

Grizzly **Industrial, Inc.**®

MODEL G0757Z **VARIABLE-SPEED HORIZONTAL/ VERTICAL MILL w/DRO** **OWNER'S MANUAL** *(For models manufactured since 02/15)*



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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.**
#BB17431 PRINTED IN CHINA

V1.07.15

 **WARNING!**

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

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

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

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

 **WARNING!**

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

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

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

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INTRODUCTION

Contact Info

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

Grizzly Technical Support
1203 Lycoming Mall Circle
Muncy, PA 17756
Phone: (570) 546-9663
Email: techsupport@grizzly.com

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

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


Manual Accuracy

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

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

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

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

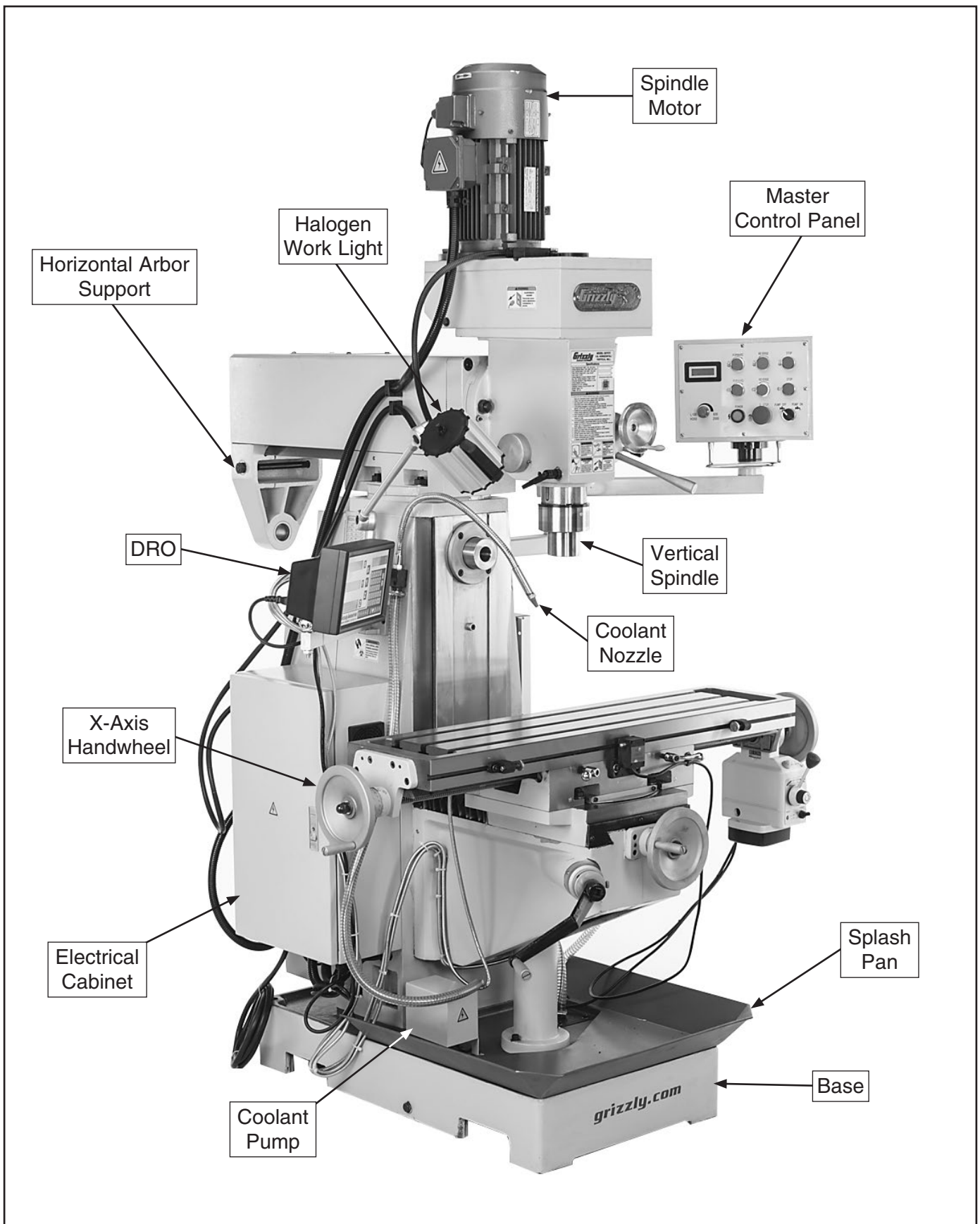
		MODEL GXXXX MACHINE NAME	
SPECIFICATIONS		▲ WARNING!	
Motor:	To reduce risk of serious injury when using this machine:		
Specification:	Read manual before operation.		
Specification:	Wear safety glasses and respirator.		
Specification:	Ensure safety glasses/respirator are properly adjusted/setup and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

Manufacture Date

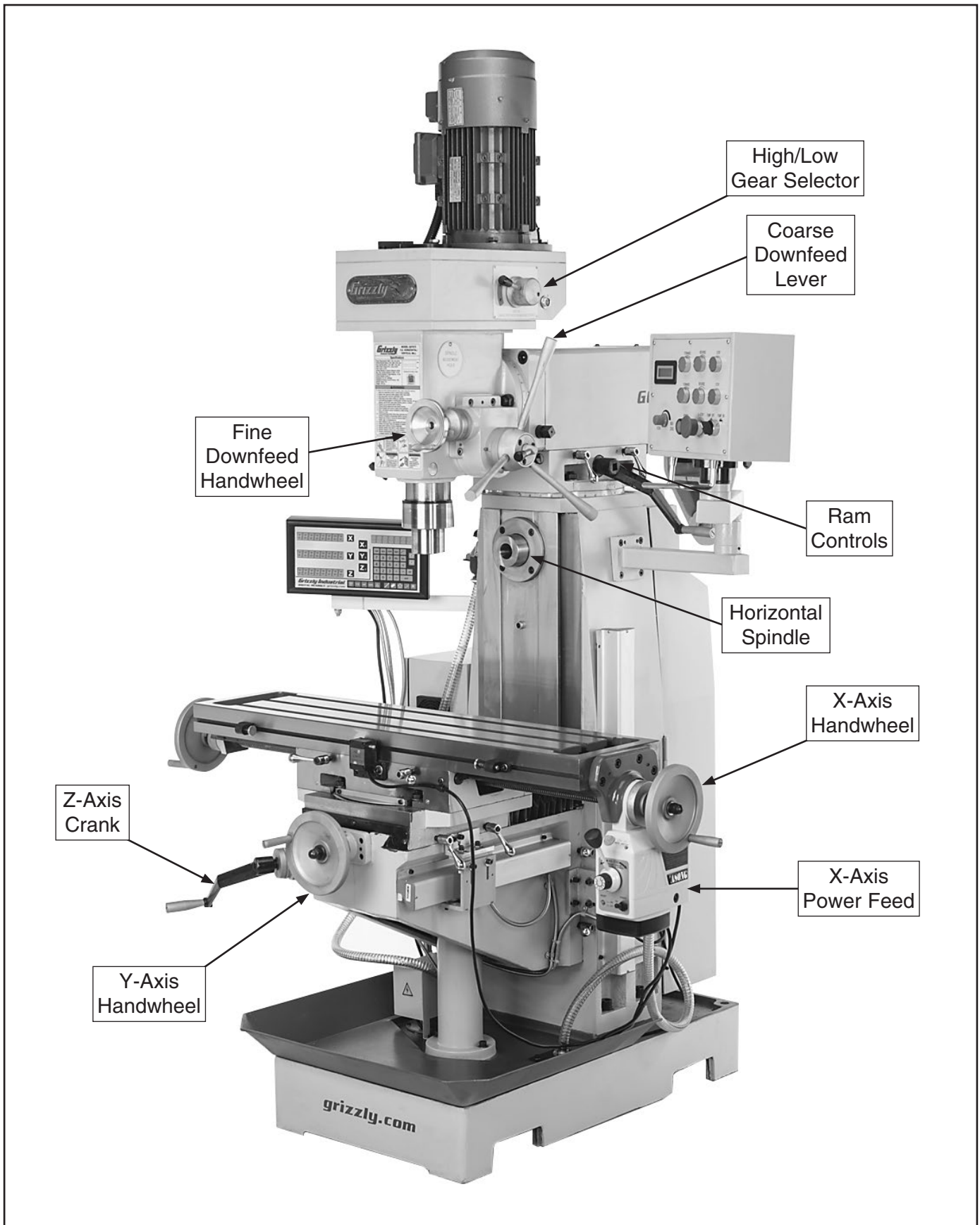
Serial Number



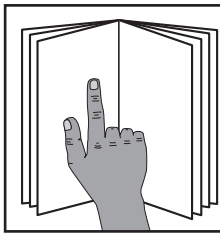
Left Front View Identification



Right Front View Identification



Controls & Components



!WARNING

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

Refer to **Figures 1–4** 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.

Master Power Switch

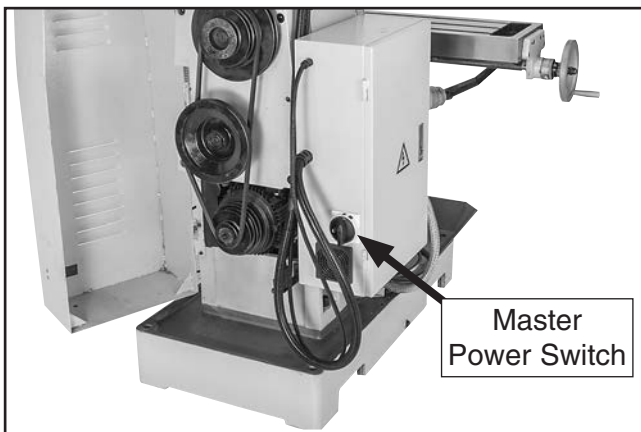


Figure 1. Location of master power switch.

Master Power Switch: Enables power to flow to machine.

Control Panel

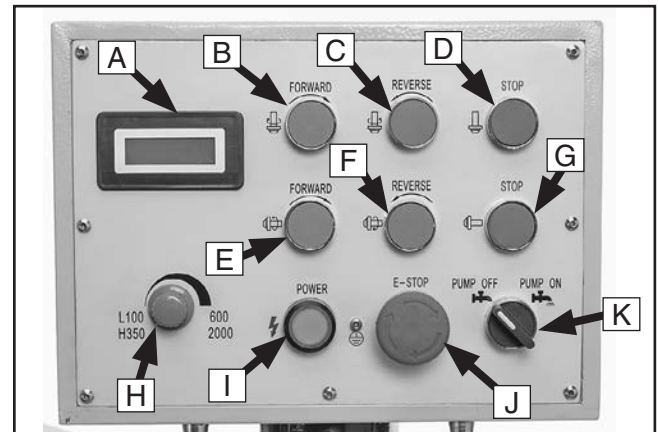


Figure 2. Control panel.

- A. Vertical Spindle RPM Readout:** Displays current spindle RPM.
- B. FORWARD Button (Vertical Spindle ⚙):** Starts vertical spindle forward rotation (clockwise looking down on headstock).

NOTICE

Spindle rotation direction can **ONLY** be changed when spindle is completely stopped.

- C. REVERSE Button (Vertical Spindle ⚙):** Starts vertical spindle reverse rotation (counterclockwise looking down on headstock).
- D. STOP Button (Vertical Spindle ⏹):** Stops vertical spindle rotation.
- E. FORWARD Button (Horizontal Spindle ⚙):** Starts horizontal spindle forward rotation (counterclockwise as viewed from front of machine).
- F. REVERSE Button (Horizontal Spindle ⚙):** Starts horizontal spindle reverse rotation (clockwise as viewed from front of machine).
- G. STOP Button (Horizontal Spindle ⏹):** Stops horizontal spindle rotation.
- H. Variable-Speed Dial:** Controls speed of vertical spindle.



- I. **POWER Lamp Button:** When pressed, illuminates and enables power to control panel. E-STOP button must be reset first.
- J. **E-STOP Button:** Disables power to control panel and stops all machine functions. To reset, twist button clockwise until it pops out.
- K. **Coolant Pump Switch:** Starts/stops coolant pump and flow of coolant.

X-Axis Power Feed

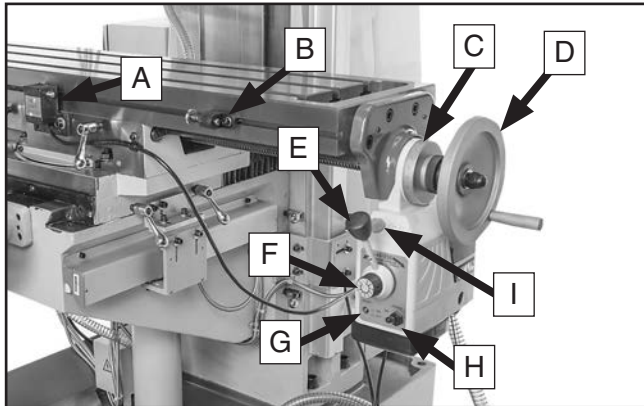


Figure 3. Power feed components.

- A. **Limit Switch:** Stops powered table movement when either side plunger comes in contact with limit stops.
- B. **Limit Stop:** Limits X-axis table travel (one on either end of table).
- C. **Graduated Dial:** Displays X-axis table movement in 0.001" increments, with each revolution equaling 0.200" of travel.
- D. **Handwheel:** Manually positions table.

- E. **Directional Lever:** Selects direction of table movement. Center position is neutral.
- F. **Speed Dial:** Controls speed of table movement. Turning dial clockwise causes table to move faster.

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

- G. **Reset Button:** Resets internal circuit breaker if unit is overloaded and shuts down.
- H. **ON/OFF Switch:** Enables/disables power to unit.
- I. **Rapid Traverse Button:** Once directional lever has been activated, causes table to travel at full speed while pushed.

Headstock

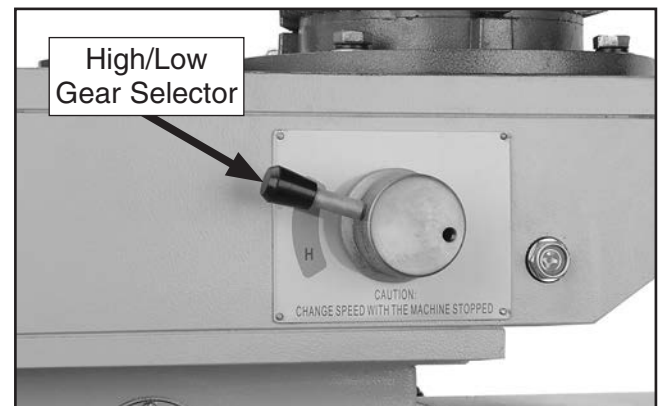


Figure 4. Headstock controls.

High/Low Gear Selector: Selects between high and low gears on the vertical spindle.





MACHINE DATA SHEET

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

MODEL G0757Z VARIABLE-SPEED HORIZONTAL/VERTICAL MILL WITH DRO

Product Dimensions:

Weight..... 1874 lbs.
 Width (side-to-side) x Depth (front-to-back) x Height..... 53-1/2 x 55 x 82 in.
 Footprint (Length x Width)..... 35-1/2 x 20 in.
 Space Required for Full Range of Movement (Width x Depth)..... 76 x 58 in.

Shipping Dimensions:

Type..... Wood Crate
 Content..... Machine
 Weight..... 2050 lbs.
 Length x Width x Height..... 53 x 45 x 88 in.
 Must Ship Upright..... Yes

Electrical:

Power Requirement..... 220V, Single-Phase, 60 Hz
 Full-Load Current Rating..... 9.5A
 Minimum Circuit Size..... 15A
 Power Cord Included..... Yes
 Power Cord Length..... 6-1/2 ft.
 Power Cord Gauge..... 14 AWG
 Plug Included..... No
 Recommended Plug Type..... NEMA 6-15
 Switch Type..... Control Panel with E-Stop Button
 Inverter Type..... Delta VFD-E

Motors:

Coolant Pump

Type..... TEFC Permanent-Split Capacitor
 Horsepower..... 40W
 Phase..... Single-Phase
 Amps..... 0.2A
 Speed..... 2800 RPM
 Power Transfer Direct Drive
 Bearings..... Shielded & Permanently Lubricated

Vertical Spindle

Type..... TEFC Capacitor-Start Induction
 Horsepower..... 3 HP
 Phase..... 3-Phase
 Amps..... 9.3A
 Speed..... 1500 RPM
 Power Transfer Gear Drive
 Bearings..... Shielded & Permanently Lubricated



Horizontal Spindle

Type.....	TEFC Capacitor-Start Induction
Horsepower.....	2 HP
Phase.....	Single-Phase
Amps.....	8.6A
Speed.....	1725 RPM
Power Transfer	V-Belt Drive
Bearings.....	Shielded & Permanently Lubricated

Main Specifications:

Operation Info

Spindle Travel.....	5 in.
Max Distance Spindle to Column.....	26-3/4 in.
Max Distance Spindle to Table.....	14-1/2 in.
Maximum Distance Horizontal Spindle Center to Table.....	14-1/8 in.
Longitudinal Table Travel (X-Axis).....	23-1/2 in.
Cross Table Travel (Y-Axis).....	8-1/2 in.
Vertical Table Travel (Z-Axis).....	12-1/2 in.
Table Swivel (Left/Right).....	45 deg.
Ram Travel.....	11 in.
Turret or Column Swivel (Left /Right).....	180 deg.
Head Tilt (Left/Right).....	90 deg.
Drilling Capacity for Cast Iron.....	1-1/8 in.
Drilling Capacity for Steel.....	1 in.
End Milling Capacity.....	1 in.
Face Milling Capacity.....	4 in.

Table Info

Table Length.....	39-3/8 in.
Table Width.....	9-1/2 in.
Table Thickness.....	2-3/8 in.
Number of T-Slots.....	3
T-Slot Size.....	5/8 in.
T-Slots Centers.....	3 in.
Number of Longitudinal Feeds.....	Variable
X-Axis Table Power Feed Rate.....	0 – 11.67 FPM
X/Y-Axis Travel per Handwheel Revolution.....	0.200 in.
Z-Axis Travel per Handwheel Revolution.....	0.200 in.

Spindle Info

Spindle Taper.....	R-8
Range of Vertical Spindle Speeds.....	100 – 600, 350 – 2000 RPM
Quill Diameter.....	3-1/2 in.
Drawbar Thread Size.....	7/16-20
Drawbar Length.....	20, 13-3/4 in.
Spindle Bearings.....	Tapered Roller Bearings (P5)
Horizontal Spindle Taper.....	R-8
Number of Horizontal Spindle Speeds.....	8
Range of Horizontal Spindle Speeds.....	72 – 1300 RPM
Horizontal Spindle Bearing Type.....	Tapered Roller Bearings (P5)

Construction

Spindle Housing/Quill.....	Chromed Cast Iron
Table.....	Precision-Ground Cast Iron
Head.....	Cast Iron
Column/Base.....	Cast Iron
Base.....	Cast Iron
Paint Type/Finish.....	Enamel



Other Specifications:

Country of Origin China
Warranty 1 Year
Serial Number Location Machine ID Label on Head
ISO 9001 Factory Yes

Features:

Variable-speed spindle control with digital readout for spindle RPMs
Recycling coolant system
Longitudinal power feed
High-precision P5 spindle bearings
Halogen work light
Independent high-CFM motor fan
3-Axis DRO

Accessories Included:

Arbor adapter, R-8 to MT#3
Horizontal arbors w/spacers, 1-1/4" & 1"
1 – 13mm drill chuck w/key & arbor
MT#3 to MT#2 adapter sleeve
T-bolts w/washers & nuts
Service tools & toolbox



SECTION 1: SAFETY

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

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



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



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



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

NOTICE

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

Safety Instructions for Machinery

WARNING

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

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

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

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

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

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

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



WARNING

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



Additional Safety for Milling Machines

WARNING

The primary risks of operating a mill are as follows: You can be seriously injured or killed by getting clothing, jewelry, or long hair entangled with rotating cutter. You can be severely cut or have fingers amputated from contact with the rotating cutter. 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.

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.

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.

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

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.

ALLOW SPINDLE TO STOP. To minimize your risk of entanglement, always allow spindle to stop on its own. DO NOT stop spindle using your hand or any other object.

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.

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.

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.

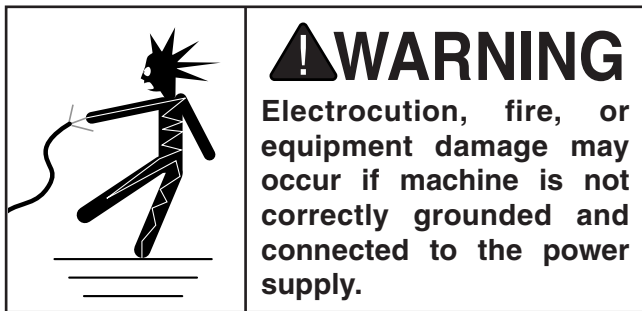
POWER DISRUPTION. In the event of a local power outage during operation, turn spindle switch **OFF** to avoid a possible sudden startup once power is restored.



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 9.5 Amps

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

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

Circuit Requirements for 220V

This machine is prewired to operate on a 220V power supply circuit that has a verified ground and meets the following requirements:

Nominal Voltage 220V/240V
Cycle 60 Hz
Phase 1-Phase
Power Supply Circuit 15 Amps
Plug/Receptacle NEMA 6-15

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.)



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



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).

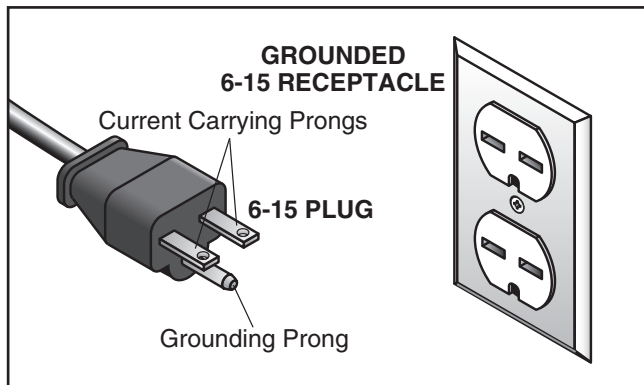
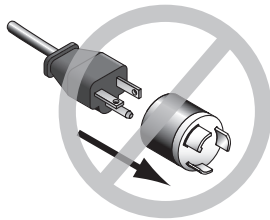


Figure 5. Typical 6-15 plug and receptacle.

CAUTION



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

WARNING

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

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

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

Extension Cords

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

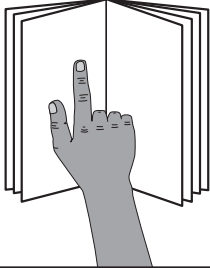
Extension cords cause voltage drop, which may damage electrical components and shorten motor life. Voltage drop increases as the extension cord size gets longer and the gauge size gets smaller (higher gauge numbers indicate smaller sizes).

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

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



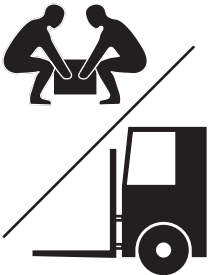
SECTION 3: SETUP



!WARNING
 This machine presents serious injury hazards to untrained users. Read through this entire manual to become familiar with the controls and operations before starting the machine!



!WARNING
 Wear safety glasses during the entire setup process!



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

Needed for Setup

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

Description	Qty
• Precision Level	1
• Safety Glasses (for each person).....	1
• Solvent/Cleaner (Page 17)	1
• Mineral Spirits.....	As Needed
• Wood Block	1
• Disposable Shop Rags.....	1
• Brass Hammer	1
• Lifting Sling (Rated for at least 2800 lbs.) ..	2
• Lifting Equipment (Rated for at least 2800 lbs.).....	1
• Mounting Hardware (Page 20) ...	As Needed

Unpacking

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

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

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



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



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.

Toolbox (Figure 6)	Qty
A. Handwheel Handles	3
B. Coarse Downfeed Handle (2 Installed)	1
C. Open-End Wrench 22/24mm.....	1
D. Open-End Wrench 17/19mm	1
E. Drill Chuck B16, 1–13mm	1
—Chuck Key	1
F. Spindle Sleeve R-8–MT#3	1
G. Drill Chuck Arbor R-8–B16.....	1
H. Spindle Sleeve MT#3–MT#2	1

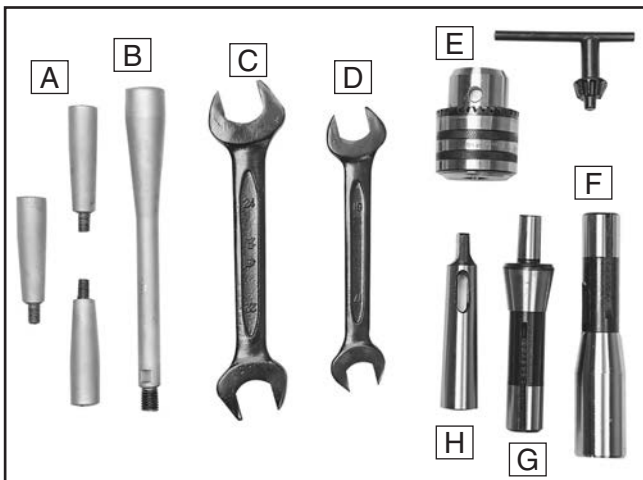


Figure 6. Toolbox inventory.

Wood Crate (Figure 7)	Qty
I. Bottle for Oil	1
J. Drift Key.....	1
K. End Mill Arbor R-8–1".....	1
L. Knee Crank Handle.....	1
M. Knee Crank	1
N. Hardware Bag	1
—T-Bolts M14-2 x 60.....	2
—Flat Washers 14mm.....	2
—Hex Nuts M14-2	2
—Hex Wrenches 3, 4, 5, 6, 8mm.....	1 Ea.
O. Vertical Spindle Drawbar $\frac{7}{16}$ "–20 x 20".....	1
P. Horizontal Spindle Drawbar $\frac{7}{16}$ "–20 x 13 $\frac{3}{4}$ ".....	1
Q. Horizontal Arbor 1 $\frac{1}{4}$ " Dia. w/Spacers.....	1
R. Horizontal Arbor 1" Dia. w/Spacers.....	1

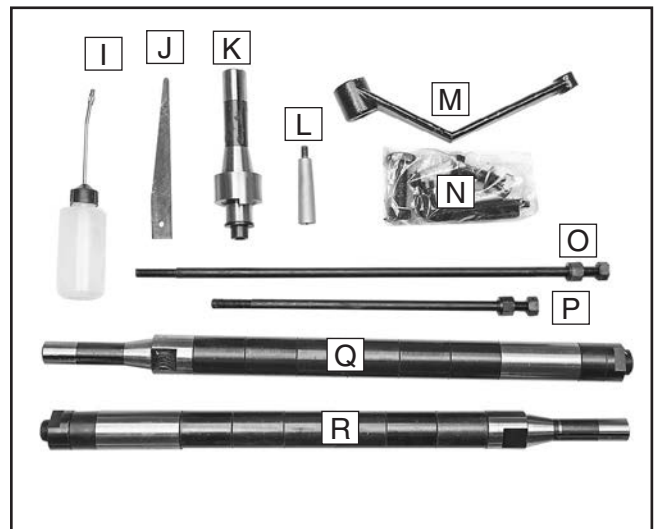


Figure 7. Wood crate inventory.



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.

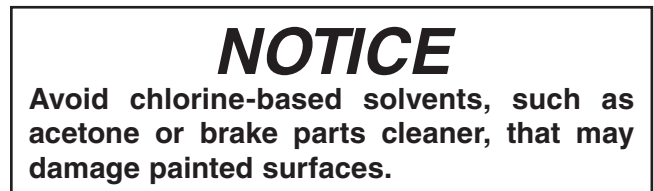
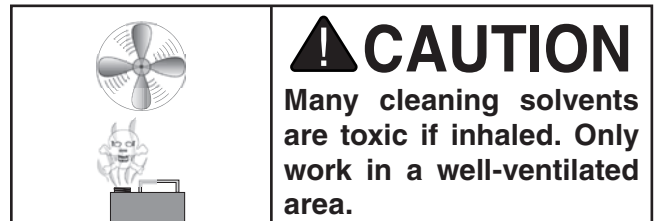
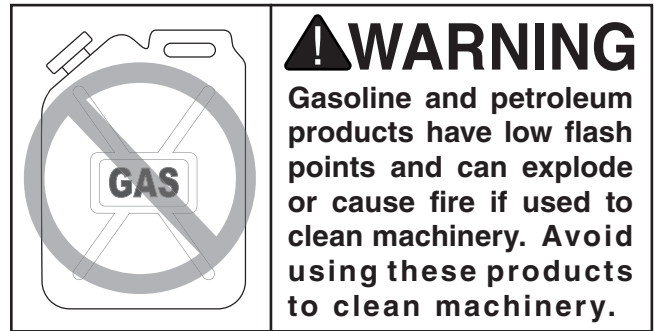
There are many ways to remove this rust preventative, but the following steps work well in a wide variety of situations. Always follow the manufacturer's instructions with any cleaning product you use and make sure you work in a well-ventilated area to minimize exposure to toxic fumes.

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.



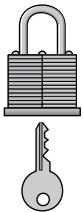
Site Considerations

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.**



CAUTION

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

Physical Environment

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

Electrical Installation

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

Lighting

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

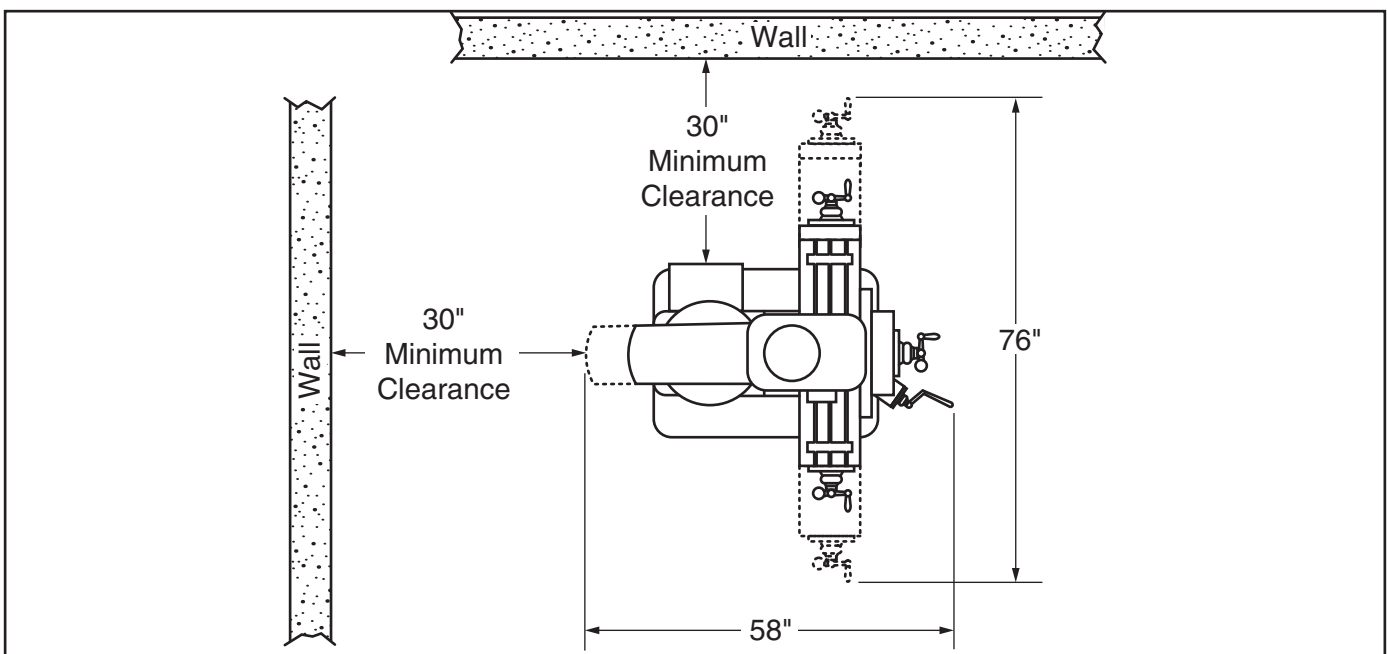
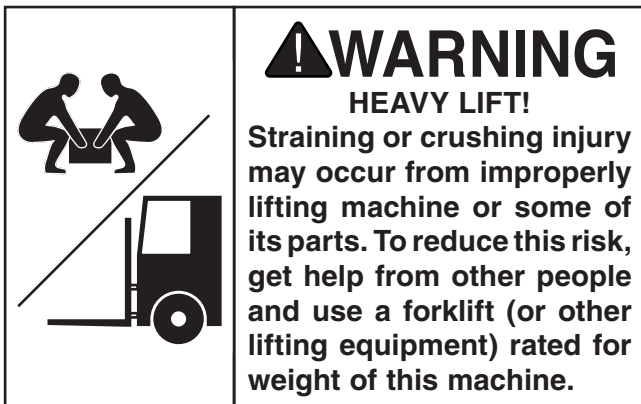


Figure 9. Minimum working clearances.



Lifting & Placing



Power lifting equipment rated for at least 50% more than the weight of the machine and at least two other people are required to lift and place the mill.

To lift and move mill:

1. Remove crate from shipping pallet, then while still on pallet, move machine to installation location.
2. Remove horizontal arbor support, and extend ram so it will clear DRO.
3. Rotate ram 180° clockwise so headstock faces backwards (see **Figure 10**).

Refer to **Head Tilt** on **Page 29** and **Ram Movement** on **Page 30** for detailed instructions to help with this step.

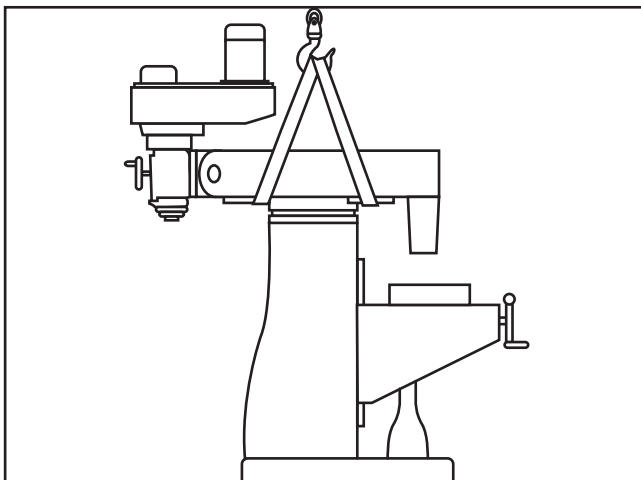


Figure 10. Using lifting slings to lift and move mill.

Note: After repositioning ram and headstock, make sure they are locked in place to prevent unexpected movement while lifting.

4. Torque four turret lock bolts (two on each side of ram, as shown in **Figure 11**) to 47 ft/lbs. This will help keep ram from unexpectedly moving from force of lifting slings.

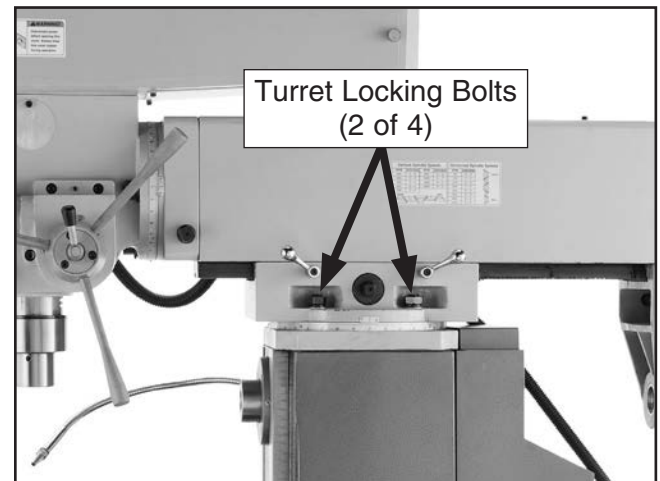


Figure 11. Locations of turret locking bolts.

5. Place lifting slings under ram and connect to a safety hook, as illustrated in **Figure 10**.

Note: Place protective material between slings and mill to protect ram and ways, and to prevent cutting lifting slings.

6. Unbolt mill from shipping pallet.
7. With other people steadying load to keep it from swaying, lift machine a couple of inches.
 - If mill tips to one side, lower it to the pallet and adjust ram or table to balance load. Make sure to retighten lock levers and bolts before lifting mill again.
 - If mill lifts evenly, remove shipping pallet and lower mill into final position.
8. Rotate ram 180° counterclockwise so headstock faces forwards, then re-install horizontal arbor support.



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 12** for an example of a high precision level available from Grizzly.

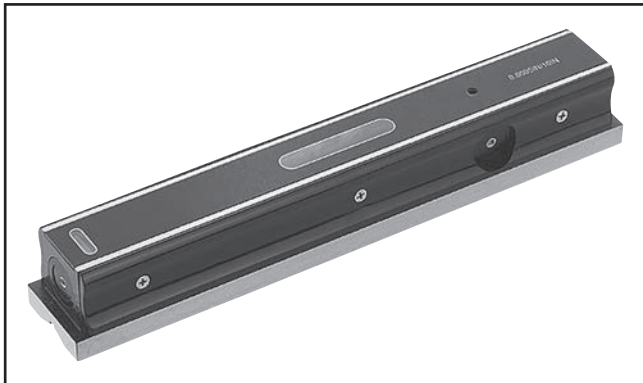


Figure 12. Example of a precision level (Model H2683 shown).

Anchoring to Floor

Number of Mounting Holes 4
Diameter of Mounting Hardware..... 1/2"

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.

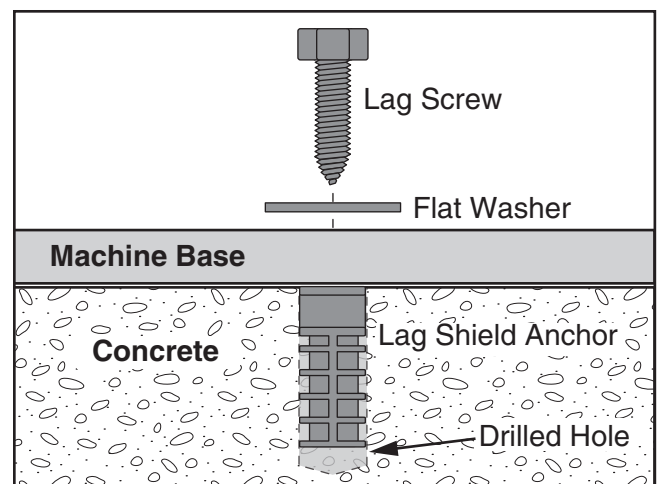


Figure 13. Popular method for anchoring machinery to a concrete floor.



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.

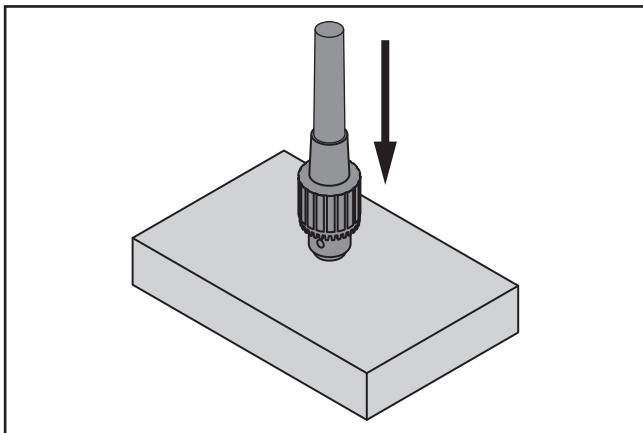


Figure 14. Arbor/chuck assembly.

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 oil reservoir level must be verified before the mill can be operated for the first time. Refer to the **Lubrication** section, beginning on **Page 45**, for details on how to check oil.

NOTICE

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



Assembly

Your mill comes from the factory mostly assembled. To complete assembly you must install:

- X-Axis handwheel handles
- Y-Axis handwheel handle
- Z-Axis crank
- Coarse downfeed handle
- Fine downfeed handwheel handle

Tools Needed	Qty
Open-End Wrench 14, 19mm.....	1 Ea.
Flathead Screwdriver.....	1

To assemble mill:

1. Install handwheel handles onto X-axis and Y-axis handwheels (see **Figure 15**).

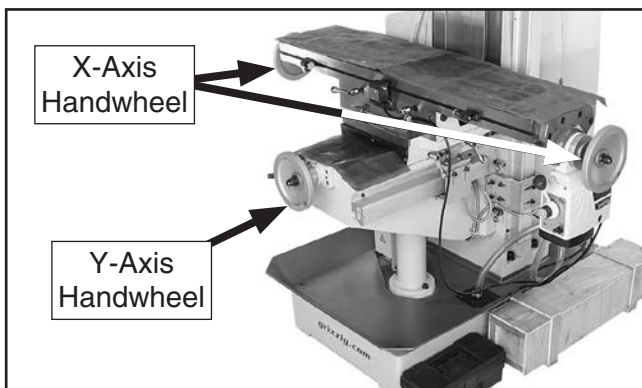


Figure 15. Locations of X-axis and Y-axis handwheels.

2. Slide Z-axis crank onto square spindle (see **Figure 16**).

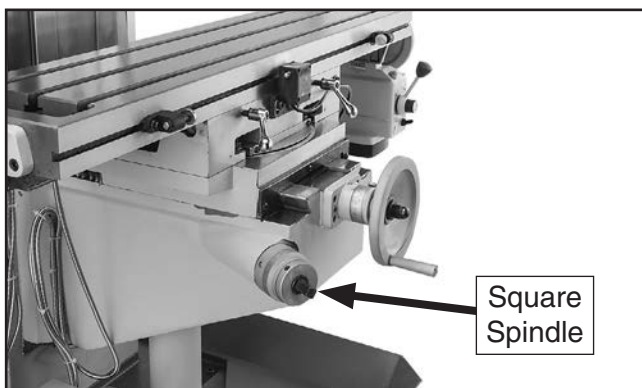


Figure 16. Location of square spindle.

3. Thread coarse downfeed handle into coarse downfeed hub (see **Figure 17**).
4. Remove fine downfeed handle from rear of fine downfeed handwheel and thread into front of handwheel (see **Figure 17**).

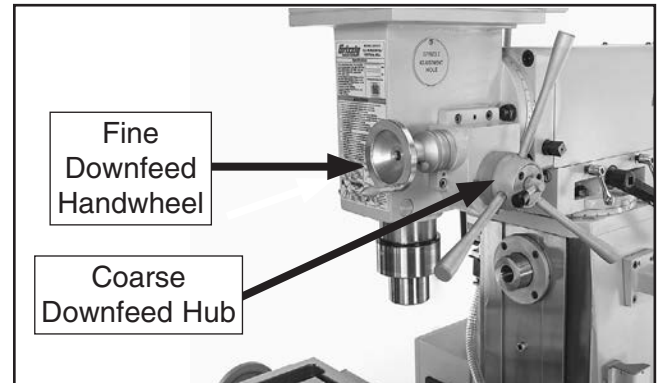
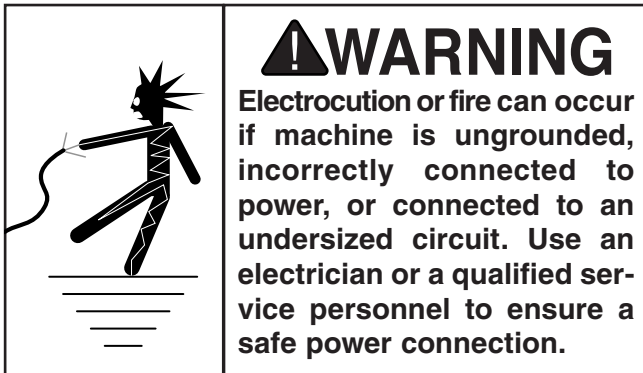


Figure 17. Downfeed components assembled.



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 13**, 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 63**.

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.

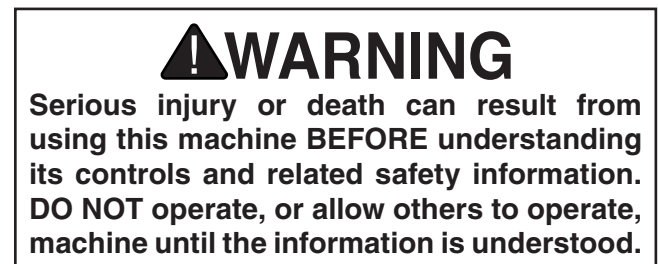
Note About Extension Cords: *Using an incorrectly sized extension cord may decrease the life of electrical components on your machine. Refer to **Extension Cords** on **Page 14** for more information.*

Test Run

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

The test run consists of the following: 1) The vertical and horizontal spindle motors run correctly, 2) the E-STOP button and column interlock safety features work correctly, and 3) the power feed unit works 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.



Mill Test Run

1. Clear all setup tools away from machine.
2. Set horizontal spindle to 72 RPM (see **Page 35** for details on how to change speeds).

Note: *Make sure to close and tighten column rear cover so interlock switch is set. Mill will not run if this is not done.*



3. Push E-STOP button to avoid unexpected start up when machine is connected to power.
4. Connect mill to power source specified in **SECTION 2: POWER SUPPLY** on **Page 13**.
5. Turn master power switch **ON**.
6. Twist E-STOP button clockwise until it pops out—this resets it for operation (see **Figure 18**).

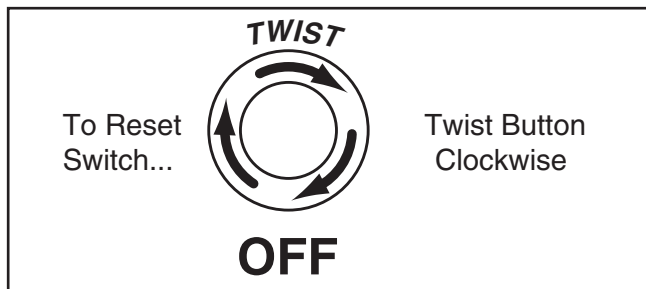


Figure 18. Resetting the E-STOP button.

7. Press POWER button on control panel to enable power to machine—power button and spindle RPM readout should light.
8. Turn variable-speed dial fully counterclockwise, then press FORWARD button (vertical spindle). Rotate variable-speed dial clockwise until 100 RPM is reached.
9. Listen for abnormal noises and watch for anything unexpected from mill. It should run smoothly and without excessive vibration or rubbing noises.

— Vertical spindle motor is equipped with an independent high CFM fan that is always on, and a variable frequency drive which causes the motor to emit a humming noise during normal operation.

— Strange or unusual noises or actions must be investigated immediately. Turn machine **OFF** and disconnect it from the power source before investigating or correcting potential problems.

10. Stop spindle rotation and wait for spindle to completely stop.
11. Repeat **Steps 8–10** with vertical spindle *reverse* rotation.
12. Repeat **Steps 8–11** with horizontal spindle.
13. Press E-STOP button on control panel.
14. **WITHOUT** resetting E-STOP button, attempt to start vertical spindle rotation. Machine should *not* start.

— If machine *does* start (with the E-STOP button pushed in), immediately disconnect power to the machine. The E-STOP button safety feature is not working correctly. This safety feature must work properly before proceeding with regular operations. Call Tech Support for help.

15. Open column rear cover.
16. Reset E-STOP button.
17. **WITHOUT** closing column rear cover, press POWER button. Machine should *not* start.

— If machine *does* start (with the column rear cover open), immediately disconnect power to the machine. The column rear cover interlock switch safety feature is not working correctly. This safety feature must work properly before proceeding with regular operations. Call Tech Support for help.
18. Close column rear cover, and fully tighten bolt.



Power Feed Test Run

The mill comes with a power feed unit for X-axis table travel. Proper operation of the limit switch attached to the front middle of the table is critical for the safe use of this power feed unit. If the power feed does not operate as expected during the following steps, disconnect it from power and contact our Tech Support at (570) 546-9663 for assistance.

To test power feed:

1. Make sure all tools, cables, and other items are well clear of table movement as you follow these steps.
2. Refer to X-axis **Power Feed** identification on **Page 6** to understand how power feed, table locks, and limit switch function.
3. Loosen X-axis table locks on front of table.
4. Make sure power feed directional lever is in neutral (middle) position, turn speed dial counterclockwise to lowest setting, then turn power feed **ON**.
5. Move direction knob to left, slowly rotate speed dial clockwise to increase speed, then confirm table is moving left.
6. Watch for table limit stop to hit limit switch and turn power feed **OFF**, stopping table movement.
7. Move direction knob through neutral (middle) position and all the way right. Table should begin moving right.
8. Confirm table stops moving when limit stop presses against limit switch plunger.
9. Move direction knob to neutral (middle) position, turn speed dial counterclockwise to lowest setting, and turn power feed **OFF**.

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

Spindle Break-In

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

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

NOTICE

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

NOTICE

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

Vertical Spindle Break-In

1. Run vertical spindle at 100 RPM for 10 minutes (see **Page 35** for details on how to change speeds).
2. Reverse spindle rotation direction and run spindle for an additional 10 minutes.
3. Run spindle for 5 minutes in each direction of spindle rotation at the following speeds: 250, 500, 1000, 1500, and 2000 RPM. Make sure to only increase speeds in the order shown.



Horizontal Spindle Break-In

1. Run horizontal spindle at 72 RPM for 10 minutes (see **Page 35** for details on how to change speeds).
2. Reverse spindle rotation direction and run spindle for an additional 10 minutes.
3. Run spindle for 5 minutes in each direction of spindle rotation. Run following speeds: 210, 550 and 1300 RPM. Make sure to only increase speeds in the order shown.

Congratulations! **Spindle Break-In** is complete. We recommend changing the headstock oil before operating the machine further (refer to **Lubrication** on **Page 46**).

Inspections & Adjustments

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

- X-Axis Leadscrew Backlash **Page 60**
- Gib Adjustments **Page 61**

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

NOTICE

Since the head has been moved around for shipping purposes, you will need to tram it so that the spindle is perpendicular to the table. Refer to the *Tramming Spindle* section on *Page 58* for detailed instructions.

NOTICE

During the first 16 hours of use, the V-belts will stretch and seat into the pulley grooves. The V-belts must be properly tensioned after this period to ensure proper power transmission and avoid reducing the life of the belts. Refer to *V-Belt Service* on *Page 52* for detailed instructions.

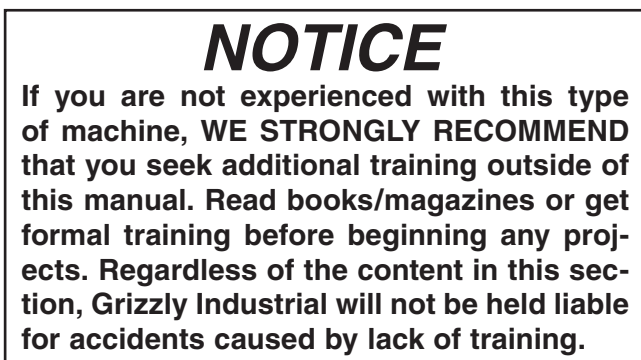


SECTION 4: OPERATIONS

Operation Overview

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

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



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

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



Table Movement

The table travels in three directions, as illustrated in **Figure 19**.

These movements are controlled by table handwheels and the Z-axis crank. Additionally, the table can be moved along the X-axis with the power feed and manually rotated 45° left and right.

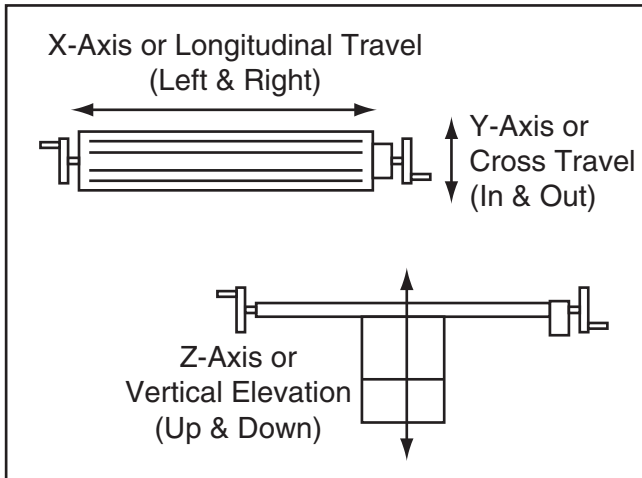


Figure 19. The directions of table movement.

Graduated Index Rings

The table handwheels and Z-axis crank have graduated rings (see **Figure 20**) that are used to determine table movement in 0.001" increments with one full revolution equaling 0.200" of travel.

Additionally, each dial has a thumbscrew that is used to adjust the dial to zero.

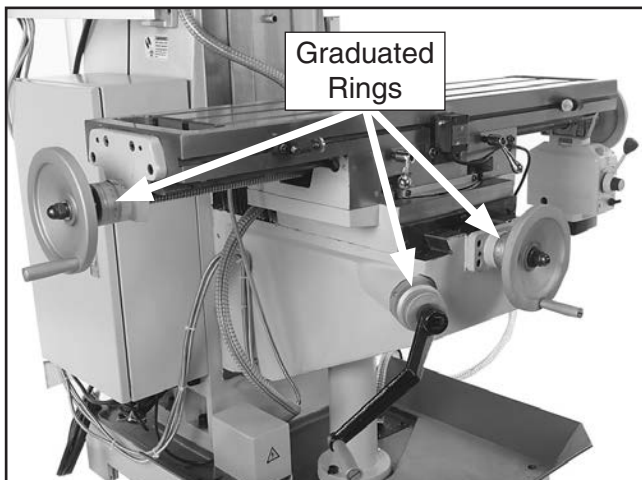


Figure 20. Locations of graduated rings.

Table Locks

Use table locks to increase the rigidity of the table when movement in that axis is not required for the operation.

Refer to **Figure 21** to identify the locks for each table axis.

Limit Stops

Use limit stops in conjunction with the powerfeed to set the total amount of travel. The limit stops come into contact with the limit switch and stop powerfeed motion.

Refer to **Figure 21** to identify the limit stops.

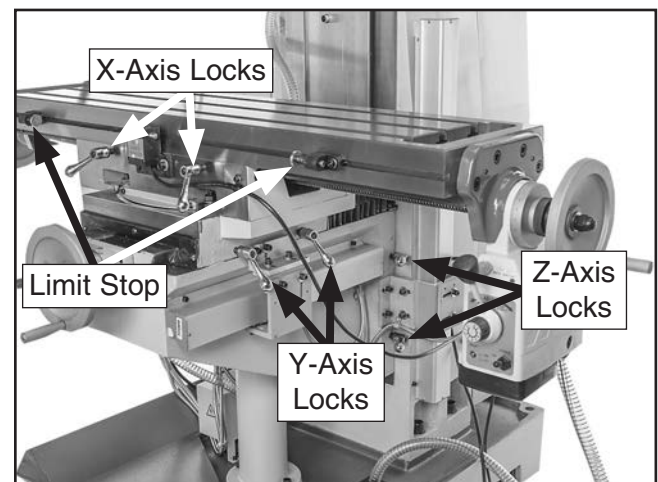


Figure 21. Locations of table locks.

NOTICE

Always keep table locked in place unless table movement is required for your operation. Unexpected table and workpiece movement could cause tooling to bind with workpiece, which may damage tooling or workpiece.



Table Rotation

The table rotates 45° left or right (see **Figure 22**).

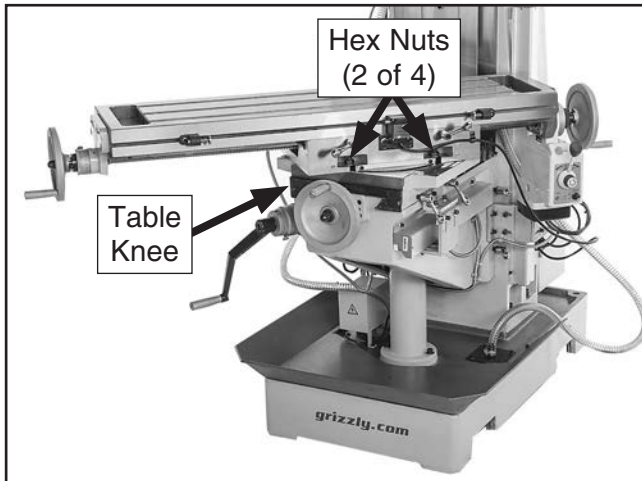


Figure 22. Table rotated 45° to the right.

Tool Needed	Qty
Open-End Wrench 19mm.....	1

To rotate table:

1. DISCONNECT MACHINE FROM POWER!
2. Remove as many items from table as possible. This makes rotating table easier.
3. Loosen four hex nuts that secure table to knee (see **Figure 22**).

Note: *There are two additional hex nuts behind table.*

4. Using angle scale on table knee as a guide, rotate table to desired position.
5. Retighten four hex nuts that secure table to knee before resuming operation.

Head Tilt

The head tilts 90° left or right at the end of the ram.

NOTICE

When positioning head back to 0° after tilting it, you will need to tram it to ensure spindle is precisely perpendicular to table to ensure proper milling accuracy. Refer to *Tramming Spindle* section on *Page 58* for detailed instructions.

Tools Needed	Qty
Open-End Wrench 19mm.....	1
Open-End Wrench 24mm.....	1

To tilt head:

1. DISCONNECT MACHINE FROM POWER!
2. Loosen three hex nuts (one on each side of head and one underneath) that secure head to ram (see **Figure 23**).

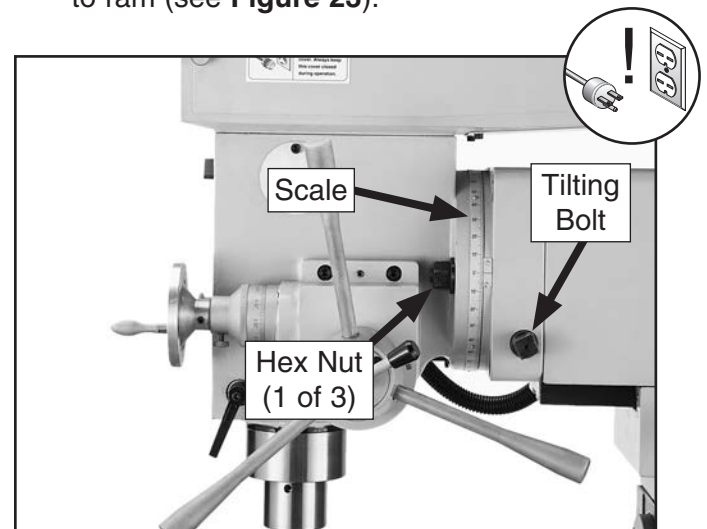


Figure 23. Head tilting controls.

3. With assistance from another person to support head, turn tilting bolt until head is in desired position.

Note: *Use angle scale shown in **Figure 23** as a guide for setting tilt angle.*

4. Retighten hex nuts that secure head to ram before resuming operation.



Ram Movement

The ram travels forward/backward 11" and rotates 180° on the turret.

Tools Needed	Qty
Open-End Wrench 15mm.....	1
Open-End Wrench 24mm.....	1

Moving Ram Forward/Backward

1. DISCONNECT MACHINE FROM POWER!
2. Loosen two lock handles shown in **Figure 24**.

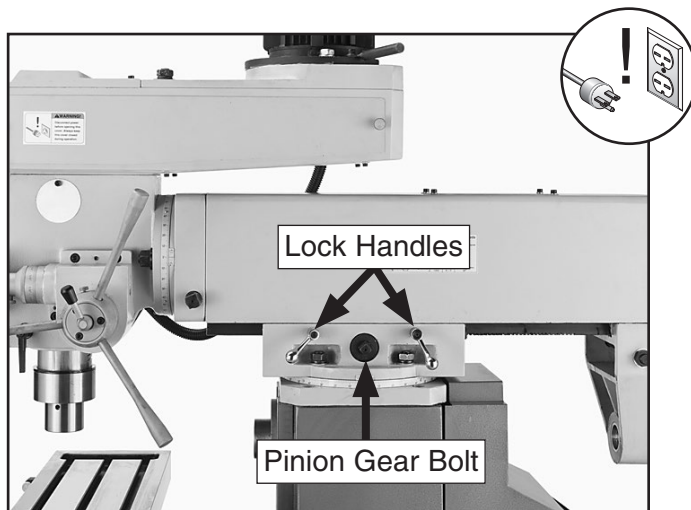


Figure 24. Ram back-and-forth controls.

3. Rotate pinion gear bolt to move ram until spindle is in desired position.
4. Retighten lock handles to secure ram movement before resuming operation.

Rotating Ram On Turret

1. DISCONNECT MACHINE FROM POWER!
2. Loosen four hex nuts (two on each side of ram) that secure ram to turret (see **Figure 25**).

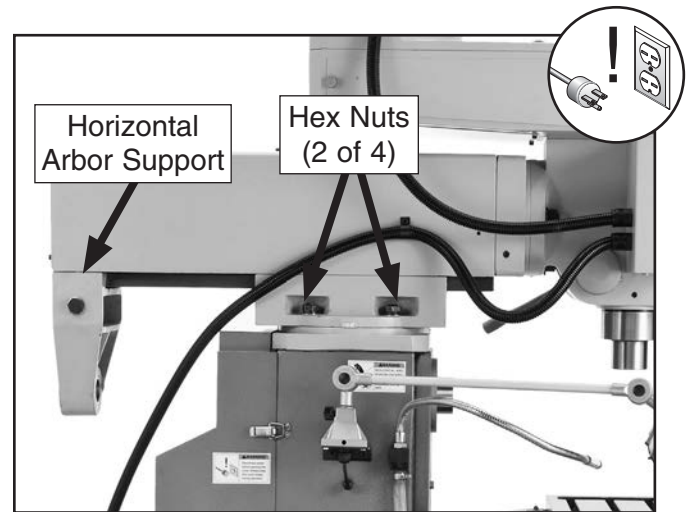


Figure 25. Ram rotation hex nuts.

3. Make sure that cables and hoses are not entangled or stretched, and that work lamp and DRO are clear of rotation path as you move ram on turret.
 - If rotating ram 180 degrees, horizontal arbor support must be removed to provide clearance for control panel and DRO (see **Figure 25**).
4. Retighten four hex nuts that secure ram on turret before resuming operation.



Installing/Removing Tooling

Tools Needed	Qty
Open-End Wrench 19mm.....	1
Brass Hammer	1

Vertical Spindle

Tooling is held in the vertical spindle by a combination of the R-8 taper, a pin inside the spindle, and a $\frac{7}{16}$ "-20 drawbar.

The Model G0757Z includes the following vertical spindle tools (see **Figure 28**):

- A. **B16 Drill Chuck w/R-8–B16 Arbor.** Refer to **Arbor/Chuck Assembly** on **Page 21**.
- B. **R-8–MT#3 Spindle Sleeve.** Used for MT#3 tools and will accommodate tools with a tang. It also has a drift key slot for tool removal.
- C. **MT#3–MT#2 Spindle Sleeve.** Used for MT#2 tools and will accommodate tools with a tang. It also has a drift key slot for tool removal.
- D. **R-8–1" End Mill Arbor.** Arbor accepts 1" bore mill cutters.
- E. **Drift Key:** Use for tool removal.

Installing Vertical Spindle Tooling

1. DISCONNECT MACHINE FROM POWER!
2. Clean any debris or surface substances from inside spindle taper and mating surface of tooling.

Note: *Debris or oily substances can prevent tooling and spindle from properly mating. This condition can cause excessive vibration, poor cutting results, or tool/workpiece damage.*

3. Align tooling keyway with pin inside spindle taper, then firmly push tooling into spindle to seat it.

⚠ CAUTION

Cutting tools are sharp and can easily cause laceration injuries. Use heavy leather gloves or shop rags to protect your hands when handling cutting tools.

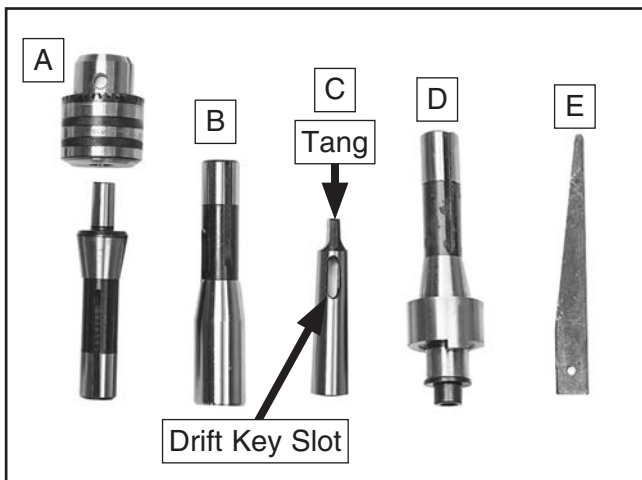


Figure 26. Vertical spindle tools included with model G0757Z.



4. With one hand holding tooling in place, insert vertical drawbar (longer of two drawbars) into spindle from top of head, then thread it into tooling (see **Figure 27**).

Note: Drawbar has an adjustment hex nut (see **Figure 27**) that is used to raise/lower drawbar to compensate for different tooling lengths.

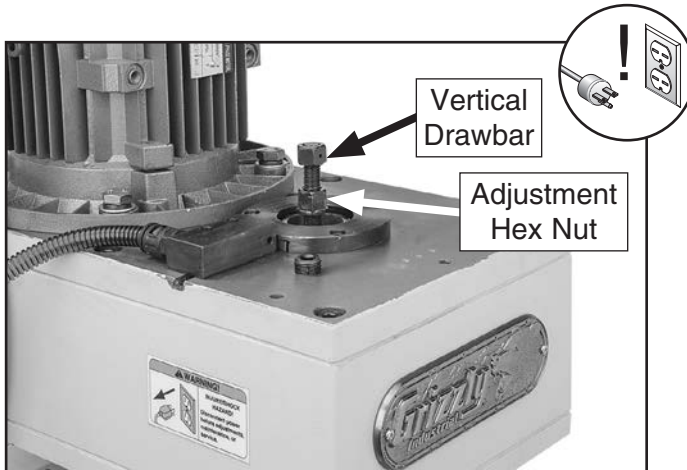


Figure 27. Vertical drawbar inserted in spindle.

5. Tighten drawbar until it is snug. Avoid over-tightening, as this could make removing tooling difficult later.

Removing Vertical Spindle Tooling

1. DISCONNECT MACHINE FROM POWER!

Note: Make sure drawbar has at least three threads engaged with tooling in next step to avoid damaging drawbar threads or tool.

2. Loosen drawbar a couple of turns, then tap top of it with a brass hammer to knock taper between spindle and tooling loose.
3. Support tooling with one hand, then completely unthread drawbar from tooling.

Installing Horizontal Spindle & Tooling

Single or multiple cutters (gang milling) can be arranged anywhere along the length of the arbor for simple to very complex cutting operations.

The Model G0757Z includes the following horizontal spindle tools (see **Figure 28**):

- A. 1 1/4" Dia. Horizontal Arbor w/Spacers.** Used for horizontal milling operations with 1 1/4" bore cutters.
- B. 1" Dia. Horizontal Arbor w/Spacers.** Used for horizontal milling operations with 1" bore cutters.

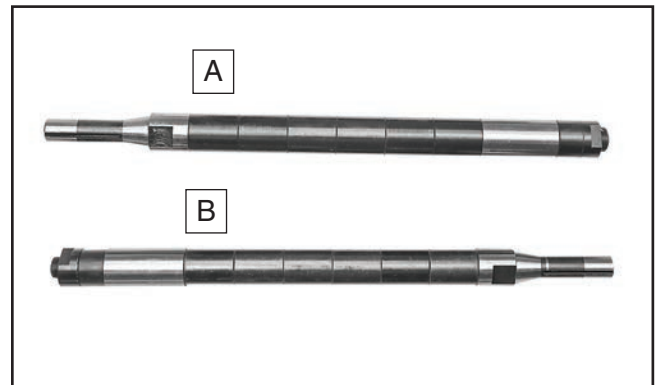


Figure 28. Horizontal arbors included with G0757Z.



Tools Needed	Qty
Open-End Wrench 19mm.....	1
Open-End Wrench 24mm.....	2
Open-End Wrench 32mm.....	1
Brass Hammer	1

To install horizontal tooling:

1. DISCONNECT MACHINE FROM POWER!
2. Loosen locking bolt on side of arbor support, and slide support off ram dovetail way (see **Figure 29**).

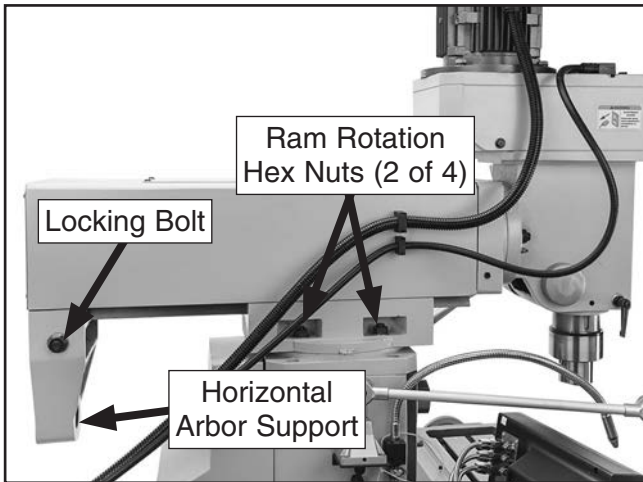


Figure 29. Horizontal arbor support, locking bolt, and ram rotation hex nut locations.

3. Loosen ram rotation hex nuts (**Figure 29**), then rotate ram 180°, as shown in **Figure 30**.

Note: Make sure "0" marks on ram base and angle scale are aligned and four ram rotation hex nuts are retightened.

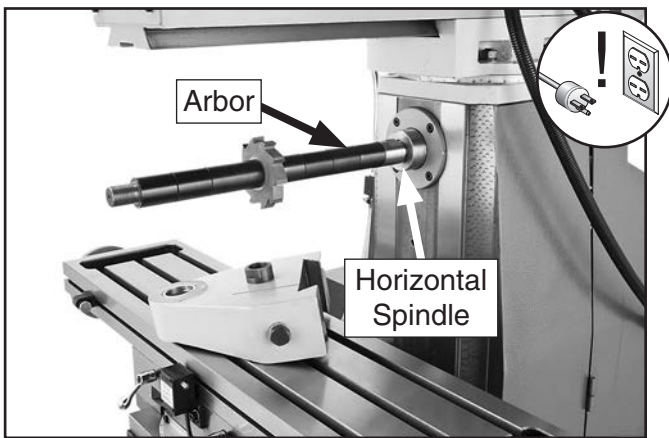


Figure 30. Horizontal arbor seated in spindle with ram fully extended and rotated 180 degrees.

4. Extend ram all the way forward.
5. Open column rear cover to gain access to rear of horizontal spindle.

Note: Opening the column rear cover activates interlock safety switch.

6. Clean any debris or surface substances from inside spindle taper and mating surface of arbor.
7. Align keyway of arbor with protruding pin inside spindle taper, then firmly push arbor into spindle to seat it (see **Figure 30**).
8. With one hand holding arbor in place, insert horizontal drawbar (shorter of two drawbars) into spindle from rear of column, then thread it into arbor.
9. Tighten drawbar until it is snug. Avoid over-tightening, as this could make removing arbor difficult later.

⚠ CAUTION

Cutting tools are sharp and can easily cause laceration injuries. Use heavy leather gloves or shop rags to protect your hands when handling cutting tools.



10. Add ISO 68 oil or equivalent to horizontal spindle and arbor support ball oilers (refer to **Ball Oilers**, beginning on **Page 47**).
11. Install cutter(s) and spacers on arbor in such a way that last spacer is inside brass bushing and arbor threads are fully exposed as you slide arbor support back onto ram dovetail ways (see **Figure 31**).
12. Secure arbor support by retightening support locking bolt.
13. Secure arbor assembly with right-hand arbor nut (see **Figure 31**).

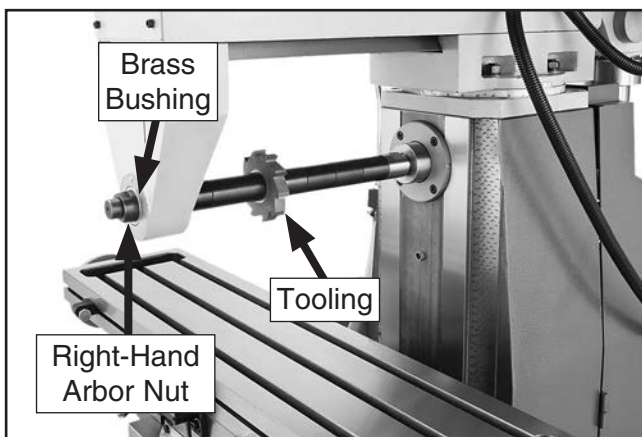


Figure 31. Horizontal arbor and cutter installed.

14. Close and secure column rear cover.

Note: Failure to secure the column rear cover will leave interlock active, and mill will not run.

Removing Horizontal Spindle Tooling

1. DISCONNECT MACHINE FROM POWER!
2. Open column rear cover to gain access to rear of horizontal spindle.

Note: Opening the column rear cover activates interlock safety switch.

3. Remove arbor nut from arbor, then remove arbor support from ram dovetail ways.

Note: Make sure drawbar has at least three threads engaged with arbor in next step to avoid damaging drawbar threads or arbor.

4. Loosen drawbar a couple of turns. Then tap end of drawbar with a brass hammer to knock taper loose between spindle and arbor.
5. Support arbor with one hand, then completely unthread drawbar from arbor.
6. Remove arbor.
7. Re-install arbor support and properly position and secure ram for next operation.
8. Close and secure column rear cover.

Note: Failure to secure the column rear cover will leave interlock active, and mill will not run.



Spindle Speed

Using the correct spindle speed is important for safe and satisfactory results, as well as maximizing tool life.

To set the spindle speed for your operation, you will need to: (1) Determine the best spindle speed for the cutting task, and (2) configure the mill controls to match the closest spindle speed.

Determining Spindle Speed

Many variables affect the optimum spindle speed to use for any given operation, but the two most important are the recommended cutting speed for the workpiece material and the diameter of the cutting tool, as noted in **Figure 32**:

$$\frac{\text{*Recommended Cutting Speed (FPM) x 12}}{\text{Tool Diameter (in inches) x 3.14}} = \text{RPM}$$

*Double if using carbide cutting tool

Figure 32. Spindle speed formula for milling.

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

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

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

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

Cutting Speeds for High Speed Steel (HSS) Cutting Tools	
Workpiece Material	Cutting Speed (sfm)
Aluminum & 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 33. Cutting speed table.

NOTICE

To avoid damaging the spindle, gears, or cutting tools when setting the spindle speed range:

- Spindle rotation must be turned **OFF** and the spindle must be at a complete stop **BEFORE** you change the spindle speed range.
- To avoid damaging the moving parts inside the headstock, never start spindle rotation without the range selector detent pin firmly seated in either the high or low position.
- When the spindle speed range is changed, the spindle rotation direction reverses. You will need to either change the cutting tool to match the direction of spindle rotation or use the spindle direction switch to compensate for the reversal.



Setting Vertical Spindle Speed

1. Select appropriate speed range using high/low gear selector (see **Figure 34**).

"L" represents low speed range, which is capable of spindle speeds from 100–600 RPM. "H" represents high range, which maximizes spindle torque and is capable of spindle speeds from 350–2000 RPM.

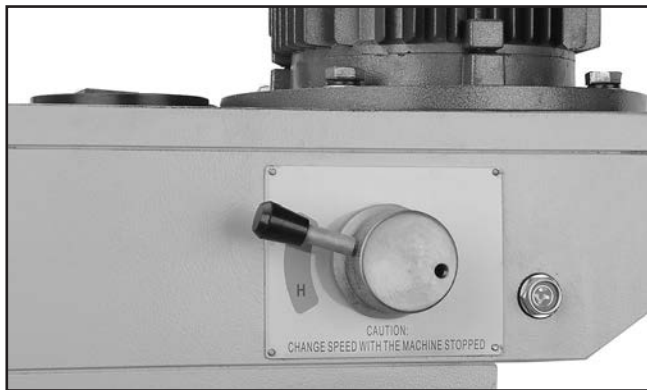


Figure 34. High/Low gear selector in "L" position.

Note: It may be necessary to rotate vertical spindle by hand to enable gears to mesh properly.

2. Rotate variable-speed dial fully counterclockwise (slowest), then press power button and use vertical spindle direction buttons to choose direction of spindle travel and start spindle rotation (see **Figure 35**).

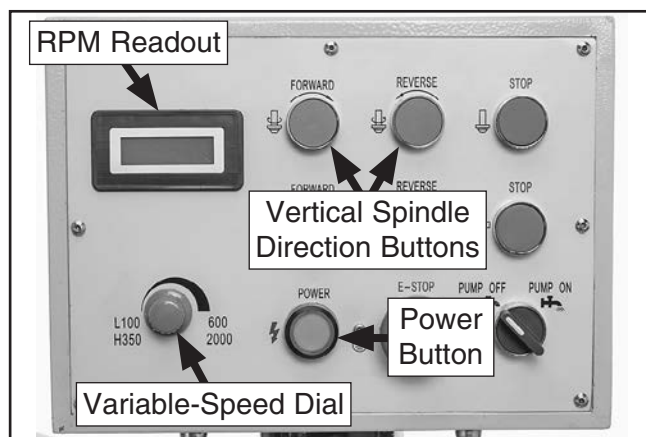


Figure 35. Controls to adjust spindle speed.

3. Watching vertical spindle RPM readout, rotate variable-speed dial until desired RPM is reached.

Setting Horizontal Spindle Speed

Tools Needed	Qty
Open-End Wrench 24mm.....	1
Dead Blow Hammer	1
Hex Wrench 8mm.....	1

To set horizontal spindle speed:

1. DISCONNECT MACHINE FROM POWER!
2. Open column rear cover to gain access to horizontal spindle V-belts and pulleys, as shown in **Figure 36**.

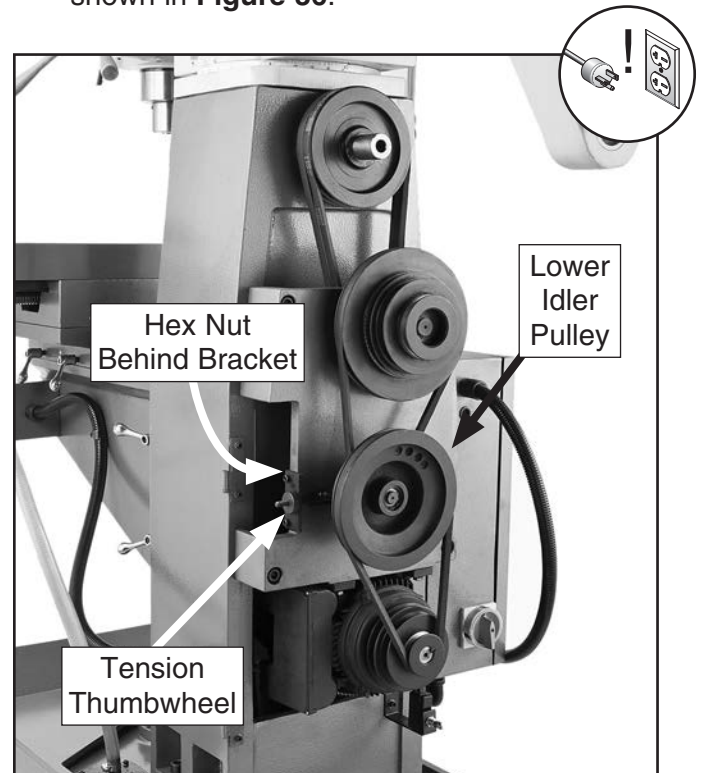


Figure 36. Horizontal spindle V-belts and pulleys (cover removed for photo clarity).

3. Loosen tension thumb wheel and hex nut behind lower idler pulley bracket.
4. Move lower idler pulley to right to release V-belt tension.

Note: You may have to bump lower idler pulley with dead blow hammer to get it to move.



5. Arrange V-belts for desired horizontal spindle speed (see **Figure 37**).

Note: Horizontal spindle speed chart shown below is also on side of column.

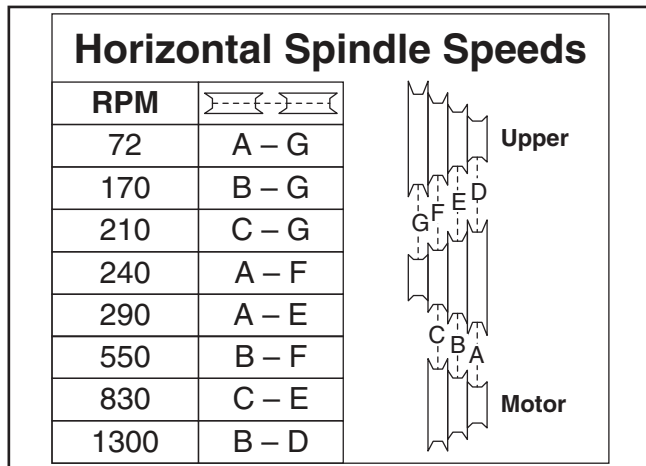


Figure 37. Horizontal spindle speed chart.

6. Apply pressure on lower idler pulley to left as you tighten tension thumbwheel.

Note: There is proper V-belt tension when approximately $\frac{1}{4}$ "– $\frac{1}{2}$ " deflection is achieved by applying moderate pressure midway between pulleys as shown in **Figure 38**.

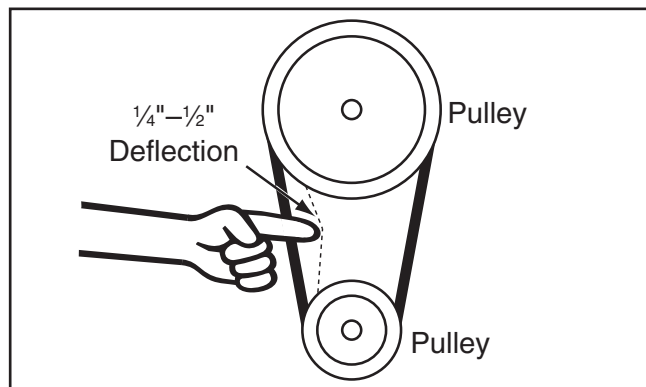


Figure 38. Checking V-belt tension.

7. Retighten hex nut behind lower idler pulley bracket.
8. Close and latch V-belt cover.

Using Spindle Downfeed Controls

Use **Figure 39** and the descriptions below to understand the downfeed components that control the 5" spindle downfeed travel.

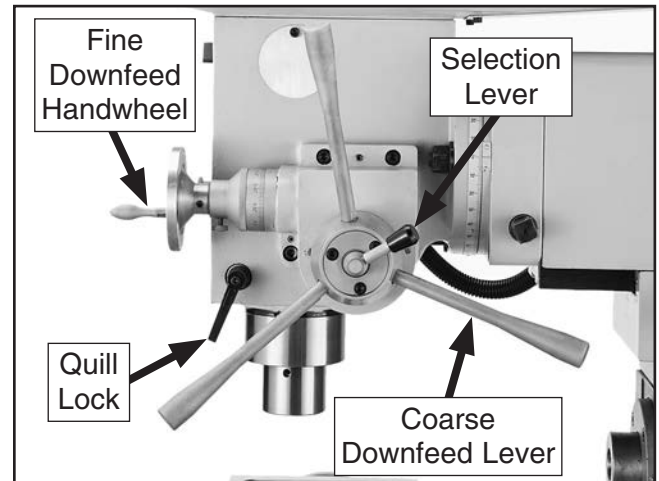


Figure 39. Spindle downfeed controls.

Coarse Downfeed Levers: Manually control downfeed travel in a rapid manner. Generally used for drilling operations. Spindle automatically returns to top position when pressure is released from the handle.

Fine Downfeed Handwheel: Manually controls downfeed travel in a slow, precise manner. Unlike coarse downfeed, spindle does not automatically retract. The attached graduated dial has increments of 0.001" with one full revolution representing 0.100" of travel. Generally used for milling operations.

Selection Lever: When tightened, enables the fine downfeed handwheel; conversely, when loosened enables the coarse downfeed levers.

Quill Lock: Secures the quill in place for increased stability during milling operations.



Coarse Downfeed

When coarse downfeed is engaged, pull coarse downfeed levers to lower the spindle. An internal coil spring helps raise the spindle up when you stop applying downward pressure on the lever.

Note: *To maintain control of the upward spindle travel and the rotating bit in your workpiece, always continue holding the lever until the spindle returns to the top position. Letting go of the coarse downfeed levers when the spindle is in the lowered position will cause the spindle to retract too quickly and slam up into the headstock or lift the workpiece and cause it to spin out of control.*

The coarse downfeed hub features a graduated dial that measures spindle movement in 1" increments, with one full revolution equaling 5.00" of spindle travel.

Fine Downfeed

When fine downfeed is engaged the spindle only moves up or down when the handwheel is rotated (there is no automatic spindle return to the top position, as with the coarse downfeed controls). This level of control allows the spindle height to be locked in place with quill lock when milling a flat surface across the face of a workpiece. In order to ensure the milled surface remains flat, the spindle height cannot move until the entire milling operation is complete.

The graduated dial on the fine downfeed handle measures spindle movement in 0.010" increments, with one full revolution equaling 0.100" of spindle travel.

Using Fine Downfeed Controls

In the following example, the fine downfeed controls are used to mill 0.010" off a workpiece:

1. Use Z-axis crank to adjust workpiece surface just below cutting tool, then secure the headstock with Z-axis lock levers.
2. Tighten selection lever to engage fine downfeed handwheel.
3. Loosen quill lock.
4. Rotate fine downfeed handwheel clockwise and lower cutting tool so it just touches workpiece.
5. Move workpiece out of the way.
6. Using graduated dial to gauge spindle movement, rotate fine downfeed handwheel clockwise 0.010".
7. Tighten quill lock.
8. Turn mill **ON** and perform cutting pass.



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.

T23964—Armor Plate with Moly-D Multi-Purpose Grease, 14.5 oz. (NLGI#2 Equivalent)
Armor Plate with Moly-D is a rich green moly grease that provides excellent stability and unsurpassed performance under a wide range of temperatures and operating conditions. Armor Plate grease is entirely unique due to the fact that the moly in it is solubilized, which provides superior performance to other greases containing the black solid form of molybdenum disulfide.



Figure 40. T23964 Armor Plate with Moly-D Multi-Purpose Grease.

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 41. ISO 68 and ISO 32 machine oil.

H7615—High Pressure Oil Can, 5 Oz.

Whether you're lubricating cutting tools or maintaining machinery in top operating condition, you'll appreciate this High Pressure Oil Can. Holds 5 ounces of oil and has a trigger activated, high pressure pump. Colors may vary.



Figure 42. H7615 High Pressure Oil Can.

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



G1075—52-Pc. Clamping Kit

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

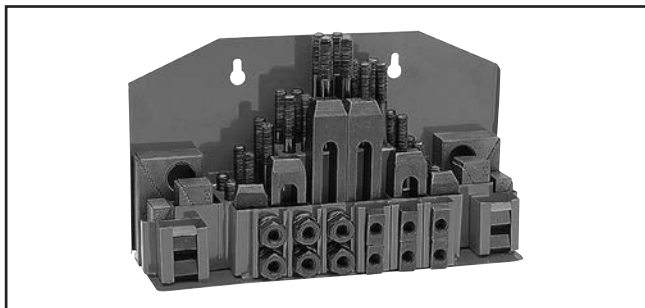


Figure 43. G1075 Clamping Kit.

T10168—3" Boring Head Set

This all-inclusive set features a precision 3" boring head, R-8 shank, five-piece set of 3/4" carbide-tipped boring bars, five-piece set of 1/2" HSS boring bars, 1/2" to 3/4" adapter, wrenches, and fitted case.



Figure 44. T10168 3" Boring Head Set.

T25702— 5-Pc. R-8 End Mill Holder Set

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



Figure 45. T25702 5-Pc. R-8 End Mill Holder Set.

T26688—8-Pc. R-8 Quick Change Collet Set

These collets are hardened and ground for maximum holding power and ultra precision. Threaded for 7/16"-20 draw bars, this set has a maximum runout of 0.001". Set includes collect chuck, 1/4", 5/16", 3/8", 1/2", 5/8", 3/4", and 1" collets, spanner wrench, and moulded plastic case.



Figure 46. T26688 Quick Change Collet Set.



G9756—20-Pc. HSS End Mill Set

This High Speed Steel set features 2 flute and 4 flute end cutting end mills in the following sizes: $\frac{3}{16}$ ", $\frac{1}{4}$ ", $\frac{5}{16}$ ", $\frac{3}{8}$ ", $\frac{7}{16}$ ", $\frac{1}{2}$ ", $\frac{9}{16}$ ", $\frac{5}{8}$ ", $\frac{11}{16}$ " and $\frac{3}{4}$ ". Sizes are marked in a durable molded case.



Figure 47. G9756 20-Pc. HSS End Mill Set.

G9760—20-Pc. 2 & 4 Flute TiN End Mill Set

Includes these sizes and styles in two and four flute styles: $\frac{3}{16}$ ", $\frac{1}{4}$ ", $\frac{5}{16}$ ", $\frac{3}{8}$ ", $\frac{7}{16}$ ", $\frac{1}{2}$ ", $\frac{9}{16}$ ", $\frac{5}{8}$ ", $\frac{3}{8}$ ", $\frac{11}{16}$ ", and $\frac{3}{4}$ ".



Figure 48. G9760 20-Pc. End Mill Set.

H5935—3-Pc. Fly Cutter Set w/Tool Bits 1/2"

Here is a 3-pc. Fly Cutter Set that's hard to beat! Each is supplied with black oxide finish, a set-screw flat and a blank high speed steel tool.



Figure 49. H5935 3-Pc. Fly Cutter Set.

T10390—R-8 Holder for T10388

T10388—4" Milling Cutter

H8323—4" Face Mill Cutter

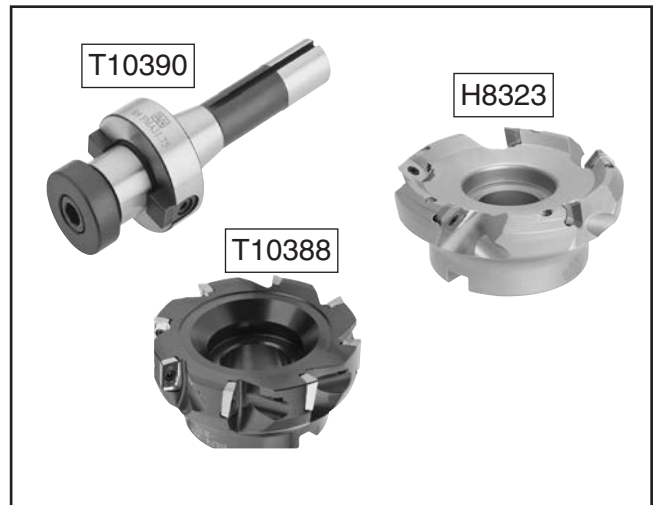


Figure 50. Assortment of cutting tools and holder.



G7066— 5" Tilting/Swiveling Milling Vise

Tilting and swiveling milling vise offers the ultimate in work set-up. Precision aligned jaws and easily accessible tilt and swivel clamps secure for positively worry-free operation. Worth its weight in gold!

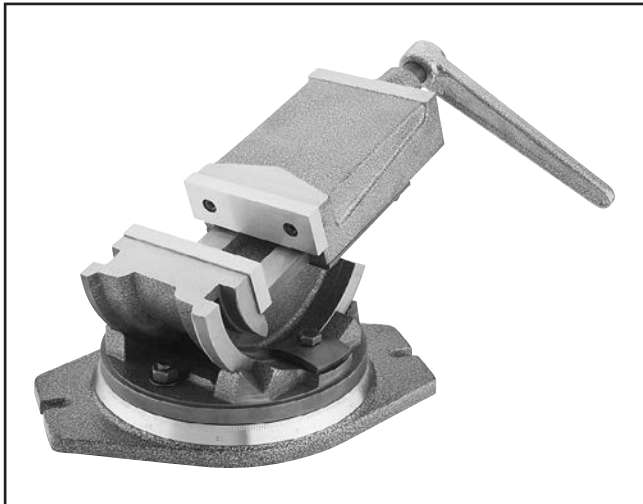


Figure 51. G7066 5" Tilting/Swiveling Milling Vise.

Tilt Tables

G5758—5" x 7" x 3³/₄"

G5759—7" x 10" x 5"

Set your work at any angle from -45° to +45° with these sturdy Tilt Tables. Heavy-duty construction includes 7/16" T-slots, two locking screws, and precision base. 1/2" mounting slots.

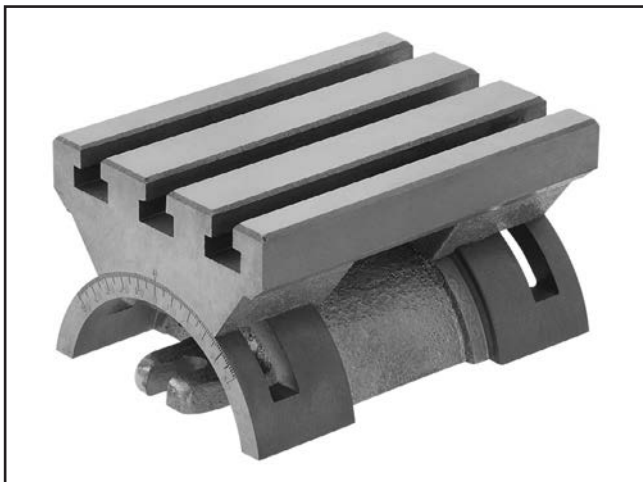


Figure 52. Tilt Table.

G7156—4" (3⁵/₈") Precision Milling Vise

G7154—5" (4¹/₂") Precision Milling Vise

G7155—6" (5⁵/₈") Precision Milling Vise

Swiveling Milling Vises feature perfectly aligned, precision ground jaws, large Acme® screws and easy to read 0°–360° scales.

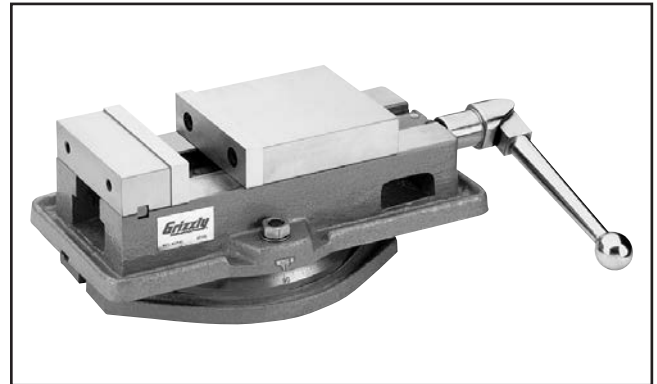


Figure 53. Precision Milling Vise.

H7527— 6" Rotary Table w/ Div. Plates

Use this 6" rotary table in either the horizontal or vertical position for a variety of milling applications and with the set of dividing plates and adjustable tailstock, your milling applications are nearly unlimited. With 4 degree table movement per handle rotation and 20 second vernier scale, control is very accurate and precise. Also includes a 3/8" clamping set for the 4-slot table. Everything you need in one great set!

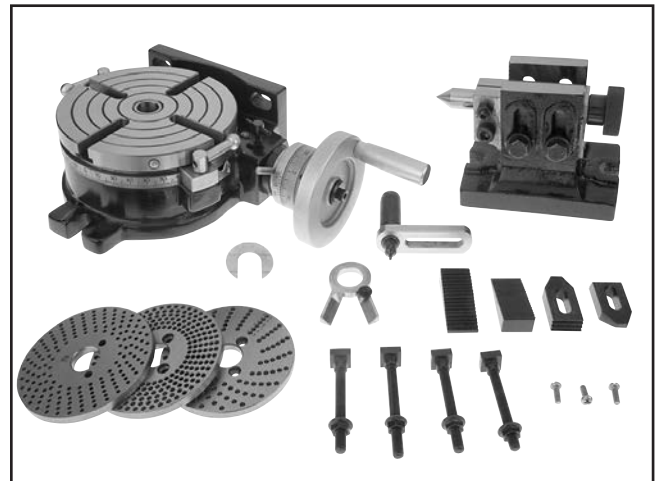


Figure 54. H7527 6" Rotary Table w/Div. Plates.



Digital Indicators

G9806—Dial Indicator 0.05" Range x 0.0001"

H3326— Digital Indicator

If your measuring requirements call for supreme accuracy within a short range, this is the Dial Indicator for you. Graduations are 0.0001" (one ten thousandth of an inch) and range is 0.05" (five hundredths of an inch). Fits all dial indicator magnetic bases.



Figure 55. Assortment of digital indicators.

Basic Eye Protection

T20501—Face Shield Crown Protector 4"

T20502—Face Shield Crown Protector 7"

T20503—Face Shield Window

T20451—"Kirova" Clear Safety Glasses

T20452—"Kirova" Anti-Reflective S. Glasses

H7194—Bifocal Safety Glasses 1.5

H7195—Bifocal Safety Glasses 2.0

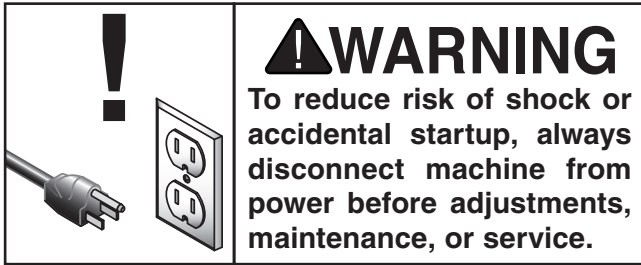
H7196—Bifocal Safety Glasses 2.5



Figure 56. Assortment of basic eye protection.



SECTION 6: MAINTENANCE



Schedule

Regular maintenance will help ensure proper care of the equipment. We strongly recommend that all operators make a habit of following the maintenance procedures found in this section. 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 the machine down immediately, disconnect it from power, and fix the problem before continuing operations.

- Loose mounting bolts or fasteners.
- Worn, frayed, cracked, or damaged wires.
- E-STOP button not working correctly.
- Worn or loose V-belts (see **Page 52**).
- Missing or open belt guards/door.
- Coolant not flowing correctly.
- Any other unsafe condition.

Before Beginning Operations

- Press the E-STOP button on the control panel to prevent high-speed spindle startup when connected to power.
- Make sure the X-axis power feed is turned **OFF** to prevent unintentional table movement when connected to power.
- Check the coolant reservoir in the base. Fill it or clean it out if necessary (see **Page 51**).
- Perform all required lubrication tasks (see **Page 45**).
- Check table movement in all three axes for loose/tight gibs. Adjust the gibs if necessary.

Daily, After Operations

- Push the E-STOP button, turn the master power switch **OFF**, and disconnect the machine from power.
- Vacuum/clean all chips and swarf from table, slides, and base.
- Wipe down all unpainted or machined surfaces with a high-quality rust preventative.

Cleaning & Protecting

Metal chips and other debris left on the machine will invite oxidation and a gummy residue build-up around the moving parts. Use a brush and shop vacuum to remove chips and debris from the working surfaces of the mill. Never blow off the mill with compressed air, as this will force metal chips deep into the mechanisms and may cause injury to yourself or bystanders.

Remove any rust build-up from unpainted cast iron surfaces of your mill and treat them with a non-staining lubricant after cleaning.

Keep unpainted cast iron surfaces rust-free with regular applications of products like G96® Gun Treatment, SLIPIT®, or Boeshield® T-9 (see **Figure 57** and the Grizzly catalog or website).



Figure 57. Products to clean and protect unpainted cast iron surfaces.



Lubrication

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

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

DISCONNECT MACHINE FROM POWER before performing any lubrication task!

Important: *Before adding lubricant, clean the debris and grime from the device and the immediate area to prevent contamination of the new lubricant.*

Use the schedule and information in the chart below as a daily guide for lubrication tasks.

Lubrication Task	Frequency (Hours of Operation)	Page Ref.
Ball Oilers	4–8	47
Vertical Spindle Bearings	4–8	48
Quill Exterior	4–8	48
Quill Rack & Pinion	40	48
Table Leadscrews	40	49
Ram Ways	40	49
Z-Axis Bevel Gears	80	49
X-Axis Power Feed Gears	80	50

NOTICE

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



Headstock

Oil TypeModel T23963 or ISO 32 Equivalent
Oil Amount.....2.1 Quarts
Lubrication Frequency..... Annually

The headstock uses ISO 32 machine oil to lubricate the gears, and is equipped with an oil-level sight glass to gauge when the proper amount of oil is in the headstock.

The amount of oil in the headstock must be regularly monitored before each operation to ensure it doesn't drop below sight glass visibility. Headstock oil must be changed on an annual basis to ensure proper lubricity of oil.

Tools Needed	Qty
Open-End Wrench 12mm.....	1
Hex Wrench 8mm.....	1
Drain Pan (2-Gallon or Larger).....	1
Pump-Type Oil Can with Plastic or Rubber Tip. 1	

To change oil in headstock:

1. Remove oil fill plug from top of headstock (see **Figure 58**).

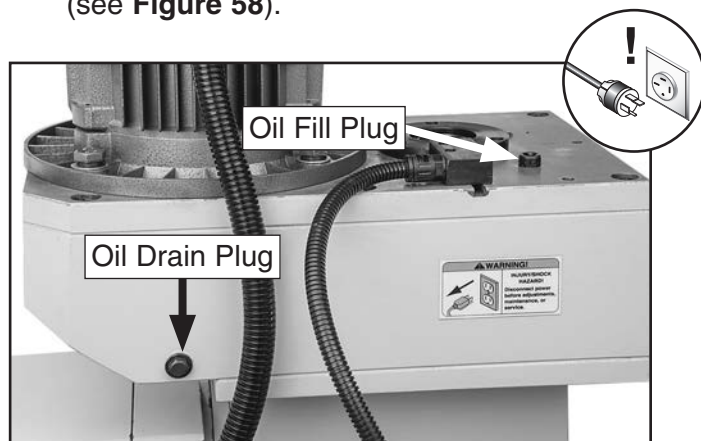


Figure 58. Headstock oil fill and drain locations.

2. Hold drain pan under drain plug and remove drain plug. Allow old oil to drain into drain pan.
3. Replace and tighten drain plug.

NOTICE

Do not fill headstock with oil above red mark. This could damage machine and create an overflow of oil.

4. Fill headstock with oil to red mark on sight glass (see **Figure 59**).

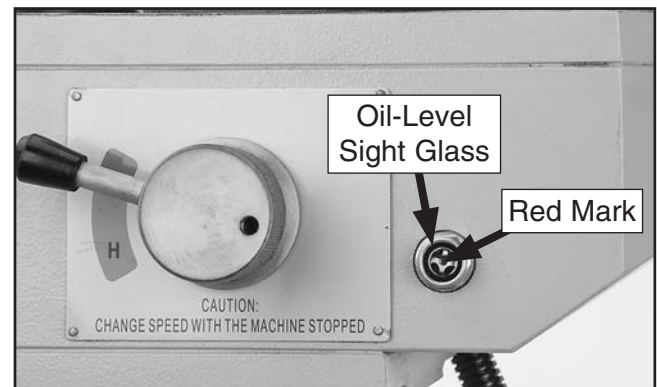


Figure 59. Red mark on sight glass indicates headstock oil level is full.

5. Re-install oil fill plug.
6. Discard used oil following federal, state, and fluid manufacturer guidelines for proper disposal.



Ball Oilers

Oil TypeModel T23963 or ISO 32 Equivalent
Oil Amount..... 1-2 Pumps
Lubrication Frequency 4-8 Hrs. of Operation

Proper lubrication of ball oilers is done with a pump-type oil can that has a cone tip (see **Page 39** for offerings from Grizzly). We do not recommend using metal needle or lance tips, as they can push the ball too far into the oiler, break the spring seat, and lodge the ball in the oil galley.

Push the tip of the oil can nozzle against the ball oiler to create a hydraulic seal, then pump the oil can once or twice. If you see sludge and contaminants coming out of the lubrication area, continue pumping the oil can until the oil runs clear. Move the components through the entire path of travel a few times to distribute the oil. When finished, wipe away the excess oil.

Use **Figures 60-64** to locate the 13 ball oilers on the Model G0757Z.

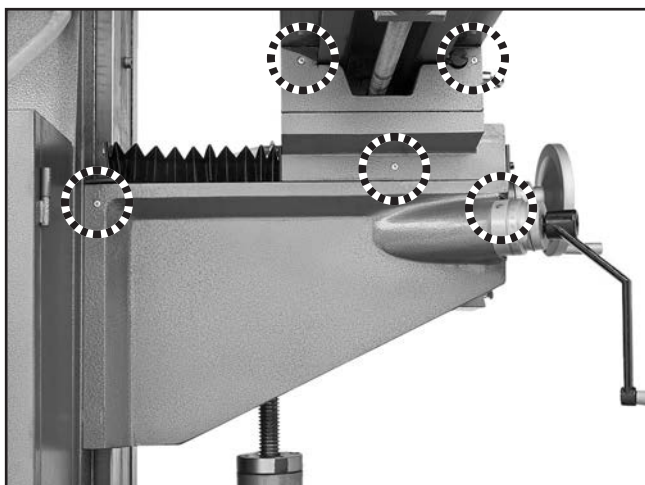


Figure 60. Ball oilers on the side of the knee and Z-axis crank ball oiler.

Note: *There is a single ball oiler duplicated on the opposite side of the knee.*

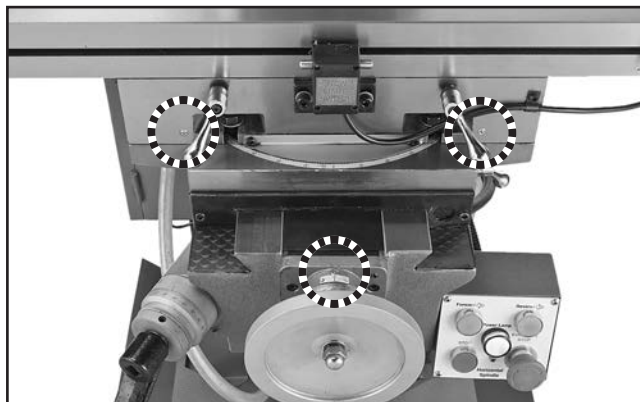


Figure 61. Front saddle and Y-axis handwheel ball oilers.



Figure 62. Rear saddle ball oilers.

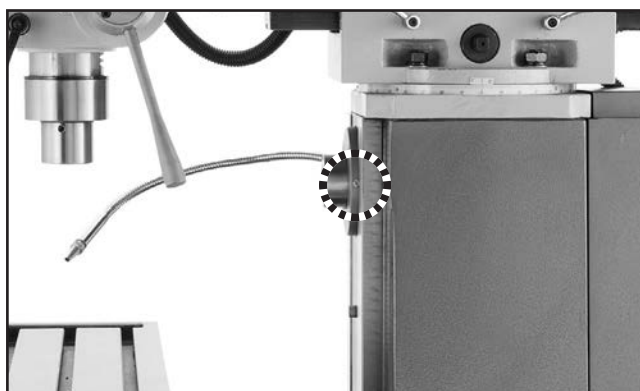


Figure 63. Horizontal spindle ball oiler.

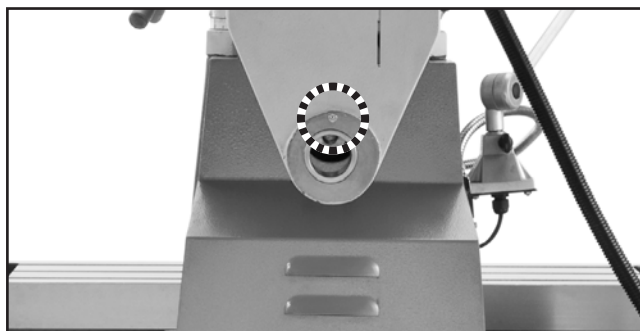


Figure 64. Horizontal spindle arbor support ball oiler.



Vertical Spindle Bearings

Oil TypeModel T23963 or ISO 32 Equivalent
Oil Amount..... 1-2 Pumps
Lubrication Frequency 4-8 Hrs. of Operation

To lubricate vertical spindle bearings:

1. Remove circular cover on right side of head to expose vertical spindle spline (see **Figure 65**).

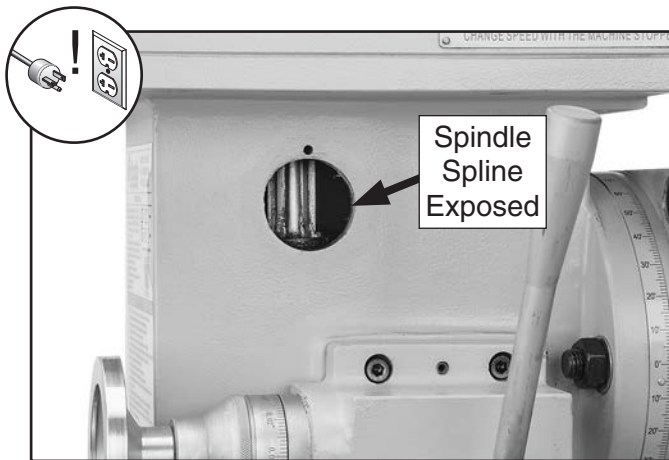


Figure 65. Vertical spindle spline exposed for lubrication.

2. Raise spindle until you can see top of quill.
3. Add 1-2 pumps from an oil can between spindle spline and top of quill.
4. Replace circular cover and run vertical spindle for a few minutes to distribute oil in bearings.

Quill Exterior

Oil TypeModel T23962 or ISO 68 Equivalent
Oil Amount.....Thin Coat
Lubrication Frequency 4-8 Hrs. of Operation

Fully extend the spindle to expose the quill (see **Figure 66**), then use an oily shop rag to apply a thin coat of lubricant to the smooth surface of the quill.

Note: If you remove any of the grease from the teeth of the quill rack, replace it as instructed below.

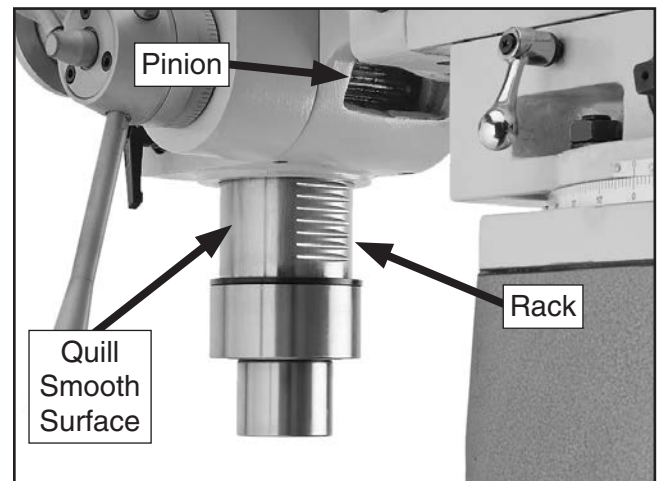


Figure 66. Quill lubrication points.

Quill Rack & Pinion

Grease Type NLGI#2 Grease or Equivalent
Oil Amount.....Thin Coat
Lubrication Frequency40 Hrs. of Operation

Fully extend the spindle to expose the quill rack (see **Figure 66**), then use mineral spirits, shop rags, and a brush to clean the old grease from the teeth of the rack and pinion.

When dry, use a brush to apply a thin coat of grease to the teeth, then move the quill up and down several times to evenly distribute the grease.



Table Leadscrews

Oil TypeModel T23962 or ISO 68 Equivalent
Oil Amount.....Thin Coat
Lubrication Frequency.....40 Hrs. of Operation

Move the table as necessary to access the entire length of the X-, Y-, and Z-axis leadscrews (see **Figures 67–68**), then use mineral spirits, shop rags, and a brush to clean them.

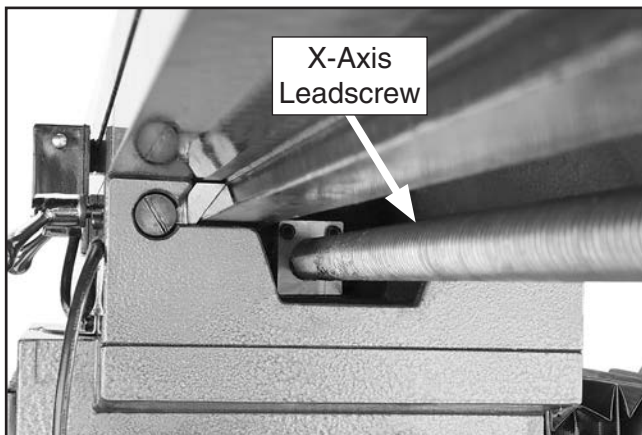


Figure 67. X-axis leadscrew (as viewed underneath the table).

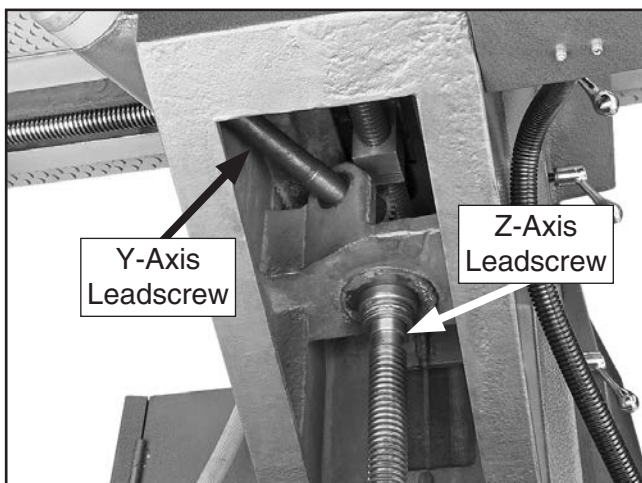


Figure 68. Y- and Z-axis leadscrews (as viewed underneath the knee).

When dry, use a clean brush to apply a thin coat of oil to the leadscrew threads, then move the table through the X-, Y-, and Z-axis paths to distribute the oil.

Ram Ways

Oil TypeModel T23962 or ISO 68 Equivalent
Oil Amount.....Thin Coat
Lubrication Frequency.....40 Hrs. of Operation

Move the ram as necessary to gain access to the entire length of the ram dovetail ways (see **Figure 69**), use mineral spirits and shop rags to clean the ways, then apply a thin coat of lubricant.

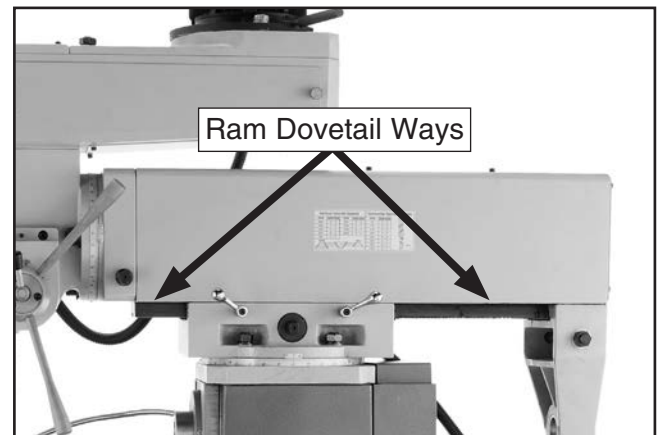


Figure 69. Ram dovetail ways.

Z-Axis Bevel Gears

Grease TypeNLGI#2 Grease or Equivalent
Oil Amount.....Thin Coat
Lubrication Frequency.....80 Hrs. of Operation

Use mineral spirits, shop rags, and a brush to clean the old grease from the teeth of the bevel gears shown in **Figure 70**.

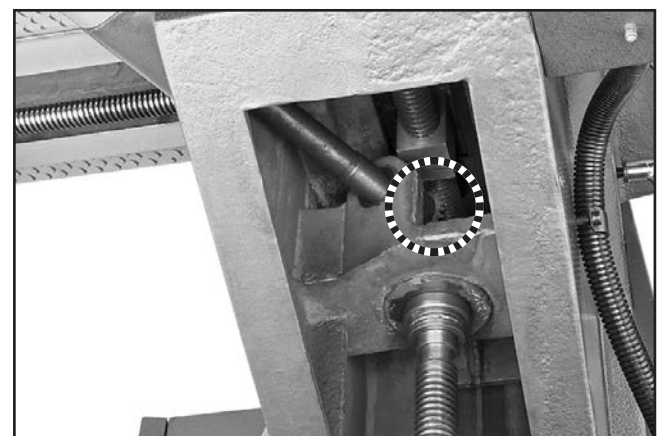


Figure 70. Location of Z-axis bevel gears.

When dry, use a brush to apply a thin coat of grease to the teeth, then move the table up and down to evenly distribute the grease.



X-Axis Power Feed Gears

Grease TypeT23964 or NLGI#2 Equivalent
AmountThin Coat
Add Frequency40 Hrs. of Operation

Tool Needed	Qty
Open-End Wrench 19mm.....	1

To lubricate power feed gears:

1. DISCONNECT MACHINE FROM POWER!
2. Remove hex nut and ball handle from power unit end of the X-axis leadscrew.
3. Unthread and remove knurled retaining ring and graduated dial ring from end of leadscrew.
4. Remove brass bevel gear from leadscrew, then remove leadscrew alignment key (see **Figure 71**).

5. Brush a light coat of grease on bevel gear teeth and smaller drive gear.
6. Replace leadscrew alignment key, then align bevel gear keyway with key as you slide gear onto leadscrew and mesh its teeth with drive gear.
7. Replace graduated dial ring and secure it with knurled retaining ring—do not overtighten.
8. Slide ball handle onto leadscrew, align keyway with leadscrew alignment key, then secure it with hex nut removed in **Step 2**.
9. Move table with ball handle to check gear movement and distribute grease on gears. If movement is not smooth, repeat **Steps 2–8** until it is.

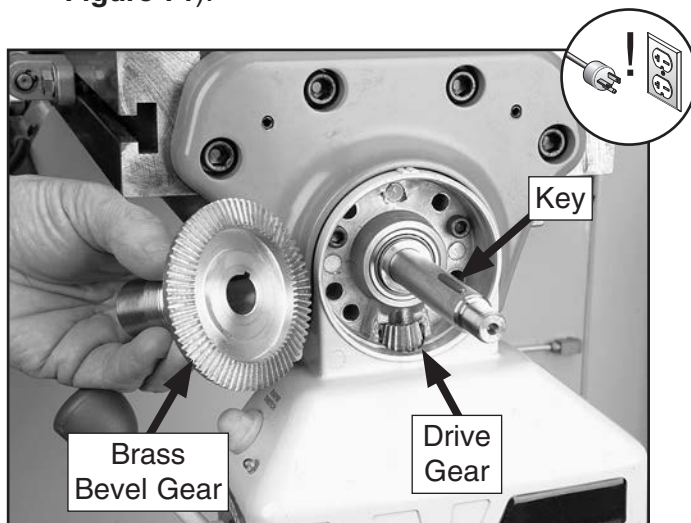


Figure 71. Power feed gears and key.

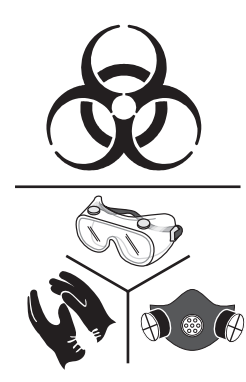


Adding/Changing Coolant

Hazards

As some coolant ages, dangerous microbes can proliferate and create a biological hazard. The risk of exposure to this hazard can be greatly reduced by replacing the old coolant on a regular basis, as indicated in the maintenance schedule.

The important thing to keep in mind when working with the coolant is to minimize exposure to your skin, eyes, and respiratory system by wearing the proper PPE (personal protective equipment), such as splash-resistant safety glasses, long-sleeve gloves, protective clothing, and a NIOSH approved respirator.

	<p>⚠️ WARNING BIOLOGICAL & POISON HAZARD! Use the correct personal protection equipment when handling coolant. Follow federal, state, and fluid manufacturer requirements for proper disposal.</p>
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A small amount of coolant is lost during normal operation. Check the coolant reservoir regularly and fill it if necessary. We recommend changing the coolant every three months or sooner if it develops an unpleasant odor. However, be sure to follow the coolant manufacturer's instructions when checking, adding, or changing coolant.

The coolant reservoir holds approximately 2 gallons (7.5 liters) of fluid.

<p>NOTICE Running coolant pump without adequate coolant in reservoir may permanently damage coolant pump, which will not covered by warranty.</p>

Checking/Adding Coolant

Tools Needed	Qty
Hex Wrench 5mm.....	1
Goggles	1 Per Person
Gloves	1 Per Person
Respirator.....	1 Per Person
New Coolant.....	Approx. 2 Gallon (7.5 Liters)
Disposable Shop Rags.....	As Needed

To check or add coolant:

1. DISCONNECT MACHINE FROM POWER!
2. Clean away debris and grime from coolant return screen and surrounding area, then remove screen from base, as shown in **Figure 72**.

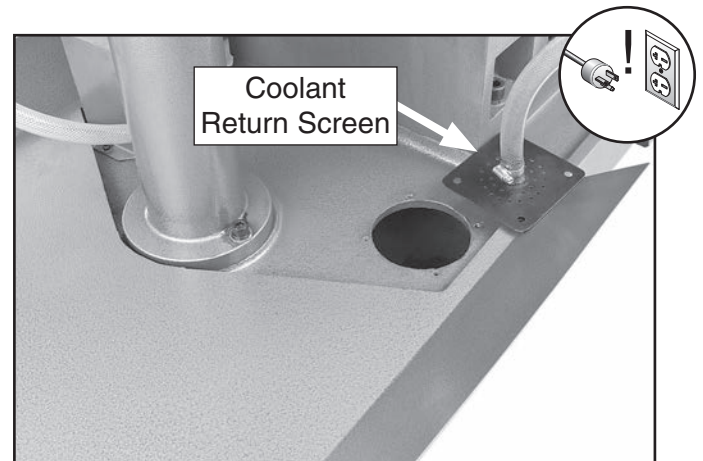


Figure 72. Coolant return screen removed.

3. Use a clean metal tool as a dip stick to measure the level of coolant in reservoir. If lower than 1½", add coolant by pouring it into return screen hole.
4. Re-install return screen before resuming milling operations.

Tip: As an alternate method, leave return screen in place and use a clean, small instrument through holes in return screen, such as a dip stick. If more coolant is necessary, make sure screen and surrounding area are clean from any containments, then add coolant through screen.



Changing Coolant

Tools Needed	Qty
Hex Wrench 5mm.....	1
Catch Pan.....	1
Empty Bucket 5-Gal.	1
Rubber Hose (optional)	1
Goggles	1 Per Person
Gloves	1 Per Person
Respirator	1 Per Person
New Coolant.....	Approx. 2 Gallons (7.5 Liters)
Disposable Shop Rags.....	As Needed

To change coolant:

1. Put on personal protective equipment.
2. Place catch pan on table, position coolant nozzle into pan, then use coolant pump to drain reservoir.

Note: When catch pan is near full, empty it into a 5 gallon bucket, then repeat process until reservoir is empty.

Tip: Alternately, slide a rubber hose onto coolant nozzle and point it 5 gallon bucket.

3. DISCONNECT MACHINE FROM POWER!
4. Clean away debris from coolant return screen and surrounding area, then remove screen from base.
5. Thoroughly clean out reservoir. Make sure interior is dry before adding new coolant.

Note: Use a shop vacuum and a cleaning solution that is compatible with type of coolant. For instance, if you are using a water-base coolant, then use a water-base cleaning solvent. Also, use magnets to remove any metal chips left behind.

6. When reservoir is clean and dry, fill reservoir with new coolant through hole in the base left by return screen.

Tip: Place a couple of magnets inside reservoir under return screen to collect metal particles and keep them out of coolant pump.

7. Re-install return screen before resuming mill- ing operations.

V-Belt Service

During the first 16 hours of use, the V-belts may stretch slightly and seat into the pulleys. It is important to check and adjust them to compensate for this initial wear. Check the tension thereafter on a regular basis. If belts become excessively worn or damaged, replace them.

All V-belts can be replaced by releasing the tension and rolling them off the pulleys, then rolling the new belts back onto the pulleys.

Tensioning Lower Horizontal Spindle V-Belts

Tools Needed	Qty
Open-End Wrench 24mm.....	1
Dead Blow Hammer	1
Hex Wrench 8mm.....	1

To tension lower horizontal spindle V-belts:

1. DISCONNECT MACHINE FROM POWER!
2. Open column rear cover to gain access to horizontal spindle V-belts and pulleys, as shown in **Figure 73**.

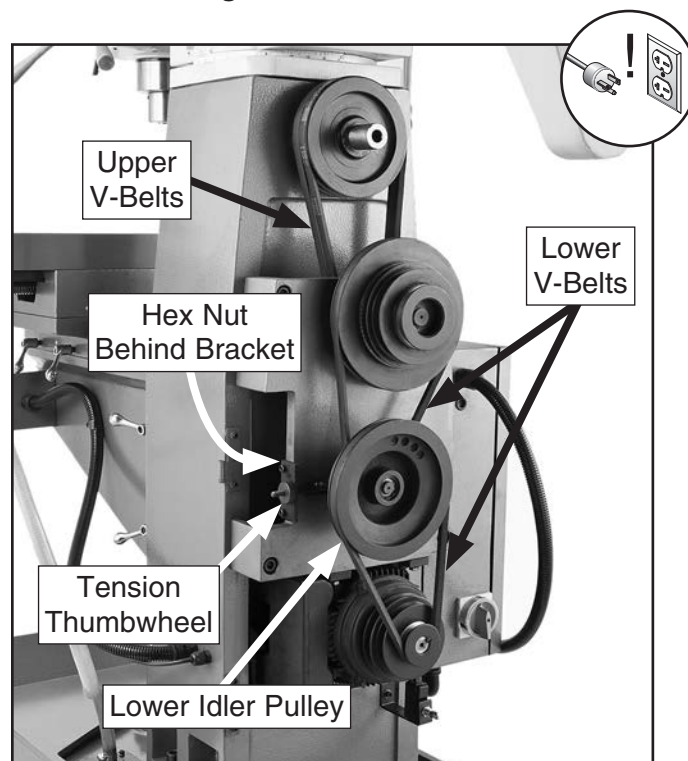


Figure 73. Horizontal spindle V-belts and pulleys (cover removed for photo clarity).



- Loosen tension thumbwheel and hex nut behind lower idler pulley bracket.

Note: In next step, you may have to bump lower idler pulley with dead blow hammer to get it to move.

- Apply pressure on lower idler pulley to the left as you tighten tension thumbwheel.

Note: There is proper V-belt tension when approximately $\frac{1}{4}$ "– $\frac{1}{2}$ " deflection is achieved (see **Figure 74**) by applying moderate pressure midway between pulleys.

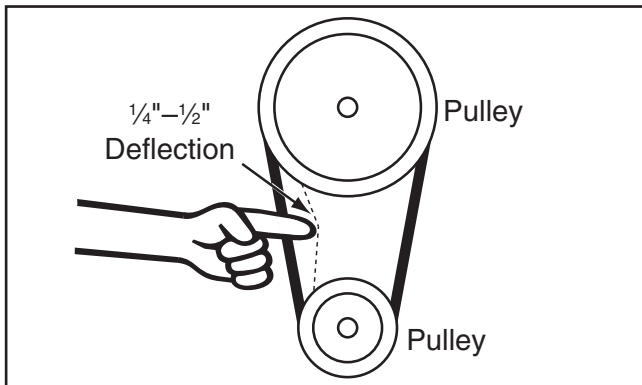


Figure 74. Checking V-belt tension.

- Retighten hex nut behind center pulley bracket.
- Close and rear column cover.

Tensioning Upper Horizontal Spindle V-Belts

Tools Needed	Qty
Hex Wrench 6mm.....	1
Open-End Wrench 14mm.....	1

To tension upper horizontal spindle V-belts:

- DISCONNECT MACHINE FROM POWER!
- Open horizontal column rear cover to gain access to horizontal spindle V-belts and pulleys.
- Loosen hex nut on center cap screw shown in **Figure 75**, then rotate cap screw clockwise to increase tension in upper V-belts.

Note: There is proper V-belt tension when approximately $\frac{1}{4}$ "– $\frac{1}{2}$ " deflection is achieved (see **Figure 74** on previous page) by applying moderate pressure midway between pulleys.

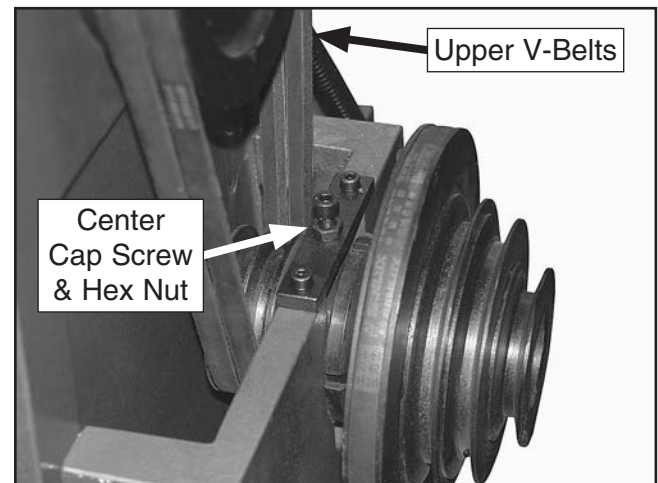


Figure 75. Upper horizontal V-belt tensioning cap screw.

- Retighten hex nut and secure column rear cover.



Machine Storage

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

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

Preparing Mill for Storage

1. DISCONNECT MACHINE FROM POWER!
2. Lubricate machine as directed in **Lubrication** on **Page 46**.
3. Clean out coolant reservoir as directed in **Changing Coolant** on **Page 51**.
4. Thoroughly clean all unpainted, bare metal surfaces, then coat them with quality rust preventative. Take care to ensure these surfaces are completely covered but rust preventative is kept off painted surfaces.

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

5. Loosen belts to prevent them from stretching during storage. Post a reminder on machine that belts need to be re-installed or tensioned before resuming operations.
6. Place a few moisture-absorbing desiccant packs inside electrical cabinet.
7. Cover and place machine in a dry area that is out of direct sunlight and away from hazardous fumes, paint, solvents, or gas. Fumes and sunlight can bleach or discolor paint and plastic parts.

Bringing Mill Out of Storage

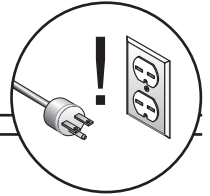
1. Re-tension V-Belts (refer to **Page 52**) if you loosened them for storage purposes.
2. Remove moisture-absorbing desiccant packs from the electrical box.
3. Repeat **Test Run** and **Spindle Break-In** procedures, beginning on **Page 23**.
4. Add coolant, as described in **Adding/Changing Coolant** on **Page 51**.



SECTION 7: SERVICE

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

Troubleshooting



Motor & Electrical

Symptom	Possible Cause	Possible Solution
Machine does not start or a breaker trips.	<ol style="list-style-type: none"> Emergency stop button depressed/at fault. Plug/receptacle at fault/wired wrong. Incorrect power supply voltage or circuit size. Column cover interlock safety switch is engaged. Blown machine fuse. Power supply circuit breaker tripped or fuse blown. Motor wires connected incorrectly. Wiring open/has high resistance. Start capacitor at fault (horizontal motor only). Potentiometer/variable-speed dial controller at fault. Contactors not energized/has poor contacts. Inverter/control box at fault. Motor at fault. 	<ol style="list-style-type: none"> Rotate button head to reset. Replace. Test for good contacts; correct the wiring. Ensure correct power supply voltage and circuit size. Re-adjust component to disengage column cover interlock safety switch. Replace fuse/ensure no shorts. Ensure circuit is sized correctly and free of shorts. Reset circuit breaker or replace fuse. Correct motor wiring connections. Check/fix broken, disconnected, or corroded wires. Test/replace. Test/replace. Test all legs for power/replace. Inspect inverter/controller box; replace. Test/repair/replace.
Machine stalls or is underpowered.	<ol style="list-style-type: none"> Machine undersized for task. Feed rate/cutting speed too fast. Wrong workpiece material. Belt(s) slipping. Oil/grease on belt(s). Motor wired incorrectly. Gearbox at fault. Motor overheated. Run capacitor at fault (horizontal motor only). Pulley/sprocket slipping on shaft. Contactors not energized/has poor contacts. 	<ol style="list-style-type: none"> Use correct cutter/bit; reduce feed rate; reduce spindle RPM; use coolant if possible. Decrease feed rate/cutting speed. Use correct type/size of metal. Tension/replace belt(s); ensure pulleys are aligned. Clean belt(s). Wire motor correctly. Select appropriate gear ratio; replace broken or slipping gears. Clean motor, let cool, and reduce workload. Test/repair/replace. Replace loose pulley/shaft. Test all legs for power/replace.



Symptom	Possible Cause	Possible Solution
Machine has vibration or noisy operation.	<ol style="list-style-type: none"> 1. Workpiece loose. 2. Chuck or cutter at fault. 3. Motor or component loose. 4. V-belt(s) worn or loose. 5. Motor fan rubbing on fan cover. 6. Motor mount loose/broken. 7. Pulley loose. 8. Machine incorrectly mounted. 9. Belts slapping cover. 10. Centrifugal switch is at fault (horizontal motor only). 11. Motor bearings at fault. 	<ol style="list-style-type: none"> 1. Use the correct holding fixture and reclamp workpiece. 2. Replace unbalanced chuck; replace/resharpen cutter; use correct feed rate. 3. Inspect/replace damaged bolts/nuts, and retighten with thread locking fluid. 4. Inspect/replace belts with a new matched set. 5. Fix/replace fan cover; replace loose/damaged fan. 6. Tighten/replace. 7. Re-align/replace shaft, pulley set screw, and key. 8. Tighten mounting bolts; relocate/shim machine. 9. Replace/realign belts with a matched set. 10. Replace. 11. Test by rotating shaft; rotational grinding/loose shaft requires bearing replacement.

Mill Operations

Symptom	Possible Cause	Possible Solution
Tool loose in spindle.	<ol style="list-style-type: none"> 1. Tool is not fully drawn up into spindle taper. 2. Taking too big of a cut. 3. Debris on tool or in spindle taper. 	<ol style="list-style-type: none"> 1. Tighten drawbar. 2. Lessen depth of cut and allow chips to clear. 3. Clean tool and spindle taper.
Breaking tools or cutters.	<ol style="list-style-type: none"> 1. Spindle speed/feed rate is too fast. 2. Cutting tool is too small. 3. Cutting tool getting too hot. 4. Taking too big of a cut. 5. Spindle extended too far down. 	<ol style="list-style-type: none"> 1. Set spindle speed correctly or use slower feed rate. 2. Use larger cutting tool and slower feed rate. 3. Use coolant or oil for appropriate application. 4. Lessen depth of cut and allow chips to clear. 5. Fully retract spindle and lower headstock. This increases rigidity.
Workpiece or tool vibrates or chatters during operation.	<ol style="list-style-type: none"> 1. Table locks not tight. 2. Workpiece not secure. 3. Spindle speed/feed rate is too fast. 4. Spindle extended too far down. 5. Quill lock not tight. 6. Gibs too loose in table. 	<ol style="list-style-type: none"> 1. Tighten table locks (Page 28). 2. Properly clamp workpiece on table or in vise. 3. Set spindle speed correctly or use slower feed rate (Page 35). 4. Fully retract spindle and lower headstock. This increases rigidity. 5. Tighten quill lock (Page 37). 6. Tighten gibs.
Table is hard to move.	<ol style="list-style-type: none"> 1. Table locks are tightened down. 2. Chips have loaded up on ways. 3. Ways are dry and need lubrication. 4. Table limit stops are interfering. 5. Gibs are too tight. 	<ol style="list-style-type: none"> 1. Make sure table locks are fully released. 2. Frequently clean away chips that load up during operations. 3. Lubricate ways. 4. Check to make sure that all table limit stops are not in the way. 5. Adjust gibs (Page 61).
Headstock is hard to raise.	<ol style="list-style-type: none"> 1. Headstock lock(s) or gib is at fault. 2. Headstock leadscrew is binding. 3. Gib is too tight. 	<ol style="list-style-type: none"> 1. Loosen/replace lock lever and adjust gib. 2. Clean and relubricate headstock leadscrew and gears. 3. Adjust gib (Page 61).



Symptom	Possible Cause	Possible Solution
Bad surface finish.	<ol style="list-style-type: none"> 1. Spindle speed/feed rate is too fast. 2. Workpiece not secure. 3. Spindle extended too far down. 4. Dull or incorrect cutting tool. 5. Wrong rotation direction of cutting tool. 	<ol style="list-style-type: none"> 1. Set spindle speed correctly or use slower feed rate (Page 35). 2. Properly clamp workpiece on table or in vise. 3. Fully retract spindle and lower headstock. This increases rigidity. 4. Sharpen cutting tool or select one that better suits the operation. 5. Check for proper cutting tool rotation direction.
Cutting results not square.	<ol style="list-style-type: none"> 1. Table and spindle are not at 90° to each other. 2. Table travel is inconsistent. 	<ol style="list-style-type: none"> 1. Tram the spindle (Page 58). 2. Adjust gibs (Page 61).
Spindle overheats.	<ol style="list-style-type: none"> 1. Poor spindle bearing lubrication. 2. Spindle bearings too tight. 3. Mill operated at high speeds for extended period. 	<ol style="list-style-type: none"> 1. Lubricate spindle bearings. 2. Properly adjust spindle bearing preload. 3. Allow mill to cool.
Lack of power at spindle.	<ol style="list-style-type: none"> 1. V-belts are loose. 2. Wrong voltage. 	<ol style="list-style-type: none"> 1. Properly tension V-belts (Page 52). 2. Correct voltage.
Spindle does not return to highest position.	<ol style="list-style-type: none"> 1. Poorly adjusted return spring. 2. Worn return spring. 	<ol style="list-style-type: none"> 1. Increase return spring tension. 2. Replace return spring.
Control Panel FORWARD and REVERSE buttons do not work.	<ol style="list-style-type: none"> 1. Shorted/disconnected wiring. 	<ol style="list-style-type: none"> 1. Inspect circuit boards, wiring connections. Replace/repair as necessary.
Power feed does not move table or is slipping.	<ol style="list-style-type: none"> 1. Table locked. 2. Drive selector not engaged. 3. Sheared pin. 4. Gears not meshing or teeth missing. 5. Motor shaft and gear shaft not engaged. 	<ol style="list-style-type: none"> 1. Unlock table locks (Page 28). 2. Select speed, engage drive selector. 3. Replace pin. 4. Check gears and adjust/replace. 5. Replace clutch.
Operates at high speed only or is inconsistent.	<ol style="list-style-type: none"> 1. Rapid micro switch is stuck. 2. Variable-speed dial doesn't work properly. 3. Wiring harness disconnected. 	<ol style="list-style-type: none"> 1. Lightly tap on it to lower it. 2. Test/Repair/Replace. 3. Reconnect wiring harness.
Lamp will not light.	<ol style="list-style-type: none"> 2. Power not turned on. 3. Bulb is burned out. 1. Short in wiring or wired incorrectly. 	<ol style="list-style-type: none"> 2. Press switch/button on lamp or control panel. 3. Replace bulb. 1. Trace and test wiring. Fix any errors.
DRO doesn't give reading.	<ol style="list-style-type: none"> 1. DRO is not turned on. 2. Batteries are dead. 3. Shorted/disconnected wiring/plugs. 	<ol style="list-style-type: none"> 1. Switch DRO ON/Power button. 2. Change batteries. 3. Inspect circuit boards, sensors, plugs, and wiring connections. Replace/repair as necessary.
DRO reading is incorrect.	<ol style="list-style-type: none"> 1. Initial reading is incorrect. 2. Sensor has gone bad. 3. Spacing between sensor and scale is incorrect. 	<ol style="list-style-type: none"> 1. Tare/Zero/Reset DRO at beginning point. 2. Test/replace sensor as necessary. 3. Adjust spacing between sensor and scale.



Tramming Mill Head

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

This procedure involves mounting a dial test indicator to the quill or spindle, rotating it around the table, and adjusting the spindle axis (Z-axis) 90° to the table X- and Y-axes, as illustrated in **Figure 76**.

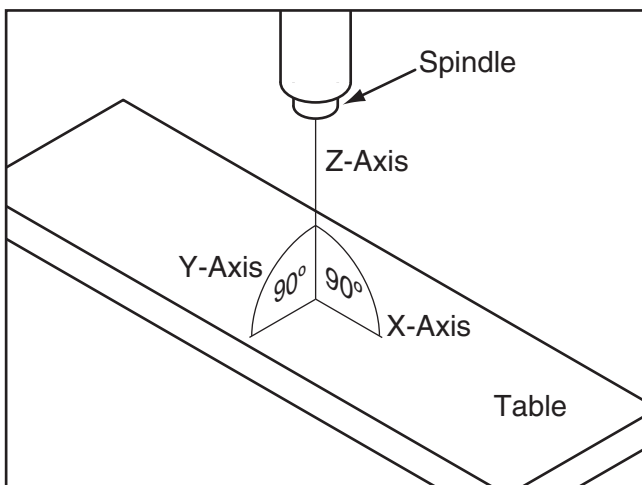


Figure 76. Spindle Z-axis perpendicular to the table X- and Y-axis.

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

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

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

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

To tram spindle to mill head:

1. DISCONNECT MACHINE FROM POWER!
2. Prepare the mill for tramming by performing following tasks:
 - Verify the table is clean by running your hand over the top of it. If necessary, stone the table to remove all nicks and burrs, then clean off all debris.
 - Position the table for the milling operation you intend to perform after tramming—preferably centered with the saddle.
 - Tighten any table, knee, quill, or ram locks that should be tight during the intended milling operation.
3. Place parallel block underneath spindle.
4. Install indicator holder in spindle or on quill, then mount indicator so that point is as parallel to the block as possible (see illustration in **Figure 77**).

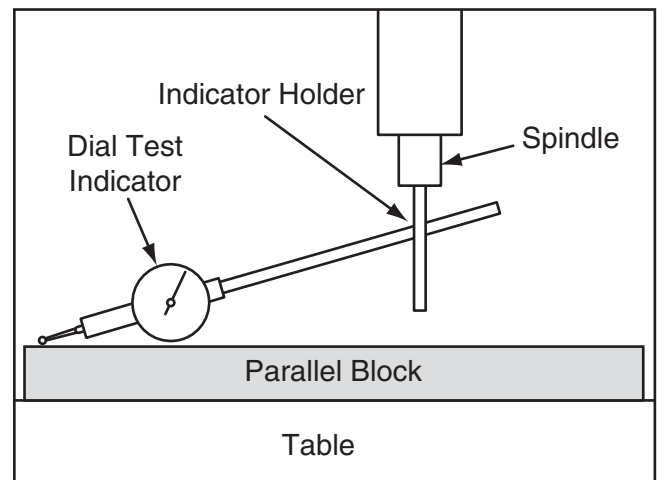


Figure 77. Dial test indicator mounted.



- To measure spindle alignment along X-axis, place parallel block directly under spindle and indicator across length of table, as illustrated in **Figure 78**.

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

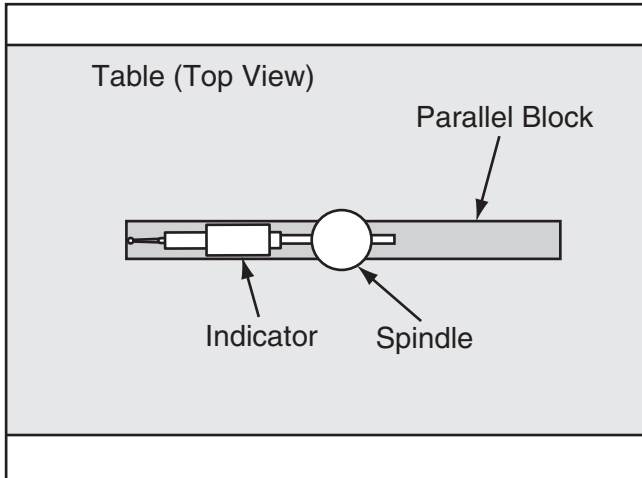


Figure 78. Parallel block and indicator positioned for the X-axis measurement (top view).

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

- Rotate spindle by hand so that indicator point rests on one end of parallel block, as illustrated in **Figures 77–78**, then zero dial.

- Rotate spindle so that indicator point rests in same manner on other end of block, then read dial.

— If indicator dial still reads zero or is within the acceptable variance, continue on with **Step 8**.

— If indicator dial has moved from zero beyond acceptable variance, you will need to compensate for that amount by rotating head left or right. Repeat **Steps 6–7** until you are satisfied with the spindle axis alignment along table X-axis.

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

- Place parallel block directly under spindle and across width of table, as illustrated in **Figure 79**.

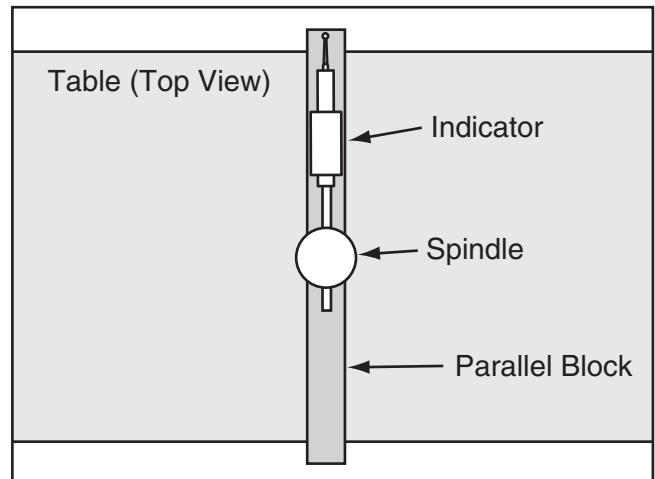


Figure 79. Parallel block and indicator positioned for the Y-axis measurement (top view).



9. Rotate spindle so indicator point rests on parallel block, as illustrated in **Figure 79**, then zero dial.
10. Rotate spindle so that indicator point rests on other end of block in same manner, then read dial.
 - If indicator dial still reads zero or is within the acceptable variance, the spindle is precisely perpendicular to table in both X- and Y-axes, and tramping procedure is complete.
 - If indicator dial has moved from zero beyond acceptable variance, you will need to compensate for that amount by tilting head forward or backward. Repeat **Steps 9–10** until you are satisfied with spindle axis alignment along table Y-axis.

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

Adjusting Leadscrew Backlash

Leadscrew backlash is the amount of free play movement in the leadscrew (when the leadscrew moves but the table does not) after changing the direction of rotation.

A leadscrew must have a certain amount of backlash to rotate easily, but over time, it increases with wear. Generally, 0.005"–0.010" leadscrew backlash is acceptable to ensure smooth movement and reduce the risk of premature thread wear.

The X-axis leadscrew backlash is adjusted using a long 4mm hex wrench to tighten/loosen the cap screws on the leadscrew nut. This adjusts the force the leadscrew nut exerts on the leadscrew threads.

The X-axis leadscrew nut shown in **Figure 80** is accessed from underneath the right side of the table.

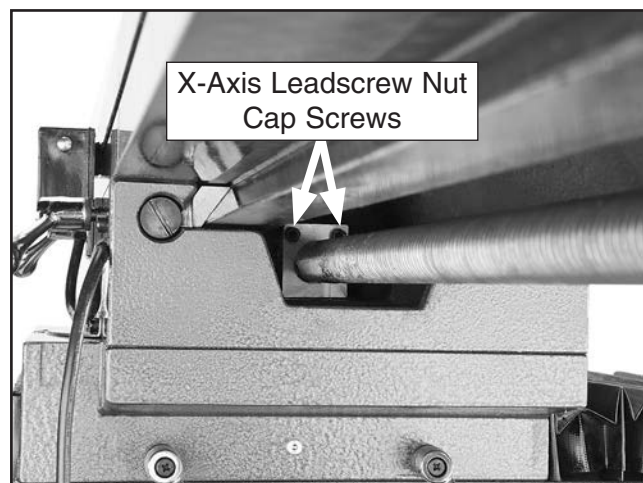


Figure 80. Location of X-axis leadscrew nut cap screws for adjusting backlash.



Adjusting Gibs

Gibs are tapered lengths of metal that are sandwiched between two moving surfaces. Gibs control the gap between these surfaces and how they slide past one another. Correctly adjusting the gibs is critical to producing good results.

Correctly positioning gibs is a matter of trial and error and patience. Tight gibs make table movement more accurate but stiff. Loose gibs make table movement sloppy but easier to do. The goal of gib adjustment is to remove unnecessary sloppiness without causing the ways to bind.

Many experienced machinists adjust the gibs just to the point where they can feel a slight drag in table movement.

Screws on each end of the gib allow gib adjustment to increase or decrease the friction between the sliding surfaces.

DISCONNECT MACHINE FROM POWER BEFORE ADJUSTING THE GIBS!

Make sure all table locks are loose. For the X- and Y-axis gibs, loosen one gib adjustment screw (see **Figure 81**) and tighten the opposite screw the same amount to move the gib, while at the same time rotating the handwheel to move the table until you feel a slight drag in that path of movement.

Note: Remove the way cover behind the table to gain access to the rear Y-axis gib adjustment screw.

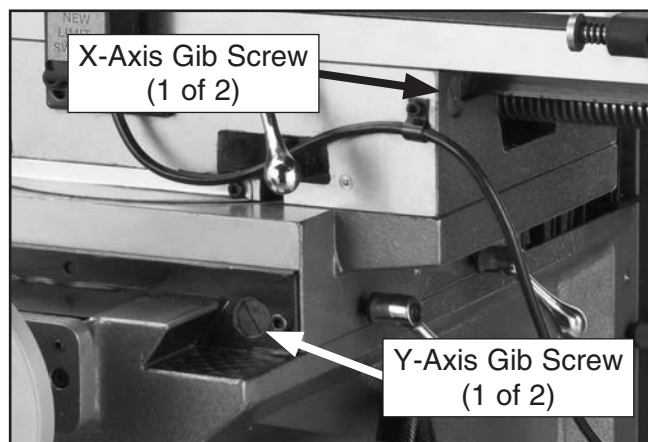


Figure 81. Locations of X- and Y-axis gib adjustment screws.

The Z-axis gib has only one adjustment screw on the top of the gib (see **Figure 82**). The screw moves the gib up and down. Other than this difference, use the same method of adjustment as with the other gibs.

Note: Remove the way cover behind the table to gain access to the Z-axis gib adjustment screw.



Figure 82. Location of Z-axis gib adjustment screw.



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.











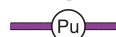

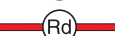

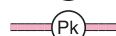
CAPACITORS/INVERTERS. Some capacitors and power inverters store an electrical charge for up to 10 minutes after being disconnected from the power source. To reduce the risk of being shocked, wait at least this long before working on capacitors.

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

NOTICE

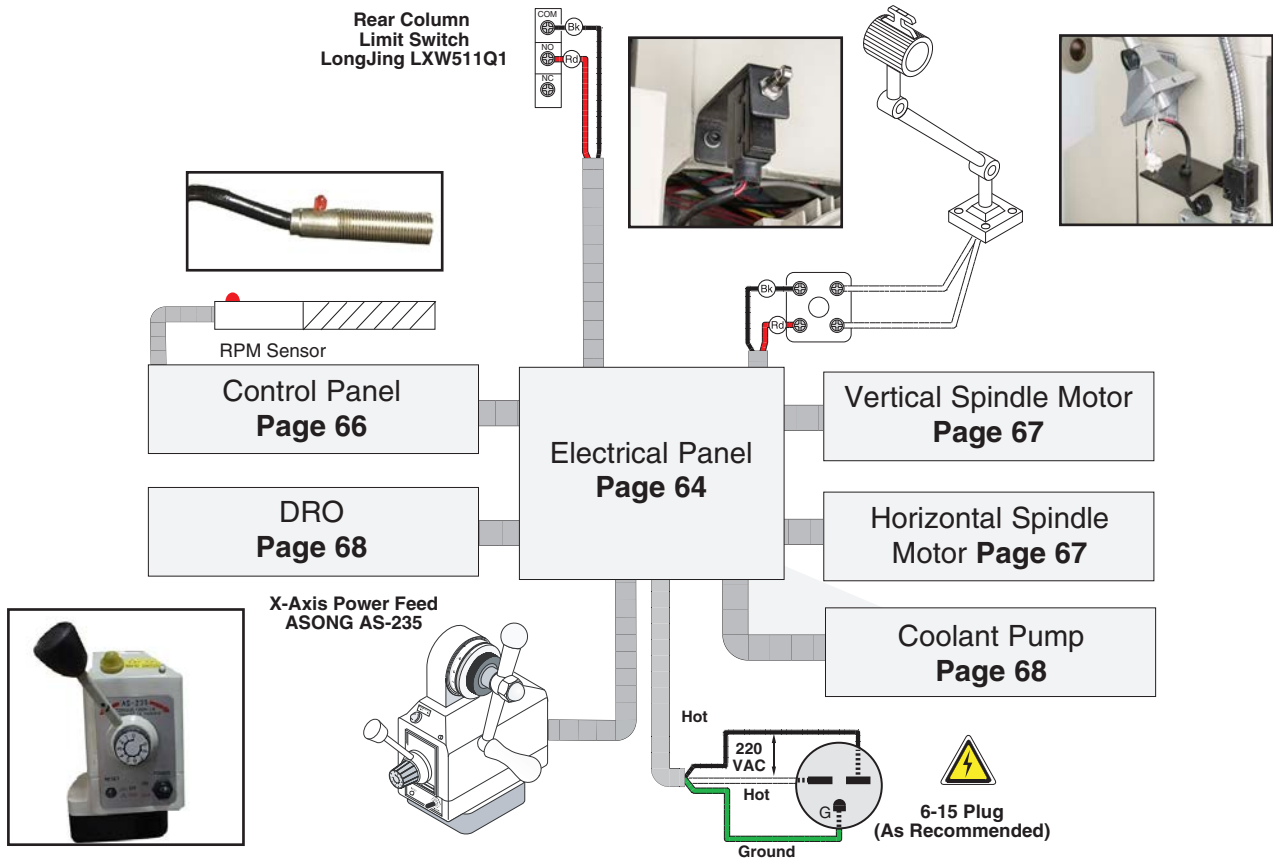
The photos and diagrams included in this section are best viewed in color. You can view these pages in color at www.grizzly.com.

COLOR KEY

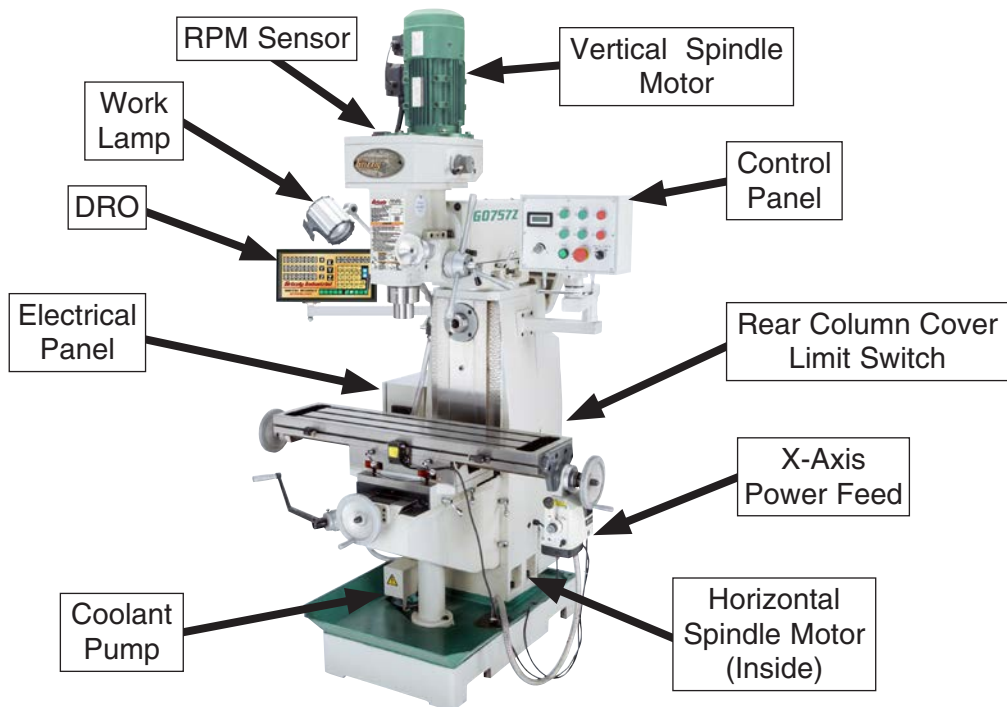
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WHITE 	BROWN 	YELLOW GREEN 	BLUE WHITE 
GREEN 	GRAY 	PURPLE 	TURQUOISE 
RED 	ORANGE 	PINK 	



Wiring Overview

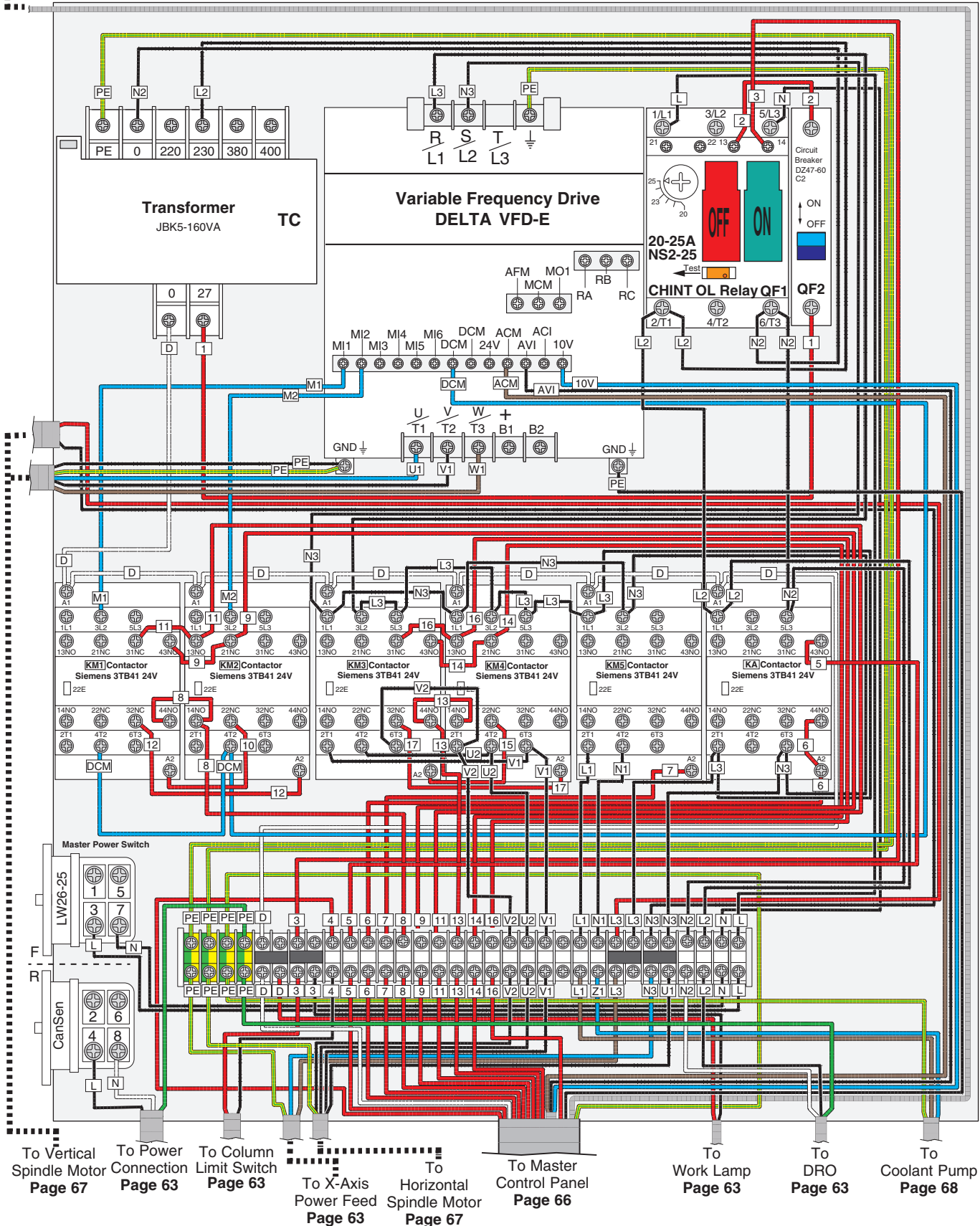


Component Location



Electrical Panel Wiring Diagram

To RPM sensor
Page 63



Electrical Panel Wiring

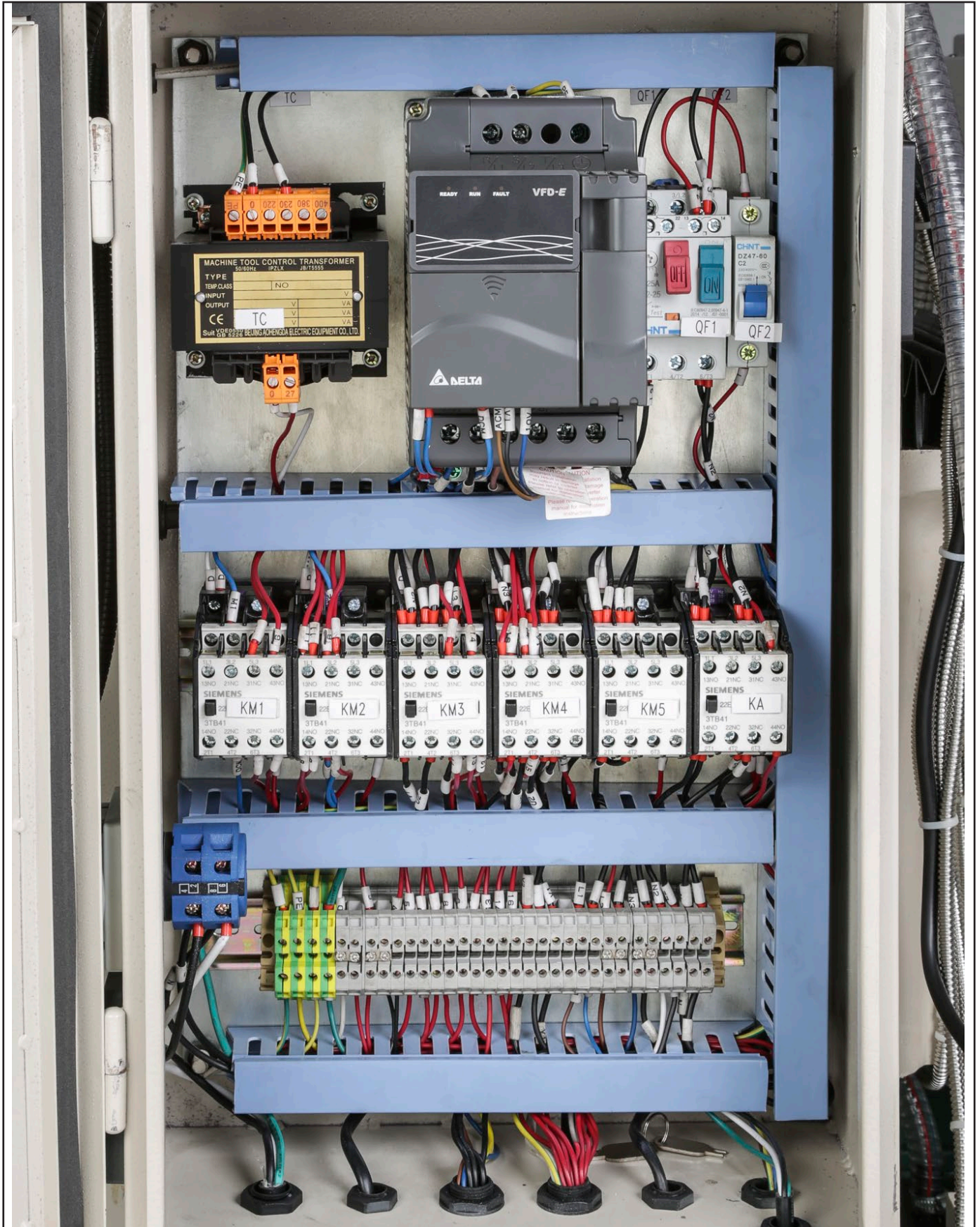
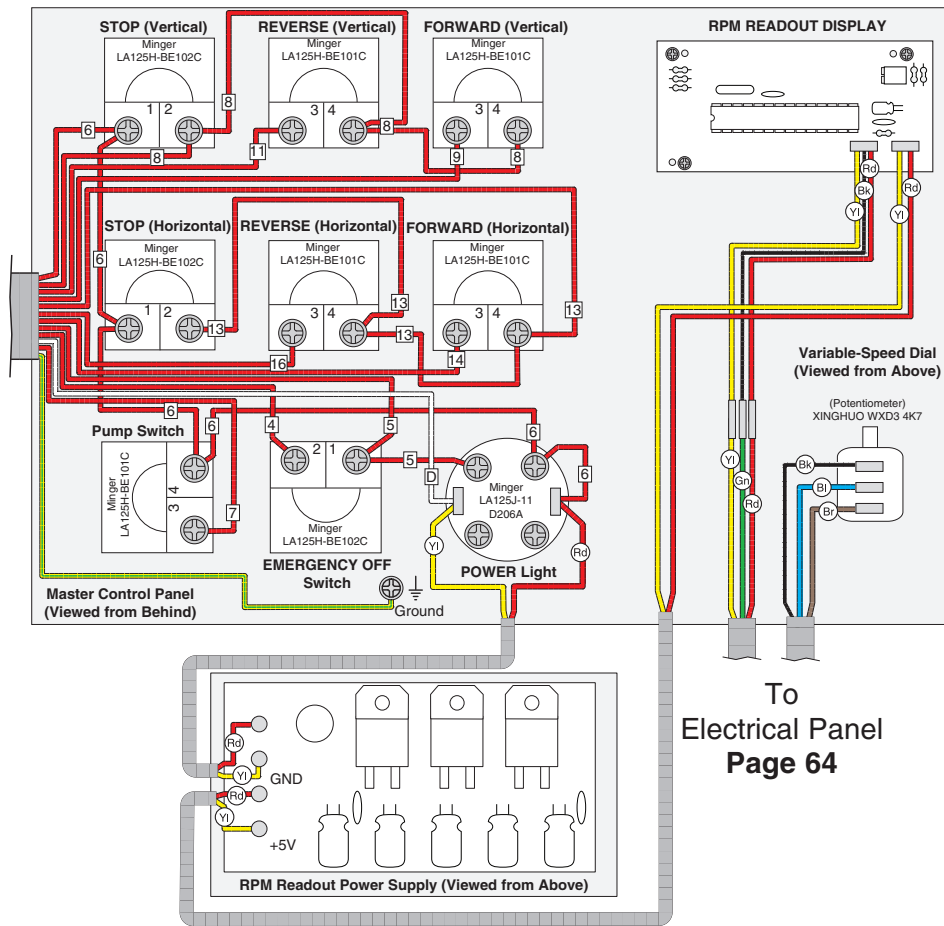


Figure 83. Electrical panel wiring.



Control Panel Wiring

To
Electrical Panel
Page 64



To
Electrical Panel
Page 64

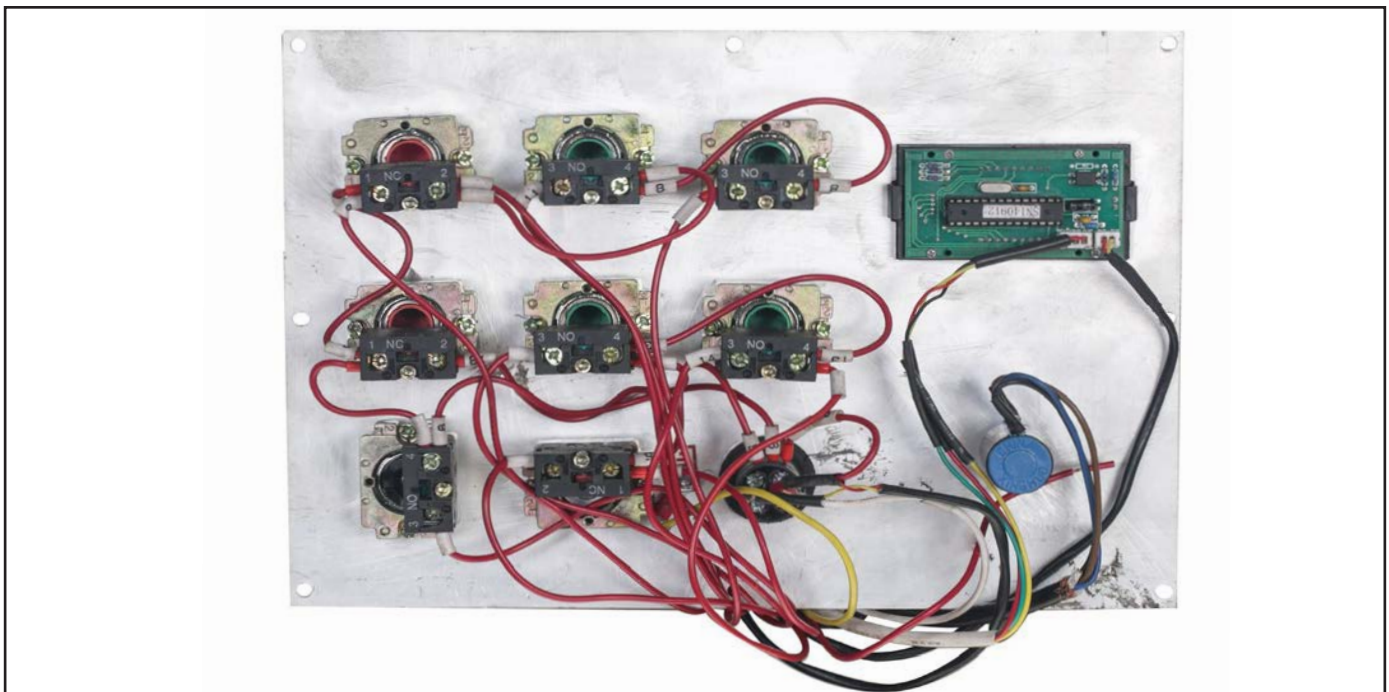
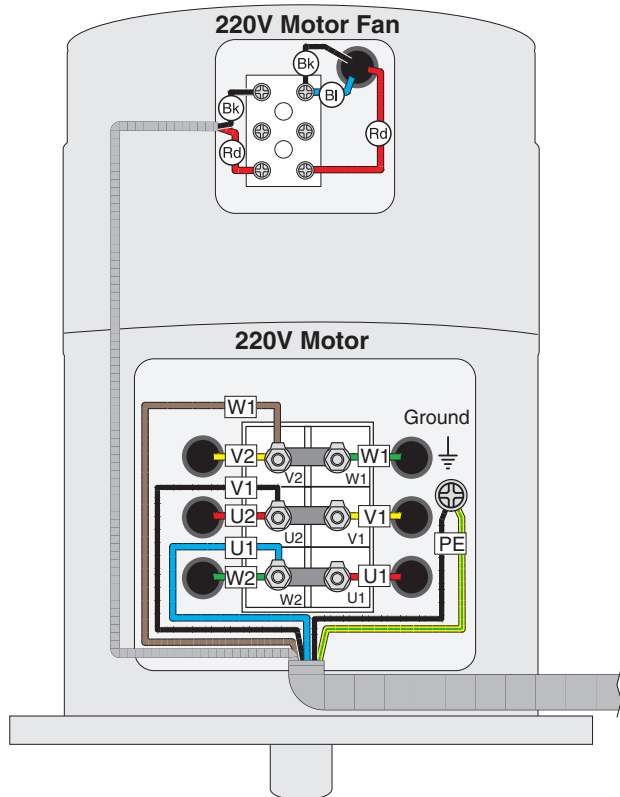


Figure 84. Control panel wiring.



Vertical Spindle Motor Wiring



To
Electrical Panel
Page 64

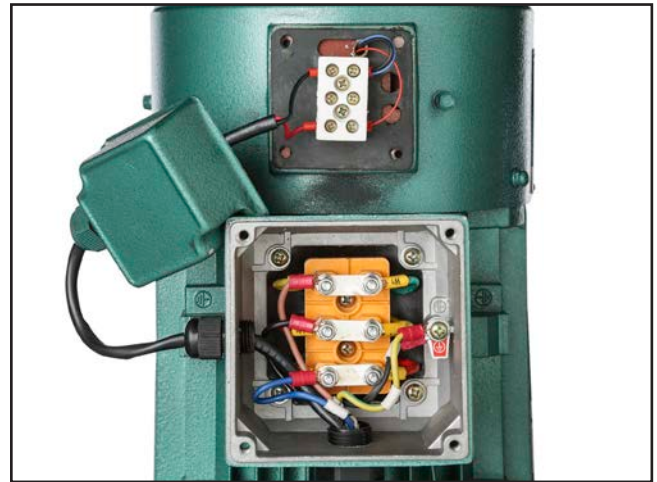
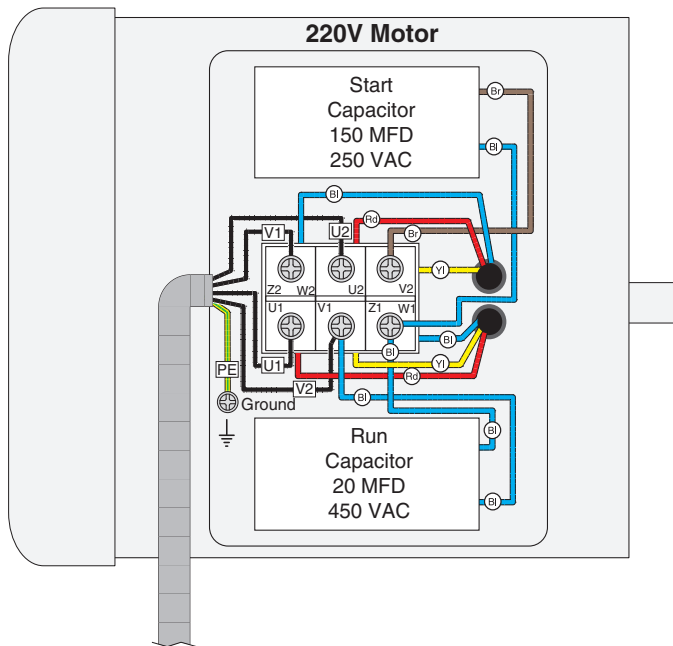


Figure 85. Vertical spindle motor wiring.

Horizontal Spindle Motor Wiring



To
Electrical Panel
Page 64



Figure 86. Horizontal spindle motor wiring.



Coolant Pump Wiring

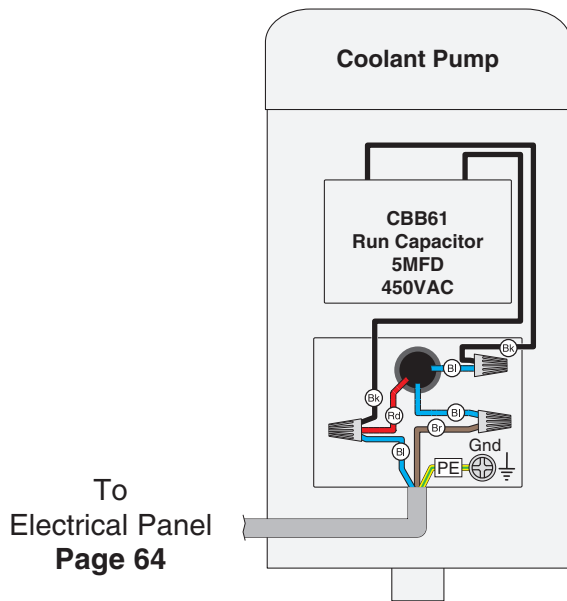


Figure 87. Coolant pump wiring.

DRO Wiring

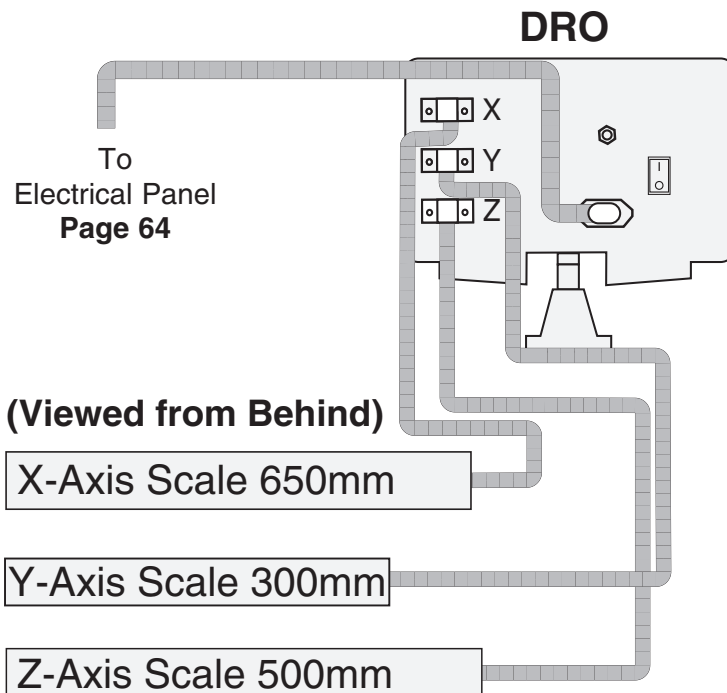


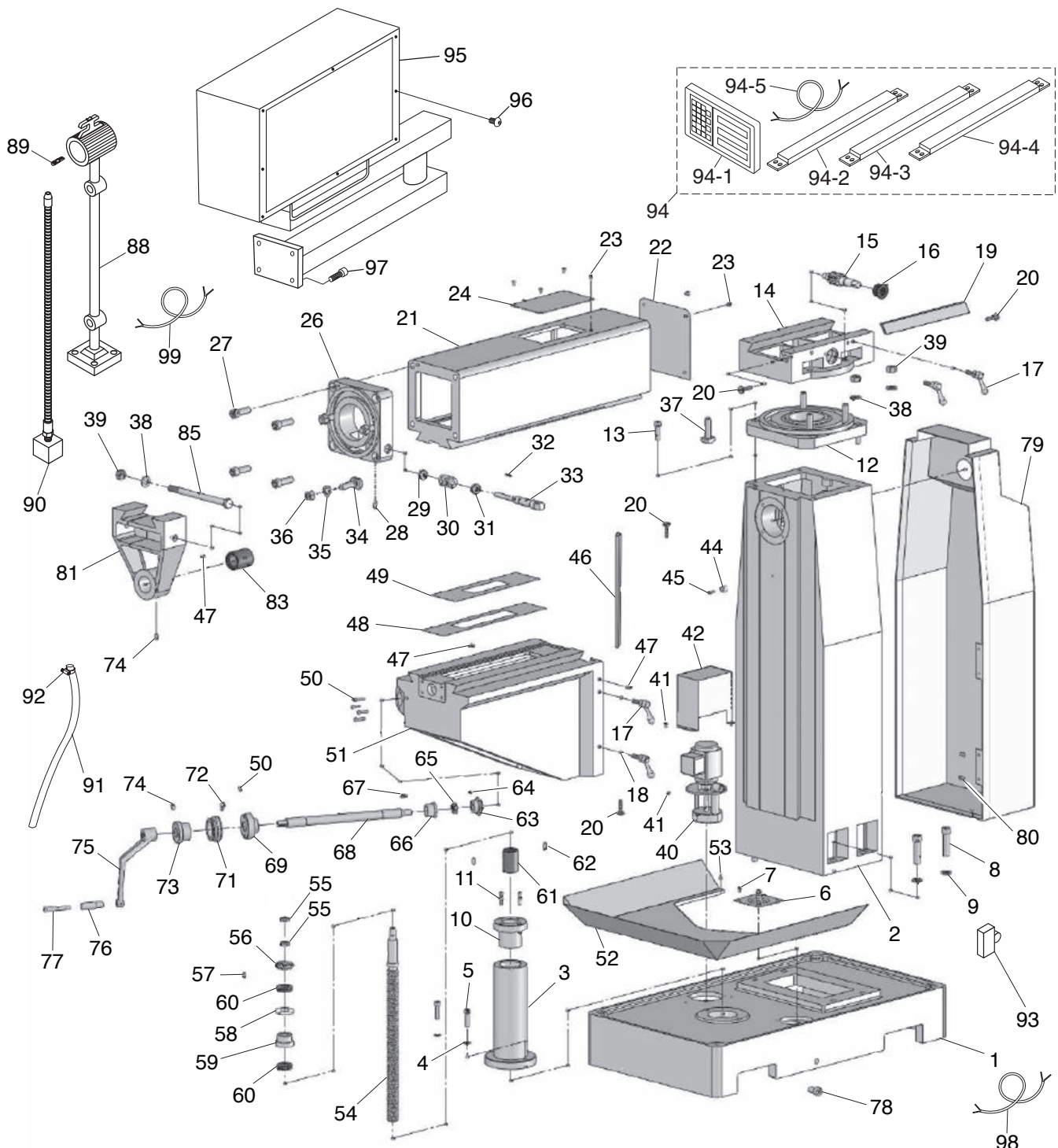
Figure 88. DRO wiring.



SECTION 9: PARTS

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

Column



Column Parts List

REF	PART #	DESCRIPTION
1	P0757Z001	BASE
2	P0757Z002	COLUMN
3	P0757Z003	Z-AXIS LEADSCREW HOUSING
4	P0757Z004	LOCK WASHER 10MM
5	P0757Z005	HEX BOLT M10-1.5 X 45
6	P0757Z006	COOLANT DRAIN SCREEN
7	P0757Z007	PHLP HD SCR M6-1 X 12
8	P0757Z008	HEX BOLT M16-2 X 65
9	P0757Z009	LOCK WASHER 16MM
10	P0757Z010	Z-AXIS LEADSCREW COLLAR
11	P0757Z011	CAP SCREW M8-1.25 X 25
12	P0757Z012	TURRET BASE
13	P0757Z013	CAP SCREW M12-1.75 X 30
14	P0757Z014	TURRET
15	P0757Z015	GEAR SHAFT 15T
16	P0757Z016	SHAFT COLLAR
17	P0757Z017	ADJUSTABLE HANDLE M10-1.5 X 25
18	P0757Z018	LOCK PLUNGER
19	P0757Z019	RAM GIB
20	P0757Z020	FLAT HD SCR M8-1.25 X 40
21	P0757Z021	RAM
22	P0757Z022	RAM END COVER
23	P0757Z023	PHLP HD SCR M6-1 X 10
24	P0757Z024	RAM TOP COVER
26	P0757Z026	HEADSTOCK MOUNT
27	P0757Z027	CAP SCREW M16-2 X 50
28	P0757Z028	SET SCREW M8-1.25 X 20
29	P0757Z029	THRUST BEARING 51101
30	P0757Z030	WORM GEAR
31	P0757Z031	THRUST BEARING 51102
32	P0757Z032	KEY 4 X 4 X 20
33	P0757Z033	WORM SHAFT
34	P0757Z034	T-BOLT M16-2 X 60
35	P0757Z035	LOCK WASHER 16MM
36	P0757Z036	HEX NUT M16-2
37	P0757Z037	T-BOLT M16-2 X 50
38	P0757Z038	FLAT WASHER 16MM
39	P0757Z039	HEX NUT M16-2
40	P0757Z040	COOLANT PUMP 40W 220V 1-PH
41	P0757Z041	CAP SCREW M5-.8 X 12
42	P0757Z042	COOLANT PUMP COVER
44	P0757Z044	SLEEVE
45	P0757Z045	CAP SCREW M6-1 X 18
46	P0757Z046	Z-AXIS GIB
47	P0757Z047	BALL OILER 8MM PRESS-IN
48	P0757Z048	LOWER WAY COVER
49	P0757Z049	UPPER WAY COVER
50	P0757Z050	CAP SCREW M6-1 X 25

REF	PART #	DESCRIPTION
51	P0757Z051	KNEE
52	P0757Z052	SPLASH PAN
53	P0757Z053	CAP SCREW M6-1 X 12
54	P0757Z054	Z-AXIS LEADSCREW
55	P0757Z055	SPANNER NUT M16-1.5
56	P0757Z056	BEVEL GEAR 25T
57	P0757Z057	KEY 6 X 6 X 12
58	P0757Z058	SPACER
59	P0757Z059	BEARING SEAT
60	P0757Z060	THRUST BEARING 51105
61	P0757Z061	Z-AXIS LEADSCREW NUT 42 X 60MM
62	P0757Z062	SET SCREW M8-1.25 X 20
63	P0757Z063	BEVEL GEAR 25T
64	P0757Z064	SET SCREW M6-1 X 10
65	P0757Z065	THRUST BEARING 51103
66	P0757Z066	BEARING SEAT
67	P0757Z067	KEY 5 X 5 X 20
68	P0757Z068	Z-AXIS CRANK SHAFT
69	P0757Z069	SHAFT BRACKET
71	P0757Z071	Z-AXIS GRADUATED DIAL
72	P0757Z072	THUMB SCREW M6-1 X 10
73	P0757Z073	CRANK BRACKET
74	P0757Z074	SET SCREW M8-1.25 X 16
75	P0757Z075	Z-AXIS CRANK
76	P0757Z076	CRANK HANDLE
77	P0757Z077	HANDLE STEP SCREW M10-1.5 X 15
78	P0757Z078	FLANGE BOLT M10-1.5 X 16
79	P0757Z079	COLUMN REAR COVER
80	P0757Z080	FLAT HD SCR M5-.8 X 12
81	P0757Z081	HORIZONTAL ARBOR SUPPORT
83	P0757Z083	BUSHING (BRASS)
85	P0757Z085	CLAMP BOLT M16-2 X 218
88	P0757Z088	HALOGEN WORK LIGHT ASSEMBLY
89	P0757Z089	HALOGEN BULB 24W BI-PIN
90	P0757Z090	COOLANT NOZZLE ASSEMBLY
91	P0757Z091	COOLANT HOSE 1/2" X 36"
92	P0757Z092	COOLANT HOSE CLAMP 3/4"
93	P0757Z093	LIMIT SWITCH CHINT XBLXW-W11Q1
94	P0757Z094	X/Y/Z-AXIS DRO SET
94-1	P0757Z094-1	DRO DISPLAY ASSEMBLY
94-2	P0757Z094-2	X-AXIS DRO SCALE
94-3	P0757Z094-3	Y-AXIS DRO SCALE
94-4	P0757Z094-4	Z-AXIS DRO SCALE
94-5	P0757Z094-5	DRO POWER CORD 3W 18G
95	P0757Z095	CONTROL PANEL BOX W/SWING ARM
96	P0757Z096	BUTTON HD CAP SCR M4-.7 X 6
97	P0757Z097	CAP SCREW M8-1.25 X 20
98	P0757Z098	LIMIT SWITCH CORD 2W 18G
99	P0757Z099	LAMP CORD 2W 18G



Table

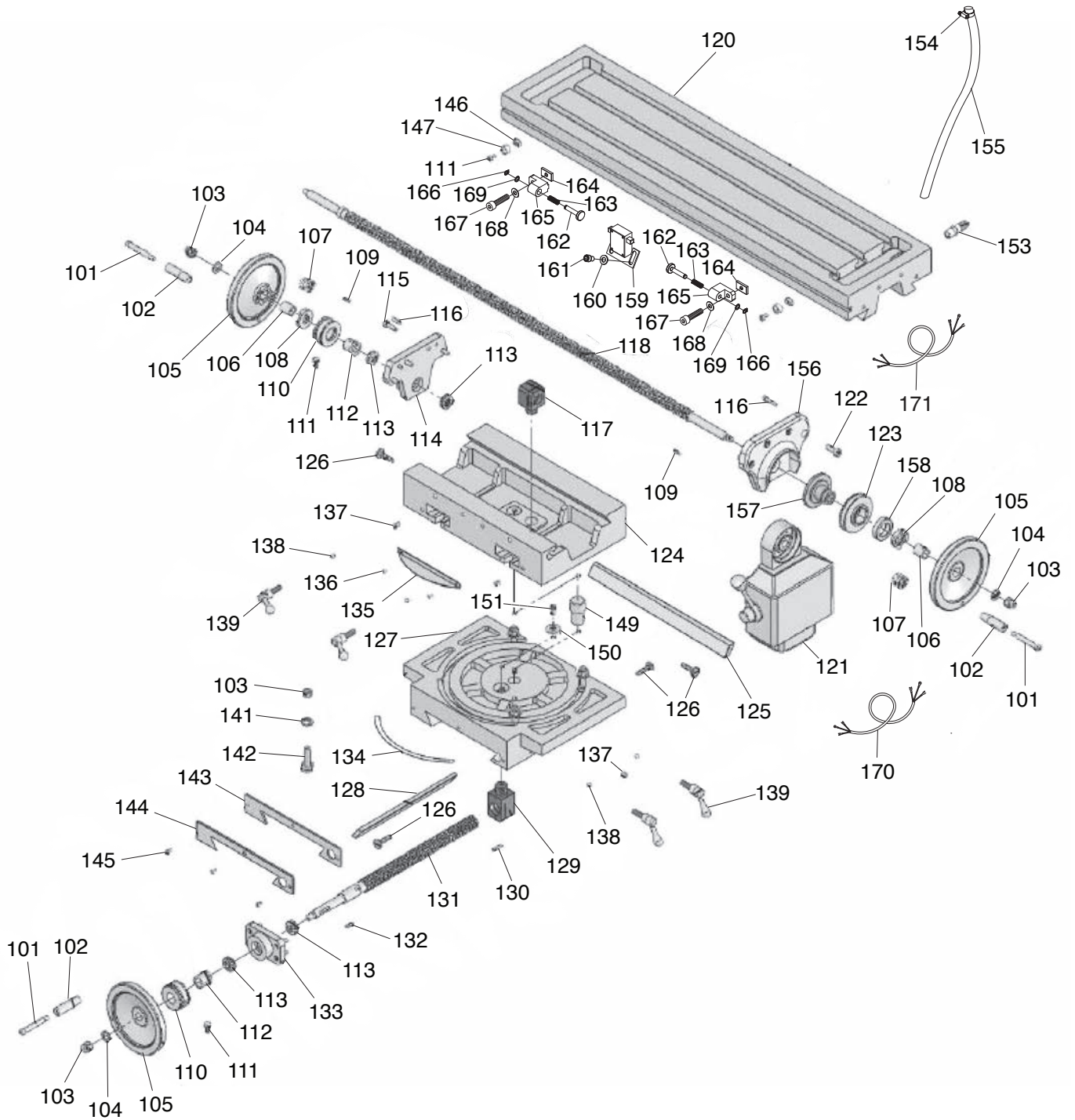


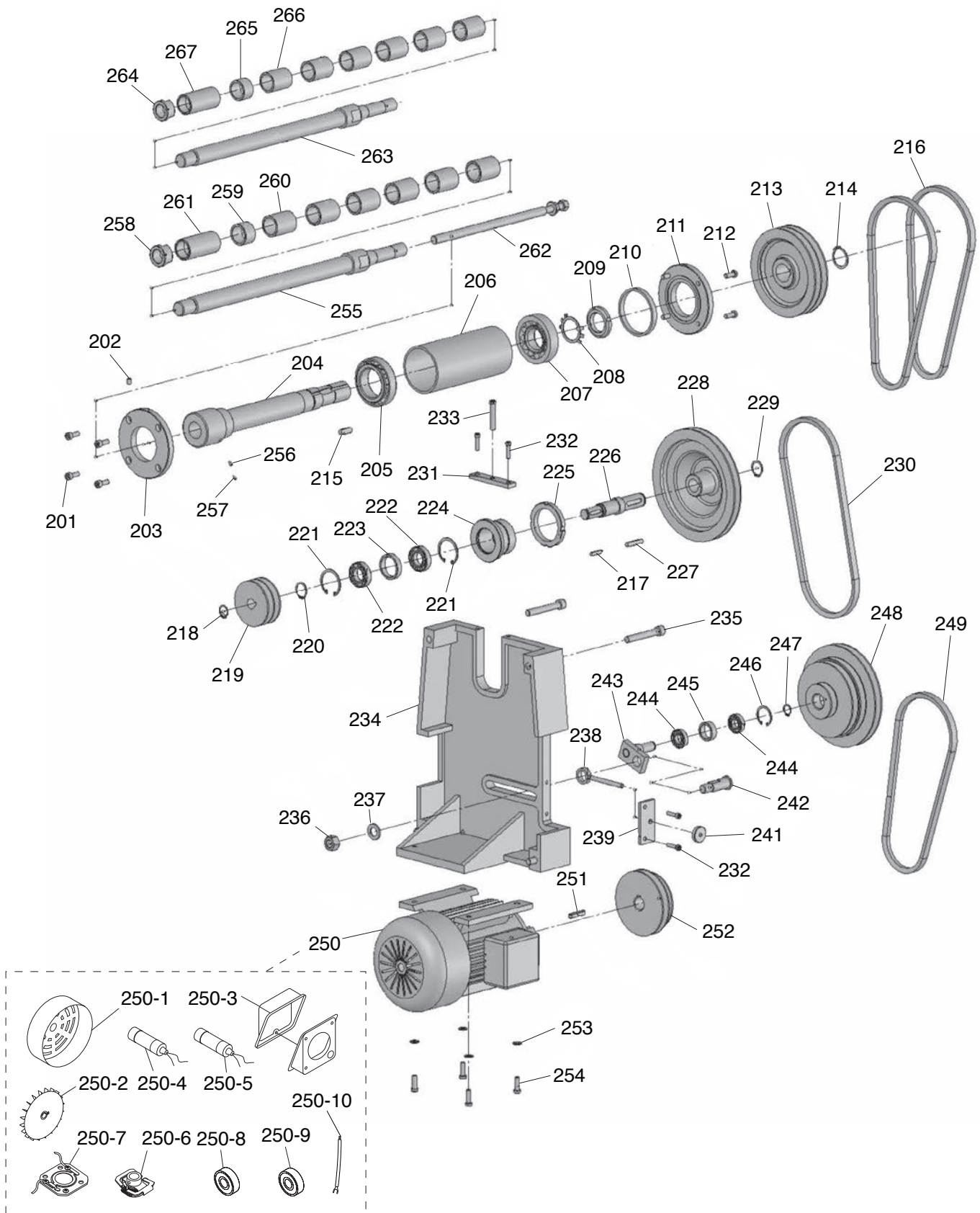
Table Parts List

REF	PART #	DESCRIPTION
101	P0757Z101	HANDLE STEP SCREW M8-1.25 X 12
102	P0757Z102	HANDWHEEL HANDLE
103	P0757Z103	HEX NUT M12-1.75
104	P0757Z104	LOCK WASHER 12MM
105	P0757Z105	HANDWHEEL
106	P0757Z106	BUSHING
107	P0757Z107	SPRING PLATE
108	P0757Z108	CLUTCH
109	P0757Z109	KEY 5 X 5 X 20
110	P0757Z110	GRADUATED DIAL (LH)
111	P0757Z111	CAP SCREW M6-1 X 16
112	P0757Z112	BUSHING
113	P0757Z113	THRUST BEARING 51103
114	P0757Z114	X-AXIS LEADSCREW BRACKET
115	P0757Z115	CAP SCREW M8-1.25 X 25
116	P0757Z116	DOWEL PIN 6 X 25
117	P0757Z117	X-AXIS LEADSCREW NUT
118	P0757Z118	X-AXIS LEADSCREW
120	P0757Z120	TABLE
121	P0757Z121	POWER FEED ASONG AS-235
122	P0757Z122	CAP SCREW M10-1.5 X 25
123	P0757Z123	X-AXIS GRADUATED DIAL (RH)
124	P0757Z124	ROTARY TABLE BASE
125	P0757Z125	X-AXIS GIB
126	P0757Z126	GIB SCREW M8-1.25
127	P0757Z127	SADDLE
128	P0757Z128	Y-AXIS GIB
129	P0757Z129	Y-AXIS LEADSCREW NUT
130	P0757Z130	CAP SCREW M5-.8 X 25
131	P0757Z131	Y-AXIS LEADSCREW
132	P0757Z132	KEY 5 X 5 X 30
133	P0757Z133	Y-AXIS LEADSCREW BRACKET
134	P0757Z134	ANGLE SCALE
135	P0757Z135	ANGLE INDICATOR PLATE

REF	PART #	DESCRIPTION
136	P0757Z136	PHLP HD SCR M5-.8 X 10
137	P0757Z137	BALL OILER 8MM PRESS-IN
138	P0757Z138	LOCK PLUNGER
139	P0757Z139	ADJUSTABLE HANDLE M10-1.5 X 25
141	P0757Z141	FLAT WASHER 12MM
142	P0757Z142	T-BOLT M12-1.75 X 42
143	P0757Z143	SADDLE WAY WIPER
144	P0757Z144	WAY WIPER PLATE
145	P0757Z145	PHLP HD SCR M5-.8 X 12
146	P0757Z146	T-NUT M6-1
147	P0757Z147	SLEEVE
149	P0757Z149	TABLE PIVOT PIN
150	P0757Z150	FLAT WASHER 6MM
151	P0757Z151	CAP SCREW M6-1 X 30
153	P0757Z153	COOLANT HOSE CONNECTOR 1/2" NPT
154	P0757Z154	COOLANT HOSE CLAMP 3/4"
155	P0757Z155	COOLANT HOSE 1/2" X 36"
156	P0757Z156	POWER FEED BEARING BRACKET
157	P0757Z157	POWER FEED BEVEL GEAR
158	P0757Z158	BEVEL GEAR NUT
159	P0757Z159	LONGITUDINAL LIMIT SWITCH ASSEMBLY
160	P0757Z160	FLAT WASHER 8MM
161	P0757Z161	CAP SCREW M8-1.25 X 20
162	P0757Z162	TRAVEL STOP SHAFT
163	P0757Z163	COMPRESSION SPRING
164	P0757Z164	TRAVEL STOP T-NUT
165	P0757Z165	TRAVEL STOP
166	P0757Z166	EXT RETAINING RING 7MM
167	P0757Z167	CAP SCREW M6-1 X 16
168	P0757Z168	FLAT WASHER 6MM
169	P0757Z169	FENDER WASHER 8MM
170	P0757Z170	LIMIT SWITCH CORD 3W 18G
171	P0757Z171	POWER FEED POWER CORD 3W 18G



Horizontal Spindle



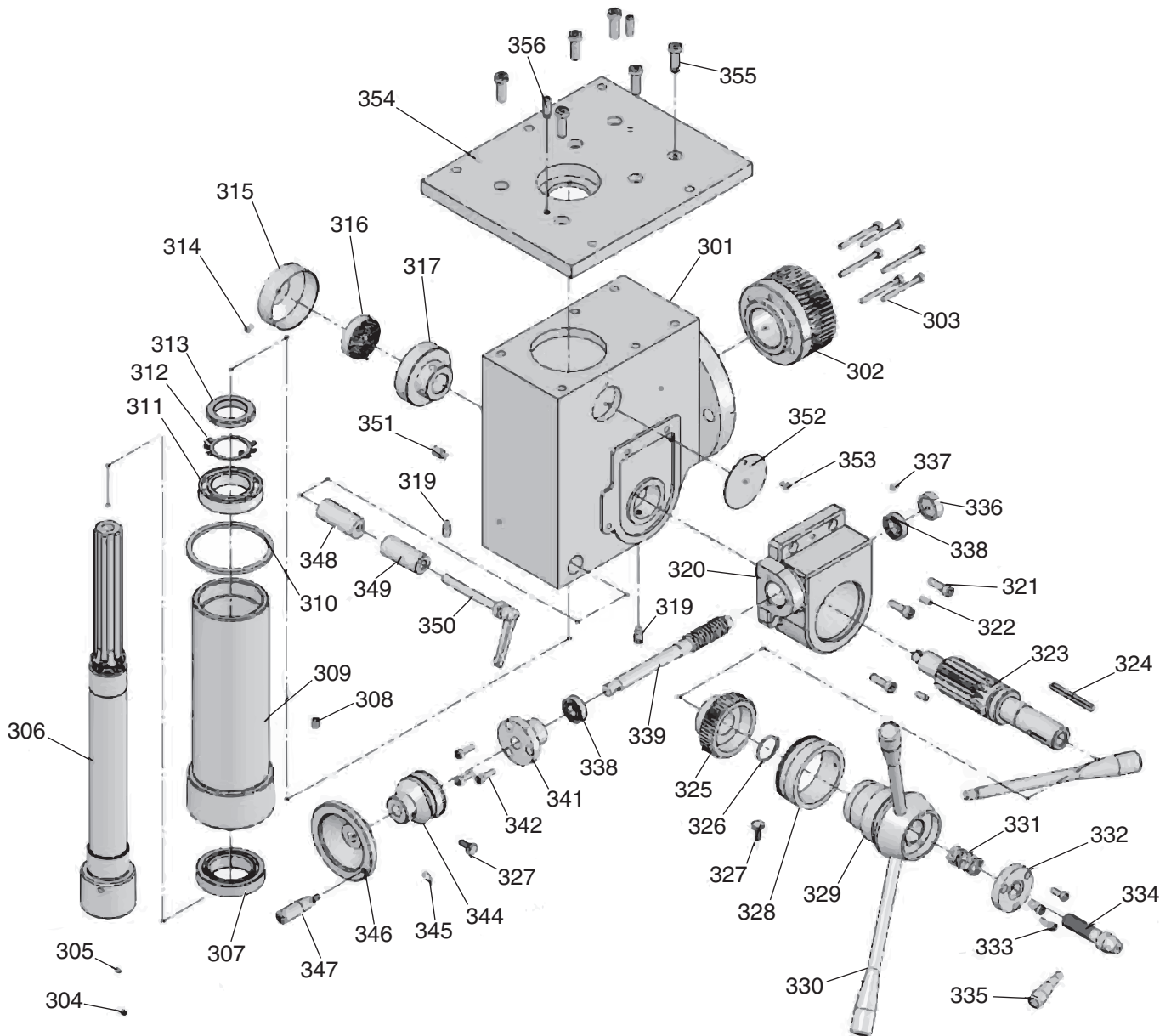
Horizontal Spindle Parts List

REF	PART #	DESCRIPTION
201	P0757Z201	CAP SCREW M8-1.25 X 25
202	P0757Z202	BALL OILER 8MM PRESS-IN
203	P0757Z203	INBOARD END COVER
204	P0757Z204	HORIZONTAL SPINDLE R-8
205	P0757Z205	TAPERED ROLLER BEARING 32011 P5
206	P0757Z206	HORIZONTAL QUILL
207	P0757Z207	TAPERED ROLLER BEARING 30308 P5
208	P0757Z208	SPANNER LOCK WASHER 39MM
209	P0757Z209	SPANNER NUT M39-1.5
210	P0757Z210	SPACER 4 X 90MM
211	P0757Z211	OUTBOARD END COVER
212	P0757Z212	CAP SCREW M8-1.25 X 25
213	P0757Z213	HORIZONTAL SPINDLE PULLEY
214	P0757Z214	EXT RETAINING RING 35MM
215	P0757Z215	KEY 10 X 8 X 30
216	P0757Z216	V-BELT GATES A33
217	P0757Z217	KEY 6 X 6 X 30
218	P0757Z218	EXT RETAINING RING 20MM
219	P0757Z219	TRANSFER PULLEY
220	P0757Z220	EXT RETAINING RING 28MM
221	P0757Z221	INT RETAINING RING 47MM
222	P0757Z222	BALL BEARING 6005ZZ
223	P0757Z223	SPACER
224	P0757Z224	BEARING SEAT
225	P0757Z225	SPANNER NUT M64-2
226	P0757Z226	UPPER IDLER PULLEY SHAFT
227	P0757Z227	KEY 8 X 8 X 40
228	P0757Z228	UPPER IDLER PULLEY
229	P0757Z229	EXT RETAINING RING 25MM
230	P0757Z230	V-BELT GATES A34
231	P0757Z231	SPANNER NUT LOCKDOWN BAR
232	P0757Z232	CAP SCREW M6-1 X 25
233	P0757Z233	CAP SCREW M8-1.25 X 60
234	P0757Z234	HORIZONTAL MOTOR/PULLEY BRACKET
235	P0757Z235	CAP SCREW M12-1.75 X 80
236	P0757Z236	HEX NUT M16-2
237	P0757Z237	FLAT WASHER 16MM
238	P0757Z238	TENSION ROD END M8-1.25 X 90

REF	PART #	DESCRIPTION
239	P0757Z239	TENSION ROD END BRACKET
241	P0757Z241	THUMB WHEEL M8-1.25
242	P0757Z242	LOWER IDLER PULLEY SHAFT
243	P0757Z243	TENSION PIVOT ARM
244	P0757Z244	BALL BEARING 6003ZZ
245	P0757Z245	SPACER
246	P0757Z246	INT RETAINING RING 35MM
247	P0757Z247	EXT RETAINING RING 17MM
248	P0757Z248	LOWER IDLER PULLEY
249	P0757Z249	V-BELT A31.5
250	P0757Z250	HORIZONTAL SPINDLE MOTOR 2HP 220V 1-PH
250-1	P0757Z250-1	MOTOR FAN COVER
250-2	P0757Z250-2	MOTOR FAN
250-3	P0757Z250-3	MOTOR JUNCTION BOX
250-4	P0757Z250-4	R CAPACITOR 20M 450V 1-5/8 X 3-1/8
250-5	P0757Z250-5	S CAPACITOR 150M 250V 1-5/8 X 3-1/8
250-6	P0757Z250-6	CENTRIFUGAL SWITCH
250-7	P0757Z250-7	CONTACT PLATE
250-8	P0757Z250-8	BALL BEARING 6205ZZ (FRONT)
250-9	P0757Z250-9	BALL BEARING 6205ZZ (REAR)
250-10	P0757Z250-10	MOTOR CORD 5W 14G
251	P0757Z251	KEY 8 X 8 X 45
252	P0757Z252	HORIZONTAL MOTOR PULLEY
253	P0757Z253	LOCK WASHER 8MM
254	P0757Z254	HEX BOLT M8-1.25 X 30
255	P0757Z255	HORIZONTAL ARBOR 1-1/4"
256	P0757Z256	SET SCREW M5-.8 X 8 DOG-PT
257	P0757Z257	SET SCREW M5-.8 X 6
258	P0757Z258	HORIZONTAL ARBOR NUT 1-1/4 X 7TPI
259	P0757Z259	ARBOR SPACER 1-1/4" X 1"
260	P0757Z260	ARBOR SPACER 1-1/4" X 2"
261	P0757Z261	ARBOR SPACER 1-1/4" X 3-1/8"
262	P0757Z262	HORIZONTAL DRAWBAR 7/16-20 X 13-3/4
263	P0757Z263	HORIZONTAL ARBOR 1"
264	P0757Z264	HORIZONTAL ARBOR NUT 1-8
265	P0757Z265	ARBOR SPACER 1" X 1"
266	P0757Z266	ARBOR SPACER 1" X 2"
267	P0757Z267	ARBOR SPACER 1" X 3-1/8"



Vertical Spindle



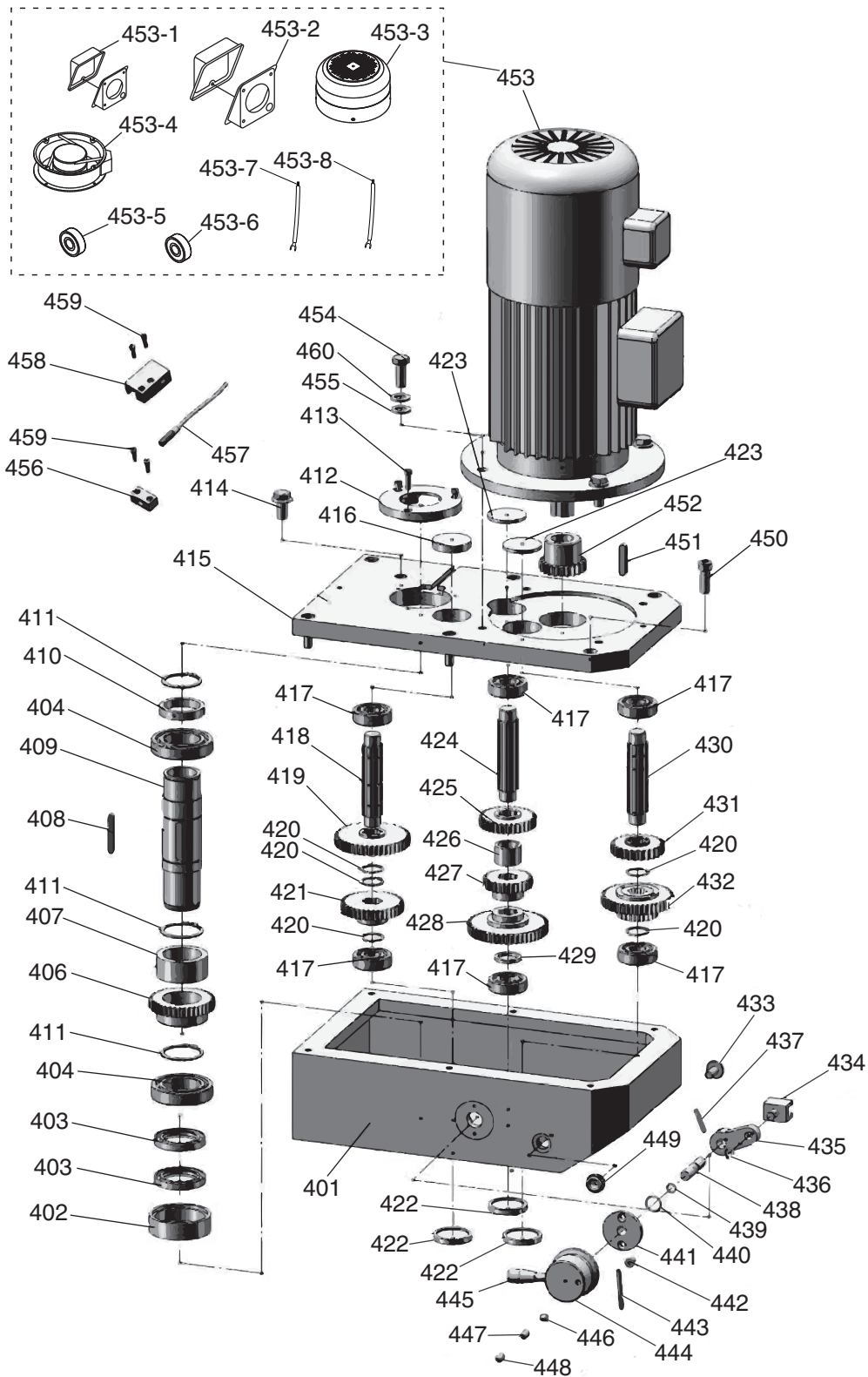
Vertical Spindle Parts List

REF	PART #	DESCRIPTION
301	P0757Z301	HEADSTOCK CASTING
302	P0757Z302	GEAR 50T
303	P0757Z303	CAP SCREW M6-1 X 70
304	P0757Z304	SET SCREW M5-.8 X 6 DOG-PT
305	P0757Z305	SET SCREW M5-.8 X 6
306	P0757Z306	VERTICAL SPINDLE R-8
307	P0757Z307	TAPERED ROLLER BEARING 32010 P5
308	P0757Z308	VERTICAL SPINDLE LOWER OIL CUP
309	P0757Z309	QUILL
310	P0757Z310	RUBBER GASKET 90MM
311	P0757Z311	BALL BEARING 6009ZZ P5
312	P0757Z312	SPANNER NUT TOOTHED WASHER 40MM
313	P0757Z313	SPANNER NUT M40-1.5
314	P0757Z314	CAP SCREW M4-.7 X 8
315	P0757Z315	SPRING CAP
316	P0757Z316	RETURN COIL SPRING
317	P0757Z317	SPRING BASE
319	P0757Z319	SET SCREW M8-1.25 X 16
320	P0757Z320	DOWNFEED GEAR HOUSING
321	P0757Z321	CAP SCREW M8-1.25 X 25
322	P0757Z322	DOWEL PIN 6 X 25
323	P0757Z323	COARSE DOWNFEED GEAR SHAFT 16T
324	P0757Z324	KEY 8 X 8 X 38
325	P0757Z325	WORM GEAR
326	P0757Z326	EXT RETAINING RING 30MM
327	P0757Z327	THUMB SCREW M6-1 X 16
328	P0757Z328	COARSE DOWNFEED GRADUATED DIAL

REF	PART #	DESCRIPTION
329	P0757Z329	COARSE DOWNFEED LEVER HUB
330	P0757Z330	COARSE DOWNFEED LEVER M12-1.75 X 15
331	P0757Z331	COMPRESSION SPRING
332	P0757Z332	LEVER HUB END CAP
333	P0757Z333	CAP SCREW M6-1 X 12
334	P0757Z334	DOWNFEED SELECTION SHAFT
335	P0757Z335	SHAFT HANDLE M8-1.25 X 10
336	P0757Z336	BEARING CAP
337	P0757Z337	CAP SCREW M6-1 X 12
338	P0757Z338	BALL BEARING 6002ZZ
339	P0757Z339	FINE DOWNFEED WORM SHAFT
341	P0757Z341	WORM SHAFT BRACKET
342	P0757Z342	CAP SCREW M6-1 X 20
344	P0757Z344	FINE DOWNFEED GRADUATED DIAL
345	P0757Z345	SET SCREW M6-1 X 12
346	P0757Z346	FINE DOWNFEED HANDWHEEL
347	P0757Z347	HANDWHEEL HANDLE M8-1.25 X 10
348	P0757Z348	INNER QUILL LOCK SLEEVE
349	P0757Z349	OUTER QUILL LOCK SLEEVE
350	P0757Z350	ADJUSTABLE HANDLE M10-1.5 X 90
351	P0757Z351	SET SCREW M10-1.5 X 10
352	P0757Z352	COVER PLATE
353	P0757Z353	CAP SCREW M5-.8 X 10
354	P0757Z354	GEARBOX MOUNTING PLATE
355	P0757Z355	CAP SCREW M10-1.5 X 30
356	P0757Z356	DOWEL PIN 8 X 25



Vertical Gearbox



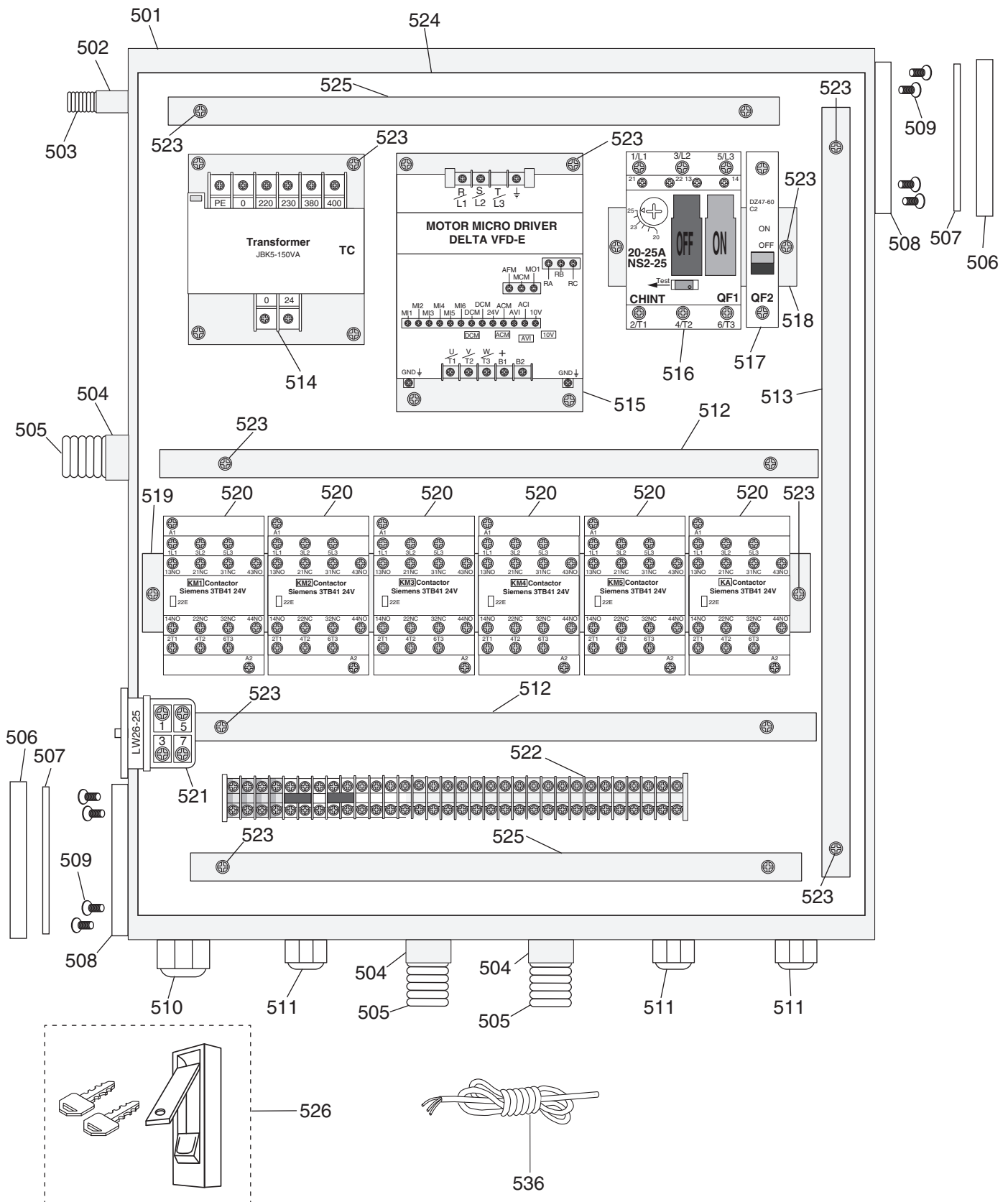
Vertical Gearbox Parts List

REF	PART #	DESCRIPTION
401	P0757Z401	GEARBOX CASTING
402	P0757Z402	COLLAR
403	P0757Z403	OIL SEAL FB 45 X 62 X 8MM
404	P0757Z404	BALL BEARING 6009-OPEN
406	P0757Z405	GEAR 38T
407	P0757Z407	SPACER
408	P0757Z408	KEY 8 X 8 X 50
409	P0757Z409	SPINDLE SHAFT
410	P0757Z410	RPM SENSOR ROTOR
411	P0757Z411	EXT RETAINING RING 45MM
412	P0757Z412	ROTOR GUARD
413	P0757Z413	CAP SCREW M5-.8 X 16
414	P0757Z414	HEX BOLT M16-2 X 10
415	P0757Z415	GEARBOX COVER
416	P0757Z416	DRIVE SHAFT END CAP
417	P0757Z417	BALL BEARING 6204ZZ
418	P0757Z418	REAR DRIVE SHAFT
419	P0757Z419	GEAR 44T
420	P0757Z420	EXT RETAINING RING 25MM
421	P0757Z421	GEAR 36T
422	P0757Z422	DRIVE SHAFT END CAP
423	P0757Z423	REAR SHAFT END CAP
424	P0757Z424	CENTER DRIVE SHAFT
425	P0757Z425	GEAR 33T
426	P0757Z426	SPACER
427	P0757Z427	GEAR 28T
428	P0757Z428	GEAR 48T
429	P0757Z429	SPACER
430	P0757Z430	FRONT DRIVE SHAFT
431	P0757Z431	GEAR 24T
432	P0757Z432	GEAR 42T/22T
433	P0757Z433	HEX BOLT M10-1.5 X 12
434	P0757Z434	LIFT FORK

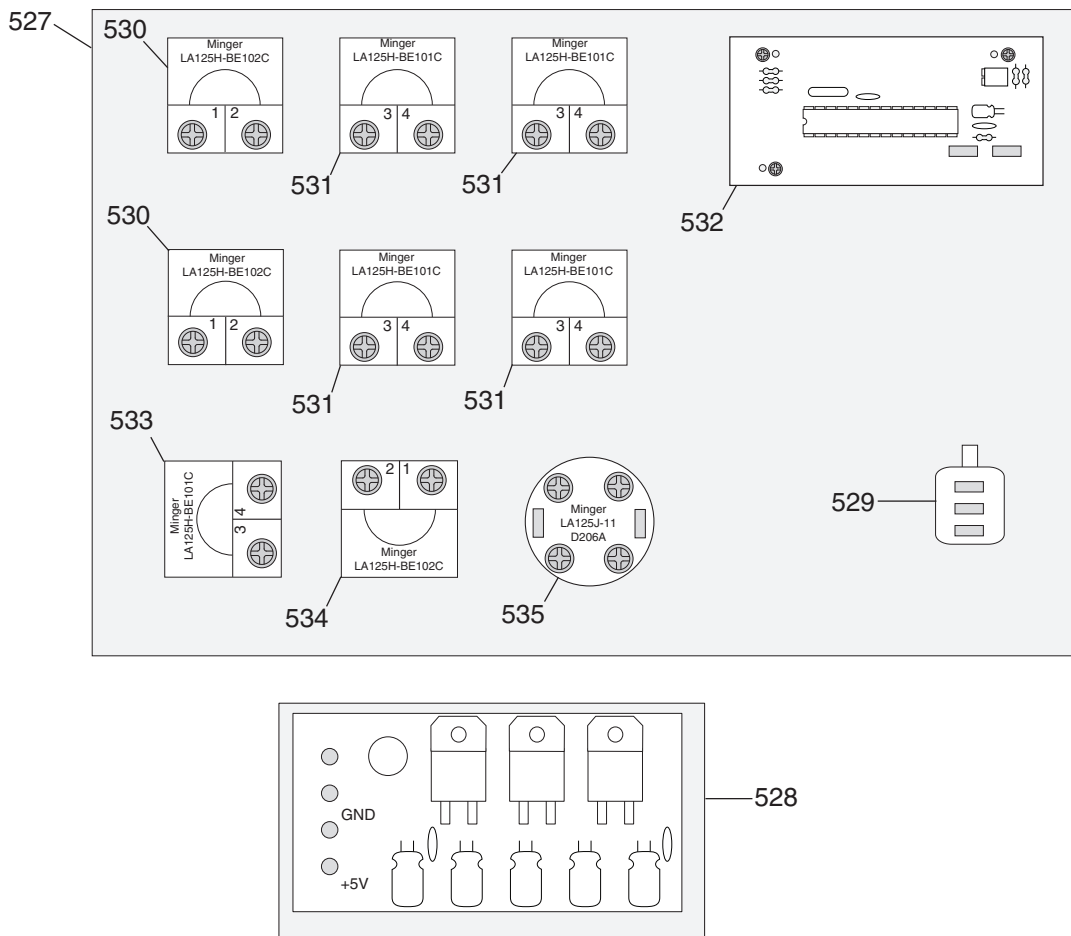
REF	PART #	DESCRIPTION
435	P0757Z435	ROCKER ARM
436	P0757Z436	EXT RETAINING RING 10MM
437	P0757Z437	DOWEL PIN 5 X 30MM
438	P0757Z438	SMALL SPINDLE
439	P0757Z439	O-RING 12 X 2 P12
440	P0757Z440	O-RING 20 X 2 P20
441	P0757Z441	HIGH/LOW GEAR PLATE
442	P0757Z442	FLAT HD SCR M5-.8 X 12
443	P0757Z443	DOWEL PIN 5 X 50MM
444	P0757Z444	HIGH/LOW GEAR HUB
445	P0757Z445	HIGH/LOW GEAR HANDLE M8-1.25 X 10
446	P0757Z446	STEEL BALL 6MM
447	P0757Z447	COMPRESSION SPRING
448	P0757Z448	SET SCREW M8-1.25 X 12
449	P0757Z449	SIGHTGLASS M27-1.5 X 12
450	P0757Z450	CAP SCREW M10-1.5 X 25
451	P0757Z451	KEY 8 X 8 X 40
452	P0757Z452	GEAR 20T
453	P0757Z453	VERTICAL MOTOR 3HP 220V 3-PH
453-1	P0757Z453-1	FAN JUNCTION BOX
453-2	P0757Z453-2	MOTOR JUNCTION BOX
453-3	P0757Z453-3	FAN COVER
453-4	P0757Z453-4	INDEPENDENT MOTOR FAN
453-5	P0757Z453-5	FRONT MOTOR BEARING
453-6	P0757Z453-6	REAR MOTOR BEARING
453-7	P0757Z453-7	MOTOR CORD 5W 14G
453-8	P0757Z453-8	FAN CORD 2W 18G
454	P0757Z454	HEX BOLT M12-1.75 X 40
455	P0757Z455	FLAT WASHER 12MM
456	P0757Z456	SPEED SENSOR BRACKET
457	P0757Z457	SPEED SENSOR
458	P0757Z458	SPEED SENSOR COVER
459	P0757Z459	CAP SCREW M4-.7 X 16
460	P0757Z460	LOCK WASHER 12MM



Electrical Components



Electrical Components Cont.



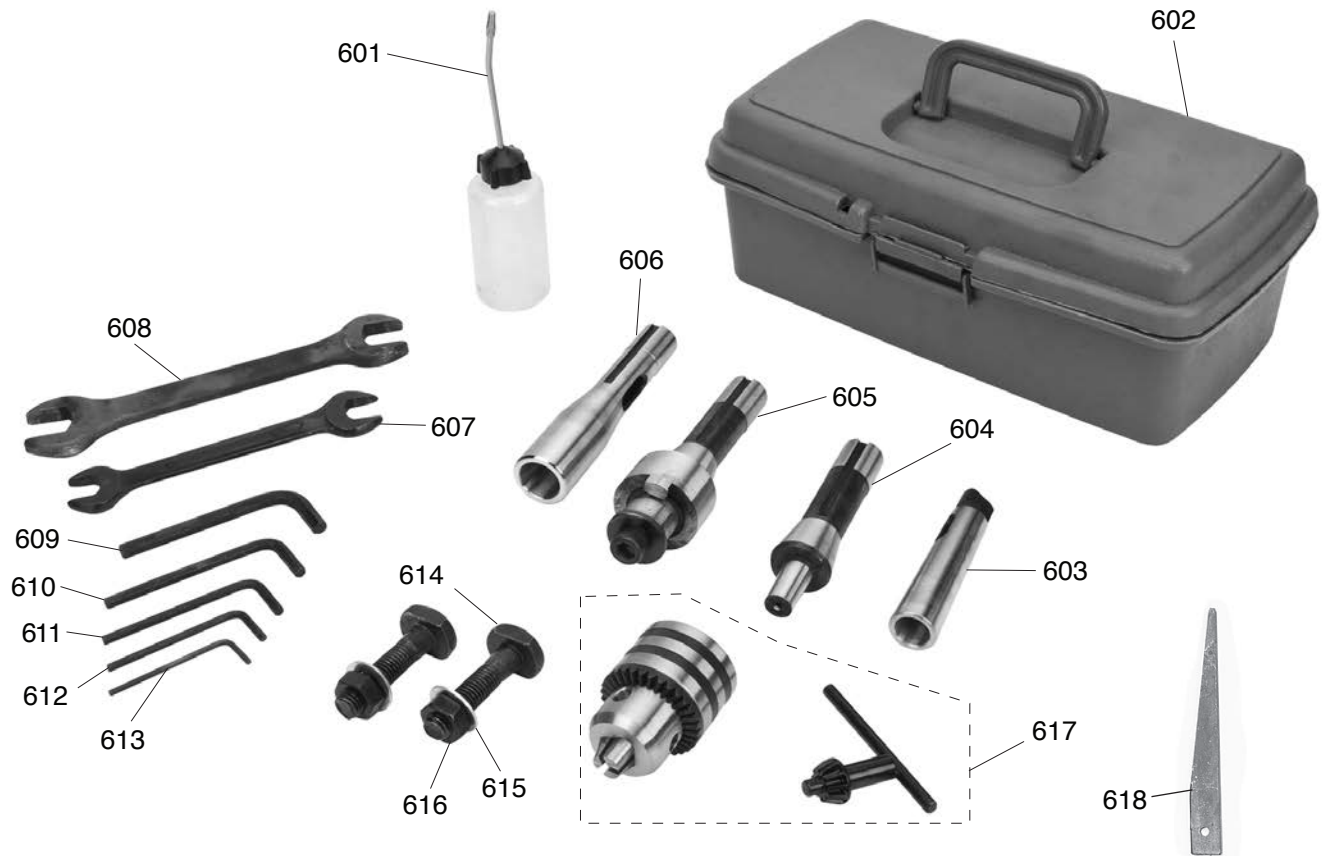
Electrical Components Parts List

REF PART #	DESCRIPTION
501	P0757Z501 ELECTRICAL BOX W/DOOR
502	P0757Z502 STRAIN RELIEF PG8 TYPE-5
503	P0757Z503 CONDUIT 10MM
504	P0757Z504 STRAIN RELIEF PG10 TYPE-5
505	P0757Z505 CONDUIT 12MM
506	P0757Z506 VENT COVER
507	P0757Z507 VENT FOAM FILTER
508	P0757Z508 VENT BODY
509	P0757Z509 FLAT HD SCR M4-.7 X 6
510	P0757Z510 STRAIN RELIEF PG10 TYPE-3
511	P0757Z511 STRAIN RELIEF PG12 TYPE-3
512	P0757Z512 WIRE LOOM 12"
513	P0757Z513 WIRE LOOM 18"
514	P0757Z514 TRANSFORMER JBK5-150V
515	P0757Z515 VARIABLE FREQUENCY DRIVE DELTA VFD-E
516	P0757Z516 OL RELAY CHINT NS2-25 20-25A
517	P0757Z517 CIRCUIT BREAKER CHINT DZ4760 C2 2P
518	P0757Z518 DIN RAIL 3"

REF PART #	DESCRIPTION
519	P0757Z519 DIN RAIL 10"
520	P0757Z520 CONTACTOR SIEMENS 3TB41 24V
521	P0757Z521 ROTARY SWITCH CANSEN LW26-25
522	P0757Z522 TERMINAL BAR 32P
523	P0757Z523 PHLP HD SCR M4-.7 X 6
524	P0757Z524 MOUNTING PLATE
525	P0757Z525 WIRE LOOM 10"
526	P0757Z526 ELECTRICAL BOX LOCK W/KEY
527	P0757Z527 CONTROL PANEL FACEPLATE
528	P0757Z528 RPM READOUT POWER SUPPLY
529	P0757Z529 POTENTIOMETER XINGHUO WXD3 B4K
530	P0757Z530 BUTTON SWITCH MINGER LA125HBE102C RED
531	P0757Z531 BUTTON SWITCH MINGER LA125HBE101C GREEN
532	P0757Z532 RPM READOUT DISPLAY
533	P0757Z533 PUMP SWITCH MINGER LA125HBE101C
534	P0757Z534 E-STOP BUTTON LA125HBE102C
535	P0757Z535 POWER BUTTON MINGER LA125J11D206A
536	P0757Z536 POWER CORD 4W 14G 6 78"



Accessories

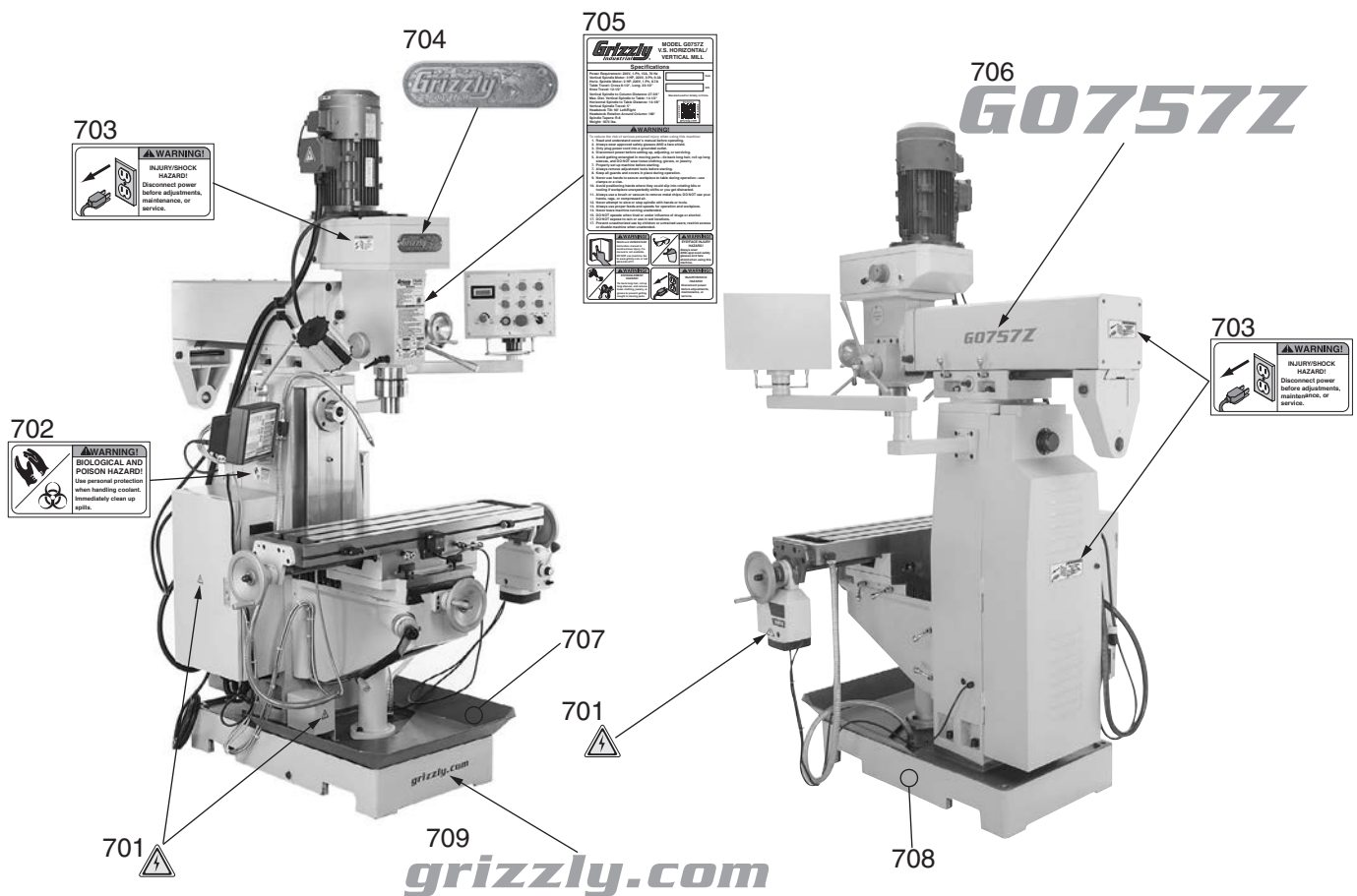


REF	PART #	DESCRIPTION
601	P0757Z601	BOTTLE FOR OIL
602	P0757Z602	TOOLBOX
603	P0757Z603	SPINDLE SLEEVE MT#3 X MT#2
604	P0757Z604	DRILL CHUCK ARBOR R8 X B16
605	P0757Z605	END MILL ARBOR R8 X 1"
606	P0757Z606	SPINDLE SLEEVE R8 X MT#3
607	P0757Z607	WRENCH 17 X 19MM OPEN-ENDS
608	P0757Z608	WRENCH 22 X 24MM OPEN-ENDS
609	P0757Z609	HEX WRENCH 8MM

REF	PART #	DESCRIPTION
610	P0757Z610	HEX WRENCH 6MM
611	P0757Z611	HEX WRENCH 5MM
612	P0757Z612	HEX WRENCH 4MM
613	P0757Z613	HEX WRENCH 3MM
614	P0757Z614	T-BOLT M14-2 X 60
615	P0757Z615	FLAT WASHER 14MM
616	P0757Z616	HEX NUT M14-2
617	P0757Z617	DRILL CHUCK B16 W/CHUCK KEY
618	P0757Z618	DRIFT KEY



Labels & Cosmetics



REF	PART #	DESCRIPTION
701	P0757Z701	ELECTRICITY LABEL
702	P0757Z702	BIOHAZARD WARNING LABEL
703	P0757Z703	DISCONNECT WARNING LABEL
704	P0757Z704	GRIZZLY OBLONG NAMEPLATE-SMALL
705	P0757Z705	MACHINE ID LABEL

REF	PART #	DESCRIPTION
706	P0757Z706	MODEL NUMBER LABEL
707	P0757Z707	GRIZZLY GREEN TOUCH-UP PAINT
708	P0757Z708	GRIZZLY PUTTY TOUCH-UP PAINT
709	P0757Z709	GRIZZLY.COM LABEL

WARNING

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





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1. How did you learn about us?

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 Card Deck Website Other:

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

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

3. What is your annual household income?

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

4. What is your age group?

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

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

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

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

0-2 3-5 6-9 10+

7. Do you think your machine represents a good value? Yes No

8. Would you recommend Grizzly Industrial to a friend? Yes No

9. Would you allow us to use your name as a reference for Grizzly customers in your area?
Note: We never use names more than 3 times. Yes No

10. Comments: _____

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

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

To take advantage of this warranty, contact us by mail or phone and give us all the details. We will then issue you a "Return Number," which must be clearly posted on the outside as well as the inside of the carton. We will not accept any item back without this number. Proof of purchase must accompany the merchandise.

The manufacturers reserve the right to change specifications at any time because they constantly strive to achieve better quality equipment. We make every effort to ensure that our products meet high quality and durability standards and we hope you never need to use this warranty.

Please feel free to write or call us if you have any questions about the machine or the manual.

Thank you again for your business and continued support. We hope to serve you again soon.

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