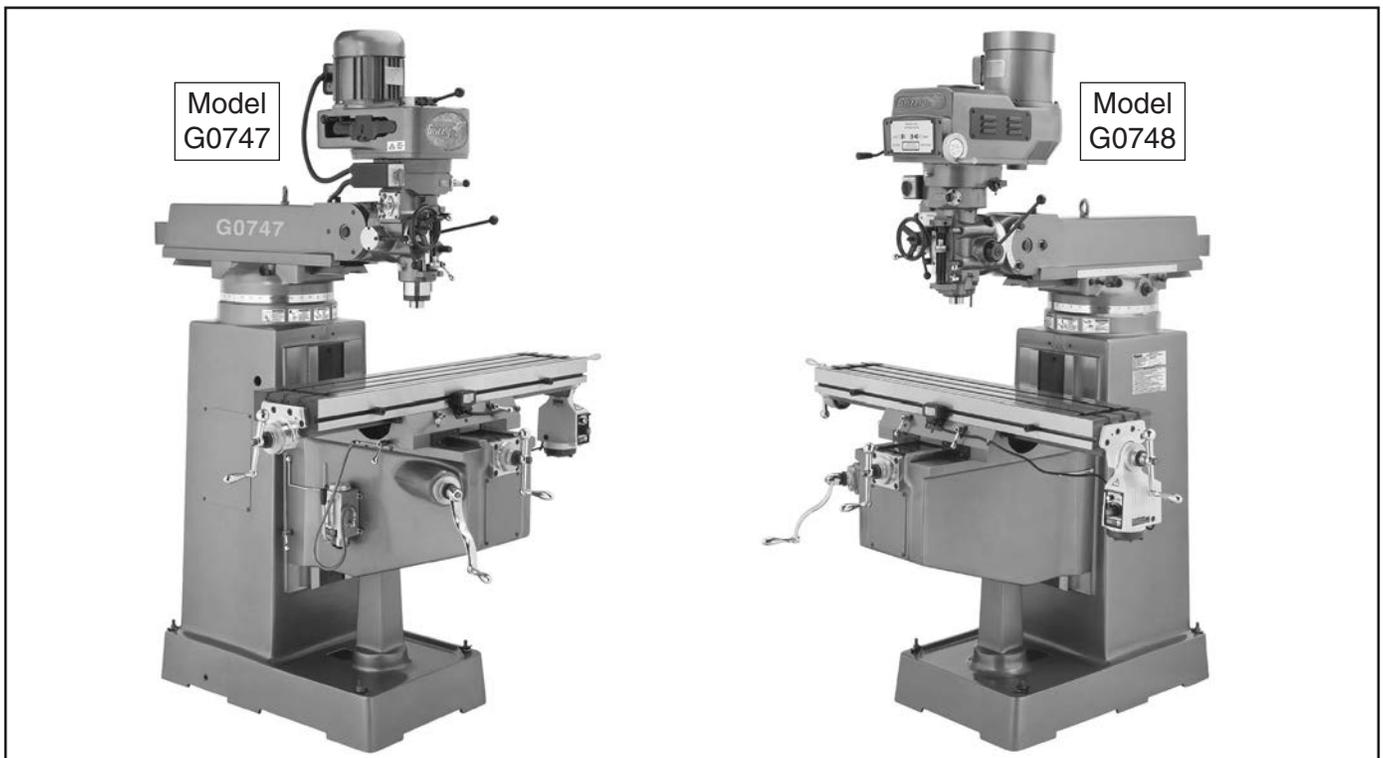


Grizzly ***Industrial, Inc.*** ®

MODELS G0747 & G0748 **10" x 50" VERTICAL** **MILLING MACHINE** **w/POWER FEED** **OWNER'S MANUAL**

(For models manufactured since 8/12)



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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.**

#TS15453 PRINTED IN CHINA



WARNING!

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

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

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

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



WARNING!

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

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

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

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INTRODUCTION

Machine Description

These milling machines are designed to remove material from a metal workpiece that is secured to the work table or a mill vise. The cutting tool is fixed to the rotating spindle and moved into the workpiece by lowering the spindle or moving the table. The table moves in three axes (X-, Y-, and Z-axis) with a power feed assist for the X-axis.

Spindle downfeed options are rapid (coarse) control or slow (fine) control with adjustable auto-downfeed controls.

Both models offer a wide range of spindle speeds and three auto-downfeed rates.

The wide range of cutting tools and optional equipment available, combined with the flexible features of these milling machines, make possible countless metalworking operations.

Contact Info

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

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

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

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

Manual Accuracy

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

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

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

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.

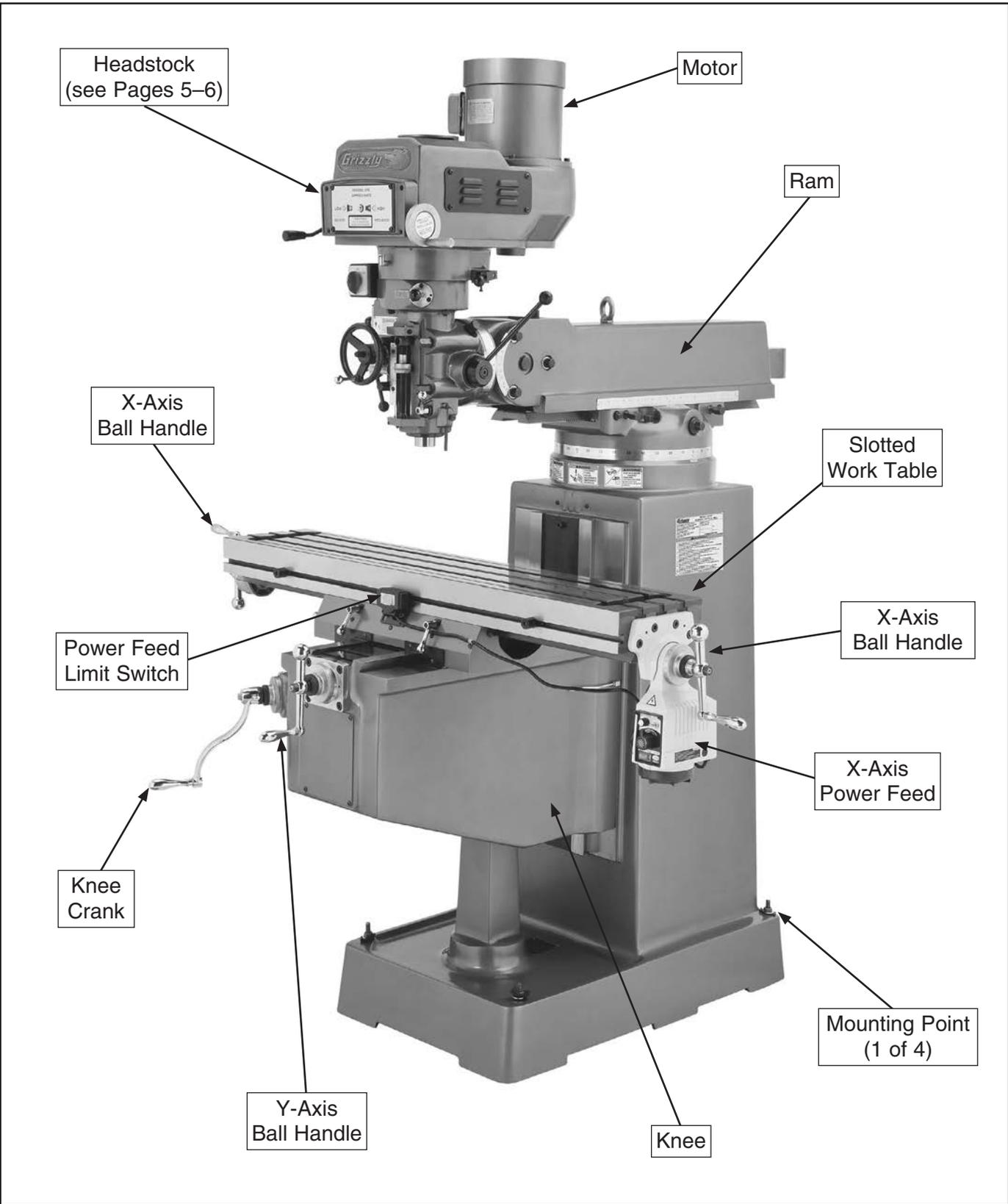
| | | | |
|--------------------------------------------------------------------------------------|--|--------------------------------------------------------------|--|
|  | | MODEL GXXXX MACHINE NAME | |
| SPECIFICATIONS | | ▲ WARNING! | |
| Motor: | | To reduce risk of serious injury when using this machine: | |
| Specification: | | Read manual before operation. | |
| Specification: | | Wear safety glasses and respirator. | |
| Specification: | | Ensure machine is 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 use while under the influence of drugs or alcohol. | |
| | | 10. Maintain machine carefully to prevent accidents. | |
| | | Manufactured for Grizzly in Taiwan | |

Manufacture Date

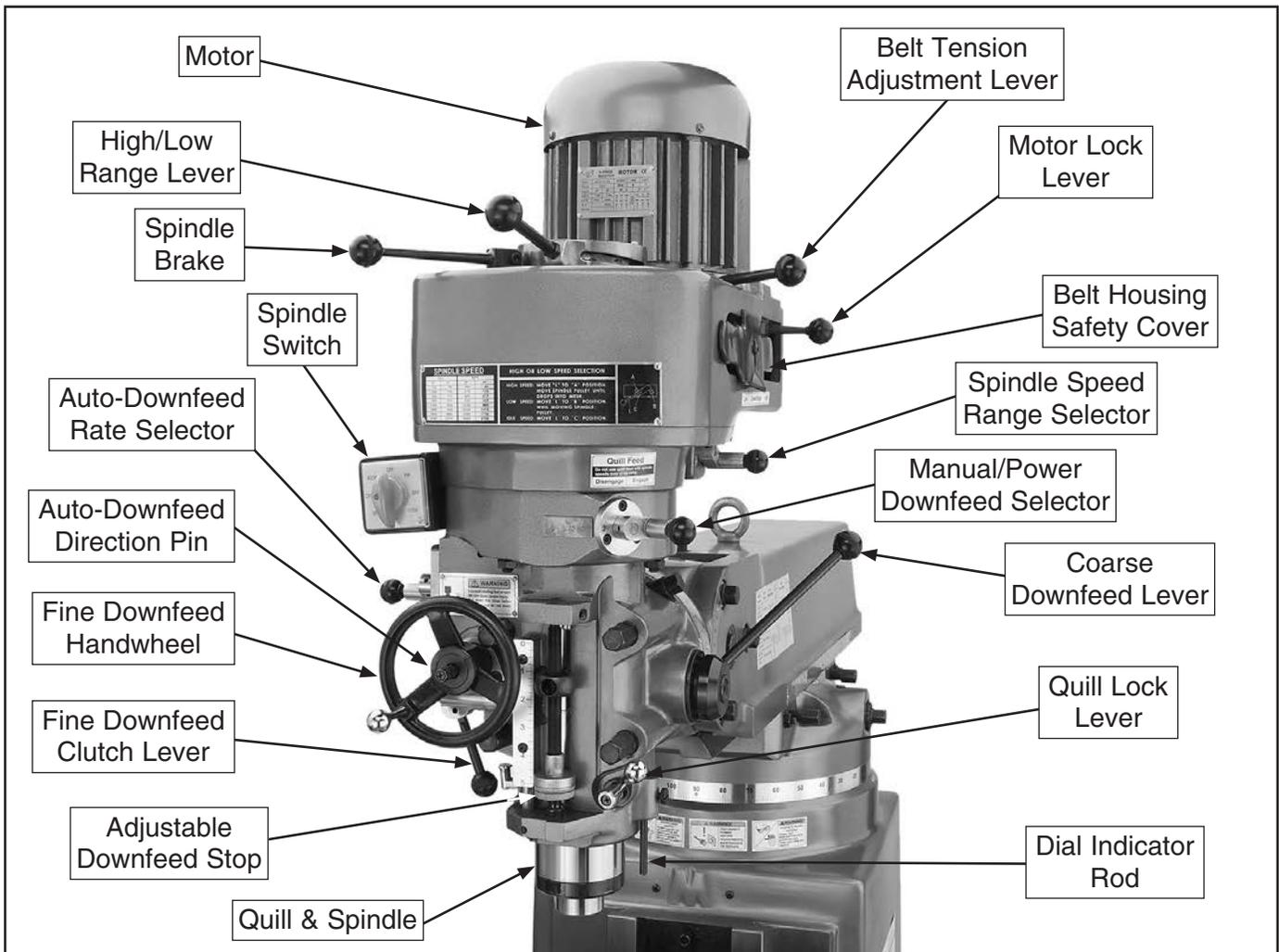
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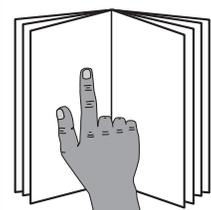


Front View Identification



Model G0747 Headstock Identification



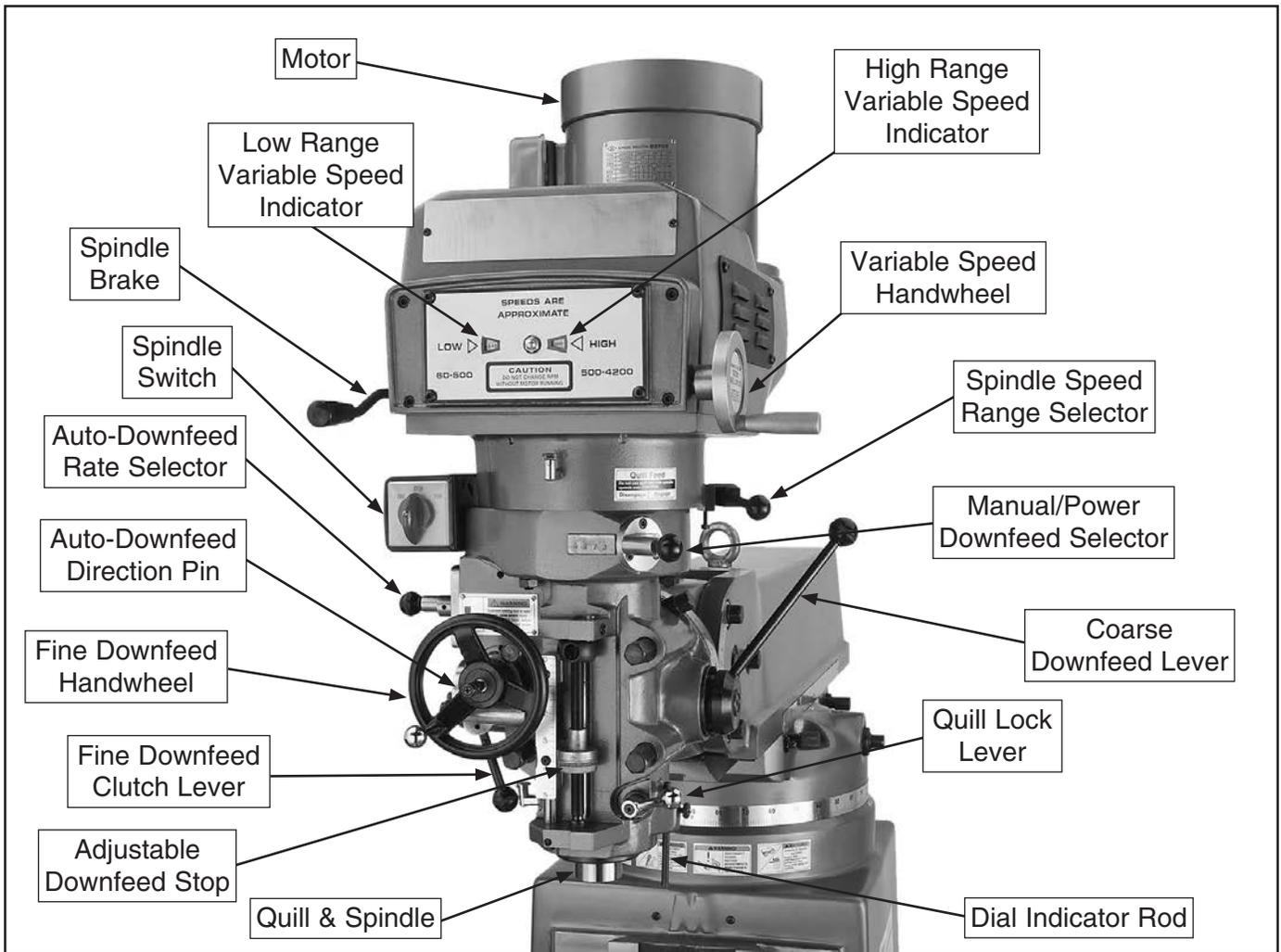


⚠ WARNING

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



Model G0748 Headstock Identification





MACHINE DATA SHEET

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

MODEL G0747 VERTICAL MILL - 16 SPEED

Product Dimensions:

Weight..... 2,249 lbs.
 Width (side-to-side) x Depth (front-to-back) x Height..... 54 x 66-1/2 x 84-3/4 in.
 Footprint (Length x Width)..... 40 x 24 in.
 Space Required for Full Range of Movement (Width x Depth)..... 95 x 56-1/2 in.

Shipping Dimensions:

Type..... Wood Crate
 Content..... Machine
 Weight..... 2492 lbs.
 Length x Width x Height..... 55 x 54 x 78 in.
 Must Ship Upright..... Yes

Electrical:

Power Requirement..... 220V, 3-Phase, 60 Hz
 Prewired Voltage..... 220V
 Full-Load Current Rating..... 7.9A
 Minimum Circuit Size..... 15A
 Connection Type..... Cord & Plug
 Power Cord Included..... Yes
 Power Cord Length..... 6 ft.
 Power Cord Gauge..... 14 AWG
 Plug Included..... No
 Recommended Plug Type..... 15-15
 Switch Type..... Forward/Reverse Switch
 Recommended Phase Converter..... G5845

Motors:

Main

Type..... TEFC Induction
 Horsepower..... 3 HP
 Phase..... 3-Phase
 Amps..... 7.8A / 7.9A
 Speed..... 3450 / 1725 RPM
 Power Transfer V-Belt Drive
 Bearings..... Shielded & Permanently Lubricated



Main Specifications:

Operation Info

| | |
|--------------------------------------------|------------|
| Spindle Travel..... | 5 in. |
| Max Distance Spindle to Column..... | 24-3/8 in. |
| Max Distance Spindle to Table..... | 16-7/8 in. |
| Longitudinal Table Travel (X-Axis)..... | 29-7/8 in. |
| Cross Table Travel (Y-Axis)..... | 15-3/4 in. |
| Vertical Table Travel (Z-Axis)..... | 16 in. |
| Ram Travel..... | 24 in. |
| Turret or Column Swivel (Left /Right)..... | 360 deg. |
| Head Tilt (Left/Right)..... | 90 deg. |
| Head Tilt (Front/Back)..... | 45 deg. |
| Drilling Capacity for Cast Iron..... | 1-1/4 in. |
| Drilling Capacity for Steel..... | 1 in. |
| End Milling Capacity..... | 1 in. |
| Face Milling Capacity..... | 3 in. |

Table Info

| | |
|-----------------------------------------------|------------|
| Table Length..... | 50 in. |
| Table Width..... | 10 in. |
| Table Thickness..... | 3-5/16 in. |
| Number of T-Slots..... | 3 |
| T-Slot Size..... | 5/8 in. |
| T-Slots Centers..... | 2-1/2 in. |
| X/Y-Axis Travel per Handwheel Revolution..... | 0.200 in. |
| Z-Axis Travel per Handwheel Revolution..... | 0.100 in. |

Spindle Info

| | |
|----------------------------------------|-------------------------------|
| Spindle Taper..... | R-8 |
| Number of Vertical Spindle Speeds..... | 16 |
| Range of Vertical Spindle Speeds..... | 80 – 5440 RPM |
| Quill Diameter..... | 86 mm |
| Quill Feed Rates..... | 0.0015, 0.003, 0.006 in./rev. |
| Drawbar Thread Size..... | 7/16-20 |
| Drawbar Length..... | 23-1/2 in. |
| Spindle Bearings..... | Angular Contact Bearings |

Construction

| | |
|----------------------------|----------------------------------------|
| Spindle Housing/Quill..... | Chrome-Plated & Precision-Ground Steel |
| Table..... | Precision-Ground Meehanite Cast Iron |
| Head..... | Aluminum |
| Column/Base..... | Meehanite Cast Iron |
| Base..... | Cast Iron |
| Paint Type/Finish..... | Enamel |

Other Specifications:

| | |
|----------------------------------------------------------------------|--------------------|
| Country of Origin | China |
| Warranty | 1 Year |
| Approximate Assembly & Setup Time | 1 Hour |
| Serial Number Location | ID Label on Column |
| ISO 9001 Factory | Yes |
| Certified by a Nationally Recognized Testing Laboratory (NRTL) | No |





MACHINE DATA SHEET

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

MODEL G0748 VERTICAL MILL - VARIABLE-SPEED

Product Dimensions:

Weight..... 2,315 lbs.
 Width (side-to-side) x Depth (front-to-back) x Height..... 54 x 66-1/2 x 84-3/4 in.
 Footprint (Length x Width)..... 40 x 24 in.
 Space Required for Full Range of Movement (Width x Depth)..... 95 x 56-1/2 in.

Shipping Dimensions:

Type..... Wood Crate
 Content..... Machine
 Weight..... 2558 lbs.
 Length x Width x Height..... 54 x 55 x 78 in.
 Must Ship Upright..... Yes

Electrical:

Power Requirement..... 220V, 3-Phase, 60 Hz
 Prewired Voltage..... 220V
 Full-Load Current Rating..... 6.6A
 Minimum Circuit Size..... 15A
 Connection Type..... Cord & Plug
 Power Cord Included..... Yes
 Power Cord Length..... 6 ft.
 Power Cord Gauge..... 14 AWG
 Plug Included..... No
 Recommended Plug Type..... 15-15
 Switch Type..... Forward/Reverse Switch
 Recommended Phase Converter..... G5845

Motors:

Main

Type..... TEFC Induction
 Horsepower..... 3 HP
 Phase..... 3-Phase
 Amps..... 6.6A
 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..... | 24-3/8 in. |
| Max Distance Spindle to Table..... | 16-7/8 in. |
| Longitudinal Table Travel (X-Axis)..... | 29-7/8 in. |
| Cross Table Travel (Y-Axis)..... | 15-3/4 in. |
| Vertical Table Travel (Z-Axis)..... | 16 in. |
| Ram Travel..... | 24 in. |
| Turret or Column Swivel (Left /Right)..... | 360 deg. |
| Head Tilt (Left/Right)..... | 90 deg. |
| Head Tilt (Front/Back)..... | 45 deg. |
| Drilling Capacity for Cast Iron..... | 1-1/4 in. |
| Drilling Capacity for Steel..... | 1 in. |
| End Milling Capacity..... | 1 in. |
| Face Milling Capacity..... | 3 in. |

Table Info

| | |
|-----------------------------------------------|------------|
| Table Length..... | 50 in. |
| Table Width..... | 10 in. |
| Table Thickness..... | 3-5/16 in. |
| Number of T-Slots..... | 3 |
| T-Slot Size..... | 5/8 in. |
| T-Slots Centers..... | 2-1/2 in. |
| X/Y-Axis Travel per Handwheel Revolution..... | 0.200 in. |
| Z-Axis Travel per Handwheel Revolution..... | 0.100 in. |

Spindle Info

| | |
|----------------------------------------|-------------------------------|
| Spindle Taper..... | R-8 |
| Number of Vertical Spindle Speeds..... | Variable |
| Range of Vertical Spindle Speeds..... | 60 – 4200 RPM |
| Quill Diameter..... | 86 mm |
| Quill Feed Rates..... | 0.0015, 0.003, 0.008 in./rev. |
| Drawbar Thread Size..... | 7/16-20 |
| Drawbar Length..... | 23-1/2 in. |
| Spindle Bearings..... | Angular Contact Bearings |

Construction

| | |
|----------------------------|----------------------------------------|
| Spindle Housing/Quill..... | Chrome-Plated & Precision-Ground Steel |
| Table..... | Precision-Ground Meehanite Cast Iron |
| Head..... | Aluminum |
| Column/Base..... | Meehanite Cast Iron |
| Base..... | Cast Iron |
| Paint Type/Finish..... | Enamel |

Other Specifications:

| | |
|----------------------------------------------------------------------|--------------------|
| Country of Origin | China |
| Warranty | 1 Year |
| Approximate Assembly & Setup Time | 1 Hour |
| Serial Number Location | ID Label on Column |
| ISO 9001 Factory | Yes |
| Certified by a Nationally Recognized Testing Laboratory (NRTL) | No |



SECTION 1: SAFETY

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

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

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

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

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

NOTICE 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 your workshop kid proof!

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

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

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

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

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



WARNING

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



WARNING

Additional Safety for Milling Machines

UNDERSTANDING CONTROLS: The mill is a complex machine that presents severe cutting or amputation hazards if used incorrectly. Make sure you understand the use and operation of all controls before you begin milling.

SAFETY ACCESSORIES: Flying chips or debris from the cutting operation can cause eye injury or blindness. Always use safety glasses or a face shield when milling.

WORK HOLDING: Milling a workpiece that is not properly secured to the table or in a vise could cause the workpiece to fly into the operator with deadly force! Before starting the machine, be certain the workpiece has been properly clamped to the table. NEVER hold the workpiece by hand during operation.

SPINDLE SPEED: To avoid tool or workpiece breakage that could send flying debris at the operator and bystanders, use the correct spindle speed for the operation. Allow the spindle to gain full speed before beginning the cut.

SPINDLE DIRECTION CHANGE: Changing spindle rotation direction while it is spinning could lead to impact injury from broken tool or workpiece debris, and workpiece or machine damage. ALWAYS make sure the spindle is at a complete stop before changing spindle direction.

STOPPING SPINDLE: To reduce the risk of hand injuries or entanglement hazards, DO NOT attempt to stop the spindle with your hand or a tool. Allow the spindle to stop on its own or use the spindle brake.

CHIP CLEANUP: Chips from the operation are sharp and hot, which can cause burns or cuts. Using compressed air to clear chips could cause them to fly into your eyes, and may drive them deep into the working parts of the machine. Use a brush or vacuum to clear away chips and debris from machine or workpiece and NEVER clear chips while spindle is turning.

MACHINE CARE & MAINTENANCE: Operating the mill with excessively worn or damaged machine parts increases risk of machine or workpiece breakage which could eject hazardous debris at the operator. Operating a mill in poor condition will also reduce the quality of the results. To reduce this risk, maintain the mill in proper working condition by ALWAYS promptly performing routine inspections and maintenance.

CUTTING TOOL USAGE: Cutting tools have very sharp leading edges—handle them with care! Using cutting tools that are in good condition helps to ensure quality milling results and reduces risk of personal injury from broken tool debris. Inspect cutting tools for sharpness, chips, or cracks before each use, and ALWAYS make sure cutting tools are firmly held in place before starting the machine.

WARNING

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

CAUTION

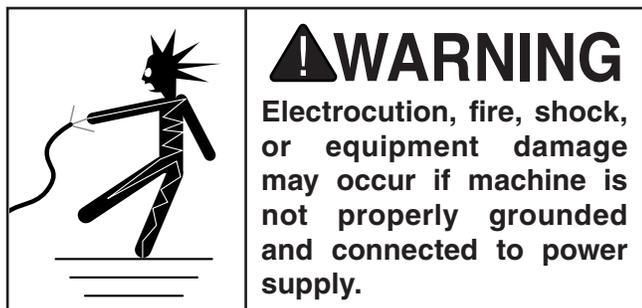
No list of safety guidelines can be complete. Every shop environment is different. Always consider safety first, as it applies to your individual working conditions. Use this and other machinery with caution and respect. Failure to do so could result in serious personal injury, damage to equipment, or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



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.

G0747 Full-Load Current Rating 7.9 Amps
G0748 Full-Load Current Rating 6.6 Amps

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

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

Circuit Requirements for 220V

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

Nominal Voltage 220V/240V
Cycle 60 Hz
Phase 3-Phase
Power Supply Circuit 15 Amps
Plug/Receptacle NEMA 15-15

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



Grounding Instructions

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

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

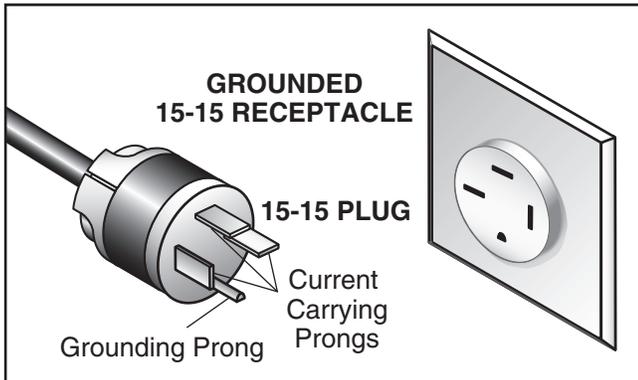
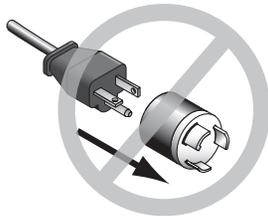


Figure 1. Typical 15-15 plug and receptacle.

⚠️ WARNING

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

⚠️ CAUTION



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

⚠️ WARNING

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

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

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

Extension Cords

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

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

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

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



SECTION 3: SETUP

Unpacking

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

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



Needed for Setup

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

For Lifting (Page 20)

- A forklift or other power lifting device rated for 25% more than the weight of the machine.
- Two lifting straps and chain with a safety hook, each rated for 25% more than the weight of the machine.
- At least two other persons to help with the operation.

For Power Connection

- We recommend a qualified electrician to ensure a safe and code-compliant connection to the power source. (Refer to **Page 14** for details.)

For Assembly

- Cotton disposable rags
- Cleaner/degreaser (see **Page 18**)
- Safety glasses for each person
- Hex Wrench 4mm
- Open-End Wrench 14mm



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.

| Small Item Inventory: (Figure 2) | Qty |
|----------------------------------------------------------|-----|
| A. Front Way Cover..... | 1 |
| B. Rear Way Cover..... | 1 |
| C. Drawbar $\frac{7}{16}$ "-20 x 23 $\frac{1}{2}$ "..... | 1 |
| D. Ball Handles..... | 3 |
| E. Fine Downfeed Handwheel..... | 1 |
| F. Ball Handle Handles..... | 3 |
| G. Toolbox..... | 1 |
| H. Bottle for Oil..... | 1 |
| I. Belt Housing Safety Covers (G0747 Only) .. | 2 |
| J. Knee Crank..... | 1 |
| K. Coarse Downfeed Lever..... | 1 |
| L. Closed-End Wrench 17 x 19mm..... | 1 |
| M. Phillips Screwdriver #2..... | 1 |
| N. Slotted Screwdriver #2..... | 1 |

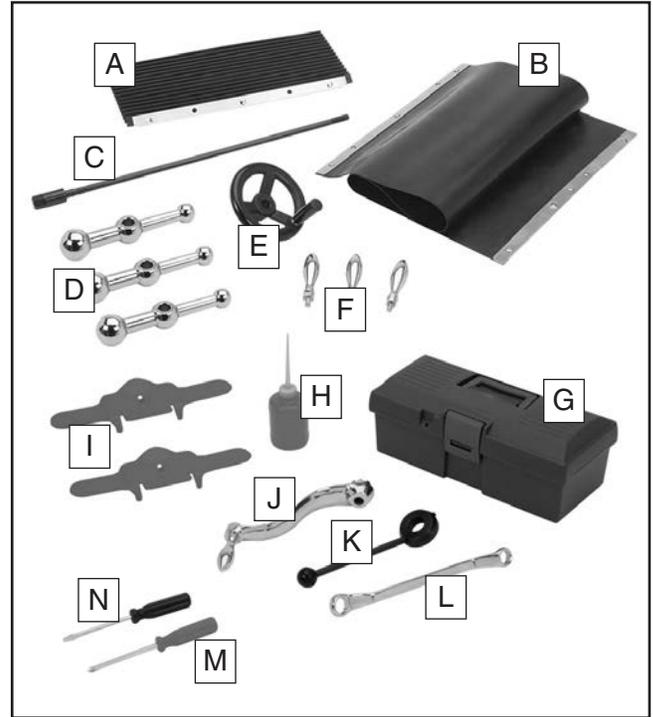


Figure 2. Small item inventory.

NOTICE

If you cannot find an item on this list, carefully check around/inside the machine and packaging materials. Often, these items get lost in packaging materials while unpacking or they are pre-installed at the factory.



Cleanup

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

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

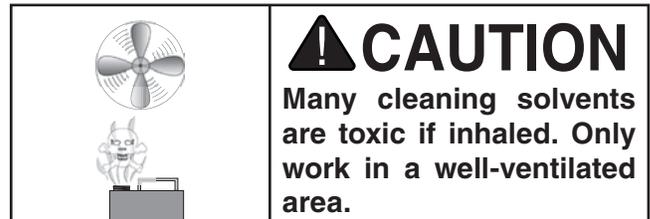
There are many ways to remove this rust preventative, but the following steps work well in a wide variety of situations. Always follow the manufacturer's instructions with any cleaning product you use and make sure you work in a well-ventilated area to minimize exposure to toxic fumes.

Before cleaning, gather the following:

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

Basic steps for removing rust preventative:

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



T23692—Orange Power Degreaser

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



Figure 3. T23692 Orange Power Degreaser.



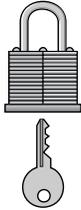
Site Considerations

Weight Load

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

Space Allocation

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

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

Physical Environment

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

Electrical Installation

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

Lighting

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

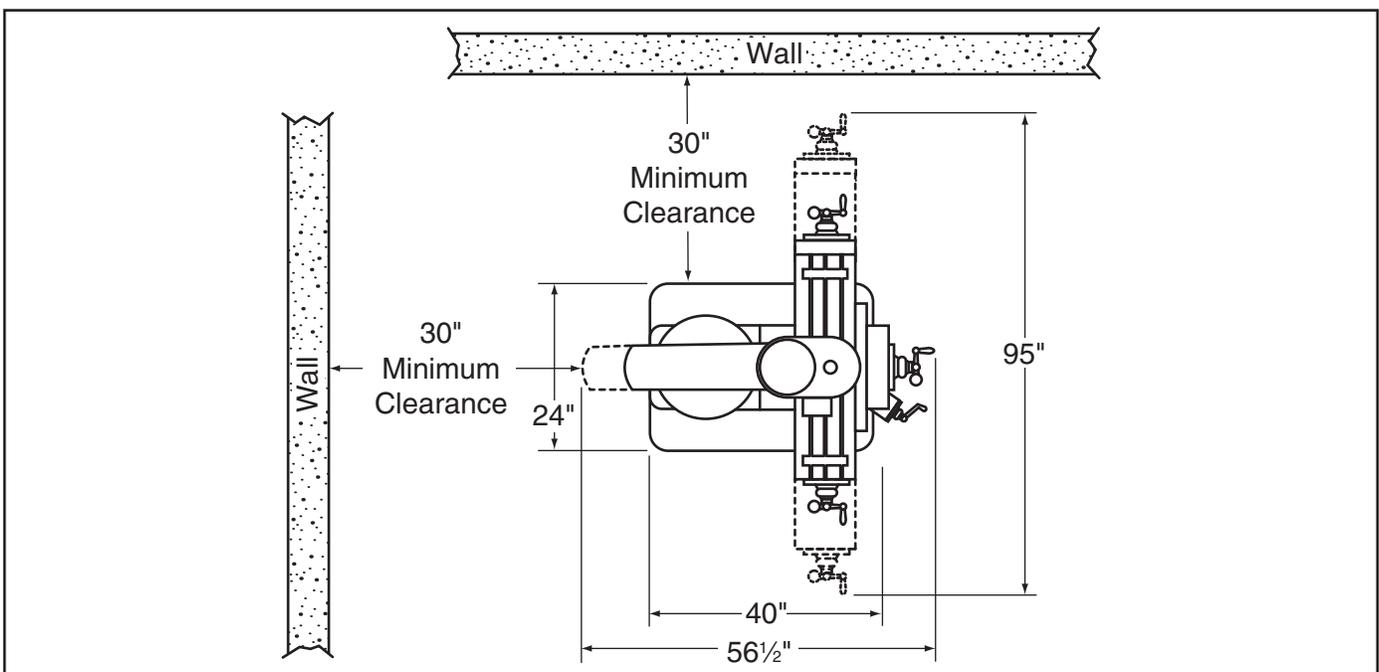
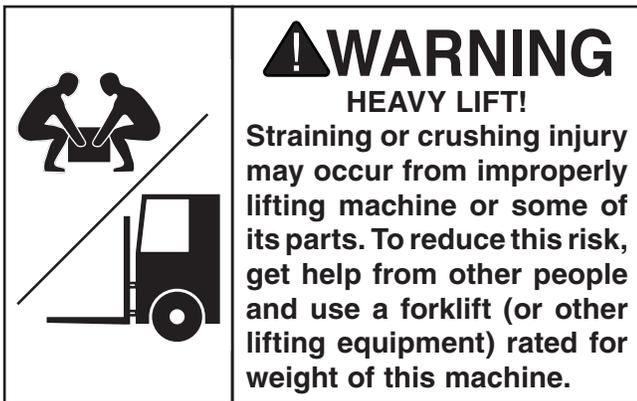


Figure 4. Minimum working clearances.



Lifting & Placing



Power lifting equipment (refer to **Page 16**) and at least two other people are required to lift and place the mill.

To lift and move the mill:

1. Remove the crate from the shipping pallet, then move the mill, while it is still on the pallet, to the installation location.
2. Rotate the ram 180° so the headstock is facing backwards (see **Figure 5**), then rotate the head upright.

Refer to **Head Movement** on **Page 29** and **Ram Movement** on **Page 31** for detailed instructions to help with this step.

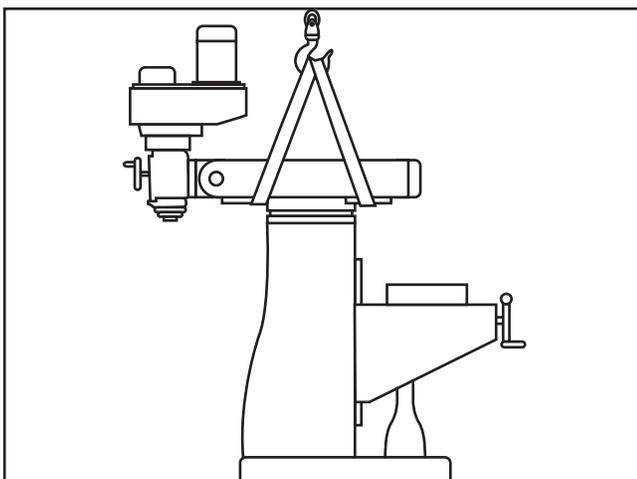


Figure 5. Illustrated example of using lifting to move the mill.

Note: After re-positioning the ram and headstock, make sure they are locked in place to prevent unexpected movement during lifting.

Make sure the four turret lock bolts (two on either side of the ram, see **Figure 6**) are torqued to 47 ft/lbs. to keep the ram from unexpectedly moving from the force of the lifting straps.

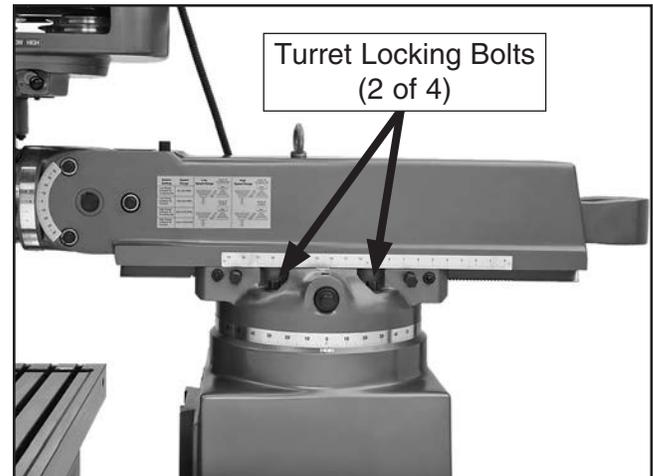


Figure 6. Locations of turret locking bolts.

3. Place the lifting straps under the ram and connect them to the safety hook, as illustrated in **Figure 5**.

Note: Place protective material between the straps and the mill to protect the ram and ways, and to keep from cutting the lifting straps.

4. Unbolt the mill from the shipping pallet.
5. With other people steadying the load to keep it from swaying, lift the mill a couple of inches.
 - If the mill tips to one side, lower it to the ground and adjust the ram or table to balance the load. Make sure to re-tighten the lock levers and bolts before lifting the mill again.
 - If the mill lifts evenly, remove the shipping pallet and lower the mill.



Leveling & Mounting

Generally, you can either bolt your machine to the floor or mount it on machine mounts. Although not required, we recommend that you secure the machine to the floor and level it while doing so. Because this is an optional step and floor materials may vary, hardware for securing the machine to the floor is not included.

NOTICE

Unless otherwise specified by your local codes, this machine **MUST** be secured to the floor if it is permanently connected (hardwired) to the power supply.

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

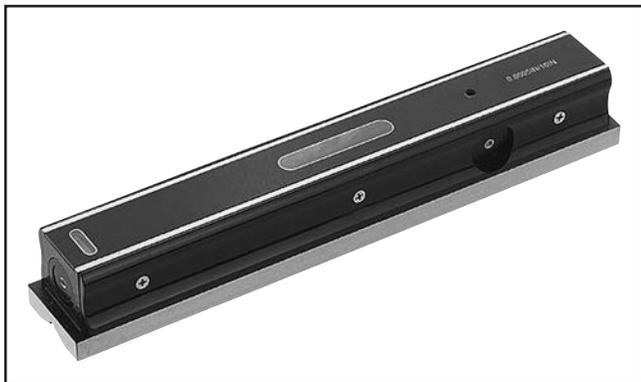


Figure 7. Example of a precision level (Model H2683 shown).

Bolting to Concrete Floors

Anchor studs and lag shield anchors with lag screw (**Figure 8**) are two popular methods for anchoring an object to a concrete floor. We suggest you research the many options and methods for mounting your machine and choose the best that fits your specific application

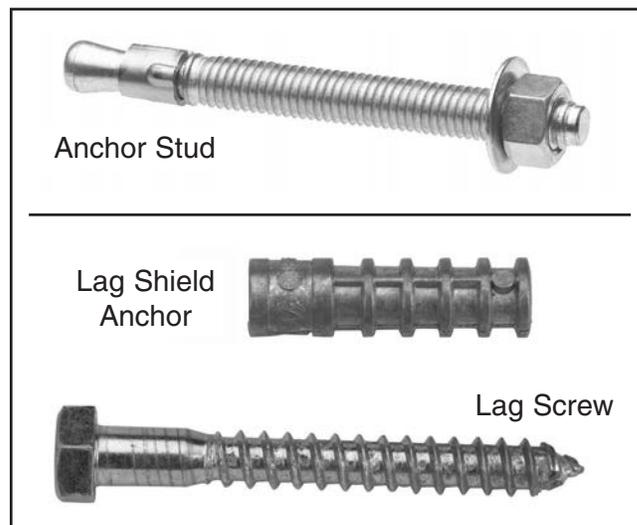


Figure 8. Typical fasteners for mounting to concrete floors.

Machine Mounts

Machine mounts (see **Figure 9** for an example) provide the advantage of fast leveling and vibration reduction. The large size of the foot pads distributes the weight of the machine to reduce strain on the floor.



Figure 9. Machine mount example.



Assembly

Assembly of the small components of the mill consists of attaching the ball handles, knee crank, and the way covers.

To assemble the mill:

1. Remove the hex nuts from the X- and Y-axis leadscrews, then slide the ball handles (**Figure 10**) onto the leadscrews and secure them with the hex nuts.

Note: Tighten the hex nuts just until they are snug. Overtightening could increase the wear of the moving parts.

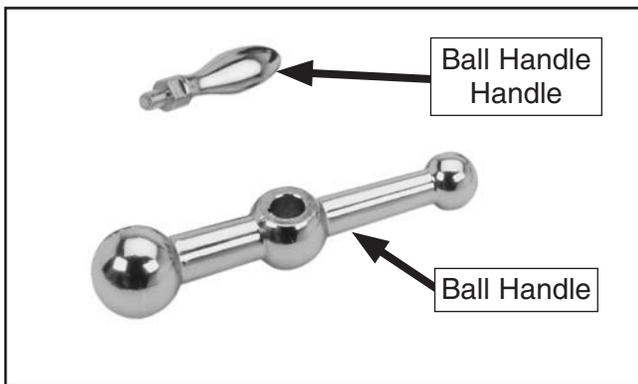


Figure 10. Ball handle assemblies.

2. Thread the handles into the small end of the ball handles and tighten them.
3. Slide the knee crank onto the shaft so that the teeth of the crank and shaft engage, as shown in **Figure 11**.



Figure 11. Knee crank teeth engaged.

4. Using the five cap screws pre-threaded into the holes, install the front way cover as shown in **Figure 12**.

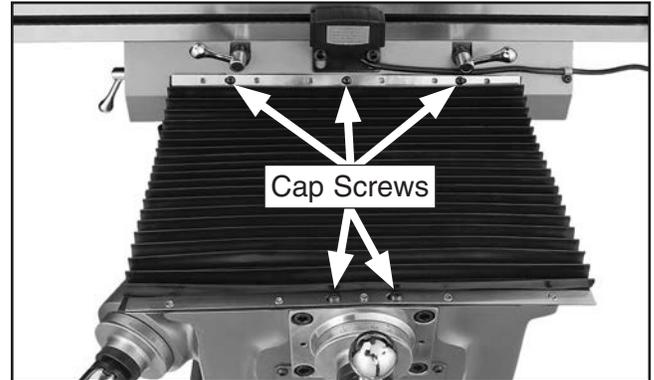


Figure 12. Front way cover installed.

5. Using the four cap screws pre-threaded into the holes, install the rear way cover as shown in **Figure 13**.

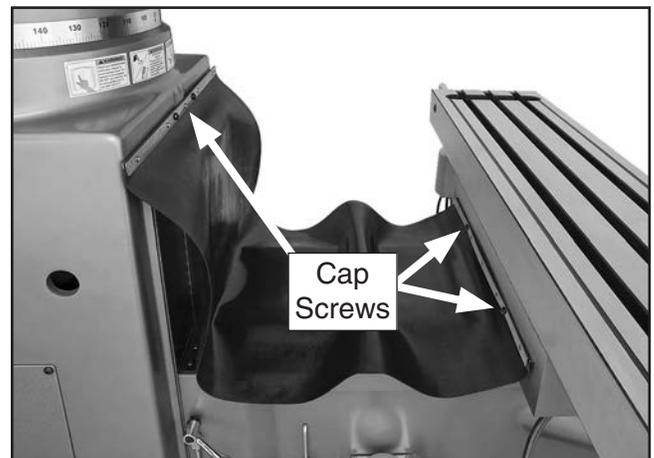


Figure 13. Rear way cover installed.

Initial Lubrication

The machine was fully lubricated at the factory, but we strongly recommend that before performing the **Test Run** you inspect all lubrication points yourself and provide additional lubrication if necessary. Refer to the **Lubrication** section on **Page 44** for specific details.



Test Run

After all preparation steps have been completed, the machine and its safety features must be tested to ensure correct operation. If you discover a problem with the operation of the machine or its safety components, do not operate it further until you have resolved the problem.

If you discover a problem with the operation of the machine or its safety components, do not operate it further until you have resolved the problem. Refer to the **Troubleshooting** section on **Page 49** for solutions to common problems that may occur with all mills. If you need additional help, contact our Tech Support at (570) 546-9663.

Mill Test Run

1. Read and follow the safety instructions at the beginning of the manual, take required safety precautions, and make sure the machine is set up and adjusted properly
2. Clear away all tools and objects used during assembly and preparation.
3. Make sure that the mill is properly lubricated (refer to the **Lubrication** section on **Page 44** for specific details).
4. Set the spindle speed to the low range (refer to **Page 33** or **35** for detailed instructions).
5. Move the downfeed selector to the manual (forward) position so that the spindle does not downfeed during this test (refer to the **Downfeed Operations** section on **Page 36** for detailed instructions).
6. Connect the mill to the power source specified in the **POWER SUPPLY** section on **Page 14**.

7. Use the spindle switch to turn the mill **ON**.

For Model G0747: Turn the spindle switch to the **FLOW** (forward low) position, as shown in **Figure 14**.



Figure 14. Model G0747 spindle switch.

For Model G0748: Turn the spindle switch to the **FOR** (forward) position, as shown in **Figure 15**.



Figure 15. Model G0748 spindle switch.

8. Listen for abnormal noises and watch for unexpected actions from the mill. The machine should run smoothly and without excessive vibration or rubbing noises.

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



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 the 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 the **X-Axis Power Feed** section, beginning on **Page 28**, to understand how the power feed, table locks, and limit switch function.
3. Loosen the table locks on the front of the table.
4. Plug the power feed power cord into a grounded 110V power outlet.
5. Make sure the power feed direction knob is in the neutral (middle) position, turn the speed dial counterclockwise to the lowest setting, then press the ON button.
6. Turn the direction knob to the left, slowly turn the speed dial clockwise to increase the speed, then confirm that the table is moving to the left.
7. Watch for the table limit stop to hit the limit switch and turn the power feed **OFF**, stopping the table movement.
8. Turn the direction knob through the neutral (middle) position and all the way to the right. The table should begin moving to the right.
9. Confirm that the table stops moving when the limit stop presses against the limit switch plunger.
10. Move the direction knob to the neutral (middle) position, turn the speed dial to the lowest setting, and press the OFF button.

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



Spindle Break-In

NOTICE

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

The bearings and gears used in the mill are manufactured to very close tolerances. Before operational stress is placed on these and other moving parts in the mill, complete this break-in procedure to conform these components to one another and ensure trouble-free performance from the mill.

To perform the spindle break-in procedure:

1. Successfully perform all the steps in the **Test Run** section beginning on **Page 23**.
2. Make sure the spindle is at a complete stop.
3. Set the spindle speed to the low range (refer to **Page 33** or **35** for detailed instructions).
4. Start the spindle rotation at a medium speed and let the mill run for 20 minutes.
5. Stop the spindle rotation and allow the spindle to come to a complete stop by itself.
6. Set the spindle speed to the high range, then start the spindle rotation at a medium speed and let the mill run for another 20 minutes.
7. Stop the spindle rotation, and turn the mill **OFF**.

The spindle break-in is now complete!

NOTICE

Since the mill head has been moved around for shipping purposes, you will need to tram the spindle with the table to ensure a 90° alignment. Refer to the *Tramming Spindle* section on *Page 54* for detailed instructions.

Inspections & Adjustments

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

- Gib Adjustments **Page 51**
- Leadscrew Backlash Adjustments..... **Page 52**

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.

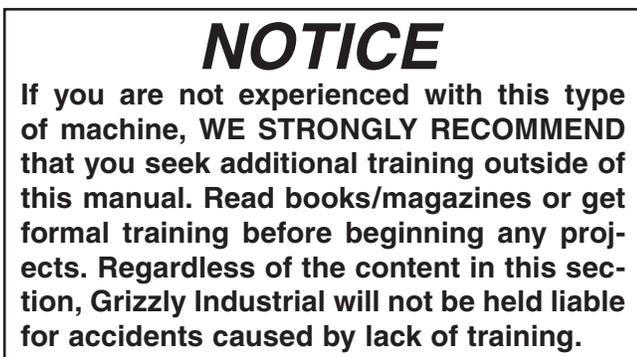


SECTION 4: OPERATIONS

Operation Overview

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

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



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

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



Table Movement

The mill table moves in three directions, as illustrated in **Figure 16**:

- X-axis (longitudinal)
- Y-axis (cross)
- Z-axis (vertical)

These movements are controlled by table ball handles and the Z-axis crank. Additionally, the table can be moved along the X-axis with the power feed.

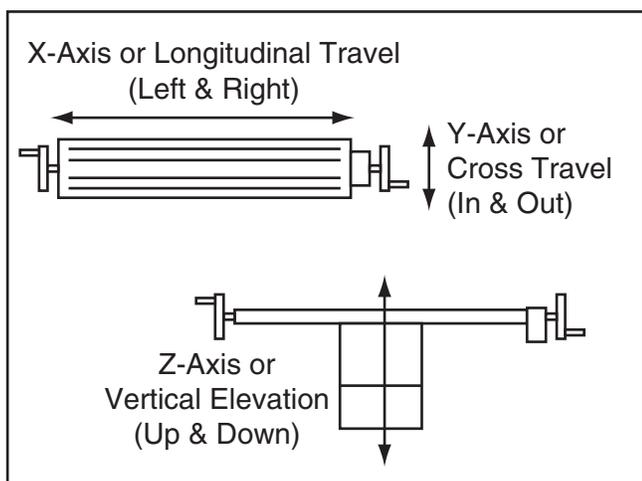


Figure 16. The directions of table movement.

Graduated Index Rings

The table ball handles and knee crank have graduated index rings (see **Figure 17**) that are used to determine table movement in the increments listed below:

| Axis | Individual Increment | One Full Revolution |
|------|----------------------|---------------------|
| X | 0.001" | 0.200" |
| Y | 0.001" | 0.200" |
| Z | 0.001" | 0.100" |

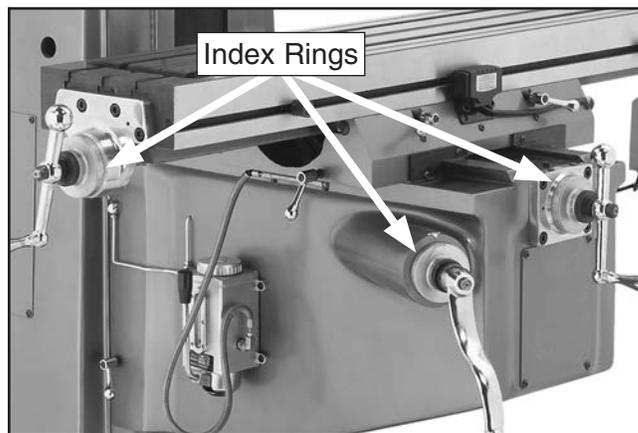


Figure 17. Locations of index rings.

Table Locks

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

Refer to **Figure 18** to identify the locks for each table axis.

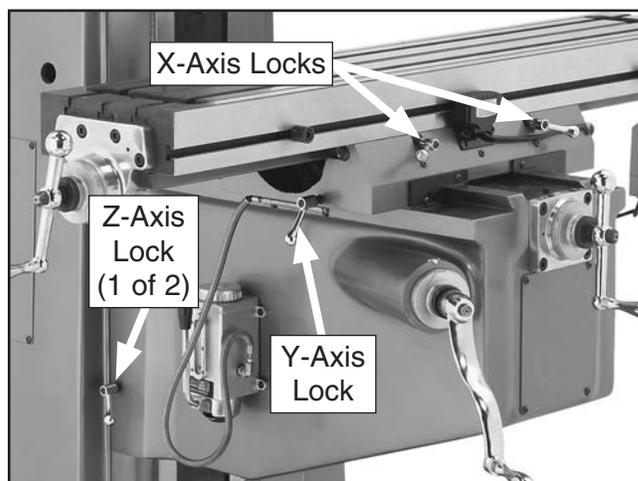


Figure 18. Locations of table locks for each axis.

NOTICE

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



X-Axis Power Feed Identification

The mill is equipped with a power feed unit for X-axis table movement. Refer to **Figure 19** and the descriptions below to understand the functions of the various components of the power feed system.

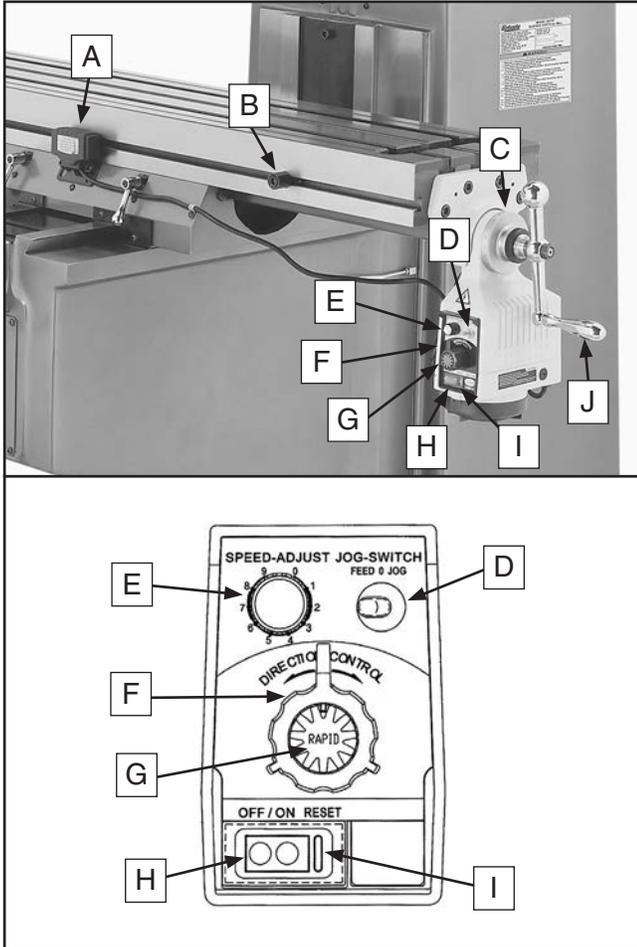


Figure 19. Power feed controls.

- A. Limit Switch.** Stops table movement when either of the switch side plungers are pressed by the limit stops.
- B. Limit Stop.** Restricts table movement by its positioning along the front of the table.
- C. Graduated Index Ring.** Displays the distance of table travel in 0.001" increments, with one full revolution equal to 0.200" of table travel.
- D. Feed/Jog Switch.** In the left (feed) position, it enables the power feed to operate normally.

While pressing the switch to the right (jog position), the table moves in the selected direction until the switch is released.

In the middle position ("0"), table movement is disabled.

- E. Speed Dial.** Controls the speed of the power feed. Turning the dial clockwise causes the table to move faster.
- F. Direction Knob.** Selects the direction of table movement. The middle position is neutral.
- G. Rapid Traverse Button.** When pressed, moves the table at full speed when it is already in motion.
- H. ON/OFF Button.** Turns the power feed **ON** and **OFF**.
- I. Circuit Breaker Reset Button.** Resets the internal circuit breaker if the unit is overloaded and shuts down.
- J. X-Axis Ball Handle.** Manually moves the table.



X-Axis Power Feed Operation

| Tool Needed | Qty |
|---------------------|-----|
| Hex Wrench 8mm..... | 1 |

To operate the X-axis power feed:

1. Loosen the X-axis table locks (refer to **Figure 18** on **Page 27** for locations).
2. Secure the limit stops if needed to restrict table movement.

Note: Make sure the cap screws firmly secure the limit stops in place when positioned.

3. Turn the speed dial all the way counterclockwise to the slowest setting.
4. Move the direction knob to the neutral (middle) position, press the feed/jog switch to the left (feed position), then push the ON button.
5. With your hand poised over the OFF button in case you need to suddenly turn the unit **OFF**, move the direction knob in the desired direction of table travel.
6. Use the speed dial to slowly bring the speed of movement up to the desired rate.
7. When you are finished using the power feed:
 - a. Turn the unit OFF.
 - b. Rotate the speed dial all the way counterclockwise.
 - c. Move the direction knob to the neutral (middle) position to avoid unexpected table movement later.

NOTICE

To confirm the power feed settings that you will be using during operation, we recommend that you use the power feed to move the table through the intended cutting path before starting the spindle rotation and taking the cut.

Head Movement

The head tilts 45° forward or backward, and rotates 90° left or right (see **Figures 20–21**).

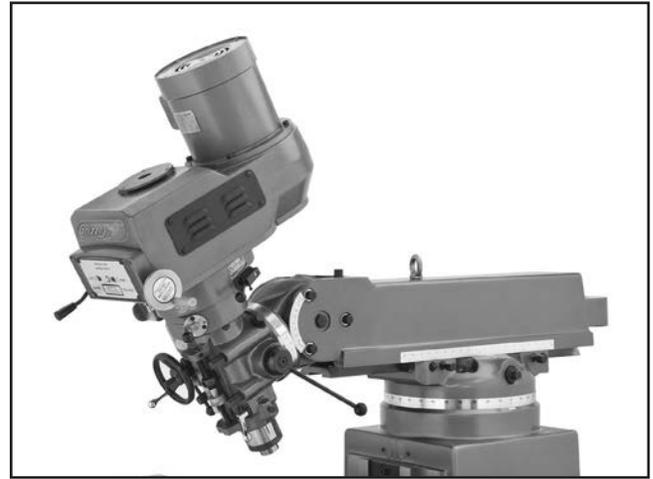


Figure 20. Head tilted 45° forward.



Figure 21. Head rotated to the left.

| Tool Needed | Qty |
|-------------------|-----|
| Wrench 19mm | 1 |



⚠ CAUTION

The head is heavy. When tilting or rotating the head, get help to support the weight as you use the controls.

Tilting Head Forward/Backward

1. DISCONNECT MILL FROM POWER!
2. Loosen the three tilt lock bolts shown in **Figure 22**.

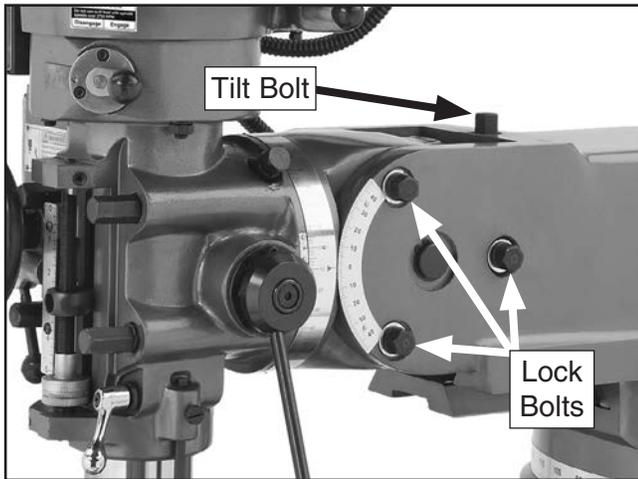


Figure 22. Head tilt controls.

3. Use one hand to apply pressure to the head in the direction of tilt, then slowly rotate the tilt bolt. Rotating this bolt clockwise will tilt the head backward.
4. Re-tighten the lock bolts.

Rotating Head Left/Right

1. DISCONNECT MILL FROM POWER!
2. Loosen the four lock bolts shown in **Figure 23**.

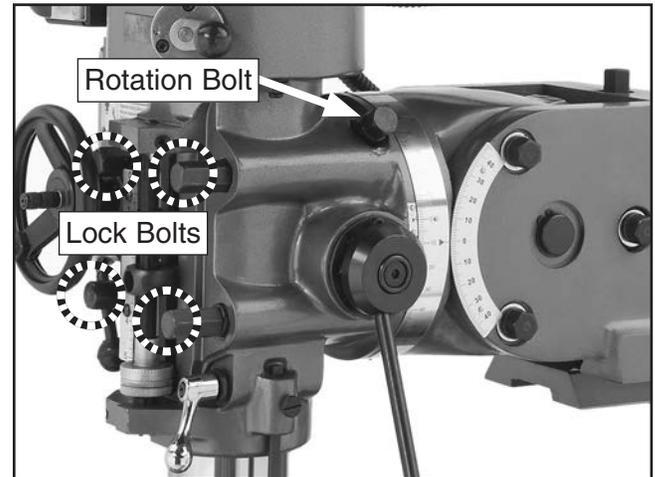


Figure 23. Head rotation controls.

3. Use one hand to apply pressure to the head in the direction of rotation, then slowly turn the rotation bolt.
4. Re-tighten the lock bolts.

NOTICE

Always lock the head firmly in place after tilting or rotating it. Unexpected movement of the head during operations could cause damage to the cutter or workpiece.



Ram Movement

The ram travels forward or backward 24" and rotates 360° around the turret.

Tool Needed Qty
Wrench 19mm 1

Moving Ram Forward/Backward

1. DISCONNECT MILL FROM POWER!
2. Loosen the two lock bolts shown in **Figure 24**.

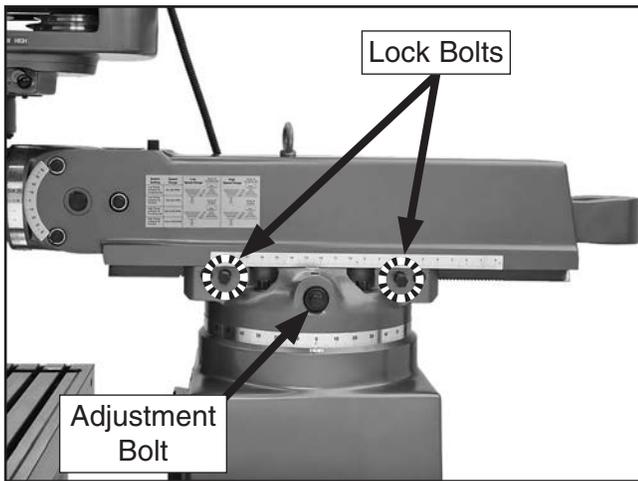


Figure 24. Ram forward/backward movement controls.

3. Make sure there are no obstructions to ram travel, especially any tooling around the workpiece, then slowly rotate the adjustment bolt to move the ram. Rotating the bolt clockwise will move the ram backward.
4. Re-tighten the lock bolts.

NOTICE

Always lock the ram firmly in place after moving it. Unexpected movement of the ram and head during operations could damage the cutter or workpiece.

Rotating Ram

1. DISCONNECT MILL FROM POWER!
2. Loosen the four lock bolts on top of the turret (see **Figure 25**).

Note: *There are two lock bolts on each side of the ram.*

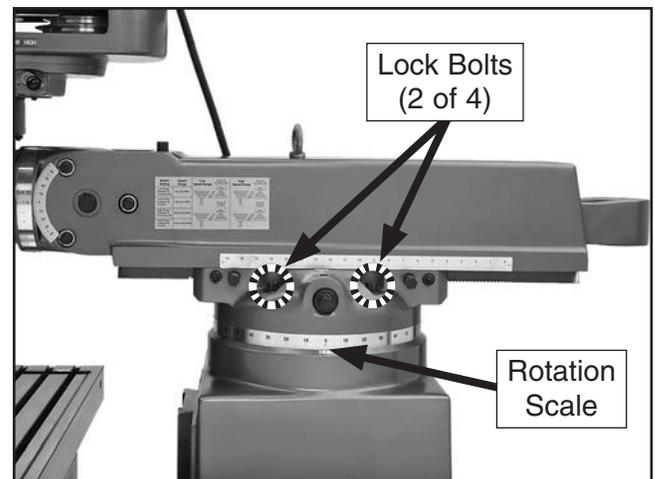


Figure 25. Ram rotational controls.

Note: *In the next step, take care not to entangle or stretch the electrical cabling as you move the ram around the turret.*

3. Push on the head to manually rotate it. Use the rotation scale to determine the correct position for your operation, then re-tighten the four lock bolts to secure the ram in place.



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 26**:

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

*Double if using carbide cutting tool

Figure 26. 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 they are a good educational resource.

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

The procedures for setting the spindle speed for the Models G0747 and Model G0748 differ. Use the appropriate section on the following pages for your mill when selecting the speed range.

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 Model G0747 Spindle Speed

The Model G0747 has 16 spindle speeds—eight in low motor speed and eight in high motor speed. Setting the spindle speed involves: 1) Selecting the spindle speed range, 2) positioning the V-belt, and 3) setting the spindle switch.

To set the Model G0747 spindle speed:

1. Make sure the spindle is completely stopped.
2. Pull the spindle speed range selector knob (see **Figure 27**) out, position the selector in the high or low position, then release the knob to seat the knob pin in the detent.

Note: If it is difficult to move the range selector, rotate the spindle by hand to help mesh the gears until the selector moves freely.



Figure 27. Model G0747 spindle speed range selector in the forward (high) position.

3. Move the high-low range lever shown in **Figure 28** to the high or low position.

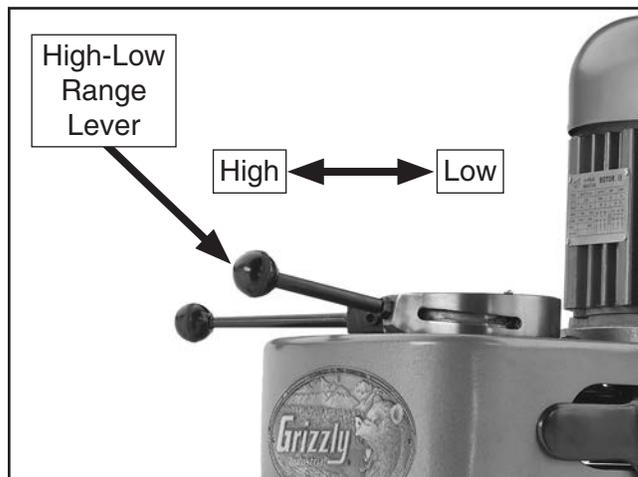


Figure 28. Model G0747 high-low range lever.

4. Firmly grasp the spindle, then quickly rotate it in a back-and-forth motion until you hear/feel the front pulley drop into the spindle clutch.

—If this step was not successful, use the high-low range lever to re-set the speed range, then repeat this step until you are certain that the spindle is seated into the spindle clutch.

5. Remove the belt housing side covers on either side of the head to expose the V-belt and pulleys, as shown in **Figure 29**.

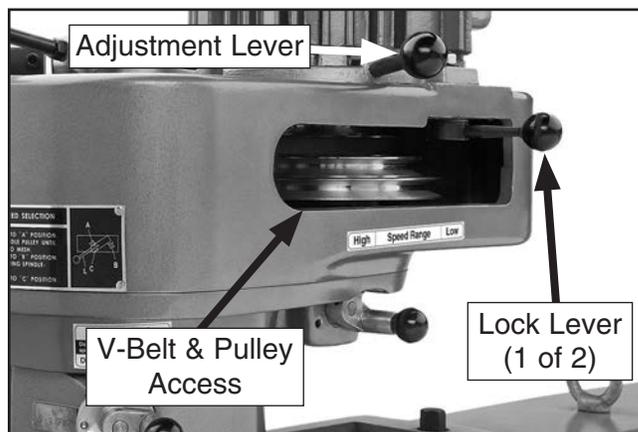


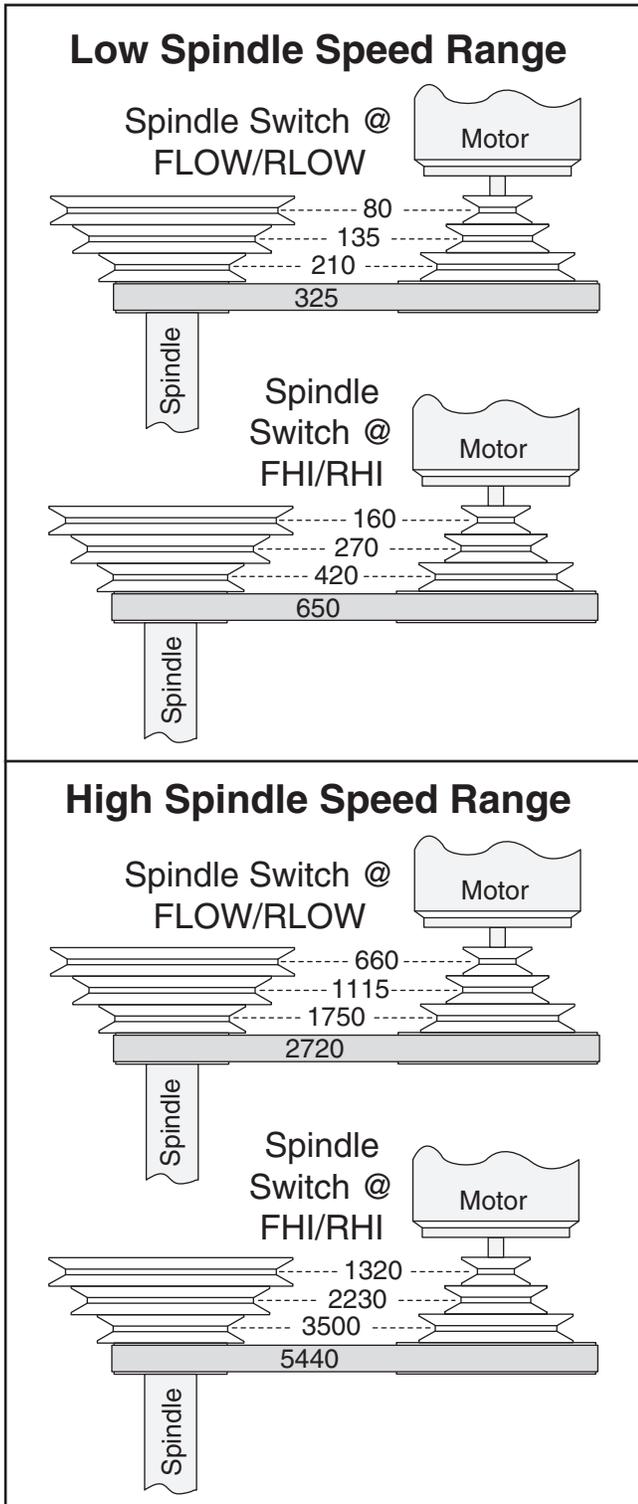
Figure 29. Model G0747 V-belt and pulleys exposed.



- Loosen the two motor lock levers, one on each side of the head, then pull the belt tension adjustment lever forward to release the V-belt tension.
- Refer to the illustrations in **Figure 30**, and position the V-belt on the pulleys for the desired spindle speed.

Note: As displayed in **Figure 30**, the Model G0747 has two spindle speeds for each V-belt position depending on the spindle switch setting.

- To re-tension the V-belt, push the adjustment lever backward with moderate force, then re-tighten the two lock levers to secure the motor.
- Replace the two belt housing side covers before re-connecting the mill to power.



CAUTION
To avoid entanglement hazards, always ensure belt housing safety covers are firmly in place before connecting the mill to power.

- Use the chart below to find the spindle speed range that includes the required spindle speed for your operation and set the spindle switch (**Figure 31**) accordingly.

| Model G0747 Spindle Speed Ranges | |
|----------------------------------|---------------|
| Low Range w/Switch @ FLOW/RLOW | 80–325 RPM |
| Low Range w/Switch @ FHI/RHI | 160–650 RPM |
| High Range w/Switch @ FLOW/RLOW | 660–2720 RPM |
| High Range w/Switch @ FHI/RHI | 1320–5440 RPM |



Figure 31. Model G0747 spindle switch.

Figure 30. Model G0747 V-belt positions.



Setting Model G0748 Spindle Speed

The Model G0748 has variable spindle speeds from 60 to 4200 RPM. Setting the spindle speed involves 1) Selecting the spindle speed range, and 2) using the variable-speed handwheel to select the spindle speed.

To set the Model G0748 spindle speed:

1. Make sure the spindle is completely stopped.
2. Pull the spindle speed range selector knob (see **Figure 32**) out, position the selector in the high or low position, then release the knob to seat the knob pin in the detent.

Note: *If it is difficult to move the range selector, rotate the spindle by hand to help mesh the gears until the selector moves freely.*



Figure 32. Model G0748 spindle speed selector.

3. Use the spindle switch to start spindle rotation.

NOTICE

For the Model G0748 ONLY, always make sure that the spindle rotation has started and is at a constant speed before using the variable-speed handwheel to adjust the spindle speed. Otherwise, the moving parts inside the belt housing could be damaged and void the warranty.

4. Slowly rotate the speed handwheel shown in **Figure 33** until the desired speed is displayed in the speed indicator window for the speed range selected.

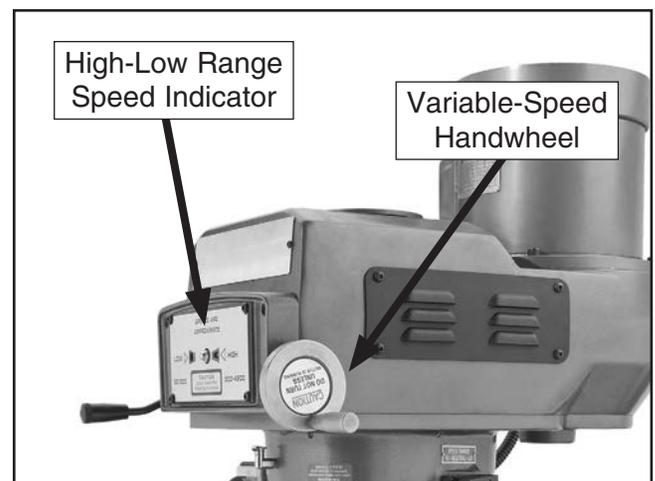


Figure 33. Model G0748 variable-speed controls.



Spindle Downfeed

Spindle downfeed movement on the mill is controlled by three mechanisms: 1) The coarse downfeed lever, 2) the fine downfeed handwheel, and 3) the auto-downfeed system.

Downfeed Controls

Use **Figure 34** and the following descriptions to become familiar with the spindle downfeed controls.

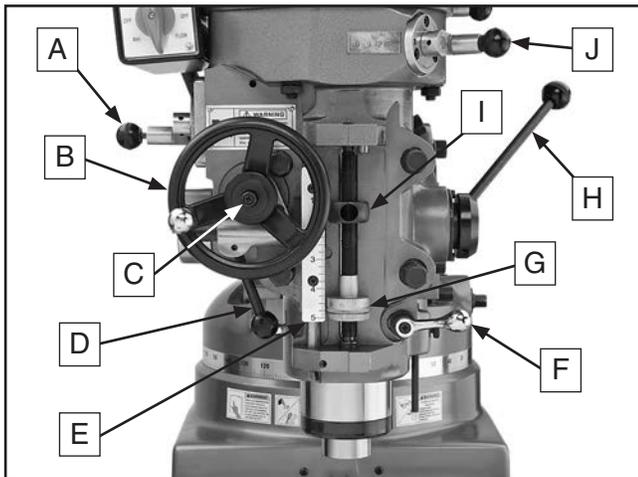


Figure 34. Downfeed controls.

- A. Auto-Downfeed Rate Selector.** Selects one of the three auto-downfeed rates.
- B. Fine Downfeed Handwheel.** Manually controls slow spindle downfeed.
- C. Auto-Downfeed Direction Pin.** Starts, stops, and reverses the auto-downfeed direction.

NOTICE

When spindle rotation is reversed, either by changing the spindle speed range or by using the spindle direction switch, the direction of spindle auto-downfeed will reverse.

- D. Fine Downfeed Clutch Lever.** Engages the fine/auto-downfeed gears.
- E. Downfeed Scale.** Used with the quill dog, shows the depth of spindle downfeed in inches.
- F. Quill Lock Lever.** Secures the quill in place for increased stability during operations.
- G. Downfeed Stop & Locking Wheel.** Sets the depth of spindle downfeed. The stop is threaded into position, then the locking wheel is used to secure it in place.
- H. Coarse Downfeed Lever.** Manually controls quick spindle downfeed.
- I. Quill Dog.** Moves with the quill and spindle, and disengages the downfeed clutch lever when it contacts either the top or the downfeed stop.
- J. Downfeed Selector.** Sets the mill for manual downfeed or auto-downfeed control.



Coarse Downfeed

Use the coarse downfeed lever to quickly move the spindle manually.

To use the coarse downfeed:

1. Make sure the spindle is completely stopped.
2. Pull the downfeed selector knob out, then rotate it clockwise until the knob pin seats in the forward manual (disengaged) detent (see **Figure 35**).

Note: It may be necessary to turn the spindle by hand as you move the selector to enable the gears to mesh.

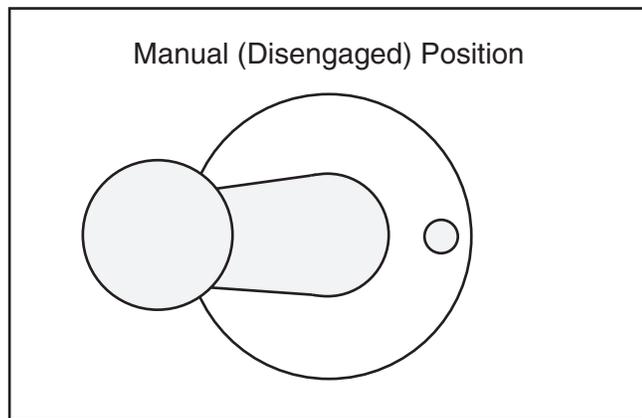


Figure 35. Downfeed selector in manual (disengaged) position.

3. Make sure the pin of the coarse downfeed lever hub is engaged with one of the detents on the downfeed sleeve (see **Figure 36**).

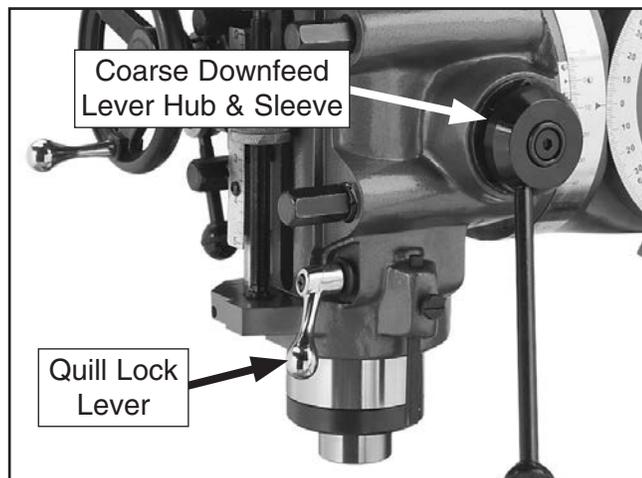


Figure 36. Coarse downfeed lever hub, downfeed sleeve, and quill lock.

4. Make sure the quill lock lever is loose so that the quill can easily move.
5. Rotate the coarse downfeed lever around the hub to control the depth of the spindle.

Fine Downfeed

1. Make sure the spindle is completely stopped.
2. Pull the downfeed selector knob out, then rotate it clockwise until the knob pin seats in the forward manual (disengaged) detent (see **Figure 35**).

Note: It may be necessary to turn the spindle by hand as you move the selector to enable the gears to mesh.

3. Set the auto-downfeed direction pin in the neutral (middle) position to disengage the fine downfeed handwheel from the auto-downfeed gears.
4. Position the downfeed stop for the spindle depth that is correct for your operation, then secure it in place with the locking wheel.
5. Use the coarse downfeed lever to lower the spindle slightly until you can pull the fine downfeed clutch lever out to the left and it locks in place. This will engage the fine downfeed handwheel with the quill and spindle.
6. To lower the spindle, rotate the fine downfeed handwheel. When the quill dog meets the downfeed stop, the clutch lever will disengage and the spindle will return to the top.



Auto-Downfeed

When using the auto-downfeed system, the spindle will move in the direction you choose with the auto-downfeed direction pin. When the quill dog reaches the top or meets the downfeed stop, the downfeed clutch lever will release. Then, if the spindle was traveling upward, the movement will simply stop. If the spindle was traveling downward, then the spindle will move back to the top at a rate controlled by the return spring on the left side of the head.

To use the auto-downfeed:

1. Make sure the spindle is completely stopped.
2. Pull the downfeed selector knob out, then rotate it clockwise until the knob pin seats in the auto-downfeed (engaged) detent (see **Figure 37**).

Note: It may be necessary to turn the spindle by hand as you move the selector to enable the gears to mesh.

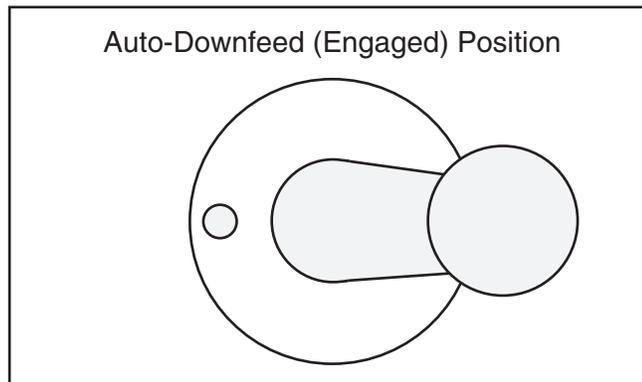


Figure 37. Downfeed selector in auto-downfeed (engaged) position.

3. Position the downfeed stop for the spindle depth that is correct for your operation, then secure it in place with the locking wheel.

4. Position the auto-downfeed direction pin in the center of the handwheel for the spindle travel that is correct for your operation. If necessary, rock the fine downfeed handwheel back-and-forth to move the pin all the way in or out.

Note: The direction pin has three positions: 1) In for one downfeed direction, 2) middle for neutral or no movement, and 3) out for the reverse direction. The direction of spindle travel for the in and out positions is relative to the direction of spindle rotation. Keep in mind that spindle rotation and downfeed direction will reverse when the spindle speed range is changed.

5. Make sure the clutch lever is all the way to the right in the disengaged position so that the spindle will not travel when rotation is started.

Note: We recommend that you complete the remaining steps without a cutting tool installed, without a workpiece in place, and the table lower than the maximum spindle downfeed travel. This will enable you to test and confirm the settings before beginning the actual cutting operation.

NOTICE

To avoid damage to the system gearing, never use the auto-downfeed system with spindle speeds over 1750 RPM.

6. Set the mill for the correct spindle speed, then begin spindle rotation.

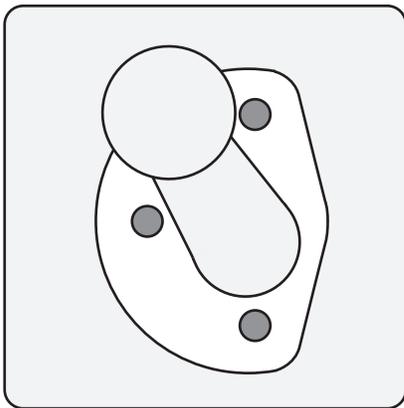


NOTICE

ALWAYS start spindle rotation before using auto-downfeed to avoid the risk of gear damage.

7. Select one of the three downfeed rates by pulling the knob of the auto-downfeed rate selector out, position the selector over the appropriate detent, then release the knob. Make sure the pin is firmly seated by attempting to move the selector without pulling the knob out.

Note: Refer to the illustration in **Figure 38** when selecting the downfeed rate.



Upper = 0.006 in./rev.
Middle = 0.0015 in./rev.
Lower = 0.003 in./rev.

(Rates given in inches of travel per revolution of the spindle)

Figure 38. Positions of auto-downfeed rate selector.

8. Use the coarse downfeed lever to lower the spindle slightly until you can pull the clutch lever out to the left and it locks in place, which will start the auto-downfeed spindle travel.

Spindle Brake

After turning the spindle switch **OFF**, move the brake lever to bring the spindle to a full stop (see **Figures 39–40**).

NOTICE

To avoid premature wear of the brake system, use the spindle brake **ONLY** after power to the spindle has been turned **OFF**.



Figure 39. Model G0747 brake lever.



Figure 40. Model G0748 brake lever.

NOTICE

To evenly wear the brake shoes, alternate the direction you move the lever when braking.



Loading/Unloading Tooling

The mill is equipped with an R8 spindle taper and a 7/16"-20 x 23 1/2" spindle drawbar (see **Figure 41**).



Figure 41. Upper portion of drawbar.

| Tools Needed | Qty |
|--------------------|-----|
| Wrench 21mm | 1 |
| Brass Hammer | 1 |

Loading Tooling

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

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

3. Place the mill in the low spindle speed range to keep the spindle from turning in the next steps.
4. Align the keyway of the tool with the protruding pin inside the spindle taper, then firmly push the tool into the spindle to seat it.

5. With one hand holding the tool in place, insert the drawbar into the spindle from the top of the head, then thread it into the tool (see **Figure 42**).

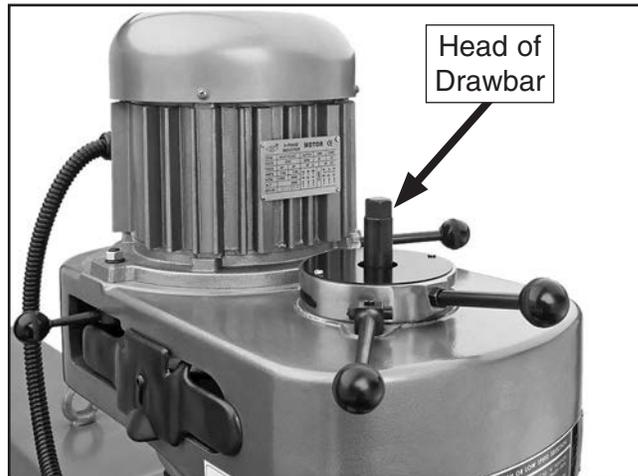


Figure 42. Drawbar loaded (Model G0747 shown).

6. Tighten the drawbar until it is snug. Avoid overtightening, as this could make removing the tool difficult.

Unloading Tooling

1. DISCONNECT MILL FROM POWER!
2. Place the mill in the low spindle speed range to keep the spindle from turning in the next step.

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

3. Loosen the drawbar a couple of turns, then tap the top of it with a brass hammer to knock the tool loose at the bottom of the spindle.
4. Support the tool with one hand, then completely unthread the drawbar from the tool.



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.

G5641—1-2-3 Blocks

G9815—Parallel Set

H5556—Edge Finder Set

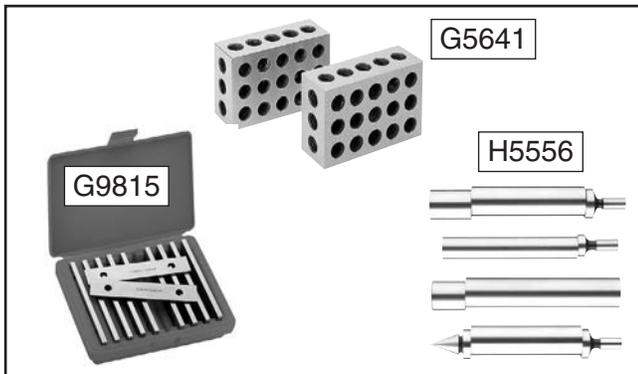


Figure 43. G5641 1-2-3 Blocks, G9815 Parallel Set, and H5556 Edge Finder Set.

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 44. G9760 20-PC End Mill Set.

G1076—52-PC. Clamping Kit

This clamping kit includes 24 studs, six step block pairs, six T-nuts, six flange nuts, four coupling nuts, and six end hold-downs. The rack is slotted so it can be mounted close to the machine for easy access.

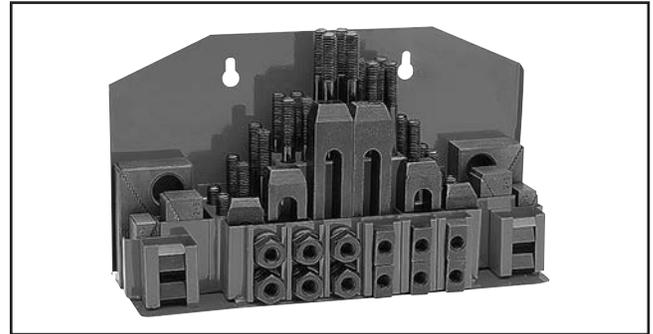


Figure 45. G1076 52-PC. Clamping Kit.

H6089—2 Axis Digital Read Out
(12" x 30")

H6093—3 Axis Digital Read Out
(12" x 30" x 5")

H7850—3 Axis Digital Read Out
(12" x 30" x 16 $\frac{3}{4}$ ")

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



Figure 46. 3 Axis Digital Read Out.

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



G7155—6" Precision Milling Vise

This swiveling milling vise features perfectly aligned, precision-ground jaws, robust clamping screws, and easy-to-read 0°–360° scales.

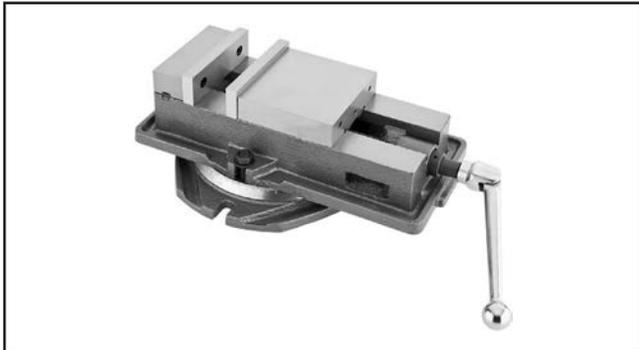


Figure 47. Model G7155 6" Precision Milling Vise.

G9299—10" Yuasa-Type Rotary Table

This high-precision, Yuasa-type rotary table features extra deep coolant channels, dual positive-action locks, very low profiles, 10 second vernier scales, gear drives with oil immersion, and satin chrome dials

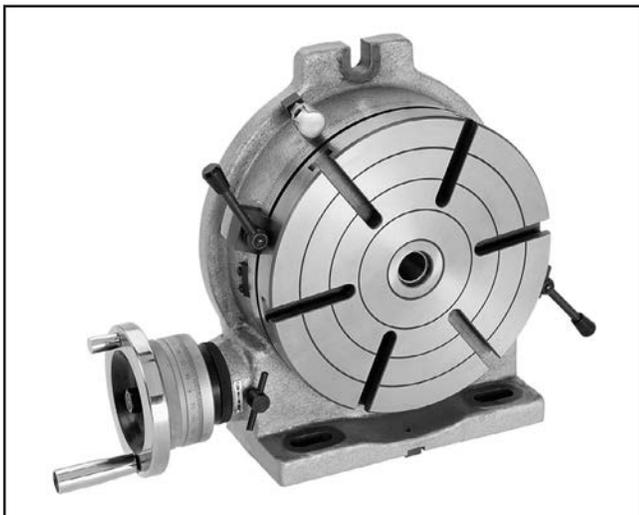


Figure 48. Model G9299 10" Yuasa-Type Rotary Table.

T23962—ISO 68 Moly-D Machine Oil, 5 gal.

T23963—ISO 32 Moly-D Machine Oil, 5 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 5-gallon quantities.



Figure 49. ISO 68 and ISO 32 machine oil.

G5562—SLIPIT® 1 Qt. Gel

G5563—SLIPIT® 12 oz Spray

G2871—Boeshield® T-9 12 oz Spray

G2870—Boeshield® T-9 4 oz Spray

H3788—G96® Gun Treatment 12 oz Spray

H3789—G96® Gun Treatment 4.5 oz Spray

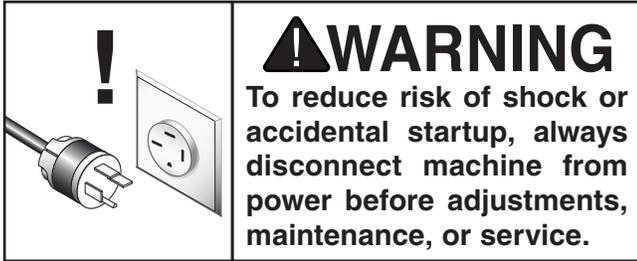


Figure 50. Recommended products for protecting unpainted cast iron/steel machinery parts.

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



SECTION 6: MAINTENANCE



Schedule

For optimum performance from your machine, follow this maintenance schedule and refer to any specific instructions given in this section.

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.
- Missing belt guards.
- Reduction in braking speed or efficiency.
- Any other unsafe condition.

Before Beginning Operations

- Turn the spindle direction switch to the off (middle) position to prevent spindle startup when connected to power (see **Page 23**).
- Move the spindle speed range selector to the manual (forward) position to prevent the spindle from unexpectedly auto-downfeeding when rotation is started (see **Page 38**).
- Make sure the X-axis power feed is turned **OFF** to prevent unintentional table movement when connected to power (see **Page 28**).
- Perform lubrications tasks as directed in the Lubrication section on **Page 44**.
- Check table movement in all three axes directions for loose/tight gibs. Adjust the gibs if necessary (see **Page 51**).

Daily, After Operations

- 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 good quality rust preventative.

Cleaning & Protecting

Regular cleaning is one of the most important steps in taking good care of this mill. Each operator is responsible for cleaning the machine immediately after using it or at the end of the day. We recommend that the cleaning routine be planned into the workflow schedule, so that adequate time is set aside to do the job right.

Typically, the easiest way to clean swarf from the ways and table is to use a wet/dry shop vacuum that is dedicated for this purpose only. The small chips leftover after vacuuming can be wiped up with a slightly oiled rag. Avoid using compressed air to blow off chips, as this may drive them deeper into moving surfaces and could cause sharp chips to fly into your face or hands.

Besides the ways and elevation leadscrew, all other unpainted and machined surfaces should be wiped down daily to keep them rust-free and in top condition. This includes any surface that could be vulnerable to rust if left unprotected (this especially includes any parts that may be exposed to water soluble cutting fluids). Typically with these parts, a thin film of oil is all that is necessary for protection.

Keep tables rust-free with regular applications of products like G96® Gun Treatment, SLIPIT®, or Boeshield® T-9 (see **Section 5: Accessories** on **Page 42** for more details).



Lubrication

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

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

Before performing any lubrication task, **DISCONNECT THE MILL FROM POWER!**

Important: *Before adding lubricant, clean the debris and grime from the oil cup or grease fitting and the immediate area to prevent contamination of the new lubricant.*

Use the schedule and information in **Figure 51** as a daily guide for lubrication tasks. Follow the referenced sections on the following pages for detailed instructions.

NOTICE

The following recommended lubrication schedule is based on light to medium mill usage. Keeping in mind that lubrication helps to protect the value and operation of the mill, you may need to perform the lubrication tasks more frequently depending on your usage.

| Lubrication Task | Frequency (Hours of Operation) | Page Ref. |
|------------------------------------|--------------------------------|------------------|
| Quill | 4 hrs. | This Page |
| Table Ways (One-Shot Oiler) | 4–8 hrs. | 45 |
| Headstock Gearing | 40 hrs. | 45 |
| Ram Ways | 40 hrs. | 46 |
| Table Elevation Leadscrew (Z-Axis) | 40 hrs. | 46 |
| Power Feed Gears | 160 hrs. | 47 |

Figure 51. Recommended lubrication tasks, schedules, and instruction page references.

NOTICE

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

Quill

Oil Type Model T23962 or ISO 68 Equivalent
 Oil Amount..... Fill Oil Cup
 Check/Add Frequency 4 hrs. of Operation

Lift the quill oil cup cap shown in **Figure 52** to add 10 drops of lubricant.

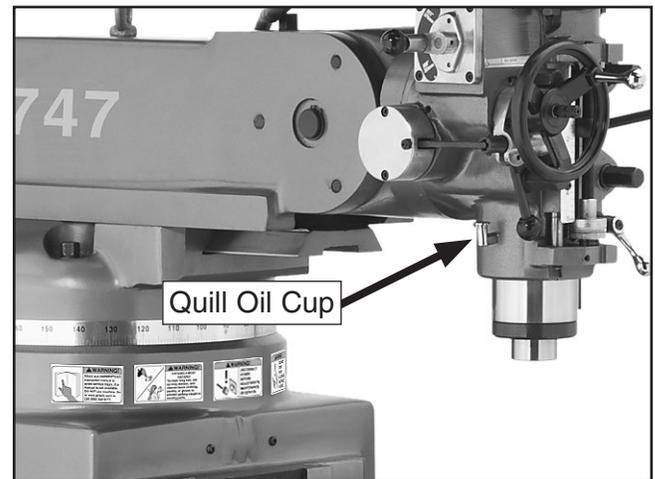


Figure 52. Quill oil cup.

Continued on next page →



Table Ways (One-Shot Oiler)

Oil Type Model T23962 or ISO 68 Equivalent
Oil Amount..... One Pull of Pump Handle
Check/Add Frequency 4–8 hrs. of Operation

The one-shot oiler is connected to a series of aluminum tubes that carry the lubricant to wear points along the table horizontal and vertical ways.

Pull the handle out slowly then release it to send the oil through the tubes (see **Figure 53**), then move the table through all paths of movement to evenly distribute the lubricant.

Use the sight glass on the side of the oiler to know when to re-fill the reservoir.

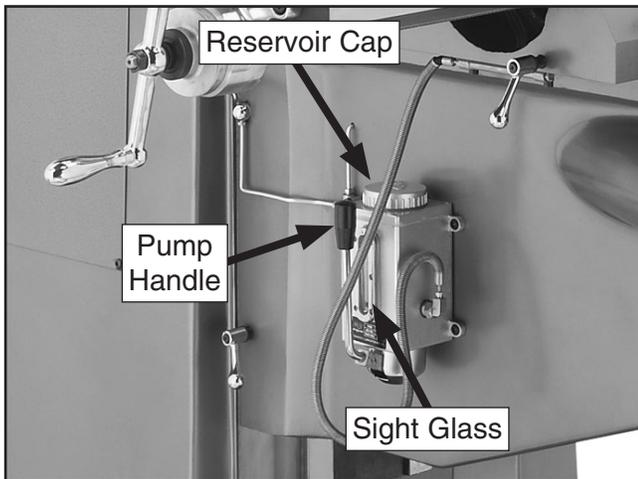


Figure 53. One-shot oiler.

Headstock Gearing

Grease TypeNLGI 2 or Equivalent
Grease AmountTwo Pumps of Grease Gun
Check/Add Frequency 40 hrs. of Operation

Add two pumps from a grease gun to the grease fittings that are shown in **Figures 54–55**.

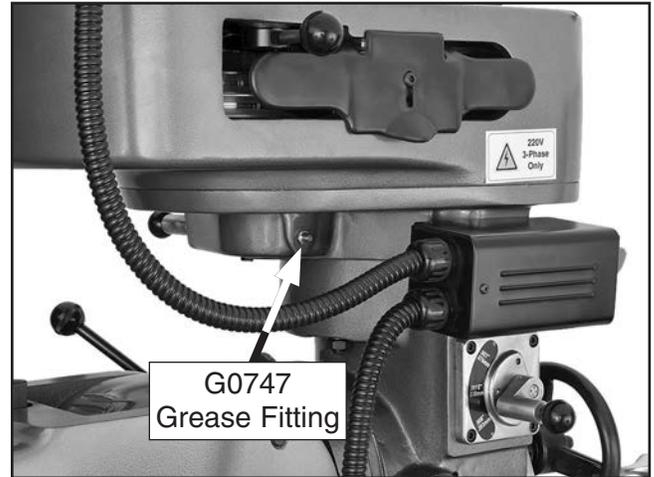


Figure 54. Model G0747 headstock gearing grease fitting.



Figure 55. Model G0748 headstock gearing grease fitting.



Ram Ways

Oil Type Model T23962 or ISO 68 Equivalent
Oil Amount..... Thin Coat
Check/Add Frequency..... 40 hrs. of Operation

Move the ram back and forth as necessary to access the full length of the ways (see **Figure 56**), then use a clean shop rag to apply a thin coat of lubricant to the ways.

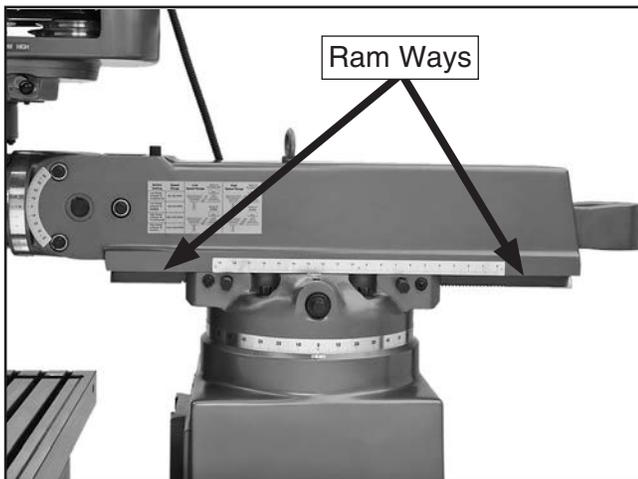


Figure 56. Ram ways.

Head Tilt & Ram Pinions

The interaction between the cast iron surfaces of these devices (see **Figure 57**) produces a dry powder that provides an adequate lubrication.

Do not apply any other lubricant that could produce a stiff compound, which may interfere with smooth movement.

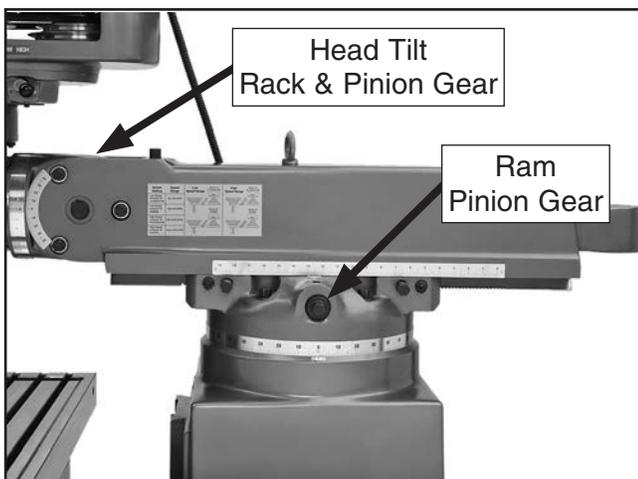


Figure 57. Head tilt and ram pinions.

Table Elevation Leadscrew

Grease TypeNLGI 2 or Equivalent
Grease Amount Thin Coat
Check/Add Frequency..... 40 hrs. of Operation

Elevate the table all the way up, then use mineral spirits to clean any debris and built-up grime from the elevation leadscrew threads. Add one pump from a grease gun to the leadscrew grease fitting shown in **Figure 58**, then run the table up and down to distribute the grease. Repeat this process until the entire leadscrew is well lubricated.

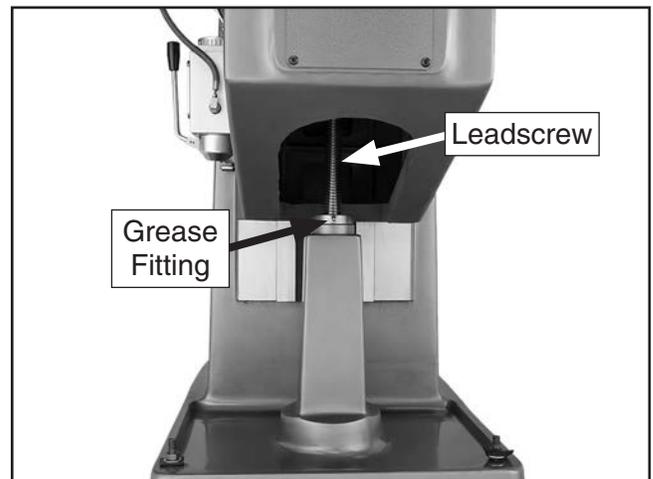


Figure 58. Elevation leadscrew grease fitting.



Power Feed Gears

Grease TypeNLGI 2 or Equivalent
 Grease AmountTwo Pumps of Grease Gun
 Check/Add Frequency 160 hrs. of Operation

Tool Needed Qty
 Wrench 19mm 1

To lubricate the power feed gears:

1. DISCONNECT MILL FROM POWER!
2. Remove the hex nut and ball handle from the power unit end of the X-axis leadscrew (see **Figure 59**).

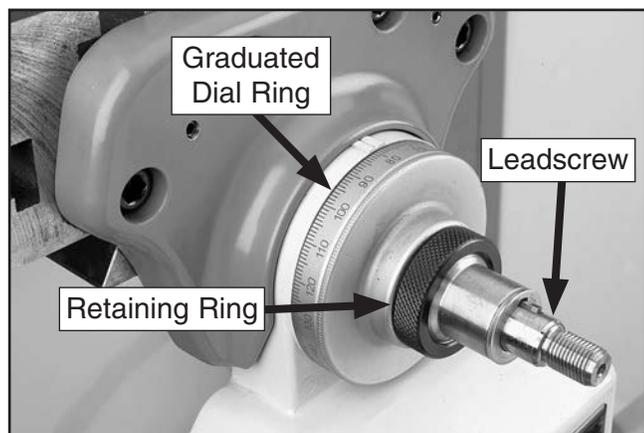


Figure 59. Power feed ball handle removed.

3. Unthread and remove the knurled retaining ring and graduated dial ring from the end of the leadscrew.
4. Remove the brass bevel gear from the leadscrew, then remove the leadscrew alignment key (see **Figure 60**).

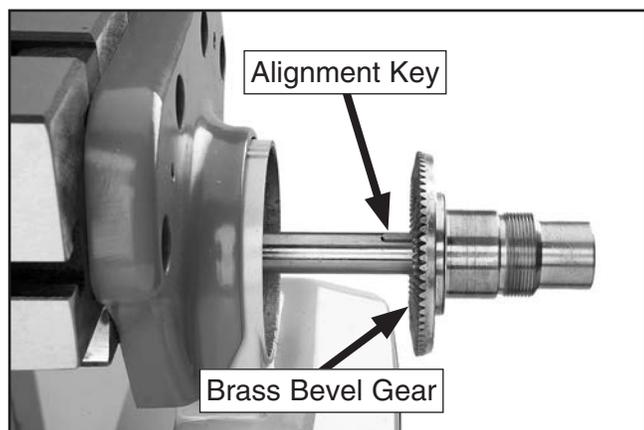


Figure 60. Power feed brass gear and leadscrew alignment key.

5. Brush a light coat of lubricant on the teeth of the bevel gear and the smaller drive gear (see **Figure 61**).

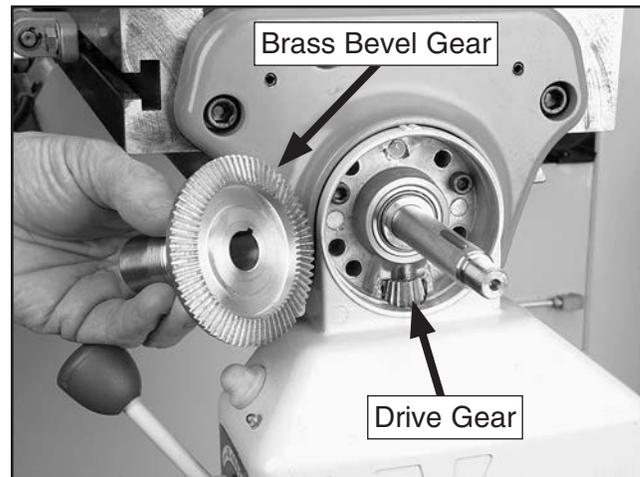


Figure 61. Power feed brass bevel gear and drive gear.

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



Machine Storage

To avoid rust problems or corrosion damage, use the following information to protect your investment when storing the mill for any length of time.

- DISCONNECT MILL FROM POWER!
- Lubricate the mill as directed in the Lubrication section beginning on **Page 44**.
- Thoroughly clean all unpainted, bare metal surfaces, then coat them with a light weight grease or rust preventative. Take care to ensure these surfaces are completely covered but that the grease or 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 or a good grade of medium-weight machine oil (not auto engine oil) in place of the grease or rust preventative.*

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



SECTION 7: SERVICE

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

Troubleshooting



| Symptom | Possible Cause | Possible Solution |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Machine does not start or a breaker trips. | <ol style="list-style-type: none"> 1. Plug/receptacle at fault or wired incorrectly. 2. Power supply is switched OFF or at fault. 3. Motor connections wired incorrectly. 4. Spindle switch at fault. 5. Motor windings or motor at fault. | <ol style="list-style-type: none"> 1. Test for good contacts; correct the wiring. 2. Ensure hot lines have correct voltage on all legs and main power supply is switched ON. 3. Correct motor wiring connections (Pages 57 & 58). 4. Replace faulty spindle switch. 5. Replace motor. |
| Machine stalls or is overloaded. | <ol style="list-style-type: none"> 1. Machine undersized for task. 2. Workpiece not securely clamped to table or mill vise. 3. Dull, damaged or incorrect cutting tool. 4. Spindle speed is incorrect for operation. 5. Motor connections wired incorrectly. 6. Plug/receptacle at fault or wired incorrectly; incorrect voltage from power supply. 7. Pulley loose. 8. Motor bearings at fault. 9. Motor overheated. 10. Motor at fault. | <ol style="list-style-type: none"> 1. Use smaller, sharp tools; reduce feed rate; reduce spindle speed; use coolant. 2. Make sure workpiece is properly clamped to table or mill vise; use work holding jig if necessary. 3. Use sharp and correct cutting tool for operation. 4. Select appropriate spindle speed (Page 33 or 35). 5. Correct motor wiring connections (Pages 57 & 58). 6. Test for good contacts; correct wiring problems; ensure hot lines have correct voltage on all legs. 7. Re-align/replace shaft, pulley, set screw, or key as required. 8. Test by rotating shaft; rotation grinding/loose shaft requires bearing replacement. 9. Let motor cool, clean off, and reduce workload. 10. Replace motor. |
| Machine has vibration or noisy operation. | <ol style="list-style-type: none"> 1. Tool holder or cutter at fault. 2. Workpiece alignment poor. 3. Spindle and spindle clutch are not properly meshed. 4. Motor or component loose. 5. Pulley loose. 6. Machine incorrectly mounted to floor or sits unevenly. 7. Motor bearings at fault. 8. Gearbox at fault. | <ol style="list-style-type: none"> 1. Replace out-of-round tool holder; replace/re-sharpen cutter; use appropriate feed rate and spindle speed. 2. Eliminate workpiece bindings; use vise or clamps as required for proper workpiece alignment control. 3. Make sure the spindle and spindle clutch are properly meshed. 4. Inspect/replace stripped or damaged bolts/nuts, and re-tighten with thread-locking fluid. 5. Re-align/replace shaft, pulley, set screw, or key as required. 6. Re-tighten/replace mounting bolts in floor; relocate/shim machine. 7. Test by rotating shaft; rotation grinding/loose shaft requires bearing replacement. 8. Rebuild gearbox and replace worn/damaged gears and bearings. |



| Symptom | Possible Cause | Possible Solution |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tool slips in collet. | <ol style="list-style-type: none"> 1. Collet not fully drawn into spindle taper. 2. Wrong size collet. 3. Debris on mating surface of collet and spindle. 4. Excessive depth of cut. | <ol style="list-style-type: none"> 1. Snug up drawbar to fully seat collet. 2. Use correct collet for tool shank diameter. 3. Remove oil and debris from mating surface, then re-install. 4. Decrease depth of cut and allow chips to clear. |
| Tool breakage. | <ol style="list-style-type: none"> 1. Spindle speed too slow or feed rate too fast. 2. Tool getting too hot. 3. Excessive depth of cut. | <ol style="list-style-type: none"> 1. Use correct spindle speed (Page 33 or 35) and feed rate. 2. Use coolant; reduce spindle speed (Page 33 or 35) or feed rate. 3. Decrease depth of cut and allow chips to clear. |
| Workpiece chatters or vibrates during operation. | <ol style="list-style-type: none"> 1. Table locks not tight. 2. Workpiece not securely clamped to table or mill vise. 3. Tool not secure or is damaged. 4. Spindle speed too fast; feed rate too slow. 5. Gibs too loose. | <ol style="list-style-type: none"> 1. Tighten all locks on mill that are not associated with necessary table movement for the operation. 2. Check that clamping is tight and sufficient for operation; make sure mill vise is clamped tight to table. 3. Properly secure the tool; replace if damaged. 4. Use correct spindle speed (Page 33 or 35) and feed rate 5. Properly adjust gibs (Page 51). |
| Table 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 in need of lubrication 4. Gibs too tight. | <ol style="list-style-type: none"> 1. Loosen locks needed for movement. 2. Frequently clean away chips from ways. 3. Use one-shot oiler to lubricate ways (Page 45). 4. Properly adjust gibs (Page 51). |
| Bad surface finish. | <ol style="list-style-type: none"> 1. Incorrect spindle speed or feed rate. 2. Dull, damaged or incorrect cutting tool. 3. Wrong spindle direction for tool. 4. Workpiece not securely clamped to table or mill vise. 5. Gibs too loose. | <ol style="list-style-type: none"> 1. Use correct spindle speed (Page 33 or 35) and feed rate. 2. Use sharp and correct cutting tool for operation. 3. Check for correct spindle rotation for tool. 4. Make sure workpiece is properly clamped to table or mill vise; use work holding jig if necessary. 5. Properly adjust gibs (Page 51). |
| Power feed chatters or grinds during operation. | <ol style="list-style-type: none"> 1. Brass bevel gear is not meshed with drive gear. 2. Power feed unit at fault. | <ol style="list-style-type: none"> 1. Remove parts from power feed side of X-axis leadscrew to ensure bevel gear is properly meshed with drive gear; make sure ball handle nut is snug. 2. Replace power feed unit. |



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 milling results.

Tight gibs make table movement more accurate but stiff. Loose gibs make moving the table sloppy but easier to do. The goal of gib adjustment is to remove unnecessary sloppiness without causing the ways to bind.

Gibs are adjusted with a screw on each end of the gib, that move the tapered gib back-and-forth to increase or decrease the friction pressure between the sliding surfaces. The process of properly adjusting the gibs requires trial-and-error and patience.

DISCONNECT MILL FROM POWER BEFORE ADJUSTING THE GIBS!

Make sure all table and knee locks are loose. Then, loosen one gib adjustment screw and tighten the other the same amount to move the gib. Use the ball handles/crank to move the table/knee until you feel a slight drag in that path of movement.

Refer to **Figures 62–64** to identify the locations of the table, saddle, and knee gibs, and one of the two adjustment screws for each.

Note: *It will be necessary to remove small parts, such as way wipers and covers, to access the gib adjustment screws.*

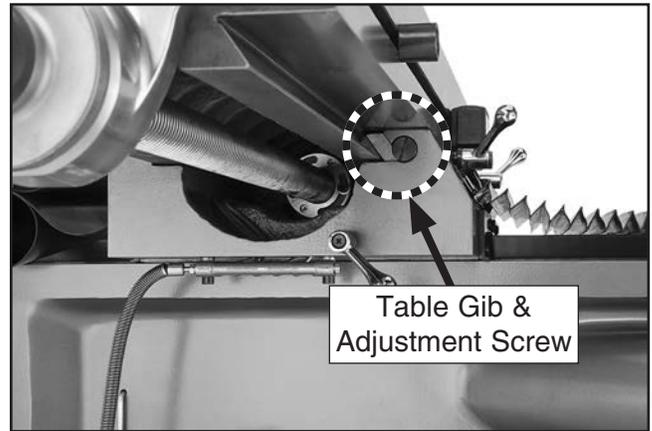


Figure 62. Table gib and adjustment screw underneath left side of table.

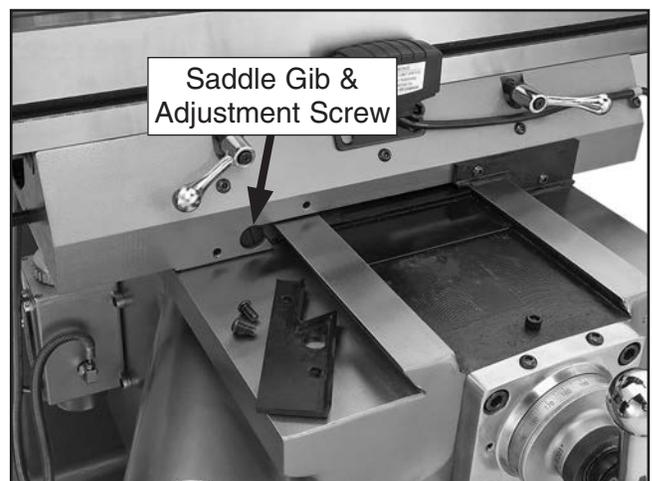


Figure 63. Saddle gib and adjustment screw.



Figure 64. Knee gib and adjustment screw.



Adjusting Leadscrew Backlash

Leadscrew backlash is the amount of motion the leadscrew rotates before the attached device begins to move.

Leadscrews will always have a certain amount of backlash that will increase with normal wear. Generally, 0.005"–0.010" leadscrew backlash is acceptable to ensure smooth movement and reduce the risk of premature thread wear. However, if you find it necessary to adjust leadscrew backlash, perform the procedures listed below.

| Tools Needed | Qty |
|------------------------------|-----|
| T-Handle Hex Wrench 5mm..... | 1 |
| Hex Wrench 3mm..... | 2 |
| Hex Wrench 8mm..... | 1 |
| Wrench 19mm | 1 |

X-Axis Leadscrew Backlash

1. DISCONNECT MILL FROM POWER!
2. Loosen the two cap screws on the X-axis leadscrew nut accessed from underneath the left side of the table (see **Figure 65**).

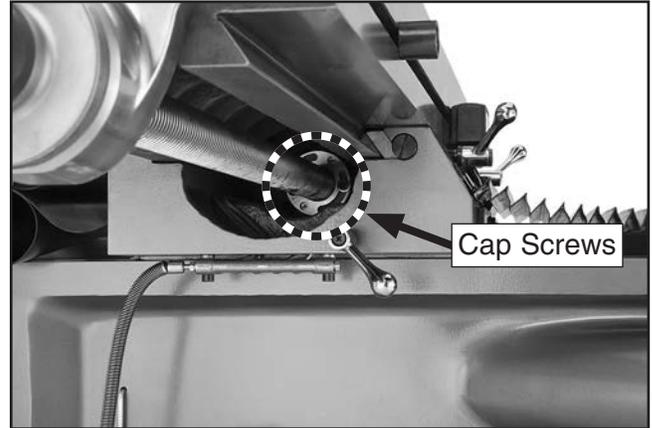


Figure 65. X-axis leadscrew nut cap screws (viewed from underneath left side of table).

3. Rotate the adjustment plate on the leadscrew nut in small increments, then check the amount of backlash.
4. When you are satisfied with the adjustment, re-tighten the two cap screws.



Cross Leadscrew Backlash

1. DISCONNECT MILL FROM POWER!
2. Remove the hex nut and ball handle from the Y-axis leadscrew.

Note: *In the next step, take care not to misplace the leadscrew key as you remove the parts.*
3. Unthread and remove the knurled retaining ring, graduated dial ring, and the leadscrew key (see **Figure 66**).

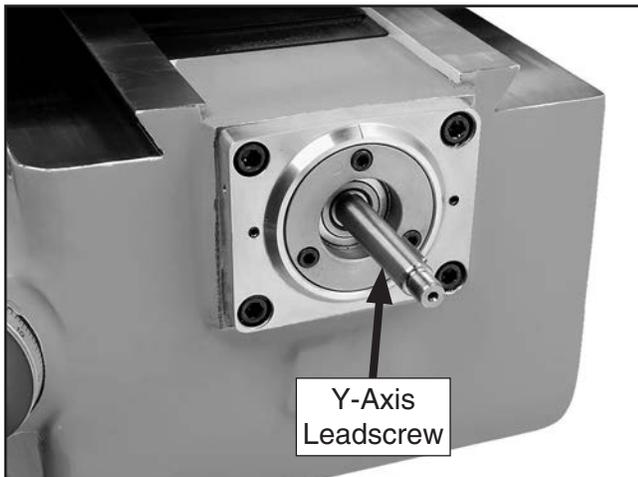


Figure 66. Ball handle, ring, and key removed from Y-axis leadscrew.

4. Remove the four cap screws from the bearing housing, then slide it off the leadscrew (see **Figure 67**).

Note: *It may be necessary to use a dead blow hammer or rubber mallet on the housing to knock it loose.*

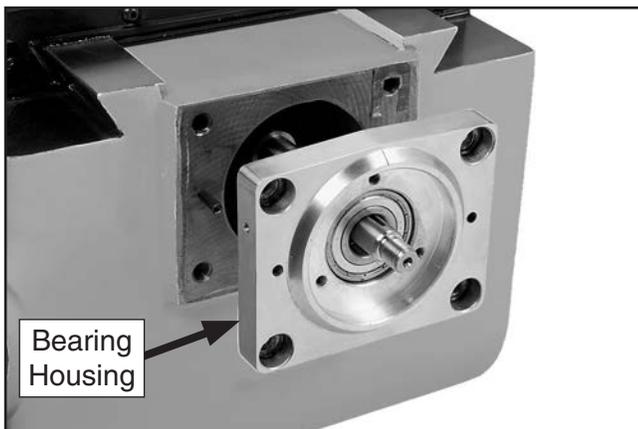


Figure 67. Y-axis bearing housing.

5. Loosen the two cap screws on the face of the leadscrew nut shown in **Figure 68**.



Figure 68. Y-axis leadscrew nut and cap screws.

6. Re-install the key back onto the leadscrew so that you can use the ball handle in the next step.
7. Rotate the adjustment plate on the leadscrew nut in small increments, slide the ball handle on the leadscrew, then check the amount of backlash.
8. When you are satisfied with the adjustment, re-tighten the two cap screws.
9. Re-install the parts previously removed in the reverse order.



Tramming Spindle

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

This procedure involves mounting a dial test indicator to the quill or spindle, rotating it around the table, and adjusting the spindle axis (Z-axis) 90° to the table X- and Y-axes, as illustrated in **Figure 69**.

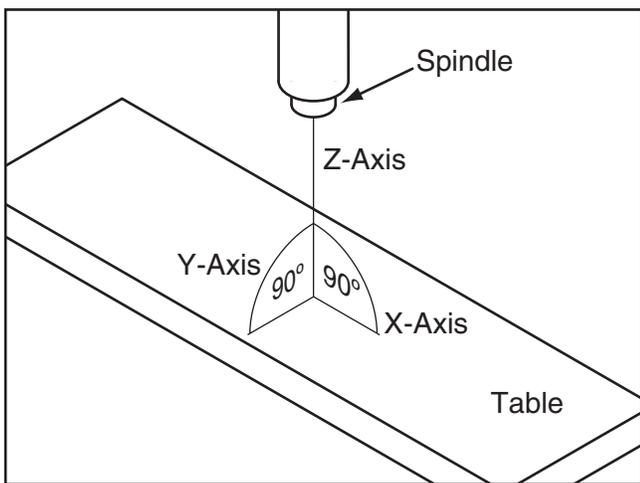


Figure 69. Spindle Z-axis perpendicular to the table X- and Y-axis.

We encourage you to research the many variations of spindle tramping 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 tramping 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 the spindle to the table:

1. DISCONNECT MILL FROM POWER!
2. Prepare the mill for tramping by performing the 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 tramping—preferably centered with the saddle.
 - Tighten any table, knee, quill, or ram locks that should be tight during the intended milling operation.
3. Place the parallel block underneath the spindle.
4. Install the indicator holder in the spindle or on the quill, then mount the indicator so that the point is as parallel to the block as possible (see the illustration in **Figure 70**).

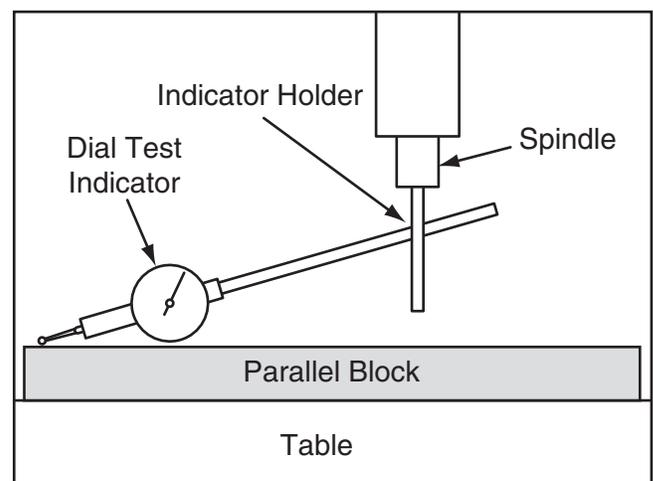


Figure 70. Dial test indicator mounted.



- To measure spindle alignment along the X-axis, place the parallel block directly under the spindle and indicator across the length of the table, as illustrated in **Figure 71**.

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

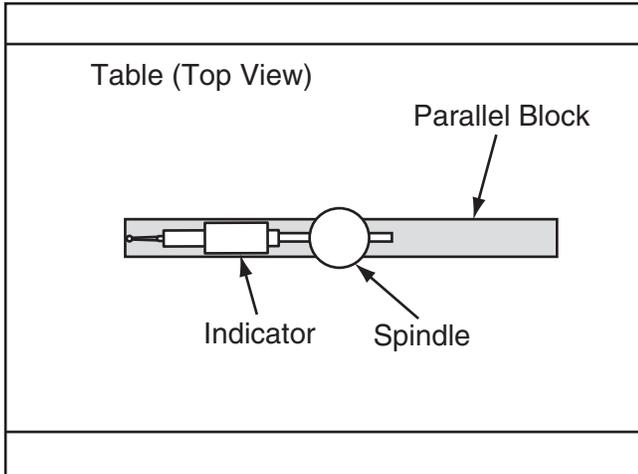


Figure 71. Parallel block and indicator positioned for the X-axis measurement (top view).

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 the spindle by hand so that the indicator point rests on one end of the parallel block, as illustrated in **Figures 70–71**, then zero the dial.
- Rotate the spindle so that the indicator point rests in the same manner on other end of the block, then read the dial.

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

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

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

- Place the parallel block directly under the spindle and across the width of the table, as illustrated in **Figure 72**.

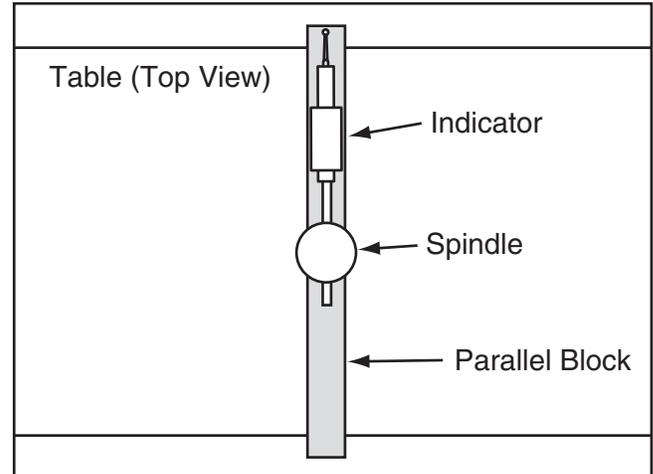


Figure 72. Parallel block and indicator positioned for the Y-axis measurement (top view).

- Rotate the spindle so the indicator point rests on the parallel bar, as illustrated in **Figure 72**, then zero the dial.
- Rotate the spindle so that the indicator point rests on the other end of the bar in the same manner, then read the dial.

—If the indicator dial still reads zero or is within the acceptable variance, the spindle is precisely perpendicular to the table in both the X- and Y-axes, and the tramping procedure is complete.

—If the indicator dial has moved from zero beyond the acceptable variance, you will need to compensate for that amount by tilting the head forward or backward. Repeat **Steps 9–10** until you are satisfied with the spindle axis alignment along the table Y-axis.

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



SECTION 8: WIRING

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

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

WARNING

Wiring Safety Instructions

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

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

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

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

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

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

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

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

NOTICE

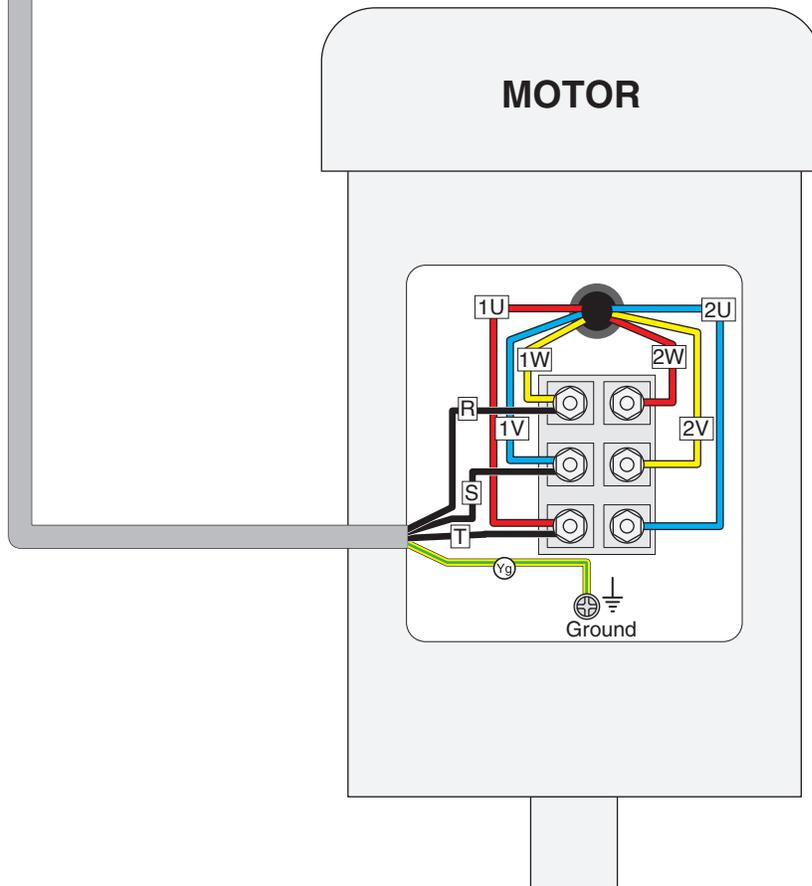
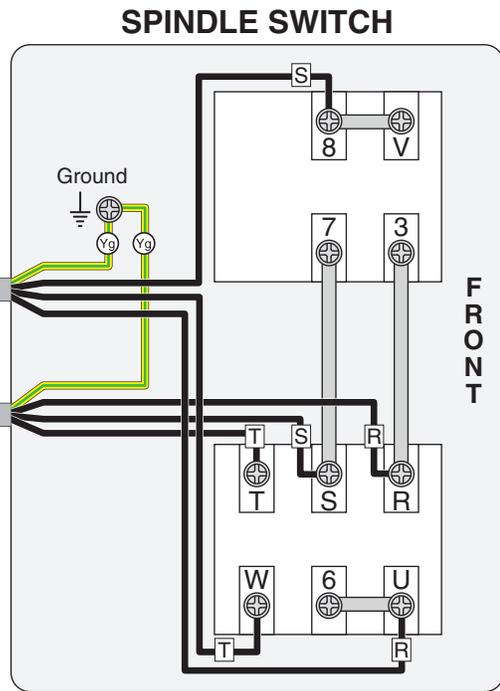
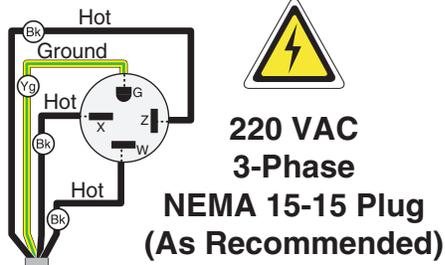
The photos and diagrams included in this section are best viewed in color. You can view these pages in color at www.grizzly.com.

COLOR KEY

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



G0748 Wiring Diagram



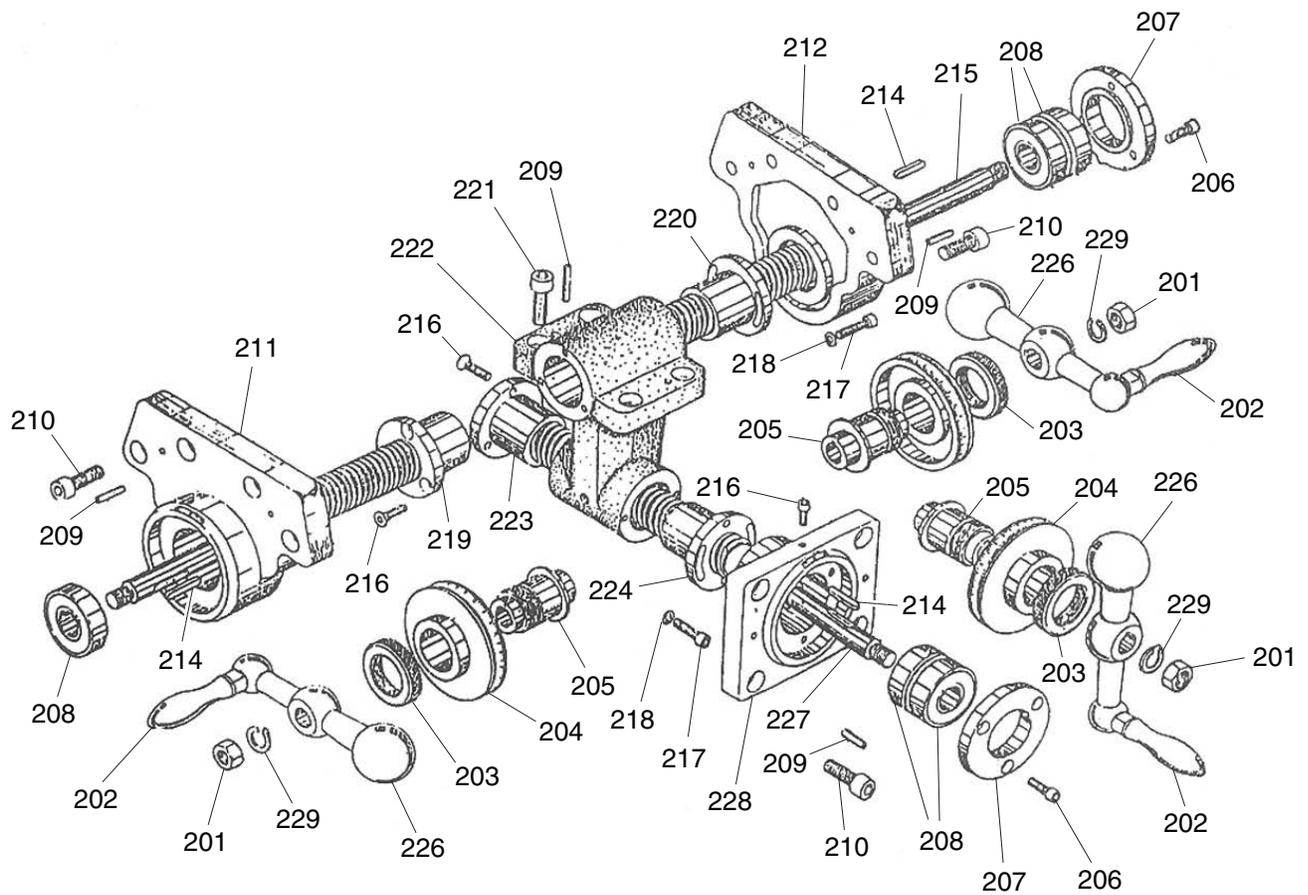
Main Parts List

| REF | PART # | DESCRIPTION |
|-----|-----------|----------------------------------------|
| 1 | P07470001 | QUILL HOUSING ADJUSTMENT GEAR |
| 2 | P07470002 | RAM ADAPTER |
| 4 | P07470004 | LIFTING EYE BOLT 28MM DIA M10-1.5 X 35 |
| 6 | P07470006 | HEAD TILT ADJUSTING WORM |
| 7 | P07470007 | THRUST WASHER 14MM |
| 8 | P07470008 | HEAD TILT ADJUSTING WORM SHAFT |
| 9 | P07470009 | KEY 5 X 5 X 50 |
| 10 | P07470010 | RAM CASTING |
| 13 | P07470013 | CAP SCREW M8-1.25 X 30 |
| 14 | P07470014 | ROLL PIN 6 X 30 |
| 15 | P07470015 | HEAD TILT SCALE |
| 16 | P07470016 | STEEL FLUTED RIVET 2 X 5MM |
| 17 | P07470017 | RAM ADAPTER PIVOT BOLT M28.5 X 181.5 |
| 18 | P07470018 | FLAT WASHER 14MM |
| 19 | P07470019 | HEX BOLT M14-2 X 190 |
| 23 | P07470023 | TABLE 10" X 50" |
| 31 | P07470031 | LIMIT STOP T-BOLT |
| 32 | P07470032 | LIMIT STOP |
| 33 | P07470033 | HEX NUT M12-1.75 |
| 37 | P07470037 | SADDLE LOCK BOLT HANDLE |
| 38 | P07470038 | SADDLE LOCK BOLT |
| 39 | P07470039 | SADDLE LOCK BOLT PLUNGER |
| 40 | P07470040 | CAP SCREW M10-1.5 X 15 |
| 41 | P07470041 | GIB ADJUSTING SCREW |
| 42 | P07470042 | TABLE STOP BRACKET |
| 43 | P07470043 | TABLE GIB |
| 44 | P07470044 | SADDLE WAY WIPER |
| 46 | P07470046 | TABLE LOCK BOLT PLUNGER |
| 47 | P07470047 | TABLE LOCK BOLT |
| 48 | P07470048 | TABLE LOCK BOLT HANDLE |
| 49 | P07470049 | SADDLE GIB |
| 50 | P07470050 | SADDLE WIPER HOLDER |
| 51 | P07470051 | PHLP HD SCR M6-1 X 12 |
| 52 | P07470052 | SADDLE CASTING |
| 53 | P07470053 | LEFT COLUMN WAY WIPER HOLDER |
| 54 | P07470054 | LEFT COLUMN WAY WIPER |
| 55 | P07470055 | KNEE GIB |
| 56 | P07470056 | CAP SCREW M6-1 X 12 |
| 57 | P07470057 | RIGHT COLUMN WAY WIPER HOLDER |
| 58 | P07470058 | RIGHT COLUMN WAY WIPER |
| 60 | P07470060 | UPPER SADDLE COVER |
| 61 | P07470061 | LOWER SADDLE COVER |
| 62 | P07470062 | KNEE CASTING |
| 64 | P07470064 | KNEE STOP BOLT |
| 65 | P07470065 | KNEE LOCK BOLT ASSEMBLY |
| 69 | P07470069 | KNEE LOCK PLUNGER |

| REF | PART # | DESCRIPTION |
|-----|-----------|-------------------------------|
| 71 | P07470071 | KNEE PLUG |
| 74 | P07470074 | HEX NUT 1/2-13 |
| 75 | P07470075 | KEY 5 X 5 X 20 |
| 76 | P07470076 | FLAT WASHER 1/2 |
| 77 | P07470077 | Z-AXIS BEVEL GEAR |
| 79 | P07470079 | ANGULAR CONTACT BEARING 3305 |
| 80 | P07470080 | BEARING RETAINER RING |
| 81 | P07470081 | CAP SCREW M6-1 X 20 |
| 82 | P07470082 | Z-AXIS LEADSCREW |
| 83 | P07470083 | CRANK HANDLE |
| 84 | P07470084 | Z-AXIS CRANK ARM |
| 85 | P07470085 | CLUTCH |
| 86 | P07470086 | DIAL LOCK NUT |
| 87 | P07470087 | GRADUATED DIAL |
| 88 | P07470088 | DIAL HOLDER |
| 89 | P07470089 | CAP SCREW M6-1 X 20 |
| 90 | P07470090 | BEARING RETAINER RING |
| 91 | P07470091 | BALL BEARING 6204ZZ |
| 92 | P07470092 | BEARING CAP |
| 93 | P07470093 | KEY 4 X 4 X 18 |
| 94 | P07470094 | Z-AXIS SHAFT |
| 95 | P07470095 | BALL BEARING 6204ZZ |
| 96 | P07470096 | BEVELED PINION GEAR |
| 98 | P07470098 | COLUMN CASTING |
| 102 | P07470102 | CAP SCREW M10-1.5 X 40 |
| 103 | P07470103 | Z-AXIS PEDESTAL |
| 104 | P07470104 | Z-AXIS LEADSCREW NUT |
| 105 | P07470105 | CAP SCREW M6-1 X 20 |
| 118 | P07470118 | RAM SWIVEL |
| 119 | P07470119 | RAM LOCK BOLT M16-2 X 35 |
| 120 | P07470120 | RAM PINION |
| 123 | P07470123 | FLAT WASHER 12MM |
| 124 | P07470124 | TURRET |
| 125 | P07470125 | RAM CLAMP BAR |
| 126 | P07470126 | UNTAPPED RAM CLAMP |
| 127 | P07470127 | TAPPED RAM CLAMP |
| 128 | P07470128 | DOWEL PIN 13.5 X 26 |
| 129 | P07470129 | RAM LOCK BOLT M12-1.75 X 185 |
| 131 | P07470131 | RAM GIB |
| 132 | P07470132 | RAM GIB ADJUSTMENT SET SCREW |
| 133 | P07470133 | HEX NUT M10-1.5 |
| 134 | P07470134 | COLUMN WAY COVER |
| 135 | P07470135 | BUTTON HED CAP SCR M5-.8 X 18 |
| 136 | P07470136 | HEX NUT M5-.8 |
| 137 | P07470137 | FLAT WASHER 5MM |
| 138 | P07470138 | FRONT SADDLE WAY COVER |



X- & Y-Axis Leadscrews

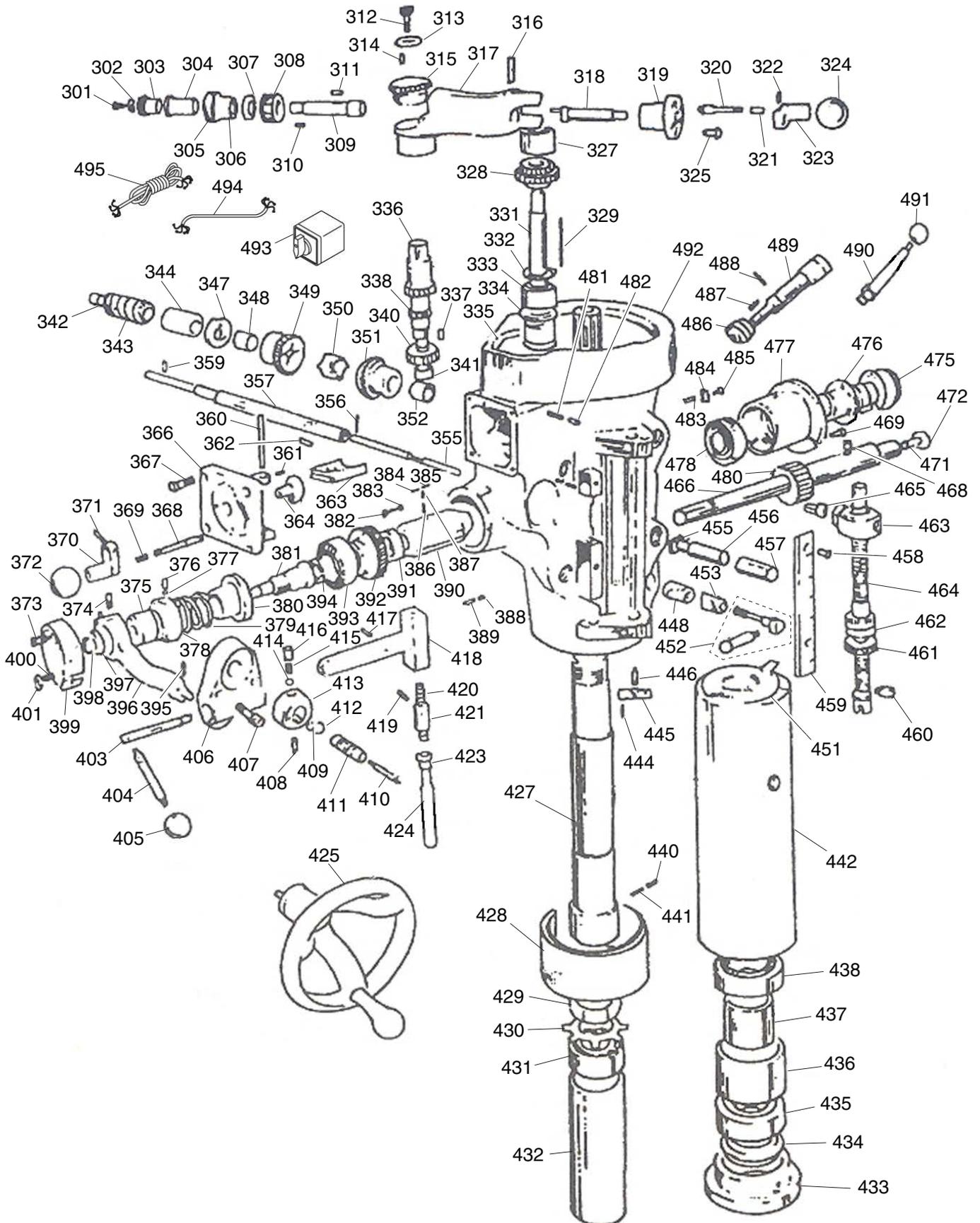


| REF | PART # | DESCRIPTION |
|-----|-----------|--------------------------------|
| 201 | P07470201 | HEX NUT 1/2-13 |
| 202 | P07470202 | BALL CRANK HANDLE |
| 203 | P07470203 | DIAL LOCK NUT |
| 204 | P07470204 | GRADUATED DIAL |
| 205 | P07470205 | DIAL HOLDER |
| 206 | P07470206 | CAP SCREW M6-1 X 16 |
| 207 | P07470207 | BEARING RETAINER RING |
| 208 | P07470208 | BALL BEARING 6204ZZ |
| 209 | P07470209 | ROLL PIN 5 X 30 |
| 210 | P07470210 | CAP SCREW M10-1.5 X 25 |
| 211 | P07470211 | LEFT X-AXIS LEADSCREW BRACKET |
| 212 | P07470212 | RIGHT X-AXIS LEADSCREW BRACKET |
| 214 | P07470214 | KEY 3 X 3 X 25 |
| 215 | P07470215 | X-AXIS LEADSCREW |

| REF | PART # | DESCRIPTION |
|-----|-----------|----------------------------|
| 216 | P07470216 | FLAT HD CAP SCR M6-1 X 12 |
| 217 | P07470217 | CAP SCREW M6-1 X 25 |
| 218 | P07470218 | FLAT WASHER 6MM |
| 219 | P07470219 | LEFT X-AXIS LEADSCREW NUT |
| 220 | P07470220 | RIGHT X-AXIS LEADSCREW NUT |
| 221 | P07470221 | CAP SCREW M10-1.5 X 25 |
| 222 | P07470222 | LEADSCREW NUT BRACKET |
| 223 | P07470223 | REAR Y-AXIS LEADSCREW NUT |
| 224 | P07470224 | FRONT Y-AXIS LEADSCREW NUT |
| 226 | P07470226 | BALL CRANK |
| 227 | P07470227 | Y-AXIS LEADSCREW |
| 228 | P07470228 | Y-AXIS LEADSCREW BRACKET |
| 229 | P07470229 | LOCK WASHER 1/2 |



Downfeed System



Downfeed System Parts List

| REF | PART # | DESCRIPTION |
|-----|-----------|---------------------------------|
| 301 | PS31 | PHLP HD SCR 10-24 X 1-3/4 |
| 302 | P07470302 | BEVEL PINION FLAT WASHER |
| 303 | P07470303 | FEED BEVEL PINION |
| 304 | P07470304 | FEED WORM GEAR SHAFT SLEEVE |
| 305 | P07470305 | WORM CRADLE BUSHING |
| 306 | PSS07 | SET SCREW 1/4-20 X 1/2 |
| 307 | P07470307 | WORM CRADLE SPACER |
| 308 | P07470308 | FEED DRIVE WORM GEAR |
| 309 | P07470309 | FEED DRIVE WORM GEAR SHAFT |
| 310 | P07470310 | KEY 3 X 3 X 10 |
| 311 | P07470311 | KEY 3 X 3 X 16 |
| 312 | P07470312 | BEVEL GEAR LOCK BOLT |
| 313 | P07470313 | FLAT WASHER 8MM |
| 314 | P07470314 | KEY 3 X 3 X 10 |
| 315 | P07470315 | FEED REVERSE BEVEL GEAR |
| 316 | P07470316 | FEED ENGAGEMENT PIN |
| 317 | P07470317 | WORM GEAR CRADLE |
| 318 | P07470318 | WORM GEAR CRADLE THROW-OUT |
| 319 | P07470319 | SHIFT SLEEVE |
| 320 | P07470320 | GEAR SHIFT PLUNGER |
| 321 | P07470321 | COMPRESSION SPRING |
| 322 | P07470322 | ROLL PIN 3 X 20 |
| 323 | P07470323 | SHIFT CRANK |
| 324 | P07470324 | ROUND PLASTIC KNOB 1/4-20 1" OD |
| 325 | P07470325 | CAP SCREW M5-.8 X 12 |
| 327 | P07470327 | CLUSTER GEAR SHAFT BRASS SLEEVE |
| 328 | P07470328 | CLUSTER COMBO GEAR |
| 329 | P07470329 | KEY 3 X 3 X 45 |
| 331 | P07470331 | CLUSTER GEAR SHAFT |
| 332 | P07470332 | EXT RETAINING RING 16MM |
| 333 | P07470333 | BEVEL GEAR BRASS SLEEVE |
| 334 | P07470334 | BEVEL GEAR THRUST WASHER |
| 335 | P07470335 | FEED REVERSE BEVEL PINION |
| 336 | P07470336 | FEED DRIVE GEAR SHAFT 18T |
| 337 | P07470337 | KEY 3 X 3 X 10 |
| 338 | P07470338 | CLUSTER GEAR INPUT SHAFT |
| 340 | P07470340 | FEED DRIVE GEAR 23T |
| 341 | P07470341 | NEEDLE BEARING BA66 |
| 342 | P07470342 | BUSHING |
| 343 | P07470343 | FEED WORM |
| 344 | P07470344 | FEED WORM SHAFT BUSHING |
| 347 | P07470347 | FEED WORM SHAFT THRUST WASHER |
| 348 | P07470348 | BUSHING |
| 349 | P07470349 | FEED REVERSE BEVEL GEAR |
| 350 | P07470350 | FEED REVERSE CLUTCH |
| 351 | P07470351 | FEED REVERSE BEVEL GEAR |
| 352 | P07470352 | BUSHING |
| 355 | P07470355 | REVERSE CLUTCH ROD |
| 356 | P07470356 | ROLL PIN 3 X 20 |
| 357 | P07470357 | FEED WORM SHAFT |
| 359 | P07470359 | ROLL PIN 3 X 12 |
| 360 | P07470360 | FEED SHAFT ROD |
| 361 | P07470361 | SET SCREW M5-.8 X 6 |

| REF | PART # | DESCRIPTION |
|-----|-----------|--------------------------------------|
| 362 | PK52M | KEY 3 X 3 X 15 |
| 363 | P07470363 | FEED GEAR SHIFT CRANK |
| 364 | P07470364 | CLUSTER GEAR SHIFT CRANK |
| 366 | P07470366 | CLUSTER GEAR COVER |
| 367 | PCAP33M | CAP SCREW M5-.8 X 12 |
| 368 | P07470368 | GEAR SHIFT PLUNGER |
| 369 | P07470369 | COMPRESSION SPRING |
| 370 | P07470370 | SHIFT CRANK |
| 371 | PRP42M | ROLL PIN 3 X 20 |
| 372 | P07470372 | ROUND PLASTIC KNOB 1/4-20 1" OD |
| 373 | P07470373 | CAP SCREW M5-.8 X 35 |
| 374 | P07470374 | CLUTCH RING PIN |
| 375 | P07470375 | CLUTCH RING |
| 376 | P07470376 | SET SCREW M6-1 X 8 |
| 377 | P07470377 | BRASS PLUG |
| 378 | P07470378 | OVERLOAD CLUTCH LOCKNUT |
| 379 | P07470379 | SAFETY CLUTCH COMPRESSION SPRING |
| 380 | P07470380 | OVERLOAD CLUTCH |
| 381 | P07470381 | OVERLOAD CLUTCH SLEEVE |
| 382 | P07470382 | LOCK WASHER 4MM |
| 383 | P07470383 | PHLP HD SCR M4-.7 X 16 |
| 384 | P07470384 | SET SCREW M6-1 X 12 |
| 385 | P07470385 | SET SCREW M6-1 X 8 |
| 386 | P07470386 | SET SCREW M6-1 X 6 |
| 387 | P07470387 | SET SCREW M6-1 X 10 |
| 388 | P07470388 | COMPRESSION SPRING |
| 389 | P07470389 | OVERLOAD CLUTCH LEVER SPRING PLUNGER |
| 390 | P07470390 | QUILL PINION SHAFT BUSHING |
| 391 | P07470391 | PINION SHAFT WORM GEAR SPACER |
| 392 | P07470392 | OVERLOAD CLUTCH WORM GEAR |
| 393 | P07470393 | OVERLOAD CLUTCH RING |
| 394 | P07470394 | EXT RETAINING RING 14MM |
| 395 | P07470395 | DOWEL PIN |
| 396 | P07470396 | OVERLOAD CLUTCH TRIP LEVER |
| 397 | P07470397 | FLAT WASHER 10MM |
| 398 | P07470398 | EXT RETAINING RING 10MM |
| 399 | P07470399 | CLUTCH ARM COVER |
| 400 | P07470400 | SET SCREW M6-1 X 6 |
| 401 | P07470401 | HEX NUT M6-1 |
| 403 | P07470403 | CAM ROD |
| 404 | P07470404 | SPRING STUD 1/4-20 X 3-1/4, 3/8 |
| 405 | P07470405 | ROUND PLASTIC KNOB 1/4-20 1" OD |
| 406 | P07470406 | FEED TRIP BRACKET |
| 407 | P07470407 | CAP SCREW M6-1 X 20 |
| 408 | P07470408 | SET SCREW M6-1 X 6 |
| 409 | P07470409 | KEY 3 X 3 X 12 |
| 410 | P07470410 | FEED REVERSE KNOB SHOULDER SCREW |
| 411 | P07470411 | FEED REVERSE KNOB |
| 412 | P07470412 | EXT RETAINING RING 14MM |
| 413 | P07470413 | HANDWHEEL CLUTCH |
| 414 | P07470414 | STEEL BALL 3/16 |
| 415 | P07470415 | COMPRESSION SPRING |
| 416 | P07470416 | SET SCREW M8-1.25 X 8 |



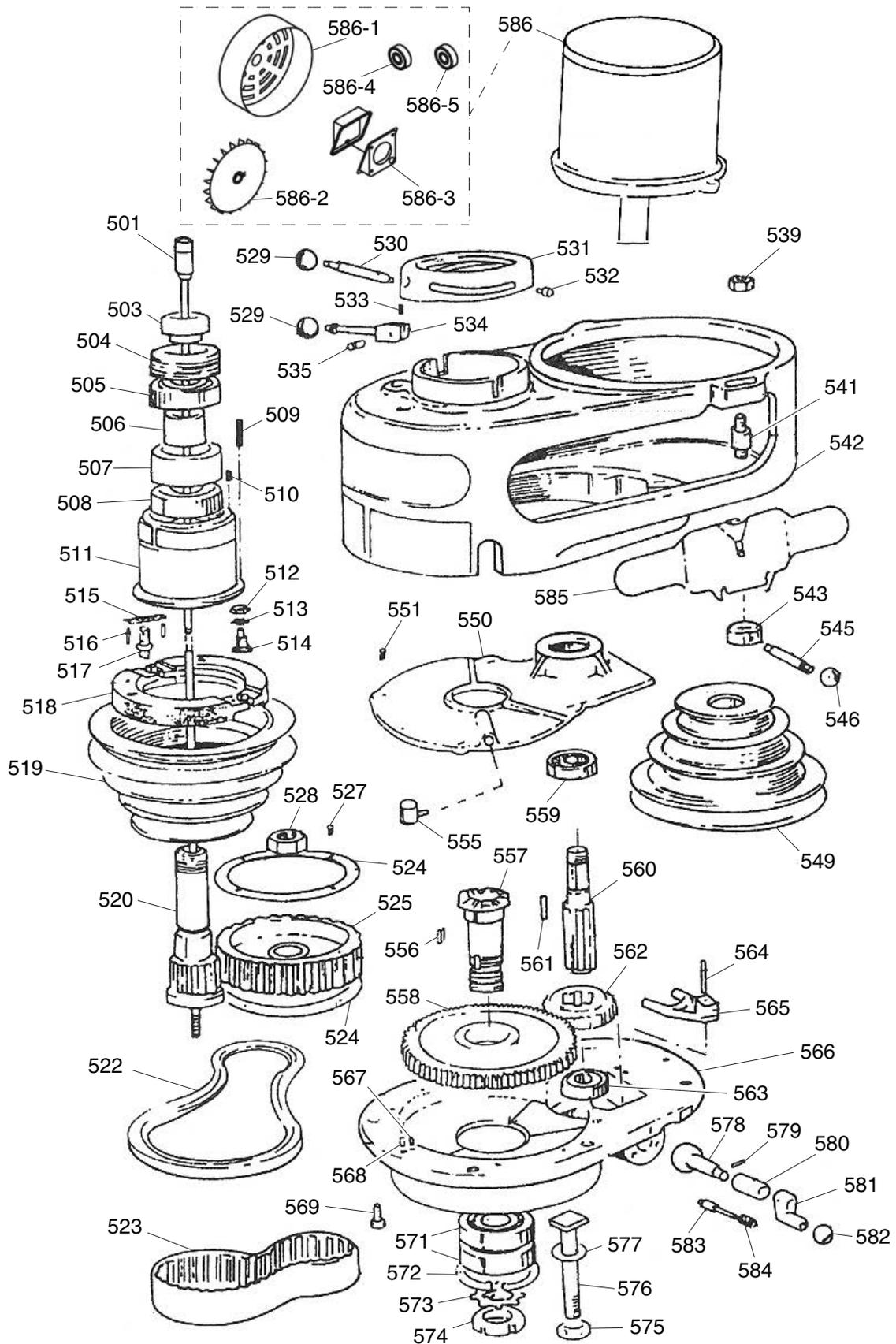
Downfeed System Parts List

| REF | PART # | DESCRIPTION |
|-----|-----------|-------------------------------|
| 417 | P07470417 | ROLL PIN 3 X 20 |
| 418 | P07470418 | CAM ROD SLEEVE ASSEMBLY |
| 419 | P07470419 | ROLL PIN 3 X 12 |
| 420 | P07470420 | COMPRESSION SPRING |
| 421 | P07470421 | TRIP PLUNGER |
| 423 | P07470423 | TRIP PLUNGER BUSHING |
| 424 | P07470424 | FEED TRIP PLUNGER |
| 425 | P07470425 | FINE DOWNFEED HANDWHEEL ASSY |
| 427 | P07470427 | SPINDLE |
| 428 | P07470428 | QUILL SKIRT |
| 429 | P07470429 | SPINDLE SPANNER NUT |
| 430 | P07470430 | SPANNER NUT LOCK WASHER |
| 431 | P07470431 | BALL BEARING 6206ZZ |
| 432 | P07470432 | SPINDLE SLEEVE |
| 433 | P07470433 | QUILL NOSE PIECE |
| 434 | P07470434 | LOWER SPINDLE SEAL 64 X 35MM |
| 435 | P07470435 | ANGULAR CONTACT BEARING 7207 |
| 436 | P07470436 | LARGE BEARING SPACER |
| 437 | P07470437 | SMALL BEARING SPACER |
| 438 | P07470438 | ANGULAR CONTACT BEARING 7207 |
| 440 | P07470440 | SET SCREW M6-1 X 8 |
| 441 | P07470441 | SET SCREW M6-1 X 6 |
| 442 | P07470442 | QUILL |
| 444 | P07470444 | SET SCREW M4-.7 X 16 |
| 445 | P07470445 | FEED TRIP LEVER |
| 446 | P07470446 | TRIP LEVER PIN |
| 448 | P07470448 | UNTAPPED QUILL LOCK PLUNGER |
| 451 | P07470451 | UPPER SPINDLE SEAL |
| 452 | P07470452 | QUILL LOCK HANDLE ASSEMBLY |
| 453 | P07470453 | TAPPED QUILL LOCK PLUNGER |
| 455 | P07470455 | HEAD ROTATION CLAMPING T-BOLT |
| 456 | P07470456 | CLAMPING BOLT SPACER |
| 457 | P07470457 | HEAD ROTATION CLAMPING BOLT |
| 458 | P07470458 | PHLP HD SCR M4-.7 X 6 |

| REF | PART # | DESCRIPTION |
|-----|-----------|--------------------------------------|
| 459 | P07470459 | QUILL TRAVEL SCALE |
| 460 | P07470460 | EXT RETAINING RING 16MM |
| 461 | P07470461 | QUILL TRAVEL STOP LOCK RING |
| 462 | P07470462 | QUILL TRAVEL STOP RING |
| 463 | P07470463 | QUILL TRAVEL DOG |
| 464 | P07470464 | QUILL TRAVEL SCREW |
| 465 | P07470465 | QUILL TRAVEL DOG SCREW |
| 466 | P07470466 | QUILL PINION SHAFT |
| 468 | P07470468 | ROLL PIN 5 X 10 |
| 469 | P07470469 | PHLP HD SCR M5-.8 X 16 |
| 471 | P07470471 | KEY 3 X 3 X 20 |
| 472 | P07470472 | PINION SHAFT HUB SCREW |
| 475 | P07470475 | RACK FEED HANDLE HUB |
| 476 | P07470476 | PINION SHAFT HUB SLEEVE |
| 477 | P07470477 | SPRING COVER |
| 478 | P07470478 | QUILL RETURN COIL SPRING |
| 480 | P07470480 | QUILL PINION |
| 481 | P07470481 | SET SCREW M6-1 X 6 |
| 482 | P07470482 | SET SCREW M6-1 X 10 |
| 483 | P07470483 | REVERSE TRIP BALL LEVER |
| 484 | P07470484 | FEED REVERSE TRIP PLUNGER |
| 485 | P07470485 | REVERSE TRIP BALL LEVER SCREW |
| 486 | P07470486 | WORM GEAR |
| 487 | P07470487 | KEY 4 X 4 X 18 |
| 488 | P07470488 | SET SCREW M6-1 X 8 |
| 489 | P07470489 | WORM SHAFT |
| 490 | P07470490 | SHOULDER STUD-DE 3/8-16 X 7-1/4, 1/2 |
| 491 | P07470491 | ROUND PLASTIC KNOB 3/8-16 1-1/4" OD |
| 492 | P07470492 | QUILL HOUSING |
| 493 | P07470493 | POWER SWITCH YK 220V 8-POS (G0747) |
| 493 | P07470493 | POWER SWITCH YK 220V 3-POS (G0748) |
| 494 | P07470494 | MOTOR CORD 14G 4W 36" |
| 495 | P07470495 | POWER CORD 14G 4W 72" |



G0747 Headstock



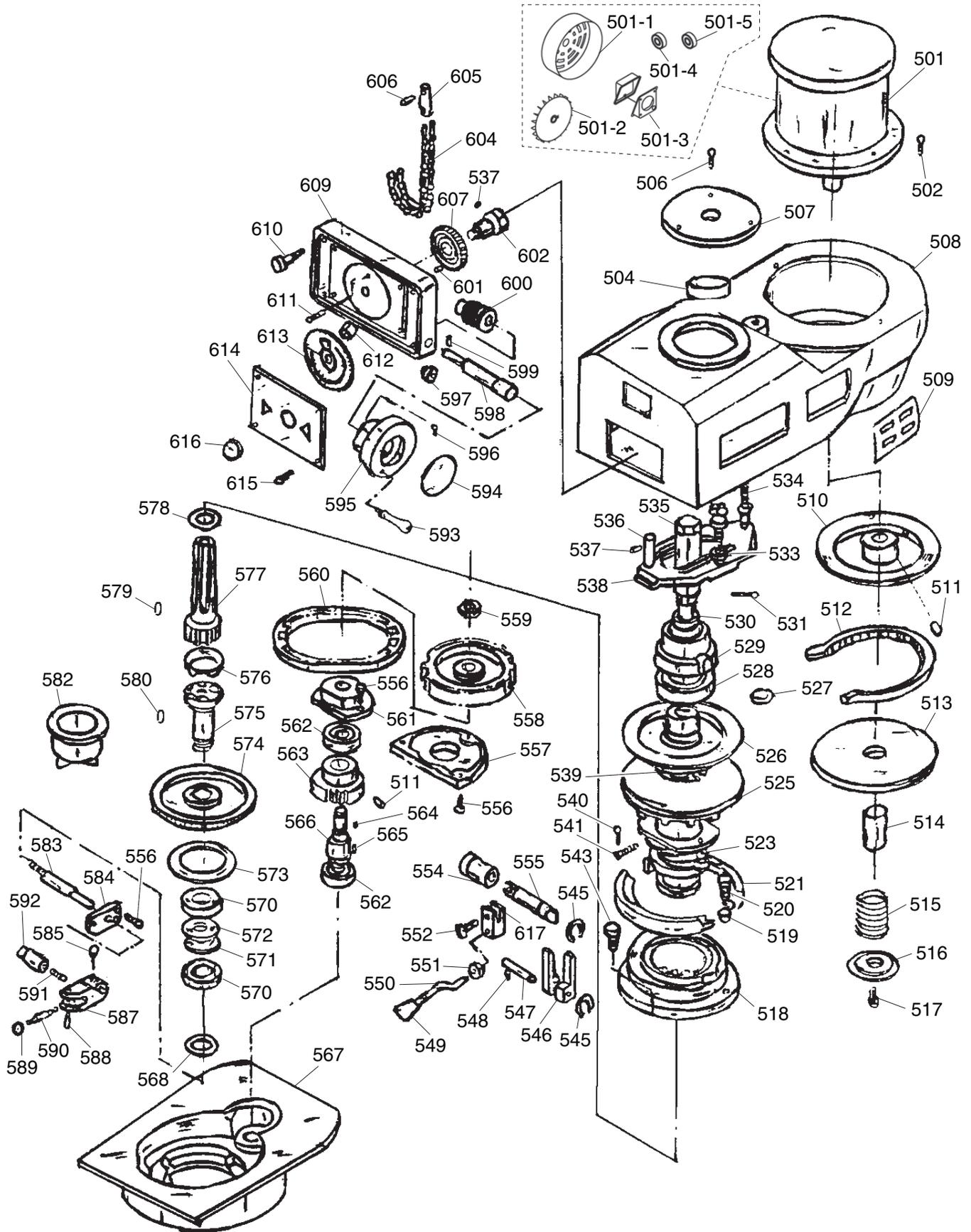
G0747 Headstock Parts List

| REF | PART # | DESCRIPTION |
|-----|-----------|---------------------------------------|
| 501 | P07470501 | DRAWBAR 7/16-20 X 23-1/2 |
| 503 | P07470503 | UPPER BEARING LOCK NUT |
| 504 | P07470504 | BEARING SLEEVE LOCK NUT |
| 505 | P07470505 | BALL BEARING 6207ZZ |
| 506 | P07470506 | SMALL UPPER BEARING SPACER |
| 507 | P07470507 | LARGE UPPER BEARING SPACER |
| 508 | P07470508 | BALL BEARING 6207ZZ |
| 509 | P07470509 | COMPRESSION SPRING |
| 510 | P07470510 | SET SCREW M6-1 X 12 |
| 511 | P07470511 | SPINDLE PULLEY BEARING SLEEVE |
| 512 | P07470512 | HEX NUT 5/16-18 |
| 513 | P07470513 | EXT TOOTH WASHER 5/16 |
| 514 | P07470514 | BRAKE RING STEP SCREW |
| 515 | P07470515 | EXTENSION SPRING |
| 516 | P07470516 | PHLP HD SCR M3-.5 X 6 |
| 517 | P07470517 | BRAKE LOCKING BOLT |
| 518 | P07470518 | BRAKE SHOE ASSEMBLY |
| 519 | P07470519 | SPINDLE PULLEY |
| 520 | P07470520 | SPINDLE PULLEY HUB |
| 522 | P07470522 | V-BELT A-33 |
| 523 | P07470523 | TIMING BELT 225L 1"W 60T |
| 524 | P07470524 | TIMING PULLEY FLANGE |
| 525 | P07470525 | TIMING PULLEY |
| 527 | P07470527 | FLAT HD SCR M5-.8 X 8 |
| 528 | P07470528 | HEX NUT 5/8-18 |
| 529 | P07470529 | ROUND PLASTIC KNOB 5/16-18 1-1/4" OD |
| 530 | P07470530 | SHOULDER STUD 5/16-18 X 4, 1/2,3/4 |
| 531 | P07470531 | CAM RING |
| 532 | P07470532 | CAM RING PIN |
| 533 | P07470533 | SET SCREW M5-.8 X 8 |
| 534 | P07470534 | BRAKE LEVER |
| 535 | P07470535 | BRAKE LOCK PIN |
| 539 | P07470539 | HEX NUT 5/16-18 |
| 541 | P07470541 | SHOULDER STUD-DE 5/16-18 X 2-1/2, 1/2 |
| 542 | P07470542 | BELT HOUSING |
| 543 | P07470543 | MOTOR LOCK NUT |
| 545 | P07470545 | SHOULDER STUD-DE 5/16-18 X 3, 5/8 |
| 546 | P07470546 | PLATIC ROUND KNOB 5/16-18 1-1/4" OD |
| 549 | P07470549 | MOTOR PULLEY |

| REF | PART # | DESCRIPTION |
|-------|-------------|----------------------------------|
| 550 | P07470550 | GEAR HOUSING COVER |
| 551 | P07470551 | PHLP HD SCR M5-.8 X 12 |
| 555 | P07470555 | OIL CUP |
| 556 | P07470556 | KEY 8 X 8 X 16 |
| 557 | P07470557 | SPLINED GEAR HUB |
| 558 | P07470558 | SPLINED BULL GEAR 81T |
| 559 | P07470559 | BALL BEARING 6203ZZ |
| 560 | P07470560 | BACK GEAR SHAFT |
| 561 | P07470561 | KEY 5 X 5 X 16 |
| 562 | P07470562 | BACK GEAR 26T |
| 563 | P07470563 | BALL BEARING 6203ZZ |
| 564 | P07470564 | DOWEL PIN 8.8 X 58 |
| 565 | P07470565 | BACK GEAR SHIFTER FORK |
| 566 | P07470566 | GEAR HOUSING |
| 567 | P07470567 | DOWEL PIN |
| 568 | P07470568 | ALIGNMENT PIN |
| 569 | P07470569 | CAP SCREW M6-1 X 25 |
| 571 | P07470571 | BALL BEARING 6208ZZ |
| 572 | P07470572 | INT RETAINING RING 80MM |
| 573 | P07470573 | SPANNER NUT LOCK WASHER |
| 574 | P07470574 | SPANNER NUT |
| 575 | P07470575 | HEX NUT 7/16-14 |
| 576 | P07470576 | T-BOLT |
| 577 | P07470577 | T-BOLT FLAT WASHER 7/16" |
| 578 | P07470578 | HIGH-LOW SHIFT LEVER |
| 579 | P07470579 | ROLL PIN 3 X 20 |
| 580 | P07470580 | HIGH-LOW SHIFT BUSHING |
| 581 | P07470581 | HIGH-LOW SHIFT CRANK |
| 582 | P07470582 | ROUND PLASTIC KNOB 1/4-20 1" OD |
| 583 | P07470583 | DETENT LOCK PIN |
| 584 | P07470584 | COMPRESSION SPRING |
| 585 | P07470585 | BELT SAFETY GUARD |
| 586 | P07470586 | MOTOR 3HP 220V 3-PH AEVF 112-4/2 |
| 586-1 | P07470586-1 | MOTOR FAN COVER |
| 586-2 | P07470586-2 | MOTOR FAN |
| 586-3 | P07470586-3 | MOTOR JUNCTION BOX |
| 586-4 | P07470586-4 | BALL BEARING 6205ZZ |
| 586-5 | P07470586-5 | BALL BEARING 6205ZZ |



G0748 Headstock



G0748 Headstock Parts List

| REF | PART # | DESCRIPTION |
|-------|-------------|------------------------------------|
| 501 | P07480501 | MOTOR 3HP 220V 3-PH AEVF 112-4 |
| 501-1 | P07480501-1 | MOTOR FAN COVER |
| 501-2 | P07480501-2 | MOTOR FAN |
| 501-3 | P07480501-3 | MOTOR JUNCTION BOX |
| 501-4 | P07480501-4 | BALL BEARING 6205ZZ |
| 501-5 | P07480501-5 | BALL BEARING 6205ZZ |
| 502 | P07480502 | MOTOR MOUNT CAP SCREW 3/8-16 |
| 504 | P07480504 | BALL BEARING 6009ZZ |
| 506 | P07480506 | CAP SCREW M6-1 X 20 |
| 507 | P07480507 | SPINDLE TOP COVER |
| 508 | P07480508 | UPPER HEADSTOCK HOUSING, ALUMINUM |
| 509 | P07480509 | HOUSING SIDE COVER, PLASTIC |
| 510 | P07480510 | MOTOR FIXED PULLEY |
| 511 | P07480511 | CAP SCREW M8-1.25 X 25 |
| 512 | P07480512 | VARIABLE SPEED BELT 3828 9001/Q828 |
| 513 | P07480513 | MOTOR MOVABLE PULLEY |
| 514 | P07480514 | MOTOR PULLEY SHAFT |
| 515 | P07480515 | COMPRESSION SPRING |
| 516 | P07480516 | SPRING BASE |
| 517 | P07480517 | SPRING BASE CAP SCREW |
| 518 | P07480518 | BRAKE BRACKET, ALUMINUM |
| 519 | P07480519 | CAP SCREW M6-1 X 8 |
| 520 | P07480520 | PHLP HD SCR M6-1 X 8 |
| 521 | P07480521 | BRAKE SHOE 2-PC SET |
| 523 | P07480523 | BALL BEARING 6012ZZ |
| 525 | P07480525 | LOWER SPINDLE PULLEY |
| 526 | P07480526 | UPPER SPINDLE PULLEY |
| 527 | P07480527 | EXT RETAINING RING 45MM |
| 528 | P07480528 | BALL BEARING 6012ZZ |
| 529 | P07480529 | SLIDING SLEEVE, ALUMINUM |
| 530 | P07480530 | DRAWBAR SPACER 22 X 13 X 8 |
| 531 | P07480531 | ROLL PIN 3 X 20 |
| 533 | P07480533 | SLEEVE |
| 534 | P07480534 | PLATE ADJUSTING ROD |
| 535 | P07480535 | DRAWBAR 7/16"-20 X 23-1/2" |
| 536 | P07480536 | CHAIN PIN |
| 537 | P07480537 | ROLL PIN 4 X 16 |
| 538 | P07480538 | SPEED CHANGE PLATE |
| 539 | P07480539 | EXT RETAINING RING 50MM |
| 540 | P07480540 | PHLP HD SCR 5-40 X 1/4 |
| 541 | P07480541 | BRAKE EXTENSION SPRING |
| 543 | P07480543 | HEX BOLT M8-1.25 X 20 |
| 545 | P07480545 | E-CLIP 13MM |
| 546 | P07480546 | BRAKE PIVOT ARM 2-PC SET |
| 547 | P07480547 | BRAKE PIVOT ROD |
| 548 | P07480548 | CAP SCREW M6-1 X 6 |
| 549 | P07480549 | TAPERED KNOB 3/8-16 |
| 550 | P07480550 | BRAKE LEVER |
| 551 | P07480551 | HEX NUT 3/8-16 |
| 552 | P07480552 | CAP SCREW M6-1 X 25 |

| REF | PART # | DESCRIPTION |
|-----|-----------|-------------------------------|
| 554 | P07480554 | BRAKE SHAFT SLEEVE |
| 555 | P07480555 | BRAKE SHAFT |
| 556 | P07480556 | CAP SCREW M6-1 X 16 |
| 557 | P07480557 | PULLEY COVER |
| 558 | P07480558 | TIMING BELT PULLEY |
| 559 | P07480559 | HEX NUT 5/8-11 |
| 560 | P07480560 | TIMING BELT 225L |
| 561 | P07480561 | BEARING HOUSING |
| 562 | P07480562 | BALL BEARING 6203ZZ |
| 563 | P07480563 | PINION GEAR |
| 564 | P07480564 | KEY 4 X 4 X 15 |
| 565 | P07480565 | TIMING BELT CLUTCH |
| 566 | P07480566 | PINION SHAFT |
| 567 | P07480567 | HEADSTOCK BOTTOM COVER |
| 568 | P07480568 | BULL GEAR SEAT |
| 570 | P07480570 | BEARING SLEEVE |
| 571 | P07480571 | SPACER |
| 572 | P07480572 | BEARING SLEEVE |
| 573 | P07480573 | THRUST WASHER |
| 574 | P07480574 | SPINDLE TIMING PULLEY |
| 575 | P07480575 | CLUTCH |
| 576 | P07480576 | CLUTCH SHAFT SLEEVE RING |
| 577 | P07480577 | SPINDLE SHAFT |
| 578 | P07480578 | SPACER |
| 579 | P07480579 | KEY 5 X 5 X 20 |
| 580 | P07480580 | KEY 8 X 8 X 12 |
| 582 | P07480582 | BEARING HOUSING |
| 583 | P07480583 | CLUTCH GEAR SHAFT |
| 584 | P07480584 | SPEED RANGE POSITIONING PLATE |
| 585 | P07480585 | CAP SCREW M5-.8 X 12 |
| 587 | P07480587 | PIVOT ARM |
| 588 | P07480588 | ROLL PIN 6 X 20 |
| 589 | P07480589 | ROUND PLASTIC KNOB 1/4"-20 |
| 590 | P07480590 | SPRING STUD 1/4"-20 X 3/4" |
| 591 | P07480591 | COMPRESSION SPRING |
| 592 | P07480592 | SPEED RANGE POSITIONING PIN |
| 593 | P07480593 | HANDWHEEL HANDLE |
| 594 | P07480594 | SPEED HANDWHEEL INFO PLATE |
| 595 | P07480595 | HANDWHEEL |
| 596 | P07480596 | SET SCREW M6-1 X 6 |
| 597 | P07480597 | BRASS SLEEVE |
| 598 | P07480598 | SPEED CHANGE SHAFT |
| 599 | P07480599 | ROLL PIN 3 X 12 |
| 600 | P07480600 | WORM |
| 601 | P07480601 | ROLL PIN 5 X 8 |
| 602 | P07480602 | CHAIN SHAFT |
| 604 | P07480604 | CHAIN |
| 605 | P07480605 | CHAIN MASTER LINK |
| 606 | P07480606 | MASTER LINK PIN |
| 607 | P07480607 | WORM GEAR |



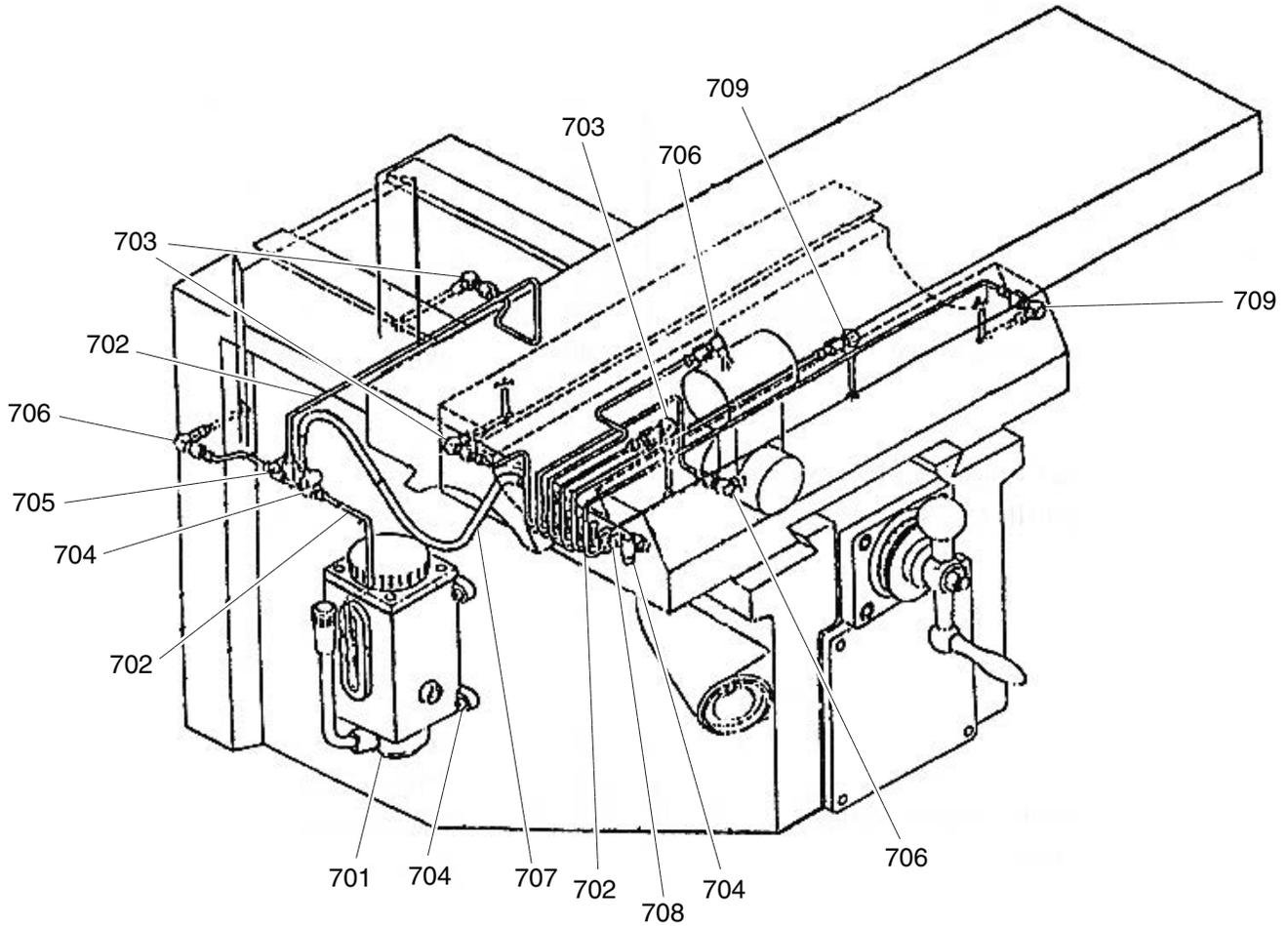
G0748 Headstock Parts List

| REF | PART # | DESCRIPTION |
|-----|-----------|---------------------------------|
| 609 | P07480609 | HEADSTOCK FRONT COVER, ALUMINUM |
| 610 | P07480610 | CAP SCREW M6-1 X 30 |
| 611 | P07480611 | CAP SCREW M6-1 X 16 |
| 612 | P07480612 | BRASS SLEEVE |
| 613 | P07480613 | SPEED CHANGE DIAL |

| REF | PART # | DESCRIPTION |
|-----|-----------|------------------------------|
| 614 | P07480614 | SPEED CHANGE INDICATOR PLATE |
| 615 | P07480615 | CAP SCREW M6-1 X 12 |
| 616 | P07480616 | ACORN NUT 5/16-18 |
| 617 | P07480617 | BRAKE PIVOT ARM |



One-Shot Oiler

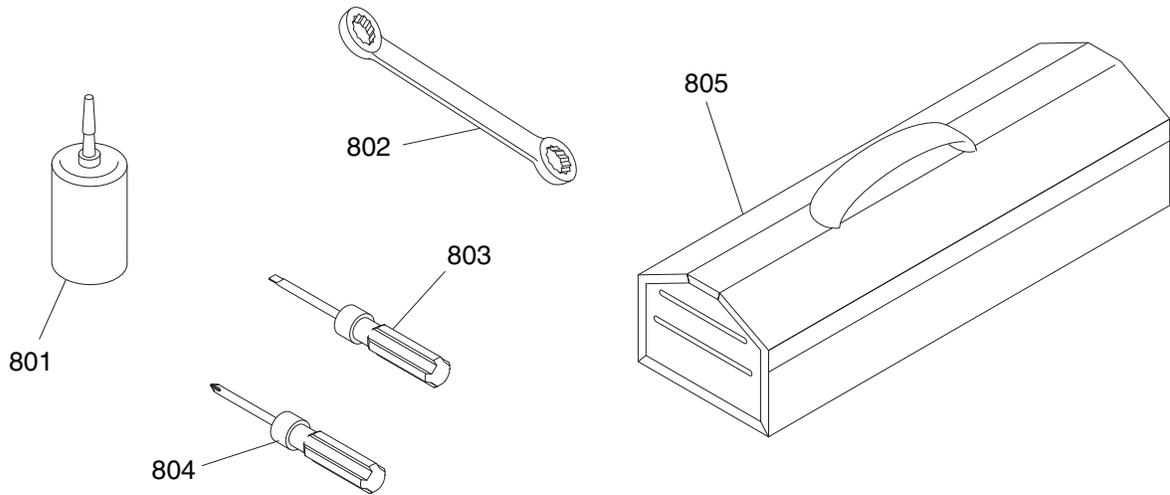


| REF | PART # | DESCRIPTION |
|-----|-----------|----------------------------|
| 701 | P07470701 | OILER PUMP AND RESERVOIR |
| 702 | P07470702 | ALUMINUM PIPE 4MM |
| 703 | P07470703 | ELBOW OIL DISTRIBUTOR CPS4 |
| 704 | P07470704 | CAP SCREW M6-1 X 20 |
| 705 | P07470705 | A-TYPE OIL DISTRIBUTOR A4 |

| REF | PART # | DESCRIPTION |
|-----|-----------|----------------------------|
| 706 | P07470706 | ELBOW OIL DISTRIBUTOR CPS3 |
| 707 | P07470707 | FLEXIBLE STEEL TUBE |
| 708 | P07470708 | A-TYPE OIL DISTRIBUTOR A8 |
| 709 | P07470709 | ELBOW OIL DISTRIBUTOR CPS5 |



Accessories

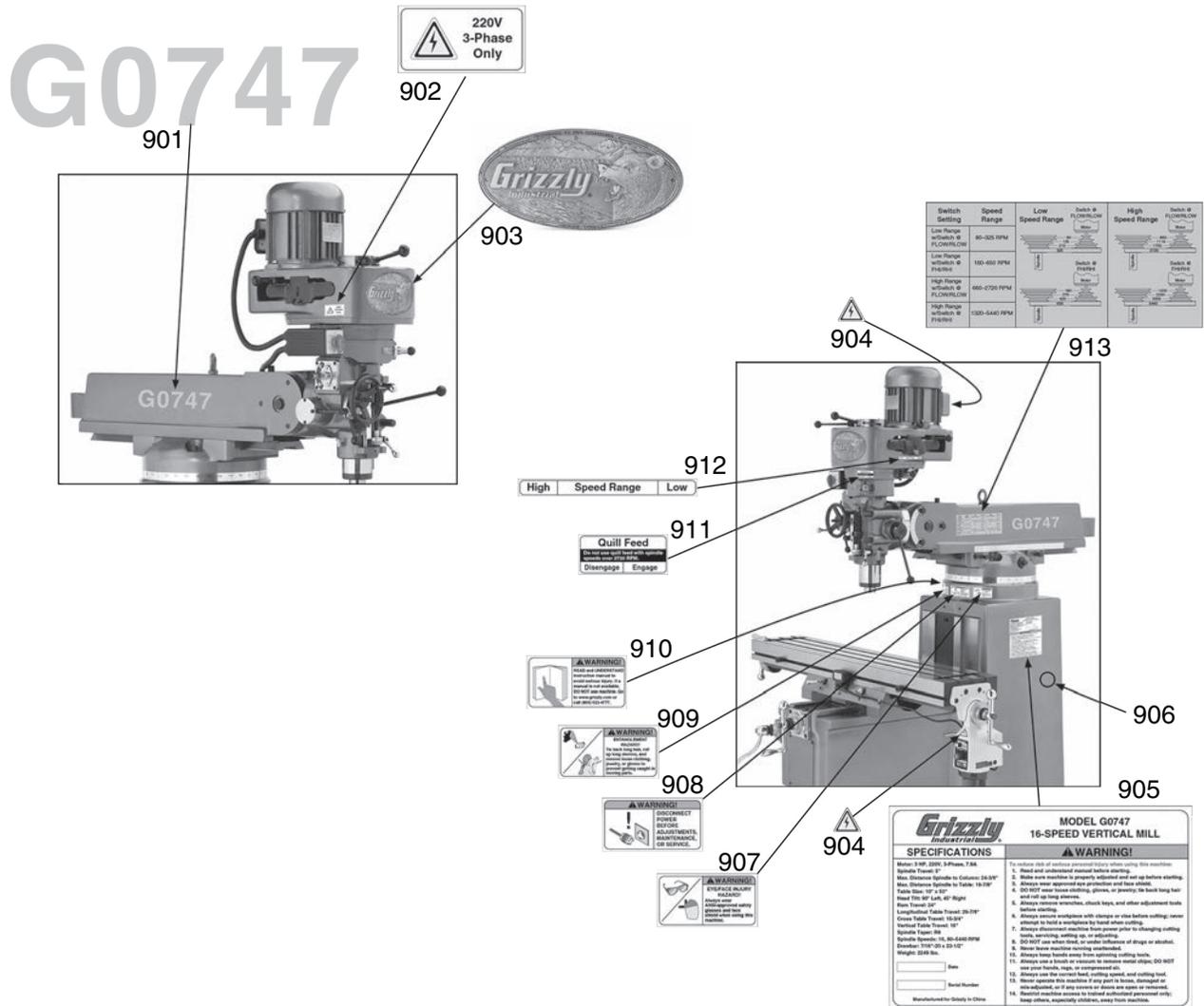


| REF | PART # | DESCRIPTION |
|-----|-----------|------------------------------|
| 801 | P07470801 | BOTTLE FOR OIL |
| 802 | P07470802 | WRENCH 17 X 19MM CLOSED ENDS |
| 803 | P07470803 | STANDARD SCREWDRIVER #2 |

| REF | PART # | DESCRIPTION |
|-----|-----------|-------------------------|
| 804 | P07470804 | PHILLIPS SCREWDRIVER #2 |
| 805 | P07470805 | TOOLBOX |



G0747 Machine Labels & Cosmetics



| REF | PART # | DESCRIPTION |
|-----|-----------|--------------------------------|
| 901 | P07470901 | MODEL NUMBER LABEL |
| 902 | P07470902 | 220V 3-PHASE ELECTRICITY LABEL |
| 903 | P07470903 | SMALL GRIZZLY NAMEPLATE |
| 904 | P07470904 | ELECTRICITY LABEL |
| 905 | P07470905 | MACHINE ID LABEL |
| 906 | P07470906 | GRIZZLY GREEN TOUCH-UP PAINT |
| 907 | P07470907 | GOGGLES/FACE SHIELD LABEL |

| REF | PART # | DESCRIPTION |
|-----|-----------|-----------------------|
| 908 | P07470908 | 220V DISCONNECT LABEL |
| 909 | P07470909 | ENTANGLEMENT LABEL |
| 910 | P07470910 | READ MANUAL LABEL |
| 911 | P07470911 | QUILL FEED LABEL |
| 912 | P07470912 | SPEED RANGE LABEL |
| 913 | P07470913 | SPINDLE SPEED LABEL |

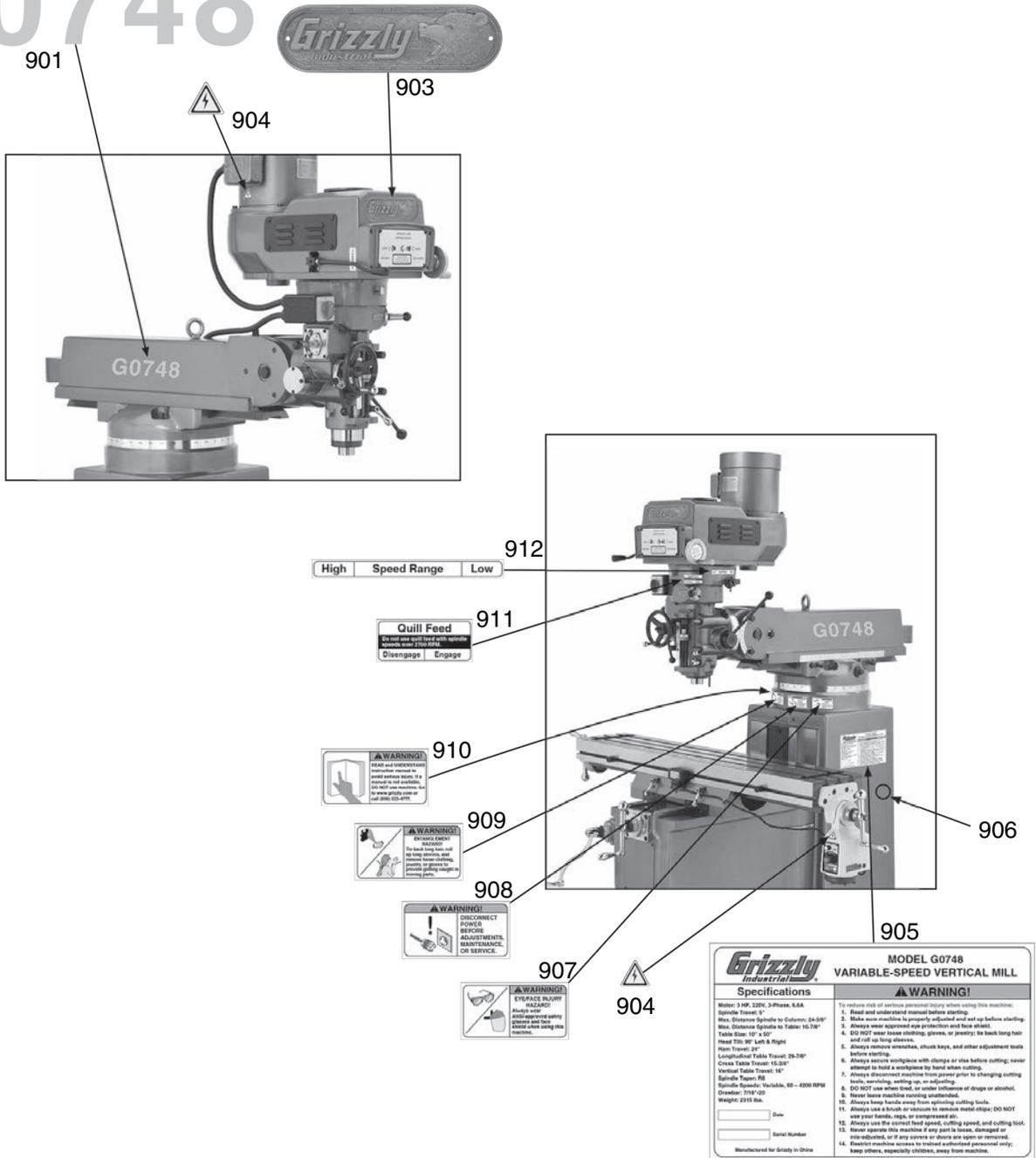
⚠️ WARNING

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.



G0748 Machine Labels & Cosmetics

G0748



| REF | PART # | DESCRIPTION |
|-----|-----------|--------------------------------|
| 901 | P07480901 | MODEL NUMBER LABEL |
| 903 | P07480903 | SMALL OBLONG GRIZZLY NAMEPLATE |
| 904 | P07480904 | ELECTRICITY LABEL |
| 905 | P07480905 | MACHINE ID LABEL |
| 906 | P07480906 | GRIZZLY GREEN TOUCH-UP PAINT |
| 907 | P07480907 | GOGGLES/FACE SHIELD LABEL |

| REF | PART # | DESCRIPTION |
|-----|-----------|-----------------------|
| 908 | P07480908 | 220V DISCONNECT LABEL |
| 909 | P07480909 | ENTANGLEMENT LABEL |
| 910 | P07480910 | READ MANUAL LABEL |
| 911 | P07480911 | QUILL FEED LABEL |
| 912 | P07480912 | SPEED RANGE LABEL |







WARRANTY CARD

Name _____
 Street _____
 City _____ State _____ Zip _____
 Phone # _____ Email _____
 Model # _____ Order # _____ Serial # _____

The following information is given on a voluntary basis. It will be used for marketing purposes to help us develop better products and services. **Of course, all information is strictly confidential.**

- How did you learn about us?

| | | |
|----------------------------------------|----------------------------------|----------------------------------|
| <input type="checkbox"/> Advertisement | <input type="checkbox"/> Friend | <input type="checkbox"/> Catalog |
| <input type="checkbox"/> Card Deck | <input type="checkbox"/> Website | <input type="checkbox"/> Other: |
- Which of the following magazines do you subscribe to?

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

| | | |
|--------------------------------------------|--------------------------------------------|--------------------------------------------|
| <input type="checkbox"/> \$20,000-\$29,000 | <input type="checkbox"/> \$30,000-\$39,000 | <input type="checkbox"/> \$40,000-\$49,000 |
| <input type="checkbox"/> \$50,000-\$59,000 | <input type="checkbox"/> \$60,000-\$69,000 | <input type="checkbox"/> \$70,000+ |
- What is your age group?

| | | |
|--------------------------------|--------------------------------|--------------------------------|
| <input type="checkbox"/> 20-29 | <input type="checkbox"/> 30-39 | <input type="checkbox"/> 40-49 |
| <input type="checkbox"/> 50-59 | <input type="checkbox"/> 60-69 | <input type="checkbox"/> 70+ |
- How long have you been a woodworker/metalworker?

| | | | |
|------------------------------------|------------------------------------|-------------------------------------|------------------------------------|
| <input type="checkbox"/> 0-2 Years | <input type="checkbox"/> 2-8 Years | <input type="checkbox"/> 8-20 Years | <input type="checkbox"/> 20+ Years |
|------------------------------------|------------------------------------|-------------------------------------|------------------------------------|
- How many of your machines or tools are Grizzly?

| | | | |
|------------------------------|------------------------------|------------------------------|------------------------------|
| <input type="checkbox"/> 0-2 | <input type="checkbox"/> 3-5 | <input type="checkbox"/> 6-9 | <input type="checkbox"/> 10+ |
|------------------------------|------------------------------|------------------------------|------------------------------|
- Do you think your machine represents a good value? Yes No
- Would you recommend Grizzly Industrial to a friend? Yes No
- Would you allow us to use your name as a reference for Grizzly customers in your area?
Note: We never use names more than 3 times. Yes No

10. Comments: _____

CUT ALONG DOTTED LINE

FOLD ALONG DOTTED LINE



Place Stamp Here



GRIZZLY INDUSTRIAL, INC.
P.O. BOX 2069
BELLINGHAM, WA 98227-2069



FOLD ALONG DOTTED LINE

Send a Grizzly Catalog to a friend:

Name _____
Street _____
City _____ State _____ Zip _____

TAPE ALONG EDGES--PLEASE DO NOT STAPLE

WARRANTY & RETURNS

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

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

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

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

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

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

grizzly.com[®]

TOOL WEBSITE

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