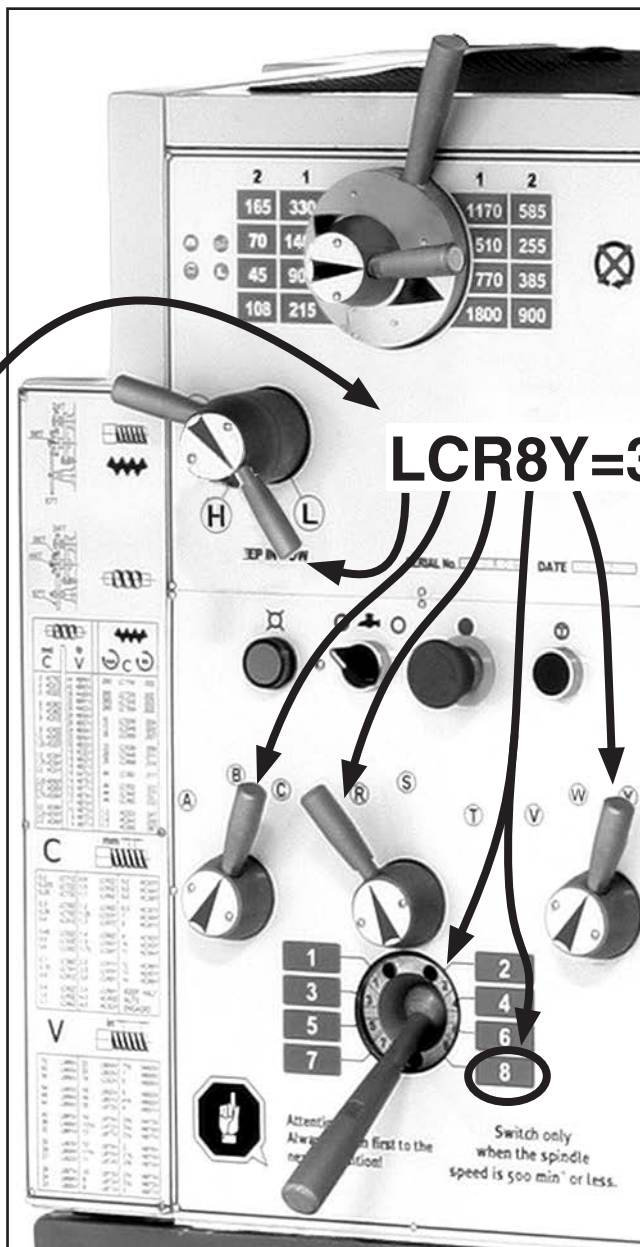


Figure 25. General usage.



# Manual Feed Handwheels

## Carriage Handwheel

The carriage handwheel (**Figure 26**) moves the carriage left or right along the bed. Remember the carriage lock must be loosened to allow for carriage movement during manual and power fed operations.

## Compound Slide Handwheel

The compound slide handwheel can adjust the cross slide at any angle. Angle adjustment is locked by two cap screws on the base of the top slide. The graduated dial can be rotated to read metric or inch conventions by turning it 180° degrees by holding the handwheel with one hand and turning the dial hub with the other.

## Cross Slide Handwheel

The cross slide handwheel moves the cross slide toward and away from the work. Turning the dial clockwise moves the slide toward the workpiece. The graduated dial can be rotated to read metric or inch conventions by turning it 180° degrees by holding the handwheel with one hand and turning the dial hub with the other.

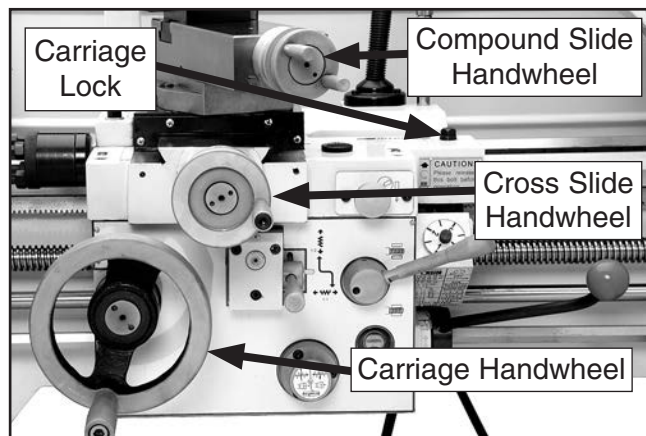


Figure 26. Handwheel locations.

# Power Feed Direction Knob

Your lathe can cut left or right while feeding or in and out when facing. The feed direction is controlled by the feed direction knob shown in **Figure 27**.

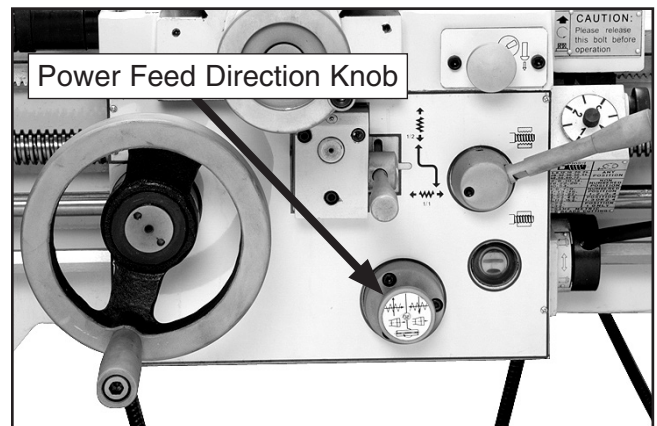


Figure 27. Feed direction knob.

# Tool Post & Holder

Cutting tools can be secured and removed by tightening or loosening the clamping screws in the top of the tool holder (**Figure 28**). A threaded stud is mounted in the top of the holder and has a knurled thumb wheel. Rotating the thumb wheel raises or lowers the tool holder so the cutting tool can be indexed on the workpiece. The handle on the tool post is rotated to lock and unlock the tool holder, which rests in the dovetail ways. The tool post may be rotated by loosening the nut at the top of the tool post.

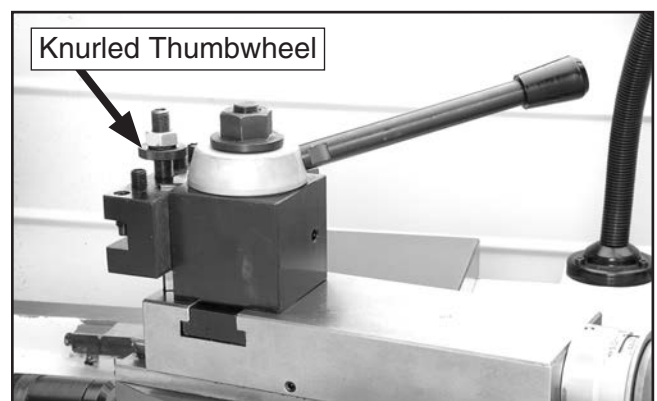


Figure 28. Quick change tool post.

Models G0509 & G0509G (Mfd. Since 3/12)





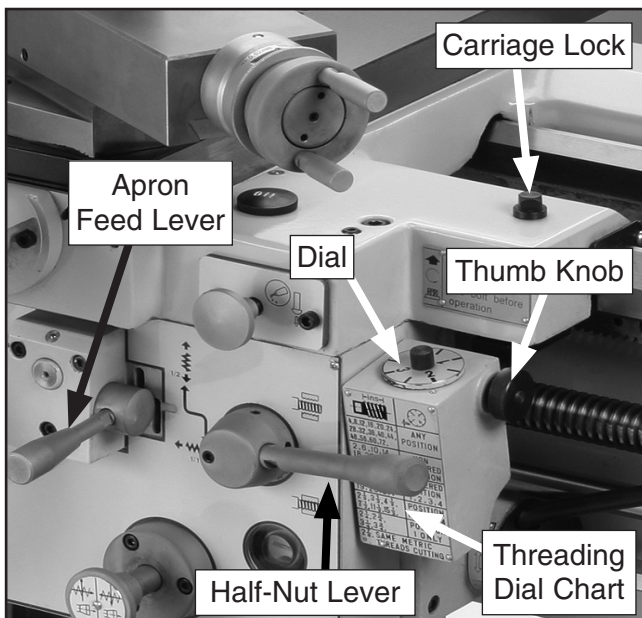
# Half-Nut Lever and Thread Dial

The half-nut lever (**Figure 29**) clamps and releases the half-nut, which clamps around the leadscrew. The lever is only engaged while cutting threads and is not designed for general power feeding operations. For general purpose feeding, use the feed lever (**Figure 29**). This lathe uses inch lead-screws, and the thread dial chart shown in **Figure 30** is only used for inch threading. For all other threading operations, the half nut lever must stay engaged until the threads are complete.

**Note:** If the apron feed lever (**Figure 29**), is engaged, the halfnut lever is blocked from use; and when the half-nut lever is engaged, the apron feed lever is blocked from use. If both levers are engaged at the same time, apron damage will occur.

When the thumb knob (**Figure 29**) is loosened, the thread dial housing pivots so its gear can be engaged or disengaged from the leadscrew. When engaged, the dial turns with the leadscrew and spindle.



**Note:** Always loosen the carriage lock (**Figure 29**) when threading or using the apron power feed. The carriage lock is used only to increase carriage stability during facing operations.



**Figure 29.** Threading dial and half-nut lever.

This column indicates when you can use the thread dial based on which thread TPI is being cut.

This column indicates which position on the thread dial you must reengage the halfnut.

	
4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 56, 60, 72,	ANY POSITION
2, 6, 10, 14, 18, 22, 26, 30, 54,	NON NUMBERED POSITION
3, 5, 7, 9, 11, 13, 15, 19, 23, 27,	NUMBERED POSITION 1, 2, 3, 4
$2\frac{1}{2}$ , $3\frac{1}{2}$ , $4\frac{1}{2}$ , $7\frac{1}{2}$ , $11\frac{1}{2}$ , $15\frac{1}{2}$ ,	POSITION 1, 3 OR 2.4
$2\frac{1}{4}$ , $2\frac{3}{4}$ , $3\frac{1}{4}$ , $3\frac{3}{4}$ ,	POSITION 1 ONLY
$2\frac{7}{8}$ ,	SAME METRIC THREADS CUTTING

**Figure 30.** Threading dial chart.



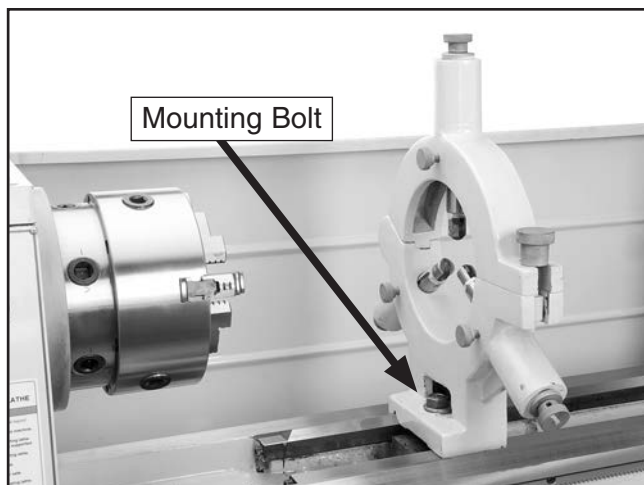
# Steady Rest

The steady rest supports long, small diameter stock that otherwise could not be turned because of deflection, and can be used instead of the tailstock when facing the end of a long workpiece.

On the G0509G, the brass wear pads at the ends of the fingers have been replaced with bearings. Having bearings here maintains consistent non-wearing support throughout the cut.

## To use the steady rest:

1. Secure the steady rest to the bedway from below with the locking plate, then snug the mounting bolt (**Figure 31**).



**Figure 31.** Steady rest in place.

2. Adjust the fingers until the bearings make contact and support the workpiece. Do not over tighten the fingers against the workpiece or you will cause workpiece deflection.
3. Oil the finger bearings and the rolling surfaces while in use to create non-marring workpiece support and to reduce finger wear.

# Follow Rest

The follow rest is normally used with small diameter stock to prevent the workpiece from “springing” under pressure from the turning tool.

On the G0509G, the brass wear pads at the ends of the fingers have been replaced with bearings. Having bearings here maintains consistent non-wearing support throughout the cut. The steady rest can also replace the tailstock to allow for cutting tool access at the end of your workpiece.

## To use the follow rest:

1. Secure the follow rest to the saddle with the two cap screws (**Figure 32**).



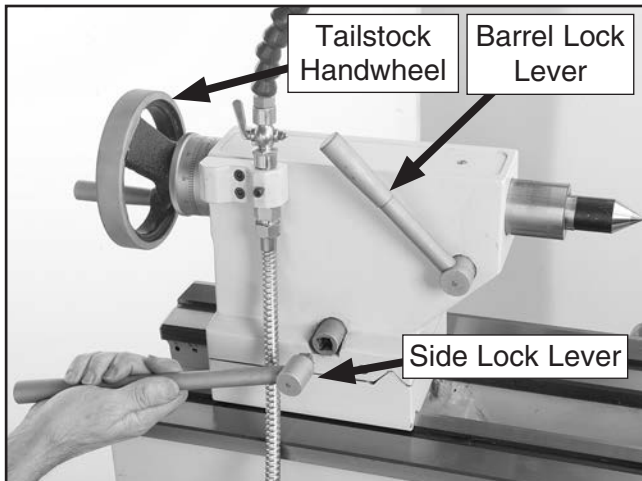
**Figure 32.** Follow rest secured to saddle.

2. Adjust the fingers until the bearings make contact and support the workpiece. Do not over tighten the fingers against the workpiece or you will cause workpiece deflection.
3. Oil the finger bearings and the rolling surfaces while in use to create non-marring workpiece support and to reduce finger wear.



# Tailstock Controls

The tailstock (**Figure 33**) serves many functions. The primary use is holding centers and drill chucks. The barrel has an MT#4 (morse taper #4) bore and is imprinted with graduations in millimeters and inches.



**Figure 33.** Tailstock controls.

## Tailstock Handwheel

Turning the handwheel advances or retracts the barrel in the tailstock. The graduated dial on the handwheel is adjustable.

## Barrel Lock Lever

This lever locks the tailstock barrel in place.

## Side Lock Lever & Torque Tightening (G0509G)

This removable lever locks the tailstock in place on the lathe bed. The socket that it fits into will accept a 1/2-inch drive torque wrench.

To repeat very accurate vertical alignment positioning, tighten the tailstock here with an inch-pound torque wrench. If you must, you can use a foot-pound torque wrench but **DO NOT** exceed 40 lbs/ft of torque or you may damage the ways and the tailstock. When tightening the tailstock down to the maximum torque of 40 lbs/ft, the center point will be drawn down approximately 0.006" from the normal centerline when the tailstock is resting free on the ways.

# Centers

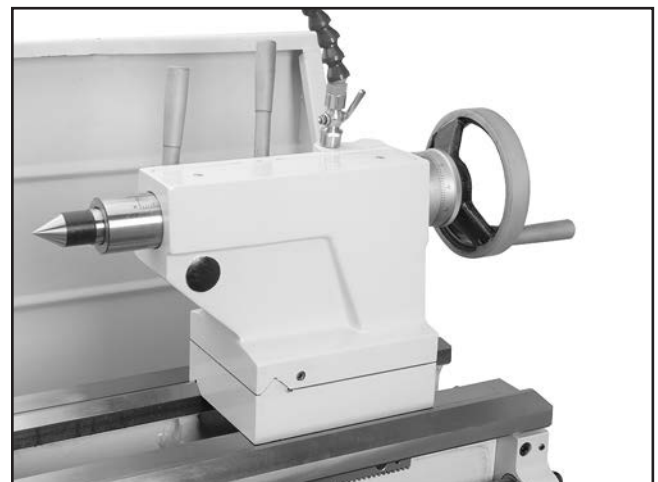
A tailstock center supports stock that is too long to be supported by the chuck alone. The tailstock barrel and dead center have an MT#4 taper. Included with this lathe is an MT#4 to MT#6 spindle adapter sleeve. If you need to install a center in the spindle when using the face plate, you can do so by using this adapter sleeve.

Before installing a center or arbor, make sure that the mating surfaces are perfectly clean. These parts will last longer and remain accurate if properly maintained. If oil is present on the mating surfaces, the tapers will not interlock.

To install the center, insert the end of it into the tailstock bore until it seats. Once the workpiece is installed, the force of a mounted workpiece will fully seat the taper.

When using a dead center (**Figure 34**), the tailstock barrel should protrude about 1/2" and not more than 2 3/4" as indicated by the scale on the barrel.

To remove the dead center, back the tailstock barrel all the way into the tailstock casting. The dead center will pop out. Be sure to catch it when it comes out to avoid damaging the tip.



**Figure 34.** Dead center installed in tailstock.



# Spider (G0509G)

Your lathe is equipped with a set of outboard spindle supports otherwise known as a "spider" (**Figure 35**). Use the spider when a long workpiece has the potential for wobble or vibration when it extends through the outboard side of the headstock.

The tips of the spider screws have brass wear pads that hold the workpiece without causing indents in the finish.

When installed, always use the jam nuts to lock each spider screw in position. Merely tightening the spider screws against the workpiece and leaving the jam nuts loose is not safe. The spiders screws may loosen up during lathe operation and crash into the lathe end cover.

## **! CAUTION**

Remove the spider screws when not in use. Always disconnect the lathe from power when installing, removing, or adjusting the spider screws. Ignoring this warning can lead to personal injury or machine damage.

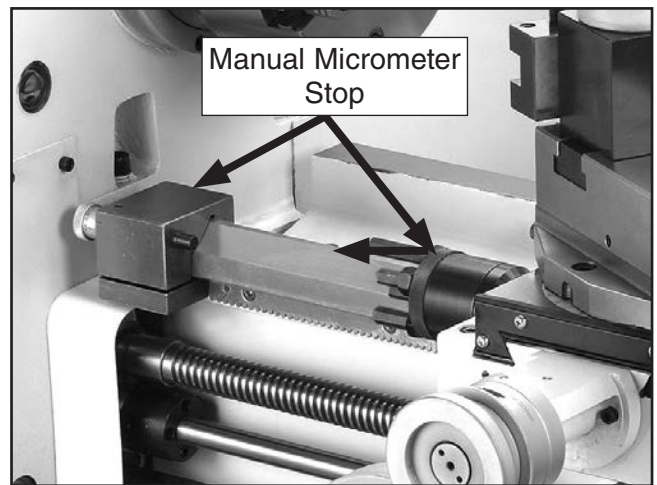


**Figure 35.** Spider.

# Manual Micrometer Stop

This lathe is equipped with a manual micrometer stop (**Figure 36**). Toward the end of the cut and as the tool approaches the shoulder of a workpiece, disengage the carriage and then manually finish the cut by hand-operating the carriage.

The micrometer stop is not an automatic carriage stop. If used as such the carriage will crash into the chuck, causing damage and possibly destroying the lathe.



**Figure 36.** Manual micrometer stop.



# Chuck & Faceplate Mounting

This lathe is shipped with the 3-jaw chuck installed. This is a scroll-type chuck, meaning that all three jaws move in unison when adjusted.

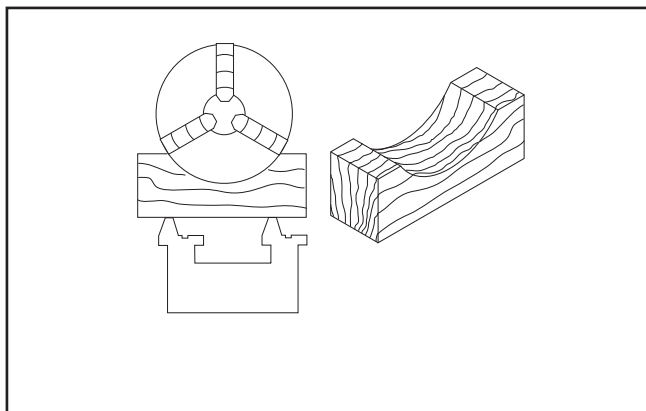
The 4-jaw chuck, on the other hand, features independent jaws. This chuck is used for square or unevenly-shaped stock.

If either chuck cannot hold your workpiece, the cast-iron faceplate has slots for T-bolts that hold standard or custom clamping hardware. With the correct clamping hardware, this faceplate will hold non-cylindrical parts such as castings.

The chucks and faceplate have a D-6 Camlock mount. Please note that there are lines stamped into the cam and on the chuck body. A chuck key is used to turn the locking cams (**Figure 38**) to secure/unsecure the chuck/faceplate.

## **!WARNING**

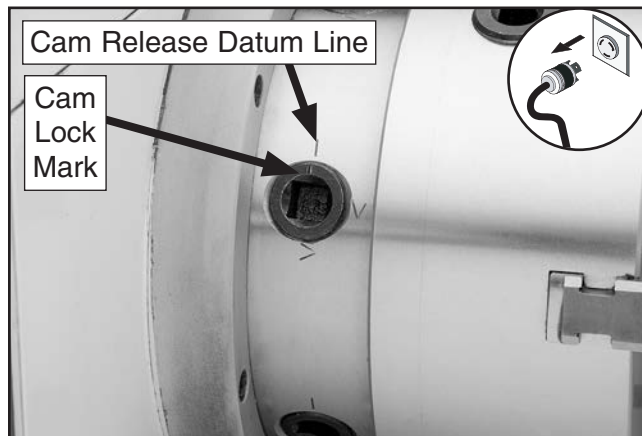
**The chuck is heavy and is awkward to handle. Always protect the ways when removing or installing a chuck, and make sure that you make a support cradle (Figure 37). Use this cradle when installing or removing chucks. Ignoring this warning may lead to a severe crushing or amputation injury!**



**Figure 37.** Wooden chuck support cradle.

## To remove a chuck or faceplate:

1. DISCONNECT LATHE FROM POWER!
2. Place a piece of plywood across the lathe ways and position it just under the chuck so the ways are protected.
3. Turn a cam with the chuck key until the cam lock mark aligns with the cam release datum line shown in **Figure 38**.



**Figure 38.** Cam and lock marks.

4. Unlock the other cams in the same manner. Make sure to support the chuck as you align the last cam. The chuck may come off at this point, so **it is important that the weight is supported by an adequate chuck cradle.**
5. Remove the chuck key.
  - If the chuck is still tight on the spindle, tap the back of the chuck with a rubber or wood mallet while supporting the bottom of the chuck.
  - If the chuck does not immediately come off, rotate the spindle approximately 60° and tap again. Make sure all the marks on the cams and spindle are in proper alignment.



**To install a chuck or faceplate:**

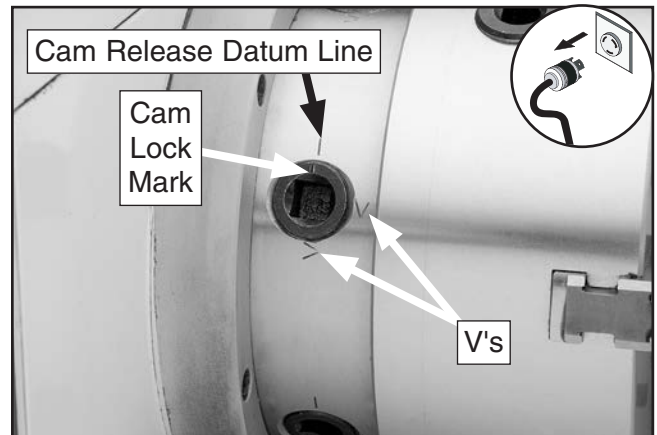
1. DISCONNECT LATHE FROM POWER!
2. Place a piece of plywood across the lathe ways and position it just under the chuck.
3. Place the chuck on the cradle.
4. Make sure the chuck taper and spindle taper mating surfaces are perfectly clean.
5. Inspect and make sure that all camlock studs are undamaged, are clean and lightly oiled, and that the camlock stud cap screws are in place and snug.

***NOTICE***

**Never install a chuck or faceplate without having the camlock cap screws in place or fully tightened. If you ignore this notice, once installed the chuck may never be able to be removed since the camlock studs will turn with the camlocks and never release.**

6. Align the chuck-to-spindle timing marks (**Figure 40**), and slide the chuck onto the spindle.

7. Turn a camlock with the chuck key until the cam line falls between the "V" marks (**Figure 39**).



**Figure 39.** Cam and lock marks.

8. Lock the other cams in a star pattern so the chuck is drawn up evenly on all sides without any chance of misalignment.

**Note:** *If any of the cam lock marks (**Figure 39**) do not fall between the "V" marks when the cam lock is tight, you must adjust the offending camlock stud as discussed in **Camlock Stud Adjustment on Page 37**.*

9. Remove the chuck key.



# Camlock Stud Adjustment

When fitting a chuck or faceplate with camlock studs, or when mounting a new chuck or faceplate, it may be necessary to adjust the camlock studs.

In order to properly install or adjust one or more camlock studs, you must remove a stud locking cap screw, then thread the camlock stud in or out until the line on the side of the stud is flush with the top of the chuck casting (**Figure 40**). This is an initial adjustment.

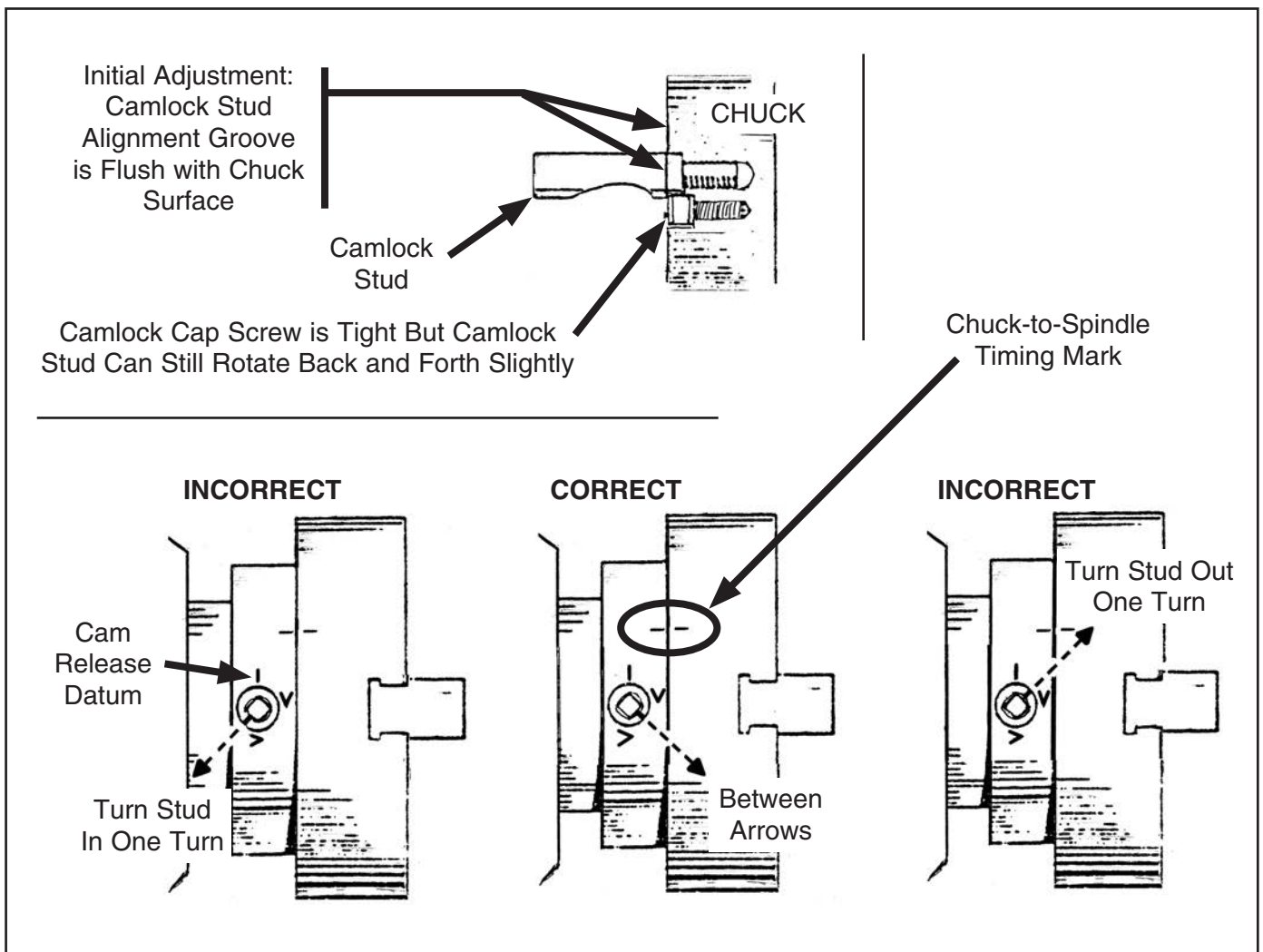
When you place the chuck onto the lathe spindle, you may find that one or more camlocks do not fully point between the "V" marks on the chuck.

If this is the case, you will have to remove the chuck and fine-tune the camlock stud adjustment. See **Figure 40** for which direction to turn the camlock studs.

Once you have adjusted the camlock studs, install the chuck or faceplate as outlined in **To Install Chuck or Faceplate** on **Page 36**.

## NOTICE

**Never install a chuck or faceplate without having the camlock cap screws in place or fully tightened. If you ignore this notice, the chuck may never be able to be removed since the camlock studs will turn with the camlocks and never release.**



**Figure 40.** Camlock stud alignment.



# SECTION 5: ACCESSORIES

## H2670—HSS Square Tool Bits ½" x ½" x 4

Our ground tool bits are M-2 HSS, making them some of the most durable tool bits around. Make your own specialized cutters in any shape using a silicon carbide grinding wheel (G8235-37) on your grinder.

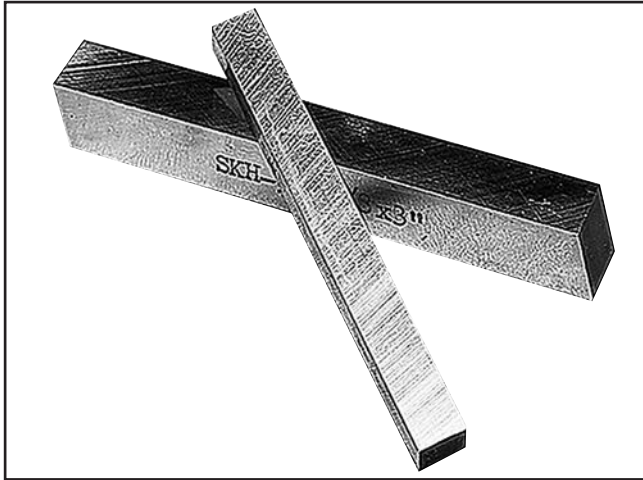


Figure 41. H2670 HSS Square Tool Bits.

## H5687—8-Pc. Pre-Ground Tool Bit Set

Tired of grinding your blank high speed steel tool bits? We've done it for you! 8-pc set comes with these sharpened profiles: offset right and left hand tools with chip breaker, straight and chip breaker style threading tools, internal threading tool, parting tool, boring tool and turning tool. These tool bits are evenly hardened to better than 64C.

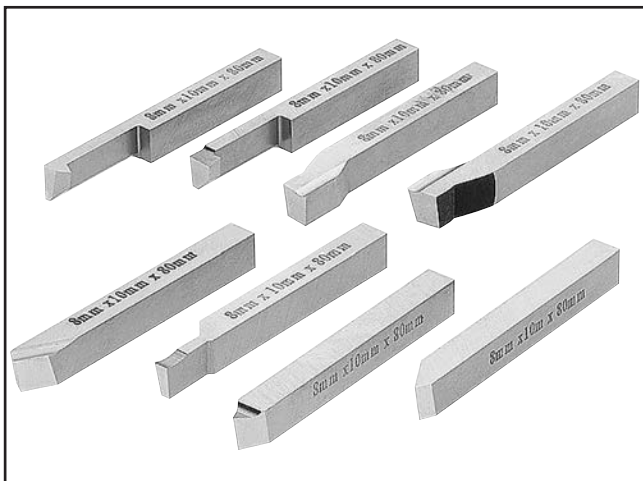


Figure 42. H5687 Pre-Ground Tool Bit Set.

## G9777—20-Pc. Carbide Tipped Tool Bit Set

An exceptional value for carbide lathe tool bits! This twenty-piece set offers tremendous savings over bits sold individually, plus every type is duplicated and ready at hand when you need it. The carbide is C-6 grade for cutting steel and alloys.

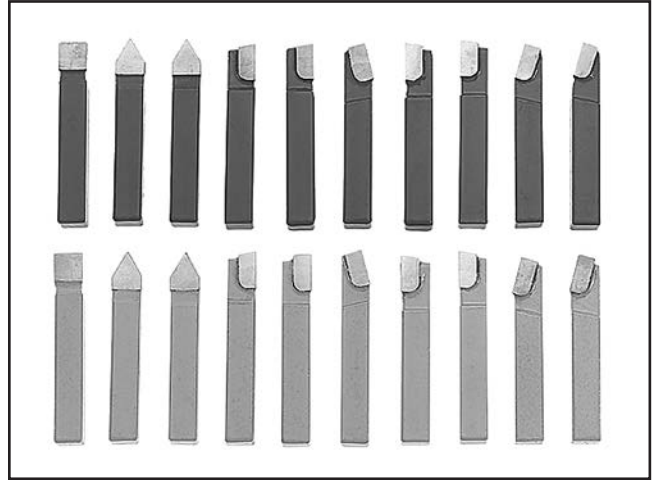


Figure 43. G9777 20 Pc. Carbide Tool Set.

## G7978—15 HP/12 HP Start, Phase Converter

Add 3-phase electrical supply with this rotary phase converter! Operate single or multiple motors, transformers, and resistance loads at 100% power and 95% efficiency while saving big dollars at cheaply metered, single-phase electrical rates. For application assistance, please call our technical support group at (570) 546-9663.



Figure 44. Typical Rotary Phase Converter

**Call 1-800-523-4777 To Order**





## Quick Change Tool Holders

All models below are Series 300

**G5708—Boring Bar Holder, 3/4" & 1" Bar**

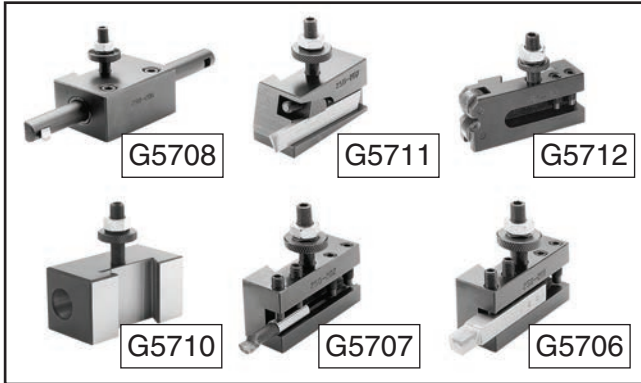
**G5711—Parting Tool Holder, 3/4" Tool**

**G5712—Knurling Tool Holder, 1/2"~3/4" Tool**

**G5710—Morse Taper Holder, MT#4 Taper**

**G5707—Turning/Boring Holder, 1/2"~3/4" Bits**

**G5706—Turning Holders, 1/2"~3/4" Bits**



**Figure 45.** Series 300 quick change tool holders.

### **H5787—MT#4 x 5" Bull Nose Rolling Center**

Built with precision sealed bearings, designed for heavy-duty use on hollow workpieces.



**Figure 46.** MT#4 bull nose rolling centers.

### **G9889—MT#4 Long Nose Precision Center**

Provides critical tool clearance. Adjustable thrust bearings, 60° tip and 30° clearance relief angle.

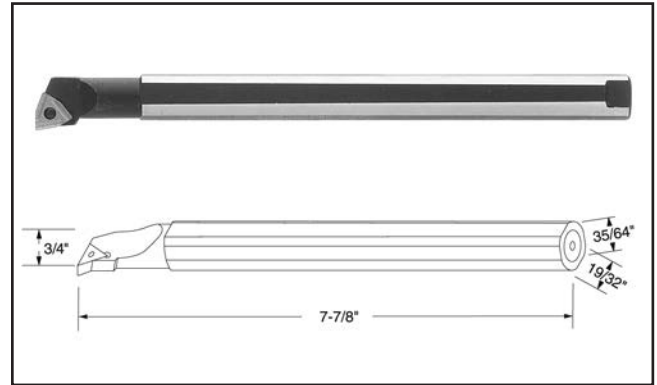


**Figure 47.** MT#4 Long Nose Center

### **G7038Z—Boring Bar**

**G7040—Carbide Inserts for Steel (5 pk)**

**G7048—Carbide Inserts for Cast Iron (5 pk)**

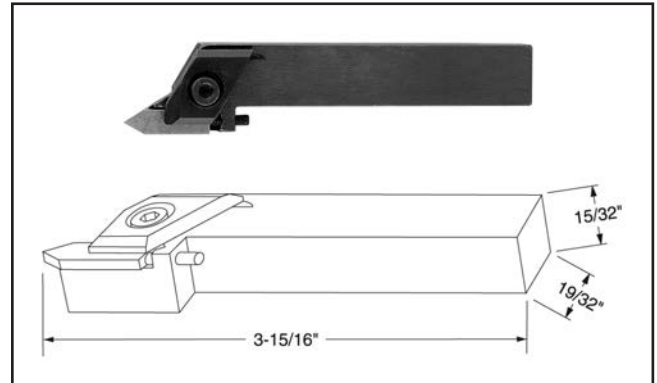


**Figure 48.** G7038Z Boring Bar.

### **G7030—Threading Tool Holder**

**G7041—Carbide Inserts for Steel (5 pk)**

**G7049—Carbide Inserts for Cast Iron (5 pk)**

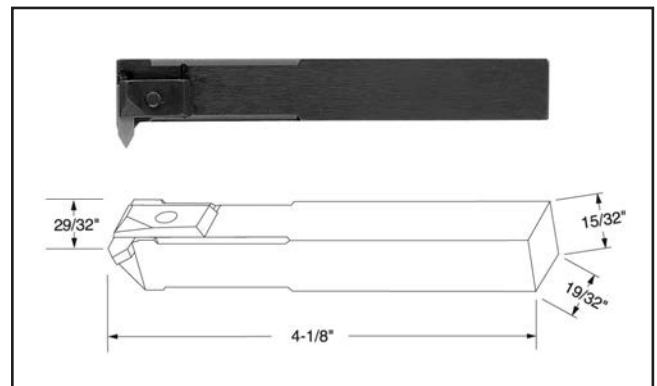


**Figure 49.** G7030 Threading Tool Holder.

### **G7033—Internal Threading Tool Holder**

**G7042—Carbide Inserts for Steel (5 pk)**

**G7050—Carbide Inserts for Cast Iron (5 pk)**



**Figure 50.** G7033 Int. Threading Tool Holder.

**Call 1-800-523-4777 To Order**



# SECTION 6: MAINTENANCE

## Basic Maintenance

Check for the following conditions and repair or replace when necessary:

- Loose mounting bolts and chuck.
- Worn switch or safety features.
- Worn or damaged power cord.
- Any other condition that could hamper the safe operation of this machine.

## Lubrication

Take the time to wipe down and oil your lathe after use. Do not leave metal chips and cutting fluid on the ways. We recommend using ISO 68.

### Saddle, Apron, Cross-Slide, and Compound Rest see Figures 51 & 52

Apply lubrication to the saddle through all ball oilers on the saddle, slides, and rests. Make sure the oil level in the apron is full as seen through the sight glass. Change the apron oil for the first time after one month of operation, and then at one year intervals. Use ISO 68 oil.

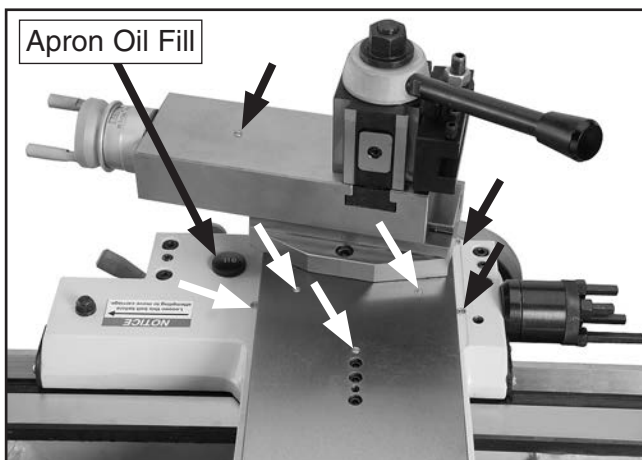


Figure 51. Saddle, compound rest, and cross slide ball oilers.

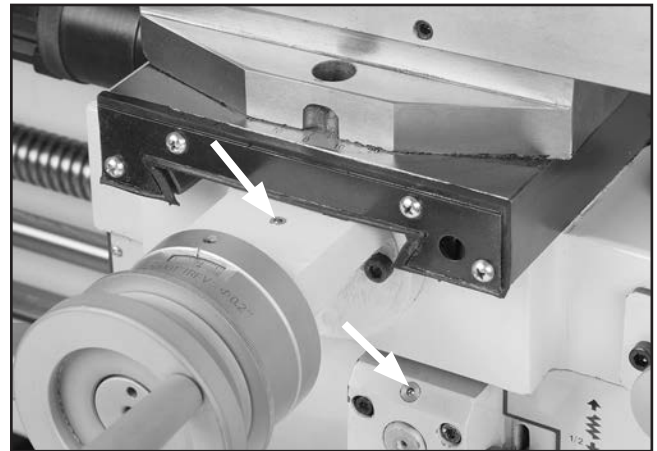


Figure 52. Slide ball oilers.

### Apron Oil Pump, see Figure 53

To lubricate the saddle slide and the cross slide way guides, pull the oil pump knob out and hold it for two or three seconds, the pump will draw oil from the apron reservoir, and then push the knob in so the oil is pumped through drilled passages to the way guides. Repeat this process until the way guides are lubricated. Lubricate the guides once before and once after using the lathe. If the lathe is in an environment that has high moisture or is very dirty, increase the lubrication interval. Use ISO 68 oil.

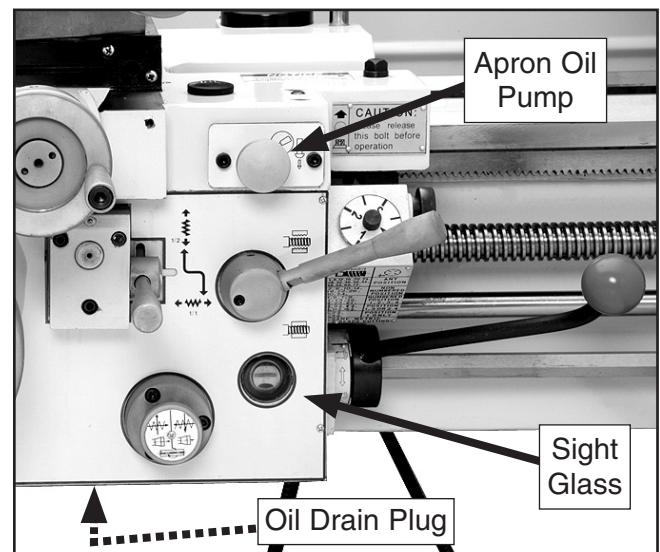


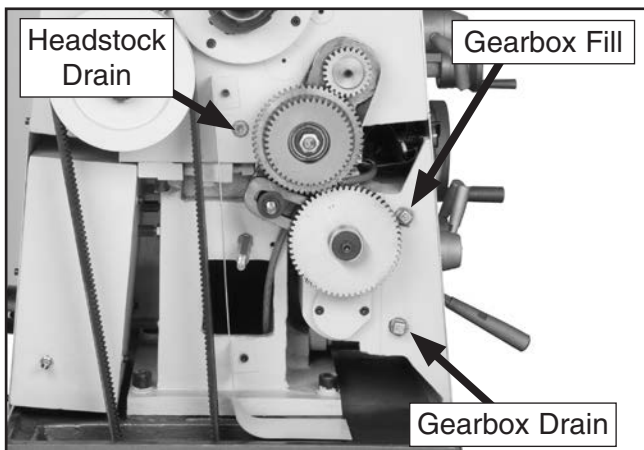
Figure 53. Apron oil pump.



**External Gearing, Headstock and Gearbox, see Figure 54**

Brush on a coat of lithium grease on the teeth of the drive gears. Avoid getting grease on the belt or pulleys when lubricating. Change the oil in the headstock and gearbox after the first 2 hours of use; then, every 6 months depending on usage. Use ISO 32 oil in the headstock, and ISO 68 oil in the gearbox.

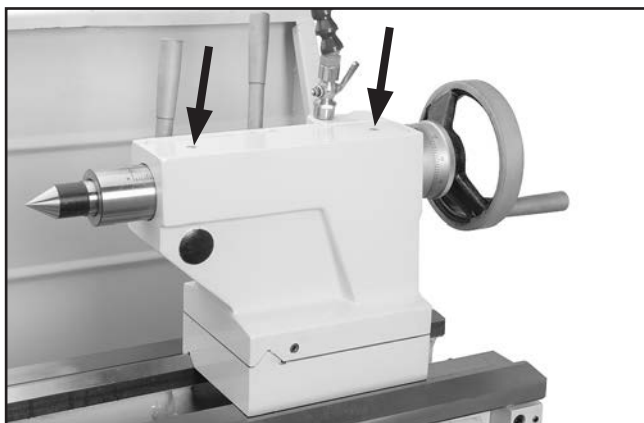
**Note:** *The headstock oil fill plug is located on the top of the headstock plate, labeled OIL.*



**Figure 54.** Headstock lubrication.

**Tailstock, see Figure 55**

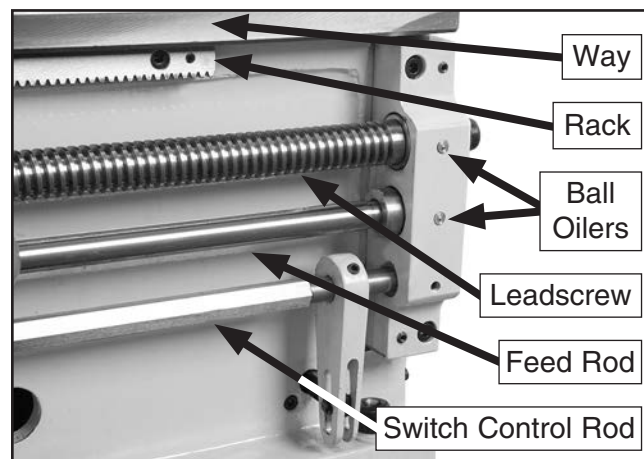
The tailstock is fitted with two ball oilers. The tailstock barrel may be oiled directly. Apply oil each week, or after every few uses (depending on the frequency of operation). Be sure to clean the slide ways for the tailstock and lift the tailstock and squirt a few drops of oil on the ways. It is a good idea to remove the tailstock once a month and wipe the bottom thoroughly and relubricate the way tracks. Use ISO 68 oil.



**Figure 55.** Tailstock lubrication.

**Leadscrew, Feed Rod, Slides, and Ways, see Figure 56**

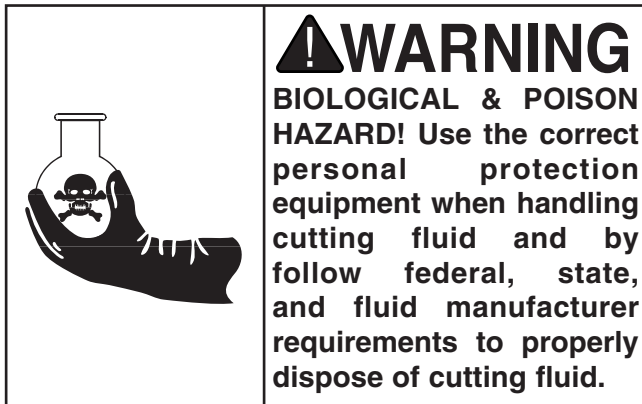
Be sure to clean and lubricate the leadscrew, feed rod and switch control rod. The leadscrew and feed rod have a bearing on the tail stock end support that requires one to two squirts of oil. Apply oil to the ways and slides after each use. Wipe the ways with a clean rag prior to lubrication to ensure that no grime is carried along with your lubricant into friction-sensitive areas. Applying oil to the bedways and other bare metal parts also protects the lathe from rust and pitting. Use ISO 68 oil in ball oilers and for wiping down the bedways and other metal parts.



**Figure 56.** General lubrication.



# Coolant System

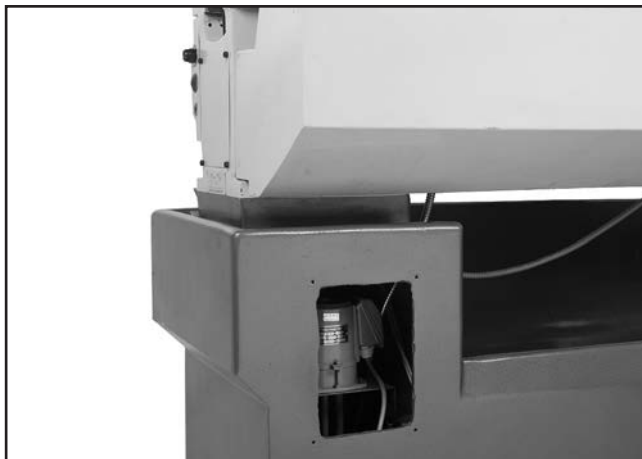


The coolant pump and reservoir are located in the base behind the vented cover on the tailstock end of the lathe.

The chip pan is fitted with a screen, so pay attention that it does not become clogged, fill the chip pan with coolant, and cause the pump to operate in an empty reservoir. Pump damage will occur if it is run for a period of time without coolant.

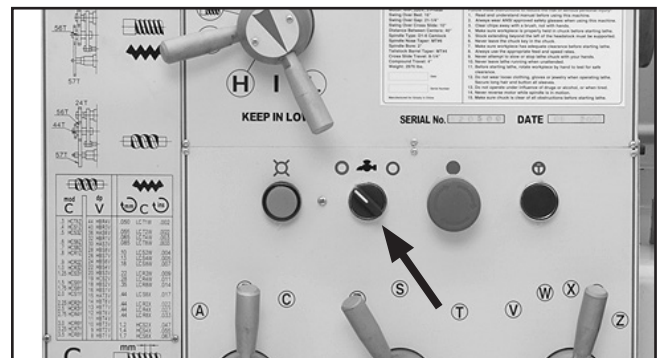
## To perform regular maintenance on the cutting fluid system:

1. Remove the access cover at the rear of the lathe (**Figure 57**).



**Figure 57.** Coolant pump and reservoir.

2. Pump the old cutting fluid out of the reservoir and dispose of according to state and federal environmental laws.
3. Using a magnet, brush, and rags, clean out metal chips from the bottom of the reservoir and the screen. Flush with hot soapy water if required.
4. Refill the reservoir with applicable water-soluble cutting fluid. Closely follow the fluid manufacturer's instructions for mixing.
5. Open the valve on the coolant nozzle.
6. Turn the coolant pump **ON (Figure 58)** to prime the coolant system and to see if the coolant is cycling properly.
7. Replace the access cover.



**Figure 58.** Coolant pump switch.



# SECTION 7: SERVICE

## Troubleshooting

Review the troubleshooting and procedures in this section to fix your machine if a problem develops. If you need replacement parts or you are unsure of your repair skills, then feel free to call our Technical Support at (570) 546-9663.



### Motor & Gearbox

Symptom	Possible Cause	Possible Solution
Motor will not start.	<ol style="list-style-type: none"> <li>1. Main power panel switch is <b>OFF</b>.</li> <li>2. Emergency switch is pushed in.</li> <li>3. Spindle rotation switch at fault.</li> <li>4. Circuit breaker or fuse has tripped.</li> <li>5. No voltage or open connection.</li> <li>6. Motor direction switch is at fault.</li> <li>7. Power switch or magnetic contactor is at fault.</li> <li>8. Motor is at fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn the main power panel switch <b>ON</b>.</li> <li>2. Emergency switch is pushed in.</li> <li>3. Rotate the switch so it points to 1 or 2, or replace bad switch.</li> <li>4. Seek an electrician to troubleshoot and repair the shop power supply.</li> <li>5. Test circuit, replace wires and connections as required.</li> <li>6. Replace switch.</li> <li>7. Replace power switch or magnetic contactor.</li> <li>8. Replace motor.</li> </ol>
Fuses or circuit breakers trip open.	<ol style="list-style-type: none"> <li>1. Short circuit in line cord or plug.</li> <li>2. Short circuit in motor or loose connections.</li> <li>3. Incorrect fuses or circuit breakers in power supply.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inspect cord or plug for damaged insulation and shorted wires.</li> <li>2. Inspect all connections on motor for loose or shorted terminals or worn insulation.</li> <li>3. Install correct fuses or circuit breakers.</li> </ol>
Machine is loud, belt slips, or bogs down during a cut.	<ol style="list-style-type: none"> <li>1. Excessive depth of cut.</li> <li>2. RPM or feed rate wrong for operation.</li> <li>3. Dull cutters.</li> <li>4. Belt is slipping.</li> <li>5. Belt is at fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Decrease depth of cut.</li> <li>2. Refer to RPM feed rate chart for appropriate rates.</li> <li>3. Sharpen or replace cutters.</li> <li>4. Remove grease or oil on belt or pulleys/tighten belt tensioner against low range belt.</li> <li>5. Replace belt.</li> </ol>
Gear change levers will not shift into position.	<ol style="list-style-type: none"> <li>1. Gears not aligned in headstock.</li> </ol>	<ol style="list-style-type: none"> <li>1. Rotate spindle by hand until gear falls into place.</li> </ol>
Loud, repetitious noise coming from machine at or near the motor.	<ol style="list-style-type: none"> <li>1. Pulley set screws or keys are missing or loose.</li> <li>2. Motor fan is hitting the cover.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inspect keys and set screws. Replace or tighten if necessary.</li> <li>2. Tighten fan or shim cover, or replace items.</li> </ol>
Motor is loud when cutting. Overheats or bogs down in the cut.	<ol style="list-style-type: none"> <li>1. Excessive depth of cut or feed rate.</li> <li>2. RPM or feed rate wrong for cutting operation.</li> <li>3. Cutting tool is dull.</li> <li>4. Gear setup is too tight, causing them to bind.</li> </ol>	<ol style="list-style-type: none"> <li>1. Decrease depth of cut or feed rate.</li> <li>2. Refer to RPM feed rate chart for appropriate rates.</li> <li>3. Sharpen or replace the cutting tool.</li> <li>4. Readjust the gear setup with a small amount of backlash so the gears move freely and smoothly when the chuck is rotated by hand.</li> </ol>



# Troubleshooting



## Operation and Work Results

Symptom	Possible Cause	Possible Solution
Entire machine vibrates excessively upon startup and while running.	<ol style="list-style-type: none"> <li>1. Workpiece is unbalanced.</li> <li>2. Worn or broken gear present.</li> <li>3. Chuck or faceplate has become unbalanced.</li> <li>4. Spindle bearings at fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reinstall workpiece so it is as centered with the spindle bore as possible.</li> <li>2. Inspect gears and replace if necessary.</li> <li>3. Rebalance chuck or faceplate; contact a local machine shop for help.</li> <li>4. Tighten or replace spindle bearings.</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. Reinstall cutting tool so no more than 1/3 of the total length is sticking out of tool holder.</li> <li>3. Tighten gib screws at affected component.</li> <li>4. Replace or re-sharpen cutting tool.</li> <li>5. Use the recommended spindle speed.</li> </ol>
Can't remove tapered tool from tailstock quill.	<ol style="list-style-type: none"> <li>1. Quill was not retracted all the way back into the tailstock.</li> <li>2. Debris was not removed from taper before inserting into quill.</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn the quill handwheel until it forces taper out of quill.</li> <li>2. Always make sure that taper surfaces are clean.</li> </ol>
Cross slide, compound rest, or carriage feed has sloppy operation.	<ol style="list-style-type: none"> <li>1. Gibs are out of adjustment.</li> <li>2. Handwheel is loose.</li> <li>3. Leadscrew mechanism worn or out of adjustment.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten gib screw(s).</li> <li>2. Tighten handwheel fasteners.</li> <li>3. Tighten any loose fasteners on leadscrew mechanism.</li> </ol>
Cross slide, compound rest, or carriage feed handwheel is hard to move.	<ol style="list-style-type: none"> <li>1. Carriage lock is engaged.</li> <li>2. Gibs are loaded up with shavings or grime.</li> <li>3. Gib screws are too tight.</li> <li>4. Backlash setting too tight (cross slide only).</li> <li>5. Bedways are dry.</li> </ol>	<ol style="list-style-type: none"> <li>1. Loosen the carriage lock.</li> <li>2. Remove gibs, clean ways/dovetails, lubricate, and readjust gibs.</li> <li>3. Loosen gib screw(s) slightly, and lubricate bedways.</li> <li>4. Slightly loosen backlash setting by loosening the locking screw and adjusting the spanner ring at the end of the handle.</li> <li>5. Lubricate bedways and handles.</li> </ol>
Bad surface finish.	<ol style="list-style-type: none"> <li>1. Wrong RPM or feed rate.</li> <li>2. Dull tooling or poor tool selection.</li> <li>3. Too much play in gibs.</li> <li>4. Tool too high.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust for appropriate RPM and feed rate.</li> <li>2. Sharpen tooling or select a better tool for the intended operation.</li> <li>3. Tighten gibs.</li> <li>4. Lower the tool position.</li> </ol>
Inaccurate turning results from one end of the workpiece to the other.	<ol style="list-style-type: none"> <li>1. Headstock and tailstock are not properly aligned with each other.</li> </ol>	<ol style="list-style-type: none"> <li>1. Realign the tailstock to the headstock spindle bore center line.</li> </ol>
Chuck jaws won't move or don't move easily.	<ol style="list-style-type: none"> <li>1. Chips lodged in the jaws.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove jaws, clean and lubricate chuck threads, and replace jaws.</li> </ol>
Carriage won't feed, or hard to move.	<ol style="list-style-type: none"> <li>1. Gears are not all engaged or broken.</li> <li>2. Gibs are too tight.</li> <li>3. Loose screw on the feed handle.</li> <li>4. Leadscrew shear pin has sheared.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust gear positions or replace.</li> <li>2. Loosen gib screw(s) slightly.</li> <li>3. Tighten.</li> <li>4. Correct for cause of shear pin breakage, and replace shear pin.</li> </ol>
Tailstock quill will not feed out of tailstock.	<ol style="list-style-type: none"> <li>1. Quill lock lever is tightened down.</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn lever counterclockwise.</li> </ol>



# Gibs

There are three main gib adjustments for the lathe. They are: the cross-slide gib, the compound slide gib, and the saddle gib.

## Cross-slide Gib, see Figure 59

The gib on the cross-slide is adjusted by the two screws located at each end. To adjust, loosen the set screw located along the edge of the cross-slide. This set screw is provided for locking the slide for certain operations. After making the adjustments detailed below, tighten the set screw until it just touches the gib.

The gib is wedge shaped and by loosening the screw closest to the operator and then tightening the opposite screw, the slide will become looser. Conversely, loosening the screw farthest away from the operator and tightening the closer screw will tighten the gib. *Do not over tighten.*

Adjust the gib so that it creates a slight drag when the slide is in motion. Test the ease of motion with the gib slightly loose. Begin tightening the gib and test after making small adjustments. When a slight drag is detected the gib is properly adjusted.

## **NOTICE**

**When adjusting gibs, keep in mind that the goal of gib adjustment is to remove unnecessary sloppiness from the slide movement without causing them to bind. Loose gibs may cause poor finishes on the workpiece. Over tightening may cause premature wear.**

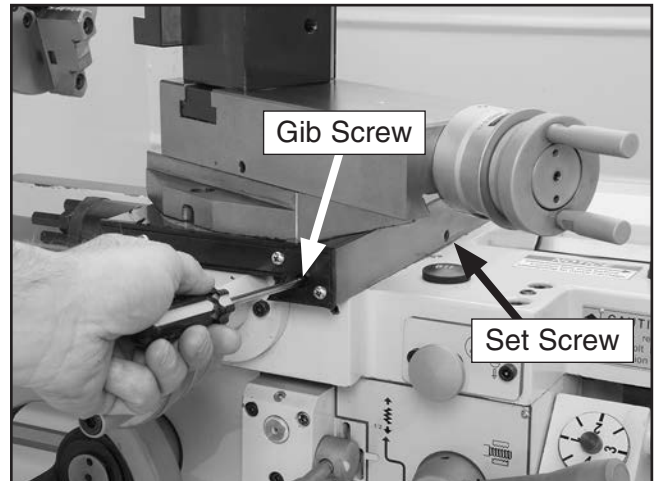


Figure 59. Adjusting the cross-slide gib.

## Compound Gib, see Figure 60

The gib on the compound is adjusted by the same method as the gibs on the cross-slide, *except* the screw closest to the operator (when the compound slide is aligned with the cross slide) must be loosened and the screw furthest from the operator tightened to make the gib tighter.

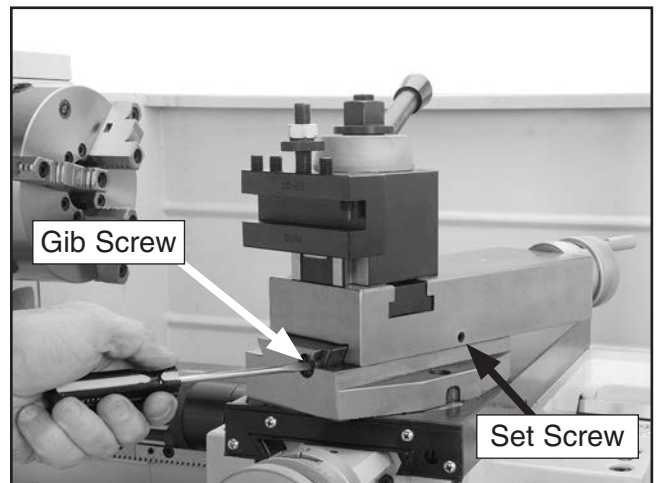


Figure 60. Adjusting the compound rest gib.



### Saddle Gib and Carriage Lock, see Figure 61

Located at the back side of the saddle, the saddle gib is adjusted by the same method as the gibs on the cross-slide and compound rest. However, you must make sure that you loosen the carriage lock bolt. This bolt is used to lock the carriage in place for increased rigidity when making face cuts.

It is important that the saddle gib be properly adjusted. A loose gib will cause finish problems in a workpiece. A gib adjusted too tightly will cause premature wear.

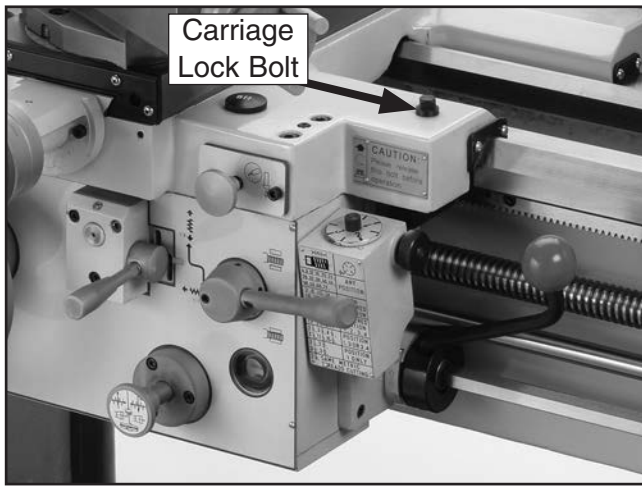


Figure 61. Carriage lock bolt.

## Cross Slide Leadscrew Adjustment

Backlash is the amount of play found in a leadscrew. It can be found by turning the cross slide handwheel in one direction, then turning the handwheel the other direction. When the cross slide begins to move, the backlash has been taken up.

**Note:** Avoid the temptation to overtighten the cross slide backlash screw. Overtightening will cause excessive wear to the sliding block and leadscrew. Reducing backlash to less than 0.010" is impractical and reduces cross slide life.

Backlash is adjusted by tightening or loosening the cap screws shown in Figure 62. These screws draw a wedge-type nut against the leadscrew and main nut. If you get the gib too tight, loosen the cap screws a few turns, tap the cross slide a few times with a rubber or wooden mallet, and turn the handle slowly back and forth until the handle turns freely. To readjust the backlash, rock the handle back and forth, and tighten the screw slowly until the backlash is at approximately 0.010" as indicated on the handwheel dial.



Figure 62. Cross slide backlash adjustment socket head cap screws.



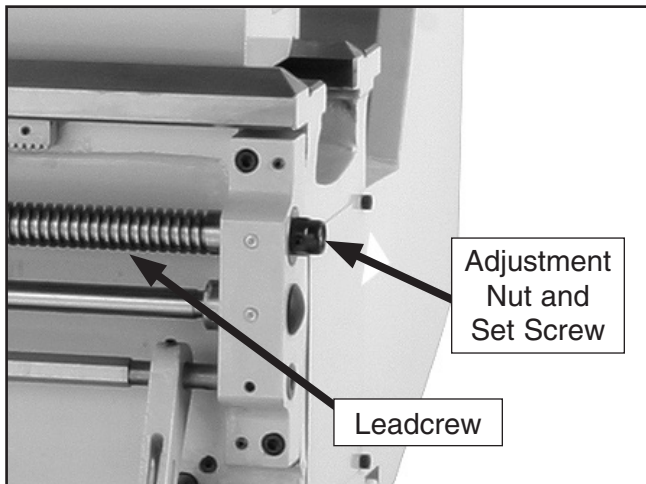


# Leadscrew Endplay Adjustment

After a long period of time, you may find that the leadscrew for threading operations may develop a bit of end play. This lathe is designed so that this play can be removed.

## To remove leadscrew end play:

1. DISCONNECT LATHE FROM POWER.
2. Using a 3mm hex wrench, loosen the retainer set screw (**Figure 63**).

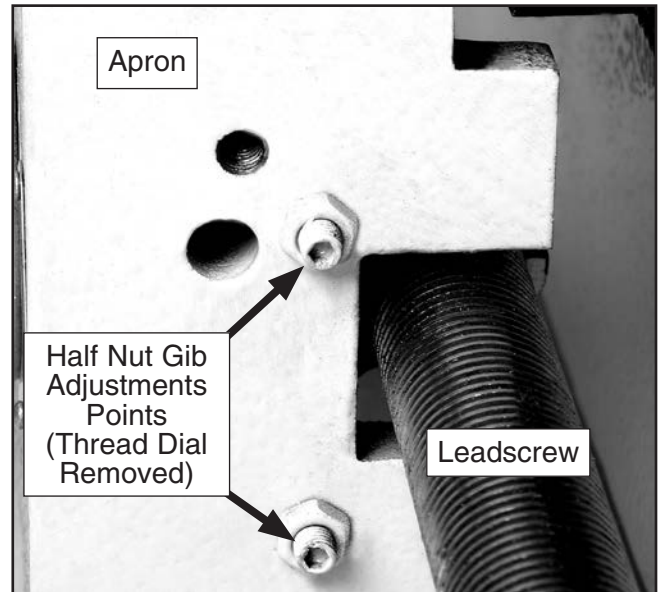


**Figure 63.** Leadscrew end play adjustment location.

3. Engage the halfnut lever and manually rotate the manual apron feed handwheel back and forth slightly to test for end play. While you are doing this, tighten the adjustment nut with a 22mm wrench until all leadscrew-endplay is removed.
4. Tighten the set screw.

# Halfnut Adjustment

To adjusted the halfnut gibs, remove the thread dial to expose the two gib screws (**Figure 64**). Your goal is to remove sloppiness in the ways without causing the half nut to bind. You will loosen the jam nuts and turn the two set screws clockwise until slight tension is felt in the set screw. The gibs will then be slightly pre-loaded. Tighten the jam nuts when finished.



**Figure 64.** Typical halfnut gib adjustment screws.



# V-Belts

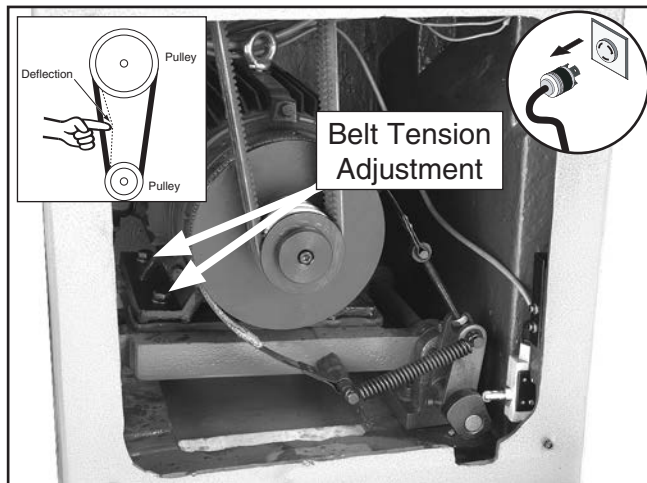
During the life of the lathe, it will be necessary to compensate for belt wear.

**To adjust or replace the V-belts on the lathe:**

1. DISCONNECT LATHE FROM POWER!
2. Open the lathe base end cover (**Figure 65**).
3. Using a wrench, adjust the belt tension hex nuts (see **Figure 65**) until there is approximately  $\frac{1}{2}$ " belt deflection on each belt when pressed firmly in the center between the pulleys.

**Note:** Replace all three belts as a matched set even if one shows cracking, glazing, or fraying.

4. Reinstall the rear cover.



**Figure 65.** V-belt adjustment.

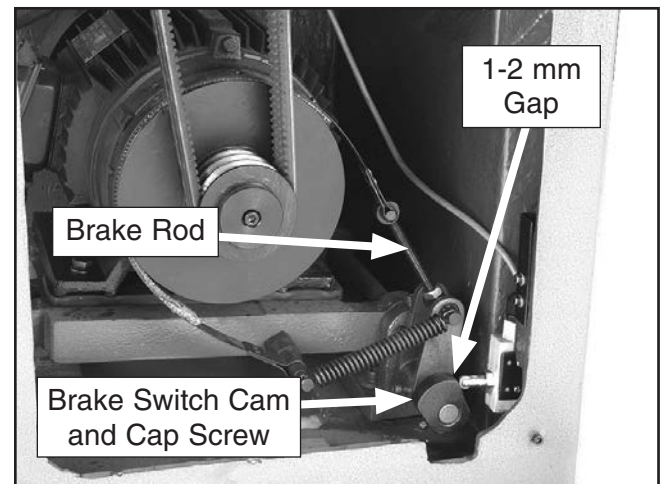
# Brake & Switch

After consistent lathe usage, it will be necessary to compensate for brake lining wear.

**To adjust the brake and brake switch:**

1. DISCONNECT LATHE FROM POWER!
2. Open the lathe base end cover (**Figure 65**).
3. Using a wrench, adjust the brake rod (**Figure 66**) so, when the foot pedal is pressed, the brake band firmly clamps the drum. When released, the brake band should be loose on the drum.

**Note:** Replace the brake band when the friction material is worn down to approximately 2mm thick.



**Figure 66.** Brake band and switch.

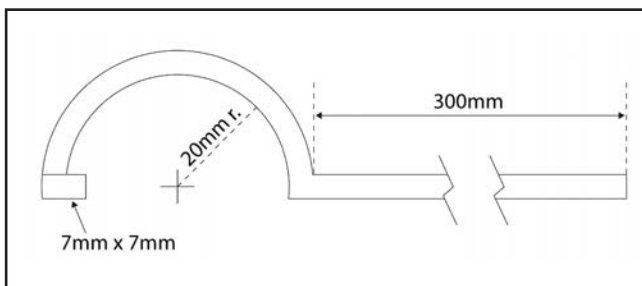
4. Adjust the brake switch cam so when in the released position, there is 1 to 2mm gap between the cam and the brake switch push-rod roller (**Figure 66**).
5. Reinstall the safety cover and test foot brake operation.



# Bearing Preload

This lathe is shipped from the factory with the spindle bearing preload adjusted. If the spindle ever develops a bit of end-play and the workpiece finish suffers, you can adjust the bearing preload to remove the end-play and improve the workpiece finish.

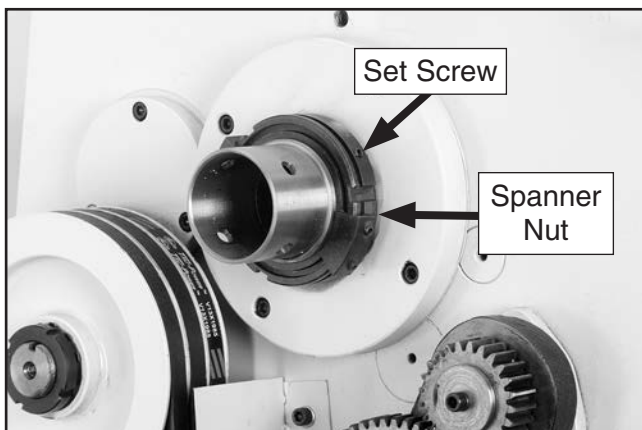
Adjusting the bearing preload requires using a spanner wrench or a punch and hammer. You can either purchase the spanner wrench at a tool store or fabricate one, using the diagram shown below in **Figure 67**.



**Figure 67.** Spanner wrench diagram.

## To adjust the preload:

1. Run the lathe for 20 minutes on high speed to bring the lathe to normal operating temperature.
2. DISCONNECT THE LATHE FROM THE POWER SOURCE!
3. Remove the chuck, shift the spindle to neutral, then remove the lathe end cover to expose the outboard spindle and spanner nut (**Figure 68**).

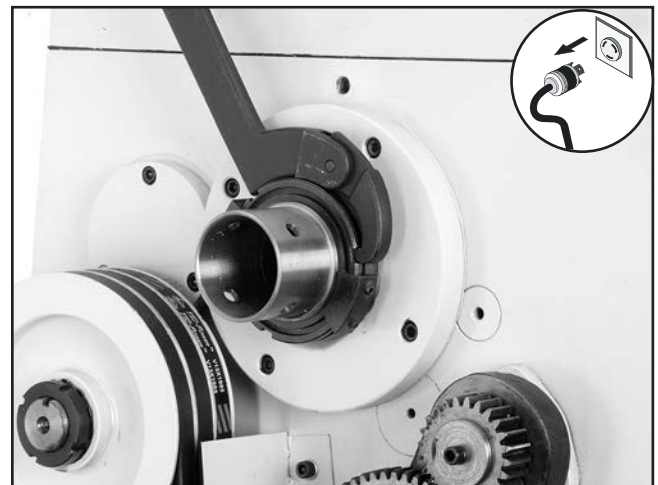


**Figure 68.** Outboard spindle/spanner nut.

Models G0509 & G0509G (Mfd. Since 3/12)

4. Using a 3mm hex wrench, remove the spanner nut locking set screw (**Figure 68**).
5. Place the chuck key in the cam-lock socket to keep the spindle from rotating.
6. Using a spanner wrench, or hammer-and-punch, loosen the spanner lock nut (**Figure 69**) counterclockwise three turns.

**Note:** You may have to tap on the outboard spindle tube as explained in **Step 13** to help unload the spindle and break the spanner nut loose.



**Figure 69.** Loosening outboard spanner nut.

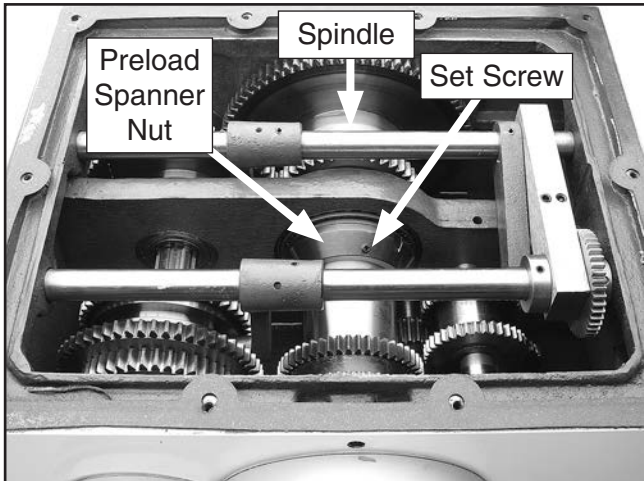
7. Place a dial indicator on the cross slide and move the carriage toward the headstock until the contact point of the indicator touches the spindle face (**Figure 70**).



**Figure 70.** Dial indicator setup.



8. Move the carriage an additional 0.100" toward the headstock.
9. Using a 5mm hex wrench, remove the headstock lid to expose the headstock gears.
10. Remove the preload spanner nut set screws (**Figure 71**) with a 3mm hex wrench.



**Figure 71.** Preload spanner nut.

11. Place the chuck key in the cam-lock socket and keep the spindle from rotating.
12. Using a spanner wrench, or hammer-and-punch, loosen the preload spanner nut (**Figure 71**) counterclockwise 1 turn.
13. Place a wooden block over the outboard end of the spindle, hit the block soundly with a metal or heavy dead blow hammer (**Figure 72**). Your goal is to slide the spindle forward just enough to introduce spindle end-play that you can feel by hand.

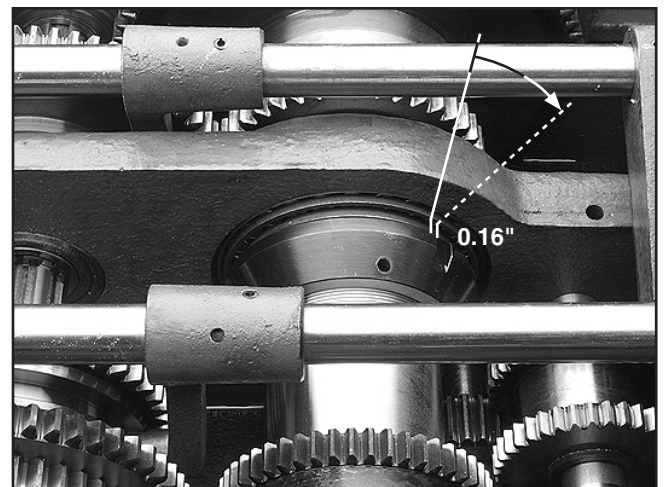


**Figure 72.** Introducing detectable end-play.

Since it can take great effort to turn the preload spanner nut, you may find it difficult to know if you have gone past the zero end-play point or not. You may find it easiest to have someone watch the dial for you while you tighten the inner spanner nut. If you think you may have gone past the zero end-play point, take the time to unload the bearings as described earlier, then re-tighten the inner spanner nut until you know you have reached the correct setting.

When you are confident that you have adjusted the preload spanner nut until zero spindle end-play and but preload exists, you now must move the spanner nut inward and additional 0.001" to set the preload.

14. To set the preload, rotate the spanner nut an additional 0.16" as shown in **Figure 73**.



**Figure 73.** Preload spanner nut adjustment.

15. Reinstall the setscrews in the preload spanner nut.
16. Position the gasket correctly, and re-install the headstock cover.
17. Tighten the outboard spindle spanner nut until it is snug and reinstall the locking set-screw.
18. Reinstall the lathe end cover, and make sure the counterweights (**Figure 74**) do not rub on the cover when the lathe is turned on.



To confirm that the bearings are correctly pre-loaded:

1. Make sure all safety precautions have been taken and setup steps are complete to make the lathe fully operational.
2. Install the chuck and tighten the jaws.
3. Set the spindle speed to its highest setting.
4. Connect the lathe to power and turn the lathe spindle **ON**.
5. Let the lathe run for 20 minutes.
6. Turn the spindle **OFF**, disconnect lathe from power, and check the temperature of the spindle.

—If the spindle nose is hotter than you can comfortably keep your hand on, the preload is too tight and you must repeat the bearing preload adjustment procedure.

—If the spindle nose is slightly warm to the touch, you have correct bearing preload. Now complete **Spindle Balancing** procedure.

## Spindle Balancing

After the spindle has been broken in, or if the lathe has been used for a considerable amount of time, you should adjust the spindle weights to minimize spindle vibration.

To minimize spindle vibration:

1. Run the lathe for five minutes on the fastest RPM.
2. DISCONNECT LATHE FROM POWER!
3. Open the side cover, loosen the counter weight set screws (**Figure 74**), and reposition one or both counterweights to a new position around the circumference of the spanner nut.

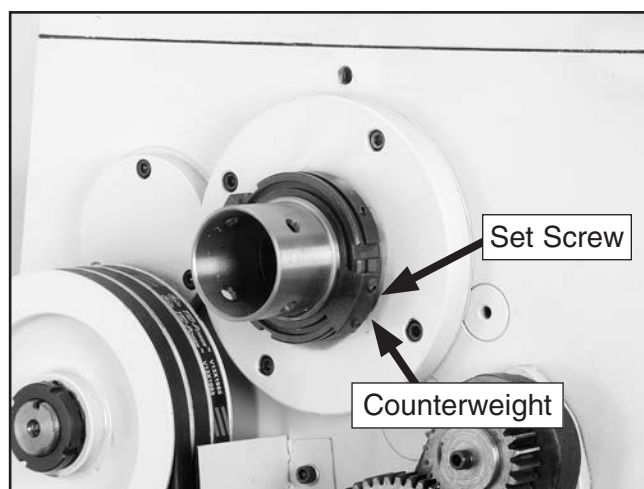


Figure 74. Spindle counterweights.

4. Close the side cover, reconnect to power, restart the lathe, and run at 900 RPM.
5. Place your hand on the headstock cover and feel for harmonic vibration.
6. Repeat **Steps 2–5** until vibration is reduced to a minimum.
7. Now, repeat **Steps 2–5** at 1800 RPM until vibration is reduced to a minimum.



# Main Electrical Box



Note: See Pages 56 and 57 for wire connections.

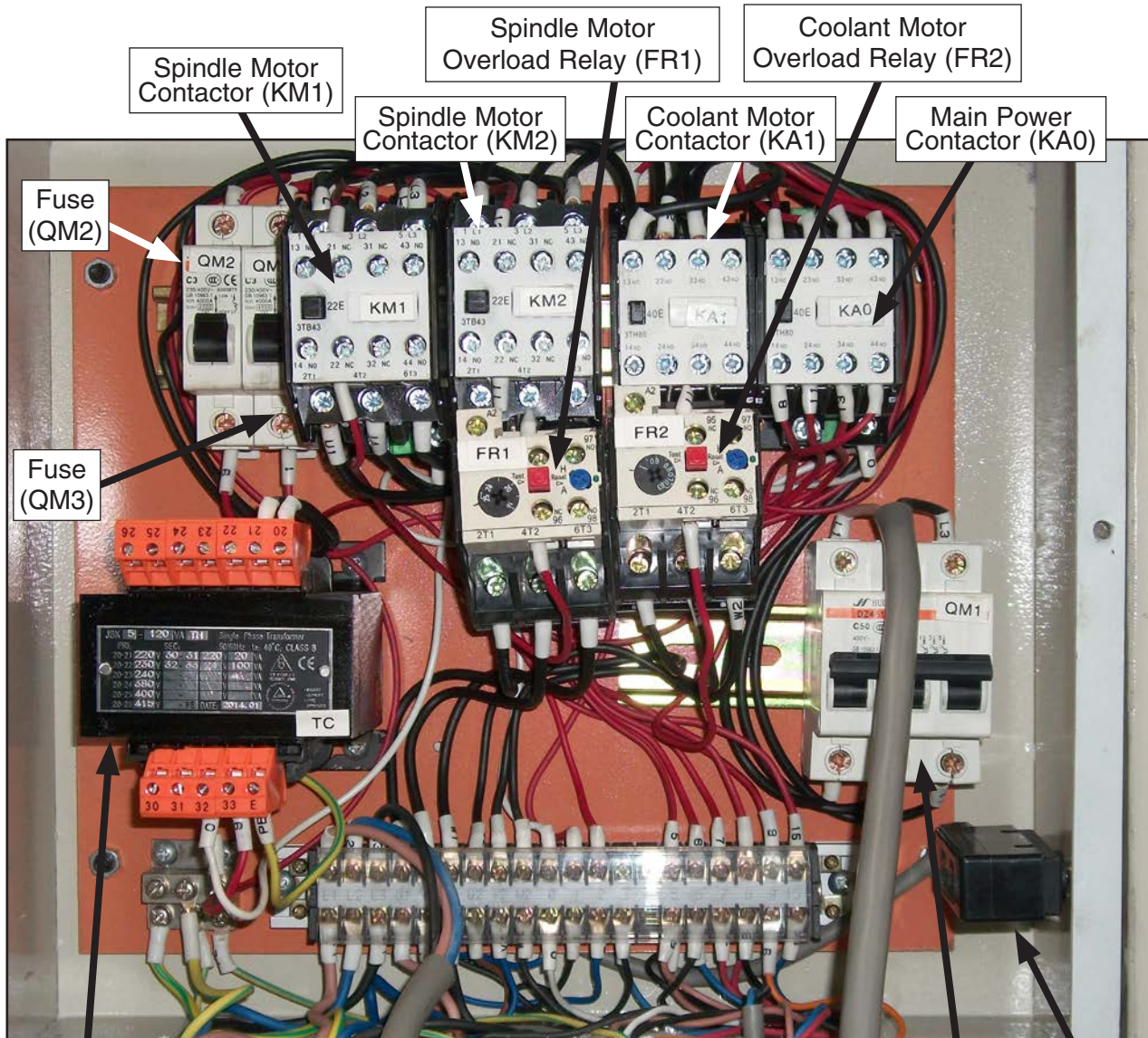


Figure 75. Electrical box wiring.

Transformer (TC)

Belt Cover Safety Limit Switch (QM1)



Main Power Circuit Breaker (QM1)

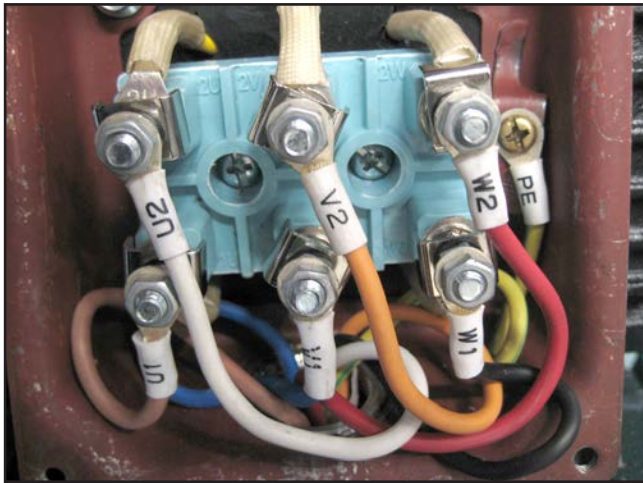
Figure 76. Master power switch (S) connections.



# Motors & Switches



**Note:** See Pages 56 and 57 for wire connections.



**Figure 77.** Spindle motor (M1) connections.



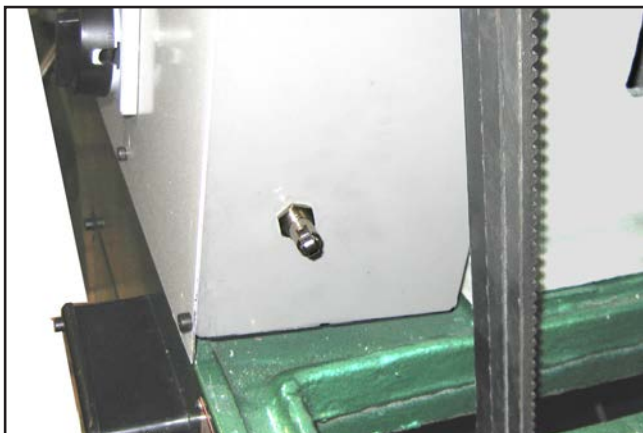
**Figure 80.** Power-in junction box connections.



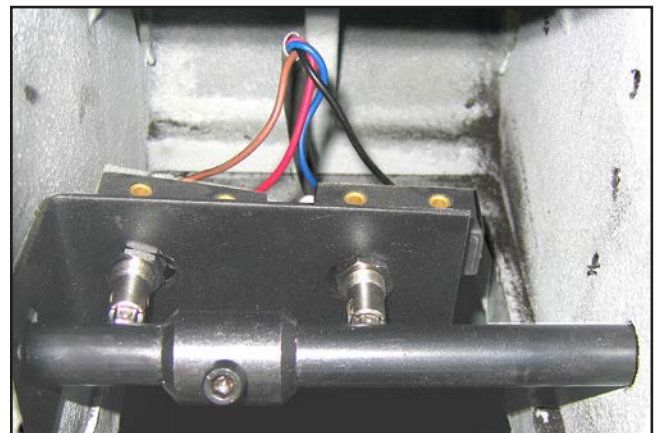
**Figure 78.** Pump motor (M2) connections.



**Figure 81.** Brake switch (SQ1).



**Figure 79.** Belt cover safety switch (SQ3).



**Figure 82.** Spindle motor rotation switches (SQ4, SQ5).



# Control Panel & Switches



Note: See Pages 56 and 57 for wire connections.

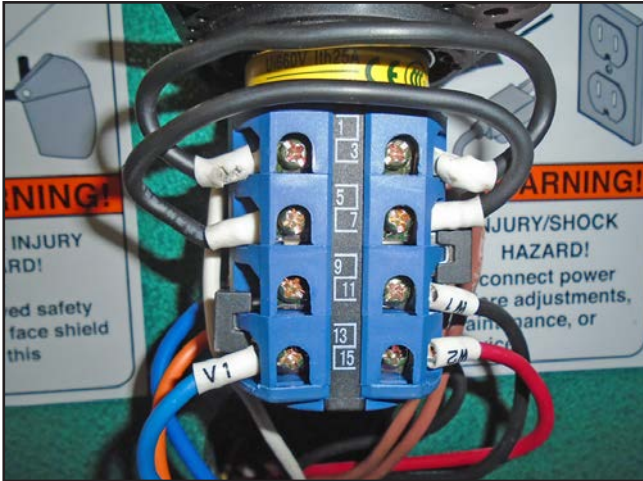


Figure 83. Motor speed switch (SA), side 1.

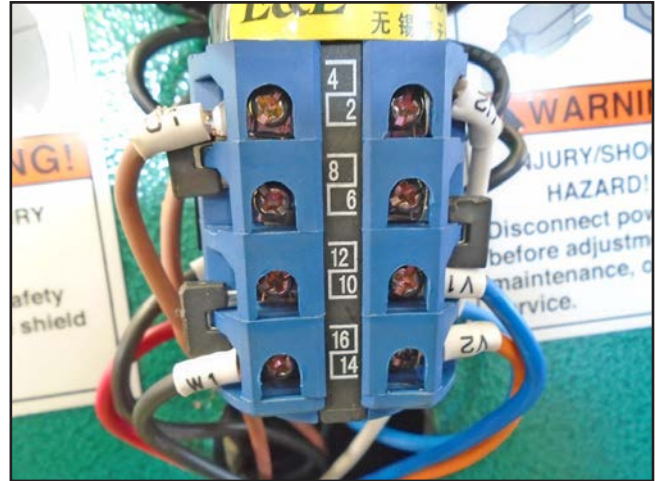


Figure 84. Motor speed switch (SA), side 2.

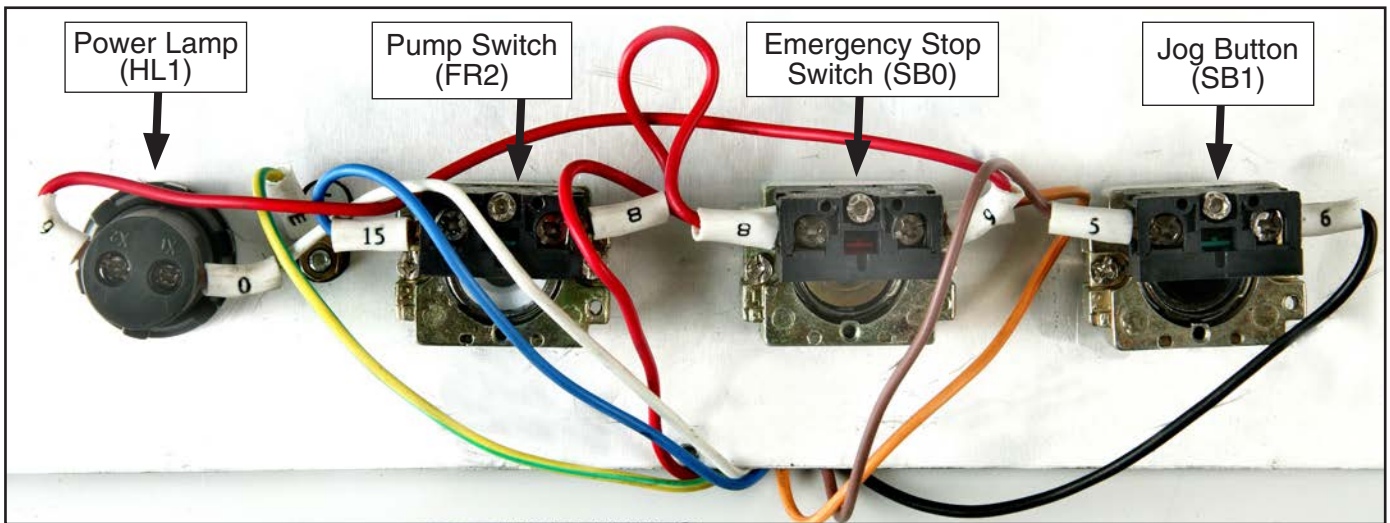


Figure 85. Control panel).

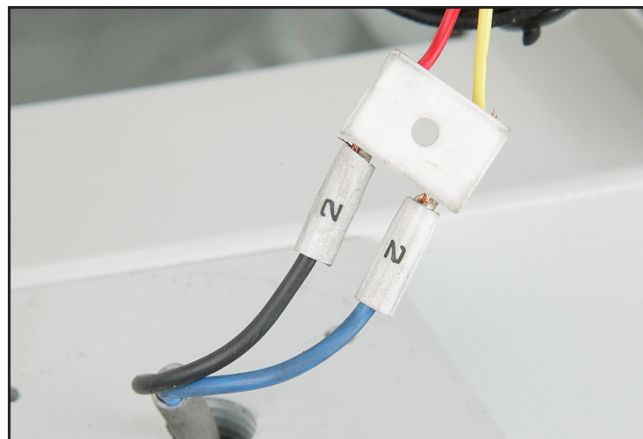


Figure 86. Work lamp (EL).





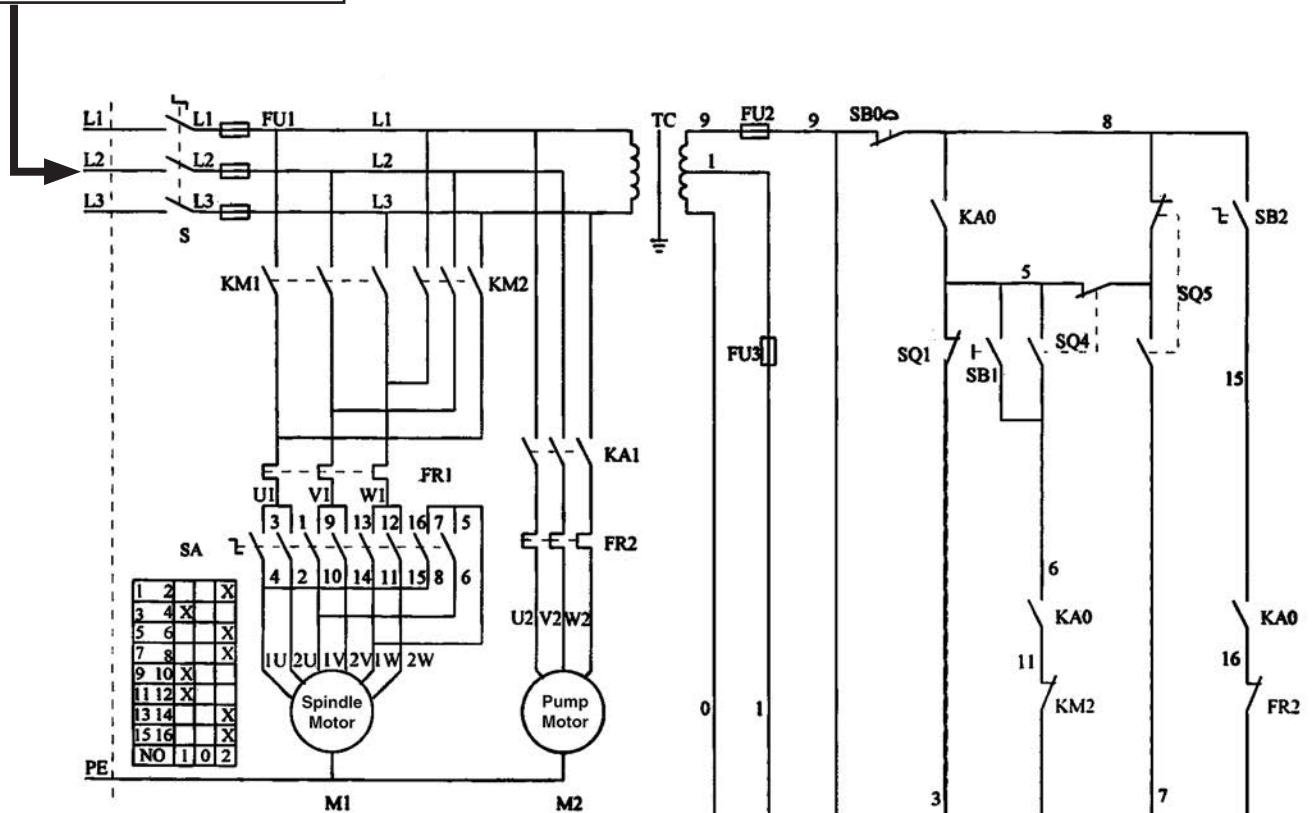
# Component Relationship Diagram



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Industrial, Inc.®

If a phase converter is being used, connect the "Wild Wire" or "Manufactured Leg" to L2 or contactor and transformer failure may result!

**⚠ WARNING!**  
**SHOCK HAZARD!**  
Disconnect power before working on wiring.

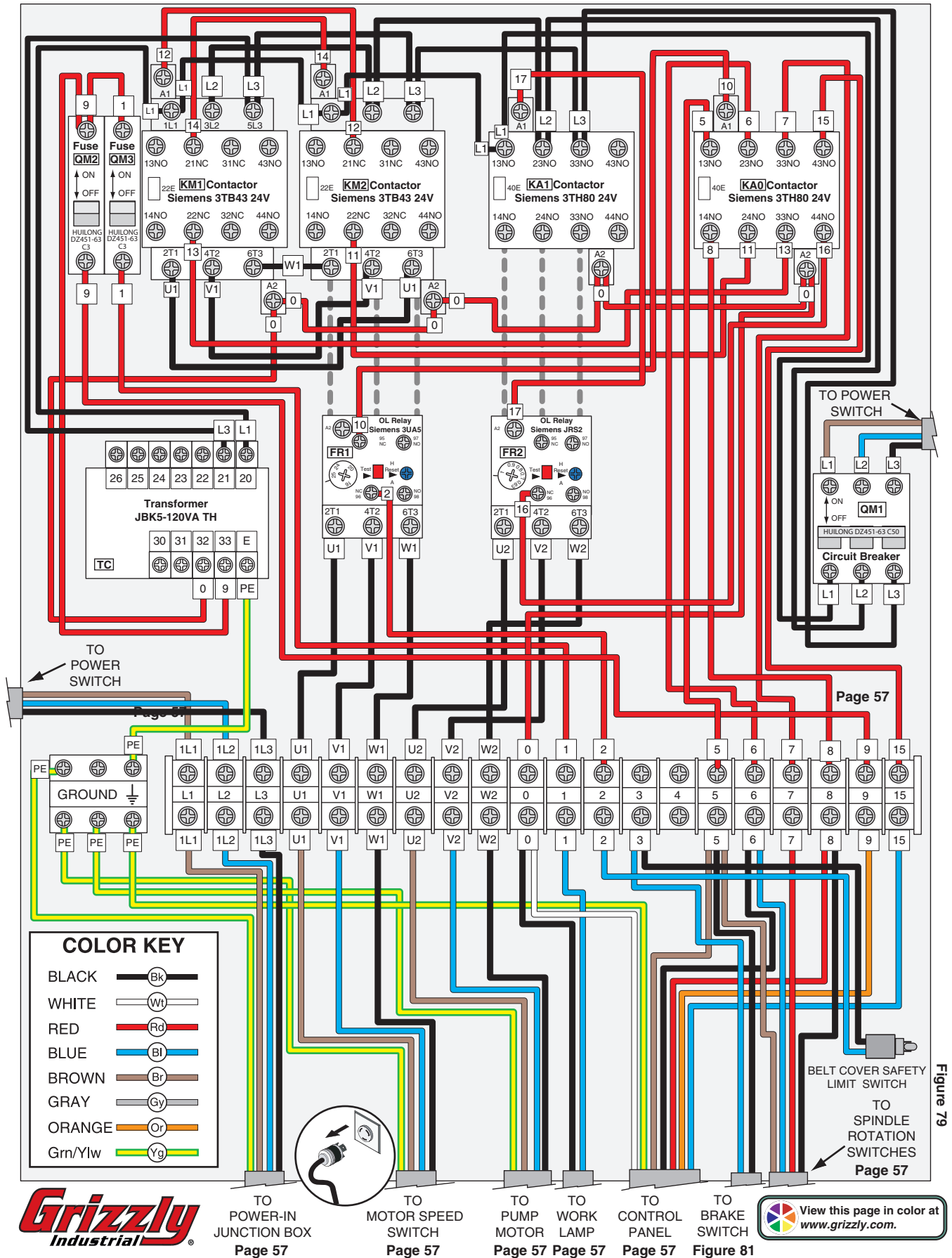


See **Figures 75 through 86** component locations, and **Pages 56 and 57** for wire connections.

- |                       |                                  |
|-----------------------|----------------------------------|
| SB2: Pump Switch      | SQ3: Belt Cover Limit Switch     |
| TC: Transformer       | SQ4: Spindle Motor Switch        |
| S: Motor Speed Switch | SQ5: Spindle Motor Switch        |
| EL: Work Lamp         | SB0: Emergency Stop Button       |
| HL1: Power Lamp       | KM1: Spindle Motor Contactor     |
| M1: Spindle Motor     | KM2: Spindle Motor Contactor     |
| M2: Pump Motor        | FR1: Spindle Motor Thermal Relay |
| FU2: Fuse             | KA1: Pump Contactor              |
| FU3: Fuse             | KA0: Master Power Contactor      |
| SB1: Jog Button       | FR2: Pump Motor Thermal Relay    |
| SQ1: Brake Switch     | FU1: Main Circuit Breaker        |
| SQ2: Work Lamp Switch |                                  |



# Main Electrical Box Wiring Diagram



**COLOR KEY**

BLACK	—(Bk)—
WHITE	—(Wt)—
RED	—(Rd)—
BLUE	—(Bl)—
BROWN	—(Br)—
GRAY	—(Gy)—
ORANGE	—(Or)—
Gm/Ylw	—(Yg)—



- TO POWER-IN JUNCTION BOX Page 57
- TO MOTOR SPEED SWITCH Page 57
- TO PUMP MOTOR Page 57
- TO WORK LAMP Page 57
- TO CONTROL PANEL Page 57
- TO BRAKE SWITCH Figure 81

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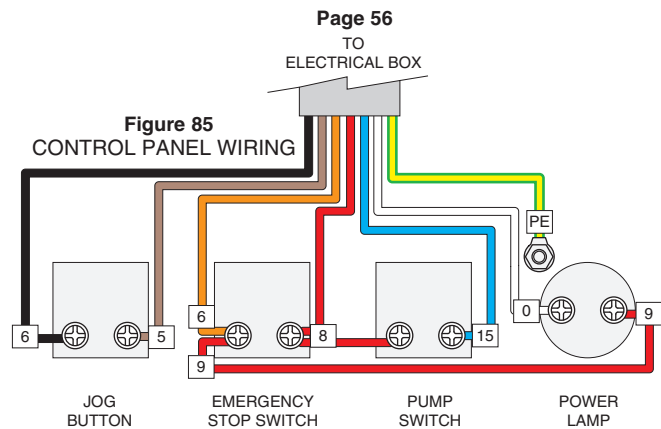
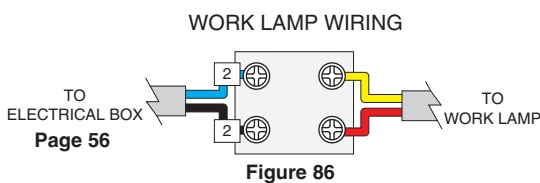
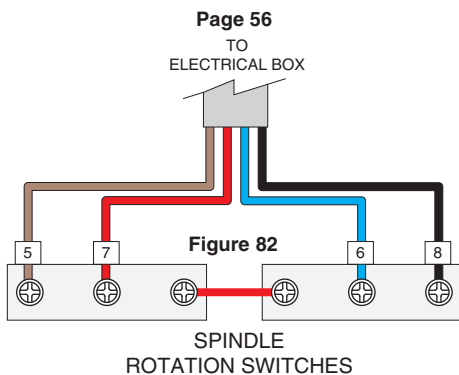
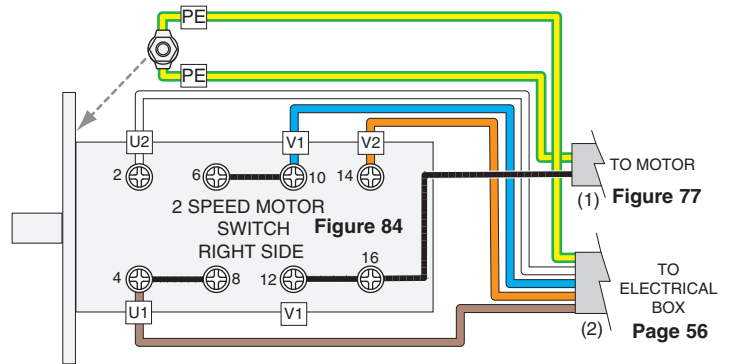
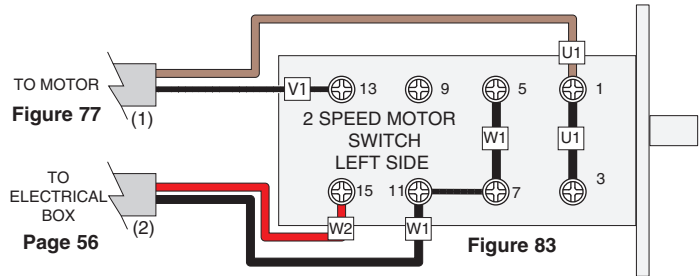
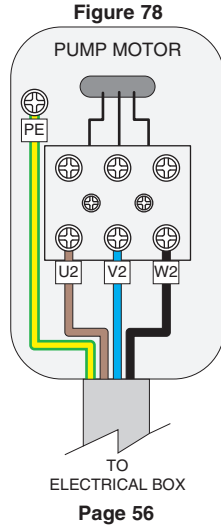
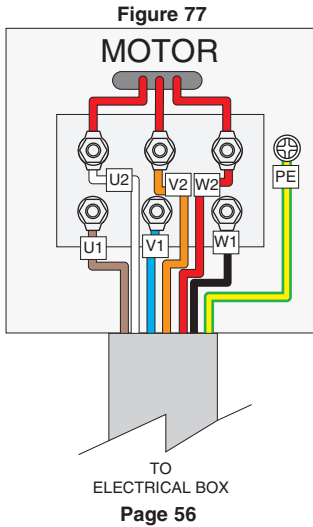
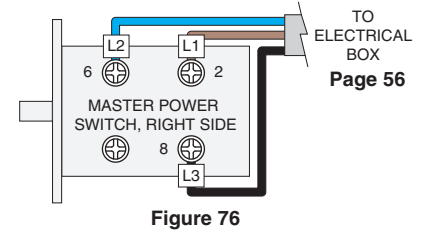
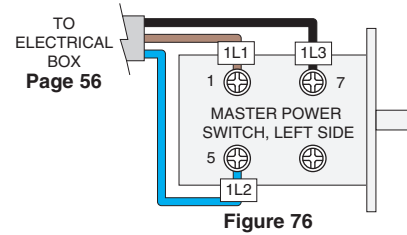
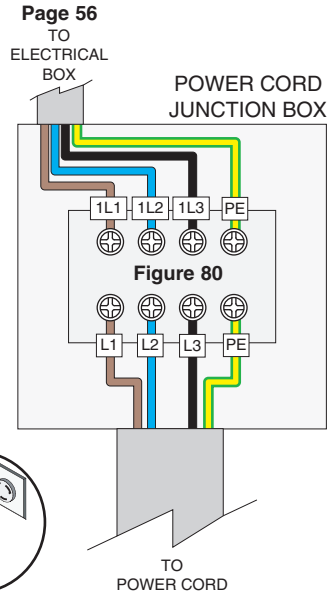
# Component Wiring Diagram

**COLOR KEY**

BLACK		Bk
WHITE		Wl
RED		Rd
BLUE		Bl
BROWN		Br
GRAY		Gy
ORANGE		Or
Grn/Ylw		Yg

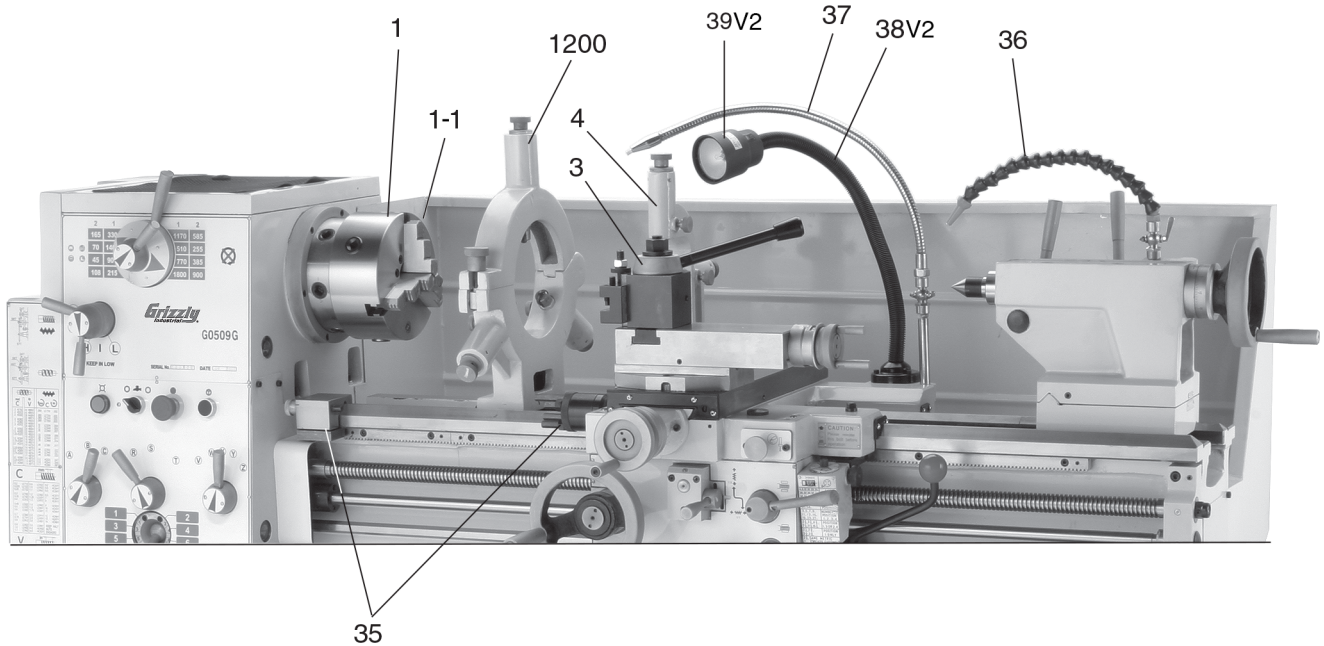
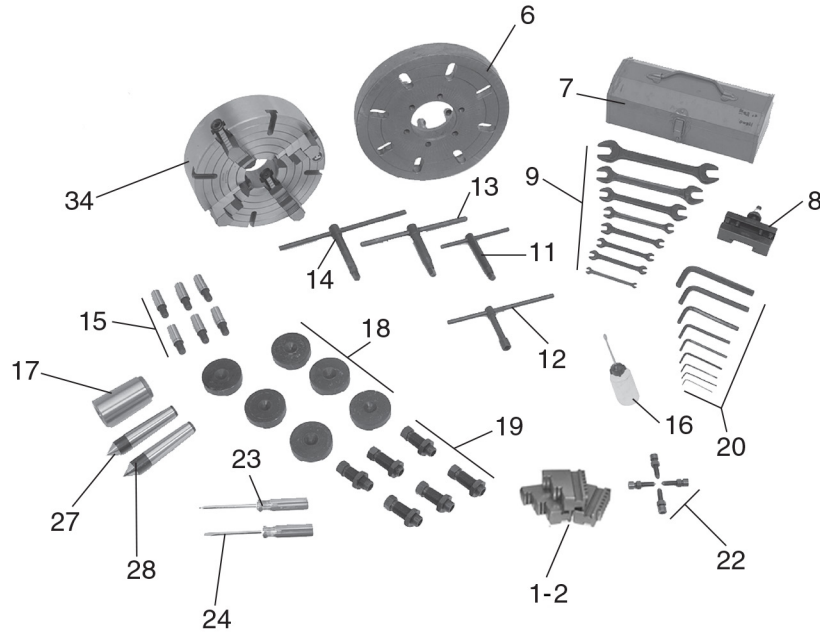


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# SECTION 8: PARTS

## Accessories



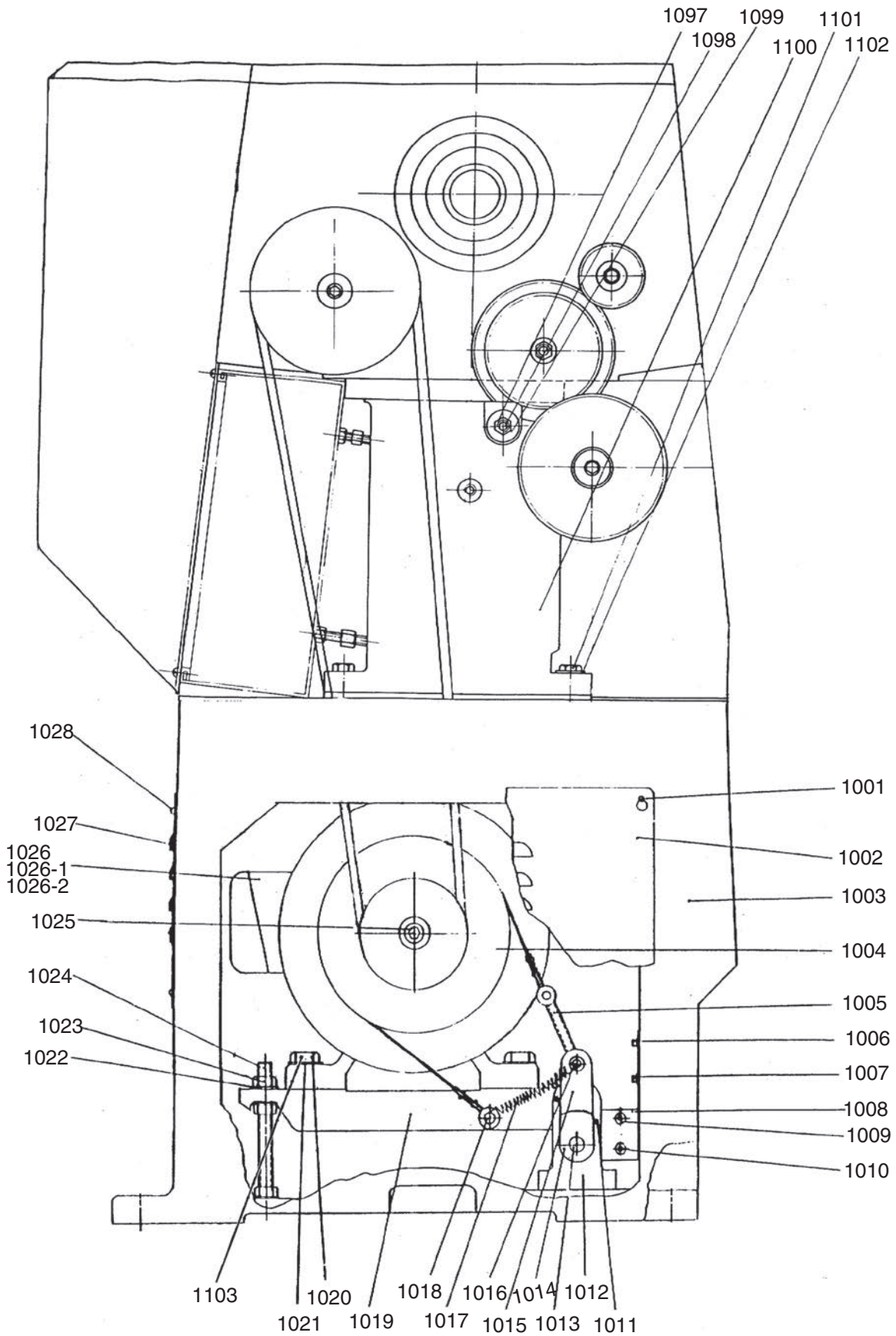
# Accessories Parts List

REF	PART #	DESCRIPTION
1	P0509G0001	8" THREE-JAW CHUCK (G0509G)
1-1	P0509G0001-1	EXTERNAL JAW SET 3-PC
1-2	P0509G0001-2	INTERNAL JAW SET 3-PC
3	P05090003	TOOL POST W/TOOL HOLDER
4	P05090004	COMPLETE FOLLOW REST
6	P05090006	14" FACEPLATE
7	P05090007	TOOL BOX
8	P05090008	TOOL HOLDER
9	P05090009	WRENCH SET
11	P05090011	CAM LOCK T-WRENCH
12	P05090012	TOOL HOLDER T-WRENCH
13	P05090013	4-JAW CHUCK T-WRENCH
14	P05090014	3-JAW CHUCK T-WRENCH
15	P05090015	4-JAW CHUCK CAMLOCK STUDS
16	P05090016	OIL BOTTLE
17	P05090017	MT#6 TO MT#4 ADAPTER

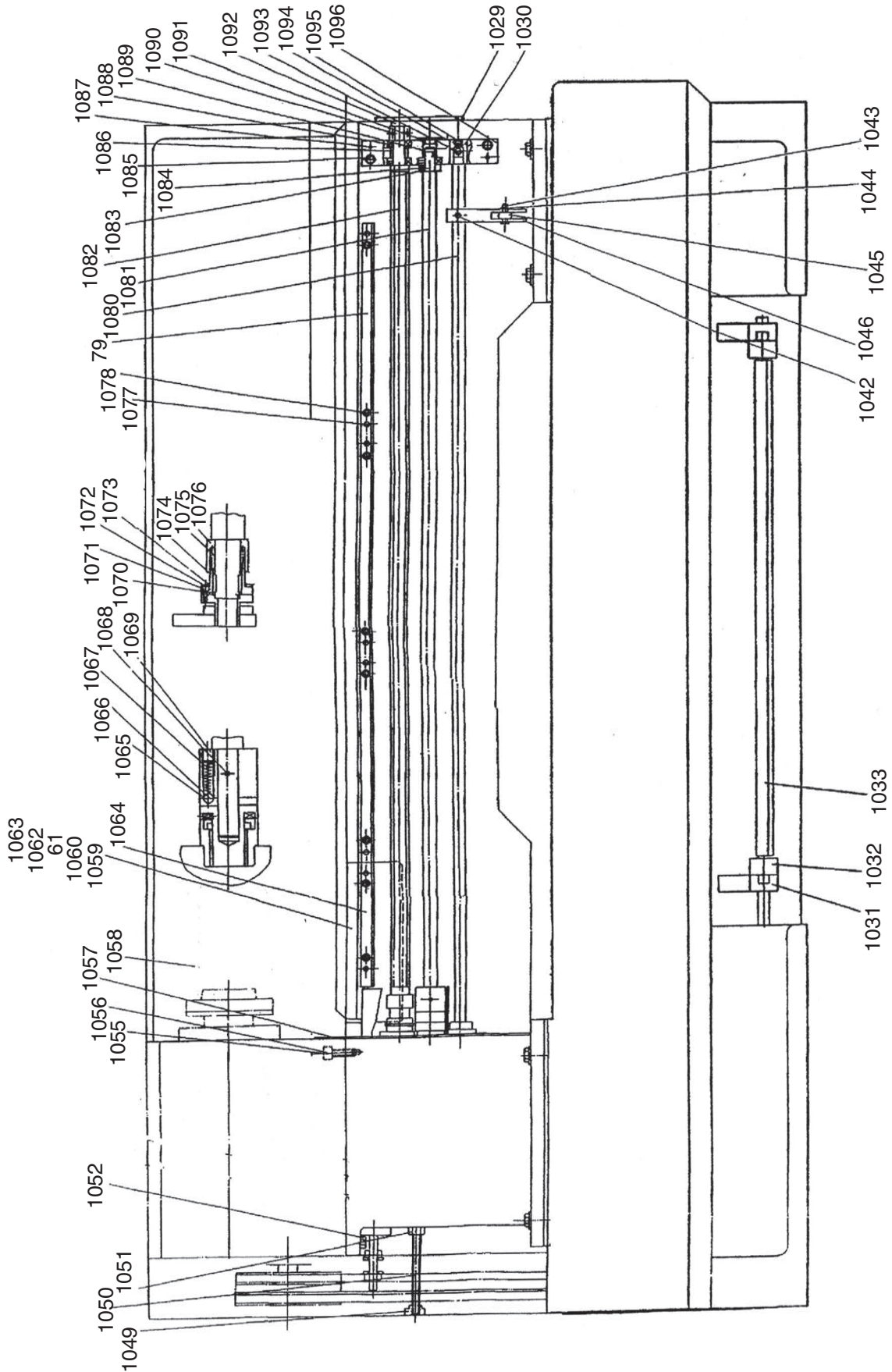
REF	PART #	DESCRIPTION
18	P05090018	CAST-IRON FEET
19	P05090019	JACKING STUDS W/NUTS
20	P05090020	HEX WRENCH SET
22	P0509G0022	SPIDER SCREW SET (G0509G)
23	P05090023	#2 PHILLIPS SCREWDRIVER
24	P05090024	#2 STANDARD SCREWDRIVER
27	P05090027	CARBIDE TIP DEAD CENTER MT#4
28	P05090028	STANDARD TIP DEAD CENTER MT#4
34	P0509034	12" FOUR-JAW UNIVERSAL CHUCK
35	P05090035	MANUAL MICROMETER STOP KIT
36	P0509G8009	TAILSTOCK COOLANT KIT (G0509G)
37	P05090037	CUTTING COOLANT HOSE KIT
38V2	P05090038V2	LED WORK LAMP ASSY
39V2	P05090039V2	LED BULB 24V MR16 (1W X 3) V3.05.15
80	P05090080	ADJUSTABLE TURRET STOP
1200	P05091200	COMPLETE STEADY REST



# Frame, Ways, & Stand (1-2)



# Frame, Ways, & Stand (2-2)



# Frame, Ways, & Stand Parts List

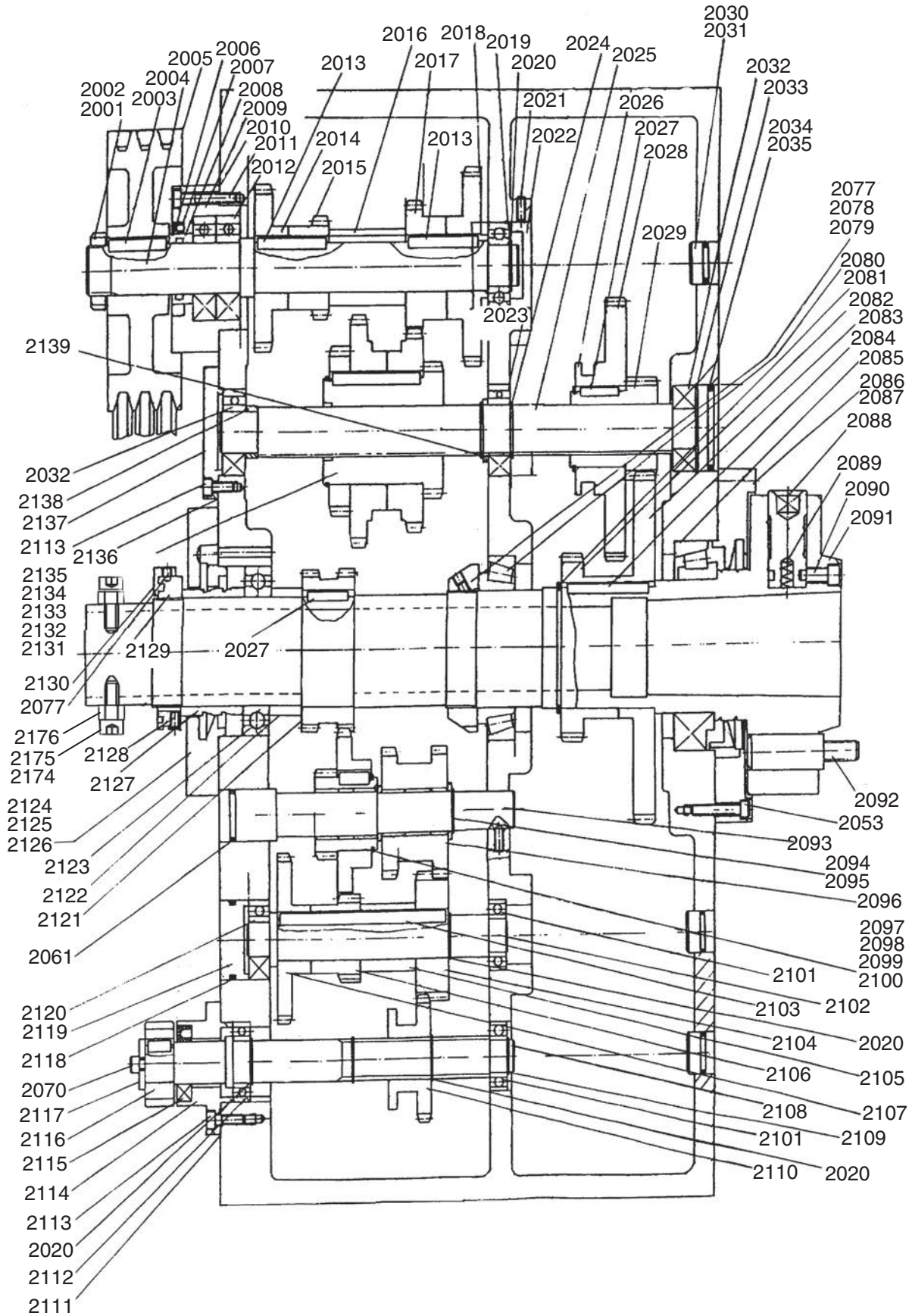
REF	PART #	DESCRIPTION
61	P0509061	TAPER PIN 8 X 85MM
79	P0509079	RACK
1001	PS68M	PHLP HD SCR M6-1 X 10
1002	P05091002	COVER (G0509)
	P0509G1002	COVER (G0509G)
1003	P05091003	STAND
1004	P05091004	PULLEY
1005	P05091005	BELT BRAKE
1006	PS68M	PHLP HD SCR M6-1 X 10
1007	PS68M	PHLP HD SCR M6-1 X 10
1008	P05091008	SWITCH SEAT
1009	PN04M	HEX NUT M4-.7
1010	PSB21M	CAP SCREW M4-.7 X 30
1011	P05091011	LIMIT SWITCH
1012	P05091012	MOTOR SEAT BRACKET
1013	P05091013	SHAFT
1014	P05091014	CAM
1015	P05091015	BRAKE ARM
1016	P05091016	SHAFT
1017	P05091017	SPRING
1018	P05091018	SHAFT
1019	P05091019	MOTOR SEAT
1020	PB31M	HEX BOLT M10-1.5 X 40
1021	PLW06M	LOCK WASHER 10MM
1022	PLW10M	LOCK WASHER 16MM
1023	PN13M	HEX NUT M16-2
1024	P05091024	THREADED STUD M16-2 X 150
1025	P05091025	SPECIAL WASHER
1026	P05091026	MOTOR
1026-1	P05091026-1	MOTOR FAN COVER
1026-2	P05091026-2	MOTOR FAN
1027	P05091027	COVER (G0509)
	P0509G1027	COVER (G0509G)
1028	PSB04M	CAP SCREW M6-1 X 10
1029	P05091029	COVER
1030	P05091030	SLEEVE
1031	P05091031	BRACKET
1032	P05091032	ARM
1033	P05091033	BRAKE PEDAL
1042	PSB52M	CAP SCREW M8-1.25 X 10
1043	P05091043	CLEVIS PIN 7.5 X 25MM
1044	PEC09M	E-CLIP 6MM
1045	P05091045	ROD
1046	P05091046	LEVER
1049	P05091049	KNURLED THUMB NUT
1050	P05091050	MOUNTING STUD
1051	PN02M	HEX NUT M10-1.5
1052	PB35M	HEX BOLT M12-1.75 X 40

REF	PART #	DESCRIPTION
1055	PSB92M	CAP SCREW M12-1.75 X 40
1056	P05091056	DOWEL PIN 12 X 30MM
1057	P05091057	COVER
1058	P05091058	GUARD ASSEMBLY
1059	P05091059	GAP BLOCK
1060	PSB70M	CAP SCREW M10-1.5 X 45
1062	PN03M	HEX NUT M8-1.25
1063	PSB05M	CAP SCREW M8-1.25 X 50
1064	P05091064	RACK
1065	P05091065	CLUTCH
1066	P05091066	STEEL BALL 8MM
1067	P05091067	TAPER PIN 5 X 45MM
1068	P05091068	COMPRESSION SPRING 1.2 X 6 X 46MM
1069	P05091069	SPECIAL SCR M10-1.5 X 10
1070	P05091070	SLEEVE
1071	P05091071	DOWEL PIN
1072	P05091072	THRUST WASHER
1073	PR19M	EXT RETAINING RING 28MM
1074	PK08M	KEY 5 X 5 X 16MM
1075	P05091075	COMPRESSION SPRING 1.8 X 2.5 X 55
1076	P05091076	COVER
1077	PSB07M	CAP SCREW M6-1 X 30
1078	PRP08M	ROLL PIN 6 X 30MM
1080	P05091080	ROD
1081	P05091081	FEED ROD
1082	P05091082	LEAD SCREW
1083	P05091083	SLEEVE
1084	PSS02M	SET SCREW M6-1 X 6
1085	PSB40M	CAP SCREW M8-1.25 X 35
1086	P05091086	SLEEVE
1087	P05091087	TAPER PIN 6 X 50MM
1088	P8203	THRUST BEARING 8203
1089	P05091089	SLEEVE
1090	PSS03M	SET SCREW M6-1 X 8
1091	P05091091	PLUG
1092	P05091092	END PLAY ADJUSTMENT NUT
1093	P05091093	STEEL BALL 9.5MM
1094	P05091094	COMPRESSION SPRING 1 X 9 X 20MM
1095	PSB68M	CAP SCREW M6-1 X 8
1096	P05091096	BRACKET
1097	P05091097	STUD M12-1.75 X 100
1098	PN09M	HEX NUT M12-1.75
1099	PW06M	FLAT WASHER 12MM
1100	P05091100	BED
1101	PB24M	HEX BOLT M12-1.75 X 45
1102	PLW05M	LOCK WASHER 12MM
1103	P0509G1103	BUFFER BUMPER

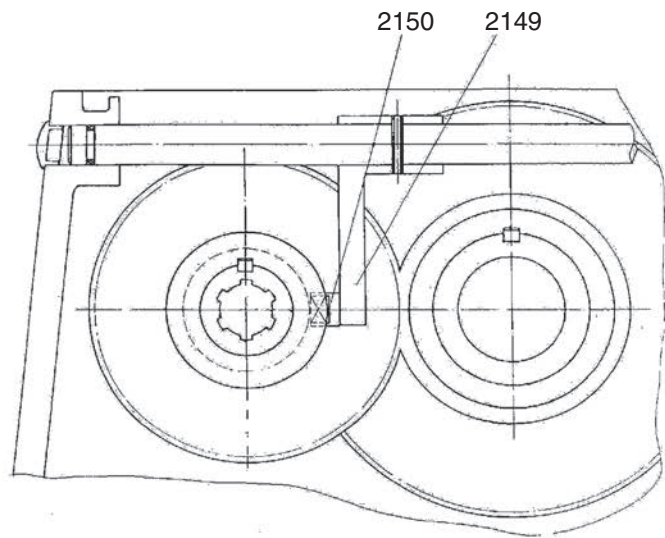
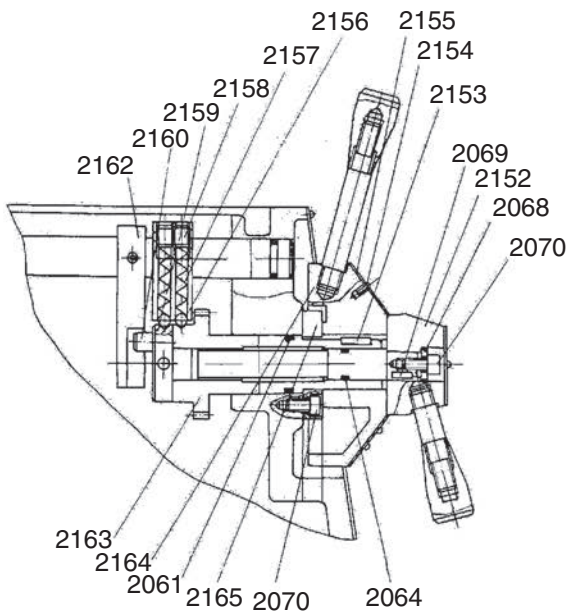
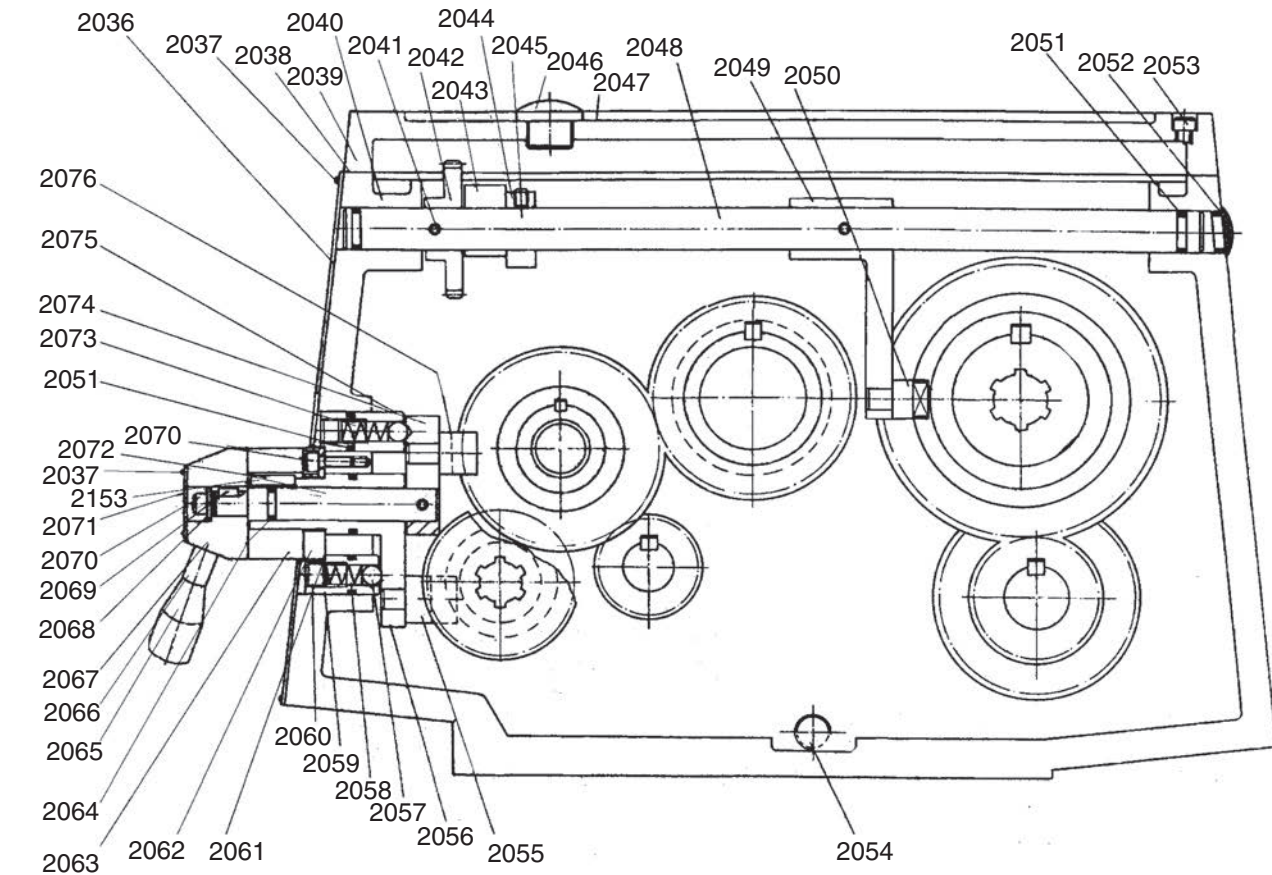




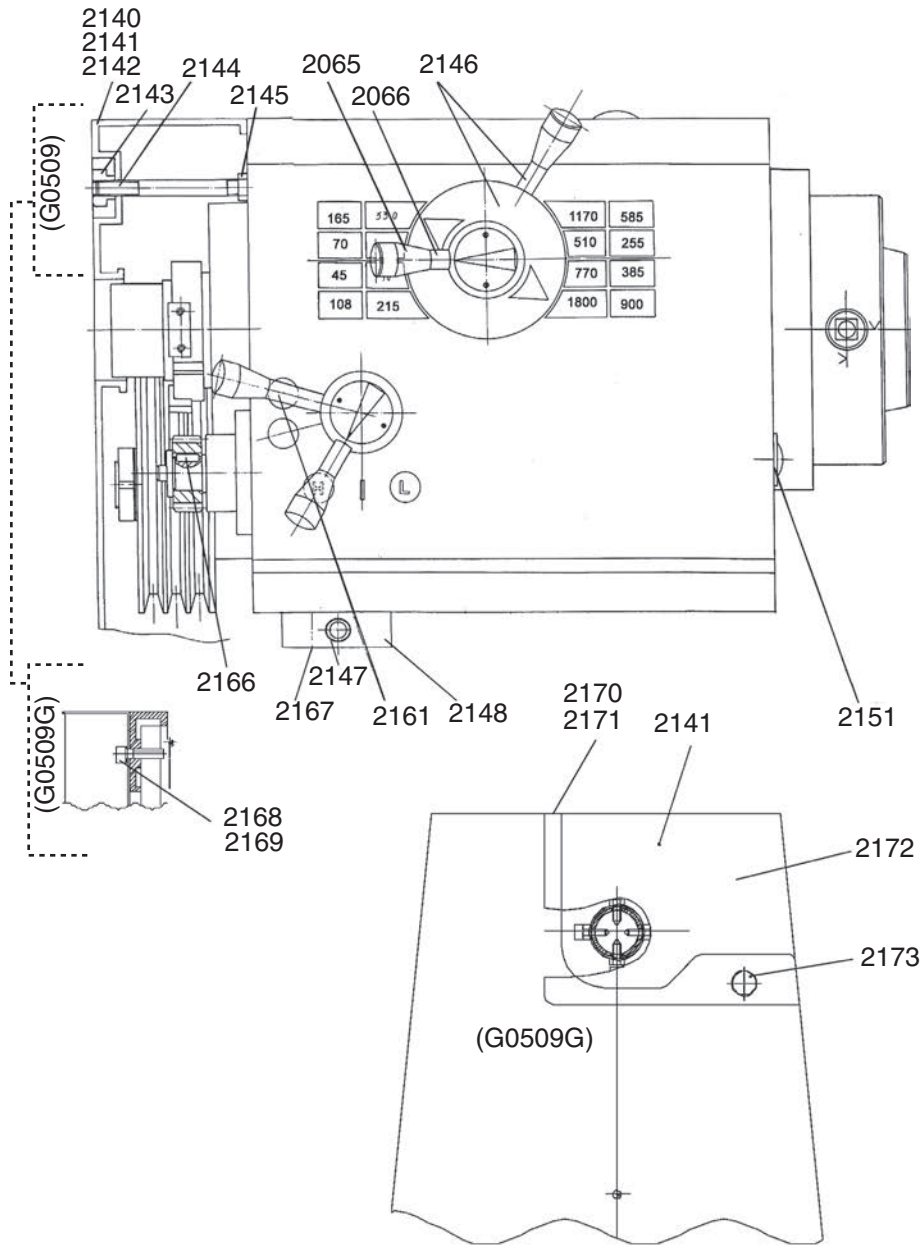
# Headstock (1-3)



# Headstock (2-3)



# Headstock (3-3)



# Headstock Parts List

REF	PART #	DESCRIPTION
2001	P05092001	HEX NUT M30-1.5
2002	P05092002	TOOTHED LOCK WASHER 30MM
2003	PK41M	KEY 8 X 8 X 40MM
2004	P05092004	SHAFT
2005	P05092005	PULLEY
2006	P05092006	SPACER
2007	P05092007	OIL SEAL
2008	P05092008	O-RING 36 X 3.5MM
2009	P05092009	BEARING COVER
2010	P05092010	PACKING
2011	PSB29M	CAP SCREW M6-1 X 40
2012	P6206ZZ	BALL BEARING 6206
2013	P05092013	KEY 8 X 8 X 50MM
2014	P05092014	GEAR 38-TOOTH
2015	P05092015	GEAR 33-TOOTH
2016	P05092016	SLEEVE
2017	P05092017	GEAR 23-TOOTH
2018	P05092018	GEAR 33-TOOTH
2019	P6205ZZ	BALL BEARING 6205ZZ
2020	PR11M	EXT RETAINING RING 25MM
2021	PSS34M	SET SCREW M5-.8 X 16
2022	P05092022	PLUG
2023	P05092023	BALL BEARING E206 (G0509)
2024	PR15M	EXT RETAINING RING 30MM
2025	P05092025	SHAFT
2026	PR56M	EXT RETAINING RING 45MM
2027	PK136M	KEY 8 X 8 X 30MM
2028	P05092028	GEAR 60-TOOTH
2029	P05092029	GEAR 21-TOOTH
2030	P05092030	PLUG
2031	P05092031	O-RING 19 X 2.65MM
2032	P6305ZZ	BALL BEARING 6305ZZ
2033	P05092033	EXT RETAINING RING 62MM
2034	P05092034	COVER
2035	P05092035	O-RING 56 X 3.5MM
2036	P05092036	PLATE
2037	P05092037	FLAT HD SCR M3-.5 X 15
2038	P05092038	PACKING
2039	P05092039	COVER
2040	P05092040	CASTING
2041	PRP05M	ROLL PIN 5 X 30MM
2042	P05092042	GEAR 43-TOOTH
2043	P05092043	BRACKET
2044	P05092044	SLEEVE
2045	PSS01M	SET SCREW M6-1 X 10
2046	P05092046	PLUG
2047	P05092047	COVER

REF	PART #	DESCRIPTION
2048	P05092048	SHAFT
2049	P05092049	LEVER
2050	P05092050	FORK
2051	P05092051	O-RING 14 X 2.65MM
2052	P05092052	PLUG
2053	PSB07M	CAP SCREW M6-1 X 30
2054	P05092054	OIL PLUG
2055	P05092055	FORK
2056	P05092056	LEVER
2057	P05092057	STEEL BALL 10MM
2058	P05092058	COMPRESSION SPRING 0.9 X 9 X 35MM
2059	P05092059	BRACKET
2060	PSS01M	SET SCREW M6-1 X 10
2061	P05092061	O-RING 28 X 3.1MM
2062	P05092062	COVER
2063	P05092063	LEVER HUB
2064	P05092064	O-RING 10 X 2.65MM
2066	P05092066	LEVER
2067	P05092067	LEVER HUB
2068	PR04M	EXT RETAINING RING 6MM
2069	PK05M	KEY 4 X 4 X 10MM
2070	PSB26M	CAP SCREW M6-1 X 12
2071	P05092071	PLATE
2072	P05092072	SHAFT
2073	P05092073	COMPRESSION SPRING 0.9 X 9 X 40MM
2074	P05092074	LEVER
2075	P05092075	BRACKET
2076	P05092076	FORK
2077	PSS03M	SET SCREW M6-1 X 8
2078	P05092078	SPANNER NUT
2079	P05092079	LEAD PLUG
2080	P05092080	TAPERED ROLLER BEARING
2081	P05092081	EXT RETAINING RING 75MM
2082	P05092082	GEAR 43-TOOTH
2083	P05092083	GEAR 82-TOOTH
2084	P05092084	KEY 8 X 8 X 60MM
2085	P05092085	TAPERED ROLLER BEARING
2086	P05092086	COVER
2087	P05092087	PACKING
2088	P05092088	CAM LOCK
2089	P05092089	COMPRESSION SPRING
2090	P05092090	SPECIAL CAP SCREW
2091	P05092091	SPINDLE D1-6 (G0509)
	P0509G2091	SPINDLE D1-6 (G0509G)
2092	P05092092	CAM LOCK STUD
2093	P05092093	SHAFT
2094	P05092094	SPACER



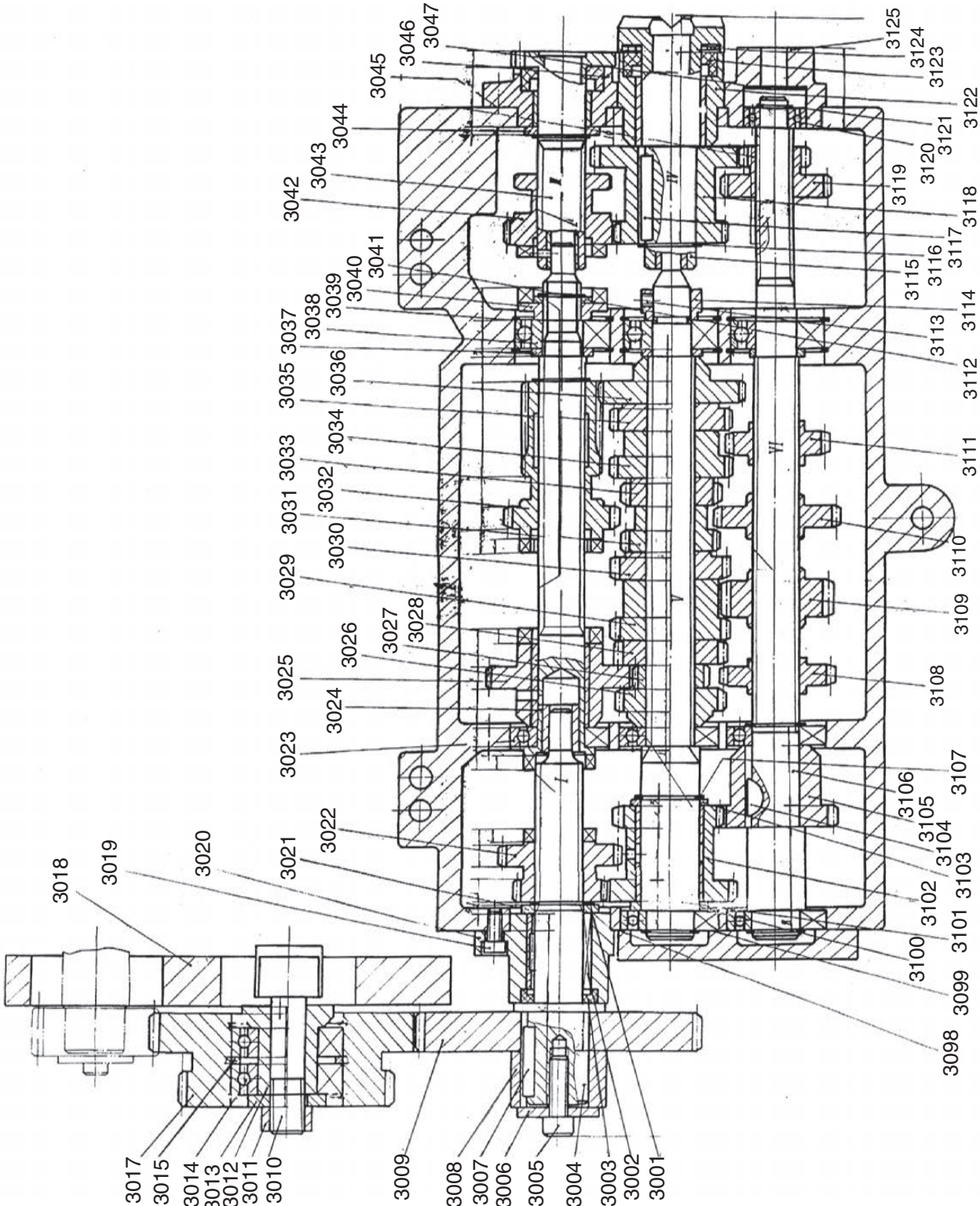
# Headstock Parts List

REF	PART #	DESCRIPTION
2095	PR10M	EXT RETAINING RING 22MM
2096	P05092096	GEAR 36-TOOTH
2097	P05092097	GEAR 24-TOOTH
2098	P05092098	GEAR 48-TOOTH
2099	PK34M	KEY 5 X 5 X 20MM
2100	PR62M	EXT RETAINING RING 42MM
2101	P6204-2RS	BALL BEARING 6204
2102	P05092102	SHAFT
2103	P05092103	KEY 8 X 8 X 115MM
2104	P05092104	GEAR 26-TOOTH
2105	P05092105	SLEEVE
2106	P05092106	GEAR 24-TOOTH
2107	P05092107	GEAR 48-TOOTH
2108	P05092108	SHAFT
2109	PR09M	EXT RETAINING RING 20MM
2110	P05092110	GEAR 36-TOOTH
2111	P05092111	PACKING
2112	P60052RS	BALL BEARING 6005
2113	PSB27M	CAP SCREW M6-1 X 14
2114	P05092114	COVER
2115	P05092115	OIL SEAL
2116	P05092116	CHANGE GEAR 24-TOOTH
2117	P05092117	SPACER
2118	P05092118	O-RING 46 X 3.5MM
2119	P05092119	COVER
2120	P6204-2RS	BALL BEARING 6204
2121	P05092121	GEAR 48-TOOTH
2122	P05092122	SLEEVE
2123	P05092123	BALL BEARING E213
2124	P05092124	COVER
2125	P05092125	PACKING
2126	PSB06M	CAP SCREW M6-1 X 25
2127	P05092127	OIL RING
2128	PSS01M	SET SCREW M6-1 X 10
2129	P05092129	SPANNER NUT
2130	P05092130	COUNTERWEIGHT
2131	P05092131	GEAR 39-TOOTH
2132	P05092132	GEAR 54-TOOTH
2133	P05092133	GEAR 47-TOOTH
2134	P05092134	GEAR 31-TOOTH
2135	PR13M	EXT RETAINING RING 65MM
2136	P05092136	PACKING

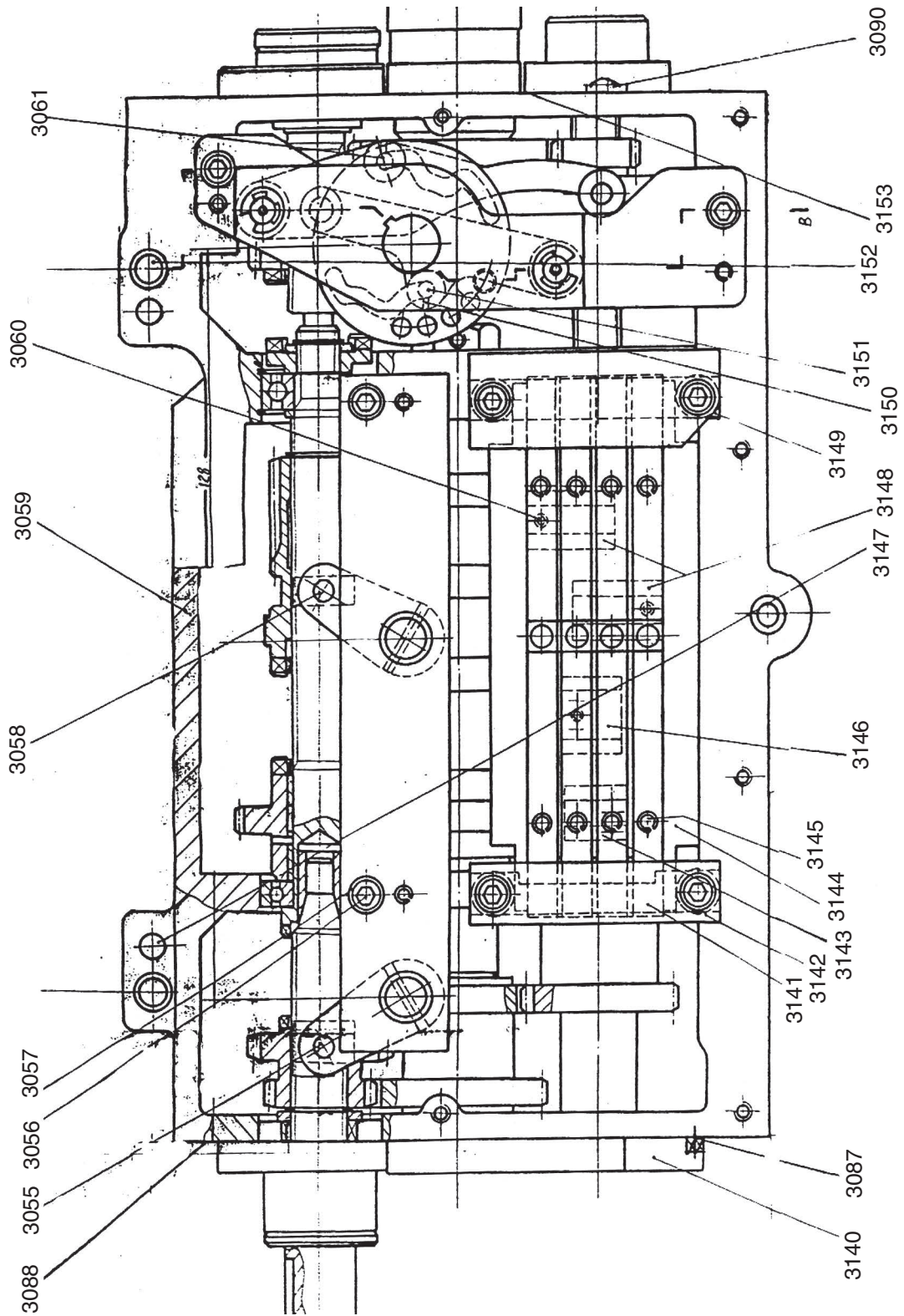
REF	PART #	DESCRIPTION
2137	P05092137	COVER
2138	P05092138	SPACER
2139	P05092139	SPACER
2140	P05092140	PLATE
2141	P05092141	COVER (G0509)
	P0509G2141	COVER (G0509G)
2142	PS79M	PHLP HD SCR M3-.5 X 8
2143	P05092143	KNURLED NUT M10-1.5
2144	P05092144	STUD M10-1.5 X 85
2145	PN02M	HEX NUT M10-1.5
2146	P05092146	LEVER W/HUB ASSEMBLY
2147	P05092147	SPECIAL SCR M12-1.75 X 20
2148	P05092148	BRACKET
2149	P05092149	BRACKET
2150	P05092150	FORK
2151	P05092151	SIGHT GLASS 16MM
2152	P05092152	LEVER BRACKET
2153	PK14M	KEY 5 X 5 X 18MM
2154	P05092154	RIVET 2 X 5MM
2155	P05092155	PLATE
2156	P05092156	STEEL BALL 6.5MM
2157	P05092157	COMPRESSION SPRING 1 X 5 X 22MM
2158	PSS14M	SET SCREW M8-1.25 X 12
2159	P05092159	LEVER SHAFT
2160	P05092160	DOWEL PIN
2161	P05092161	LEVER
2162	P05092162	BRACKET
2163	P05092163	GEAR SHAFT 37-TOOTH
2164	P05092164	LEVER BRACKET
2165	P05092165	COVER
2166	PK101M	KEY 6 X 6 X 14MM
2167	P05092167	SPECIAL ADJUSTING SCREW
2168	PSB143M	CAP SCREW M10-1.5 X 50 (G0509G)
2169	PW04M	FLAT WASHER 10MM (G0509G)
2170	P0509G2170	HINGE (G0509G)
2171	PSB110M	CAP SCREW M4-.7 X 6 (G0509G)
2172	P0509G2172	COVER (G0509G)
2173	PSB31M	CAP SCREW M8-1.25 X 25 (G0509G)
2174	P0509G2174	SPIDER BOLT 3/8-18 X 1-1/2" (G0509G)
2175	P0509G2175	SPIDER BOLT 3/8-24 X 1/2" (G0509G)
2176	PN11	HEX NUT 3/8-24 (G0509G)



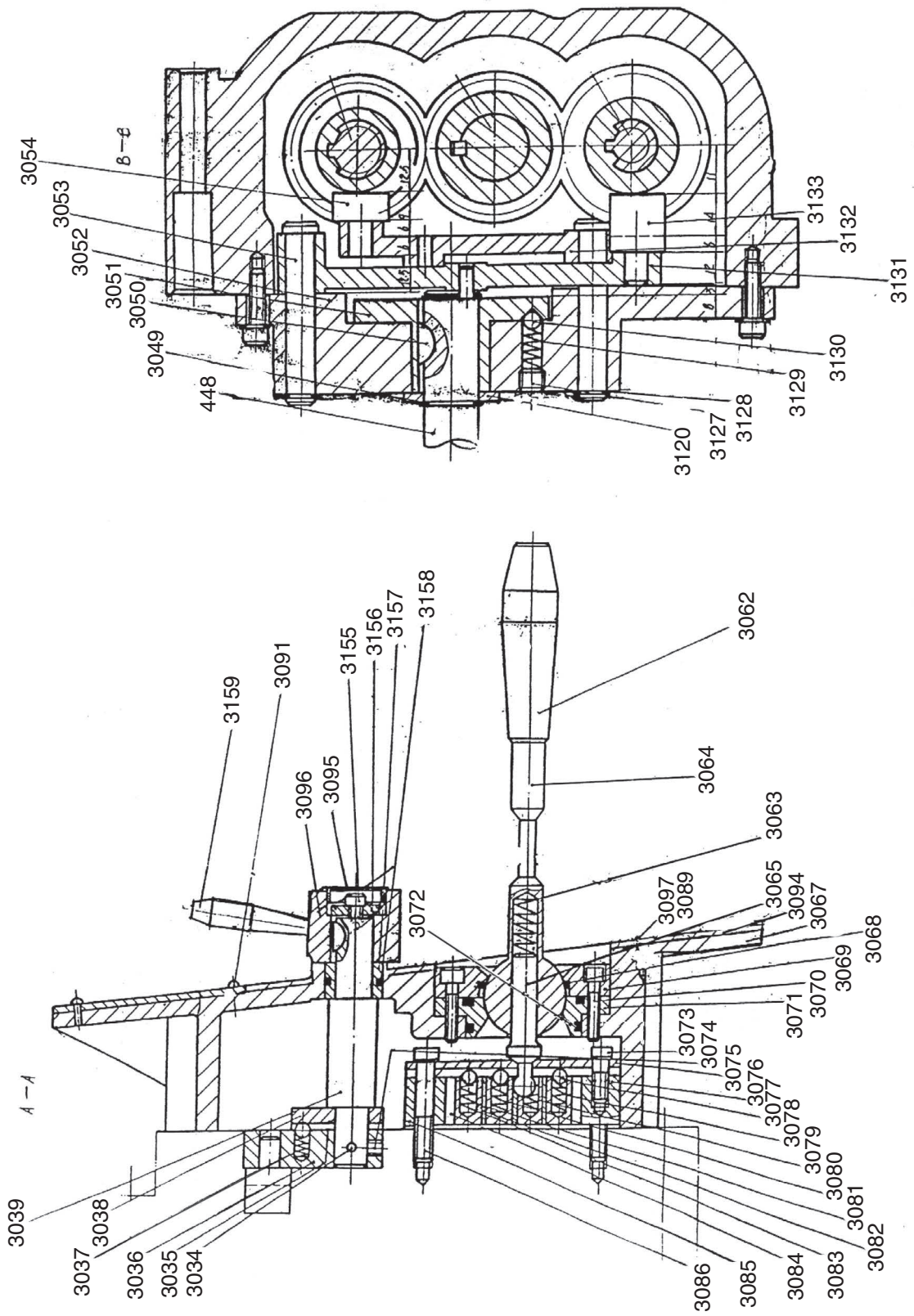
# Gearbox (1-3)



# Gearbox (2-3)



# Gearbox (3-3)





# Gearbox Parts List

REF	PART #	DESCRIPTION
448	P05090448	LEVER
3001	PEC06M	E-CLIP 20MM
3002	P05093002	ROLLER BEARING 943/20
3003	P05093003	OIL SEAL
3004	P05093004	SHAFT
3005	PSB11M	CAP SCREW M8-1.25 X 16
3006	P05093006	WIDE WASHER
3007	P05093007	KEY 8 X 8 X 28MM
3008	P05093008	SLEEVE
3009	P05093009	CHANGE GEAR 57-TOOTH
3010	P05093010	SHAFT
3011	PN32M	HEX NUT M14-2
3012	P05093012	SLEEVE
3013	P05093013	WIDE WASHER 14MM
3014	P05093014	ROLLER BEARING 160105
3015	PR25M	INT RETAINING RING 47MM
3017	P05093017	CHANGE GEAR 44/52-TOOTH
3018	P05093018	BELLCRANK SWING ARM
3019	PSB01M	CAP SCREW M6-1 X 16
3020	P05093020	BRACKET
3021	P05093021	THRUST WASHER
3022	P05093022	GEAR 39/20-TOOTH
3023	P05093023	BALL BEARING 7000104
3024	P05093024	SHAFT
3025	P05093025	GEAR 38-TOOTH
3026	P05093026	GEAR 22-TOOTH
3027	P05093027	GEAR 19-TOOTH
3028	P05093028	GEAR 20-TOOTH
3029	P05093029	GEAR 24-TOOTH
3030	P05093030	GEAR 23-TOOTH
3031	P05093031	GEAR 27-TOOTH
3032	P05093032	GEAR 23/19-TOOTH
3033	P05093033	GEAR 24-TOOTH
3034	P05093034	GEAR 28-TOOTH
3035	P05093035	GEAR 26-TOOTH
3036	P05093036	GEAR 38-TOOTH
3037	P05093037	THRUST WASHER
3038	P203	BALL BEARING 203
3039	PR23M	INT RETAINING RING 40MM
3040	P05093040	CLUTCH
3041	PR02M	EXT RETAINING RING 14MM
3042	P05093042	CLUTCH GEAR
3043	P05093043	SHAFT
3044	P05093044	THRUST WASHER
3045	P05093045	PACKING
3046	P05093046	COVER
3047	P05093047	THRUST WASHER
3049	PR18M	EXT RETAINING RING 17MM
3050	P05093050	KEY 3 X 3 X 12MM
3051	P05093051	CAM
3052	P05093052	BRACKET
3053	P05093053	SHAFT

REF	PART #	DESCRIPTION
3054	P05093054	FORK
3055	P05093055	FORK
3056	PSB01M	CAP SCREW M6-1 X 16
3057	PLW03M	LOCK WASHER 6MM
3058	P05093058	FORK
3059	P05093059	CASTING
3060	PSB15M	CAP SCREW M5-.8 X 20
3061	P05093061	FORK
3062	P05093062	LEVER
3063	P05093063	COMPRESSION SPRING 1 X 8 X 32
3064	P05093064	LEVER
3065	P05093065	SELECTOR
3067	P05093067	COVER
3068	P05093068	O-RING 30 X 2.65MM
3069	P05093069	COVER
3070	PSB38M	CAP SCREW M5-.8 X 25
3071	P05093071	BRACKET
3072	P05093072	O-RING 38.7 X 2.65MM
3073	PSB01M	CAP SCREW M6-1 X 16
3074	P05093074	BRACKET
3075	PSS02M	SET SCREW M6-1 X 6
3076	P05093076	CAP SCREW
3077	P05093077	STEEL BALL 6MM
3078	P05093078	FORK
3079	P05093079	FORK
3080	P05093080	FORK
3081	P05093081	FORK
3082	P05093082	DRIVE PLATE
3083	P05093083	COMPRESSION SPRING .8 X 5 X 17
3084	P05093084	TOP PLATE
3085	P05093085	SLEEVE
3086	PSB48M	CAP SCREW M6-1 X 35
3087	P05093087	PLUG
3088	P05093088	OIL INLET PIPE
3089	PSB127M	CAP SCREW M6-1 X 65
3090	P05093090	SIGHT GLASS 20MM
3091	PS05M	PHLP HD SCR M5-.8 X 8
3094	P05093094	PLATE
3095	P05093095	PLATE
3096	P05093096	LEVER
3097	PSB42M	CAP SCREW M6-1 X 85
3098	P05093098	PACKING
3099	P05093099	PACKING
3100	P05093100	THRUST WASHER
3101	P05093101	SHAFT
3102	P05093102	GEAR 30/19-TOOTH
3103	P05093103	THRUST WASHER
3104	PK08M	KEY 5 X 5 X 16MM
3105	P05093105	GEAR 22-TOOTH
3106	P05093106	SHAFT
3107	PR11M	EXT RETAINING RING 25MM



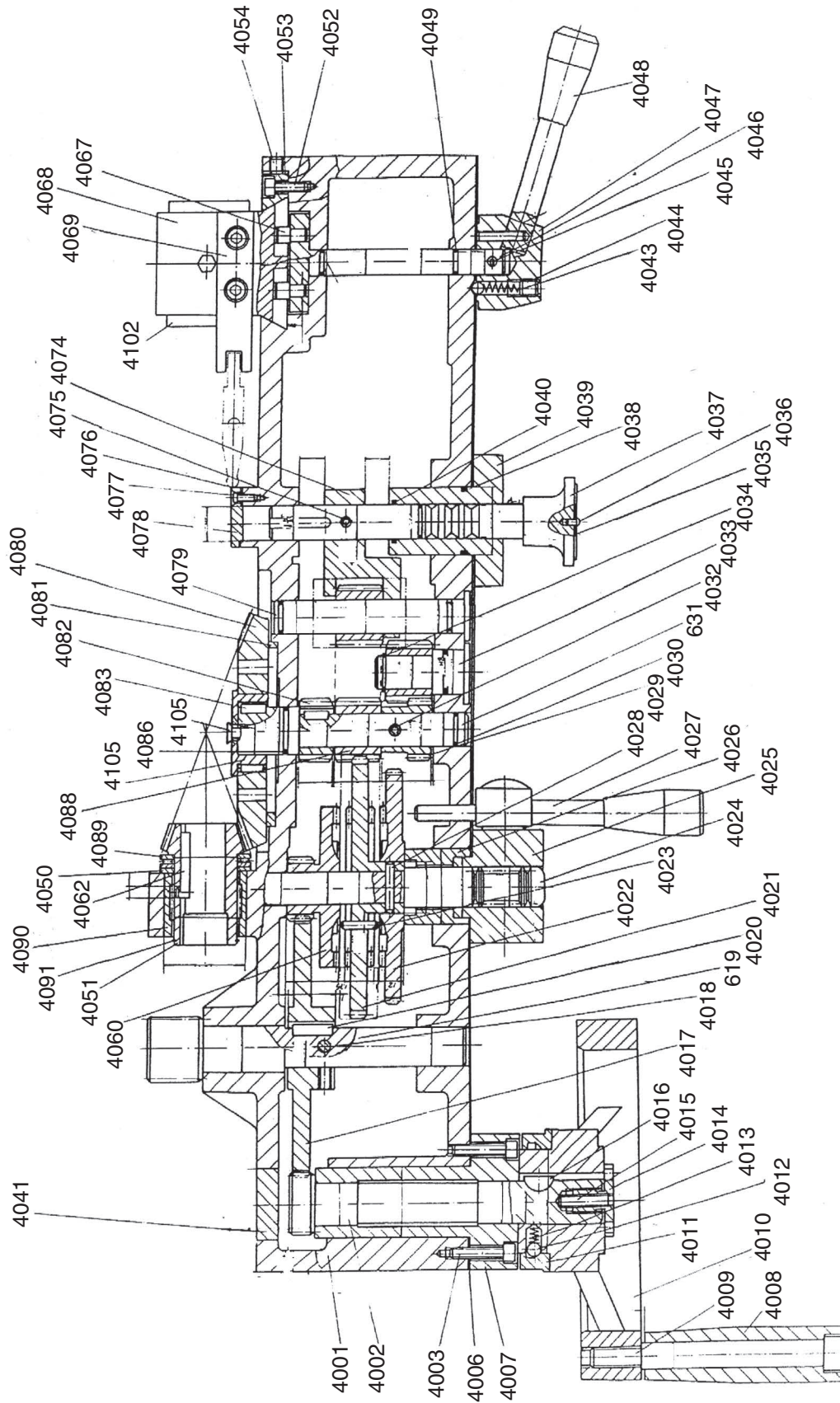
# Gearbox Parts List

REF	PART #	DESCRIPTION
3108	P05093108	GEAR 22-TOOTH
3109	P05093109	GEAR 22-TOOTH
3110	P05093110	GEAR 33-TOOTH
3111	P05093111	GEAR 22-TOOTH
3112	P05093112	THRUST WASHER
3113	P05093113	SPECIAL NUT
3114	PSS07M	SET SCREW M5-.8 X 5
3115	P05093115	SHAFT
3116	PR10M	EXT RETAINING RING 22MM
3117	PK15M	KEY 5 X 5 X 35MM
3118	P05093118	GEAR 33-TOOTH
3119	P05093119	GEAR 36/20-TOOTH
3120	P05093120	ROLLER BEARING 101
3121	PR03M	EXT RETAINING RING 12MM
3122	P05093122	BRACKET
3123	P05093123	OIL SEAL
3124	P8105	THRUST BEARING 8105
3125	P05093125	BRACKET
3126	P05093126	THRUST WASHER
3127	PSS20M	SET SCREW M8-1.25 X 8
3128	PR39M	EXT RETAINING RING 8MM
3129	P05093083	COMPRESSION SPRING
3130	P05092156	STEEL BALL 6.5MM
3131	P05093131	LEVER
3132	P05093132	LEVER
3133	P05093133	FORK

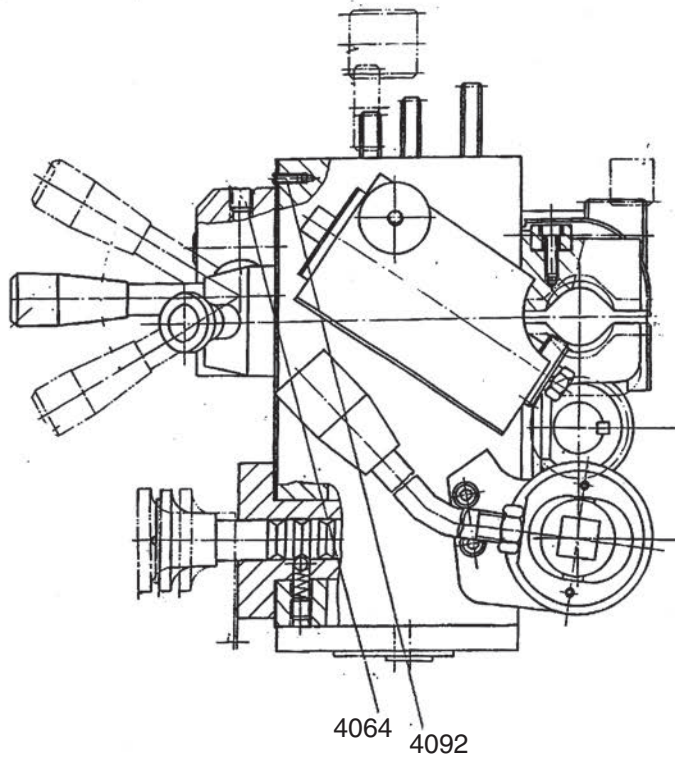
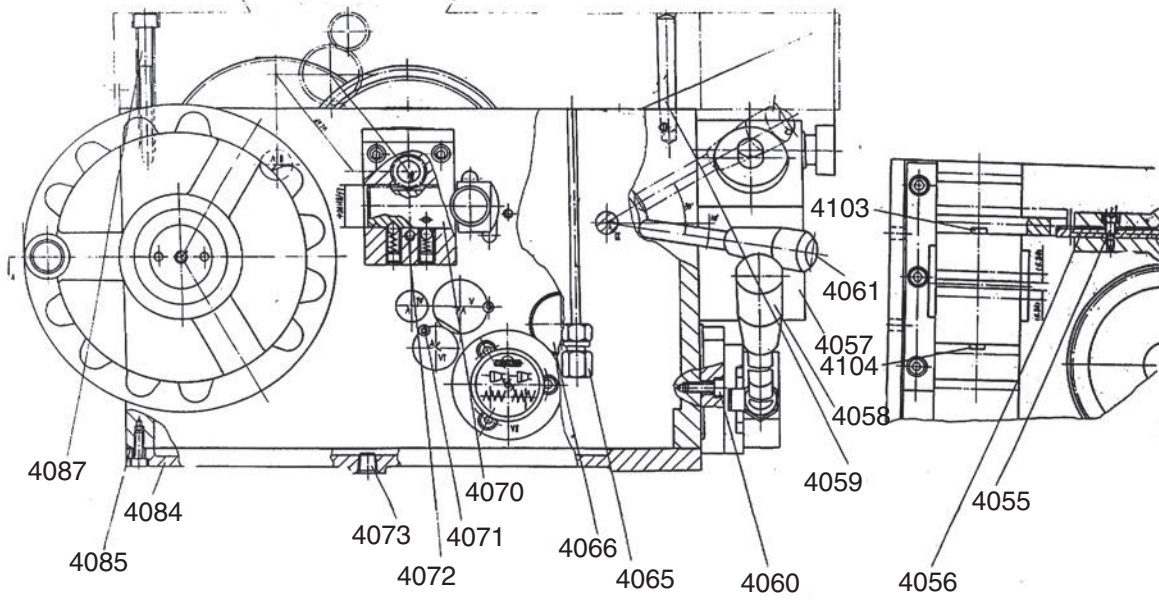
REF	PART #	DESCRIPTION
3134	PRP56M	ROLL PIN 4 X 25mm
3135	P05093135	PACKING
3136	P05093136	LEVER
3137	P05093083	COMPRESSION SPRING
3138	P05093138	SELECTOR BAR
3139	P05093139	SHAFT
3140	P05093140	COVER
3141	P05093141	PLATE
3142	P05093142	PLATE
3143	P05093143	FORK
3144	PRP70M	ROLL PIN 5 X 18MM
3145	PRP44M	ROLL PIN 3 X 10MM
3146	P05093146	FORK
3147	P05093147	TAPER PIN 8 X 90MM
3148	P05093148	FORK
3149	P05093149	PLATE
3150	PRP37M	ROLL PIN 3 X 14MM
3151	P05093151	FORK
3152	PSB35M	CAP SCREW M8-1.25 X 60
3153	P05093153	PACKING
3154	PS07M	PHLP HD SCR M4-.7 X 8
3155	PSB33M	CAP SCREW M5-.8 X 12
3156	P05093156	WASHER
3157	P05093157	SLEEVE
3158	P05093158	O-RING 16 X 2.65MM
3159	P05093159	LEVER



# Apron (1-2)



# Apron (2-2)



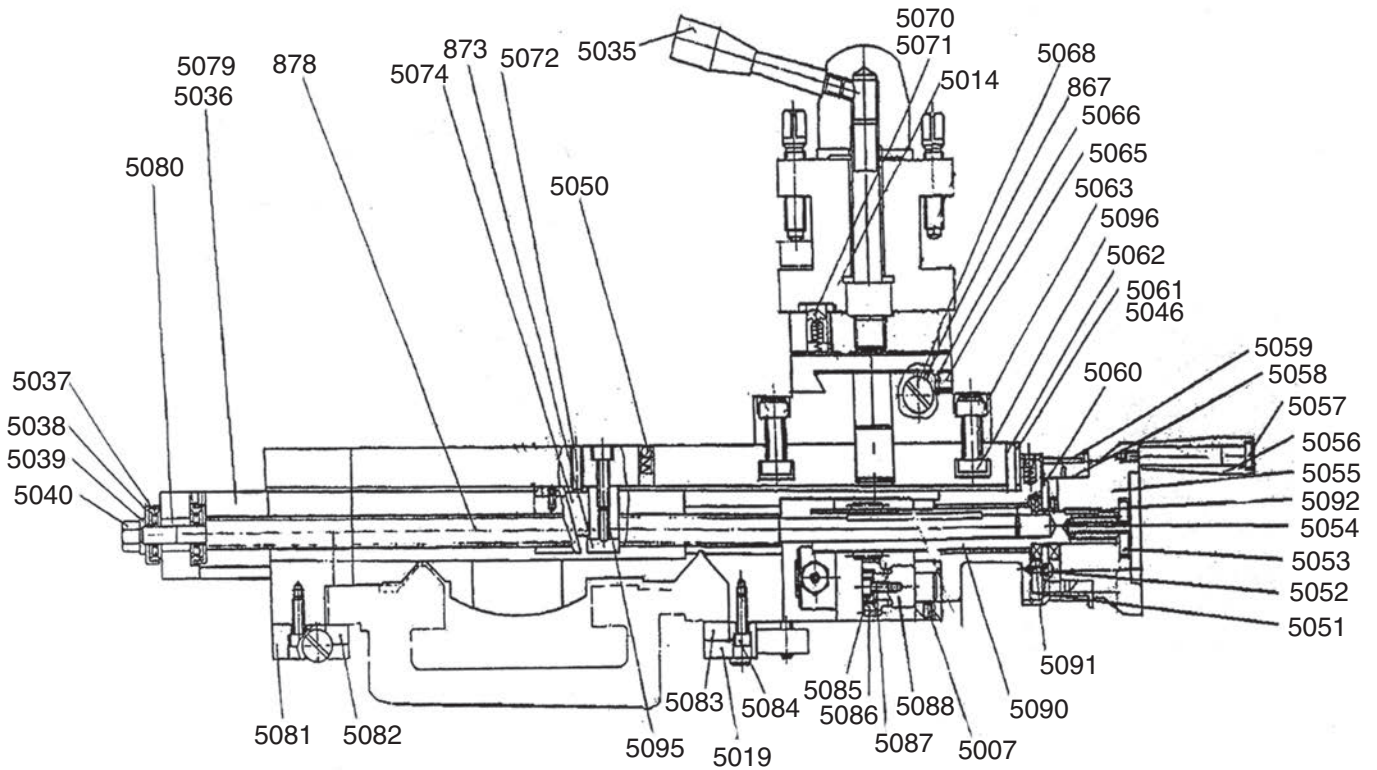
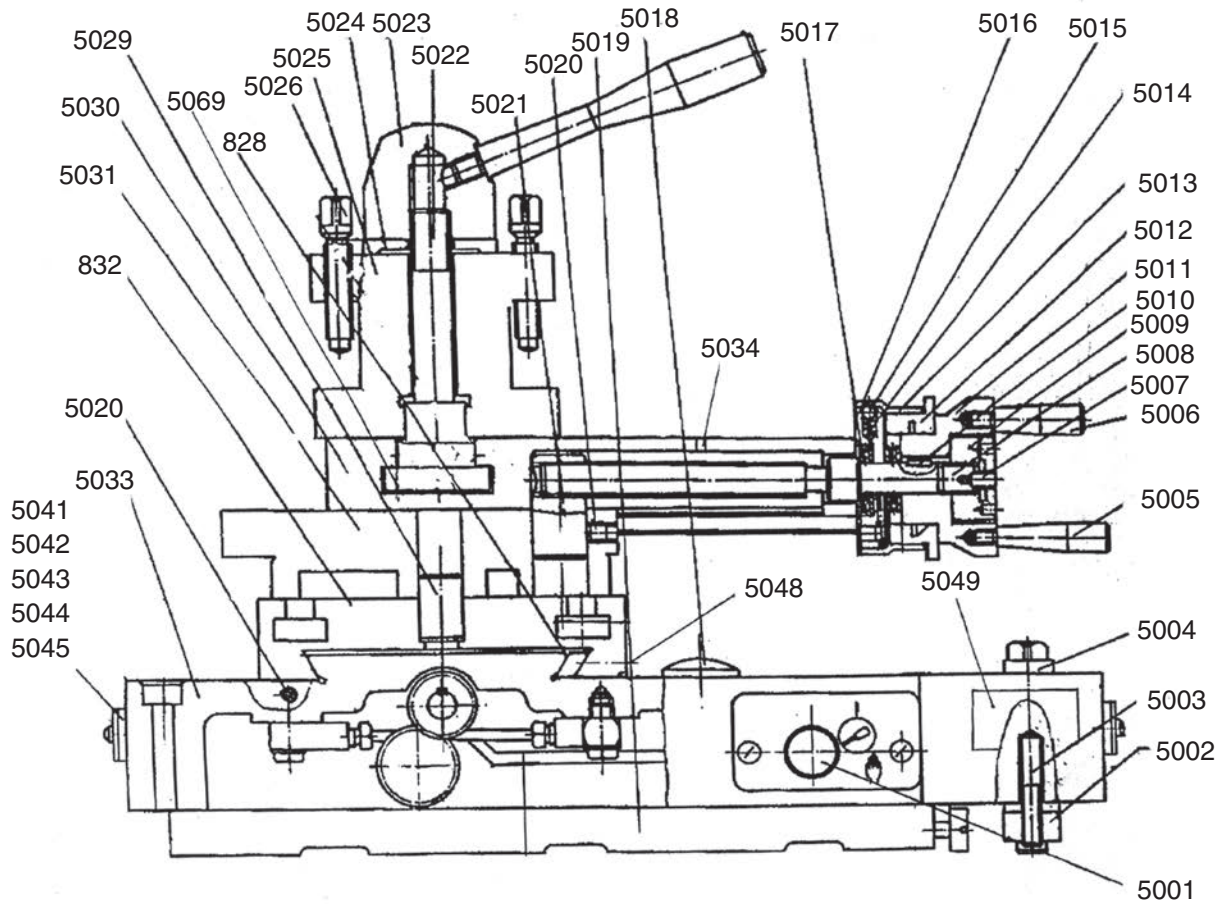
# Apron Parts List

REF	PART #	DESCRIPTION
619	P05090619	SHAFT
631	P05090631	SHAFT
4001	P05094001	APRON CASTING
4002	P05094002	SHAFT
4003	PSB38M	CAP SCREW M5-.8 X 25
4006	P05094006	NAME PLATE
4007	P05094007	SLEEVE
4008	P05094008	HANDLE
4009	P05094009	CAP SCREW
4010	P05094010	HAND WHEEL
4011	P05094011	DIAL
4012	P05092156	STEEL BALL 6.5MM
4013	P05094013	COMPRESSION SPRING
4014	P05094014	SCREW PLUG
4015	PSS24M	SET SCREW M5-.8 X 25
4016	P05094016	WOODRUFF KEY 5 X 6.5 X 16MM
4017	P05094017	GEAR 81-TOOTH
4018	PSB04M	CAP SCREW M6-1 X 10
4020	PK147M	KEY 6 X 6 X 18MM
4021	P05094021	GEAR 80/60-TOOTH
4022	P05094022	GEAR 72/60-TOOTH
4023	P05094023	DOWEL PIN 4 X 20mm
4024	P05094024	SHAFT
4025	P05094025	LEVER HUB
4026	P05094026	SLEEVE
4027	P05094027	LEVER
4028	PRP88M	ROLL PIN 5 X 22MM
4029	P05094029	GEAR 18-TOOTH
4030	P05094030	O-RING 11.2 X 2.65MM
4032	PRP88M	ROLL PIN 5 X 22MM
4033	P05094033	SHAFT
4034	PR06M	EXT RETAINING RING 16MM
4035	P05094035	INDICATOR PLATE
4036	P05094036	RIVET 2 X 6MM
4037	P05094037	SHAFT
4038	P05094038	O-RING 25.8 X 3.55MM
4039	P05094039	SLEEVE
4040	P05094040	O-RING 16 X 1.8MM
4041	P05094041	PLUG
4043	PEC015M	E-CLIP 8MM
4044	PSB52M	CAP SCREW M8-1.25 X 10
4045	PRP29M	ROLL PIN 5 X 45MM
4046	P05094046	SHAFT
4047	P05094047	LEVER HUB
4048	P05094048	HANDLE
4049	P05094030	O-RING 11.2 X 2.65MM
4050	P05094050	THRUST WASHER

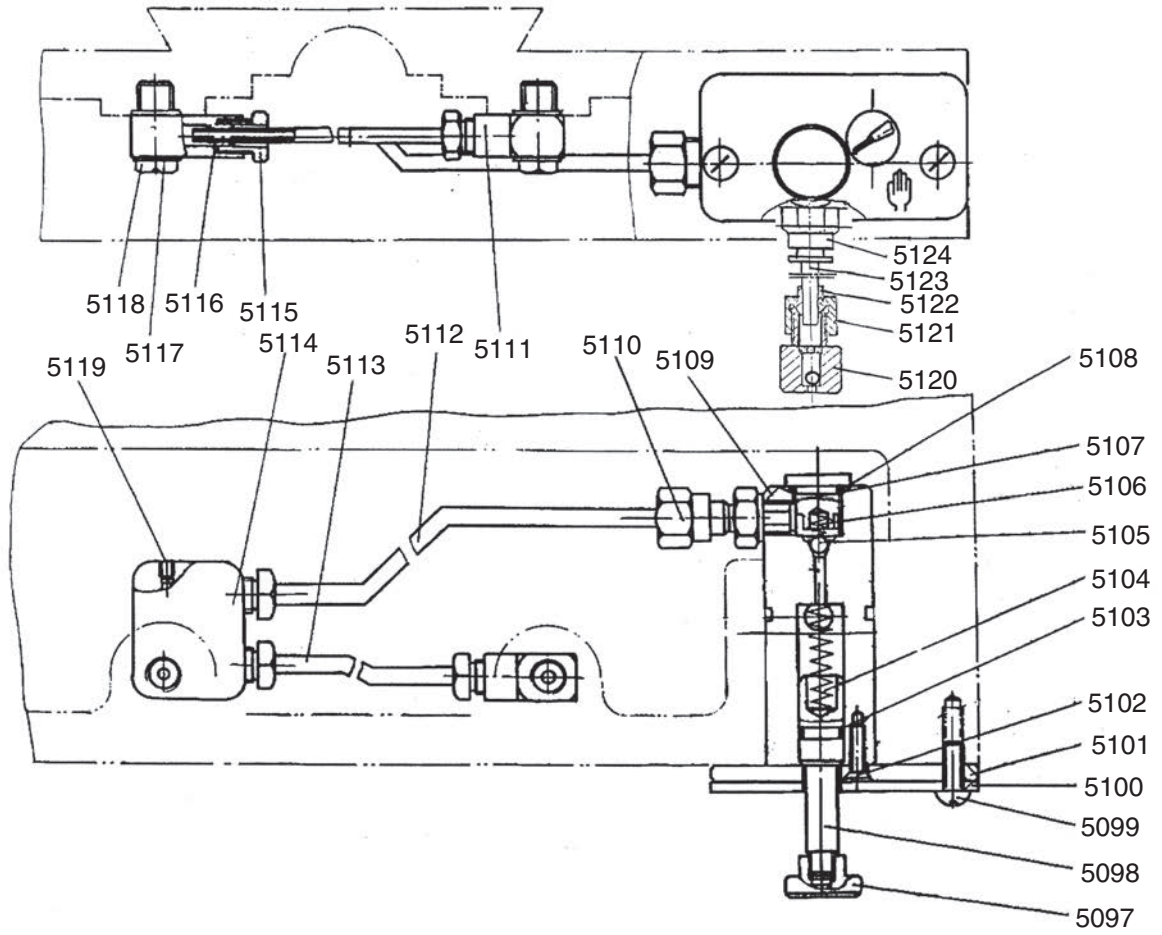
REF	PART #	DESCRIPTION
4051	P05094051	BEVEL-DRIVE GEAR 23-TOOTH
4052	PSB24M	CAP SCREW M5-.8 X 16
4053	P05094053	GIB
4054	PSS26M	SET SCREW M5-.8 X 6
4055	P05094055	CAP SCREW
4056	P05094056	LEVER
4057	P05094057	WORM GEAR BRACKET
4058	P05094058	SPINDLE CONTROL LEVER
4059	P05094059	DOWEL PIN 8 X 60MM
4060	PSB01M	CAP SCREW M6-1 X 16
4061	P05094061	GEAR 18/60-TOOTH
4062	P05094062	KEY
4064	P05094064	BALL OILER 8MM
4065	P05094065	VALVE
4066	P05093090	SIGHT GLASS 20MM
4067	P05094067	CASTING
4068	P05094068	HALF BRACKET
4069	P05094069	STOP
4070	P05094070	GEAR SHAFT 14-TOOTH
4071	PSS02M	SET SCREW M6-1 X 6
4072	PSB78M	CAP SCREW M5-.8 X 40
4073	P05094073	PLUG
4074	P05094074	FORK
4075	PRP73M	ROLL PIN 4 X 30MM
4076	P05094076	PACKING
4077	PSB17M	CAP SCREW M4-.7 X 10
4078	P05094078	COVER
4079	P05094079	SHAFT
4080	P05094080	BEVEL-DRIVE GEAR 64-TOOTH
4081	P05094081	THRUST WASHER
4082	P05094082	GEAR 18-TOOTH
4083	PK10M	KEY 5 X 5 X 12MM
4084	P05094084	BOTTOM PLATE
4085	P05094085	PACKING
4086	P05094086	O-RING 17 X 2.65MM
4087	PSB35M	CAP SCREW M8-1.25 X 60
4088	P05094088	GEAR 18-TOOTH
4089	P8106	THRUST BEARING 8106
4090	P05094090	NEEDLE BEARING
4091	PR15M	EXT RETAINING RING 30MM
4092	PS38M	PHLP HD SCR M4-.7 X 10
4102	P05094102	HALF NUT
4103	PB02M	HEX BOLT M6-1 X 12
4104	PB04M	HEX BOLT M6-1 X 10
4105	P05094105	INPUT BUSHING
4106	PFH06M	FLAT HD SCR M6-1 X 20



# Cross Slide, Compound Rest, Oil Pump



# Oil Pump



# Cross Slide, Compound Rest, & Oil Pump Parts List

REF	PART #	DESCRIPTION
828	P05090828	GIB
832	P05090832	COVER-CROSS SLIDING
867	P05090867	GIB
873	P05090873	HALF NUT
878	P05090878	FEED SCREW
5001	P05095001	PUMP BODY
5002	P05095002	CLAMP BLOCK
5003	P05095003	SUPPORT SCREW
5004	P05095004	CLAMP SCREW
5005	P05095005	HANDLE
5006	P05095006	HANDLE
5007	P05095007	CAP SCREW M6-1 X 8
5008	P05095008	FEED SCREW
5009	P05095009	PLUG
5010	P05095010	KEY 4 X 4 X 12MM
5011	P05095011	HANDLE
5012	P05095012	DIAL-COMPOUND REST
5013	P05095013	STEEL BALL
5014	P05095014	COMPRESSION SPRING 0.5 X 5 X 18
5015	P05095015	STEEL BALL 6MM
5016	P05095016	SEAT
5017	P05095017	THRUST BEARING 8101
5018	P05095018	PLUG
5019	P05095019	GIB
5020	P05095020	SET SCREW M6-1 X 10
5021	P05095021	BLOCK NUT
5022	P05095022	TOOL POST SHAFT
5023	P05095023	CLAMPING HANDLE
5024	P05095024	RUB WASHER
5025	P05095025	TOOL POST ASSEMBLY
5026	P05095026	TOOLING SCREW M10-1.5 X 50
5029	P05095029	SHAFT
5030	P05095030	COMPOUND REST
5031	P05095031	SWIVEL TABLE
5033	P05095033	CARRIAGE
5034	P05095034	BALL OILER 6MM
5035	P05095035	CLAMP HANDLE
5036	P05095036	SET SCREW M8-1.25 X 20
5037	P05095037	THRUST BEARING 8100
5038	P05095038	BEARING COVER
5039	P05095039	BRACKET
5040	P05095040	CLAMPING NUT M10-1.5
5041	P05095041	WIPER
5042	P05095042	WIPER COVER
5043	P05095043	CAP SCREW M5-.8 X 16
5044	P05095044	WIPER
5045	P05095045	WIPER COVER
5046	P05095046	CAP SCREW M5-.8 X 12
5048	P05095048	CAP SCREW M8-1.25 X 16
5049	P05095049	PLATE

REF	PART #	DESCRIPTION
5050	P05095050	BALL OILER 8MM
5051	P05095051	BRACKET
5052	P05095052	CAP SCREW M4-.7 X 10
5053	P05095053	CLAMP SCREW
5054	P05095054	PHLP HD SCR M6-1 X 35
5055	P05095055	WHEEL
5056	P05095056	HANDLE SPACER
5057	P05095057	SHOULDER SCREW
5058	P05095058	FEED DIAL
5059	P05095059	HANDLE SPACER
5060	P05095060	THRUST WASHER
5061	P05095061	WIPER COVER
5062	P05095062	WIPER
5063	P05095063	HEX NUT M10-1.5
5065	P05095065	SET SCREW M8-1.25 X 8
5066	P05095066	BASE
5068	P05095068	GIB SCREW
5069	P05095069	SLEEVE
5070	P05095070	BUSHING
5071	P05095071	DETENT PIN
5072	P05095072	SET SCREW M6-1 X 20
5074	P05095074	BRACKET
5079	P05095079	BRACKET
5080	P05095080	SPACER
5081	P05095081	GIB
5082	P05095082	GIB
5083	P05095083	GIB
5084	P05095084	CAP SCREW M6-1 X 20
5085	P05095085	THRUST WASHER
5086	P05095086	GEAR 25-TOOTH
5087	P05095087	CAP SCREW M5-.8 X 10
5088	P05095088	SHAFT
5090	P05095090	GEAR SHAFT 16-TOOTH
5091	P05095091	THRUST BEARING 8103
5092	P05095092	KEY 3 X 3 X 20MM
5095	P05095095	CAP SCREW M6-1 X 25
5096	P05095096	T-BOLT M10-1.5 X 25
5097	P05095097	KNOB
5098	P05095098	PISTON
5099	P05095099	DOME HD SCR M5-.8 X 15
5100	P05095100	PUMP INDICATOR PLATE
5101	P05095101	PLATE
5102	P05095102	FLAT HD SCR M5-.8 X 12
5103	P05095103	O-RING 8 X 2.65MM
5104	P05095104	COMPRESSION SPRING 1 X 7 X 45MM
5105	P05095105	STEEL BALL 5MM
5106	P05095106	COMPRESSION SPRING 0.5 X 4 X 15MM
5107	P05095107	PLUG
5108	P05095108	O-RING 11.2 X 1.8MM





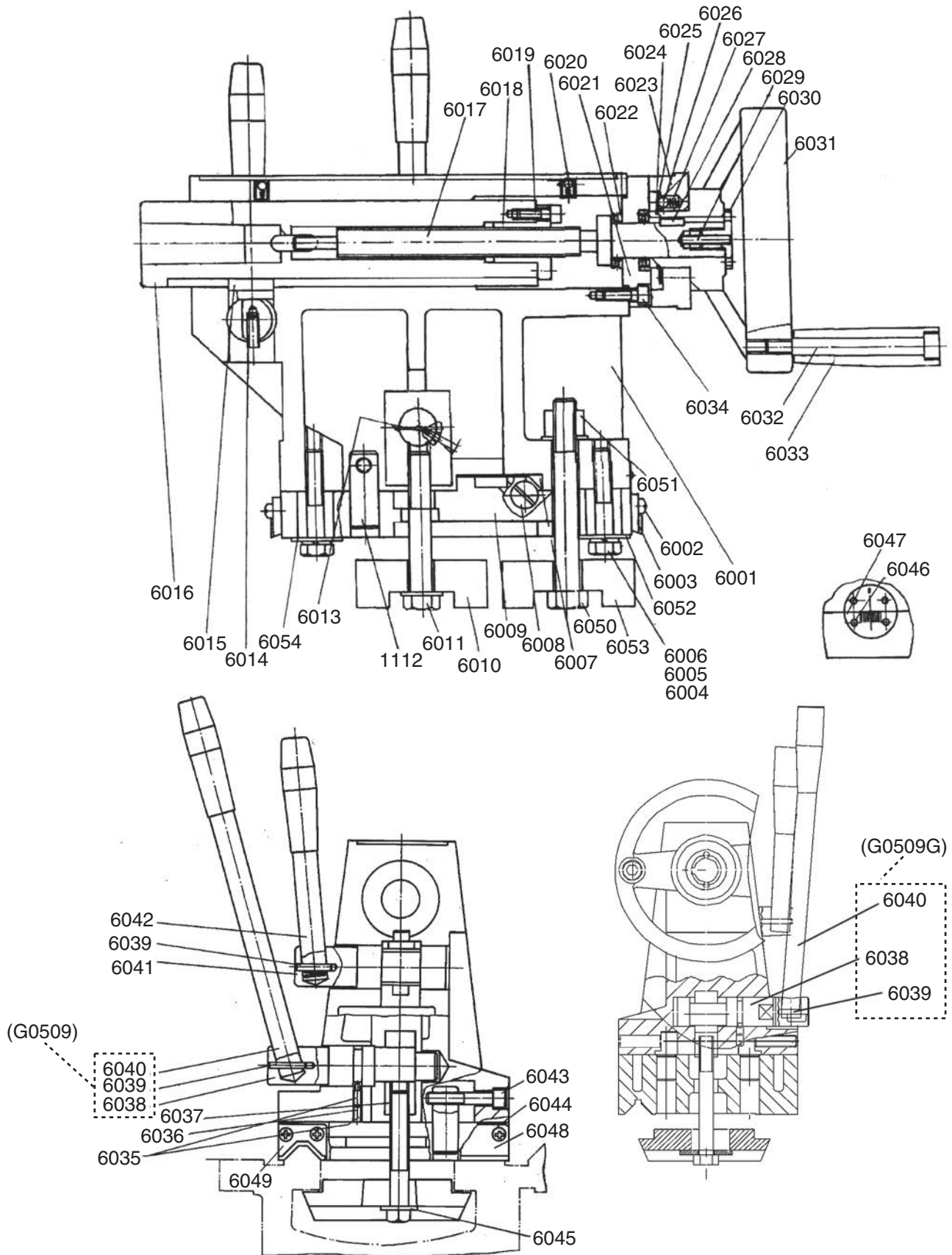
# Cross Slide, Compound Rest, & Oil Pump Parts List

REF	PART #	DESCRIPTION
5109	P05095109	PUMP
5110	P05095110	BRASS FITTING
5111	P05095111	TUBE JOINT
5112	P05095112	LUBE TUBE 5MM
5113	P05095112	LUBE TUBE 5MM
5114	P05095114	DISTRIBUTOR
5115	P05095115	BRASS FITTING
5116	P05095116	DOUBLE TAPER SHEATH

REF	PART #	DESCRIPTION
5117	P05095117	SEALING WASHER 10MM
5118	P05095118	SPECIAL PORT BOLT
5119	PSS08M	SET SCREW M4-.7 X 5
5120	P05095120	VALVE
5121	P05095121	BRASS FITTING NUT
5122	P05095122	BRASS FITTING
5123	P05095123	LUBE TUBE 6 X 150MM
5124	P05095124	BRASS FITTING



# Tailstock



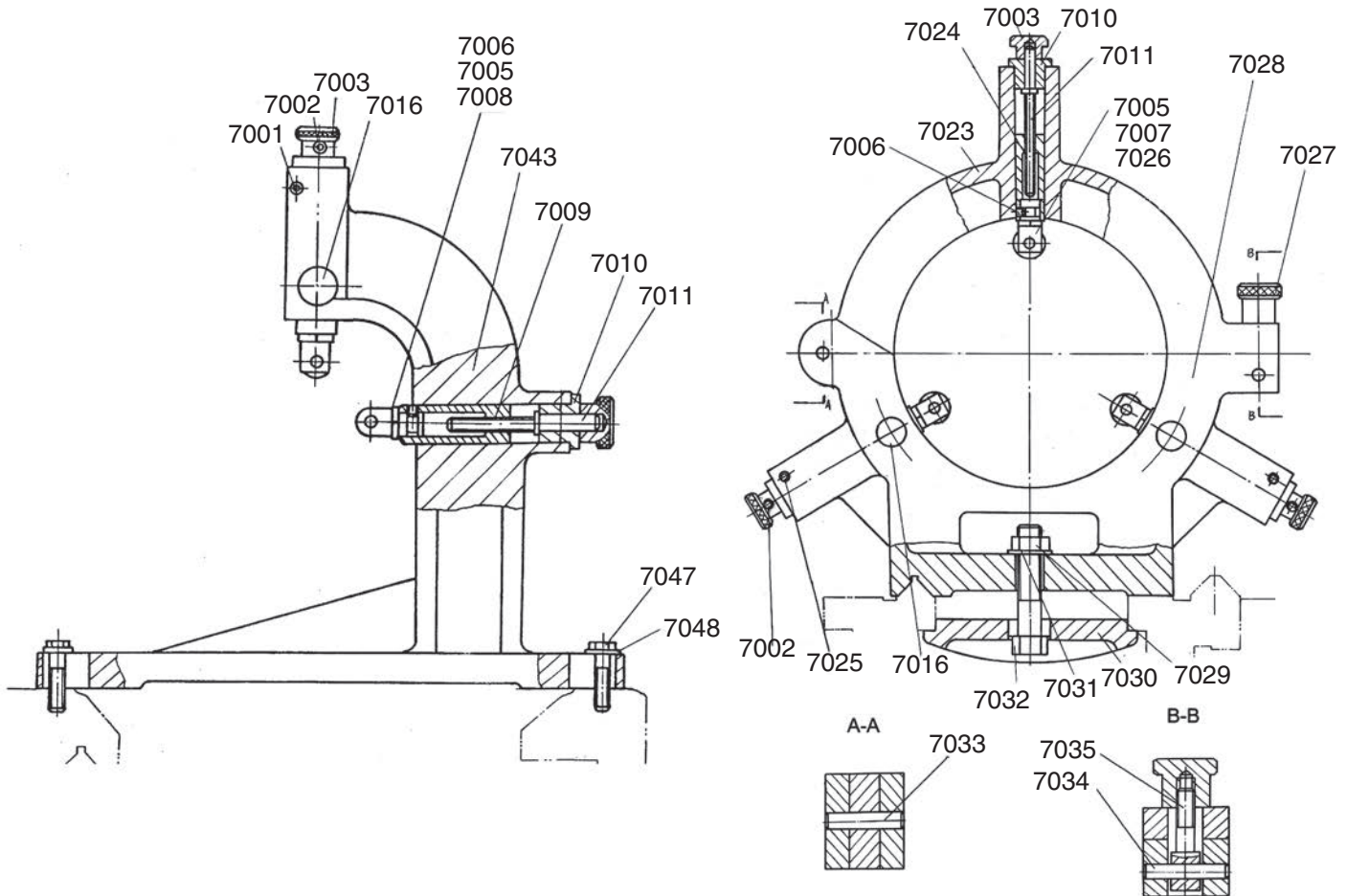
# Tailstock Parts List

REF	PART #	DESCRIPTION
1112	P05091112	SHAFT
6001	P05096001	TAILSTOCK (G0509)
	P0509G6001	TAILSTOCK (G0509G)
6002	PS38M	PHLP HD SCR M4-.7 X 10
6003	P05096003	BEDWAY WIPER
6004	PB116M	HEX BOLT M10-1.5 X 45
6005	PLW06M	LOCK WASHER 10MM
6006	PLW06M	LOCK WASHER 10MM
6007	P05096007	GIB
6008	P05096008	GIB SCREW
6009	P05096009	TAIL STOCK BASE (G0509)
	P0509G6009	TAIL STOCK BASE (G0509G)
6010	P05096010	CLAMPING BLOCK
6011	PB121M	HEX BOLT M12-1.75 X 100
6013	PRP24M	ROLL PIN 5 X 16MM
6014	PSS64M	SET SCREW M6-1 X 15
6015	P05096015	KEY
6016	P05096016	QUILL (G0509)
	P0509G6016	QUILL (G0509G)
6017	P05096017	FEED SCREW (G0509)
	P0509G6017	FEED SCREW (G0509G)
6018	P05096018	FEED NUT
6019	PSS11M	SET SCREW M6-1 X 16
6020	P05094064	BALL OILER 8MM
6021	P05096021	BRACKET
6022	P8104	THRUST BEARING 8104
6023	P05096023	DIAL
6024	PR37M	EXT RETAINING RING 32MM
6025	P05096025	SEALING RING
6026	P05092156	STEEL BALL 6.5MM
6027	P05096027	FLAT SPRING 0.6 X 5 X 16MM

REF	PART #	DESCRIPTION
6028	PK23M	KEY 5 X 5 X 25MM
6029	PSS24M	SET SCREW M5-.8 X 25
6030	P05096030	PLUG
6031	P05096031	HAND WHEEL
6032	P05096032	SHOULDER BOLT
6033	P05096033	HANDLE
6034	PSB15M	CAP SCREW M5-.8 X 20
6035	PSS01M	SET SCREW M6-1 X 10
6036	PSS01M	SET SCREW M6-1 X 10
6037	P05096037	ADJUSTING BLOCK
6038	P05096038	CLAMPING HUB (G0509)
	P0509G6038	RECIEVER HUB (G0509G)
6039	PRP56M	ROLL PIN 4 X 25MM
	PK23M	KEY 5 X 5 X 25 (G0509G)
6040	P05096040	LEVER (G0509)
	P0509G6040	LEVER (G0509G)
6041	P05096041	SHAFT
6042	P05096042	LEVER
6043	PSB05M	CAP SCREW M8-1.25 X 50
6044	P05096044	BEDWAY WIPER
6045	PW06M	FLAT WASHER 12MM
6046	P05096046	RIVET 2 X 8MM
6047	P05096047	OFFSET INDICATOR PLATE
6048	P05096048	BEDWAY WIPER PLATE
6049	P05096049	BEDWAY WIPER PLATE
6050	PB76M	HEX BOLT M12-1.75 X 110
6051	P05096051	HIGH NUT M12-1.75
6052	PW04M	FLAT WASHER 10MM
6053	P05096053	CLAMPING BLOCK
6054	PW04M	FLAT WASHER 10MM



# Steady Rest & Follow Rest



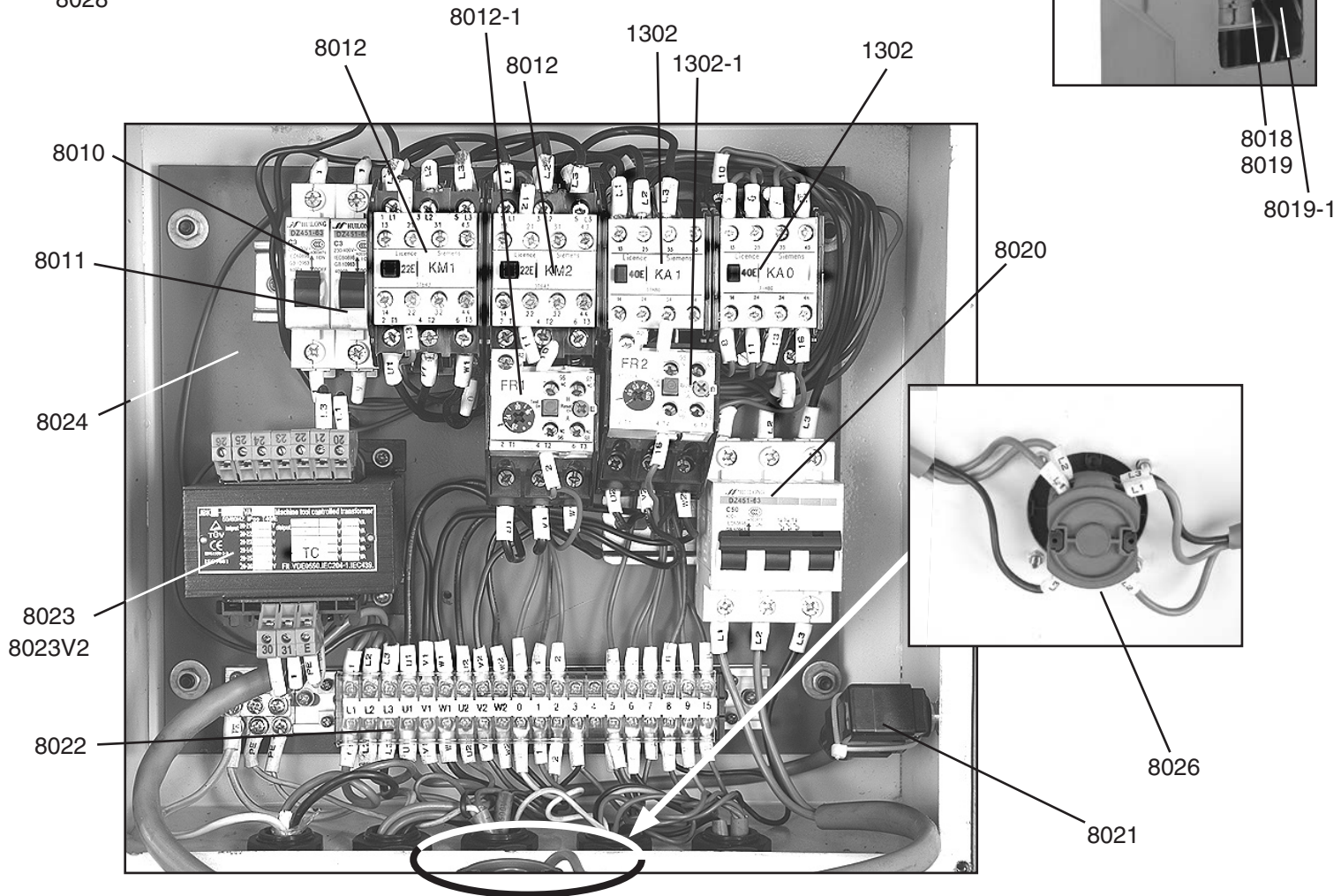
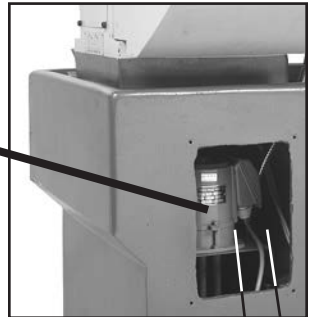
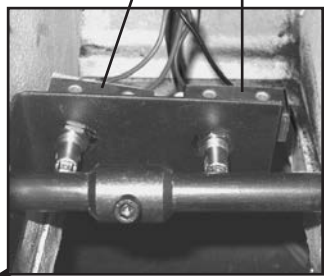
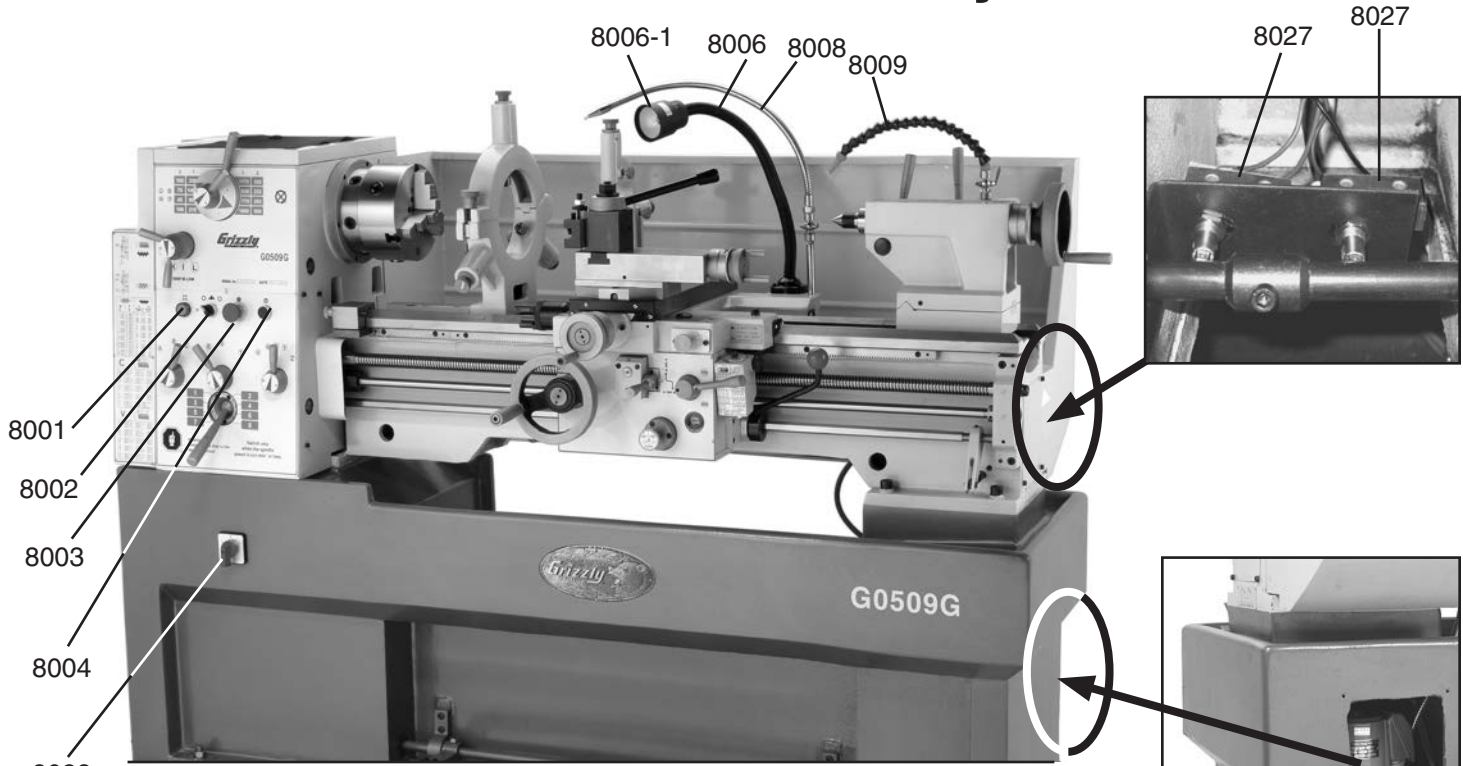
## Steady Rest & Follow Rest Parts List

REF	PART #	DESCRIPTION
7001	PRP26M	ROLL PIN 5 X 26MM
7002	PSS03M	SET SCREW M6-1 X 8
7003	P05097003	KNURLED KNOB
7005	P05097005	SUPPORT SHAFT
7006	PSS02M	SET SCREW M6-1 X 6
7007	P05097007	BALL BEARING W/WHEEL
7008	P626ZZ	BALL BEARING 626ZZ
7009	P05097009	SLEEVE
7010	P05097010	FLANGE BUSHING
7011	P05097011	SCREW SHAFT
7016	P05097016	KNURLED THUMB KNOB M10-1.5 X 25
7023	P05097023	UPPER CASTING
7024	P05097024	SLEEVE

REF	PART #	DESCRIPTION
7028	P05097028	LOWER CASTING
7027	P05097027	LARGE KNURLED KNOB
7029	PN13M	HEX NUT M16-2
7030	P05097030	CLAMPING BRACKET
7031	PW08M	FLAT WASHER 16MM
7032	PB159M	HEX BOLT M16-2 X 80
7025	PRP45M	ROLL PIN 5 X 32MM
7033	P05097033	DOWEL PIN 10 X 50MM
7035	P05097035	CLAMPING SCREW
7034	PRP80M	ROLL PIN 10 X 50mm
7043	P05097043	FOLLOW REST CASTING
7047	PSB47M	CAP SCREW M10-1.5 X 40
7048	PW04M	FLAT WASHER 10MM



# Electrical & Coolant System



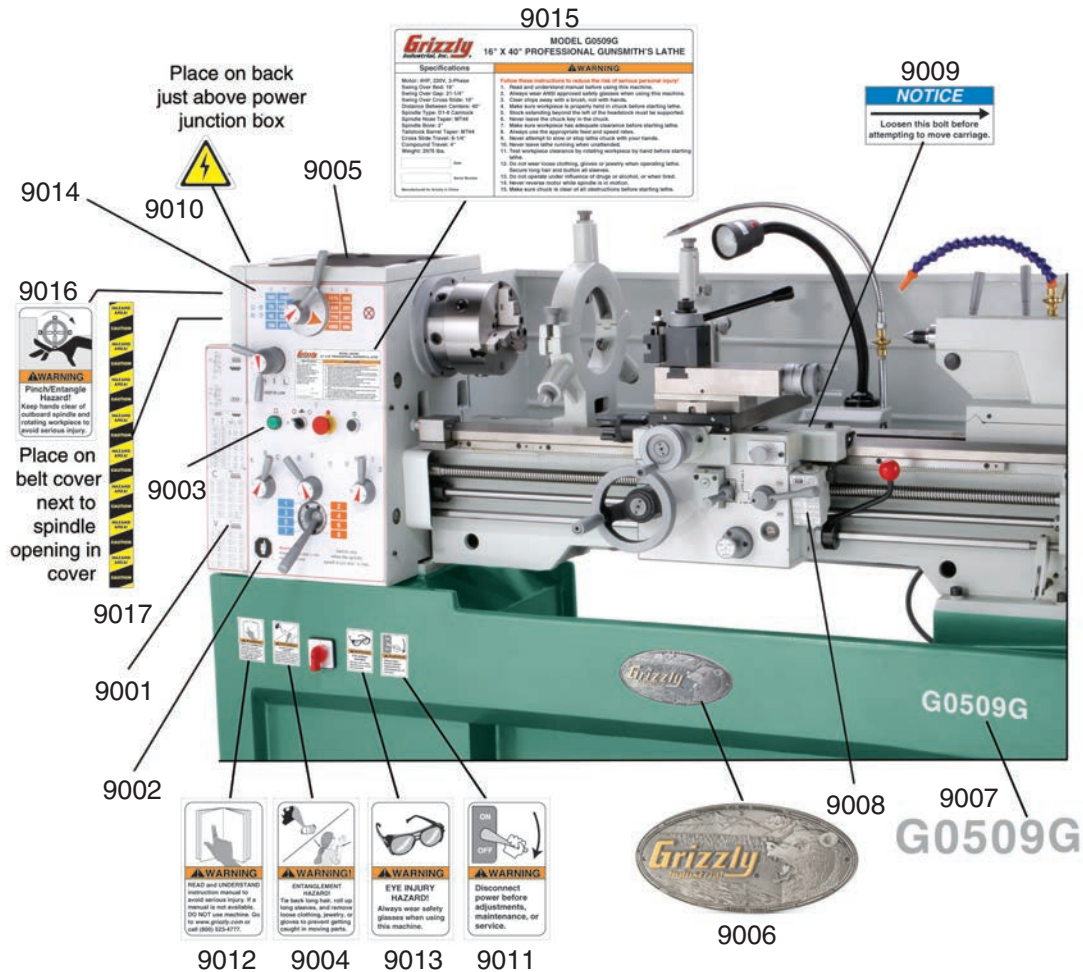
# Electrical & Coolant System Parts List

REF	PART #	DESCRIPTION
1100	P05091100	TWO-SPEED SWITCH
1302	P05091302	CONTACTOR SIEMENS 40E, 24V
1302-1	P05091302-1	THERMAL RELAY SIEMENS, 0.05-0.32 AMP (G0509)
1302-1	P0509G1302-1	OL RELAY SIEMENS JRS2-12.5 0.63-1A (G0509G)
8001	P05098001	POWER LAMP
8002	P05098002	PUMP SWITCH
8003	P05098003	EMERGENCY STOP SWITCH
8004	P05098004	JOG BUTTON
8006	P05098006	WORK LAMP ASSEMBLY
8006-1	P05098006-1	BULB
8008	P05098008	CUTTING FLUID TUBE KIT
8009	P0509G8009	TAILSTOCK FLUID TUBE KIT (G0509G)
8010	P05098010	FUSE HOUSING
8011	P05098011	FUSE HOUSING
8012	P05098012	CONTACTOR SIEMENS 22E, 24V

REF	PART #	DESCRIPTION
8012-1	P05098012-1	THERMAL RELAY SIEMENS, 3UA52 10-16 AMP (G0509)
8012-1	P0509G8012-1	OL RELAY SIEMENS 3UA5 16-25A (G0509G)
8018	P05098018	PUMP
8019	P05098019	PUMP MOTOR 220V 3-PH
8019-1	P05098019-1	PUMP POWER CORD ASSY
8020	P05098020	CIRCUIT BREAKER SET
8021	P05098021	LIMIT SWITCH
8022	P05098022	40-POST TERMINAL BLOCK
8023	P05098023	TRANSFORMER (G0509)
8023V2	P0509G8023V2	TRANSFORMER JKB 5-120 V2.03.12 (G0509G)
8024	P05098024	MAIN POWER BOX
8026	P05098026	MAIN POWER ON/OFF SWITCH
8027	P05098027	MOTOR ROTATION LIMIT SWITCH



# Labels & Placement



REF	PART #	DESCRIPTION
9001	P05099001	THREADING CHART
9002	P05099002	GEARBOX PANEL
9003	P05099003	SWITCH PANEL
9004	P05099004	ENTANGLEMENT SLEEVES LABEL
9005	P05099005	RUBBER MAT
9006	G8589	GRIZZLY LOGO PLATE
9007	P05099007	MODEL NUMBER LABEL (G0509)
	P0509G9007	MODEL NUMBER LABEL (G0509G)
9008	P05099008	THREAD DIAL CHART
9009	P05099009	UNLOCK CARRIAGE LABEL

REF	PART #	DESCRIPTION
9010	PLABEL-14	ELECTRICITY LABEL
9011	PLABEL-36	DISCONNECT POWER LABEL
9012	PLABEL-12	READ MANUAL LABEL
9013	PLABEL-11	SAFETY GLASSES LABEL
9014	P05099014	HEADSTOCK PANEL
9015	P05099015	DATA LABEL (G0509)
	P0509G9015	DATA LABEL (G0509G)
9016	P0509G9016	ENTANGLEMENT LABEL (G0509G)
9017	P0509G9017	WARNING TAPE (G0509G)

## ⚠️ WARNING

Safety labels warn about machine hazards and ways to prevent injury. The owner of this machine **MUST** maintain the original location and readability of the labels on the machine. If any label is removed or becomes unreadable, **REPLACE** that label before using the machine again. Contact Grizzly at (800) 523-4777 or [www.grizzly.com](http://www.grizzly.com) to order new labels.



# WARRANTY AND RETURNS

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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** WARRANTY CARD  
Industrial, Inc.

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: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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**P.O. BOX 2069**  
**BELLINGHAM, WA 98227-2069**



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Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

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