

Grizzly **Industrial, Inc.**®

MODEL G0695 **VS MILLING MACHINE w/RAM HEAD** **OWNER'S MANUAL** *(For models manufactured since 01/21)*



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**WARNING: NO PORTION OF THIS MANUAL MAY BE REPRODUCED IN ANY SHAPE
OR FORM WITHOUT THE WRITTEN APPROVAL OF GRIZZLY INDUSTRIAL, INC.**
#TRCRBLTSJB11908 PRINTED IN TAIWAN

V4.01.21



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

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.

Grizzly Industrial MODEL GXXXX MACHINE NAME

WARNING!

To reduce risk of serious injury when using this machine:

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

Manufacture Date

Serial Number

Manufactured for Grizzly in Taiwan

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

Machine Description

The Model G0695 vertical mill is used to remove material from metal workpieces with the use of a rotating cutting tool.

During most operations, the workpiece is clamped to the table, then moved into the rotating cutter in any combination of three paths.

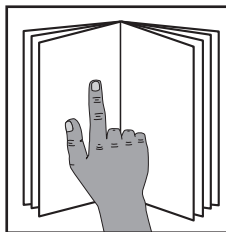
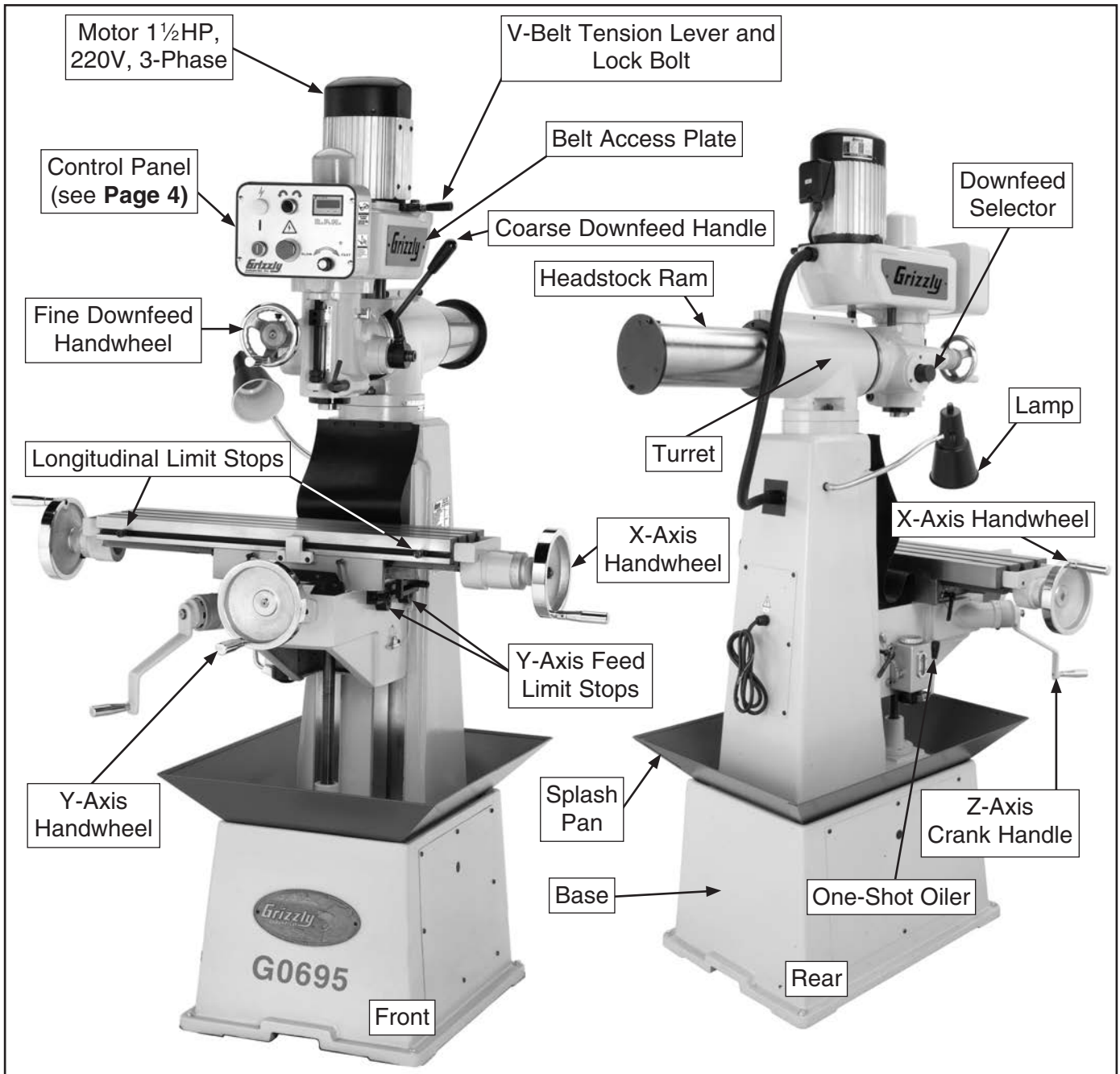
This mill uses a frequency drive to convert incoming 220V single-phase power to 220V 3-phase for efficient performance from the spindle motor. Power is transferred directly to the spindle from the motor by a V-belt and pulleys.

Spindle speed is electronically controlled by using the variable speed dial and readout on the control panel.



Identification

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



!WARNING

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



Controls & Components



Refer to **Figure 1** 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.

Control Panel

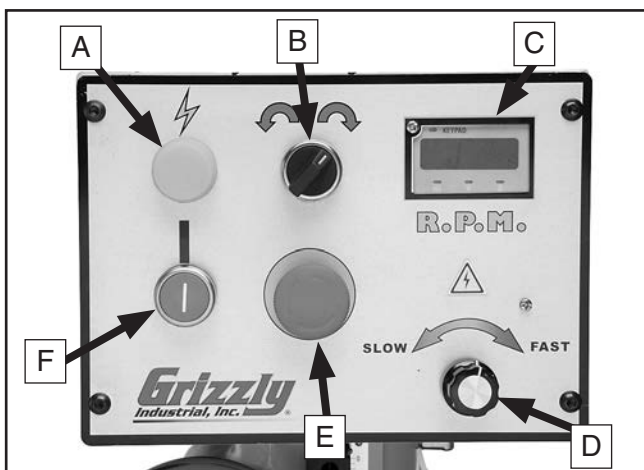


Figure 1. Control panel.

- A. Power Lamp:** Lights when there is power to the machine.
- B. Direction Switch:** Controls the direction of spindle rotation.
- C. Digital Speed Readout:** Displays the spindle speed in revolutions per minute (RPM).
- D. Speed Dial:** Controls the spindle speed.
- E. Stop Button:** Turns the spindle **OFF**. You must twist this button clockwise so that it pops out before restarting the spindle with the ON button.

Note: Pressing this button **DOES NOT DISCONNECT MILL FROM POWER**.

- F. ON Button:** Turns the spindle **ON** when there is power to the machine and the stop button is not pushed in.

Table Controls

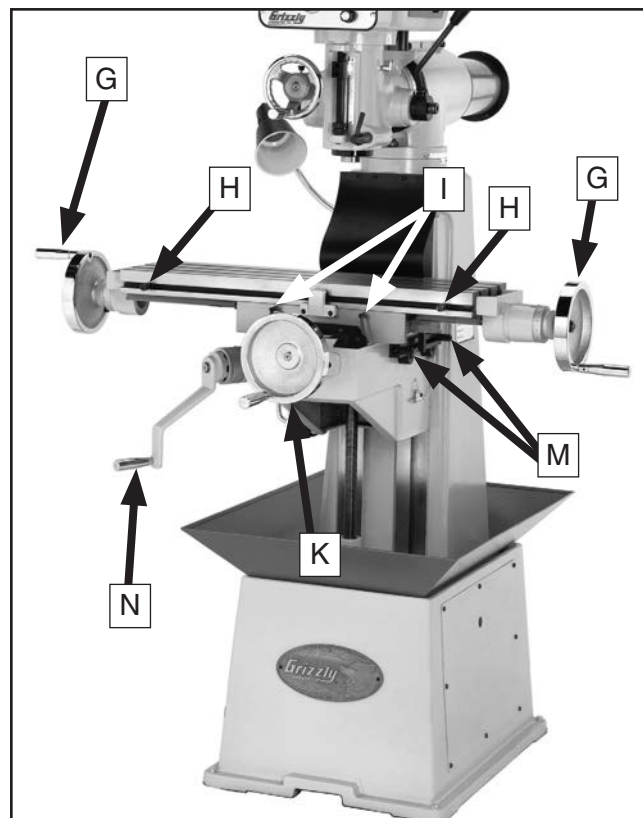


Figure 2. Main table travel controls.

- G. X-Axis Handwheels:** Controls left-right (X-axis) travel of the table.
- H. X-Axis Limit Stops:** Limits X-axis table travel.
- I. X-Axis Table Locks:** Locks the table, preventing table travel in the X-axis.
- J. Limit Block:** Stops X-axis table movement when the limit stops contact the block.
- K. Y-Axis Handwheel:** Controls in-out (Y-axis) travel of the table.
- L. Y-Axis Lock:** Locks the saddle, preventing the table from moving in the Y-axis.
- M. Y-Axis Limit Stops:** Limit Y-axis table travel.



- N. **Z-Axis Crank Handle:** Controls up-down (Z-axis) travel of the table.
- O. **Z-Axis Lock:** Locks the knee, preventing knee or table travel in the Z-axis.

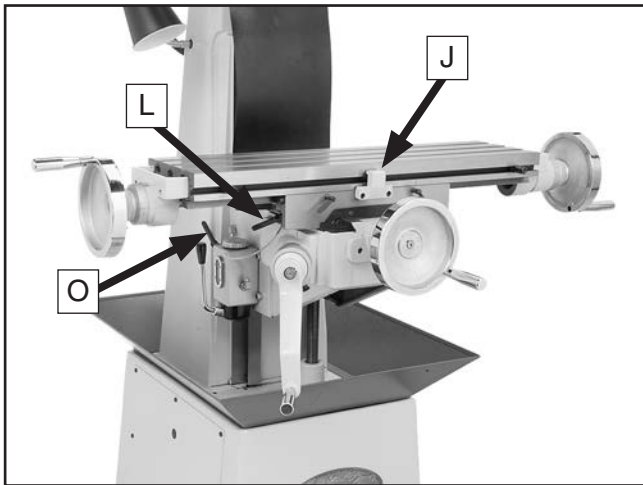


Figure 3. Additional table travel controls.

Downfeed Controls

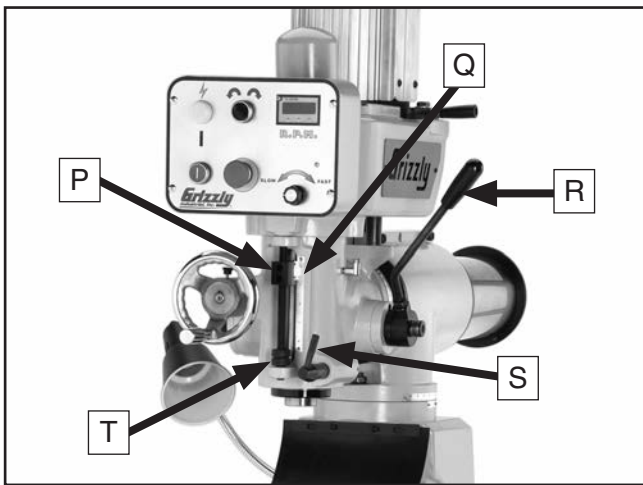


Figure 4. Downfeed controls viewed from the right side.

- P. **Quill Dog:** Moves with the quill. Use the pointer on the side of the dog with the downfeed scale to determine the depth of downfeed.
- Q. **Downfeed Scale:** Displays in $\frac{1}{8}$ " increments the amount of quill travel.
- R. **Coarse Downfeed Handle:** When this handle is enabled with the downfeed selector, it raises/lowers the quill quickly.

- S. **Quill Lock:** Locks the quill in place but does not affect spindle rotation.
- T. **Downfeed Stop & Lock:** Stops downfeed travel when the quill dog reaches this point. Set the stop at any position along the downfeed scale, then secure it in place by tightening the lock up to it.
- U. **Graduated Scale:** Displays quill travel in 0.001" increments when the fine downfeed handwheel is used. One full revolution of the handwheel represents 0.080" of quill travel.
- V. **Fine Downfeed Handwheel:** When this handwheel is rotated with the downfeed selector, it raises/lowers the quill in small increments.
- W. **Downfeed Selector:** When rotated, enables either coarse or fine downfeed control. Tighten the selector to engage the fine downfeed handwheel, and loosen it to engage the coarse downfeed handle.

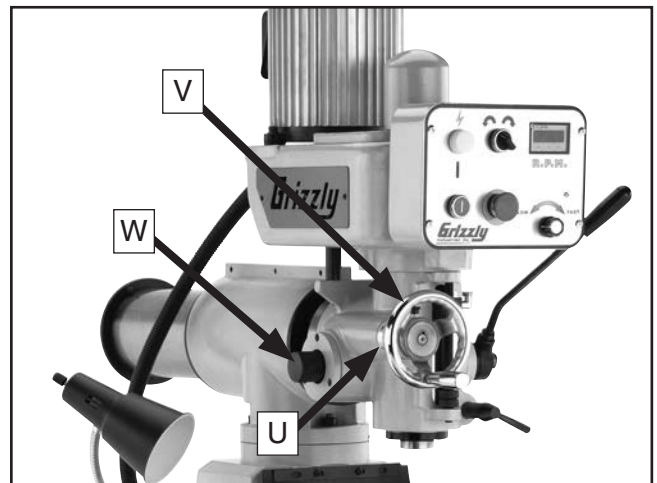


Figure 5. Downfeed controls viewed from the left side.





MACHINE DATA SHEET

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

MODEL G0695 8" X 30" 1-1/2 HP VARIABLE-SPEED KNEE MILL WITH RAM HEAD

Product Dimensions:

Weight..... 1070 lbs.
 Width (side-to-side) x Depth (front-to-back) x Height..... 42-3/4 x 40-1/2 x 79 in.
 Footprint (Length x Width)..... 19 x 26 in.
 Space Required for Full Range of Movement (Width x Depth)..... 68 x 49 in.

Shipping Dimensions:

Type..... Wood Crate
 Content..... Machine
 Weight..... 1006 lbs.
 Length x Width x Height..... 45 x 44 x 86 in.
 Must Ship Upright..... Yes

Electrical:

Power Requirement..... 220V, Single-Phase, 60 Hz
 Full-Load Current Rating..... 8A
 Minimum Circuit Size..... 15A
 Connection Type..... Cord & Plug
 Power Cord Included..... No
 Recommended Power Cord..... "S"-Type, 3-Wire, 16 AWG, 300 VAC
 Plug Included..... No
 Recommended Plug Type..... 6-15
 Switch Type..... Control Panel w/Magnetic Switch Protection
 Inverter (VFD) Type..... Rhymebus RM6S2
 Inverter (VFD) Size..... 1 HP

Motors:

Main

Horsepower..... 1.5 HP
 Phase..... 3-Phase
 Amps..... 4.8A
 Speed..... 1725 RPM
 Type..... TEFC Induction
 Power Transfer Belt
 Bearings..... Shielded & Permanently Lubricated



Main Specifications:

Operation Info

Spindle Travel.....	3-1/2 in.
Max Distance Spindle to Column.....	18 in.
Max Distance Spindle to Table.....	20 in.
Longitudinal Table Travel (X-Axis).....	18 in.
Cross Table Travel (Y-Axis).....	7-1/2 in.
Vertical Table Travel (Z-Axis).....	17-3/4 in.
Ram Travel.....	18 in.
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.....	Variable
Range of Vertical Spindle Speeds.....	220 – 2250 RPM
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.....	Hardened & Precision-Ground Cast Iron
Head.....	Cast Iron
Column/Base.....	Cast Iron
Base.....	Cast Iron
Paint Type/Finish.....	Urethane

Other Specifications:

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

Features:

- One-Shot Lubrication
- High Precision Ball Bearings
- Bronze Nut on Longitudinal and Cross Feed Leadscrews
- Variable Frequency Drive Speed Controls
- Hardened and Precision-Ground Leadscrews
- Runs on Single-Phase Power Using a 3-Phase Inverter



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

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

Safety Instructions for Machinery

WARNING

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

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

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

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

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

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

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



WARNING

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



Additional Safety for 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.



Glossary of Terms

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

Arbor: A tapered shaft that holds a cutting tool.

Collet: A tapered shaped split-sleeve bushing that holds round tools by their outside diameter.

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

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

Dividing Head: A milling machine accessory used to divide a circular object into a number of equal parts.

Down or Climb Milling: Feeding the workpiece in the same or opposite direction as the cutter rotation.

End Milling: The operation of machining flat surfaces either horizontal, vertical, or at an angle using an end mill as a cutter.

Face Milling: The milled surface in this method results from the combined action of cutting edges located on the face or end of the cutting tools.

Milling Feed: This is the product of multiplying the desired chip size by the number of teeth on the cutter and the cutter RPM. It is usually measured in inches per minute.

Fixture: A device that securely holds the workpiece in place during a cutting operation.

Form Milling: The machining of irregular contours by using form cutters.

Gang Milling: When more than two cutters are mounted on the arbor to machine surfaces of a workpiece.

Gib: A piece of metal placed along a sliding member to take up wear or to ensure a proper fit.

Headstock: The component that houses the vertical spindle, motor, and drive system.

Knee: The component upon which the saddle and table are mounted and which can move vertically.

Lead Screw: The threaded shaft that moves the table along the X-axis, Y-axis, and Z-axis paths.

Peripheral Milling: The milled surface is produced by cutting teeth located on the outer edge of the cutter body.

Headstock Ram: The component that holds the headstock and moves in a linear path across the column.

Saddle: The sliding component that holds the table and moves along the Y-axis path.

Side Milling: The operation of machining a vertical surface on the side of a workpiece using a side milling cutter.

Slitting and Cutting Off: Metal slitting saws are used for milling narrow slots and for cutting off stock.

Spindle: The rotating hollow shaft that transfers the driving force from the motor to the tooling.

Turret: The top part of the column on which the ram rotates.

Ways: The precision-machined, flat tracks on which the table, saddle, and knee travel.

X-Axis: The path the table travels left-to-right.

Y-Axis: The path the table travels in or out.

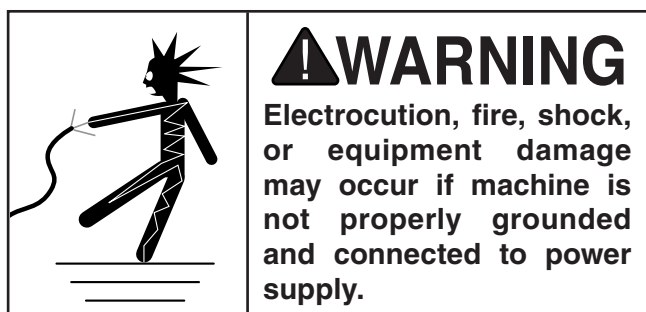
Z-Axis: The path the table travels up or down.



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 220V 8 Amps

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

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

! WARNING

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

Circuit Requirements for 220V

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

Nominal Voltage220V
Cycle60 Hz
Phase Single-Phase
Power Supply Circuit 15 Amps
Plug/Receptacle NEMA 6-15
Cord “S”-Type, 3-Wire, 16 AWG, 300 VAC

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

! CAUTION

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

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



Grounding Instructions

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

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

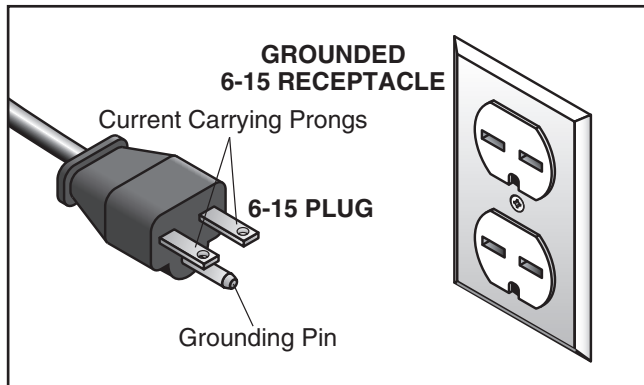

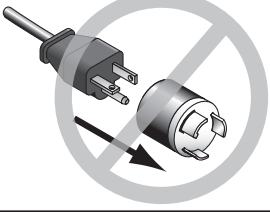


Figure 6. Typical 6-15 plug and receptacle.



CAUTION



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

WARNING

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

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

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

Extension Cords

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

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

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

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



SECTION 3: SETUP

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.*

Needed for Setup

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

Description	Qty
• Other People	2
• Precision Level	1
• Safety Glasses	1 Per Person
• Wrench 1/2"	1
• External Retaining Ring Pliers	1
• Lifting Straps (rated for at least 1500 lbs.).....	2
• Power Lifting Equipment (rated for at least 1500 lbs.).....	1
• Machine Mounting Hardware	As Needed
• Cleaning Solvent & Rags	As Needed

Inventory

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

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

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 7)	Qty
A. Handwheels.....	3
B. Graduated Dials	3
C. Dial Positioning Screws.....	3
D. Cap Screws M6-1 x 25.....	3
E. Keys 5 x 5 x 20.....	3
F. Hex Wrenches 5mm, 4mm.....	2
G. Hex Nut 5/8-11	1
H. Handwheel Handles	3

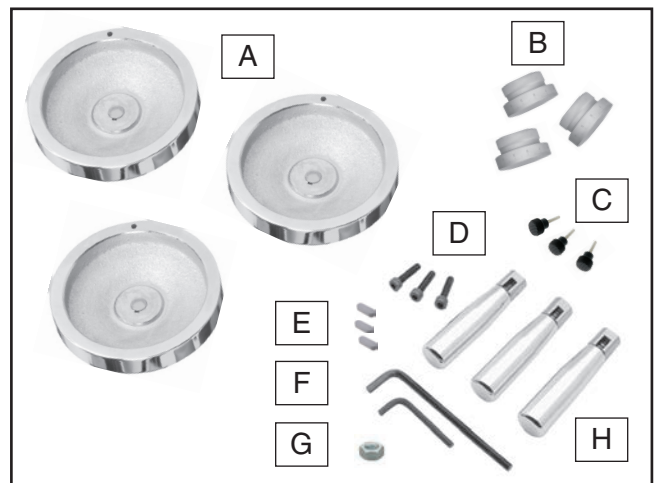


Figure 7. Model G0695 inventory.



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.

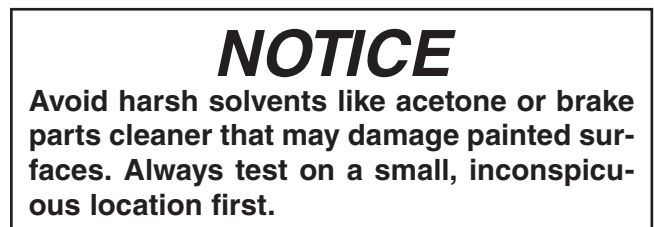
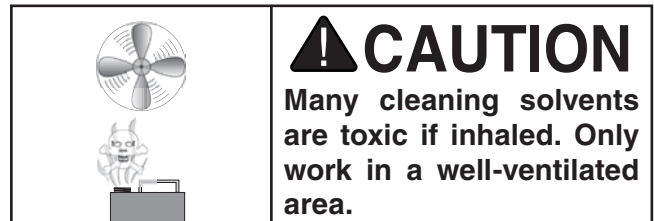
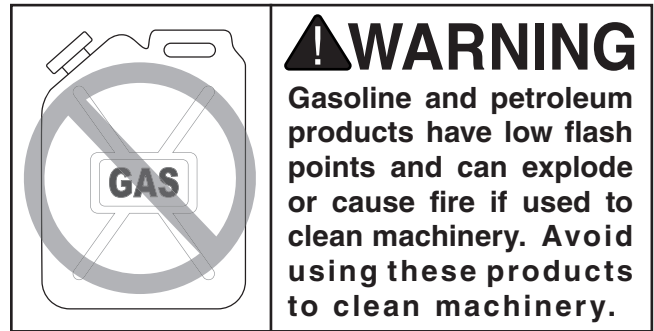
There are many ways to remove this rust preventative, but the following steps work well in a wide variety of situations. Always follow the manufacturer's instructions with any cleaning product you use and make sure you work in a well-ventilated area to minimize exposure to toxic fumes.

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.



T23692—Orange Power Degreaser

A great product for removing the waxy shipping grease from the **non-painted** parts of the machine during clean up.



Figure 8. T23692 Orange Power Degreaser.



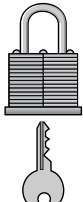
Site Considerations

Weight Load

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

Space Allocation

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

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

Physical Environment

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

Electrical Installation

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

Lighting

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

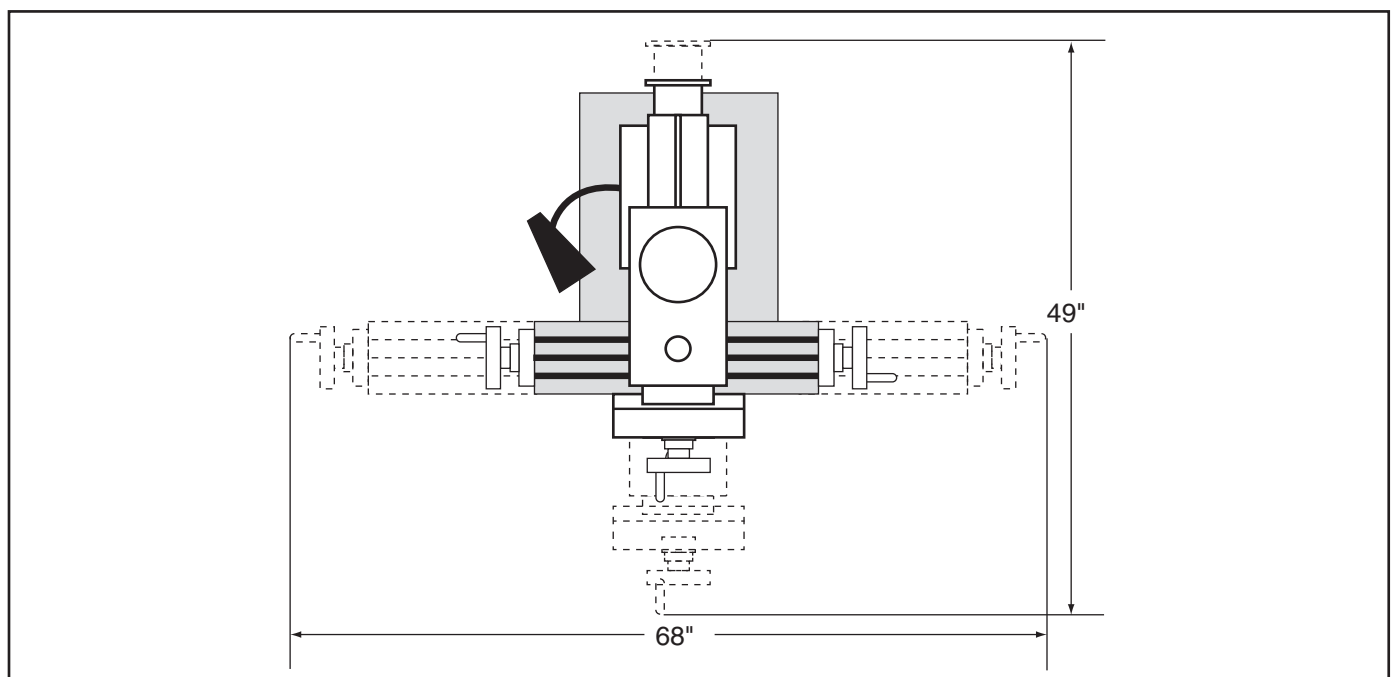
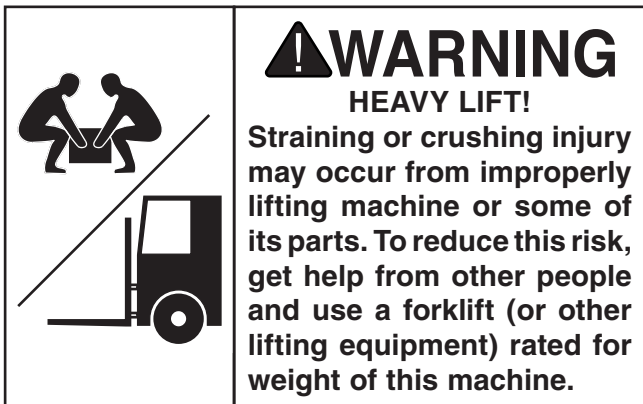


Figure 9. Minimum working clearances.



Lifting & Placing Mill



To move and place your mill:

1. After removing the crate sides from the shipping pallet, adjust the headstock and table as close to the mill body as possible, and install the lifting straps, as shown in **Figure 10**.

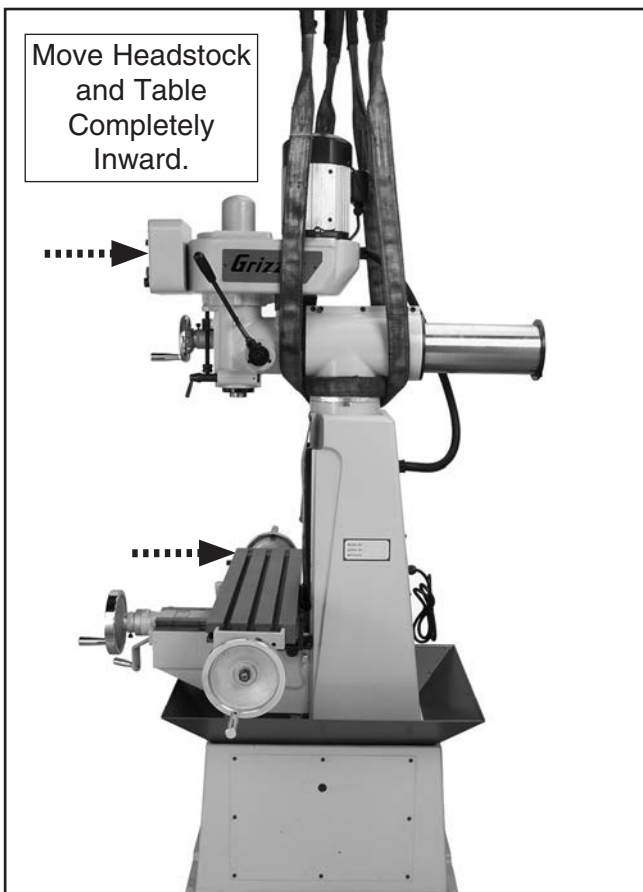


Figure 10. Lifting straps positioned.

2. Use a 1/2" wrench to unbolt the mill from the pallet.
3. Have another person steady the machine to keep it from swaying and lift it just enough to clear the pallet and floor obstacles, then move it to the prepared location.
4. 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.*

Leveling

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

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

See **Figure 11** for an example of a high precision level available from Grizzly.

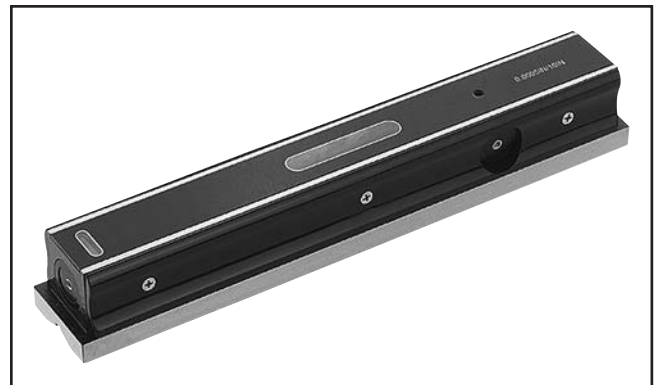


Figure 11. Example of a precision level (Model H2683 shown).



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.

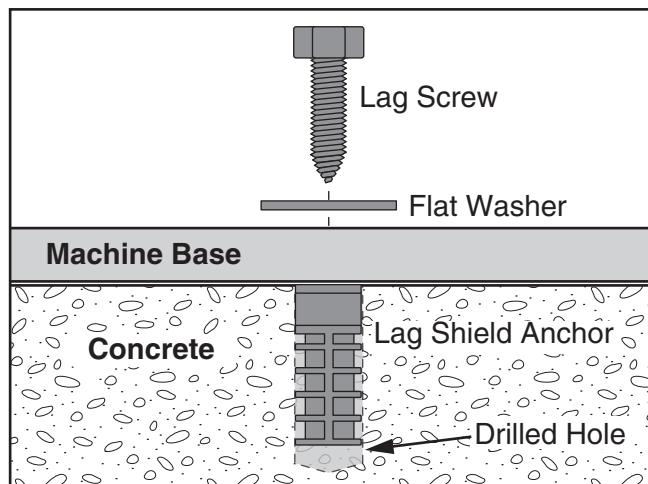


Figure 12. Popular method for anchoring machinery to a concrete floor.

Arbor/Chuck Assembly

An arbor is included for the drill chuck that comes with this machine. The following procedure describes how to install the arbor in the chuck.

After the arbor is installed in the drill chuck, it is very difficult to separate the assembly. If you would like to use a different chuck in the future, we recommend obtaining a new arbor.

IMPORTANT: DO NOT install the drill chuck and arbor assembly into the spindle until **AFTER** the test run.

To join drill chuck and arbor:

1. Use acetone or lacquer thinner to clean drill chuck and arbor mating surfaces, especially the bore.
2. Retract chuck jaws completely into chuck.
3. Insert small end of arbor into chuck.
4. Hold assembly by the arbor and tap chuck onto a block of wood with medium force, as illustrated below.

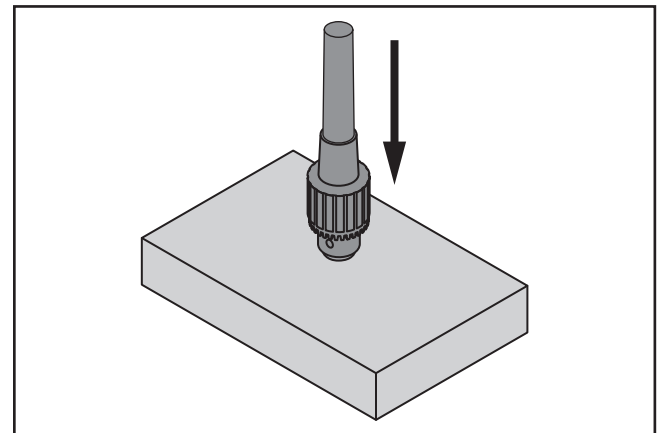


Figure 13. Arbor/chuck assembly.

5. Attempt to separate drill chuck and arbor by hand—if they separate, repeat **Steps 3–4**.



Verifying Lubrication



This machine was shipped from the factory with oil in it, but the headstock and column oil reservoir levels must be verified before the mill is operated for the first time. Refer to the **Lubrication** section, beginning on **Page 32**, for details on how to check oil.

NOTICE

Damage caused by running mill without oil in reservoir will not be covered under warranty.

Assembly

To assemble your mill:

1. Slide the graduated dials on the leadscrews, then install the three handwheels using the 5 x 5 x 20 keys and the set screws already in place. Secure all three to the leadscrew.

TIP: Nut attaches to right side of leadscrew.

2. Secure the three handles to the handwheels with the M6-1 x 25 cap screws, as shown in **Figure 14**.

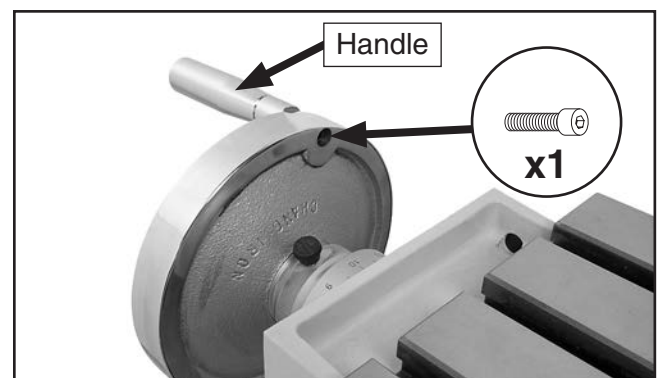


Figure 14. Handle attached to handwheel.

3. Use external retaining ring pliers to remove the retaining ring from the end of the vertical crank screw, reverse the crank handle from its shipping position, then re-install the retaining ring (see **Figure 15**).

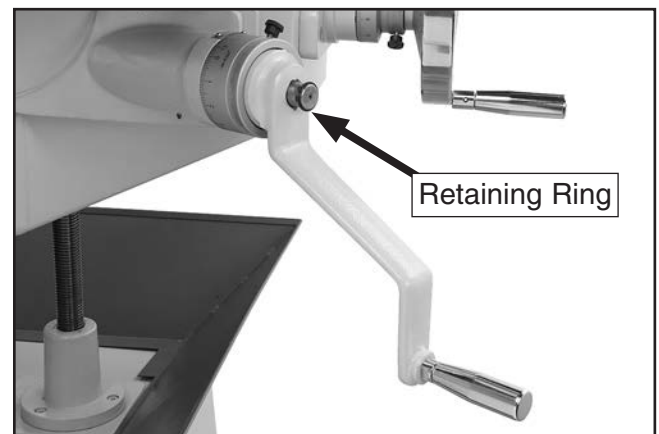
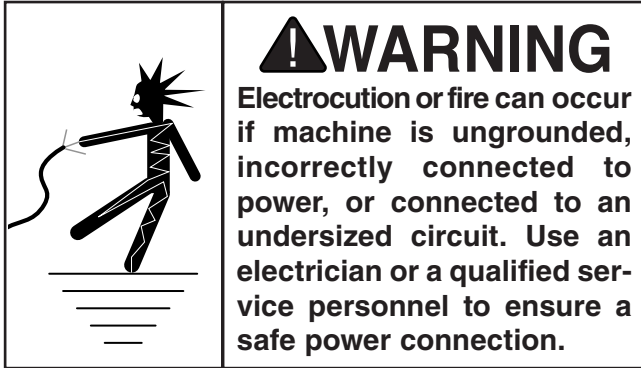


Figure 15. Vertical crank handle properly installed.



Power Connection



Before the machine can be connected to the power supply, there must be an electrical circuit that meets the **Circuit Requirements** on **Page 12**, and the correct plug must be installed according to the instructions and wiring diagrams provided by the plug manufacturer.

If the plug manufacturer did not include instructions, the wiring of a generic NEMA 6-15 plug is illustrated in the **Wiring** section on **Page 40**.

To minimize the risk of electrocution, fire, or equipment damage, installation work and electrical wiring **MUST** be done by an electrician or qualified service personnel.

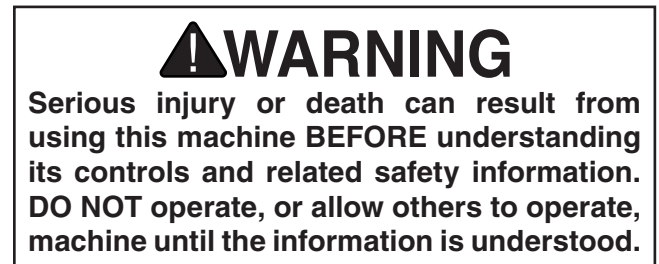
Note About Extension Cords: *Using an incorrectly sized extension cord may decrease the life of electrical components on your machine. Refer to **Extension Cords** on **Page 13** for more information.*

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) motor powers up and runs correctly, 2) stop button safety feature works correctly.



To test run the machine:

1. Make sure all tools and objects used during setup are cleared away from the machine.
2. Make sure the machine is lubricated (refer to **Lubrication** on **Page 32** for detailed instructions).
3. Refer to **Basic Controls** on **Page 4** to become familiar with the control panel functions.
4. Connect the machine to the power source—the power lamp on the control panel should light.



5. Push the stop button in, then twist it clockwise so it pops out. When the stop button pops out, the switch is reset and ready for operation (see **Figure 16**).

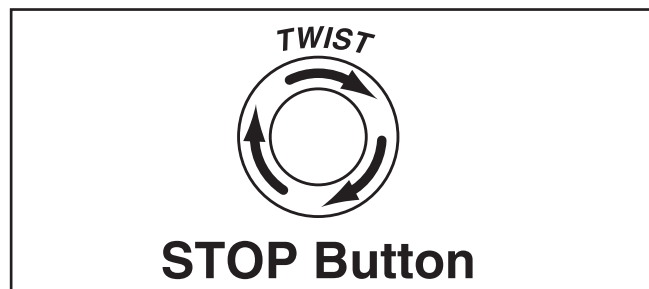


Figure 16. Resetting the switch.

6. Verify that the machine is operating correctly by pushing the ON button.
 - When operating correctly, the machine runs smoothly with little or no vibration or rubbing noises.
 - Investigate and correct strange or unusual noises or vibrations before operating the machine further. Always disconnect the machine from power when investigating or correcting potential problems.
7. With the machine still running, use the speed dial to decrease/increase the spindle speed.
8. Press the stop button to stop the machine.
9. WITHOUT resetting the switch, press the ON button. The machine should not start.
 - If the machine does not start, the stop button safety feature is working correctly. The Test Run is complete.
 - If the machine does start (with the stop button pushed in), immediately disconnect power to the machine. The stop button safety feature is not working correctly. This safety feature must work properly before proceeding with regular operations. Call Tech Support for help.

When all of the **Test Run** procedures are successfully completed, proceed to **Spindle Break-In**.

Spindle Break-In

It is essential to closely follow the proper break-in procedures to ensure trouble-free performance of your mill.

NOTICE

DO NOT leave the area while the break-in procedure is under way. You must be ready to stop the machine if any problem occurs.

NOTICE

Successfully complete the spindle break-in procedure to avoid rapid wear of spindle components when placed into operation.

To perform the spindle break-in procedure:

1. Turn the machine **ON**, then use the speed dial to adjust the spindle speed to approximately 200 RPM.
2. Let the mill run at this speed for 20 minutes, then turn the spindle **OFF** and wait for it to stop.
3. Use the spindle direction switch on the control panel to reverse the spindle direction, then turn the mill **ON** and let it run for another 20 minutes.
4. Set the spindle speed at approximately 1800 RPM, repeat **Steps 2–3**, then proceed to **Step 5**.
5. Turn the mill **OFF**. The spindle break-in is now complete and the machine is ready for operation.



SECTION 4: OPERATIONS

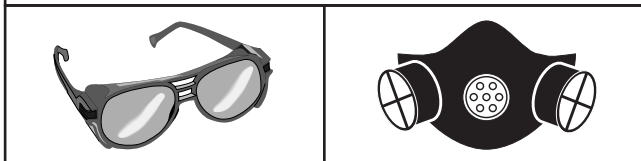
Operation Overview

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

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

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

! WARNING To reduce risk of eye injury from flying chips or lung damage from breathing dust, always wear safety glasses and a respirator when operating this machine.



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

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

1. Loosens the knee lock, and adjusts the table height to ensure there is sufficient room to install the tooling in the quill and the workpiece on the table.
2. Installs correct tooling for the task.
3. Mounts the workpiece securely to the table using a vise or clamps.
4. Selects the appropriate spindle speed for the workpiece and tooling.
5. Selects the direction the spindle will turn, based on the type of cut needed, using the direction switch.
6. Unlocks the X- and Y-axis table locks, then secures the Z-axis lock.
7. Wears safety glasses or a face shield.
8. Starts the machine.
9. Adjusts the spindle height.
10. For milling operations, uses the X-axis handwheel to move the table left-and-right and uses the Y-axis handwheel to move the table in-or-out, so the cutter removes material evenly from the workpiece.

For drilling operations, uses the coarse downfeed lever or fine downfeed handle to lower the tooling into the workpiece, then raises the tooling out of the workpiece.
11. Presses the STOP button to stop the spindle.



Table Movement

This mill table has three paths of movement controlled by the corresponding handwheels or crank (see **Figure 17**):

1. Left–right (X-axis)
2. In–out (Y-axis)
3. Up–down (Z-axis)

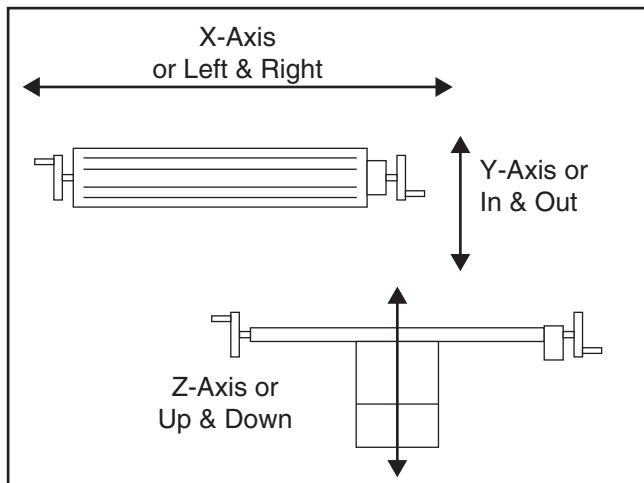


Figure 17. The three movement paths of the mill table.

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

Locks

Use the table, saddle, and knee locks shown in **Figures 18–19** to secure the table in position.

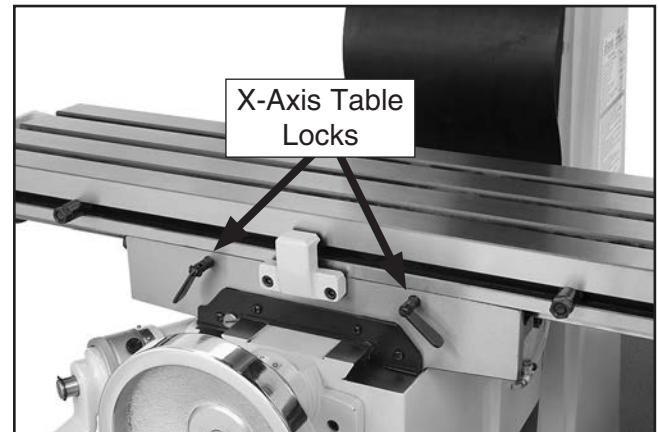


Figure 18. X-axis table locks.

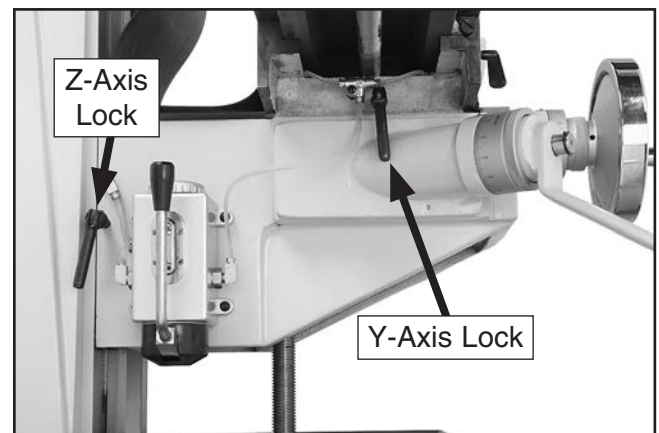


Figure 19. Y-axis and Z-axis locks.

Limit Stops

Position the limit stops along the limit stop tracks to confine the distance the table or saddle can travel (see **Figures 20–21**).

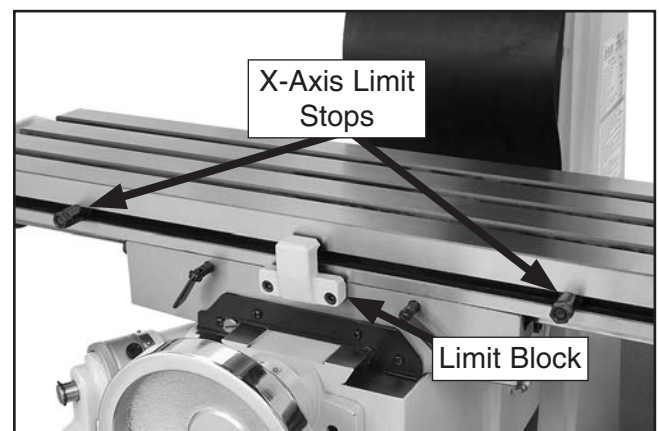


Figure 20. X-axis limit stops and block.



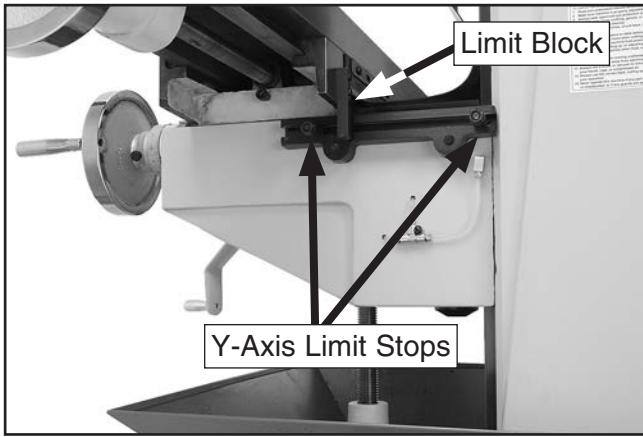


Figure 21. Y-axis limit stops and block.

⚠ 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 damage to the cutter and workpiece, and possible personal injury.

Headstock Tilting

The head tilts from 45° right to 45° left (see **Figure 22**). However, the headstock can be tilted past 45°R or 45°. If this is done, you will not be able to use the angle scale, and the headstock lock bolts may bind.

NOTICE

This mill is designed to operate with a right-left headstock tilt of 45°. To prevent headstock binding and insufficient support, do not tilt the headstock to a full 90°. Binding occurs when one of the hex bolts on the side of the headstock (Figures 23–24) binds in the T-slot.

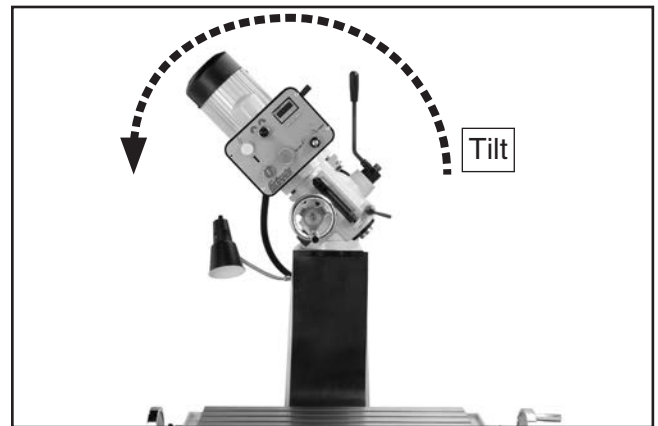


Figure 22. Head tilted 45° to the left.

Tools Needed	Qty
Wrench 19mm	1

To tilt the head:

1. DISCONNECT MILL FROM POWER!
2. Loosen the two locking hex nuts on both sides of the turret (see **Figures 23–24**).

⚠ WARNING

Hold the motor housing when tilting. Do not hold the drawbar cap. If you do, the cap can come off and the headstock can swing down uncontrollably, causing severe personal injury or machine damage.



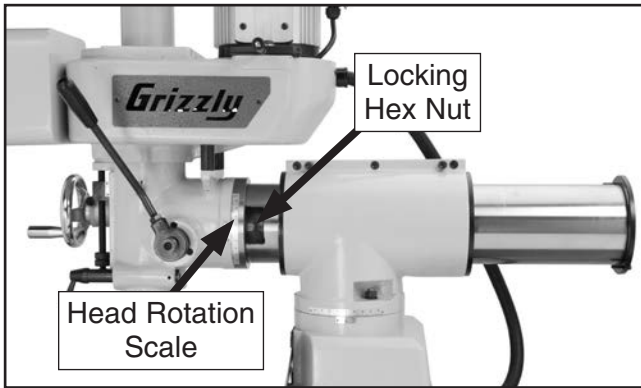


Figure 23. Right side head tilt.

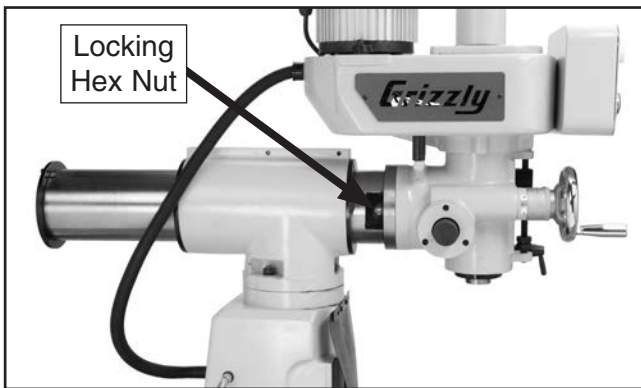


Figure 24. Left side head tilt.

3. While holding the motor, tilt the head up to 45° right or 45° left and use the tilt scale to determine the angle of tilt.

—If the headstock binds after you tilt it, follow **Steps 5-9** to return the headstock to its vertical position.

4. Re-tighten the two locking hex nuts to secure the headstock.

⚠ CAUTION

Always get an assistant to help you tilt the headstock or tighten the headstock lock nuts during the following steps. The headstock is very heavy and may be difficult to control once it is tilted past 45°R or 45°L. If you do not pay attention, it can flip over, causing serious personal injury and possible machine damage.

5. Determine which of the two hex bolts that lock the headstock vertically is loose.
6. Tighten the locking hex nut on the opposite side of the headstock to secure it.
7. Remove the hex nut and flat washer from the hex bolt that is loose.
8. While an assistant holds the machine motor, loosen the locking hex nut on the opposite side, then push the loose hex bolt back into the headstock (see **Figure 25**) until your assistant can tilt the headstock back to the vertical position.
9. Reinstall the flat washer and hex nut you removed earlier.

Note: *The head of the hex bolt must re-engage with the T-slot on the inside of the headstock for the headstock to move.*

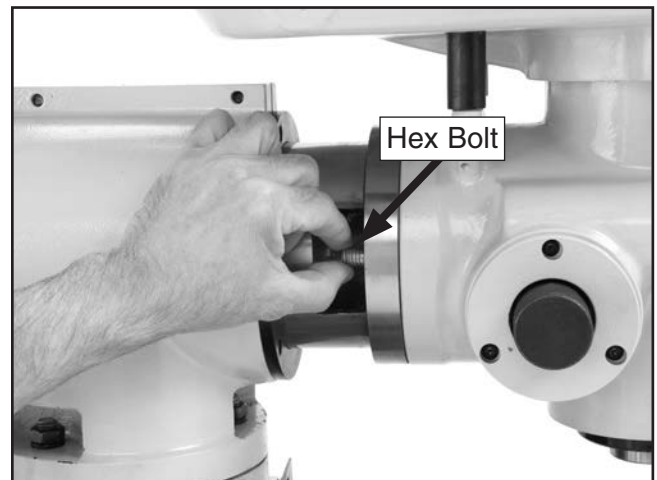


Figure 25. Pushing hex bolt back into headstock.

⚠ CAUTION

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



Headstock Turret Rotation

The turret rotates 360° around the column (see **Figure 26**).

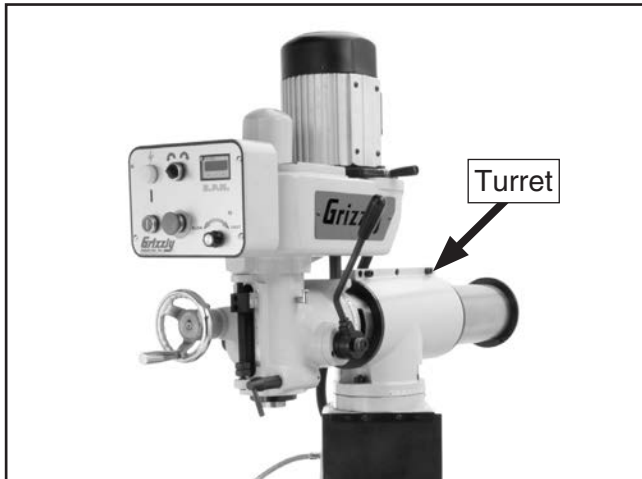


Figure 26. Headstock turret rotated 45° to the left.

Tools Needed	Qty
Wrench 19mm	1

To rotate the turret:

1. DISCONNECT MILL FROM POWER!

⚠ CAUTION

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

2. Loosen the three locking hex nuts on the turret (see **Figure 27**).

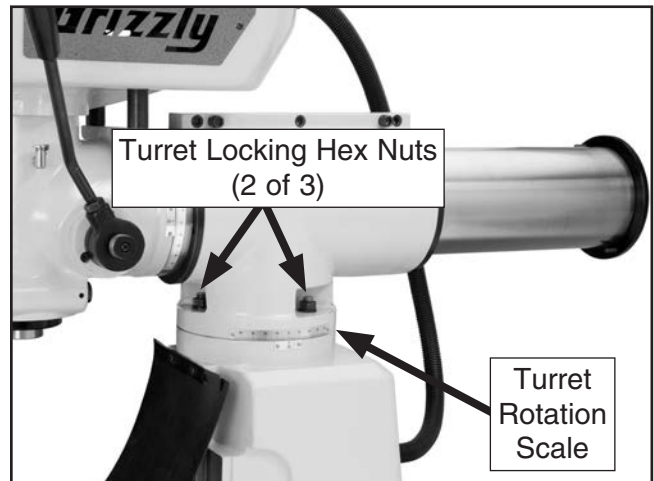


Figure 27. Turret rotation locking hex nuts (2 of 3 shown).

3. Rotate the head and turret around the column to the left or right, and use the turret rotation scale to determine the amount of rotation.

NOTICE

Do not rotate the headstock past 50° right or 50° left. If you do, you run the risk of binding a turret bolt and the headstock could jam.

—If the headstock jams, remove the rear-most turret locking hex nut. While swiveling the exposed hex bolt back and forth, rotate the column until the headstock freely moves, then reinstall the locking hex nut.

Note: Swiveling the hex bolt head allows the flats of the bolt head to re-align with the T-slot.

4. Re-tighten the three locking hex nuts to secure the head and turret in place.



Headstock Ram Movement

The headstock can be moved inward or outward along the ram.

⚠️ WARNING

Always lock the ram firmly in place after adjusting its position. If the headstock slips during milling operation, the spinning cutter could bind and break apart, causing serious personal injury or property damage.

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

To move the ram inward or outward:

1. DISCONNECT MILL FROM POWER!

2. Loosen the three recessed cap screws, then tighten the two raised cap screws slightly to expand the clamp (see **Figure 28**).

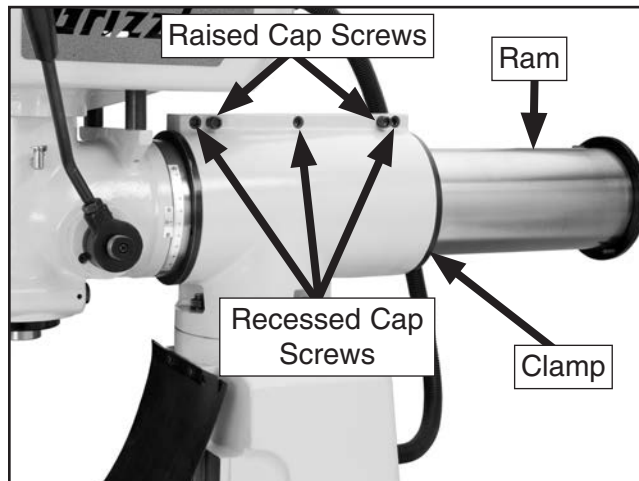


Figure 28. Location of cap screws for adjusting ram movement.

3. Push or pull the headstock in the direction of desired ram movement.
4. Loosen the two raised cap screws to allow the clamp to close, then tighten the three recessed cap screws to tighten the clamp around the headstock tube.



Setting Spindle Speed

To select the correct spindle speed (RPM) for your milling operation, you will need to: 1) Determine the spindle speed needed for your workpiece, and 2) set the speed dial for the calculated speed.

This mill is designed to use most end mills, drill bits, and face cutters that are 3" in diameter or less. The milling table has a coolant system trough with drain for an optional fluid system.

Calculating Spindle Speed

1. Use the table in **Figure 29** to determine the cutting speed or surface feet per minute (SFM) required for your 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 29. Cutting speed table for HSS cutting tools.

2. Measure the diameter of your cutting tool in decimal inches.

3. Use the following formula to calculate the required spindle speed (RPM) for your operation:

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

*Double if using carbide cutting tool

Setting Spindle Speed

1. Rotate the speed dial all the way to the left, setting the startup spindle speed close to zero.

Note: This precaution avoids unexpected high speed startup of the spindle.

2. Use the direction switch to select the direction of spindle rotation, turn the spindle **ON**, then rotate the speed dial until the calculated spindle speed is displayed at the digital readout on the control panel (see **Figure 30**).

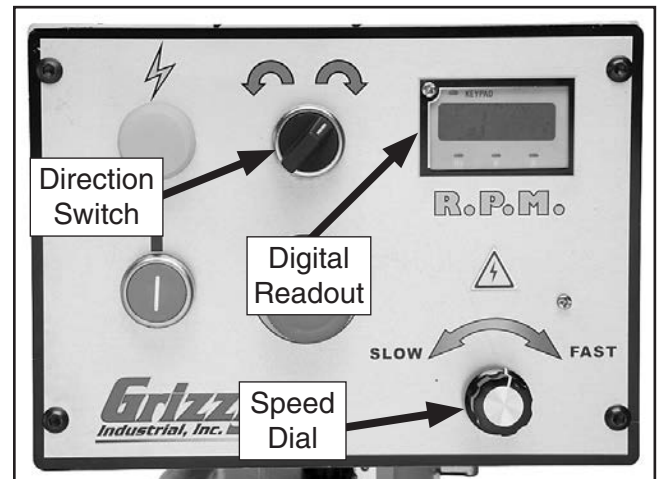


Figure 30. Spindle direction switch, speed dial, and digital readout.

⚠ WARNING

Failure to follow spindle speed and feed rate guidelines may threaten operator safety from ejected parts or ejected tools.

Remember: Milling with the quill fully extended can cause tool chatter. For maximum spindle rigidity, keep the spindle retracted into the headstock as far as possible with the quill lock lever locked and the downfeed selector tightened.



Chip Characteristics

If chips produced by your operation are blue and burnt and overheated, but the cutting speed is correct, reduce the feed rate until the chips are silver.

If the chips are powdery, increase the feed rate so the chips are more coarse but not overheated.

Loading/Unloading Tooling

Your mill is equipped with a 7/16"-20 x 12" drawbar (see **Figure 31**).



Figure 31. Drawbar.

Tools Needed	Qty
Wrench 19mm	1

Loading Tooling

1. DISCONNECT MILL 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 quickly injure your hands. Always protect your hands when handling cutting tools.

3. Remove the drawbar cap and place the drawbar through the top of the spindle if it is not already installed (see **Figure 32**).

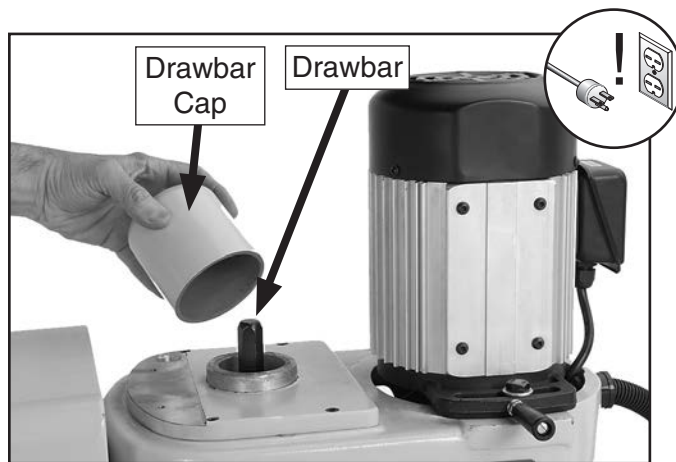


Figure 32. Drawbar inserted through the top of the spindle.

4. Align the keyway of the tool (collet with cutter, face mill, or drill chuck with taper shank) with the protruding set screw inside the spindle, and push 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 until it is snug.

Note: Make sure the drawbar is threaded into the tool a minimum of five to 10 turns.

6. To fully seat the tool into the spindle, tighten the drawbar with a 19mm wrench.

Note: Over-tightening the drawbar could make removing the tool difficult, so only snug the drawbar in place.

7. Re-install the drawbar cap.

Unloading Tooling

1. DISCONNECT MILL FROM POWER!
2. While wearing gloves, keep one hand on the tool, loosen the drawbar with the 19mm wrench, then completely unthread it.

—If the tool does not release from the spindle taper when the drawbar is unthreaded, turn the drawbar back into the tool five to ten threads, then tap the top of the drawbar with a dead-blow hammer or block of wood 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.

SB1365—South Bend Way Oil ISO-68
T26419—Syn-O-Gen Synthetic Grease



Figure 33. Recommended products for machine lubrication.

T25614—The Metalworker's Workshop for Home Machinists

This book presents a complete guide to creating a workshop space and then equipping it to serve a wide range of metalworking activities. Softcover, 152 pages.

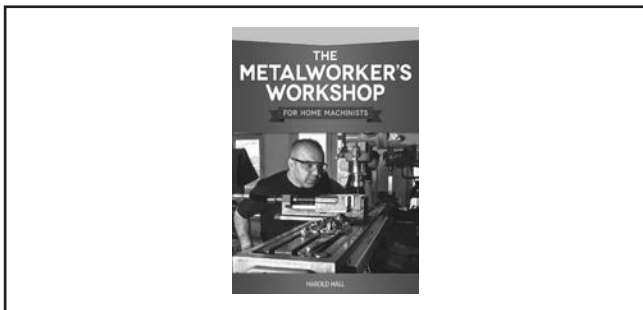


Figure 34. T25614 Metalworker's Workshop for Home Machinists book.

T23962—ISO-68 Moly-D Way Oil, 5 Gal.
T23963—ISO-32 Moly-D Machine Oil, 5 Gal.
T26685—ISO-32 Moly-D Machine Oil, 1 Gal.
Moly-D oils are some of the best we've found for maintaining the critical components of machinery because they tend to resist run-off and maintain their lubricity under a variety of conditions—as well as reduce chatter or slip. Buy in bulk and save with 1- or 5-gallon quantities.



Figure 35. ISO-68 and ISO-32 machine oil.

H8371—Power Feed for Knee Mills

If you want to get the most out of your mill, you really need a power feed. This power feed comes with everything required to start milling with exact control. Comes supplied with a bi-directional limit switch with stops, mounting bracket, bevel gear and motor. Specs: 4–160 RPM, 160 RPM rapid switch, 650 in/lb. maximum torque, 110V 60Hz motor, 4:8:1 bevel drive gear.



Figure 36. H8371 Power Feed.

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



G1075—58-Pc. Clamping Kit for 1/2" T-Slots

Our Clamping Kits are among the best in the world! All the blocks, bolts, nuts and hold-downs are case hardened. Each clamping kit includes: (24) studs (four studs each: 3", 4", 5", 6", 7", and 8" long), (6) step block pairs, (6) T-nuts, (6) flange nuts, (4) coupling nuts, and (6) end hold-downs. The Model G1075 set fits 1/2" T-slots and includes 3/8"-16 studs. Racks can be bolted to the wall or side of machine for easy access.

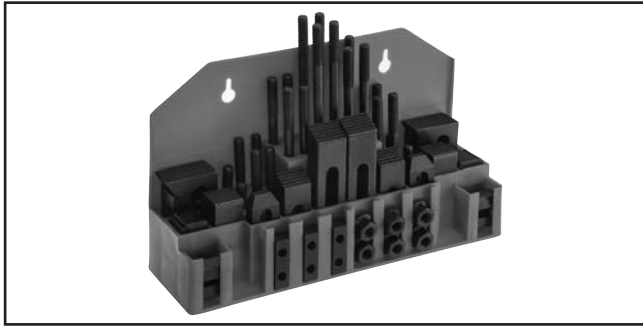


Figure 37. G1075 Clamping Kit.

H6087—2 Axis Digital Readout (8" x 20")

You will be amazed the list of features for these DROs that include: selectable resolution down to 5µm, absolute/incremental coordinate display, arc function, line of holes function, angled cuts function, 199 user-defined datum points, centering/cutter offset, double sealed scales, inches/millimeters, calculator with trig functions, and linear error compensation.

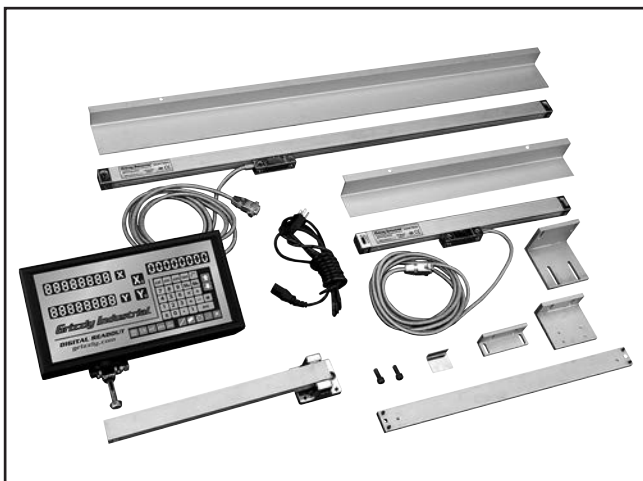


Figure 38. H6087 3-Axis Digital Readout.

T25702—5-Pc. R8 End Mill Holder Set

Hold various sized end mills in your R8 spindle with this End Mill Holder Set. Includes holders for 3/16", 3/8", 1/2", 5/8", and 3/4" end mills.



Figure 39. T25702 5-Pc. R8 End Mill Holder Set.

SB1348—South Bend® 8-Pc. R8 Collet Set

SB1349—South Bend® 16-Pc. R8 Collet Set

Get true South Bend® quality and precision with one of these Quick-Change Collet Sets. Each set includes hardened and precision-ground spring collets for maximum holding power, collet chuck, spanner wrench, and protective moulded case.

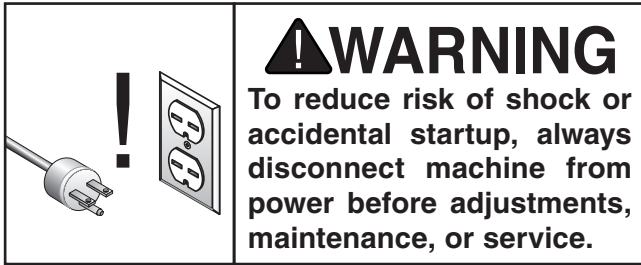


Figure 40. Model SB1349 South Bend 16-Pc. R-8 Collet Set.

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

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

Weekly Maintenance

- Use the one-shot oiler (**Page 33**).
- Lubricate quill gearing (**Page 33**).
- Clean the mill.

Monthly Check

- Lubricate the vertical bevel gears (**Page 33**).
- Lubricate the longitudinal, cross, and vertical leadscrews (**Page 34**).

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 your mill, then treat them with regular applications of products such as South Bend Way Oil ISO-68, or ISO-32 Moly-D Machine Oil (see **Section 5: Accessories** on **Page 1** for more details).

Lubrication

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

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

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

DISCONNECT MILL FROM POWER BEFORE PERFORMING LUBRICATION!



NOTICE

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

One-Shot Oiler

Lubricant	Frequency	Qty
ISO 68 Lubricant or Equivalent	Every 8 Hours of Operation	1 Pump

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 41**) and release it to send lubricant through the lines.

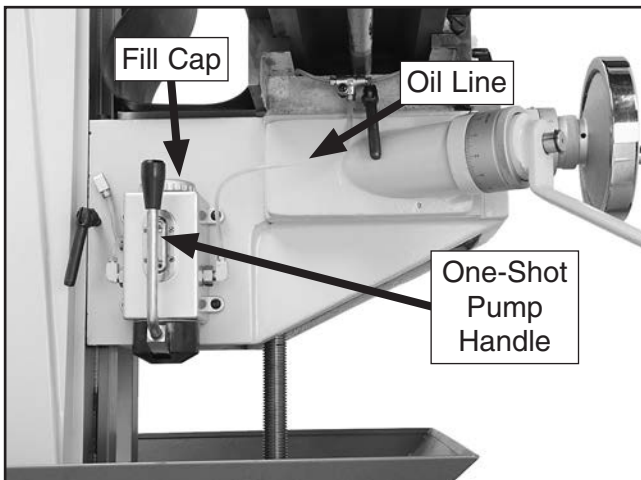


Figure 41. One-shot oiler.

Quill Gearing

Lubricant	Frequency	Qty
ISO 68 Lubricant or Equivalent	Every 8 Hours of Operation	5 Drops

Lift the cap of the oil cup shown in **Figure 42** to add the lubricant.



Figure 42. Quill gearing oil cup.

Vertical Bevel Gears

Lubricant	Frequency	Qty
NLGI #2 Grease	Every 40 Hours of Operation	Thin Coat

Raise the knee up to access the vertical bevel gears underneath the saddle, then clean and lubricate the bevel gears shown in **Figure 43**.

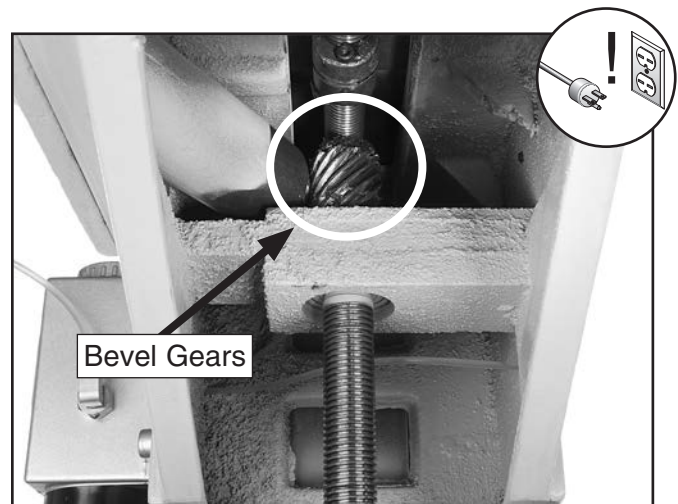


Figure 43. Vertical bevel gears.



Leadscrews

Lubricant	Frequency	Qty
NLGI #2 Grease	Every 40 Hours of Operation	Thin Coat

Use a shop rag 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 44–45**).



Figure 44. Longitudinal leadscrew.

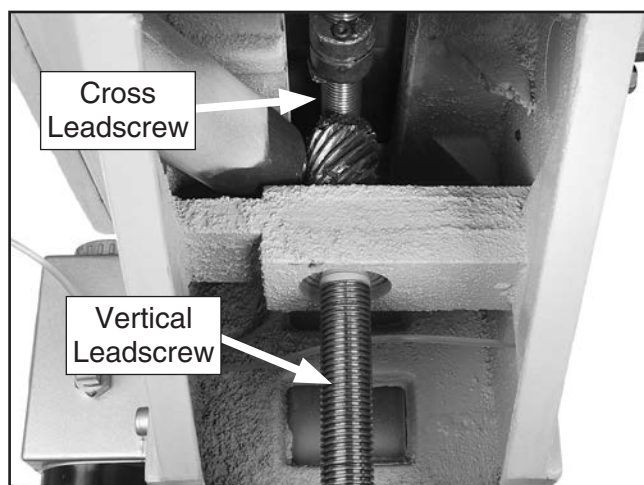


Figure 45. Cross and vertical leadscrews.

V-Belt Tensioning

Periodically remove the belt cover and inspect the belt for cracking, slipping, or fraying. If the belt shows signs of excessive wear, replace it as outlined in **Belt Replacement on Page 38**.

However, with normal use, the belt will gradually stretch over time. When it does, perform the following procedures to keep it tensioned. No belt deflection is recommended for this belt.

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

To tension the V-belt:

1. DISCONNECT MILL FROM POWER!
2. Using a 17mm wrench, loosen the lock bolt, push firmly and hold the belt tension lever toward the rear of the machine and retighten the lock bolt (**Figure 46**).

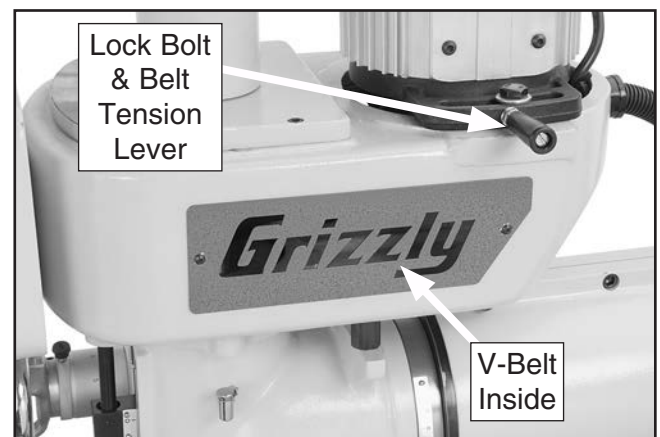


Figure 46. V-belt tension adjustment bolt.



SECTION 7: SERVICE

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

Troubleshooting

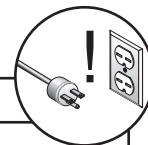


Motor & Electrical

Symptom	Possible Cause	Possible Solution
Machine doesn't start or a breaker trips.	<ol style="list-style-type: none"> 1. Stop button is pushed in or is at fault. 2. ON button is at fault. 3. Plug/receptacle is at fault or wired incorrectly. 4. Power supply is switched OFF or is at fault, or the breaker tripped. 5. Motor connection wired incorrectly. 6. Motor windings or motor is at fault. 	<ol style="list-style-type: none"> 1. Turn the stop button clockwise until it pops out; replace if faulty. 2. Replace faulty ON button. 3. Test for good contacts; correct the wiring. 4. Ensure hot lines have correct voltage on all legs and main power supply is switched ON. 5. Correct motor wiring connections (Page 41). 6. Replace motor.
Machine stalls or is overloaded.	<ol style="list-style-type: none"> 1. Machine is undersized for the task. 2. Workpiece alignment is poor. 3. Dull or incorrect cutting tool. 4. Motor connection is wired incorrectly. 5. Plug/receptacle is at fault. 6. Pulley/sprocket slipping on shaft. 7. Motor bearings are at fault. 8. Motor has overheated. 9. Motor is at fault. 	<ol style="list-style-type: none"> 1. Use smaller sharp tooling; reduce the feed rate; reduce the spindle RPM; use coolant. 2. Eliminate workpiece binding; use vise or clamps as required for workpiece alignment control. 3. Use sharp and correct cutting tool for the operation. 4. Correct motor wiring connections (Page 41). 5. Test for good contacts; correct the wiring. 6. Replace loose pulley/shaft. 7. Test by rotating shaft; rotational grinding/loose shaft requires bearing replacement. 8. Clean off motor, let cool, and reduce workload. 9. Test and repair or replace.
Machine has vibration or noisy operation.	<ol style="list-style-type: none"> 1. Tool holder or cutter is at fault. 2. Workpiece alignment is poor. 3. Motor or component is loose. 4. Pulley is loose. 5. Machine is incorrectly mounted or sits unevenly. 6. Motor fan is rubbing on fan cover. 7. Motor bearings are at fault. 	<ol style="list-style-type: none"> 1. Replace out-of-round tool holder; replace/resharpen cutter; use appropriate feed rate and cutting RPM. 2. Eliminate workpiece binding; use vise or clamps as required for workpiece alignment control. 3. Inspect/replace stripped or damaged bolts/nuts, and re-tighten with thread locking fluid. 4. Realign/replace shaft, pulley, setscrew, and key as required. 5. Tighten/replace mounting bolts in floor; relocate/shim machine. 6. Replace dented fan cover or fan. 7. Test by rotating shaft; rotational grinding/loose shaft requires bearing replacement.



Operation



Symptom	Possible Cause	Possible Solution
Tool slips in collet.	<ol style="list-style-type: none"> 1. Collet is not fully drawn into spindle taper. 2. Wrong size collet. 3. Debris on collet or spindle mating surface. 4. Excessive depth of cut. 	<ol style="list-style-type: none"> 1. Snug up drawbar. 2. Use correct collet for shank diameter. 3. Remove oil and debris from collet and spindle mating surfaces, then re-install. 4. Decrease depth of cut and allow chips to clear.
Breaking tooling.	<ol style="list-style-type: none"> 1. Spindle speed/feed rate too fast. 2. Tooling getting too hot. 3. Excessive depth of cut. 	<ol style="list-style-type: none"> 1. Use correct spindle RPM and feed rate (Page 28). 2. Use coolant; reduce spindle RPM/feed rate. 3. Decrease depth of cut and allow chips to clear.
Machine is loud when cutting; overheats or bogs down in the cut.	<ol style="list-style-type: none"> 1. Excessive depth of cut. 2. Dull tooling. 3. Feed rate too fast. 	<ol style="list-style-type: none"> 1. Decrease depth of cut and allow chips to clear. 2. Use sharp tooling. 3. Decrease feed rate.
Workpiece vibrates or chatters during operation.	<ol style="list-style-type: none"> 1. Locks not tight. 2. Workpiece not securely clamped to table or mill vise. 3. Tooling not secure or is damaged. 4. Spindle speed/feed rate too fast. 5. Gibs are too loose. 	<ol style="list-style-type: none"> 1. Tighten all locks on mill that are not associated with movement for the operation. 2. Check that clamping is tight and sufficient for the operation; make sure mill vise is tight to table. 3. Secure tooling; replace if damaged. 4. Use correct spindle RPM and feed rate (Page 28). 5. Adjust gibs properly (Page 37).
Table hard to move.	<ol style="list-style-type: none"> 1. Locks are tightened down. 2. Chips have loaded up on the ways. 3. Ways are dry and in need of lubrication. 4. Gibs are too tight. 	<ol style="list-style-type: none"> 1. Fully loosen locks needed for movement. 2. Frequently clean away chips that load up during operations. 3. Use one-shot oiler to lubricate ways (Page 33). 4. Adjust gibs properly (Page 37).
Bad surface finish.	<ol style="list-style-type: none"> 1. Wrong spindle speed/feed rate. 2. Dull/damaged tooling; wrong tooling for operation. 3. Wrong spindle rotation for tooling. 4. Workpiece not securely clamped to table or mill vise. 5. Gibs are too loose. 	<ol style="list-style-type: none"> 1. Use correct spindle RPM and feed rate (Page 28). 2. Sharpen/replace tooling; use correct tooling for operation. 3. Check for proper spindle rotation for tooling. 4. Check that clamping is tight and sufficient for the operation; make sure mill vise is tight to table. 5. Adjust gibs properly (Page 37).



Adjusting Gibs

Gibs control the accuracy of the table movements along the ways. Tight gibs make the movements more accurate, but harder to move. Loose gibs make the movements 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 MILL FROM POWER BEFORE ADJUSTING 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 47–49** for the locations of the table, saddle, and knee gib adjustment screws.

Tools Needed	Qty
Flat Head Screwdriver	1

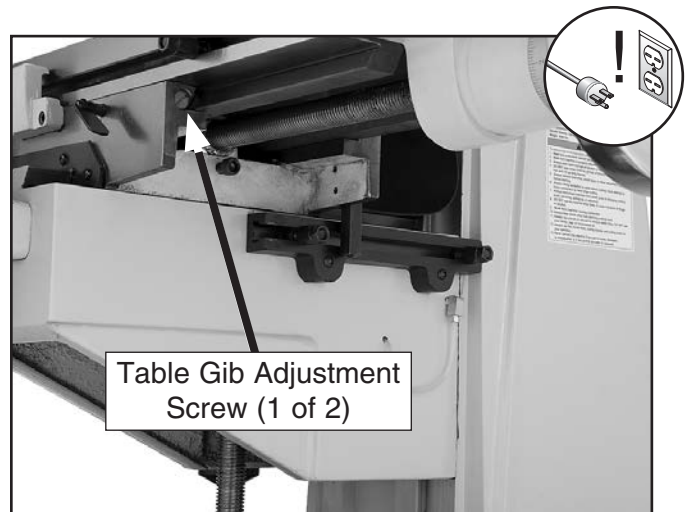


Figure 47. Table gib adjustment screw (1 of 2).



Figure 48. Saddle gib adjustment screw (1 of 2).



Figure 49. 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 that will increase with wear. Generally, 0.005"–0.010" of backlash is acceptable.

The backlash of the longitudinal and cross leadscrew can be adjusted by changing the gap in the leadscrew nuts (see **Figures 50–51**).

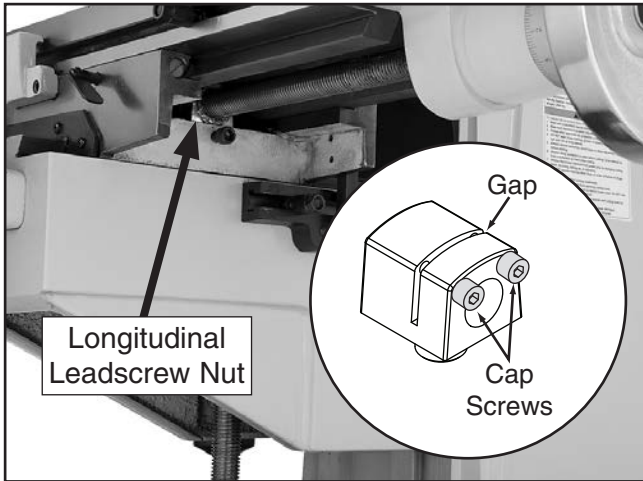


Figure 50. Longitudinal leadscrew nut.

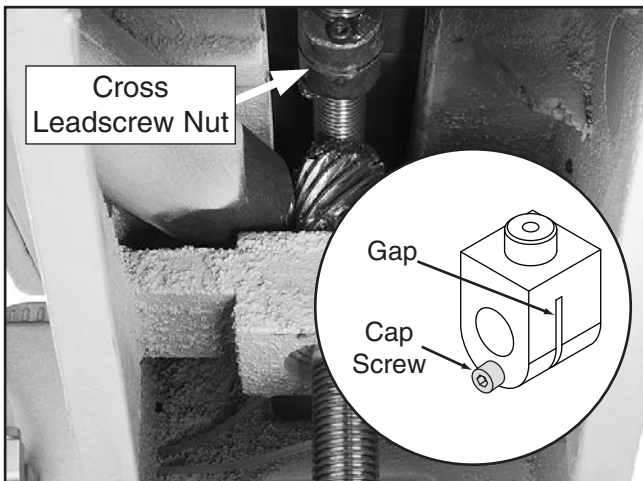


Figure 51. Cross leadscrew nut.

Use a 5mm hex wrench to tighten or loosen the cap screws on the leadscrew nuts shown in **Figures 50–51**, then test the amount of backlash by slowly rocking the handwheels back-and-forth.

V-Belt Replacement

If the belt is cracked, frayed, or shows signs of slipping and glazing you must replace it.

Tools Needed	Qty
Wrench 17mm.....	1
Hex Wrench 5mm.....	1

To replace V-belt:

1. DISCONNECT MILL FROM POWER!
2. Get an assistant's help, and tilt the headstock to approximately 90 degrees (see **Figure 52**), then tighten the headstock tilt lock nuts to hold the headstock in place.



Figure 52. Headstock tilted to 90 degrees.

3. Using a Phillips screwdriver, remove one of the belt access plates.



- Using a 5mm hex wrench, remove the belt cover by pulling the four cap screws (see **Figure 53**).

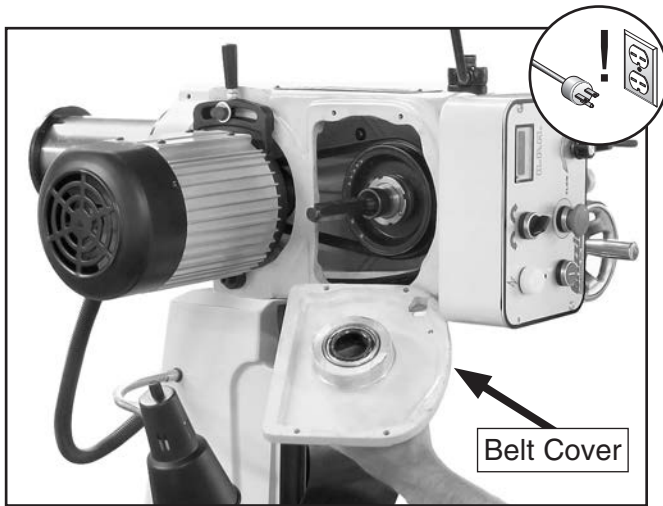


Figure 53. Belt cover removal.

- Using a 17mm wrench, loosen the lock bolt, use the belt tension lever to de-tension the belt, then remove the belt.

- Install a new belt.

- Push firmly and hold the belt tension lever toward the rear of the machine and re-tighten the lock bolt (see **Figure 54**). No belt deflection is required.



Figure 54. V-belt tension lever.

- Re-install the belt cover, the belt access plate, and return the headstock to the vertical position.



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.















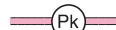
CAPACITORS/INVERTERS. Some capacitors and power inverters store an electrical charge for up to 10 minutes after being disconnected from the power source. To reduce the risk of being shocked, wait at least this long before working on capacitors.

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

NOTICE

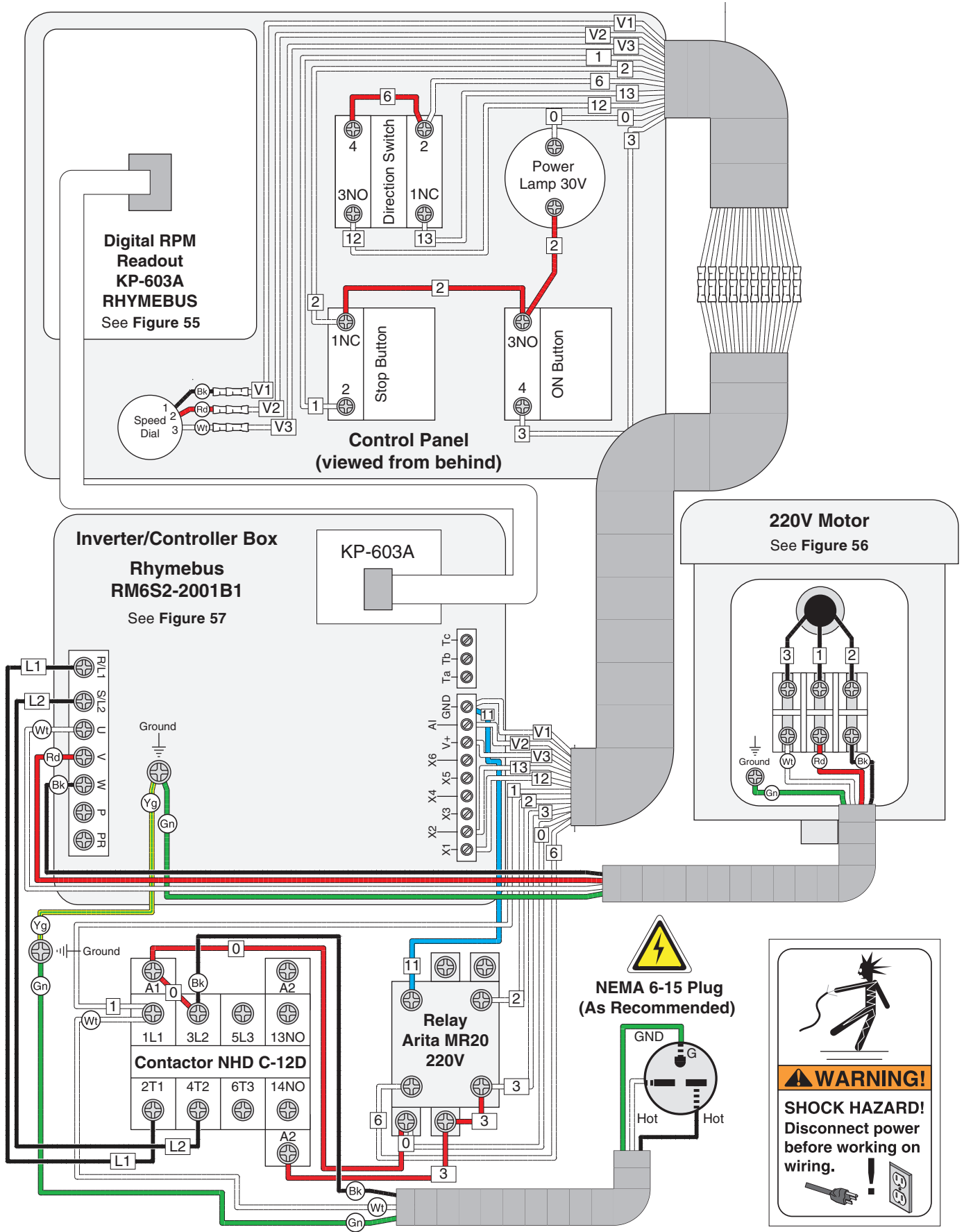
The photos and diagrams included in this section are best viewed in color. You can view these pages in color at www.grizzly.com.

COLOR KEY

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



Wiring Diagram



Electrical Component Wiring



Figure 55. Control panel wiring.

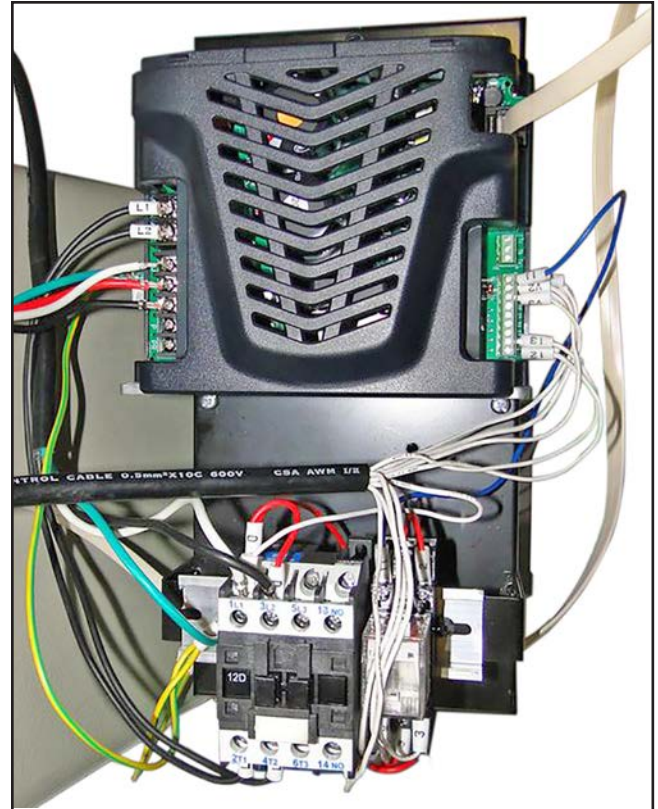


Figure 57. Inverter, contactor, and relay wiring.



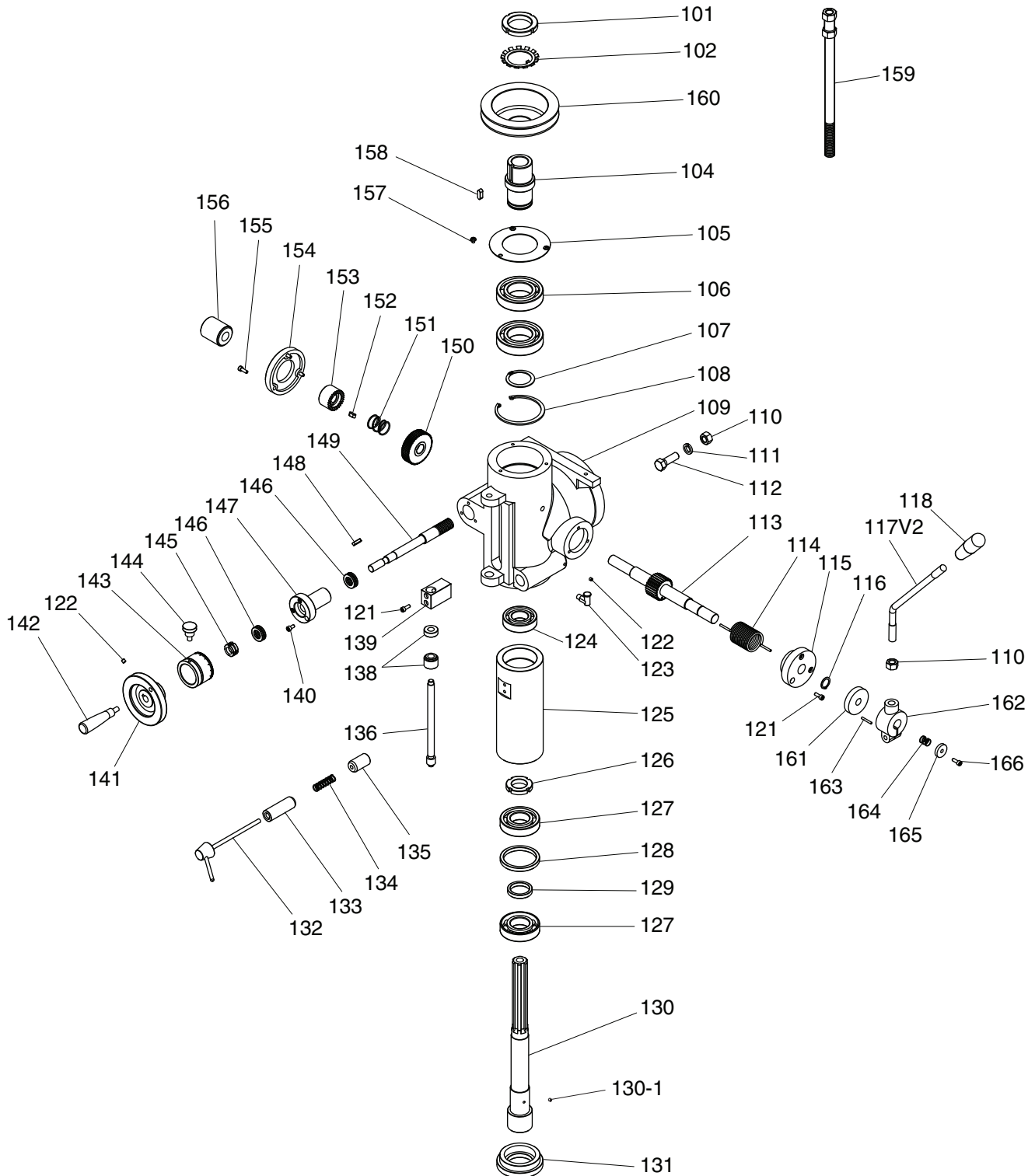
Figure 56. Motor junction box.



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



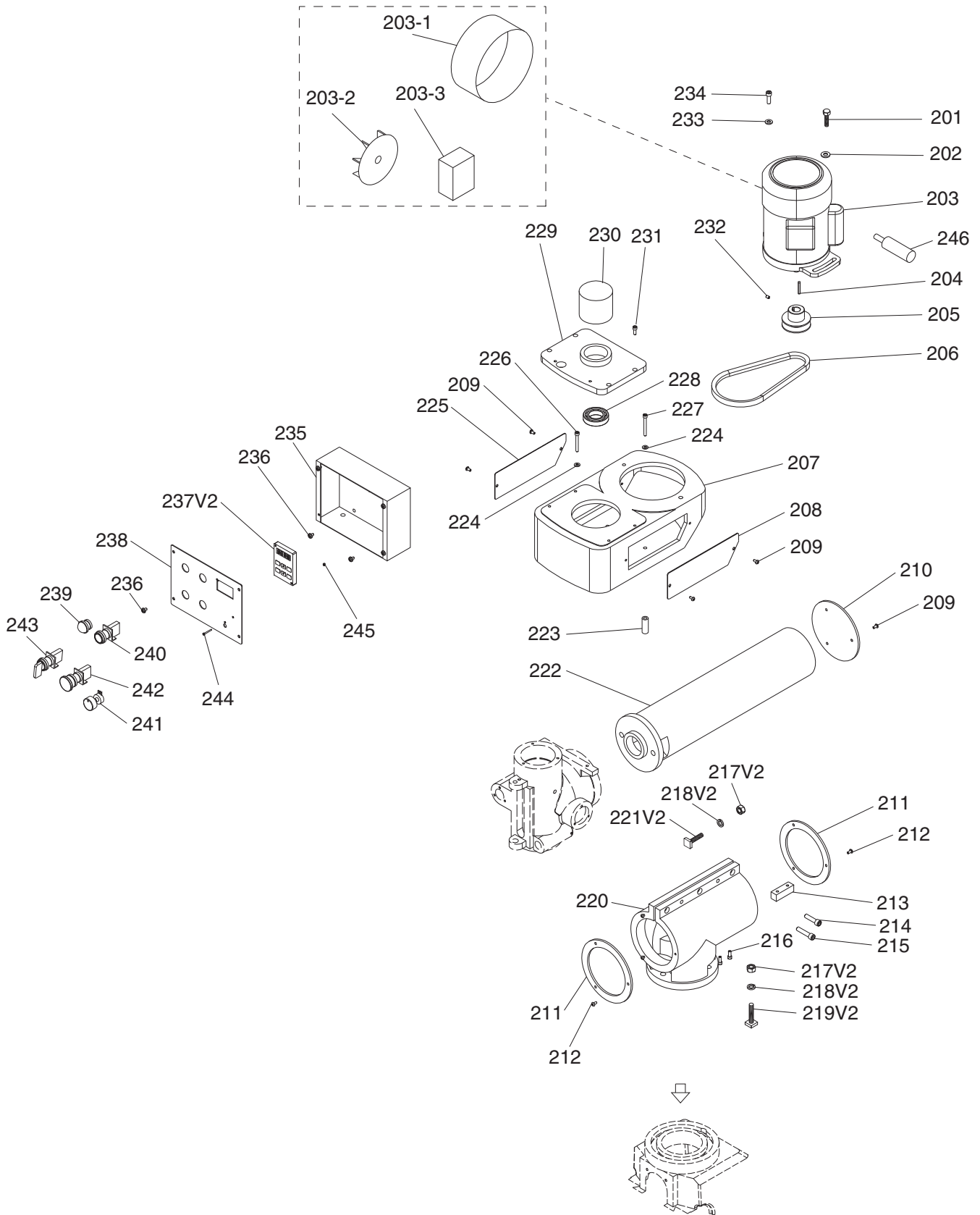
Head Parts List

REF	PART #	DESCRIPTION
101	P0695101	SPANNER NUT 45MM
102	P0695102	SPANNER LOCK WASHER 45MM
104	P0695104	SPLINE SLEEVE
105	P0695105	BEARING COVER
106	P0695106	BALL BEARING 6209ZZ
107	P0695107	EXT RETAINING RING 45MM
108	P0695108	INT RETAINING RING 82MM
109	P0695109	HEAD CASTING
110	P0695110	HEX NUT 1/2-13
111	P0695111	LOCK WASHER 1/2
112	P0695112	HEX BOLT 1/2-13 X 1-1/2
113	P0695113	GEAR SHAFT
114	P0695114	TORSION SPRING
115	P0695115	FLANGE COVER
116	P0695116	EXT RETAINING RING 19MM
117V2	P0695117V2	DOWNFEED HANDLE COARSE M10-1.5
118	P0695118	DOWNFEED LEVER KNOB
121	P0695121	CAP SCREW M5-.8 X 16
122	P0695122	SET SCREW M6-1 X 8
123	P0695123	OIL CUP 1/8" NPT X 8MM X 24MM ELBOW
124	P0695124	BALL BEARING 6206ZZ
125	P0695125	QUILL
126	P0695126	SPANNER NUT 35MM
127	P0695127	ANGULAR CONTACT BEARING 7207
128	P0695128	BEARING WASHER BIG
129	P0695129	BEARING WASHER SMALL
130	P0695130	SPINDLE
130-1	P0695130-1	SET SCREW M4-.7 X 10
131	P0695131	SPINDLE NUT
132	P0695132	SPINDLE LOCK SHAFT
133	P0695133	LOCK PLUNGER LARGE
134	P0695134	COMPRESSION SPRING

REF	PART #	DESCRIPTION
135	P0695135	LOCK PLUNGER SMALL
136	P0695136	DEPTH SCREW
138	P0695138	DEPTH ADJUSTMENT NUT
139	P0695139	THREADED BRACKET
140	P0695140	PHLP HD SCR M5-.8 X 10
141	P0695141	HANDWHEEL
142	P0695142	HANDWHEEL HANDLE
143	P0695143	FINE GRADUATED DIAL
144	P0695144	DIAL POSITIONING SCREW
145	P0695145	THRUST BEARING NUT 9/16-12
146	P0695146	THRUST BEARING 51102
147	P0695147	FLANGE SLEEVE
148	P0695148	KEY 5 X 5 X 20
149	P0695149	WORM SHAFT
150	P0695150	COUPLING WORM GEAR
151	P0695151	COMPRESSION SPRING
152	P0695152	KEY 6 X 6 X 15
153	P0695153	CLUTCH
154	P0695154	END CAP
155	P0695155	PHLP HD SCR M5-.8 X 10
156	P0695156	DOWNFEED SELECTOR KNOB
157	P0695157	PHLP HD SCR M5-.8 X 8
158	P0695158	KEY 7 X 7 X 20
159	P0695159	DRAWBAR
160	P0695160	SPINDLE PULLEY
161	P0695161	SPACER
162	P0695162	LEVER HUB
163	P0695163	LEVER HUB PIN
164	P0695164	COMPRESSION SPRING
165	P0695165	LEVER HUB FLAT WASHER
166	P0695166	CAP SCREW M5-.8 X 25



Motor & Ram



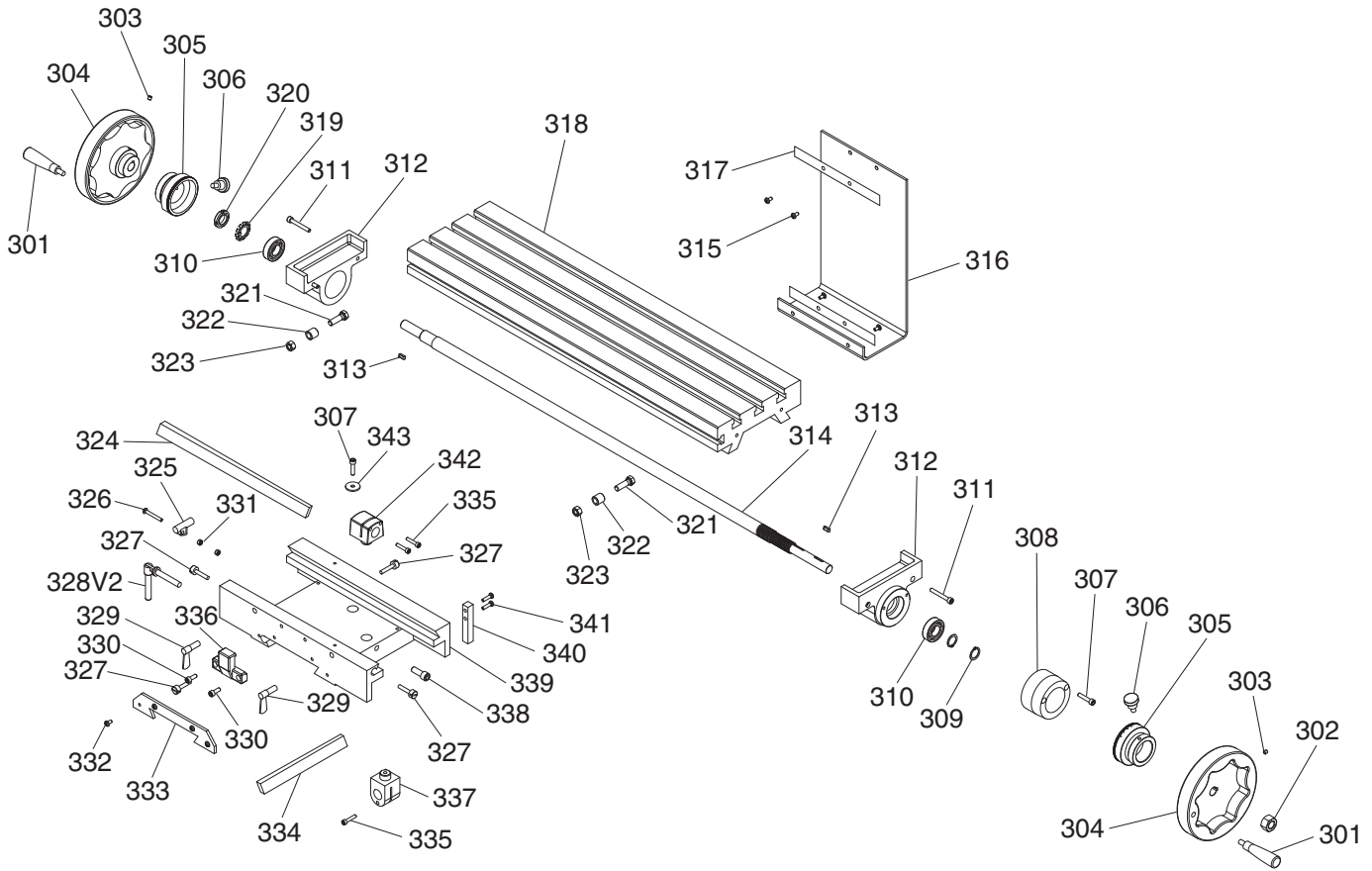
Motor & Ram Parts List

REF	PART #	DESCRIPTION
201	P0695201	HEX BOLT 3/8-16 X 1-1/4
202	P0695202	FLAT WASHER 10MM
203	P0695203	MOTOR 1.5HP 220V 3-PH
203-1	P0695203-1	MOTOR FAN COVER
203-2	P0695203-2	MOTOR FAN
203-3	P0695203-3	MOTOR WIRING JUNCTION BOX
204	P0695204	KEY 5 X 5 X 40
205	P0695205	MOTOR PULLEY
206	P0695206	V-BELT B28
207	P0695207	V-BELT HOUSING
208	P0695208	V-BELT COVER RIGHT
209	P0695209	PHLP HD SCR M5-.8 X 12
210	P0695210	RAM END COVER
211	P0695211	RAM FLANGE
212	P0695212	CAP SCREW M6-1 X 10
213	P0695213	RAM GIB
214	P0695214	CAP SCREW M10-1.5 X 30
215	P0695215	CAP SCREW M10-1.5 X 40
216	P0695216	CAP SCREW M6-1 X 20
217V2	P0695217V2	HEX NUT M12-1.75
218V2	P0695218V2	LOCK WASHER 12MM
219V2	P0695219V2	SQUARE BOLT M12-1.75 X 45 V2.01.17
220	P0695220	RAM HOUSING
221V2	P0695221V2	SQUARE BOLT M12-1.75 X 40 V2.01.17
222	P0695222	RAM

REF	PART #	DESCRIPTION
223	P0695223	BUSHING
224	P0695224	FLAT WASHER 6MM
225	P0695225	V-BELT COVER LEFT
226	P0695226	CAP SCREW M6-1 X 50
227	P0695227	CAP SCREW M6-1 X 55
228	P0695228	BALL BEARING 6007ZZ
229	P0695229	BEARING COVER
230	P0695230	DRAWBAR COVER
231	P0695231	CAP SCREW M6-1 X 20
232	P0695232	SET SCREW M6-1 X 8
233	P0695233	FLAT WASHER 8MM
234	P0695234	CAP SCREW M8-1.25 X 25
235	P0695235	CONTROL BOX
236	P0695236	PHLP HD SCR M6-1 X 16
237V2	P0695237V2	SPINDLE SPEED READOUT UNIT V2.01.21
238	P0695238	CONTROL PANEL
239	P0695239	POWER INDICATOR LIGHT 22MM WHT
240	P0695240	ON/OFF BUTTON
241	P0695241	SPINDLE SPEED DIAL
242	P0695242	STOP BUTTON
243	P0695243	SPINDLE DIRECTION SWITCH
244	P0695244	PHLP HD SCR M3-.5 X 25
245	P0695245	HEX NUT M3-.5
246	P0695246	HANDLE



Table

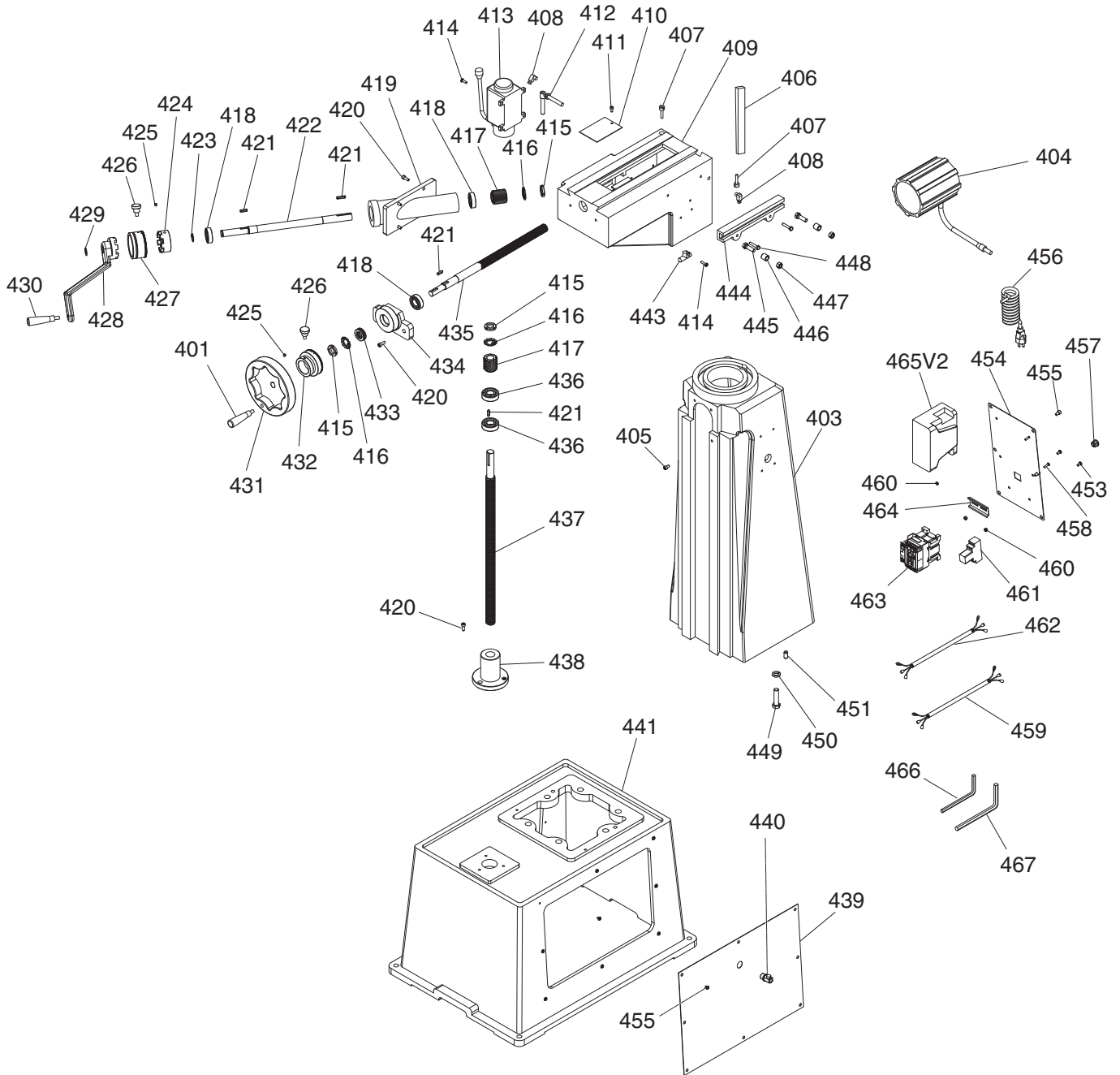


REF	PART #	DESCRIPTION
301	P0695301	HANDWHEEL HANDLE
302	P0695302	HEX NUT 5/8-11
303	P0695303	SET SCREW M6-1 X 8
304	P0695304	HANDWHEEL
305	P0695305	LONGITUDINAL GRADUATED DIAL
306	P0695306	DIAL POSITIONING SCREW
307	P0695307	CAP SCREW M6-1 X 25
308	P0695308	SPACER
309	P0695309	EXT RETAINING RING 20MM
310	P0695310	BALL BEARING 6004ZZ
311	P0695311	CAP SCREW M6-1 X 45
312	P0695312	LEADSCREW BRACKET
313	P0695313	KEY 5 X 5 X 20
314	P0695314	LONGITUDINAL LEADSCREW
315	P0695315	PHLP HD SCR M6-1 X 8
316	P0695316	WAY COVER
317	P0695317	WAY COVER HOLDER
318	P0695318	TABLE
319	P0695319	SPANNER LOCK WASHER 20MM
320	P0695320	SPANNER NUT 20MM
321	P0695321	HEX BOLT M10-1.5 X 30
322	P0695322	TABLE STOP SLEEVE

REF	PART #	DESCRIPTION
323	P0695323	HEX NUT M10-1.5
324	P0695324	LONGITUDINAL GIB
325	P0695325	LIMIT STOP
326	P0695326	PHLP HD SCR M5-.8 X 30
327	P0695327	GIB ADJUSTMENT SCREW
328V2	P0695328V2	ADJUSTABLE HANDLE 3L, 3/8-16 X 1
329	P0695329	LONGITUDINAL LOCK HANDLE
330	P0695330	CAP SCREW M6-1 X 16
331	P0695331	HEX NUT M5-.8
332	P0695332	PHLP HD SCR M5-.8 X 10
333	P0695333	WAY WIPER
334	P0695334	CROSS GIB
335	P0695335	CAP SCREW M8-1.25 X 25
336	P0695336	LIMIT BRACKET
337	P0695337	CROSS FEED LEADSCREW NUT
338	P0695338	CAP SCREW M8-1.25 X 25
339	P0695339	SADDLE
340	P0695340	LIMIT BLOCK
341	P0695341	PHLP HD SCR M5-.8 X 20
342	P0695342	LONGITUDINAL LEADSCREW NUT
343	P0695343	FLAT WASHER 6MM



Base, Column & Knee



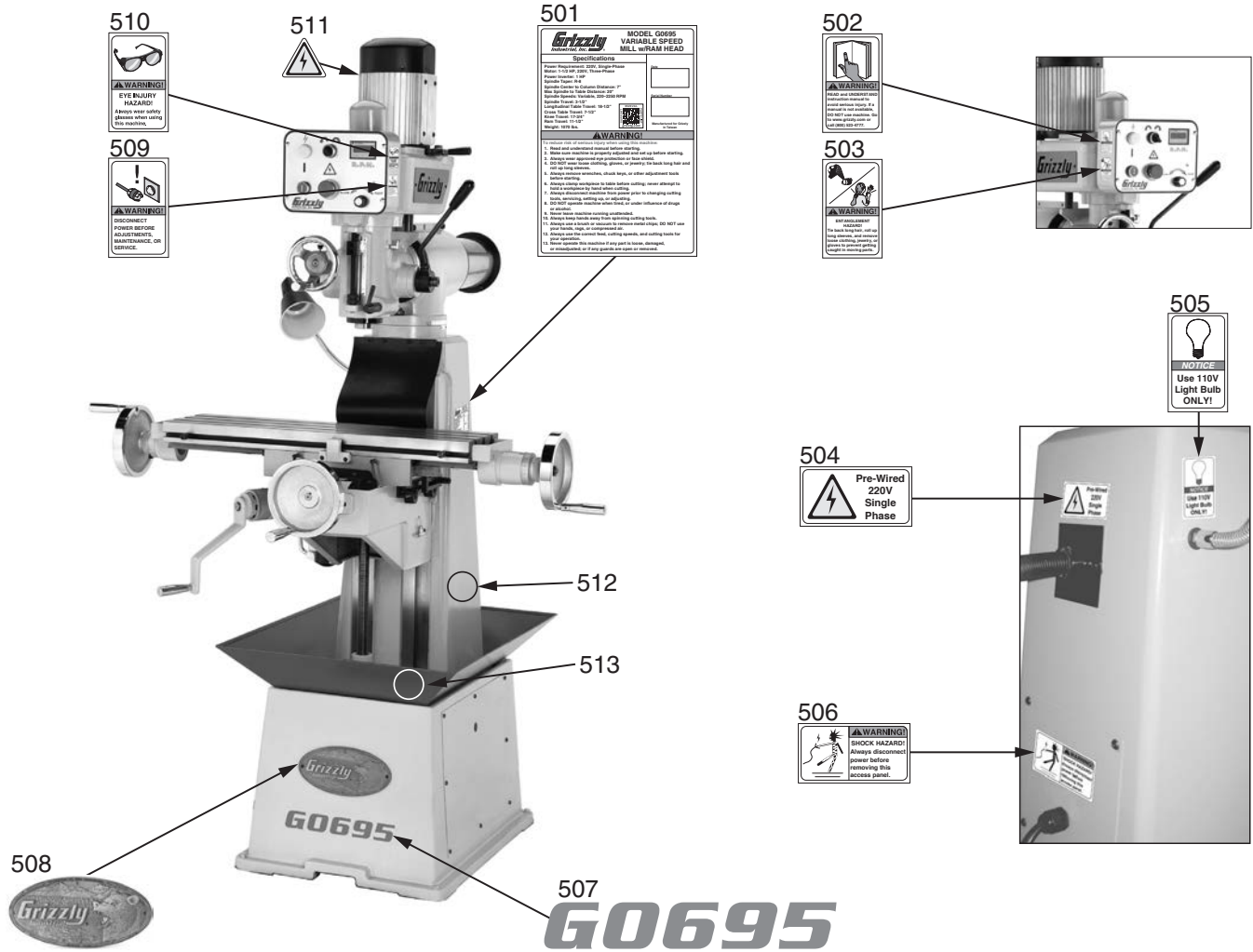
Base, Column & Knee Parts List

REF	PART #	DESCRIPTION
401	P0695401	HANDWHEEL HANDLE
403	P0695403	COLUMN
404	P0695404	HALOGEN LAMP ASSEMBLY
405	P0695405	CAP SCREW M6-1 X 8
406	P0695406	KNEE GIB
407	P0695407	GIB ADJUSTMENT SCREW
408	P0695408	PIPE JOINT
409	P0695409	KNEE
410	P0695410	KNEE SLIDE COVER
411	P0695411	PHLP HD SCR M5-.8 X 16
412V2	P0695412V2	ADJ HANDLE 3L, 3/8-16 X 1 V2.10.18
413	P0695413	ONE-SHOT OILER ASSEMBLY
414	P0695414	PHLP HD SCR M5-.8 X 15
415	P0695415	SPANNER NUT 20MM
416	P0695416	SPANNER LOCK WASHER 20MM
417	P0695417	BEVEL GEAR
418	P0695418	BALL BEARING 6004ZZ
419	P0695419	GEAR SHAFT SLEEVE
420	P0695420	CAP SCREW M6-1 X 16
421	P0695421	KEY 5 X 5 X 20
422	P0695422	GEAR SHAFT
423	P0695423	EXT RETAINING RING 20MM
424	P0695424	CLUTCH
425	P0695425	SET SCREW M6-1 X 8
426	P0695426	DIAL POSITIONING SCREW
427	P0695427	ELEVATION GRADUATED DIAL
428	P0695428	CRANK
429	P0695429	EXT RETAINING RING 18MM
430	P0695430	HANDWHEEL HANDLE
431	P0695431	HANDWHEEL
432	P0695432	LONGITUDINAL GRADUATED DIAL
433	P0695433	THRUST BEARING 51104

REF	PART #	DESCRIPTION
434	P0695434	BEARING HOUSING
435	P0695435	CROSS FEED LEADSCREW
436	P0695436	BALL BEARING 6204ZZ
437	P0695437	ELEVATION LEADSCREW
438	P0695438	PEDESTAL
439	P0695439	BASE SIDE COVER
440	P0695440	STRAIN RELIEF 3/4" TYPE-10 ST
441	P0695441	BASE
443	P0695443	LIMIT STOP
444	P0695444	LIMIT TRACK
445	P0695445	HEX BOLT M10-1.5 X 30
446	P0695446	TABLE STOP SLEEVE
447	P0695447	HEX NUT M10-1.5
448	P0695448	HEX BOLT M6-1 X 30
449	P0695449	HEX BOLT 1/2-13 X 2
450	P0695450	LOCK WASHER 1/2
451	P0695451	PIN 10 X 20
453	P0695453	PHLP HD SCR 10-24 X 1/2
454	P0695454	COLUMN COVER
455	P0695455	PHLP HD SCR M6-1 X 8
456	P0695456	POWER CORD 12G X 3W 86"L
457	P0695457	STRAIN RELIEF TYPE-10 ST
458	P0695458	PHLP HD SCR 10-24 X 3/4
459	P0695459	CORD 3 WIRE
460	P0695460	HEX NUT 10-24
461	P0695461	RELAY ARITA MR20 220V
462	P0695462	CORD 4 WIRE
463	P0695463	CONTACTOR NHD C-12D
464	P0695464	MOUNTING TRACK
465V2	P0695465V2	INVERTER RHYME RM6S2 1-PH 200V V2.01.21
466	P0695466	HEX WRENCH 4MM
467	P0695467	HEX WRENCH 5MM



Labels & Cosmetics



REF	PART #	DESCRIPTION
501	P0695501	MACHINE ID LABEL
502	P0695502	READ MANUAL LABEL
503	P0695503	ENTANGLEMENT HAZARD LABEL
504	P0695504	PREWIRED 220V LABEL
505	P0695505	LIGHT BULB 110V LABEL
506	P0695506	ELECTROCUTION HAZARD LABEL
507	P0695507	MODEL NUMBER LABEL

REF	PART #	DESCRIPTION
508	P0695508	GRIZZLY OVAL NAMEPLATE
509	P0695509	DISCONNECT WARNING LABEL
510	P0695510	EYE INJURY WARNING LABEL
511	P0695511	ELECTRICITY LABEL
512	P0695512	TOUCH UP PAINT, GRIZZLY PUTTY
513	P0695513	TOUCH UP PAINT, GRIZZLY GREEN

⚠ 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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