

READ THIS FIRST



Model G0731

*****IMPORTANT UPDATE*****

For Machines Mfd. Since 07/22
and Owner's Manual Revised 06/22

For questions or help with this product contact Tech Support at (570) 546-9663 or techsupport@grizzly.com

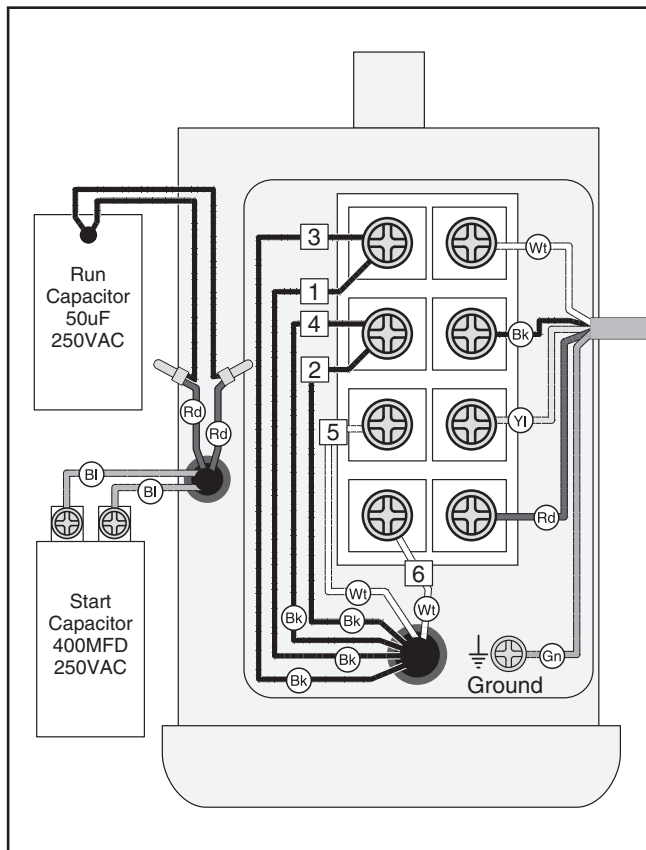
The following change was recently made since the owner's manual was printed:

- Motor start capacitor has changed.

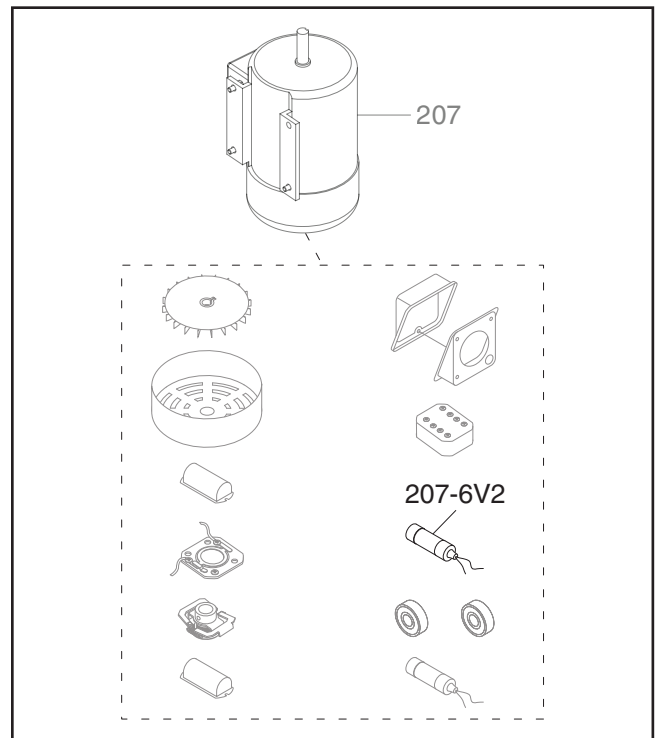
Aside from this information, all other content in the owner's manual applies and **MUST** be read and understood for your own safety. **IMPORTANT: Keep this update with the owner's manual for future reference.**

For questions or help, contact our Tech Support at (570) 546-9663 or techsupport@grizzly.com.

Revised Motor Wiring



Revised Parts



REF	PART #	DESCRIPTION
207-6V2	P0731207-6V2	S CAPACITOR 400M 250V 3 X 2 V2.07.22

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#MN22424 PRINTED IN TAIWAN

Grizzly **Industrial, Inc.**®

MODEL G0731 **8" X 30" VERTICAL MILL** **w/POWER FEED** **OWNER'S MANUAL** *(For models manufactured since 01/17)*



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V2.06.22

******Keep for Future Reference******

 **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

CAUTION

No list of safety guidelines can be complete. Every shop environment is different. Always consider safety first, as it applies to your individual working conditions. Use this and other machinery with caution and respect. Failure to do so could result in serious personal injury, damage to equipment, or poor work results.

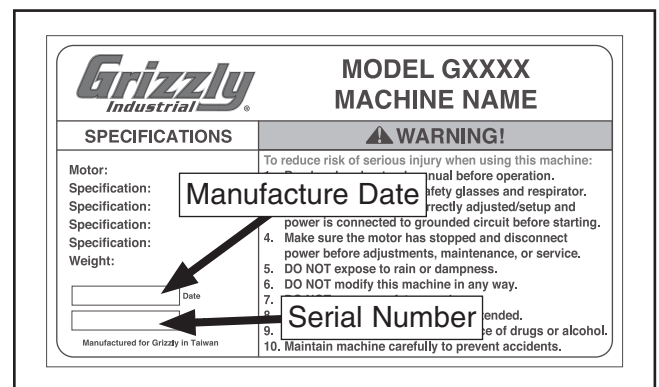
Manual Accuracy

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

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

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

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

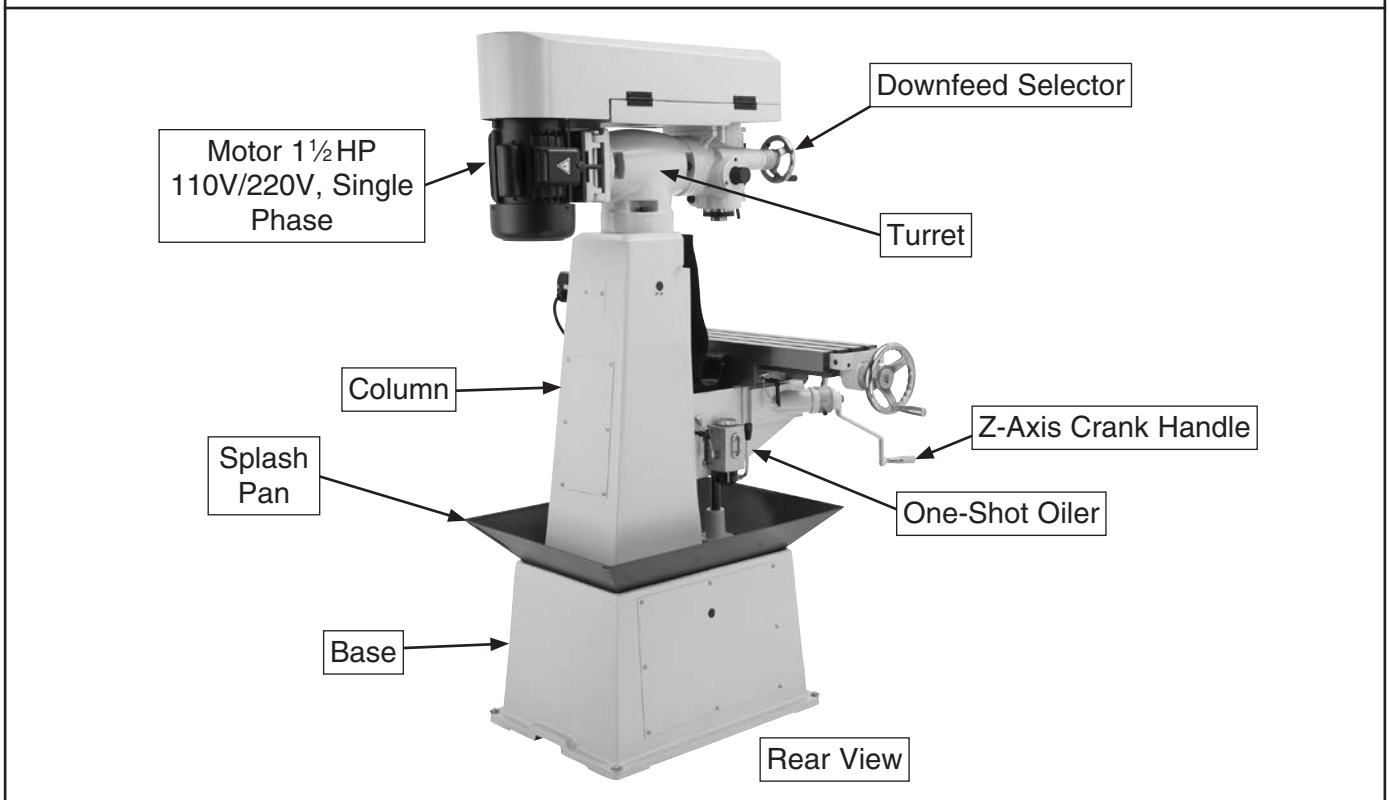
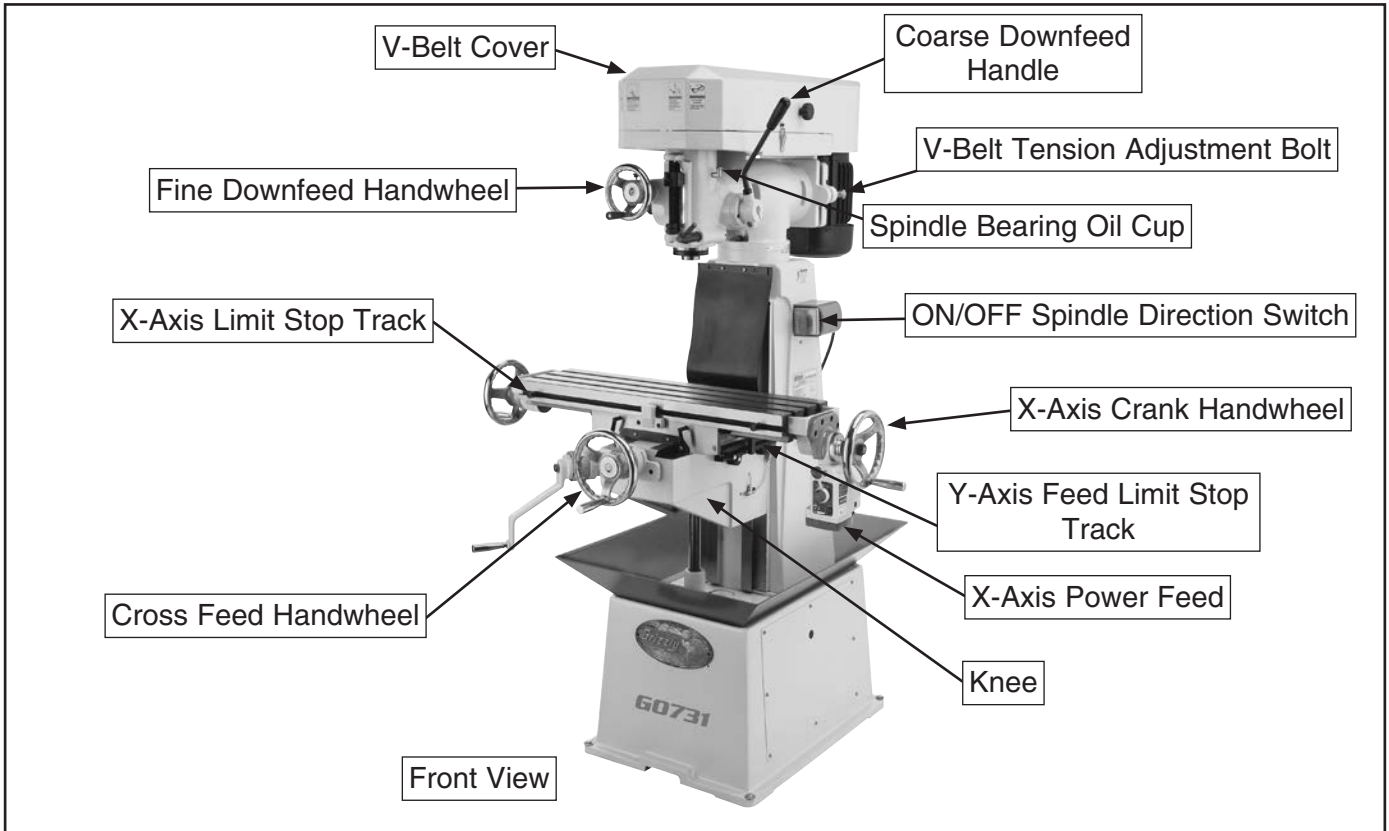


The diagram shows a rectangular label with the Grizzly Industrial logo at the top left. To the right of the logo, it says "MODEL GXXXX" and "MACHINE NAME". Below the logo is a "SPECIFICATIONS" section with fields for Motor, Specification, and Weight. To the right of this is a "WARNING!" section with a list of 10 safety instructions. In the center of the label, there are two fields: "Manufacture Date" and "Serial Number". Arrows point from these fields to the "Date" and "Number" fields in the specifications section. At the bottom left, it says "Manufactured for Grizzly in Taiwan".



Identification

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



Controls & Components



Refer to **Figures 1–2** and the following descriptions to become familiar with the basic controls and components of this machine. Understanding these items and how they work will help you understand the rest of the manual and stay safe when operating this machine.

Downfeed Controls

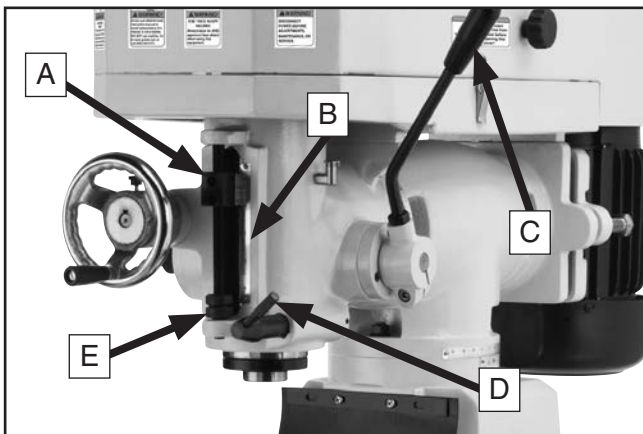


Figure 1. Downfeed controls viewed from the right side.

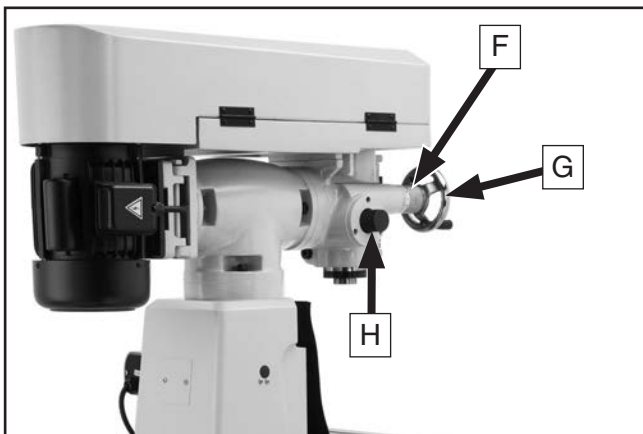


Figure 2. Downfeed controls viewed from the left side.

- A. Quill Dog:** Moves with the quill. Use the pointer on the side with the downfeed scale to determine the depth of downfeed travel.
- B. Downfeed Scale:** Displays the amount of quill travel in inches.
- C. Coarse Downfeed Handle:** When this lever is enabled with the downfeed selector, it raises/lowers the quill quickly.
- D. Quill Lock Lever:** Locks the quill in place but does not affect spindle rotation.
- E. Downfeed Stop & Lock Wheels:** Stops the downfeed travel when the quill dog reaches this point. Set the stop wheel along the downfeed scale for the desired depth of cut, then secure it in place by tightening the lock wheel.
- F. Graduated Dial (Fine Downfeed):** Displays quill travel in 0.001" increments when the fine downfeed handwheel is used. One full revolution represents 0.080" of quill travel.
- G. Fine Downfeed Handwheel:** When enabled, it raises/lowers the quill in small increments.
- H. Downfeed Selector:** Enables either the coarse or fine downfeed control. Tighten the selector to enable the fine downfeed handwheel, and loosen it to enable the coarse downfeed lever.



Table Controls

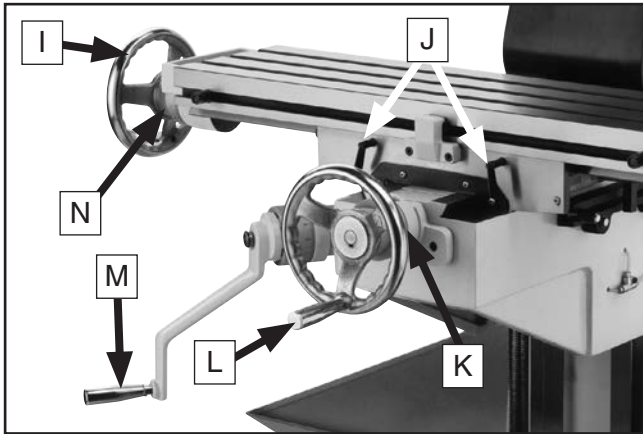


Figure 3. Table control handwheels and X-axis locks.

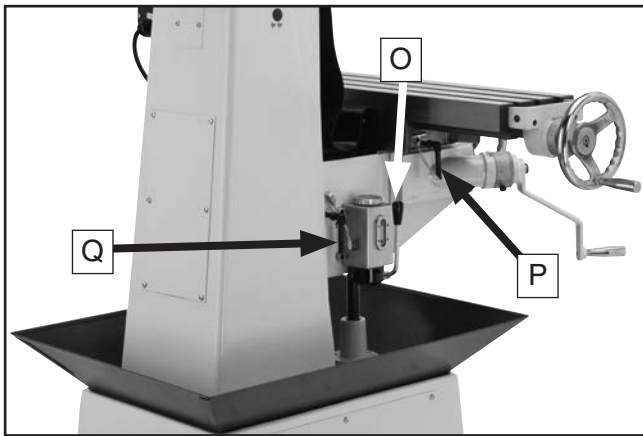


Figure 4. Knee and cross slide locks, and one-shot oiler.

- I. **X-Axis Handwheel (1 of 2):** Manually moves table along X-axis (left and right).
- J. **X-Axis Locks:** Tighten to prevent X-axis table movement for increased rigidity during operations when the X-axis should not move.
- K. **Graduated Dial (Y-Axis):** Displays Y-axis table movement in 0.001" increments. One full revolution represents 0.125" of table travel.

- L. **Y-Axis Handwheel:** Manually moves table along Y-axis (front and back).
- M. **Knee Crank:** Manually moves table along Z-axis (up and down).
- N. **Graduated Dial (X-Axis):** Displays X-axis table movement in 0.001" increments. One full revolution represents 0.125" of table travel.
- O. **One-Shot Oiler:** Lubricates table ways.
- P. **Y-Axis Lock:** Tightens to prevent Y-axis table movement for increased rigidity during operations when the Y-axis should not move.
- Q. **Z-Axis Lock:** Tightens to prevent Z-axis table movement for increased rigidity during operations when the Z-axis should not move.

Spindle Direction Switch

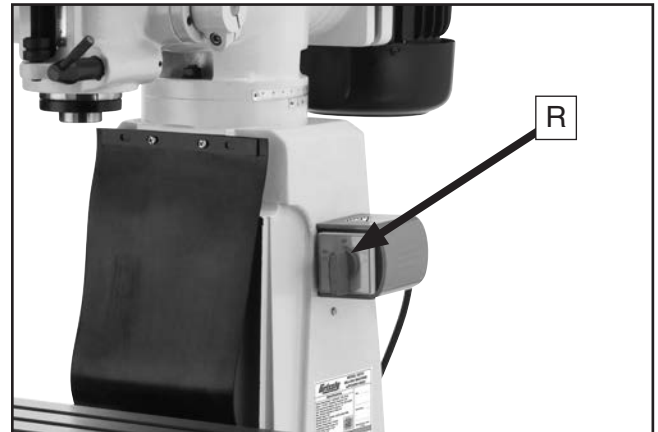


Figure 5. Location of spindle direction switch.

- R. **Spindle Direction Switch:** Turns motor **ON** in Forward (FWD) or Reverse (REV) direction. Turns motor **OFF** in OFF position.



X-Axis Power Feed Controls

Model G0731 is equipped with a power feed unit for X-axis table movement. Refer to **Figure 6** and the following descriptions to understand the functions of the various components of the power feed system.

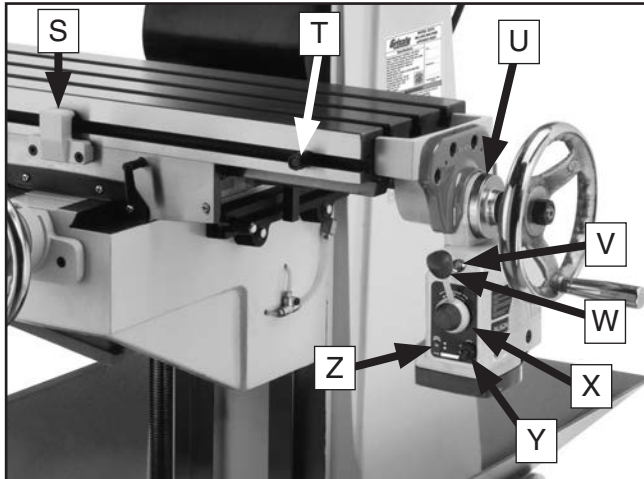


Figure 6. Power feed controls.

- S. Power Feed Limit Switch:** Stops table movement when either of the switch side plungers are pressed by limit stops.
- T. Limit Stop (1 of 2):** Restricts table movement by its positioning along front of table.
- U. Graduated Dial (X-Axis):** Displays distance of X-axis table travel in 0.001" increments. One full revolution equal to 0.125" of table travel.
- V. Rapid Traverse Button:** When pressed, moves table at full speed when already in motion.
- W. Direction Lever:** Selects direction of table movement. Middle position is neutral.
- X. Speed Dial:** Controls speed of table movement. Turning dial clockwise causes table to move faster.

Note: *Feed rates for table travel are extremely difficult to precisely calculate. We recommend that you combine research and experimentation to find feed rates that best work for your operations.*

- Y. ON/OFF Switch:** Turns power feed **ON** and **OFF**.
- Z. Circuit Breaker Reset Button:** Resets internal circuit breaker if unit is overloaded and shuts down.





MACHINE DATA SHEET

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

MODEL G0731 8" X 30" VERTICAL MILL WITH POWER FEED

Product Dimensions:

Weight..... 935 lbs.
 Width (side-to-side) x Depth (front-to-back) x Height..... 40-1/2 x 42-3/4 x 67 in.
 Footprint (Length x Width)..... 19 x 36 in.
 Space Required for Full Range of Movement (Width x Depth)..... 68 x 48 in.

Shipping Dimensions:

Type..... Wood Crate
 Content..... Machine
 Weight..... 954 lbs.
 Length x Width x Height..... 44 x 44 x 76 in.

Electrical:

Power Requirement..... 110V or 220V, Single-Phase, 60 Hz
 Prewired Voltage..... 110V
 Full-Load Current Rating..... 18A at 110V, 9A at 220V
 Minimum Circuit Size..... 20A at 110V, 15A at 220V
 Connection Type..... Cord & Plug
 Power Cord Included..... Yes
 Power Cord Length..... 6 ft.
 Power Cord Gauge..... 14 AWG
 Plug Included..... Yes
 Included Plug Type..... 5-15 for 110V
 Recommended Plug Type..... 6-15 for 220V
 Switch Type..... Forward/Reverse Switch

Motors:

Main

Horsepower..... 1.5 HP
 Phase..... Single-Phase
 Amps..... 18A/9A
 Speed..... 1725 RPM
 Type..... TEFC Capacitor-Start Induction
 Power Transfer..... V-Belt Drive
 Bearings..... Shielded & Permanently Lubricated
 Centrifugal Switch/Contacts Type..... External



Main Specifications:

Operation Info

Spindle Travel.....	3-1/2 in.
Max Distance Spindle to Column.....	7 in.
Max Distance Spindle to Table.....	20 in.
Longitudinal Table Travel (X-Axis).....	18 in.
Cross Table Travel (Y-Axis).....	7-3/4 in.
Vertical Table Travel (Z-Axis).....	17-3/4 in.
Turret or Column Swivel (Left /Right).....	360 deg.
Head Tilt (Left/Right).....	45 deg.
Drilling Capacity for Cast Iron.....	1 in.
Drilling Capacity for Steel.....	3/4 in.
End Milling Capacity.....	1 in.
Face Milling Capacity.....	3 in.

Table Info

Table Length.....	30 in.
Table Width.....	8 in.
Table Thickness.....	2 in.
Number of T-Slots.....	3
T-Slot Size.....	1/2 in.
T-Slots Centers.....	2-3/16 in.

Spindle Info

Spindle Taper.....	R-8
Number of Vertical Spindle Speeds.....	9
Range of Vertical Spindle Speeds.....	300 – 2840 RPM
Quill Diameter.....	2.950 in.
Drawbar Thread Size.....	7/16-20
Drawbar Length.....	12-3/8 in.
Spindle Bearings.....	Angular Contact Bearings

Construction

Spindle Housing/Quill.....	Chrome-Plated & Precision-Ground Steel
Table.....	Precision-Ground Cast Iron
Head.....	Cast Iron
Column/Base.....	Cast Iron
Base.....	Cast Iron
Stand.....	Cast Iron
Paint Type/Finish.....	Urethane

Other Specifications:

Country of Origin	Taiwan
Warranty	1 Year
Approximate Assembly & Setup Time	1 Hour
Serial Number Location	ID Label



SECTION 1: SAFETY

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

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



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



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



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

NOTICE

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

Safety Instructions for Machinery



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

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

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

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

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

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

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



WARNING

WEARING PROPER APPAREL. Do not wear clothing, apparel or jewelry that can become entangled in moving parts. Always tie back or cover long hair. Wear non-slip footwear to avoid accidental slips, which could cause loss of workpiece control.

HAZARDOUS DUST. Dust created while using machinery may cause cancer, birth defects, or long-term respiratory damage. Be aware of dust hazards associated with each workpiece material, and 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!

INTENDED USAGE. Only use machine for its intended purpose and never make modifications not approved by Grizzly. Modifying machine or using it differently than intended may result in malfunction or mechanical failure that can lead to serious 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.

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.

CHECK DAMAGED PARTS. Regularly inspect machine for any condition that may affect safe operation. Immediately repair or replace damaged or mis-adjusted parts before operating machine.

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 Milling Machines

WARNING

You can be seriously injured or killed by getting clothing, jewelry, or long hair entangled with rotating cutter/spindle. You can be severely cut or have fingers amputated from contact with rotating cutters. You can be blinded or struck by broken cutting tools, metal chips, workpieces, or adjustment tools thrown from the rotating spindle with great force. To reduce your risk of serious injury when operating this machine, completely heed and understand the following:

UNDERSTAND ALL CONTROLS. Make sure you understand the function and proper use of all controls before starting. This will help you avoid making mistakes that result in serious injury.

AVOIDING ENTANGLEMENT. DO NOT wear loose clothing, gloves, or jewelry, and tie back long hair. Keep all guards in place and secure. Always allow spindle to stop on its own. DO NOT stop spindle using your hand or any other object.

WEAR FACE SHIELD. Always wear a face shield in addition to safety glasses. This provides more complete protection for your face than safety glasses alone.

USE CORRECT SPINDLE SPEED. Follow recommended speeds and feeds for each size and type of cutting tool. This helps avoid tool breakage during operation and ensures best cutting results.

INSPECT CUTTING TOOL. Inspect cutting tools for sharpness, chips, or cracks before each use. Replace dull, chipped, or cracked cutting tools immediately.

PROPERLY SECURE CUTTER. Firmly secure cutting tool or drill bit so it does not fly out of spindle during operation.

POWER DISRUPTION. In the event of a local power outage during operation, turn spindle switch **OFF** to avoid a possible sudden startup once power is restored.

CLEAN MACHINE SAFELY. Metal chips or shavings can be razor sharp. DO NOT clear chips by hand or compressed air that can force chips farther into machine—use a brush or vacuum instead. Never clear chips while spindle is turning.

SECURE WORKPIECE TO TABLE. Clamp workpiece to table or secure in a vise mounted to table, so workpiece cannot unexpectedly shift or spin during operation. NEVER hold workpiece by hand during operation.

PROPERLY MAINTAIN MACHINE. Keep machine in proper working condition to help ensure that it functions safely and all guards and other components work as intended. Perform routine inspections and all necessary maintenance. Never operate machine with damaged or worn parts that can break or result in unexpected movement during operation.

DISCONNECT POWER FIRST. To reduce risk of electrocution or injury from unexpected startup, make sure mill/drill is turned **OFF**, disconnected from power, and all moving parts have come to a complete stop before changing cutting tools or starting any inspection, adjustment, or maintenance procedure.

REMOVE CHUCK KEY & SPINDLE TOOLS. Always remove chuck key, drawbar wrench, and other tools used on the spindle immediately after use. This will prevent them from being thrown by the spindle upon startup.

WARNING

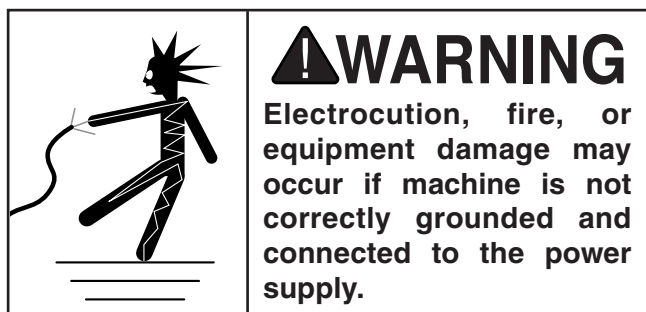
Like all machinery there is potential danger when operating this machine. Accidents are frequently caused by lack of familiarity or failure to pay attention. Use this machine with respect and caution to decrease the risk of operator injury. If normal safety precautions are overlooked or ignored, serious personal injury may occur.



SECTION 2: POWER SUPPLY

Availability

Before installing the machine, consider the availability and proximity of the required power supply circuit. If an existing circuit does not meet the requirements for this machine, a new circuit must be installed. To minimize the risk of electrocution, fire, or equipment damage, installation work and electrical wiring must be done by an electrician or qualified service personnel in accordance with all applicable codes and standards.



Full-Load Current Rating

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

Full-Load Current Rating at 110V..... 18 Amps

Full-Load Current Rating at 220V 9 Amps

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

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

Circuit Information

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

! CAUTION

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

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

Circuit Requirements for 110V

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

Nominal Voltage 110V, 115V, 120V
Cycle.....60 Hz
Phase..... Single-Phase
Power Supply Circuit 20 Amps
Plug/Receptacle NEMA 5-15

Circuit Requirements for 220V

This machine can be converted to operate on a power supply circuit that has a verified ground and meets the requirements listed below. (Refer to **Voltage Conversion** instructions for details.)

Nominal Voltage 208V, 220V, 230V, 240V
Cycle.....60 Hz
Phase..... Single-Phase
Power Supply Circuit 15 Amps
Plug/Receptacle NEMA 6-15



Grounding Requirements

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

For 110V operation: This machine is equipped with a power cord that has an equipment-grounding wire and a grounding plug (see following figure). The plug must only be inserted into a matching receptacle (outlet) that is properly installed and grounded in accordance with all local codes and ordinances.

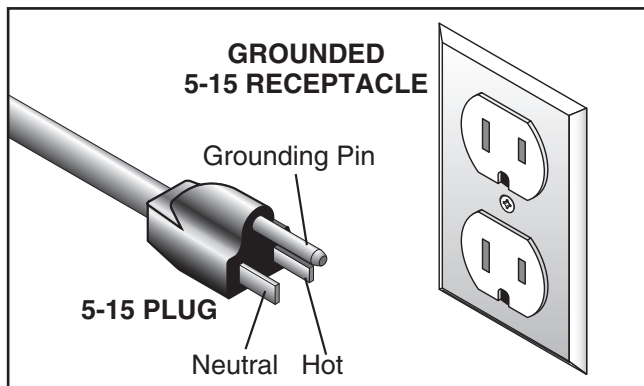


Figure 7. Typical 5-15 plug and receptacle.

⚠ CAUTION

SHOCK HAZARD!

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

For 220V operation: The plug specified under “Circuit Requirements for 220V” on the previous page has a grounding prong that must be attached to the equipment-grounding wire on the included power cord. The plug must only be inserted into a matching receptacle (see following figure) that is properly installed and grounded in accordance with all local codes and ordinances.

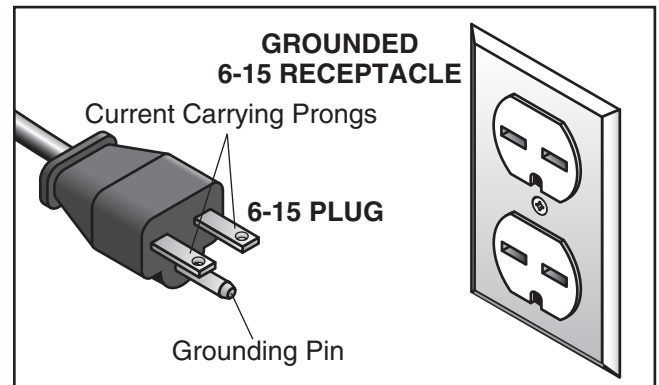


Figure 8. Typical 6-15 plug and receptacle.

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

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

Extension Cords

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

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

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

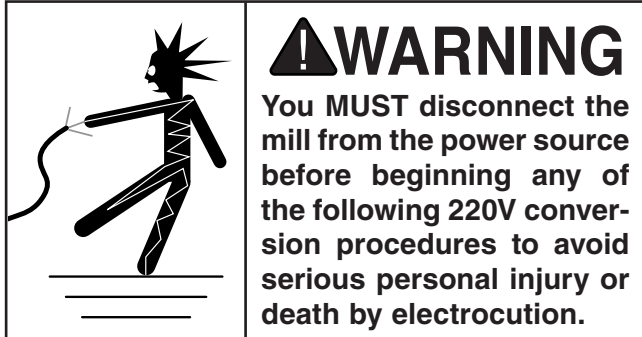
- Minimum Gauge Size14 AWG**
- Maximum Length (Shorter is Better).....50 ft.**



Voltage Conversion

To convert this mill for 220V power, you must rewire the motor and install a NEMA 6-15 plug and receptacle.

Refer to **Page 44** for the full **Wiring Diagram**.



Tools/Items Needed

Qty

Phillips Head Screwdriver #2	1
Wire Nut	1

To rewire the motor:

1. Remove the cover of the motor wiring junction box.
2. Re-configure the motor wiring by removing wires 1, 2, 3, 4, 5, and 6 from the terminal block (see **Figure 9**).
3. Replace wires 4, 1, and 6 on the terminal block, as shown in **Figure 10**.
4. Use the wire nut to secure wires 2, 3, and 5 together, as shown in **Figure 10**.
5. Replace the cover of the motor wiring junction box.

Replacing the Plug

Replace the molded NEMA 5-15 plug with a NEMA 6-15 by removing the original and installing the new plug according to the manufacturer's instructions.

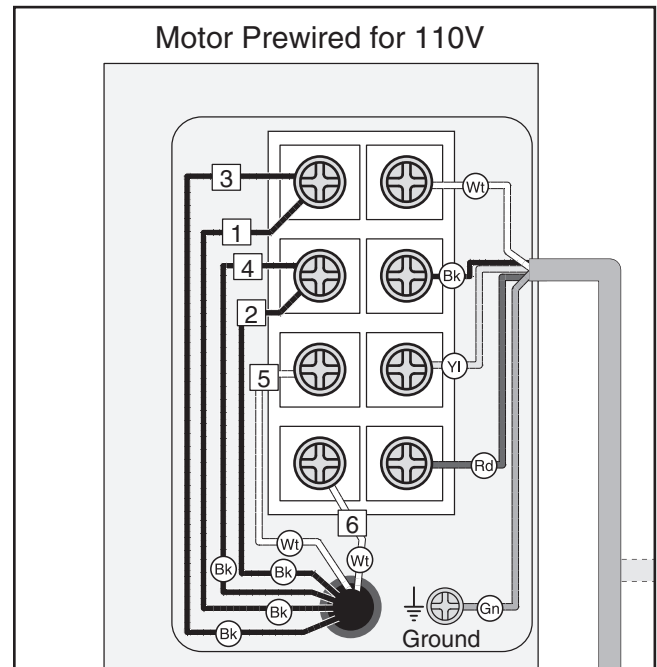


Figure 9. Motor configured for 110V operation.

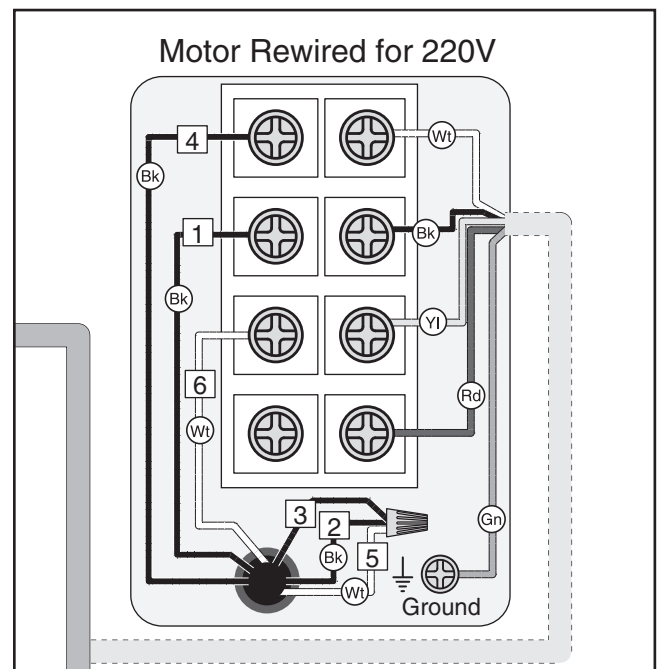


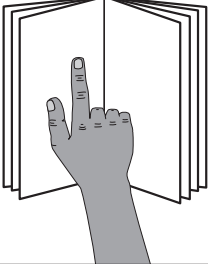
Figure 10. Motor configured for 220V operation.

⚠️ WARNING

Covers, guards, and safety devices on this machine are provided for your safety. Always keep them secured in place before connecting the machine to power to avoid serious personal injury.




SECTION 3: SETUP



!WARNING
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!



!WARNING
Wear safety glasses during the entire setup process!



!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.

Needed for Setup

The following items are needed, but not included, for the setup/assembly of this machine.

Description	Qty
• Additional Person	1
• Safety Glasses (for each person).....	1
• Disposable Rags	As Needed
• Cleaner/Degreaser	As Needed
• Disposable Gloves	As Needed
• Precision Level	1
• Lifting Straps (rated for at least 1500 lbs.).....	2
• Power Lifting Equipment (rated for at least 1500 lbs.).....	1
• Mounting Hardware	As Needed
• External Retaining Ring Pliers	1 Pair
• Wrench 1/2", 24mm.....	1 Ea.
• Hex Wrench 3mm.....	1
• ISO 68 Oil Or Equivalent.....	5 Drops

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.*



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.

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.

Inventory (Figure 11)	Qty
A. Hex Wrench 4mm.....	1
B. Hex Wrench 5mm.....	1
C. Open-End Wrench 12/14mm.....	1
D. Handwheel Handles.....	3
E. Keys 5 x 5 x 20.....	2
F. Thumb Screws.....	2
G. Graduated Dials.....	2
H. Handwheels.....	2

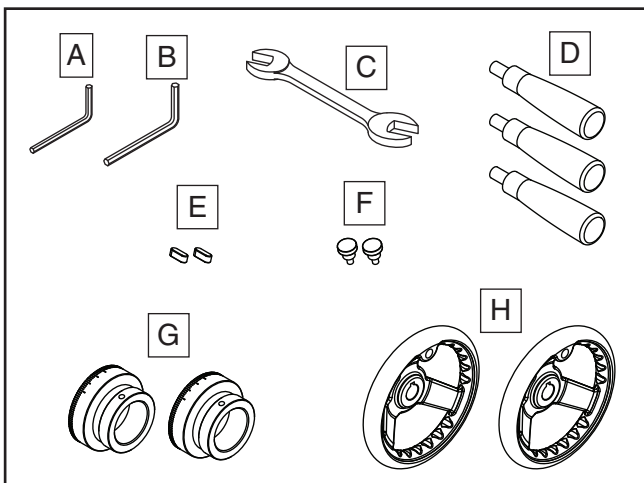


Figure 11. Model G0731 inventory.

Cleanup

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

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

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

Before cleaning, gather the following:

- Disposable Rags
- Cleaner/degreaser (WD•40 works well)
- Safety glasses & disposable gloves
- Plastic paint scraper (optional)

Basic steps for removing rust preventative:

1. Put on safety glasses.
2. Coat the rust preventative with a liberal amount of cleaner/degreaser, then let it soak for 5–10 minutes.
3. Wipe off the surfaces. If your cleaner/degreaser is effective, the rust preventative will wipe off easily. If you have a plastic paint scraper, scrape off as much as you can first, then wipe off the rest with the rag.
4. Repeat **Steps 2–3** as necessary until clean, then coat all unpainted surfaces with a quality metal protectant to prevent rust.

NOTICE

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



Site Considerations

Weight Load

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

Space Allocation

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

Physical Environment

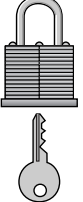
The physical environment where the machine is operated is important for safe operation and longevity of machine components. For best results, operate this machine in a dry environment that is free from excessive moisture, hazardous chemicals, airborne abrasives, or extreme conditions. Extreme conditions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

Electrical Installation

Place this machine near an existing power source. Make sure all power cords are protected from traffic, material handling, moisture, chemicals, or other hazards. Make sure to leave access to a means of disconnecting the power source or engaging a lockout/tagout device, if required.

Lighting

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

	<p>⚠ CAUTION Children or untrained people may be seriously injured by this machine. Only install in an access restricted location.</p>
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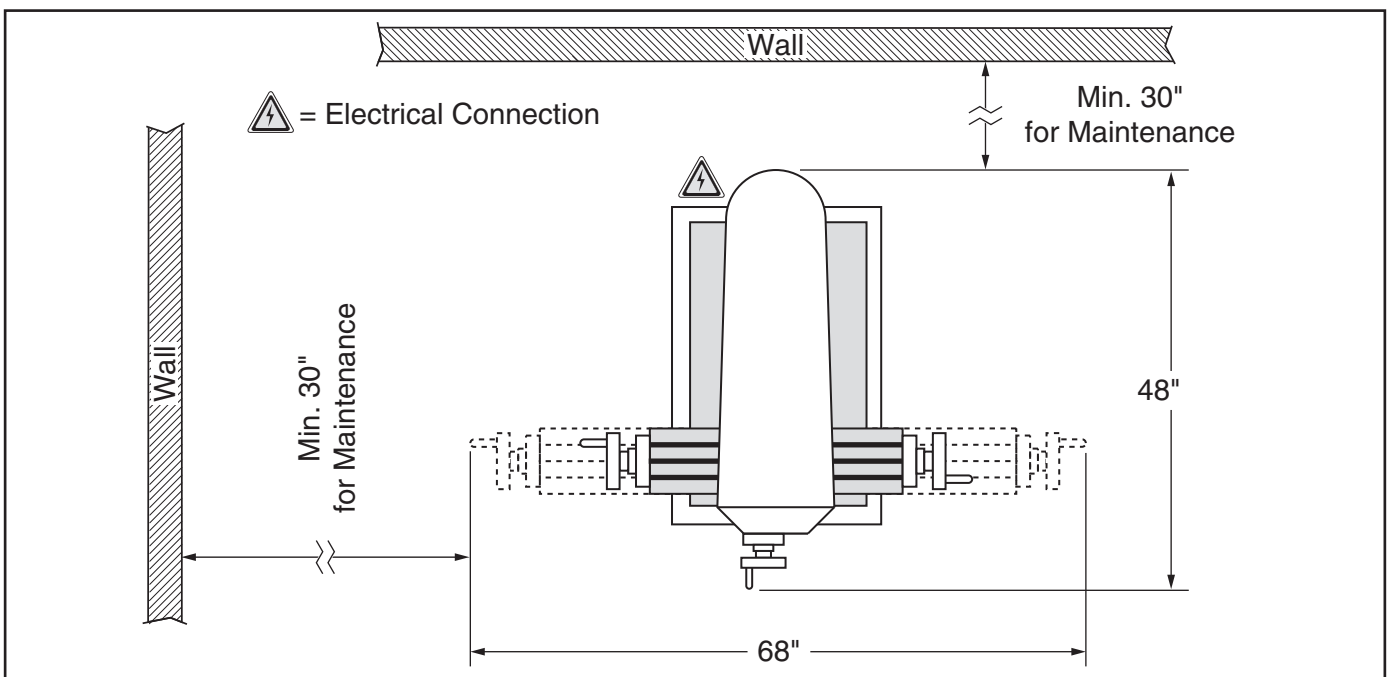
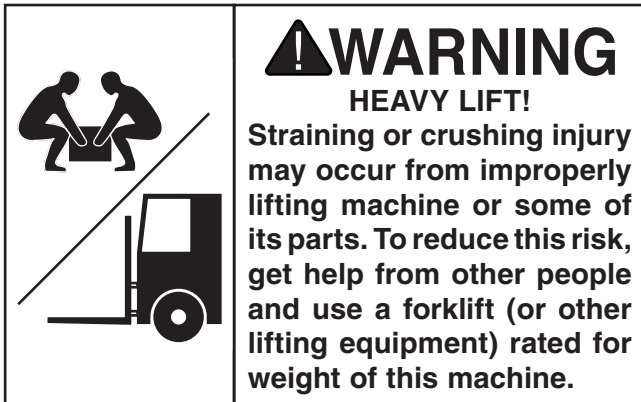


Figure 12. Minimum working clearances.



Lifting & Placing



To lift and place this mill:

1. After removing the crate from the shipping pallet, wrap lifting straps around the turret, as shown in **Figure 13**, and securely attach them to your power lifting equipment.

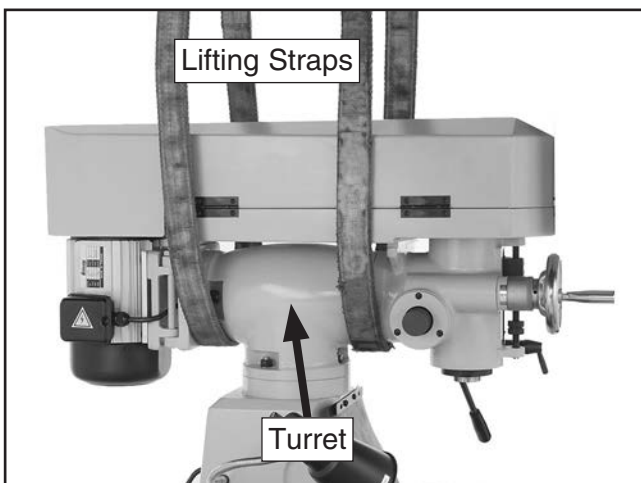


Figure 13. Example of positioning lifting straps.

2. Use a 1/2" wrench to unbolt the mill from the pallet.
3. With assistance to steady the machine, move it as close to the prepared location as possible.
4. Lift it just enough to clear the pallet and any floor obstacles, then situate it in its final position.
5. When mounting the machine to the floor, use a precision level to make sure the table is level from side to side and front to back.

Note: *If necessary, use shims to make sure there are no gaps between the base and the floor to avoid cracking or warping the cast iron.*



Anchoring to Floor

Number of Mounting Holes 4
Diameter of Mounting Hardware..... 3/8"

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

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

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

Anchoring to Concrete Floors

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

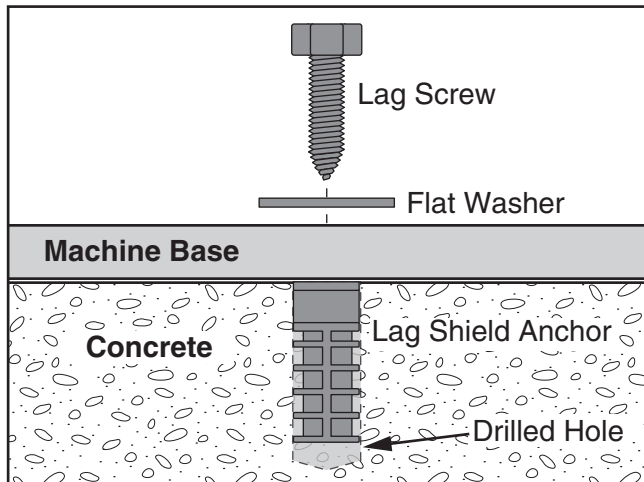


Figure 14. Popular method for anchoring machinery to a concrete floor.

Assembly

The machine must be fully assembled before it can be operated. Before beginning the assembly process, refer to **Needed for Setup** and gather all listed items. To ensure the assembly process goes smoothly, first clean any parts that are covered or coated in heavy-duty rust preventative (if applicable).

To assemble the mill:

1. Install a thumb screw on each graduated dial, slide a dial onto X-axis and cross feed lead-screws, then install the handwheels using 5 x 5 x 20 keys and the pre-installed set screws. Secure as shown in **Figures 15–16**.
2. Thread (3) handwheel handles into handwheels (see **Figures 15–17**).

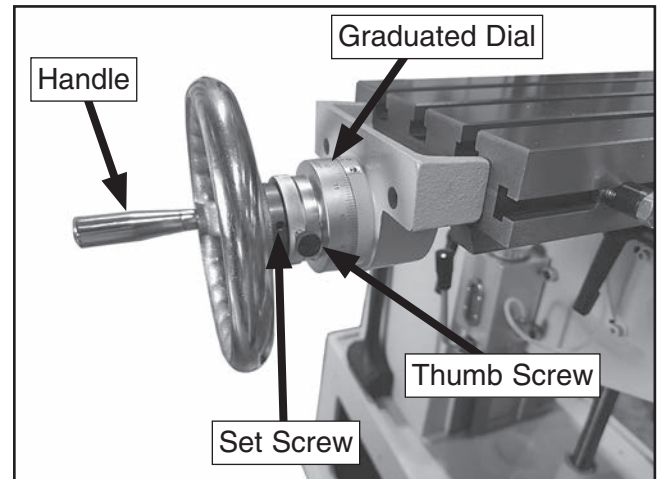


Figure 15. Left X-axis table handwheel installed.

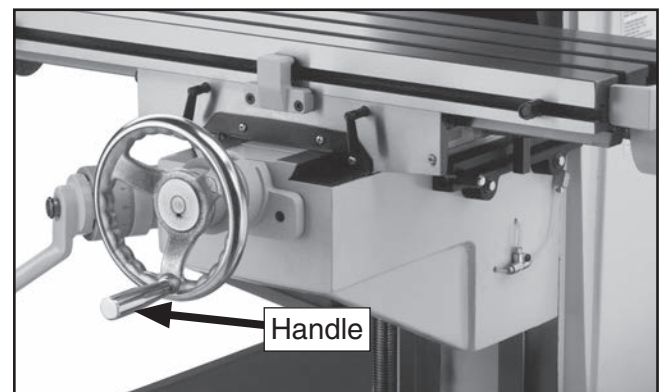


Figure 16. Handle attached to cross feed handwheel.



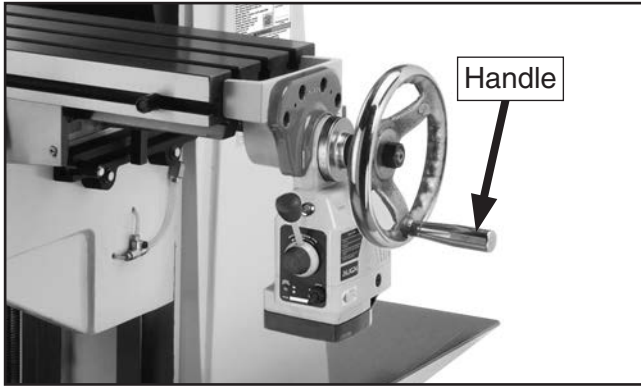


Figure 17. Right X-axis handwheel installed.

3. Remove the retaining ring from the end of the vertical crank screw, reverse crank handle, then re-install the retaining ring, as shown in **Figure 18**.

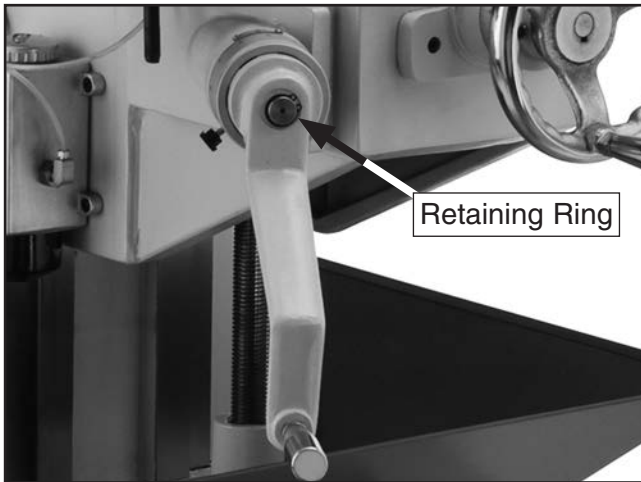


Figure 18. Vertical crank handle properly installed.

Initial Lubrication

This mill has numerous moving metal-to-metal contacts that require proper lubrication to help ensure efficient and long-lasting mill operation. However, some lubrication must be performed manually. Lubricate the spindle and quill before proceeding to the **Test Run** or **Spindle Break-In** sections.

NOTICE

Failure to follow reasonable lubrication practices as outlined in this manual for your mill could lead to premature failure of your mill and will void the warranty.

To lubricate the spindle:

1. Using the coarse downfeed handle, completely feed out the quill and lock it in position with the quill lock. Rub the quill down with a lightly oiled rag.
2. While holding the coarse downfeed handle, release the quill lock and return the quill to its initial position.
3. Add 6 to 10 drops of oil to the spindle lubrication cup and wait 5–10 minutes (see **Figure 19**).



Figure 19. Spindle lubrication cup location.

Note: *The spindle lubrication cup is a gradual gravity powered system. Extending the quill at this stage will empty the cup too rapidly to effectively lubricate the spindle.*



Test Run

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

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

The Test Run consists of verifying the following: 1) The motor powers up and runs correctly, 2) the spindle switch works correctly, and 3) the power feed controls work correctly.

If, during the test run, you cannot easily locate the source of an unusual noise or vibration, stop using the machine immediately, then review **Troubleshooting** on **Page 37**.

WARNING

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

WARNING

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

NOTICE

Complete the Initial lubrication procedures on Page 20 before proceeding. Failure to follow reasonable lubrication practices as outlined in this manual could lead to premature failure of your mill and will void the warranty.

Machine Test Run

1. Clear all setup tools and loose objects away from the machine.
2. Make sure the spindle is lubricated (refer to **Initial Lubrication** on **Page 20** for detailed instructions).
3. Ensure the spindle switch is in the OFF position.
4. Connect the machine to the power supply.
5. Verify that the machine is operating correctly by turning the spindle switch to the FWD position.
 - When operating correctly, the machine runs with little or no vibration or rubbing noises.
 - Investigate and correct strange or unusual noises or vibrations before operating the machine further. Always disconnect the machine from power when investigating or correcting potential problems.
6. Turn the spindle switch to the OFF position.
7. Turn the spindle switch to the REV position.
 - When operating correctly, the machine runs with little or no vibration or rubbing noises.
 - Investigate and correct strange or unusual noises or vibrations before operating the machine further. Always disconnect the machine from power when investigating or correcting potential problems.



Power Feed Test Run

The Model G0731 comes with a power feed unit for X-axis table travel. Proper operation of the limit switch attached to the front middle of the table is important to the operation of this power feed unit. If the power feed does not operate as expected during the following steps, disconnect it from power and refer to **Troubleshooting** on **Page 37**.

CAUTION

During power feed operation, X-axis handwheels spin rapidly when engaged. Always stay clear of X-axis handwheels when using power feed. Failure to do so could lead to entanglement or impact injuries.

To test run power feed:

1. Make sure all tools, cables, and other items are well clear of table movement and potential direction of travel.
2. Refer to **X-Axis Power Feed System** section, beginning on **Page 26**, to understand how power feed, table locks, and limit switch function.
3. Adjust limit stops to far right and left of table to allow for maximum table movement in following steps.
4. Loosen X-axis locks on front of table.
5. Make sure power feed direction lever is in neutral (middle) position and turn speed dial counterclockwise to lowest setting.
6. Plug power feed power cord into a grounded 110V power outlet.
7. Move ON/OFF switch to ON position.
8. Move direction lever to left, slowly turn speed dial clockwise to increase speed, then confirm that table is moving to left.
9. Allow table limit stop to hit limit switch and turn power feed **OFF**. Table movement should stop.
 - If table movement does not stop, DISCONNECT POWER IMMEDIATELY and troubleshoot limit switch.
10. Move direction lever through neutral (middle) position and all the way to the right. Table should begin moving to the right.
11. Repeat **Step 9** with table moving to the right.
12. Move direction lever through neutral (middle) position and all the way to the left, then press and hold Rapid Traverse button for a few moments to confirm rapid traverse is operating correctly. Table should move rapidly to the left.
13. Release Rapid Traverse button and move direction lever to neutral (middle) position.
14. Repeat **Steps 12–13** with table moving to the right.
15. Turn speed dial to lowest setting, move direction lever neutral, and move ON/OFF switch to OFF position.

Congratulations! The **Test Run** of the power feed is complete. Continue to the next page to perform the **Spindle Break-In** and **Inspections & Adjustments** procedures.



Spindle Break-In

NOTICE

Complete the Initial lubrication procedures on Page 20 before proceeding. Failure to follow reasonable lubrication practices as outlined in this manual could lead to premature failure of mill and will void warranty.

NOTICE

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

NOTICE

Complete spindle bearing break-in procedure to prevent rapid wear and tear of spindle components once mill is placed into operation.

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

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

To perform the spindle break-in procedure:

1. DISCONNECT MACHINE FROM POWER!
2. Adjust the pulleys to set the spindle speed to 300 RPM (see **Page 29** for detailed instruction on **Adjusting Spindle Speed**).

3. Connect the machine to power.
4. Turn the spindle switch to the FWD position.
5. Let the mill run at this speed for 20 minutes, then turn the spindle **OFF** and wait for it to stop.
6. Turn the spindle direction switch to the REV position, and let it run for another 20 minutes.
7. Repeat **Steps 4–6** for 1800 RPM, and then 2840 RPM.
8. Turn the mill **OFF**. The spindle break-in is now complete and the machine is ready for operation.

Inspections & Adjustments

The following list of adjustments were performed at the factory before the machine was shipped:

- Gib Adjustments **Page 39**
- Leadscrew Backlash Adjustments.. **Page 40**

Be aware that machine components can shift during the shipping process. Pay careful attention to these adjustments during operation of the machine. If you find that the adjustments are not set according to the procedures in this manual or your personal preferences, re-adjust them.

NOTICE

Since the mill head has been moved around for shipping purposes, you will need to tram the spindle with the table to ensure a 90° alignment. Refer to the *Tramming Spindle* section on **Page 41** for detailed instructions.

NOTICE

During first 16 hours of use, V-belts will stretch and seat into pulley grooves. V-belts must be properly tensioned after this period to ensure proper power transmission and avoid reducing life of belts. Refer to *Tensioning/Replacing V-Belts* on **Page 35**.



SECTION 4: OPERATIONS

Operation Overview

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

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

	<p>!WARNING To reduce your risk of serious injury, read this entire manual BEFORE using machine.</p>
--	--

<p>!WARNING To reduce risk of eye or face injury from flying chips, always wear approved safety glasses and a face shield when operating this machine.</p>	
	

<p>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.</p>
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To complete a typical operation, the operator does the following:

1. Examines workpiece to make sure it is suitable for operation.
2. Firmly clamps workpiece to table or a mill vise securely mounted to table.
3. Installs correct cutting tool for operation.
4. Uses downfeed and table controls to correctly position cutting tool and workpiece for operation. If X-axis power feed will be used during operation, operator confirms speed and length of table movement required.
5. Configures machine for correct spindle speed of operation.
6. Puts on personal protective equipment, and makes sure workpiece and table are clear of all tools, cords, and other items.
7. Turns machine **ON**, then starts spindle rotation and performs operation.
8. Turns machine **OFF**.



Table Movement

This mill table has three paths of movement that are controlled by the corresponding handwheels or the vertical crank handle (see **Figure 20**).

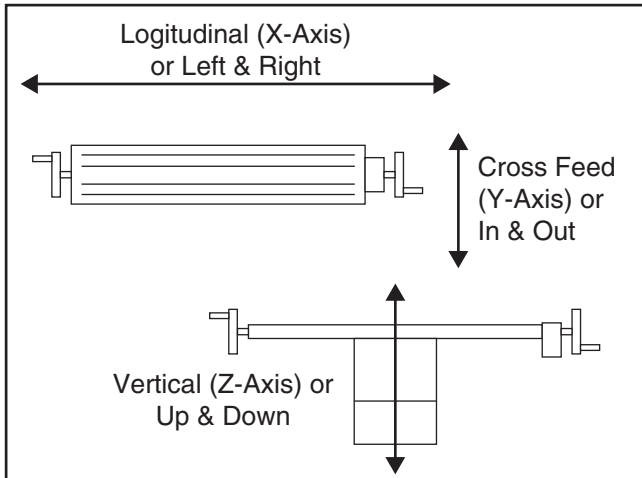


Figure 20. Three movement paths of the mill table.

The graduated dials are marked in increments of 0.001", with one full revolution moving the table 0.125".

Table Locks

The table of this vertical mill has locks to secure the table in position along each axis of movement. Locking the table reduces unwanted movement and reduces error in milling operations. Use the table, saddle, and knee locks shown in **Figures 21–22** to secure the table in position.

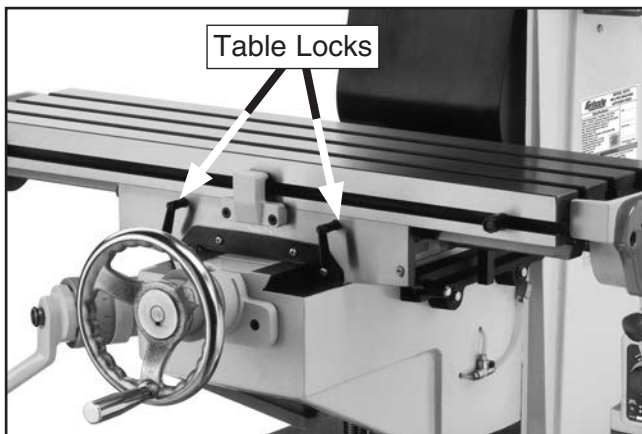


Figure 21. Location of table locks.

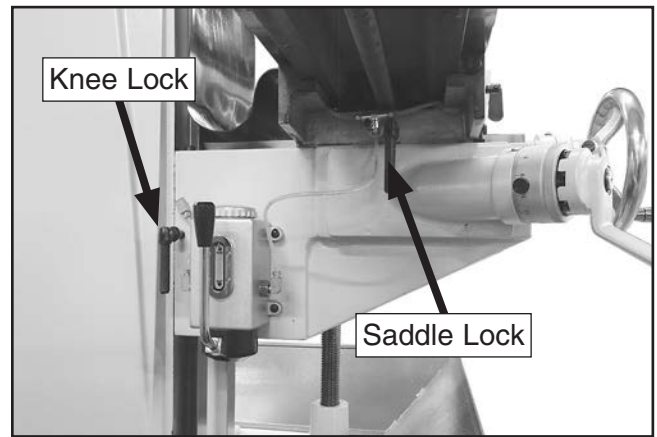


Figure 22. Saddle and knee locks.

Limit Stops

Limit stops increase repeatability in milling operations. Positioning the stops along the table slots limits the distance the table or saddle can travel (see **Figures 23–24**).

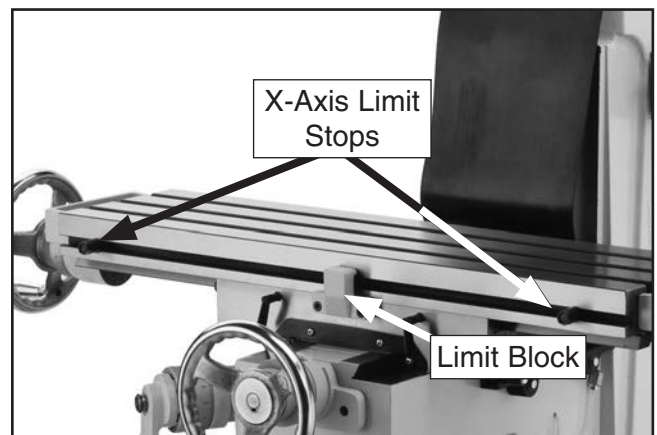


Figure 23. Table limit stops and block.

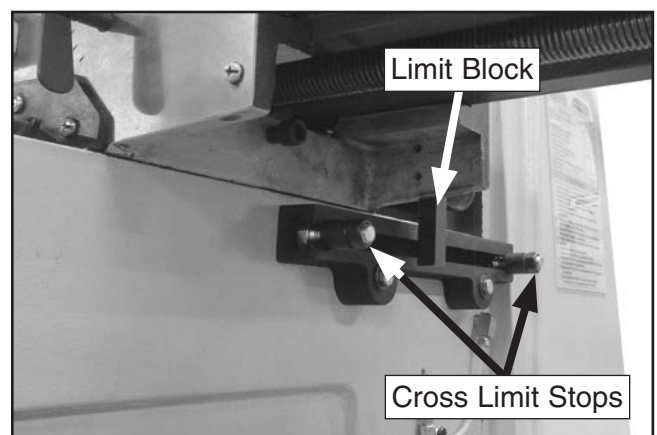


Figure 24. Cross limit stops and block.



X-Axis Power Feed System

The mill is equipped with a power feed system for controlled X-axis table movement. Refer to **Figure 25** and the descriptions below to understand the functions of these devices.

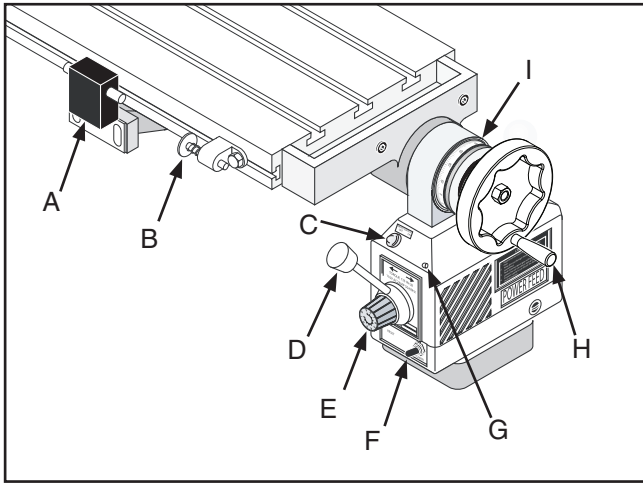


Figure 25. X-axis power feed system.

- A. Limit Switch:** Stops powered table movement when either limit stop presses a plunger on the switch.
- B. Limit Stop:** Activates the limit switch. Secure these devices along the table to limit longitudinal movement.
- C. Rapid Traverse Button:** When pressed, moves the table at the maximum speed in the direction selected.
- D. Direction Lever:** Starts, reverses, and stops longitudinal table movement.
- E. Speed Dial:** Controls the speed that the table moves—turn the dial clockwise to increase the speed.
- F. ON/OFF Switch:** The master power switch for the power feed.
- G. Power Lamp:** Lights when the power feed is turned **ON**.
- H. Handwheel:** Manually positions the table.
- I. Graduated Dial:** Marked in 0.001" increments, each complete revolution is equal to 0.125" of longitudinal table travel.

Tools Needed

Qty

Wrench or Socket 12mm..... 1

To operate the X-axis power feed:

1. Loosen the table locks (see **Figure 26**).

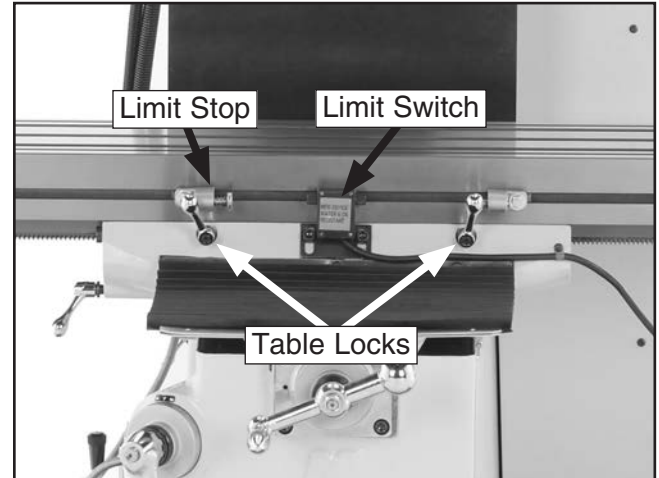


Figure 26. Example of table locks, limit switch, and limit stop.

2. Position the limit stops along the table to confine the longitudinal distance you want the table to travel, then tighten the hex bolts to secure them in place.
3. Move the power feed direction lever to the center or neutral position, rotate the speed dial to the minimum speed (all the way to the left).

! CAUTION

Be sure there is enough running clearance between the table, spindle, vise/clamps, or jigs before turning the power feed **ON**. Failure to do so could result in injury from tool breaking and pieces being thrown at high speed.



4. Use the direction lever to select the direction of table travel, then plug the power feed power cord into an appropriate receptacle.
5. Flip the ON/OFF switch up to turn the power feed **ON**.
6. Adjust the speed dial to move the table at the correct speed for your operation.

Note: *Power feed rates are difficult to precisely adjust. We recommend that you experiment with different dial settings to find the feed rate that best works for your operation.*

7. When you are through using the power feed, leave the direction lever in the center or neutral position, and flip the ON/OFF switch down to turn the power feed **OFF**.

⚠ CAUTION

Always keep the table locked in place unless controlled movement is required for your operation. Unexpected table movement during operations could cause the cutter to bind with the workpiece, resulting in personal injury, and possible damage to the cutter and workpiece.

Positioning Headstock

The head tilts 45° to the left or right and the turret rotates 360° around the column (see **Figures 27–28**).

Any time the head has been tilted or rotated, you must tram the spindle with the table when setting the headstock back to the 90° position. This is the only way to ensure precision milling results later. Refer to **Tramming Spindle** on **Page 41** for more information.

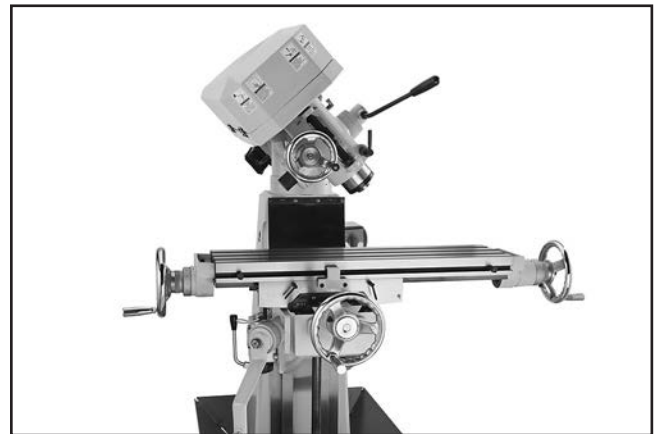


Figure 27. Example of head tilted 45° to the left.

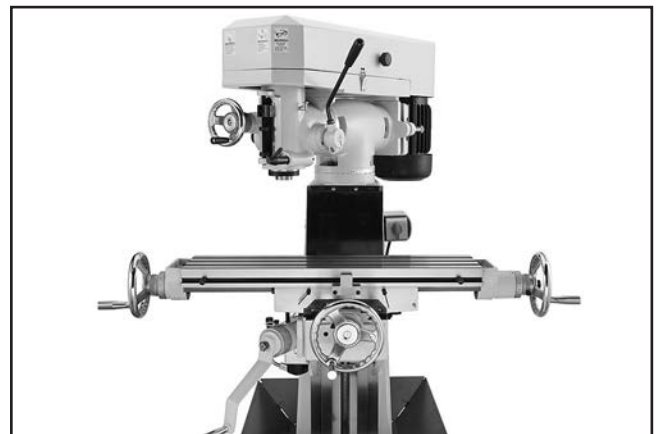


Figure 28. Example of head and turret rotated 45° to the left.

Tools Needed	Qty
Wrench 17mm.....	1



Tilting Head Left/Right

1. DISCONNECT MACHINE FROM POWER!
2. Loosen the four hex nuts on both sides of the turret (see **Figure 29**).

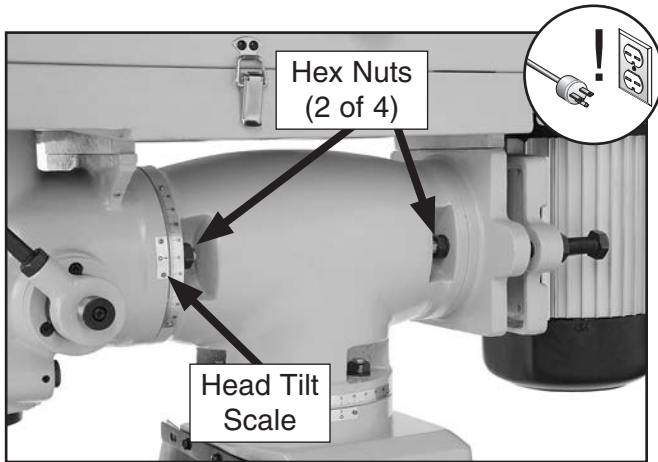


Figure 29. Head tilting hex nuts (2 of 4 shown).

3. Tilt the head to the left or right and use the head tilt scale to determine the angle of tilt.
4. Re-tighten the four hex nuts to secure the head.

⚠ CAUTION

Always lock the head in place after adjusting tilt. Unexpected movement of the head during operations could cause the cutter to bind with the workpiece, resulting in personal injury, and possible damage to the cutter and workpiece.

Rotating Turret

1. DISCONNECT MACHINE FROM POWER!
2. Loosen the three hex nuts on the turret (see **Figure 30**).

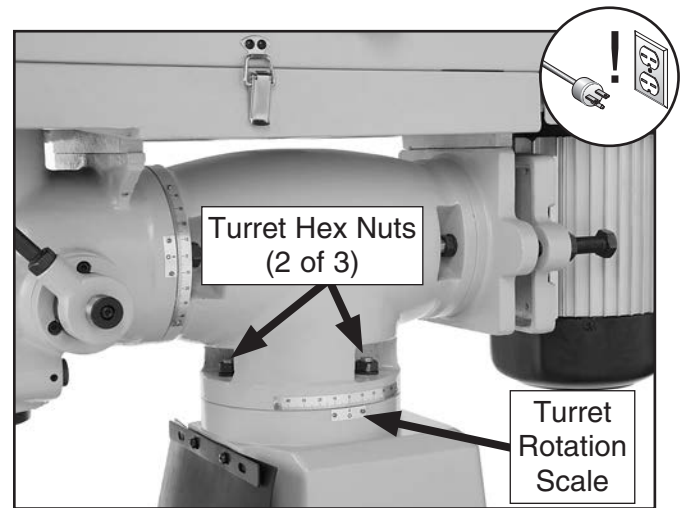


Figure 30. Turret rotation hex nuts (2 of 3 shown).

3. Rotate the head and turret around the column to the left or right using the turret rotation scale to determine the amount of rotation.
4. Re-tighten the three hex nuts to secure the head and turret in place.

⚠ CAUTION

Always lock the turret in place after rotation. Unexpected movement of the head during operations could cause the cutter to bind with the workpiece, resulting in personal injury, and possible damage to the cutter and workpiece.



Setting Spindle Speed

Setting Spindle Speed

Tools Needed	Qty
Open-End Wrenches 24mm.....	2

To select the correct spindle speed (RPM) for a milling operation, you will need to: 1) Determine the spindle speed needed for the workpiece, and 2) configure the belts to provide the closest calculated speed.

Calculating Spindle Speed

1. Use the table in **Figure 31** to determine the cutting speed or surface feet per minute (SFM) required for the workpiece material.

Cutting Speeds for High Speed Steel (HSS) Cutting Tools	
Workpiece Material	Cutting Speed (SFM)
Aluminum & alloys	300
Brass & Bronze	150
Copper	100
Cast Iron, soft	80
Cast Iron, hard	50
Mild Steel	90
Cast Steel	80
Alloy Steel, hard	40
Tool Steel	50
Stainless Steel	60
Titanium	50
Plastics	300-800
Wood	300-500

Note: For carbide cutting tools, double the cutting speed. These values are a guideline only. Refer to the *MACHINERY'S HANDBOOK* for more detailed information.

Figure 31. Cutting speed table for HSS cutting tools.

2. Measure the diameter of the cutting tool in inches.
3. Use the following formula to calculate the required spindle speed RPM:

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

*Double if using carbide cutting tool

To set the spindle speed:

1. DISCONNECT MACHINE FROM POWER!.
2. Release motor pulley tension by loosening the jam nut and then the tensioner bolt (see **Figure 32**).

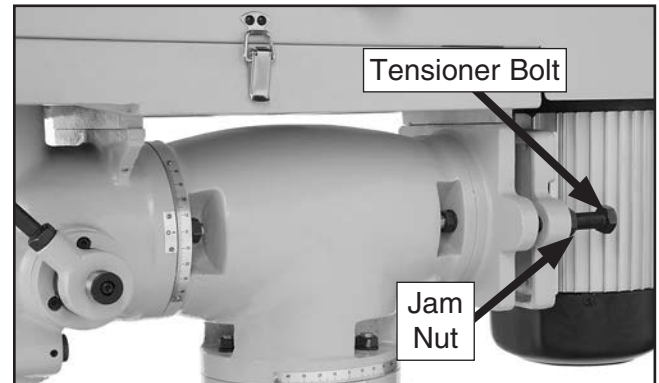


Figure 32. Tensioner bolt and jam nut location.

3. Using the table in **Figure 33**, arrange the belts to provide the best RPM for the cutting operation.

PULLEY ARRANGEMENT				
A	B	C	D	I II III
SPINDLE RPM CHART				
	A	B	C	D
I	1000	/	480	300
II	1800	1220	/	540
III	2840	1930	1350	/

Figure 33. Vertical milling machine RPM table.

4. Retension the belts to the proper tension (see **Tensioning V-Belts on Page 35**).



Spindle Downfeed

Spindle downfeed movement on the mill is controlled by two mechanisms: 1) The coarse downfeed lever, and 2) the fine downfeed handwheel. Refer to **Downfeed Controls** on **Page 4** for detailed descriptions of all downfeed controls and components.

Using Coarse Downfeed

Coarse downfeed is typically used for drilling, because it allows you to quickly lower the spindle with varying speed/pressure, and it automatically retracts the spindle to the top position when released.

To use coarse downfeed, make sure the spindle is completely stopped. Loosen the downfeed selector, and then rotate the coarse downfeed handle around the hub to control spindle depth (see **Figures 34–35**).

Note: *To maintain control of the upward spindle travel, always continue holding the handle until the spindle returns to the top position. Letting go of the handle too soon will cause the spindle to retract too quickly and slam up into the headstock.*



Figure 34. Location of downfeed selector.

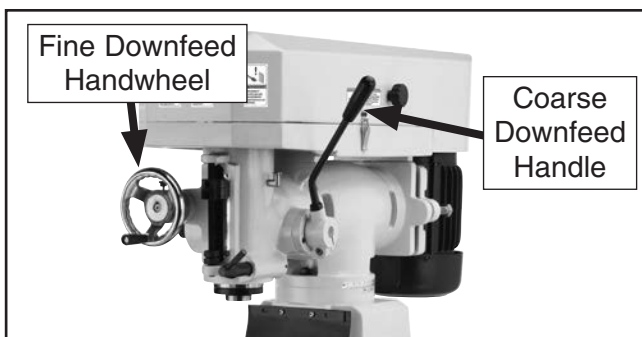


Figure 35. Location of fine and coarse downfeed controls.

Using Fine Downfeed

Fine downfeed is used for precise Z-axis positioning of a cutter or end-mill when milling a flat surface across the face of a workpiece. In order to ensure the milled surface remains flat, the quill lock lever should be locked after each adjustment to ensure the spindle height cannot move until the entire milling operation is complete.

To use fine downfeed, make sure the spindle is completely stopped. Tighten the downfeed selector, and then rotate the fine downfeed handwheel to raise or lower the spindle (see **Figures 34–35**).

Setting Downfeed Stop

The downfeed stop sets the depth of spindle travel for repeat operations.

To set downfeed stop:

1. Lower spindle to desired depth, then lock quill.
2. Rotate downfeed stop until it contacts quill dog, then tighten locking wheel against stop to secure it (see **Figure 36**).
3. Release quill lock and raise quill (see **Figure 36**).

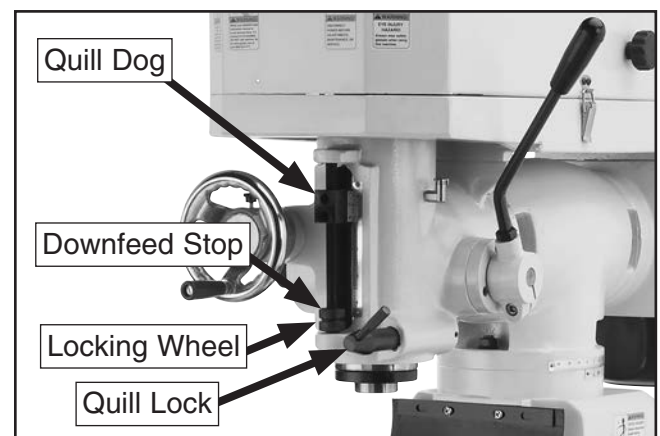


Figure 36. Location of downfeed stop controls.



Loading/Unloading Tooling

This mill is equipped with an R-8 spindle taper and 7/16"-20 drawbar (see **Figure 37**). Use the drawbar to secure/remove tooling during loading/unloading.

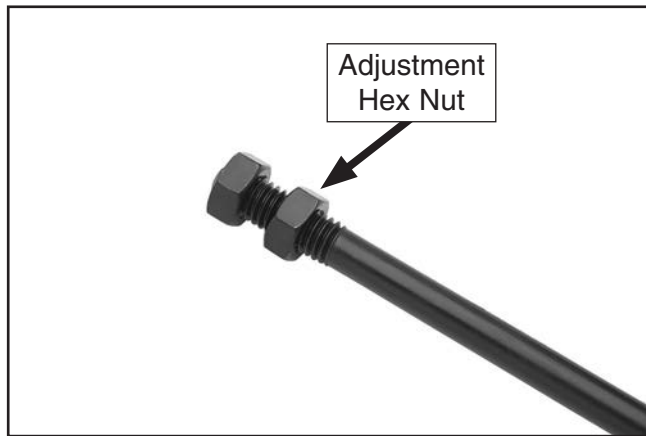


Figure 37. Drawbar and adjustment nut.

Tools Needed	Qty
Open-End Wrenches 19mm.....	2

Loading Tooling

1. DISCONNECT MACHINE FROM POWER!
2. Clean any debris or oily substances from the mating surfaces of the spindle and tool tapers.

⚠ CAUTION

Cutting tools are sharp and can easily cut your hands. Always protect your hands when handling cutting tools.

3. Open the V-belt cover and rotate the adjustment hex nut to the top of the drawbar to extend the drawbar fully within the spindle (see **Figure 38**).

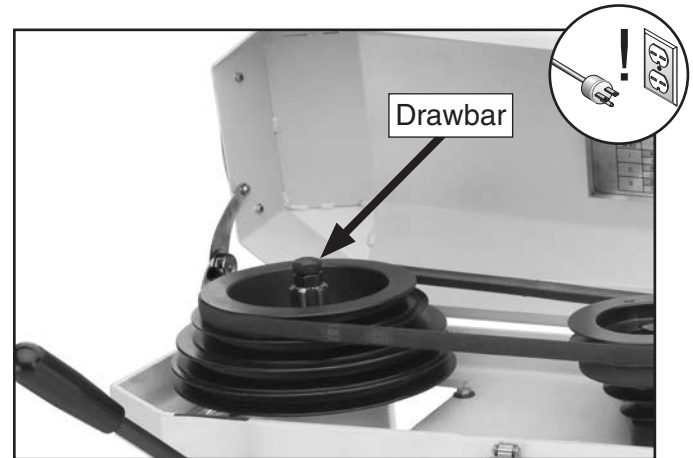


Figure 38. Drawbar inserted through the top of the spindle.

4. Align the tooling key way with the quill set screw while pushing the tool firmly into the spindle taper to seat it.
5. While holding the tool in place with one hand, thread the drawbar into the tool and hand tighten.
6. To fully seat the tool into the spindle, use the wrenches to tighten the drawbar adjustment hex nut down to draw the tool up until it is snug.

Note: *Over-tightening the drawbar could make removing the tool difficult.*

Unloading Tooling

1. DISCONNECT MACHINE FROM POWER!
2. Keep one hand on the tool, loosen the adjustment hex nut, then completely unthread the drawbar.

— If the tool does not release from the spindle as the drawbar is unthreaded, turn the drawbar back into the tool one or two threads, then tap the top of the drawbar with a dead-blow hammer or rubber mallet until the tool releases.



SECTION 5: ACCESSORIES

! WARNING

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

NOTICE

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

T10063—Milling Vise 12⁵/₁₆" x 6⁹/₁₆"

T10064—Milling Vise 17¹/₈" x 8³/₄"

- Ultra precise in flatness, parallelism and verticality.
- Anti-lift mechanism ensures the workpiece does not lift when jaws are tightened.
- Ductile iron body.
- Flame hardened vise bed and jaws.
- Sealed bearing system.
- 8200 lbs. of clamping pressure.

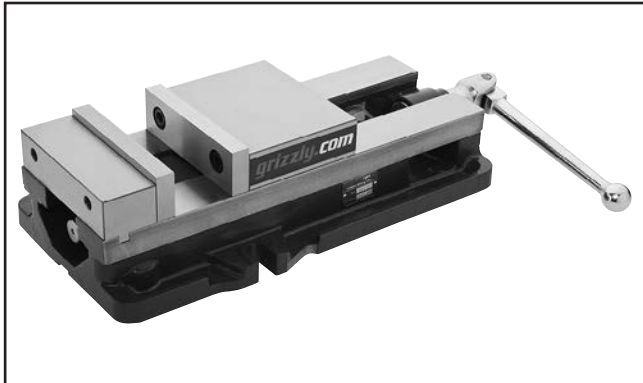


Figure 39. T10064 Milling Vise.

G1075—58-Pc. Clamping Kit

This clamping kit includes 24 studs, 6 step block pairs, 6 T-nuts, 6 flange nuts, 4 coupling nuts, and 6 end hold-downs. The rack is slotted so it can be mounted close to the machine for easy access. Made for 1/2" T-slots.

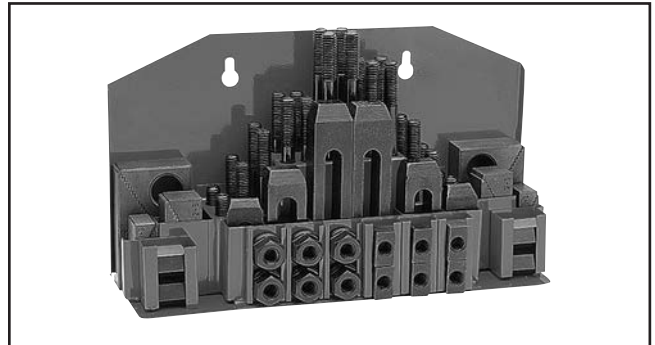


Figure 40. G1075 58-Pc. Clamping Kit.

Basic Eye Protection

T20501—Face Shield Crown Protector 4"

T20502—Face Shield Crown Protector 7"

T20503—Face Shield Window

T20451—"Kirova" Clear Safety Glasses

T20456—DAKURA Safety Glasses, Black/Clear

T28175—R3 SAFETY Stealth Safety Glasses



Figure 41. Assortment of basic eye protection.

order online at www.grizzly.com or call 1-800-523-4777



SECTION 6: MAINTENANCE



Schedule

For optimum performance from this machine, this maintenance schedule must be strictly followed.

Ongoing

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

- Loose mounting bolts.
- Worn or damaged tooling.
- Worn or damaged wires.
- Any other unsafe condition.

Every 8 Hours of Operation:

- Use the one-shot oiler (**Page 34**).
- Add oil to the spindle lubrication cup (**Page 34**).
- Clean the mill.

Every 40 Hours of Operation:

- Lubricate the vertical bevel gears (**Page 34**).
- Lubricate the longitudinal, cross, and vertical leadscrews (**Page 35**).

Note: *This maintenance schedule is based on average usage. Adjust the maintenance schedule to match your actual usage to keep this mill running smoothly and to protect your investment.*

Cleaning & Protecting

Use a brush and shop vacuum to remove chips and debris from the mill. Never blow off the mill with compressed air, as this will force metal chips deep into the mechanisms and may injure yourself or bystanders.

Wipe built-up grime from the mill with a rag and a mild solvent. Remove any rust from the unpainted cast iron surfaces of this mill, then treat them with regular applications of products such as Primrose Armor Plate Way Oil, G96® Gun Treatment, SLIPIT®, or Boeshield® T-9 (see Grizzly Catalog for more details).

Lubrication

This mill has numerous moving metal-to-metal contacts that require proper lubrication to help ensure efficient and long-lasting mill operation.

NOTICE

Failure to follow reasonable lubrication practices as outlined in this manual for your mill could lead to premature failure of your mill and will void the warranty.

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

IMPORTANT: Before adding lubricant, clean debris and grime from the devices to avoid contaminating the new lubrication.

DISCONNECT MACHINE FROM POWER BEFORE PERFORMING LUBRICATION!



Lubrication Task	Frequency (Hours of Operation)	Page Ref.
One-Shot Oiler	8 Hrs.	This Page
Quill Gearing	8 Hrs.	This Page
Vertical Bevel Gears	40 Hrs.	This Page
Leadscrews	40 Hrs.	35

Figure 42. Recommended lubrication tasks, schedules, and instruction page references.

Table Ways (One-Shot Oiler)

Oil Type Model SB1365 or ISO 68 Equivalent
 Oil Amount..... One Pull of Pump Handle
 Check/Add Frequency8 Hrs. of Operation

The oil lines running from the one-shot oiler feed lubrication to the ways of the column (knee), saddle, and table.

Use the sight glass on the front of the oiler to make sure it is full, then pull the handle (see **Figure 43**) and release it to send the lubricant through the lines.

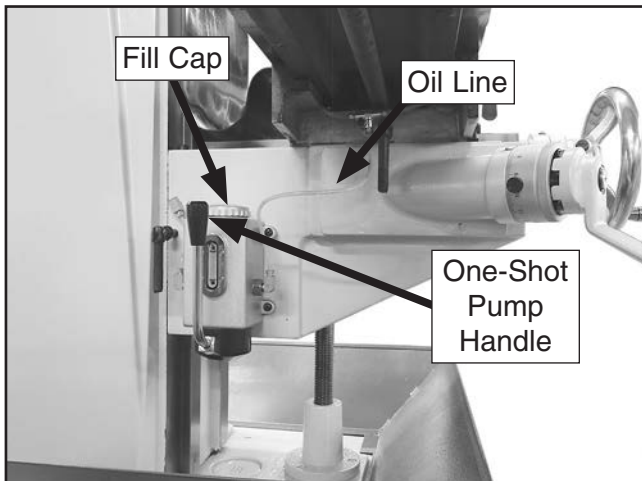


Figure 43. One-shot oiler components.

Quill Gearing

Oil Type Model SB1365 or ISO 68 Equivalent
 Oil Amount.....5 Drops
 Check/Add Frequency8 Hrs. of Operation

Lift the cap of the oil cup shown in **Figure 44** to add the lubricant.



Figure 44. Quill gearing oil cup.

Vertical Bevel Gears

Grease Type Model T26419 or NLGI#2 Equiv.
 Grease AmountThin Coat
 Check/Add Frequency40 Hrs. of Operation

Raise the knee up to access the vertical bevel gears underneath the saddle, then using a lightly oiled shop rag or stiff brush, clean and lubricate the bevel gears shown in **Figure 45**.

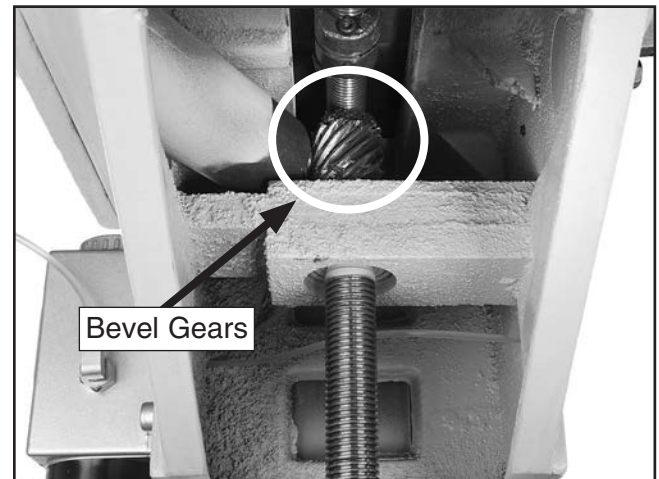


Figure 45. Vertical bevel gears.



Leadscrews

Grease Type Model T26419 or NLGI#2 Equiv.
 Grease AmountThin Coat
 Check/Add Frequency40 Hrs. of Operation

Use a shop rag, stiff brush, and mineral spirits to clean away debris and grime from the longitudinal, cross, and elevation leadscrews and leadscrew nuts. Apply a thin coat of lubricant to the leadscrews, then move the table through the full range of movement for each leadscrew to distribute the grease (see **Figures 46–47**).

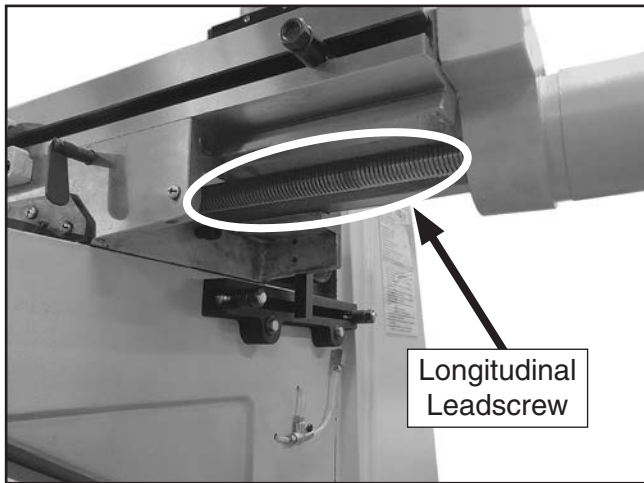


Figure 46. Longitudinal leadscrew.

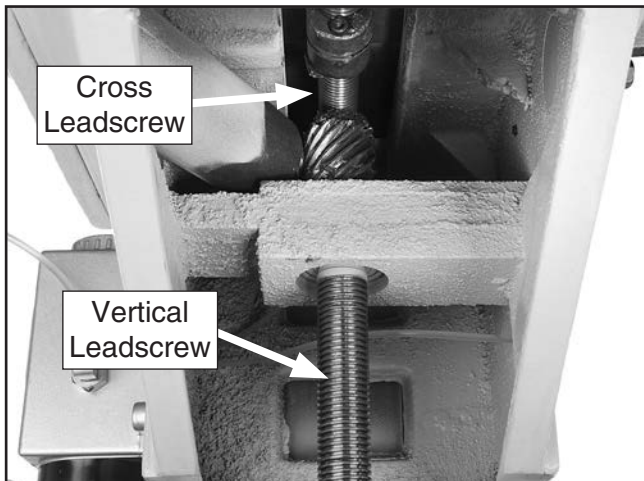


Figure 47. Cross and vertical leadscrews.

Tensioning/ Replacing V-Belts

Power is transferred from the motor to the spindle with a V-belt. With normal use, this belt will gradually stretch over time. When it does, perform the following procedures to re-tension it.

Tools Needed	Qty
Open-End Wrenches 24mm.....	2

Tensioning V-Belts

1. DISCONNECT MACHINE FROM POWER!
2. Open the V-belt cover, then loosen the adjustment bolt jam nut near the motor (see **Figure 48**).

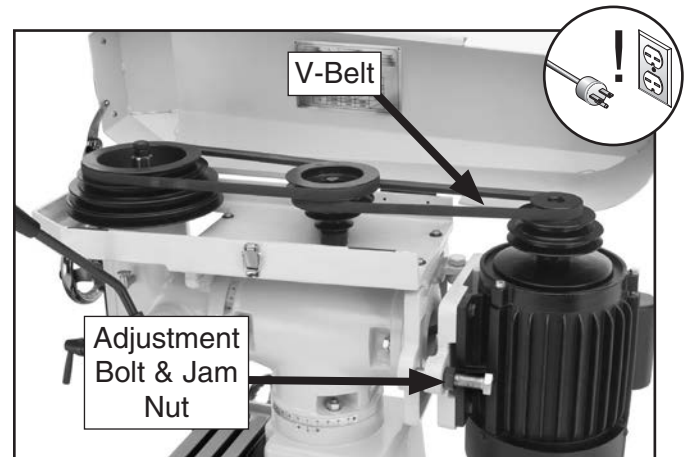


Figure 48. V-belt tension adjustment bolt.



- The V-belts tighten uniformly because of the idler pulley. Rotate the adjustment bolt until the V-belt has approximately $\frac{1}{8}$ " of deflection when moderate pressure is applied midway between the pulleys (see **Figure 49**), then re-tighten the jam nut and close the V-belt cover.

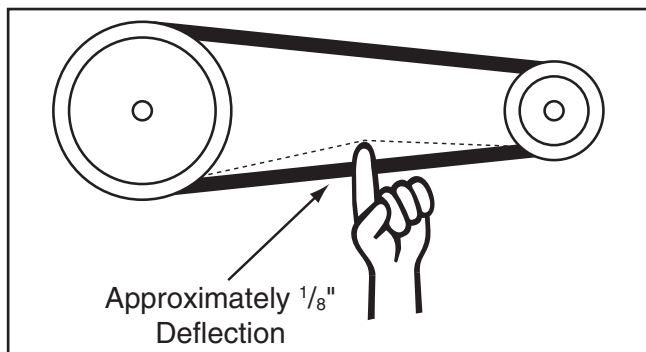


Figure 49. Checking for belt deflection.

Replacing V-Belts

Replacement V-belt part numbers can be found in the back of this manual in the PARTS section, beginning on **Page 45**.

To remove and replace V-belts:

- DISCONNECT MACHINE FROM POWER!
- Open the V-belt cover.
- Loosen the adjustment bolt jam nut near the motor (see **Figure 48**) and push motor toward machine to loosen V-belts.
- Remove belt(s) from pulleys.
- Install new V-belt(s) according to desired spindle speed (see **Setting Spindle Speed** on **Page 29**).
- Properly tension V-belts.

Machine Storage

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

Note: When taking the machine out of storage, repeat the **Test Run** and the **Spindle Break-In**.

Preparing Mill for Storage

- DISCONNECT MACHINE FROM POWER!
- Lubricate machine as directed in **Lubrication** on **Page 33**.
- Thoroughly clean all unpainted, bare metal surfaces, then coat them with quality rust preventative. Take care to ensure these surfaces are completely covered but rust preventative is kept off painted surfaces.

Note: If the machine will be out of service for only a short period of time, use way oil in place of rust preventative.

- Loosen belts to prevent them from stretching during storage. Post a reminder on machine that belts need to be re-installed or tensioned before resuming operations.
- Cover and place machine in a dry area that is out of direct sunlight and away from hazardous fumes, paint, solvents, or gas. Fumes and sunlight can bleach or discolor paint and plastic parts.
- At least once a month, start the mill and run all gear-driven components for a few minutes. This will keep the bearings, bushings, gears, and shafts well lubricated and protected from corrosion, especially during the winter months.

Bringing Mill Out of Storage

- Re-tension V-belts (refer to **Page 35**) if you loosened them for storage purposes.
- Repeat **Test Run** and **Spindle Break-In** procedures, beginning on **Page 21**.

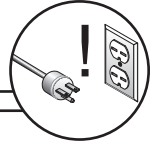


SECTION 7: SERVICE

Review the troubleshooting and procedures in this section if a problem develops with your machine. If you need replacement parts or additional help with a procedure, call our Technical Support at (570) 546-9663.

Note: Please gather the serial number and manufacture date of your machine before calling.

Troubleshooting

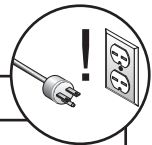


Motor & Electrical

Symptom	Possible Cause	Possible Solution
Machine does not start or a breaker trips.	<ol style="list-style-type: none"> 1. Incorrect power supply voltage or circuit size. 2. Plug/receptacle at fault/wired incorrectly. 3. Motor wires connected incorrectly. 4. Start capacitor at fault. 5. Centrifugal switch adjustment/contact points at fault. 6. Wiring broken, disconnected, or corroded. 7. Spindle rotation switch at fault. 8. Motor or motor bearings at fault. 	<ol style="list-style-type: none"> 1. Ensure correct power supply voltage and circuit size. 2. Test for good contacts; correct the wiring. 3. Correct motor wiring connections (Page 43). 4. Test/replace if at fault.. 5. Adjust centrifugal switch/clean contact points. Replace either if at fault. 6. Fix broken wires or disconnected/corroded connections. 7. Test/replace switch. 8. Replace motor.
Machine stalls or is overloaded.	<ol style="list-style-type: none"> 1. Feed rate/cutting speed too fast. 2. Wrong workpiece material. 3. Belt(s) slipping/pulleys misaligned. 4. Motor wires connected incorrectly. 5. Plug/receptacle at fault/wired incorrectly. 6. Machine undersized for task. 7. Run capacitor at fault. 8. Extension cord too long. 9. Spindle rotation switch at fault. 10. Motor or motor bearings at fault 	<ol style="list-style-type: none"> 1. Decrease feed rate/cutting speed. 2. Use correct type/size of metal. 3. Clean/tension/replace belt(s); ensure pulleys are aligned. 4. Correct motor wiring connections. 5. Test for good contacts/correct wiring. 6. Use correct cutter/bit; reduce feed rate; reduce spindle RPM; use cutting fluid if possible. 7. Test/repair/replace. 8. Move machine closer to power supply; use shorter extension cord. 9. Test/replace switch. 10. Replace motor.
Machine has vibration or noisy operation.	<ol style="list-style-type: none"> 1. Motor or component is loose. 2. V-belt(s) worn, loose, pulleys misaligned or belt slapping cover. 3. Pulley is loose. 4. Motor fan rubbing on fan cover. 5. Chuck or cutter at fault. 6. Centrifugal switch needs adjustment/at fault. 7. Motor bearings at fault. 	<ol style="list-style-type: none"> 1. Replace damaged or missing bolts/nuts or tighten if loose. 2. Inspect/replace belts with a new matched set. Realign pulleys if necessary. 3. Secure pulley on shaft. 4. Fix/replace fan cover; replace loose/damaged fan. 5. Replace unbalanced chuck; replace/resharpen cutter; use correct feed rate. 6. Adjust/replace if at fault 7. Test by rotating shaft; rotational grinding/loose shaft requires bearing replacement.



Operation



Symptom	Possible Cause	Possible Solution
Tool loose in spindle.	<ol style="list-style-type: none"> 1. Cutter/tooling loose. 2. Debris on cutting tool or in spindle taper. 3. Taking too big of a cut. 	<ol style="list-style-type: none"> 1. Secure cutter/tooling. 2. Clean cutting tool and spindle taper. 3. Lessen depth of cut and allow chips to clear.
Breaking tools or cutters.	<ol style="list-style-type: none"> 1. Spindle speed/feed rate too fast for depth of cut, cutting tool size, or workpiece material. 2. Cutting tool too small. 3. Taking too big of a cut. 	<ol style="list-style-type: none"> 1. Reduce spindle speed; reduce feed rate; take lighter cut (Page 29). 2. Use larger cutting tool and slower feed rate. 3. Lessen depth of cut and allow chips to clear.
Workpiece vibrates or chatters during operation.	<ol style="list-style-type: none"> 1. Table locks not tight. 2. Workpiece not secure. 3. Spindle speed/feed rate too fast. 4. Gibs too loose in table. 5. Bit chattering. 6. Spindle extended too far down. 7. Quill lock lever not tight. 8. Chuck/cutter at fault. 	<ol style="list-style-type: none"> 1. Tighten table locks (Page 25). 2. Properly clamp workpiece on table or in vise. 3. Reduce spindle speed; reduce feed rate (Page 29). 4. Adjust gibs properly (Page 39). 5. Replace/sharpen bit; index bit to workpiece; reduce slower feed rate. 6. Fully retract spindle and lower headstock. This increases rigidity. 7. Tighten quill lock lever. 8. Replace unbalanced chuck; replace/resharpen cutter.
Table hard to move.	<ol style="list-style-type: none"> 1. Table locks tightened down. 2. Chips loaded up on ways. 3. Ways and leadscrew need lubrication. 4. Gibs too tight. 	<ol style="list-style-type: none"> 1. Release table locks (Page 25). 2. Frequently clean away chips during operations. 3. Lubricate ways and leadscrew (Page 34). 4. Adjust gibs (Page 39).
Bad surface finish.	<ol style="list-style-type: none"> 1. Spindle speed/feed rate too fast. 2. Workpiece not secure. 3. Dull/incorrect cutting tool. 4. Wrong rotation direction of cutting tool. 5. Spindle extended too far down during or at beginning of operation. 	<ol style="list-style-type: none"> 1. Reduce spindle speed; reduce feed rate (Page 29). 2. Properly clamp workpiece on table or in vise. 3. Sharpen/replace cutting tool; select better tool for operation. 4. Check for proper direction of cutting tool rotation. 5. Fully retract spindle and lower headstock. This increases rigidity.

Power Feed

Symptom	Possible Cause	Possible Solution
Power feed will not turn ON .	<ol style="list-style-type: none"> 1. Power feed unit unplugged. 2. Limit switch engaged. 3. Circuit breaker tripped or at fault. 	<ol style="list-style-type: none"> 1. Move on/off switch to OFF position, move direction lever to neutral (middle) position, and rotate speed dial all the way counter clockwise to lowest setting to prevent accidental startup (Page 26), then plug power feed unit into properly grounded outlet. 2. Adjust limit stops, if necessary (Page 26). 3. Reset circuit breaker.
Power feed does not move table or is slipping when turned on.	<ol style="list-style-type: none"> 1. Table locked. 2. Direction lever not engaged. 3. Sheared pin. 4. Gears not meshing or teeth missing. 5. Motor shaft and gear shaft not engaged. 	<ol style="list-style-type: none"> 1. Release table locks (Page 25). 2. Engage direction lever (Page 26). 3. Replace pin. 4. Check gears and adjust/replace. 5. Replace clutch.
Operates at high speed only or is inconsistent.	<ol style="list-style-type: none"> 1. Rapid micro switch is stuck. 2. Wiring harness unplugged from circuit board. 	<ol style="list-style-type: none"> 1. Lightly tap on it to lower it. 2. Reconnect wiring harness.



Adjusting Gibs

Gibs control the accuracy of table movement along the ways. Tight gibs make the movement more accurate, but harder to move. Loose gibs make the movement sloppy, but easier to move. The goal of gib adjustment is to remove unnecessary sloppiness without causing the ways to bind.

NOTICE

Excessively loose gibs may cause poor workpiece finishes, and may cause undue wear of sliding surfaces and ways. Over-tightening the gibs may cause premature wear of these sliding devices.

Each sliding surface for the table, saddle, and knee has a tapered gib that is sandwiched between the stationary and moving surfaces. The saddle and knee have a gib on both sides. There are two adjustment screws, one on each end of each gib, that move the tapered gib back and forth, increasing or decreasing friction of the sliding surfaces.

DISCONNECT MACHINE FROM POWER BEFORE ADJUSTING THE GIBS!

To adjust the gibs, loosen one adjustment screw and tighten the other the same amount to move the gib until you feel a slight drag in that path of movement.

Refer to **Figures 50–52** for the locations of the table, saddle, and knee gib adjustment screws.

Tool Needed	Qty
Screwdriver Flat Head #2.....	1

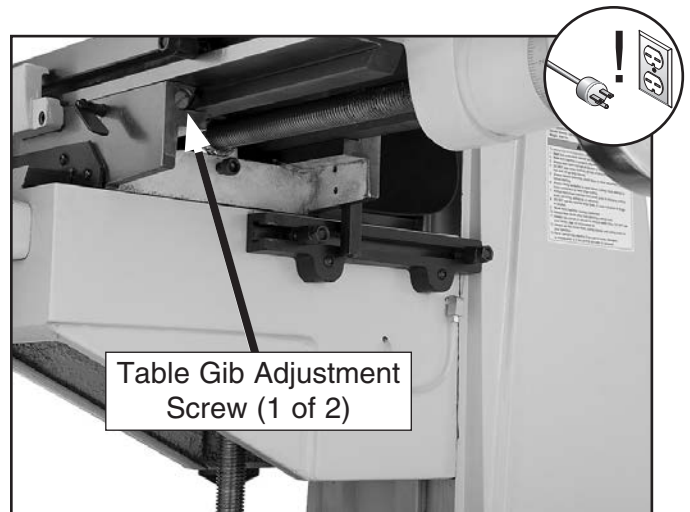


Figure 50. Table gib adjustment screw (1 of 2).

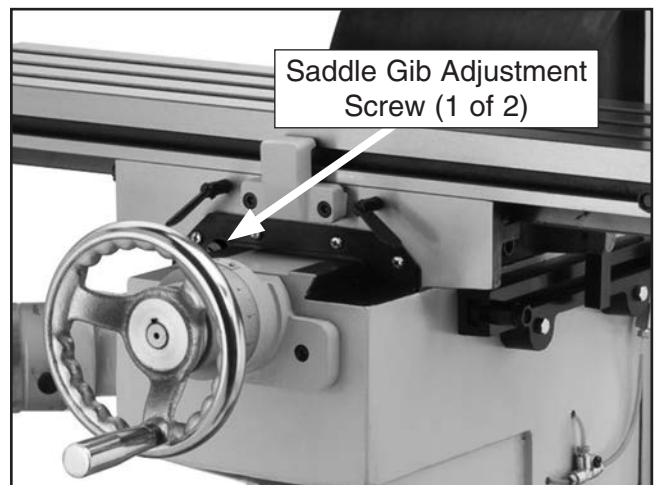


Figure 51. Saddle gib adjustment screw (1 of 2).



Figure 52. Knee gib adjustment screw (1 of 2).



Adjusting Backlash

Leadscrew backlash is the amount of motion the leadscrew rotates before the device begins to move. Leadscrews always have a certain amount of backlash which increases with wear. Generally, 0.005"–0.010" of backlash is an acceptable range.

The backlash of the longitudinal and cross leadscrew is adjusted by changing the gap in the leadscrew nuts (see **Figures 53–54**).

Tool Needed	Qty
T-Handle Hex Wrench 5mm	1

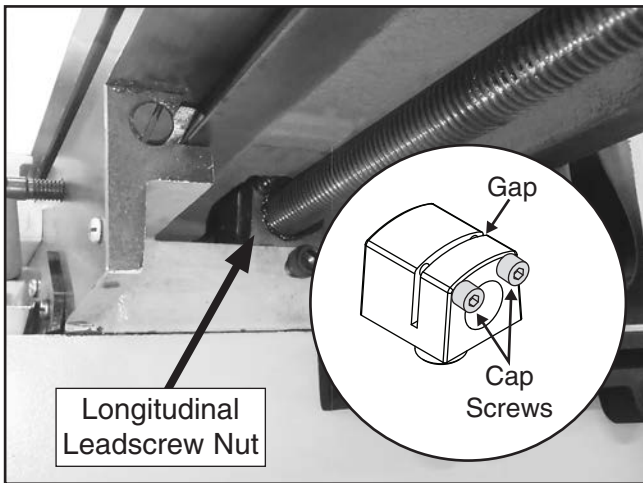


Figure 53. Longitudinal leadscrew nut.

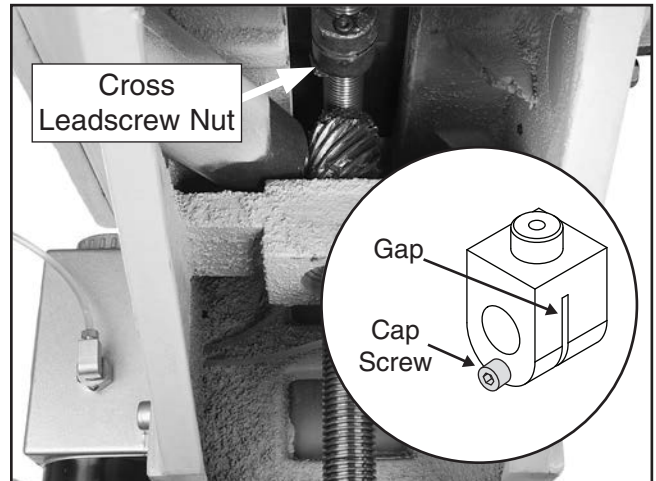


Figure 54. Cross leadscrew nut.

Tighten or loosen the cap screws on the leadscrew nuts shown in **Figures 53–54**, then test the amount of backlash by slowly rocking the handwheels back-and-forth.



Tramming Spindle

After positioning the head at an angle and when your operation requires that the spindle axis be precisely perpendicular to the table, you must tram or align the spindle with the table to ensure the spindle is exactly 90° to the table.

This procedure involves mounting a dial test indicator to the quill or spindle, rotating it around the table, and adjusting the spindle axis (Z-axis) 90° to the table X- and Y-axis, as illustrated in **Figure 55**.

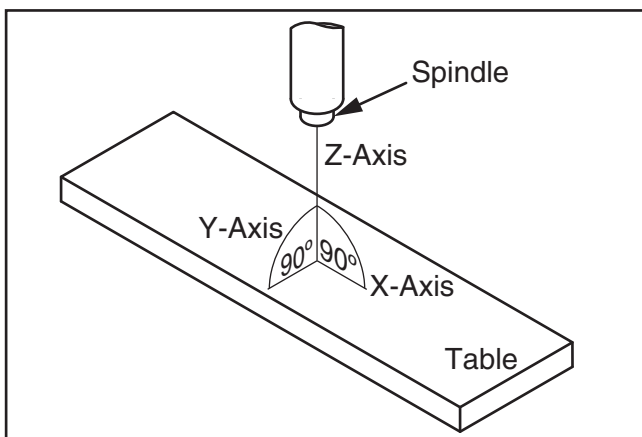


Figure 55. Spindle Z-axis perpendicular to the table X- and Y-axes.

We encourage you to research the many variations of spindle tramming to find the one that works best for you. If you do not already have a preference for performing this operation, use the following widely used procedure for accurately tramming the spindle to the table.

Keep in mind that all workpiece top surfaces are not exactly parallel with the table top. You may choose to tram the spindle to the top surface of the workpiece after it is mounted rather than tramming the spindle to the table.

Items Needed	Qty
Dial Test Indicator (w/at least 0.0005" resolution)	1
Indicator Holder (mounted on the quill/spindle)	1
Precision Parallel Block (at least 9" in length).....	1

Note: A precision-ground plate can be substituted for the parallel blocks. Keep in mind that the farther the indicator point can be placed from the spindle axis, the more accurate the alignment measurements will be.

To tram spindle to table:

1. DISCONNECT MACHINE FROM POWER!
2. Prepare mill for tramming by performing following tasks:
 - Verify the table is clean by running your hand over the top of it. If necessary, stone the table to remove all nicks and burrs, then clean off all debris.
 - Position the table for the milling operation you intend to perform after tramming—preferably centered with the saddle.
 - Tighten the quill lock lever used during intended milling operations.
3. Place parallel block underneath spindle.
4. Install indicator holder in spindle or on quill, then mount indicator so that point is as parallel to block as possible (see **Figure 56**).

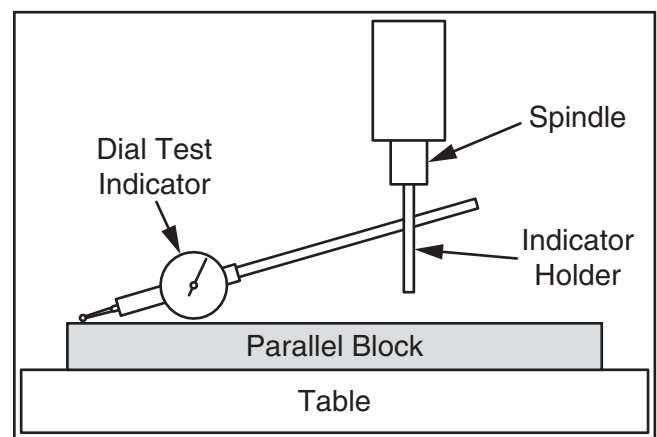


Figure 56. Dial test indicator mounted.



5. To measure spindle alignment along X-axis, place parallel block directly under spindle and indicator across length of table, as illustrated in **Figure 57**.

Note: If you must re-position the quill or the knee to accommodate the above step, then review the tasks in **Step 2** to make sure the mill is properly prepared for tramping.

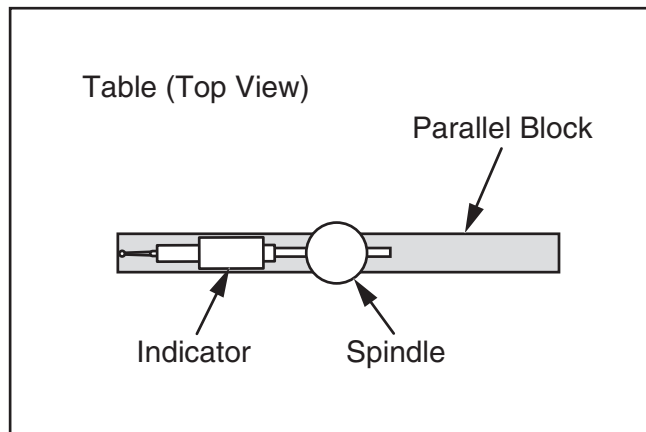


Figure 57. Parallel block and indicator positioned for the X-axis measurement (top view).

Note: Your general goal in the next steps should be to get the difference of the indicator readings between the ends of the parallel bar down to 0.0005". However, the acceptable variance will depend on the requirements for your operation.

6. Rotate spindle by hand so that indicator point rests on one end of parallel block, as illustrated in **Figures 56–57**, then zero the dial.
7. Rotate spindle so that indicator point rests in same manner on other end of block, then read dial.
 - If the indicator dial still reads zero or is within the acceptable variance, continue on with **Step 8**.
 - If the indicator dial has moved from zero beyond the acceptable variance, you will need to compensate for that amount by rotating the head left or right. Repeat **Steps 6–7** until you are satisfied with the spindle axis alignment along the table X-axis.

Note: Keep one of the rotation lock bolts just snug so the head does not move loosely while you adjust it. Remember to tighten all the rotation lock bolts after adjusting the head.

8. Place parallel block directly under spindle and across width of table, as illustrated in **Figure 58**.

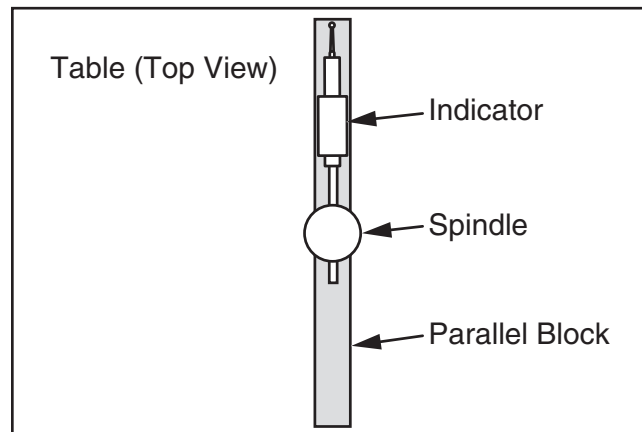


Figure 58. Parallel block and indicator positioned for the Y-axis measurement (top view).

9. Rotate spindle so indicator point rests on parallel bar, as illustrated in **Figure 58**, then zero the dial.
10. Rotate spindle so that indicator point rests on other end of bar in same manner, then read dial.
 - If the indicator dial still reads zero or is within the acceptable variance, the spindle is precisely perpendicular to the table in both the X- and Y-axis, and the tramping procedure is complete.
 - If the indicator dial has moved from zero beyond the acceptable variance, you will need to compensate for that amount by tilting the head forward or backward. Repeat **Steps 9–10** until you are satisfied with the spindle axis alignment along the table Y-axis.

Note: Keep one of the tilt lock bolts just snug so the head does not move loosely while you adjust it. Remember to tighten all the tilt lock



SECTION 8: WIRING

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

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

WARNING

Wiring Safety Instructions

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

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

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

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

WIRE/COMPONENT DAMAGE. Damaged wires or components increase the risk of serious personal injury, fire, or machine damage. If you notice that any wires or components are damaged while performing a wiring task, replace those wires or components.

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
















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

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

NOTICE

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

COLOR KEY

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



Wiring Diagram

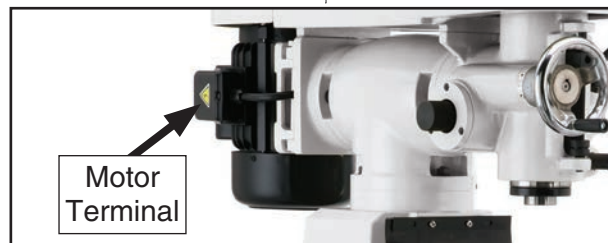
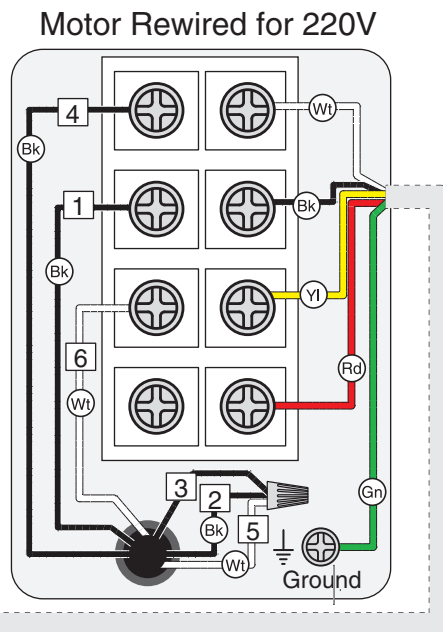
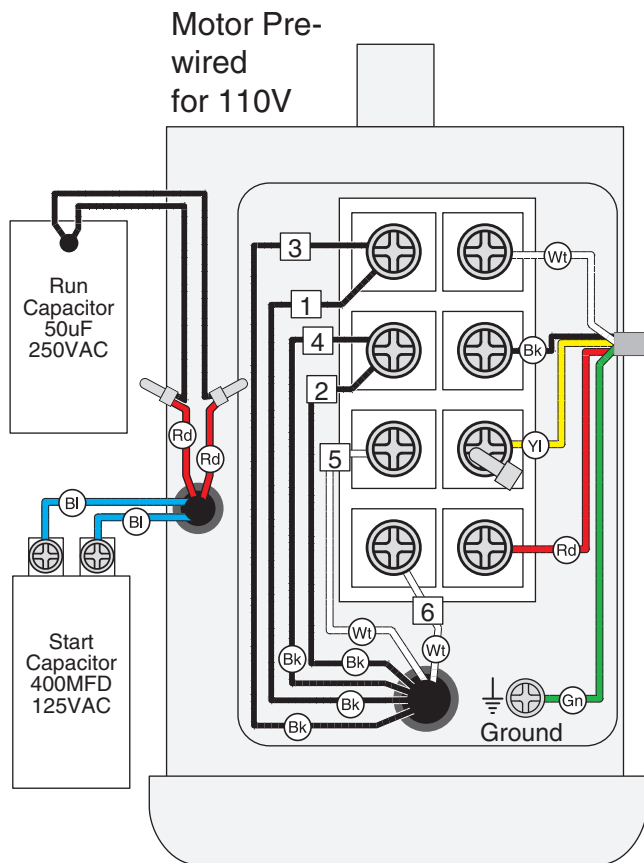


Figure 59. Motor terminal location.

Rotary Switch KEDU ZH-HC-3

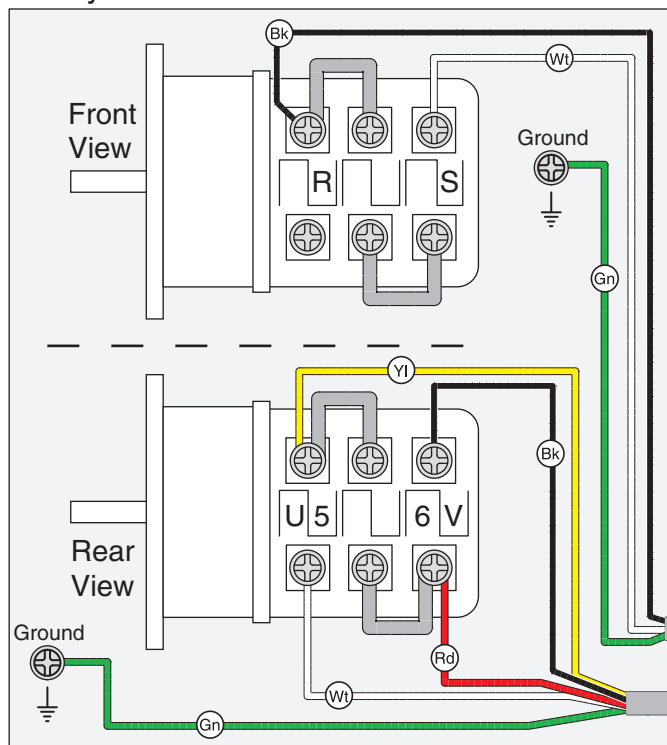
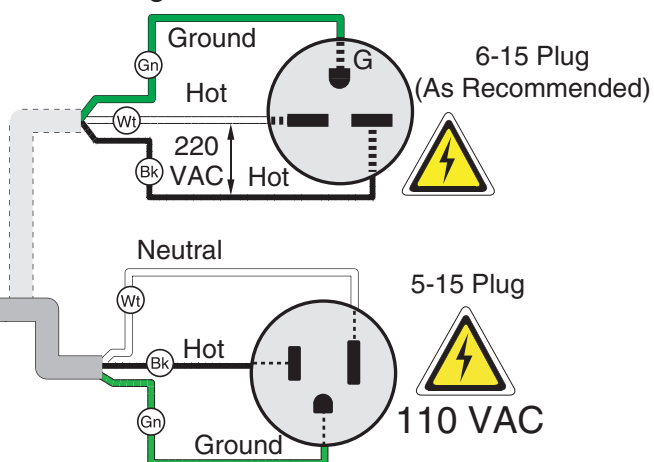


Figure 60. Switch box location.

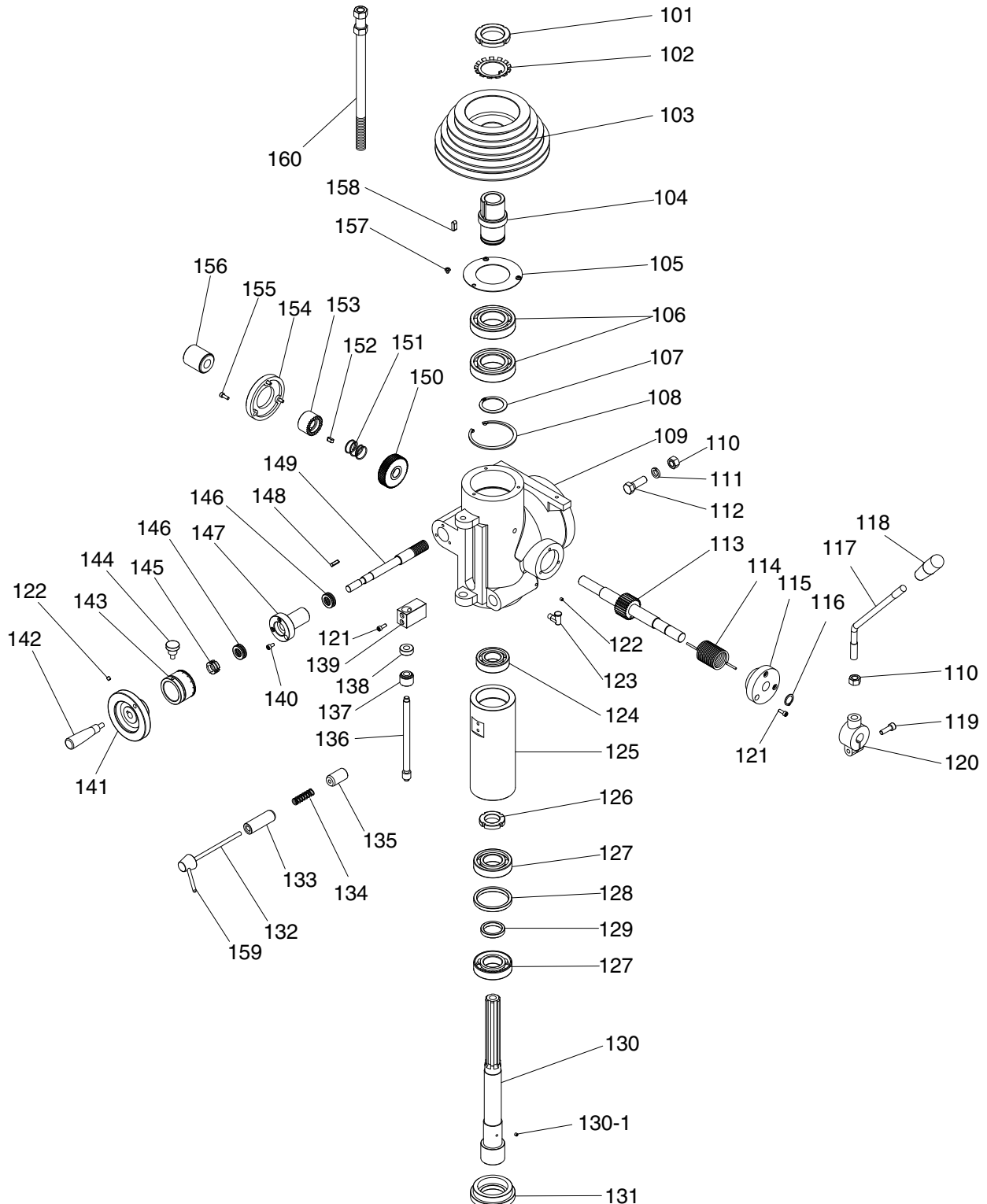
Plug Rewired for 220V



SECTION 9: PARTS

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

Head



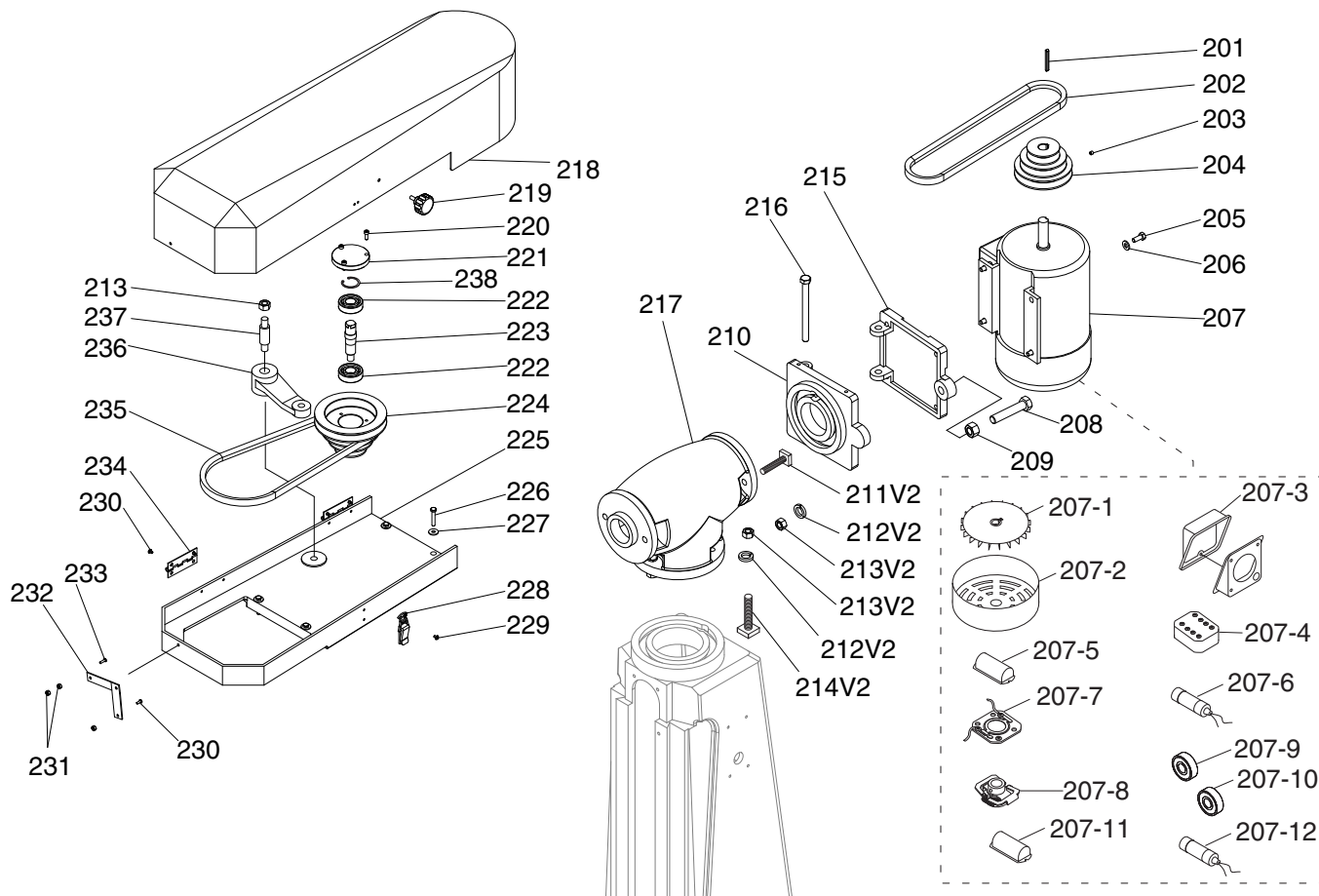
Head Parts List

REF	PART #	DESCRIPTION
101	P0731101	SPINDLE NUT
102	P0731102	SPANNER LOCK WASHER
103	P0731103	SPINDLE PULLEY
104	P0731104	SPLINE SLEEVE
105	P0731105	BEARING COVER
106	P0731106	BALL BEARING 6209ZZ
107	P0731107	EXT RETAINING RING 45MM
108	P0731108	INT RETAINING RING 85MM
109	P0731109	HEAD CASTING
110	P0731110	HEX NUT 1/2-13
111	P0731111	LOCK WASHER 1/2
112	P0731112	HEX BOLT 1/2-13 X 1-1/2
113	P0731113	GEAR SHAFT
114	P0731114	TORSION SPRING
115	P0731115	END CAP
116	P0731116	EXT RETAINING RING 19MM
117	P0731117	HANDLE LEVER
118	P0731118	KNOB 1/2-13
119	P0731119	CAP SCREW M8-1.25 X 25
120	P0731120	HANDLE BASE
121	P0731121	CAP SCREW M5-.8 X 16
122	P0731122	SET SCREW M6-1 X 8
123	P0731123	OIL CUP
124	P0731124	BALL BEARING 6206ZZ
125	P0731125	SPINDLE QUILL
126	P0731126	SPANNER NUT 35MM
127	P0731127	ANGULAR CONTACT BEARING 7207
128	P0731128	BEARING SPACER LARGE
129	P0731129	BEARING SPACER SMALL
130	P0731130	SPINDLE
130-1	P0731130-1	SET SCREW M4-.7 X 10

REF	PART #	DESCRIPTION
131	P0731131	SPINDLE COLLAR
132	P0731132	LOCK KNOB SHAFT
133	P0731133	LOCK BLOCK SLEEVE
134	P0731134	COMPRESSION SPRING
135	P0731135	LOCK PLUNGER SMALL
136	P0731136	LIMIT BLOCK SLEEVE
137	P0731137	DOWNFEED LOCK RING
138	P0731138	DOWNFEED STOP RING
139	P0731139	QUILL DOG
140	P0731140	PHLP HD SCR M5-.8 X 15
141	P0731141	HANDWHEEL
142	P0731142	HANDLE 5/16-18 X 1/2
143	P0731143	GRADUATED DIAL
144	P0731144	LOCKING THUMB SCREW 5-.8 X 12
145	P0731145	SPANNER NUT 9/16-12
146	P0731146	THRUST BEARING 51102
147	P0731147	SLEEVE
148	P0731148	WOODRUFF KEY 5 X 20
149	P0731149	WORM SHAFT
150	P0731150	COUPLING WORM GEAR
151	P0731151	COMPRESSION SPRING
152	P0731152	WOODRUFF KEY 6 X 15
153	P0731153	COUPLING
154	P0731154	END CAP
155	P0731155	PHLP HD SCR M5-.8 X 10
156	P0731156	KNURLED KNOB
157	P0731157	PHLP HD SCR M5-.8 X 8
158	P0731158	KEY 7 X 7 X 20
159	P0731159	LOCK HANDLE
160	P0731160	DRAWBAR 7/16-20 X 12-3/8 W/NUT



Drive System

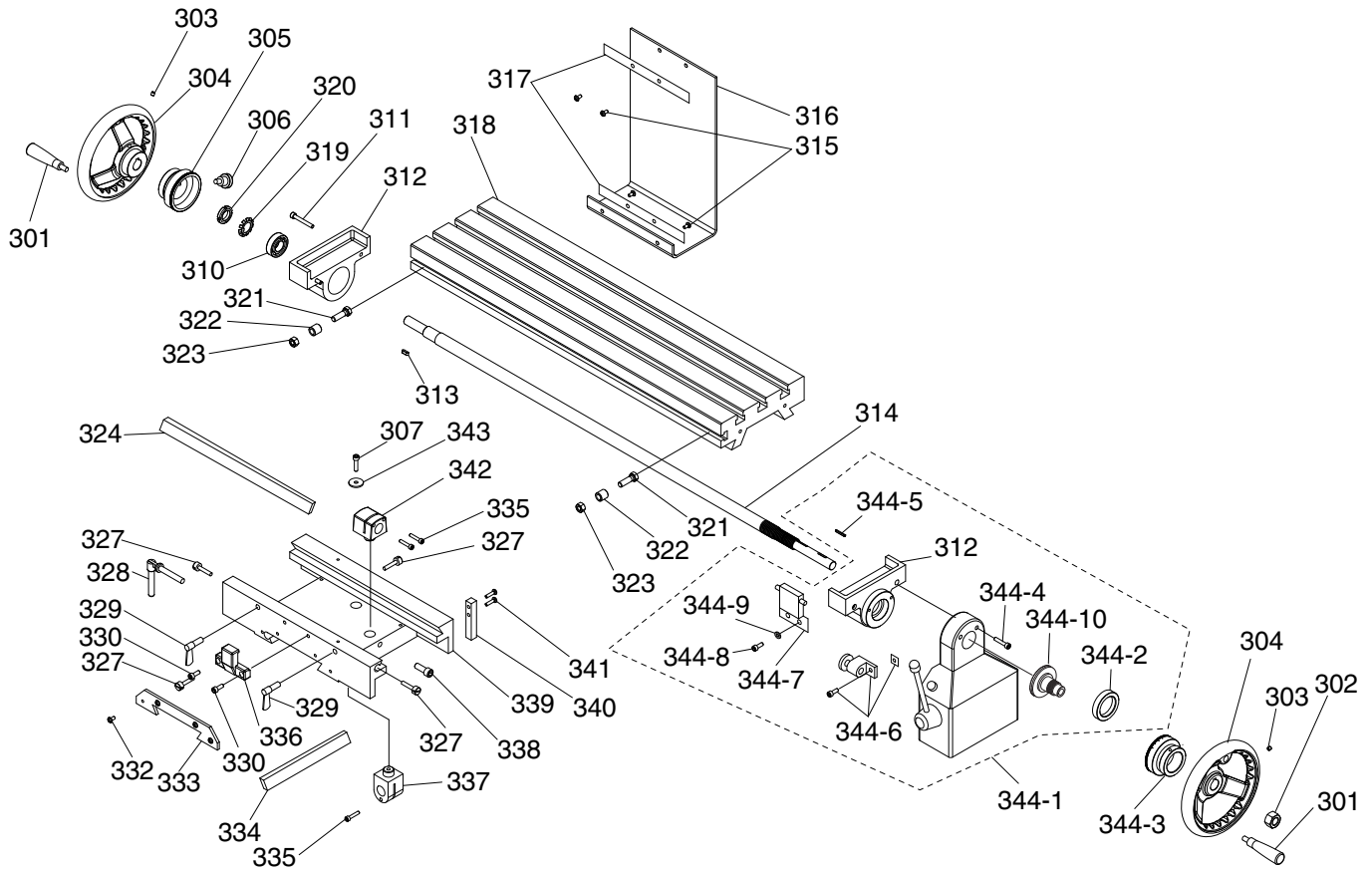


REF	PART #	DESCRIPTION
201	P0731201	KEY 5 X 40
202	P0731202	V-BELT B35
203	P0731203	SET SCREW M6-1 X 8
204	P0731204	MOTOR PULLEY
205	P0731205	CAP SCREW M8-1.25 X 20
206	P0731206	FLAT WASHER 8MM
207	P0731207	MOTOR 1-1/2HP 110V/220V 1PH
207-1	P0731207-1	MOTOR FAN
207-2	P0731207-2	MOTOR COVER
207-3	P0731207-3	JUNCTION BOX
207-4	P0731207-4	TERMINAL BAR 4P
207-5	P0731207-5	START CAPACITOR COVER
207-6	P0731207-6	S CAPACITOR 400M 125V 3 X 2
207-7	P0731207-7	CONTACTOR PLATE
207-8	P0731207-8	CENTRIFUGAL SWITCH 1725RPM
207-9	P0731207-9	BEARING 6205 ZZ
207-10	P0731207-10	BEARING 6203 ZZ
207-11	P0731207-11	RUN CAPACITOR COVER
207-12	P0731207-12	R CAPACITOR 50M 250V
208	P0731208	HEX BOLT M16-2 X 70
209	P0731209	HEX NUT M16-2
210	P0731210	MOTOR BRACKET
211V2	P0731211V2	SQUARE BOLT M12-1.75 X 40 V2.01.17
212V2	P0731212V2	LOCK WASHER 12MM V2.01.17
213V2	P0731213V2	HEX NUT M12-1.75 V2.01.17

REF	PART #	DESCRIPTION
214V2	P0731214V2	SQUARE BOLT M12-1.75 X 45 V2.01.17
215	P0731215	MOUNTING PLATE
216	P0731216	BRACKET PIVOT PIN
217	P0731217	TURRET
218	P0731218	UPPER BELT COVER
219	P0731219	KNOB 3/8-16 X 1/2
220	P0731220	CAP SCREW M5-.8 X 20
221	P0731221	FLANGE COVER
222	P0731222	BALL BEARING 6204ZZ
223	P0731223	PULLEY PIVOT STRD
224	P0731224	PULLEY
225	P0731225	LOWER BELT COVER
226	P0731226	HEX BOLT M6-1 X 35
227	P0731227	FLAT WASHER 6MM
228	P0731228	LATCH
229	P0731229	PHLP HD SCR M3-.5 X 8
230	P0731230	PHLP HD SCR M5-.8 X 8
231	P0731231	HEX NUT M5-.8
232	P0731232	BRACE
233	P0731233	PHLP HD SCR M5-.8 X 10
234	P0731234	COVER HINGE
235	P0731235	V-BELT B40
236	P0731236	PULLEY SWIVEL
237	P0731237	PULLEY SWIVEL PIN
238	P0731238	INT RETAINING RING 45MM



Table & Saddle

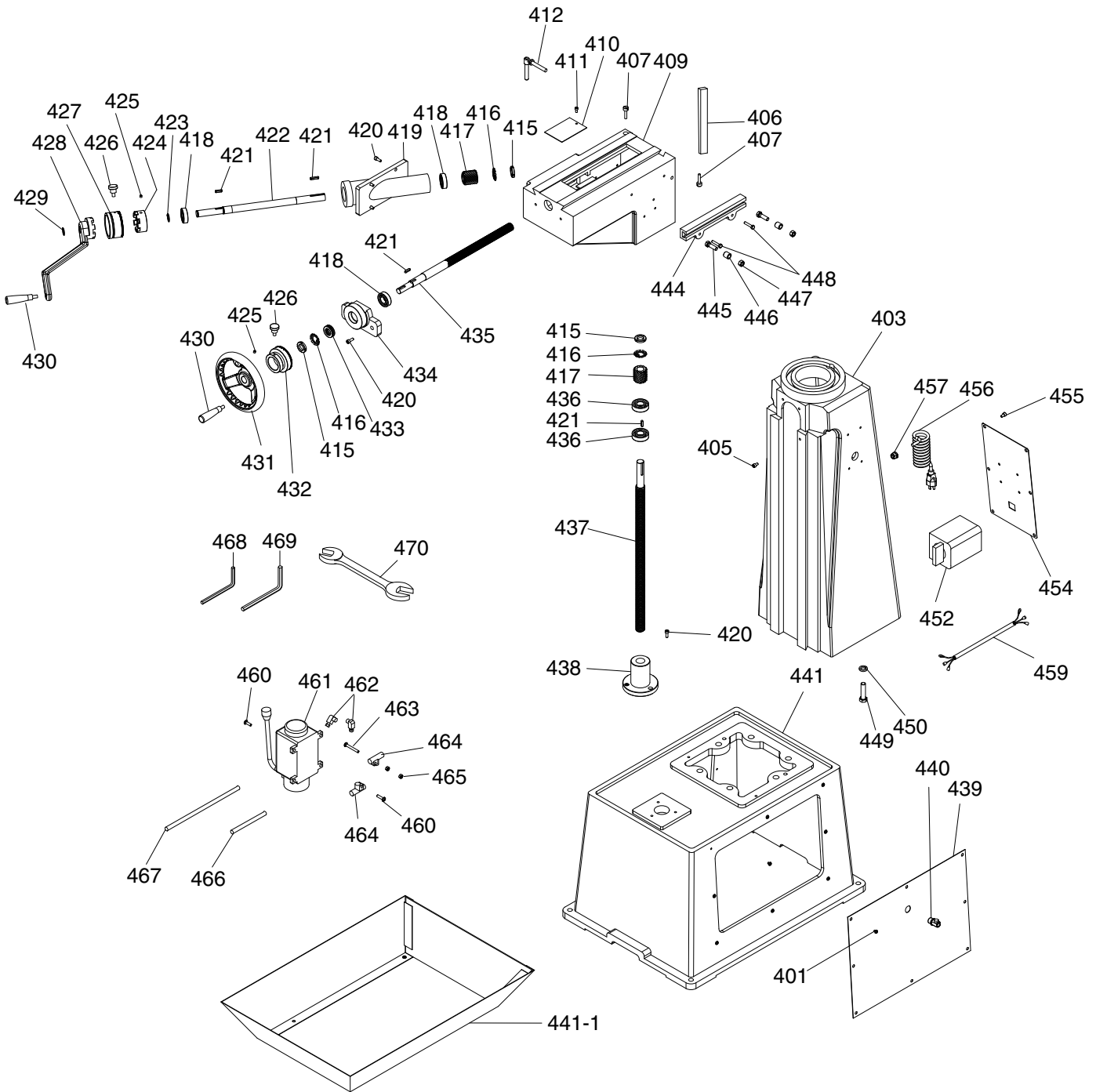


REF	PART #	DESCRIPTION
301	P0731301	HANDLE 3/8-16 X 1/2
302	P0731302	HEX NUT 5/8-11
303	P0731303	SET SCREW M6-1 X 8
304	P0731304	HANDWHEEL
305	P0731305	GRADUATED DIAL
306	P0731306	LOCKING THUMB SCREW 5-.8 X 12
307	P0731307	CAP SCREW M6-1 X 25
310	P0731310	BALL BEARING 6004ZZ
311	P0731311	CAP SCREW M6-1 X 45
312	P0731312	LEADSCREW BRACKET
313	P0731313	WOODRUFF KEY 5 X 20
314	P0731314	LONGITUDINAL LEADSCREW
315	P0731315	PHLP HD SCR M6-1 X 8
316	P0731316	WAY COVER
317	P0731317	WAY COVER HOLDER
318	P0731318	TABLE
319	P0731319	SPANNER NUT WASHER 20MM
320	P0731320	SPANNER NUT
321	P0731321	HEX BOLT M10-1.5 X 30
322	P0731322	LIMIT STOP
323	P0731323	HEX NUT M10-1.5
324	P0731324	TABLE GIB
327	P0731327	GIB ADJUSTMENT SCREW
328	P0731328	SADDLE LOCK SCREW

REF	PART #	DESCRIPTION
329	P0731329	TABLE LOCK SCREW
330	P0731330	CAP SCREW M6-1 X 16
332	P0731332	PHLP HD SCR M5-.8 X 10
333	P0731333	WAY WIPER
334	P0731334	SADDLE GIB
335	P0731335	CAP SCREW M5-.8 X 25
336	P0731336	LIMIT SEAT
337	P0731337	CROSS LEADSCREW NUT
338	P0731338	CAP SCREW M8-1.25 X 25
339	P0731339	SADDLE
340	P0731340	STOP BLOCK
341	P0731341	PHLP HD SCR M5-.8 X 20
342	P0731342	LONGITUDINAL NUT
343	P0731343	FLAT WASHER 6MM
344-1	P0731344-1	POWER FEED ASSEMBLY
344-2	P0731344-2	RETAINING COLLAR
344-3	P0731344-3	GRADUATED DIAL
344-4	P0731344-4	CAP SCREW M6-1 X 25
344-5	P0731344-5	WOODRUFF KEY 3 X 30
344-6	P0731344-6	STOP W/ PLUNGER ASSY
344-7	P0731344-7	AUTO STOP SWITCH
344-8	P0731344-8	PHLP HD SCR M6-1 X 16
344-9	P0731344-9	FLAT WASHER 6MM
344-10	P0731344-10	POWER FEED ADAPTER GEAR



Knee & Base



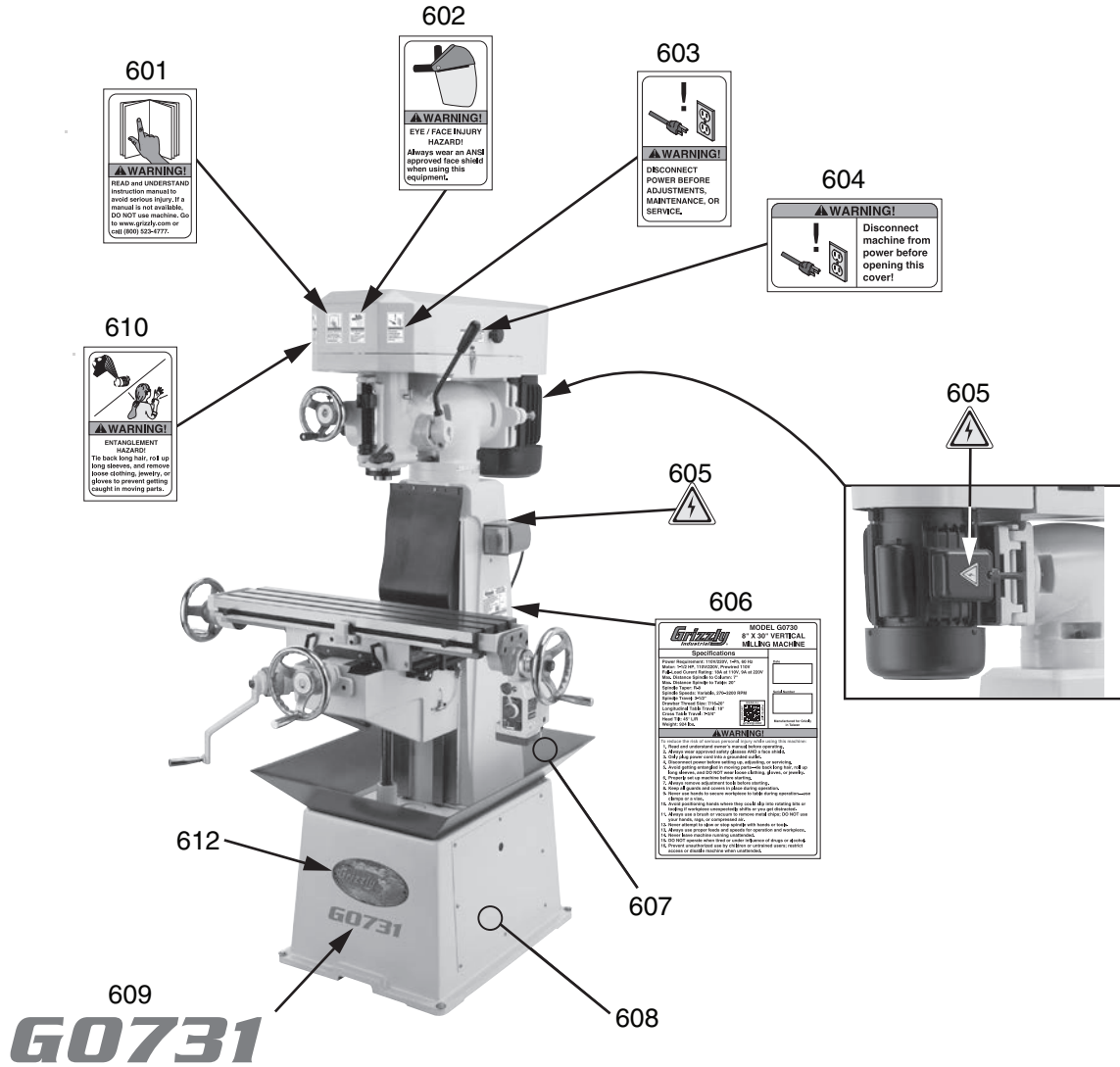
Knee & Base Parts List

REF	PART #	DESCRIPTION
401	P0731401	PHLP HD SCR M6-1 X 10
403	P0731403	COLUMN
405	P0731405	CAP SCREW M6-1 X 8
406	P0731406	KNEE GIB
407	P0731407	GIB ADJUSTMENT SCREW
409	P0731409	KNEE
410	P0731410	CHIP GUARD
411	P0731411	PHLP HD SCR M3-.5 X 6
412	P0731412	KNEE LOCKING SCREW
415	P0731415	SPANNER NUT
416	P0731416	SPANNER NUT WASHER 20MM
417	P0731417	BEVEL GEAR
418	P0731418	BALL BEARING 6004ZZ
419	P0731419	VERTICAL CRANK HOUSING
420	P0731420	CAP SCREW M6-1 X 16
421	P0731421	WOODRUFF KEY 5 X 20
422	P0731422	VERTICAL CRANK SHAFT
423	P0731423	EXT RETAINING RING 20MM
424	P0731424	CLUTCH
425	P0731425	SET SCREW M6-1 X 8
426	P0731426	LOCKING THUMB SCREW 5-.8 X 12
427	P0731427	GRADUATED DIAL
428	P0731428	CRANK HANDLE ARM
429	P0731429	EXT RETAINING RING 18MM
430	P0731430	HANDLE 3/8-16 X 1/2
431	P0731431	HANDWHEEL
432	P0731432	GRADUATED DIAL
433	P0731433	THRUST BEARING 51104
434	P0731434	BEARING HOUSING
435	P0731435	CROSS FEED LEADSCREW
436	P0731436	BALL BEARING 6204ZZ

REF	PART #	DESCRIPTION
437	P0731437	VERTICAL LEADSCREW
438	P0731438	LEADSCREW BASE
439	P0731439	BASE SIDE COVER
440	P0731440	PLUG
441	P0731441	BASE
444	P0731444	LIMIT TRACK
444-1	P0731444-1	SPLASH PAN
445	P0731445	HEX BOLT M10-1.5 X 30
446	P0731446	LIMIT STOP
447	P0731447	HEX NUT M10-1.5
448	P0731448	HEX BOLT M6-1 X 30
449	P0731449	HEX BOLT 1/2-13 X 2
450	P0731450	LOCK WASHER 1/2
452	P0731452	SPINDLE SWITCH KEDU ZH-HC-3
454	P0731454	COLUMN ACCESS PANEL
455	P0731455	PHLP HD SCR M6-1 X 8
456	P0731456	POWER CORD 14G 3W 72" 5-15
457	P0731457	STRAIGHT LT STRAIN RELIEF 3/8 PT
459	P0731459	MOTOR CORD 14G 5W 36"
460	P0731460	PHLP HD SCR M5-.8 X 15
461	P0731461	ONE SHOT OILER ASSEMBLY
462	P0731462	ELBOW ADAPTER
463	P0731463	PHLP HD SCR M5-.8 X 30
464	P0731464	T-ADAPTER
465	P0731465	HEX NUT M5-.8
466	P0731466	OIL TUBING 4MM X 100MM
467	P0731467	OIL TUBING 4MM X 340MM
468	P0731468	HEX WRENCH 4MM
469	P0731469	HEX WRENCH 5MM
470	P0731470	WRENCH 12 X 14MM OPEN-ENDS



Labels & Cosmetics



REF	PART #	DESCRIPTION
601	P0731601	READ MANUAL LABEL
602	P0731602	FACE SHIELD LABEL
603	P0731603	DISCONNECT LABEL-VERTICAL
604	P0731604	DISCONNECT LABEL-HORIZONTAL
605	P0731605	ELECTRICITY LABEL
606	P0731606	MACHINE ID LABEL

REF	PART #	DESCRIPTION
607	P0731607	GRIZZLY TOUCH UP PAINT-GREEN
608	P0731608	GRIZZLY TOUCH UP PAINT-PUTTY
609	P0731609	MODEL NUMBER LABEL
610	P0731610	ENTANGLEMENT LABEL
612	P0731612	GRIZZLY NAMEPLATE-SMALL

⚠️ WARNING

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





WARRANTY & RETURNS

Grizzly Industrial, Inc. warrants every product it sells for a period of **1 year** to the original purchaser from the date of purchase. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence, accidents, repairs or alterations or lack of maintenance. This is Grizzly's sole written warranty and any and all warranties that may be implied by law, including any merchantability or fitness, for any particular purpose, are hereby limited to the duration of this written warranty. We do not warrant or represent that the merchandise complies with the provisions of any law or acts unless the manufacturer so warrants. In no event shall Grizzly's liability under this warranty exceed the purchase price paid for the product and any legal actions brought against Grizzly shall be tried in the State of Washington, County of Whatcom.

We shall in no event be liable for death, injuries to persons or property or for incidental, contingent, special, or consequential damages arising from the use of our products.

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.

In the event you need to use 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.

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.

To take advantage of this warranty, you must register it at <https://www.grizzly.com/forms/warranty>, or you can scan the QR code below to be automatically directed to our warranty registration page. Enter all applicable information for the product.



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