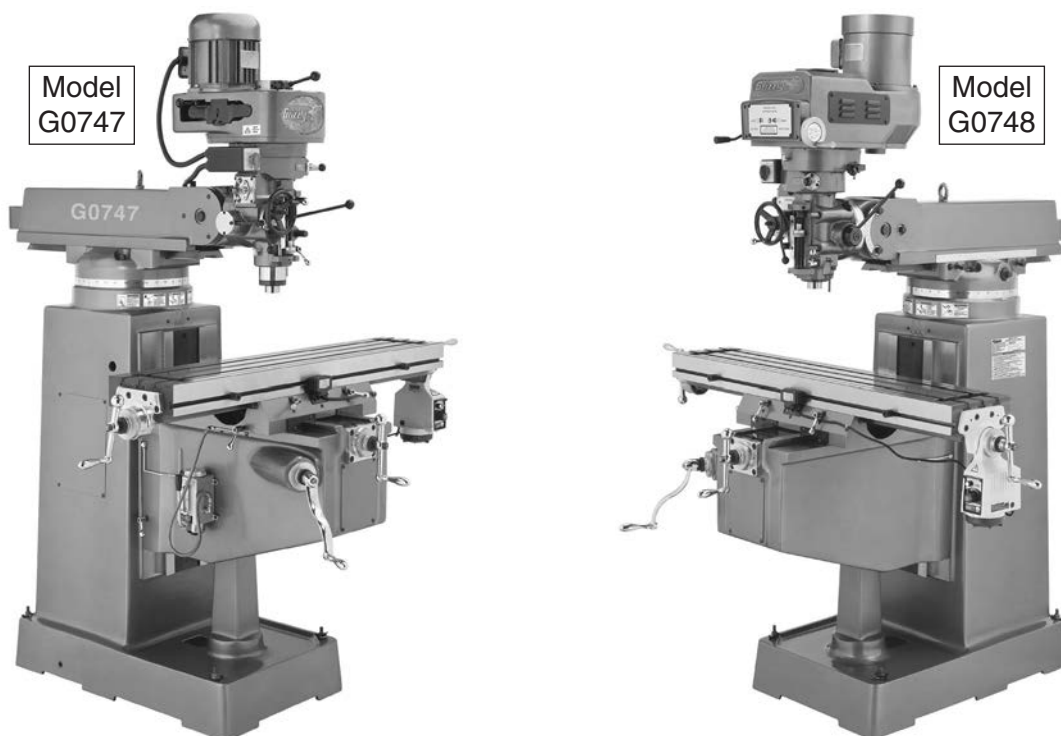


Grizzly ***Industrial, Inc.***®

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 any questions or need help, use the information below to contact us. Before contacting, please get the serial number and manufacture date of your machine. This will help us help you faster.

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

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

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


Manual Accuracy

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

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

If you find this to be the case, and the difference between the manual and machine leaves you confused about a procedure, 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, please write down the **Manufacture Date** and **Serial Number** stamped into the machine ID label (see below). This information helps us determine if updated documentation is available for your machine.

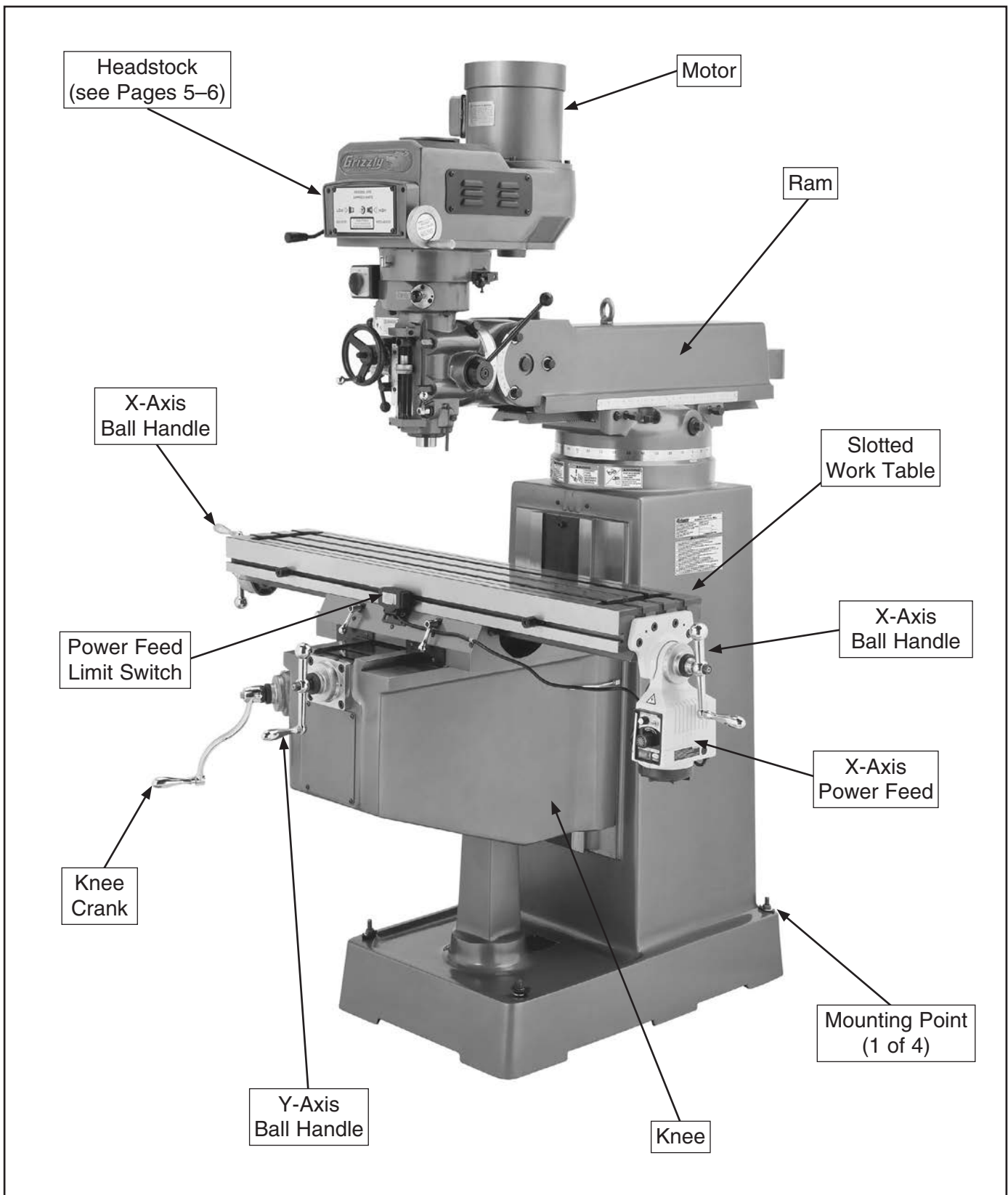
		MODEL GXXXX	
		MACHINE NAME	
SPECIFICATIONS		WARNING!	
Motor:		To reduce risk of serious injury when using this machine:	
Specification:		1. Read manual before operation.	
Specification:		2. Wear safety glasses and respirator.	
Specification:		3. Ensure safety is correctly adjusted/setup and	
Weight:		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 []

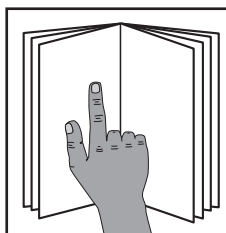
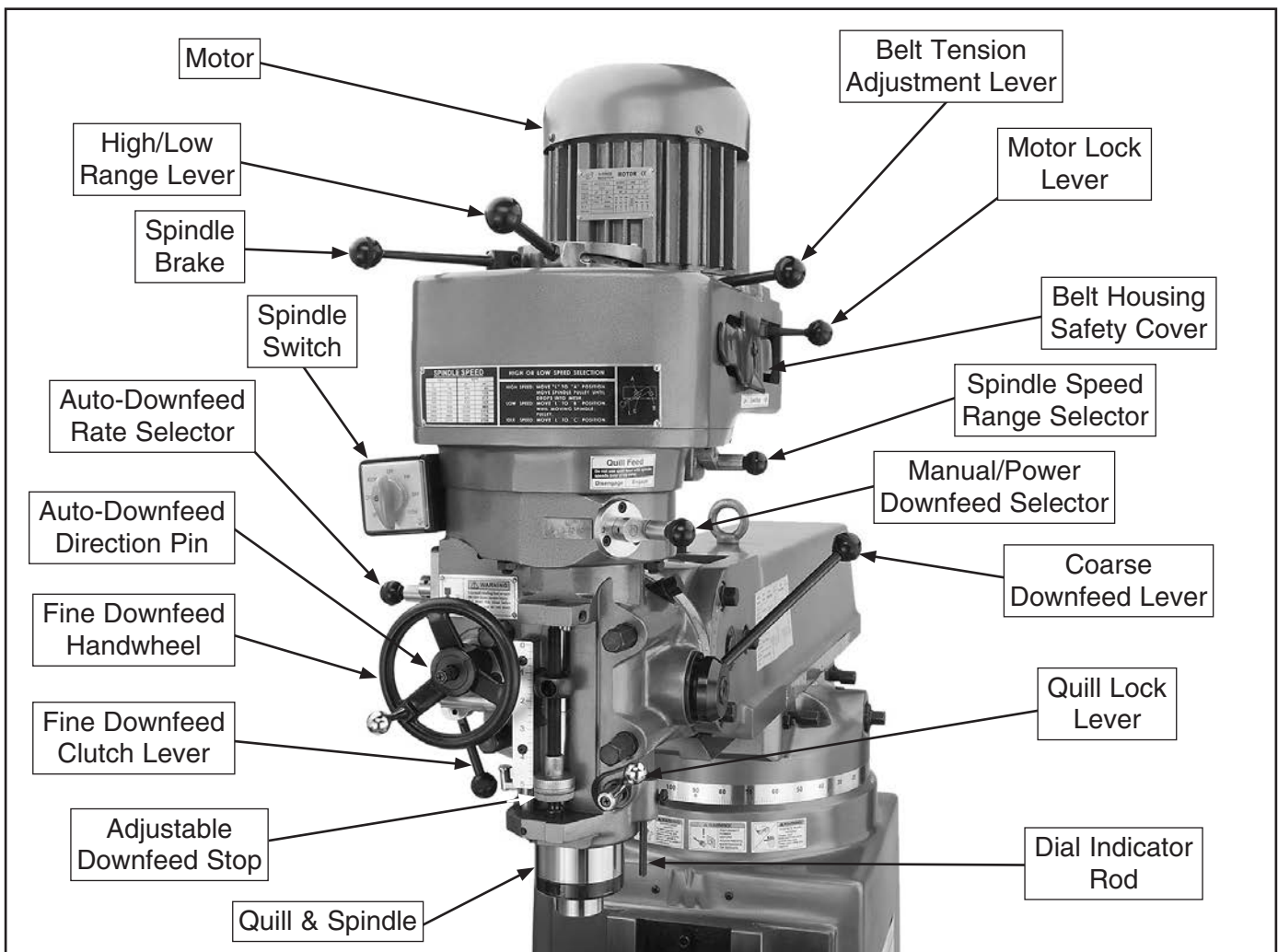
Serial Number []



Front View Identification



Model G0747 Headstock Identification

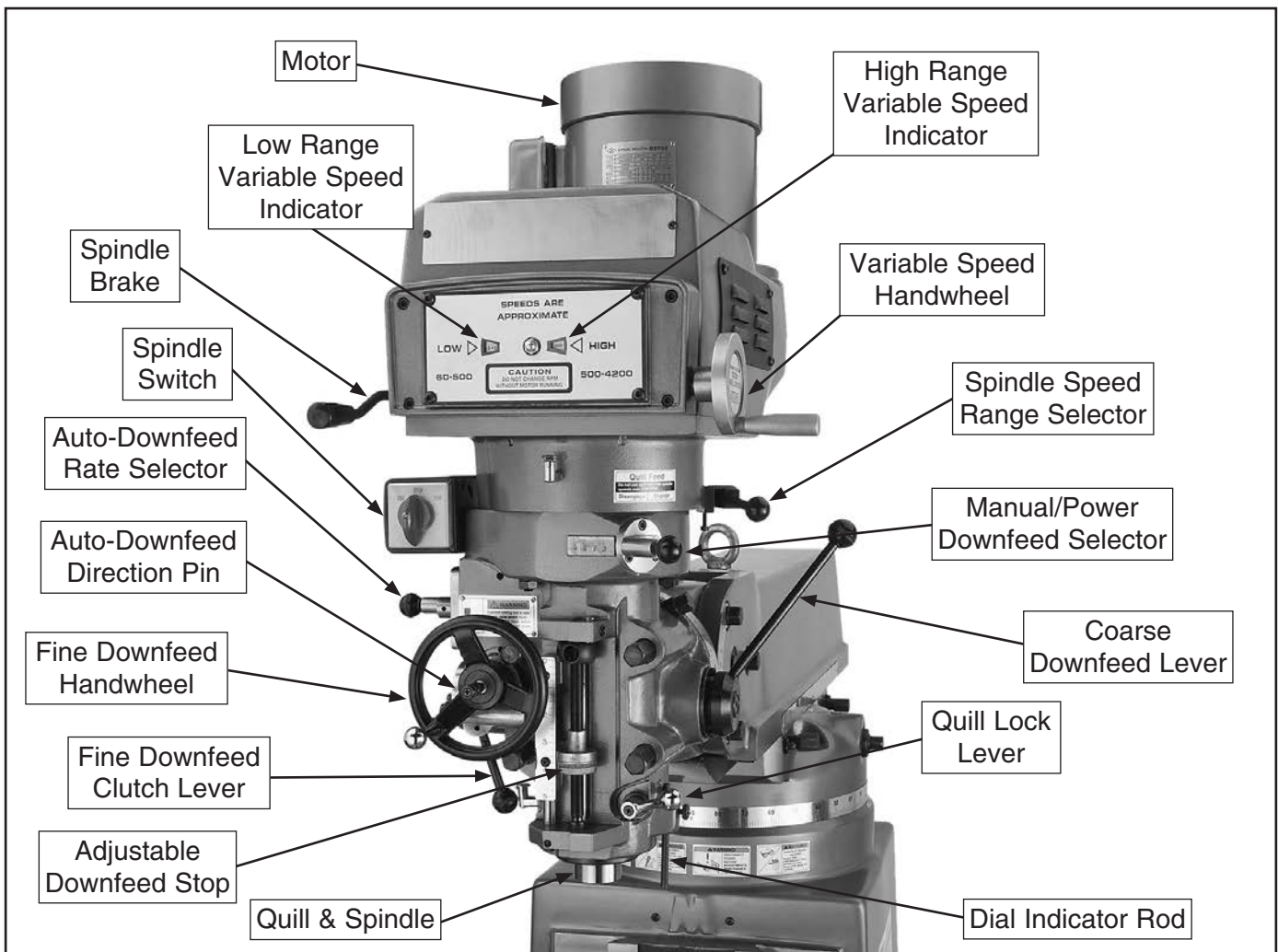


⚠ WARNING

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..... AEVF 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.....	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
CSA Certified	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..... AEVF 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.
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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.

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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.....	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
CSA Certified	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.



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



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



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

NOTICE

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

Safety Instructions for Machinery



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

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

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

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

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

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

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



WARNING

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

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

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

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

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.

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

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

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

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

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

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

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

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

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



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

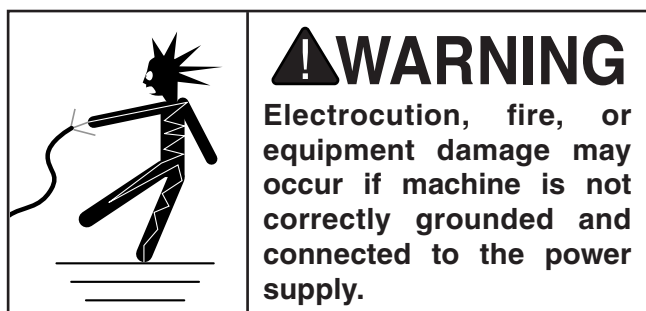
No list of safety guidelines can be complete. Every shop environment is different. Always consider safety first, as it applies to your individual working conditions. Use this and other machinery with caution and respect. Failure to do so could result in serious personal injury, damage to equipment, or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

Circuit Requirements for 220V

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

Nominal Voltage 220V/240V
Cycle 60 Hz
Phase 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.)

! CAUTION

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

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



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).

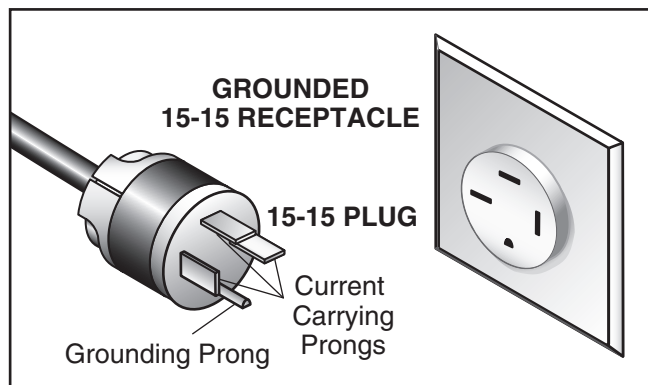
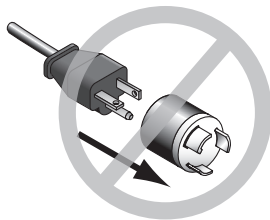


Figure 1. Typical 15-15 plug and receptacle.

!WARNING

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

!CAUTION



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

!WARNING

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

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

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

Extension Cords

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

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

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

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



SECTION 3: SETUP

Unpacking

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

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

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



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

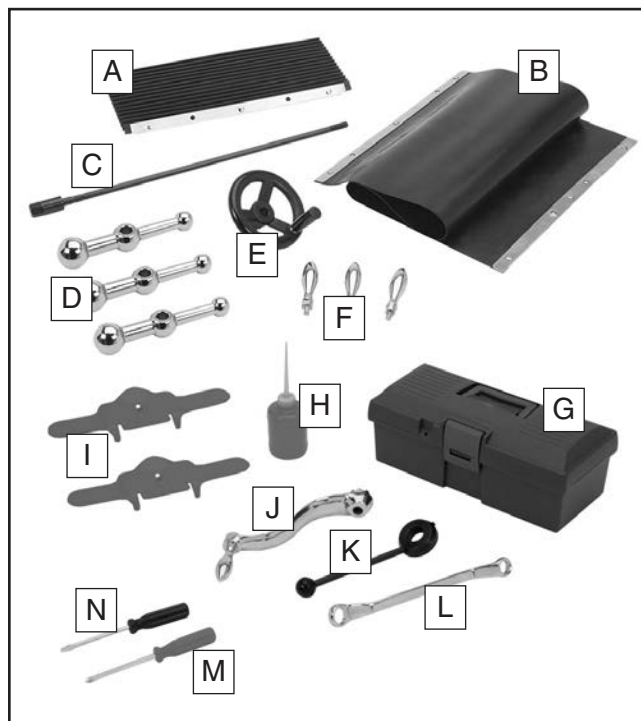


Figure 2. Small item inventory.

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.

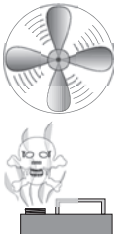
Before cleaning, gather the following:

- 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.

	! WARNING Gasoline or products with low flash points can explode or cause fire if used to clean machinery. Avoid cleaning with these products.
--	--

	! CAUTION Many cleaning solvents are toxic if concentrated amounts are inhaled. Only work in a well-ventilated area.
--	--

NOTICE Avoid chlorine-based solvents, such as acetone or brake parts cleaner, that may damage painted surfaces. Test all cleaners in an inconspicuous area before using to make sure they will not damage paint.
--

T23692—Orange Power Degreaser

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

<p>Call 1-800-523-4777 To Order</p>	
--	---

Figure 3. T23692 Orange Power Degreaser.



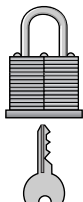
Site Considerations

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 access to a means of disconnecting the power source or engaging a lockout/tagout device, if required.

Lighting

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

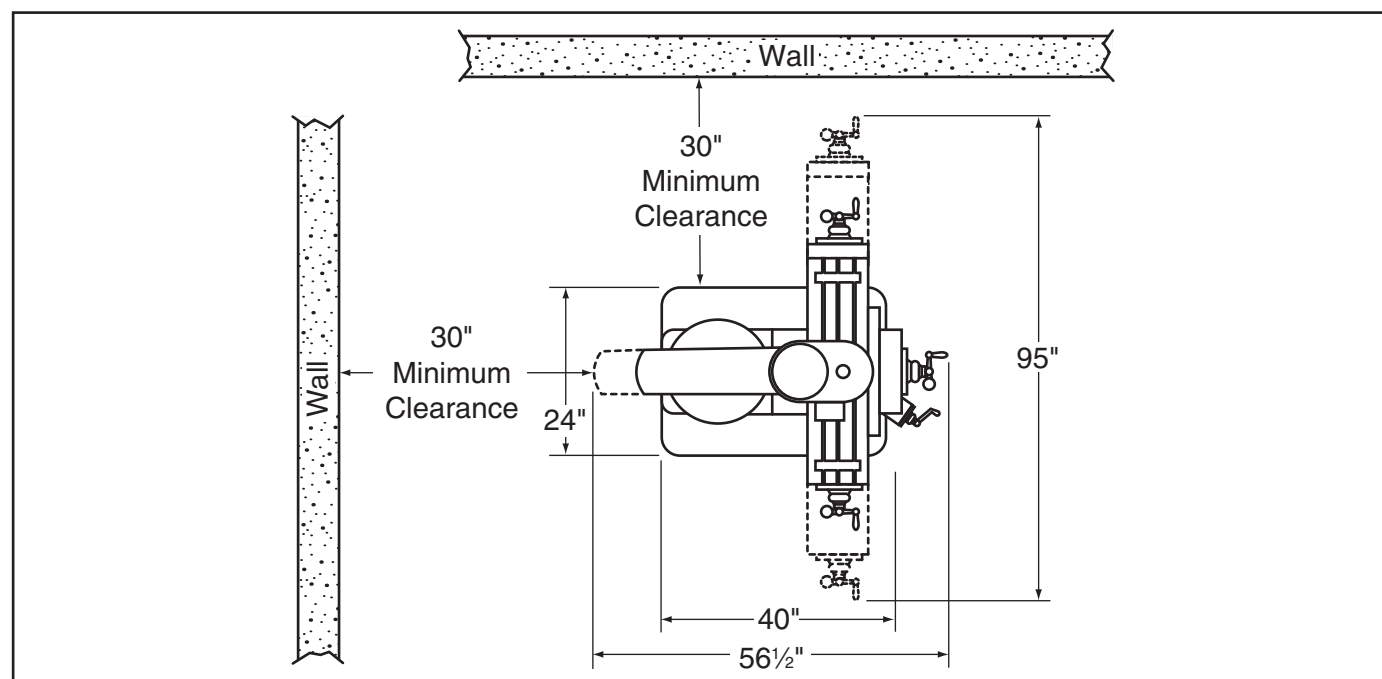
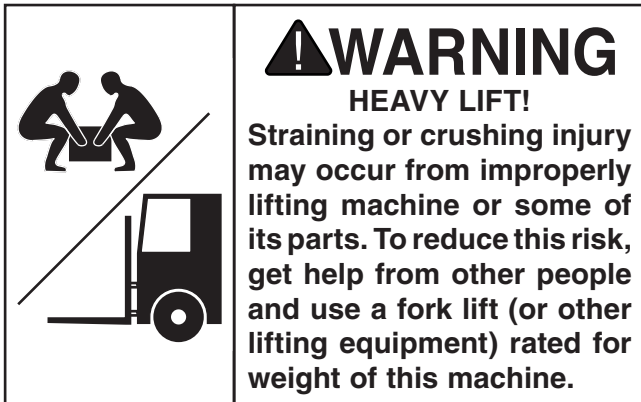


Figure 4. Minimum working clearances.



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.

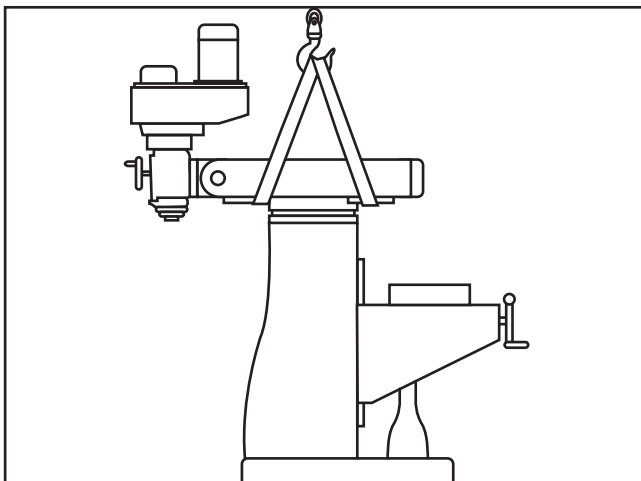


Figure 5. Illustrated example of using lifting to move the mill.

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.

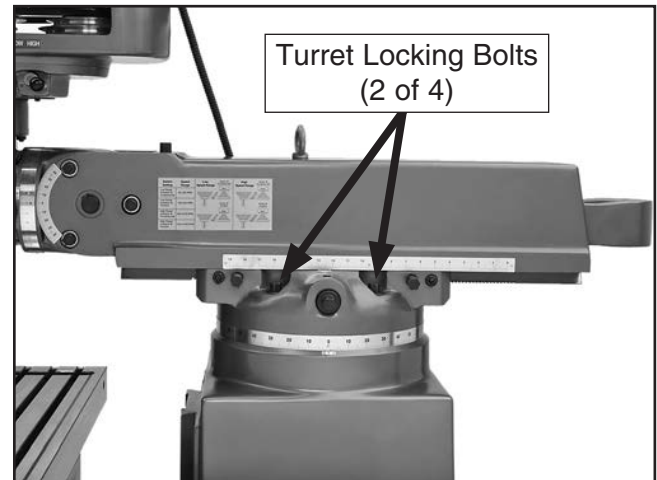


Figure 6. Locations of turret locking bolts.

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.

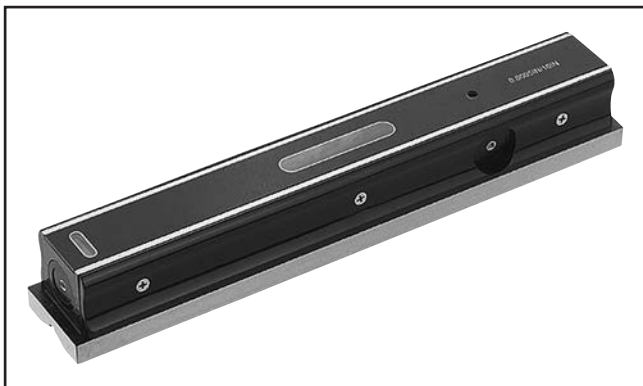


Figure 7. Example of a precision level (Model H2683 shown).

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

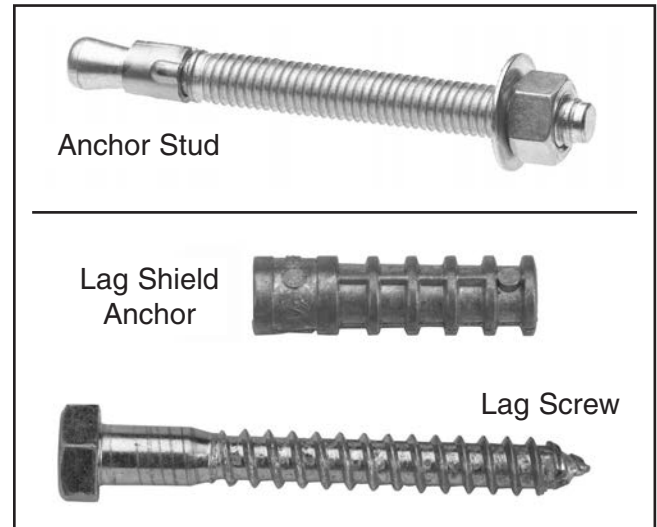


Figure 8. Typical fasteners for mounting to concrete floors.

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.

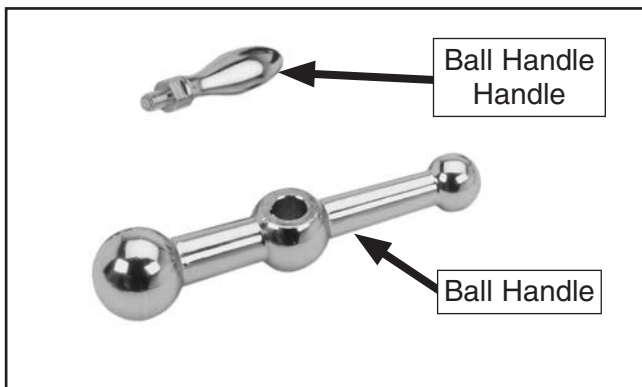


Figure 10. Ball handle assemblies.

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**.

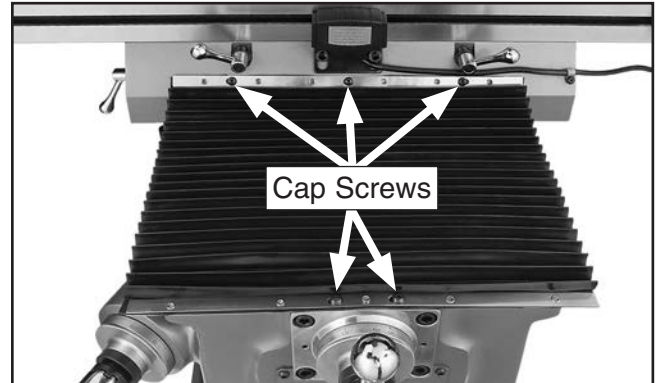


Figure 12. Front way cover installed.

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

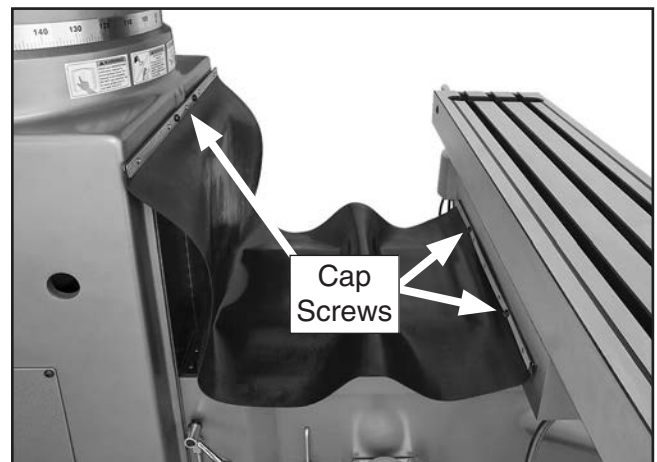


Figure 13. Rear way cover installed.

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.

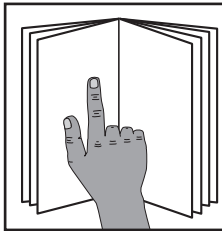


SECTION 4: OPERATIONS

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 and seek additional training from experienced machine operators, and do additional research outside of this manual by reading "how-to" books, trade magazines, or websites.



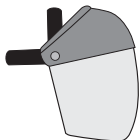
WARNING

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



WARNING

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



NOTICE

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

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

1. 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.

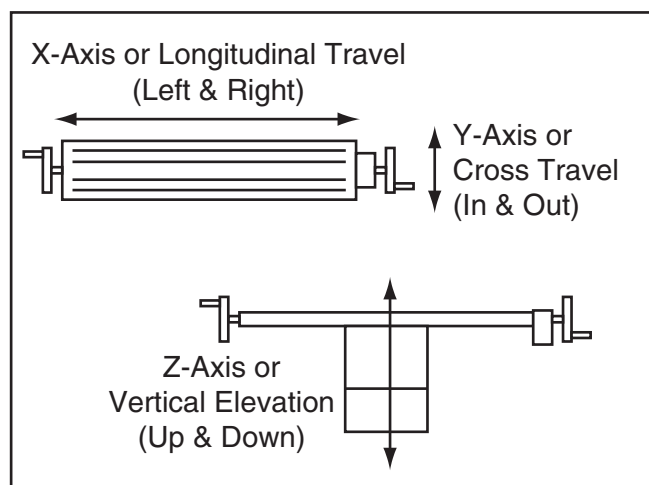


Figure 16. The directions of table movement.

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"

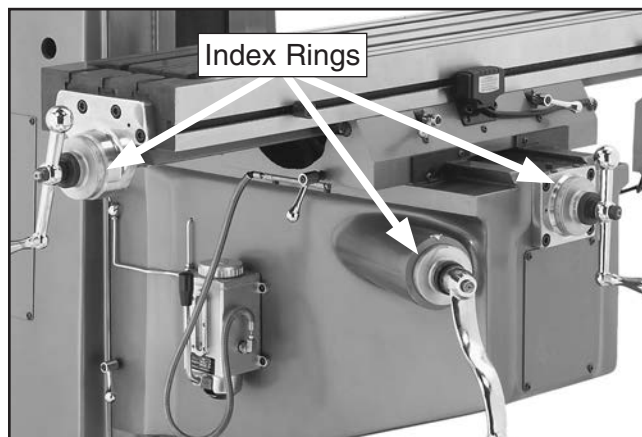


Figure 17. Locations of index rings.

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.

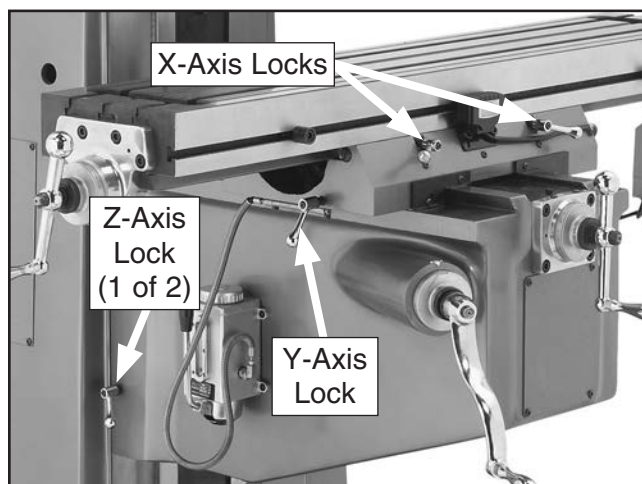


Figure 18. Locations of table locks for each axis.

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.

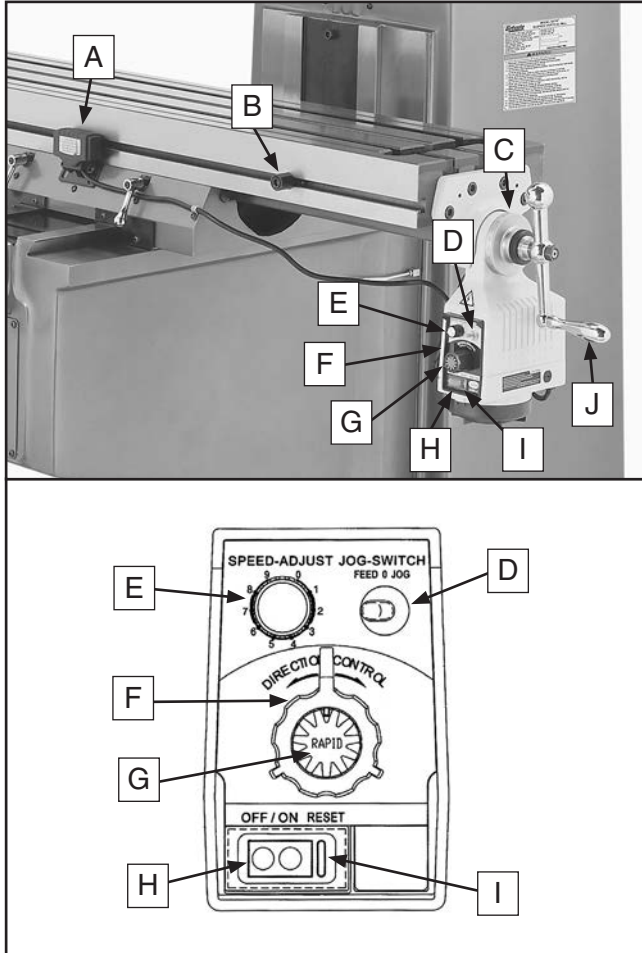


Figure 19. Power feed controls.

- 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**).

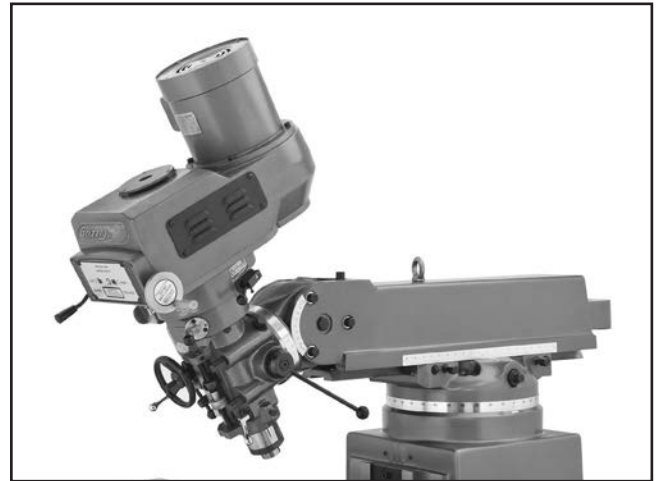


Figure 20. Head tilted 45° forward.



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**.

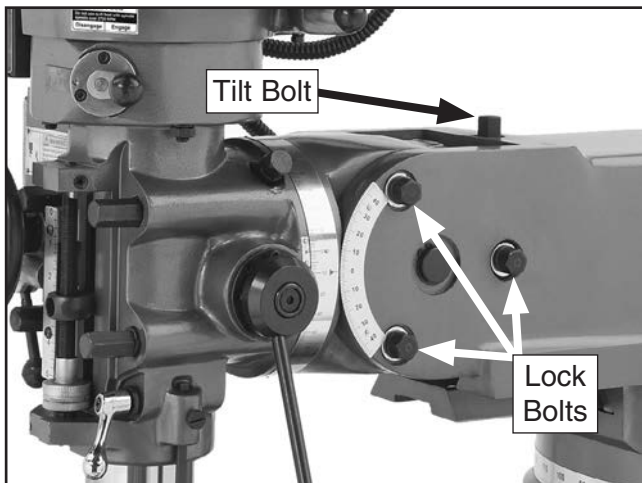


Figure 22. Head tilt controls.

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**.

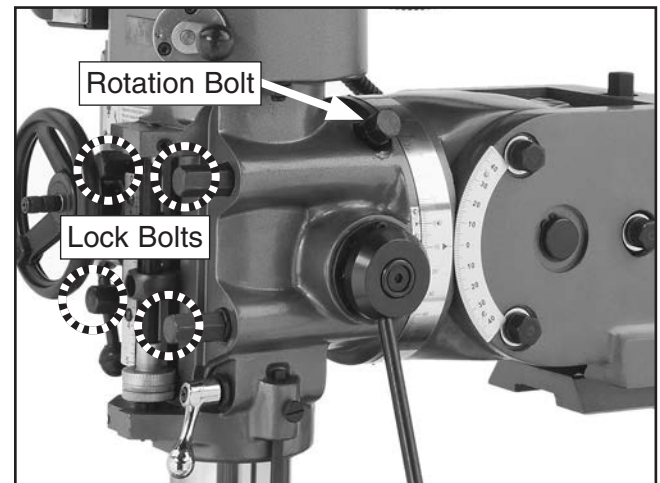


Figure 23. Head rotation controls.

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**.

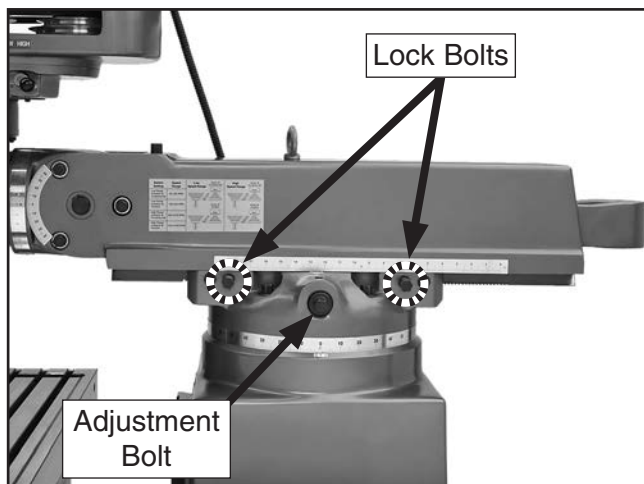


Figure 24. Ram forward/backward movement controls.

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.

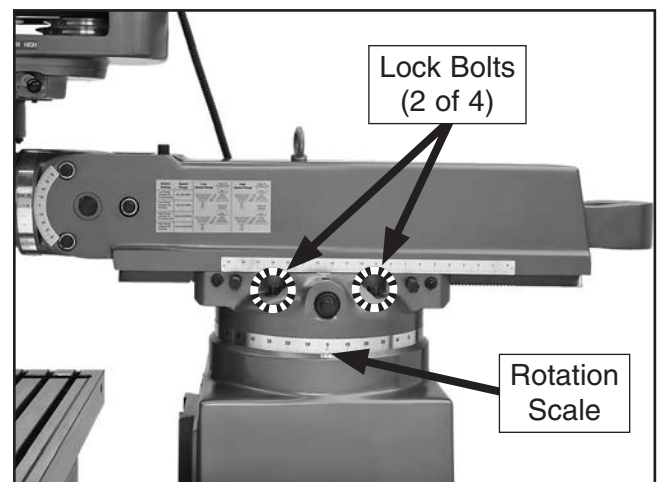


Figure 25. Ram rotational controls.

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.

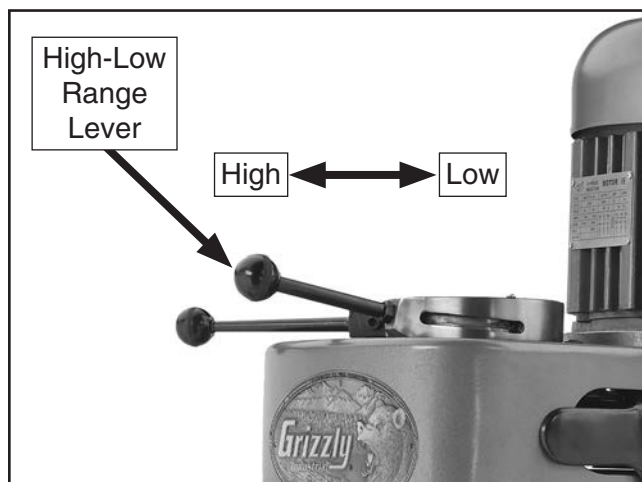


Figure 28. Model G0747 high-low range lever.

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**.

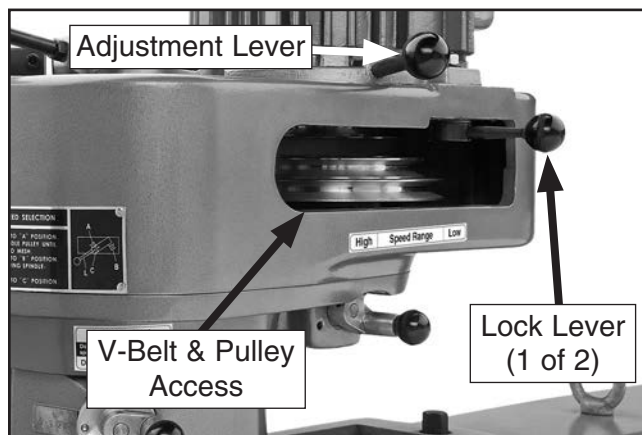


Figure 29. Model G0747 V-belt and pulleys exposed.



6. 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.
7. 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.

8. 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.
9. 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.

10. 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

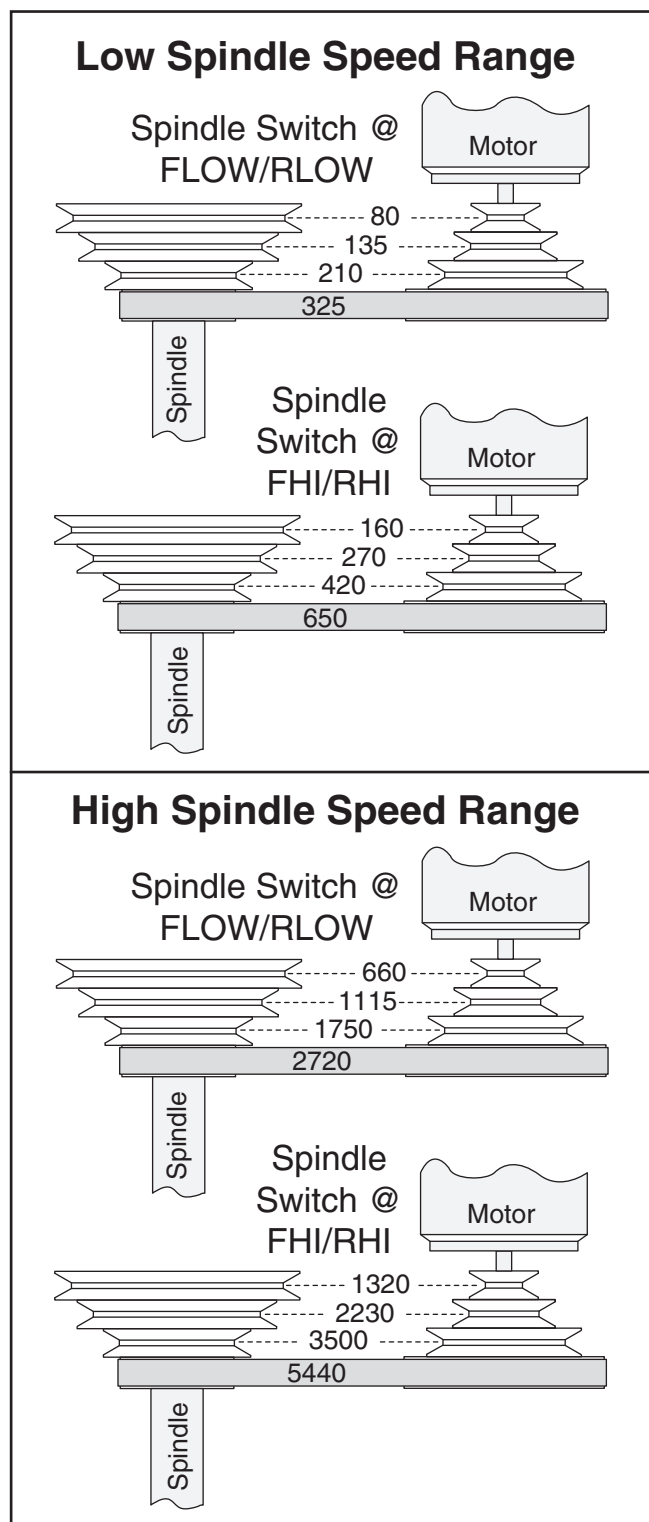


Figure 30. Model G0747 V-belt positions.



Figure 31. Model G0747 spindle switch.



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.

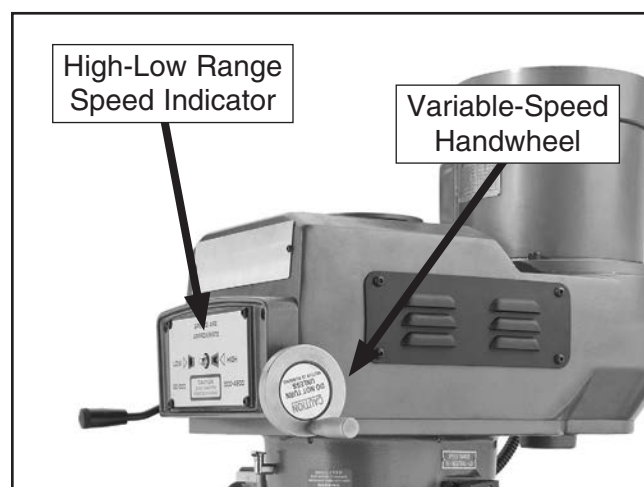


Figure 33. Model G0748 variable-speed controls.



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.

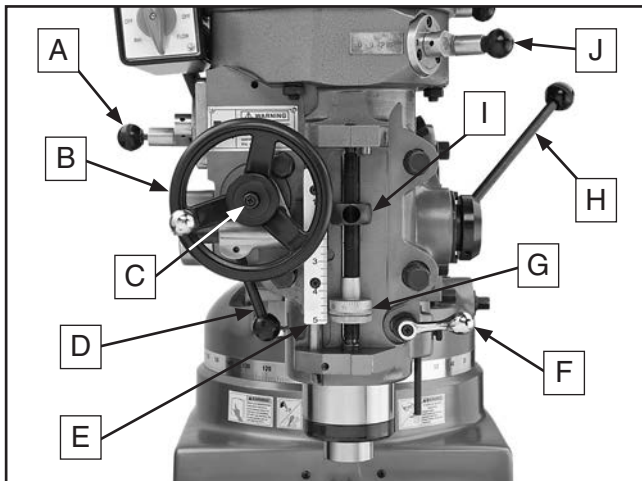


Figure 34. Downfeed controls.

- 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.

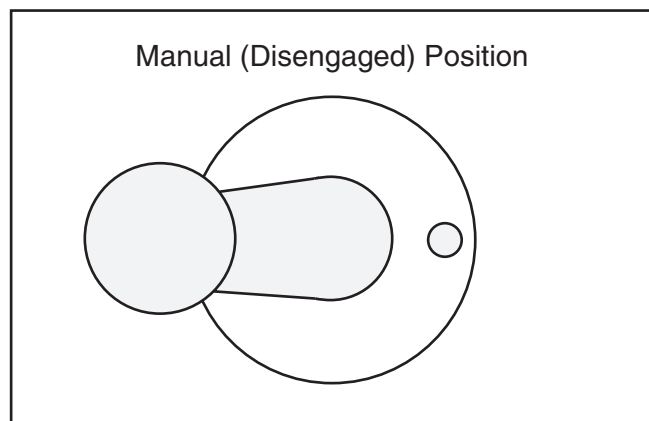


Figure 35. Downfeed selector in manual (disengaged) position.

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**).

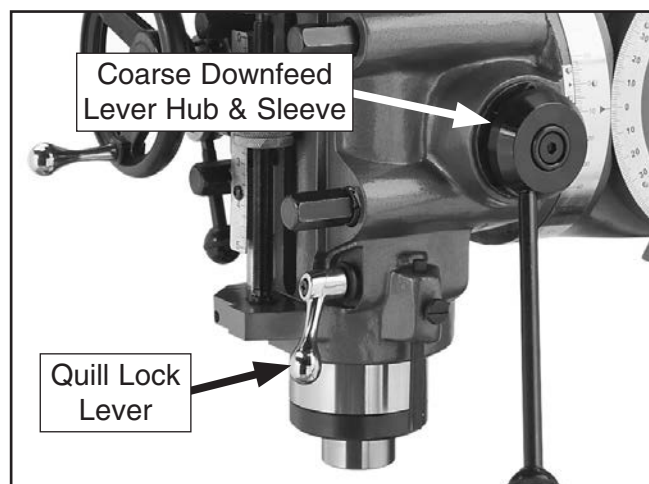


Figure 36. Coarse downfeed lever hub, downfeed sleeve, and quill lock.

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.

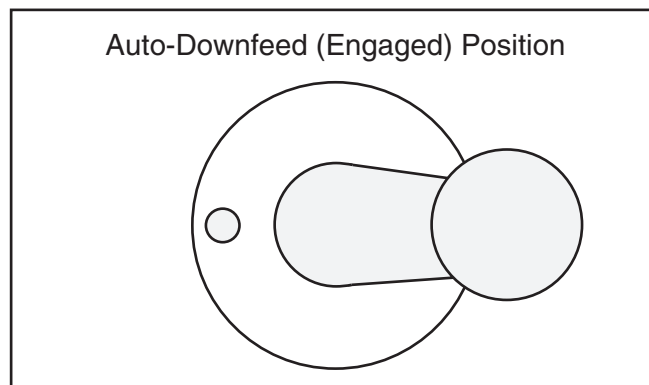


Figure 37. Downfeed selector in auto-downfeed (engaged) position.

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.

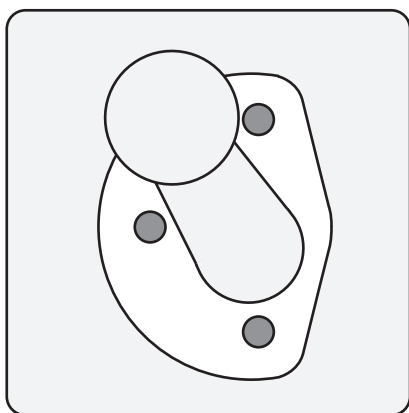


NOTICE

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**.

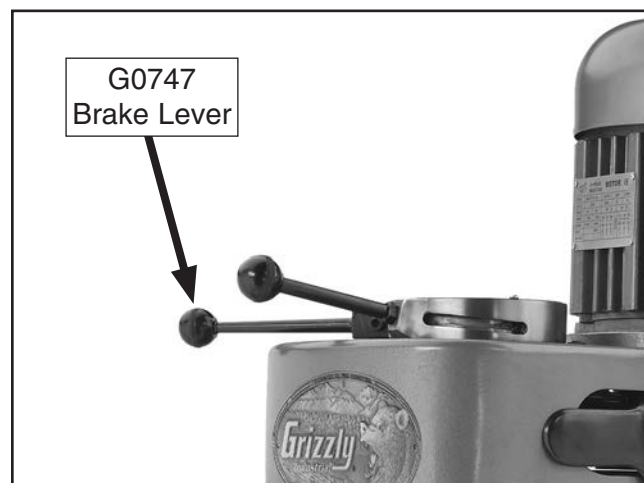


Figure 39. Model G0747 brake lever.



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 $\frac{7}{16}$ "-20 x $23\frac{1}{2}$ " 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**).

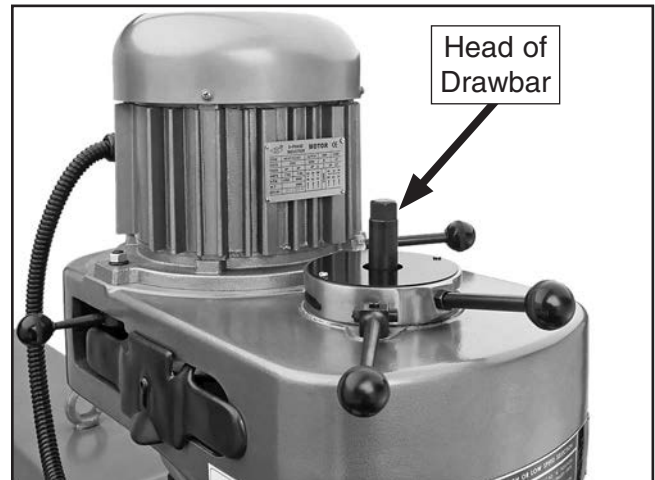


Figure 42. Drawbar loaded (Model G0747 shown).

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

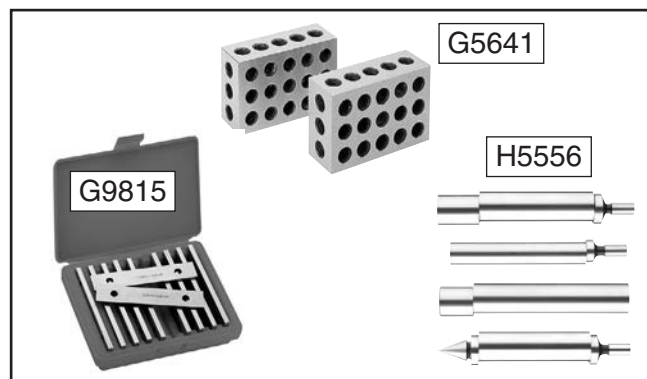


Figure 43. G5641 1-2-3 Blocks, G9815 Parallel Set, and H5556 Edge Finder Set.

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.

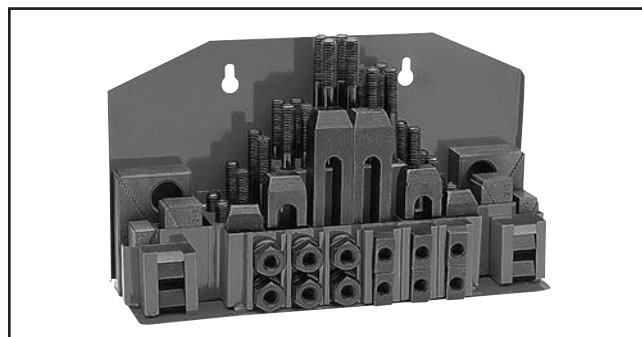


Figure 45. G1076 52-PC. Clamping Kit.

**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.

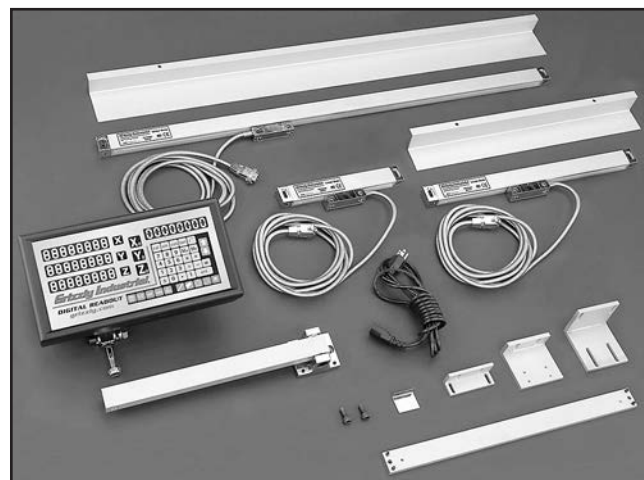


Figure 46. 3 Axis Digital Read Out.

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.

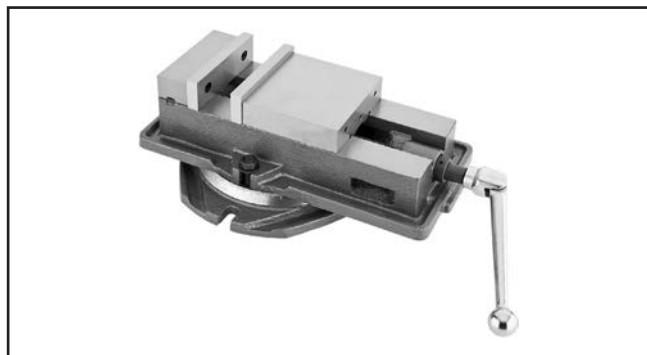


Figure 47. Model G7155 6" Precision Milling Vise.

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

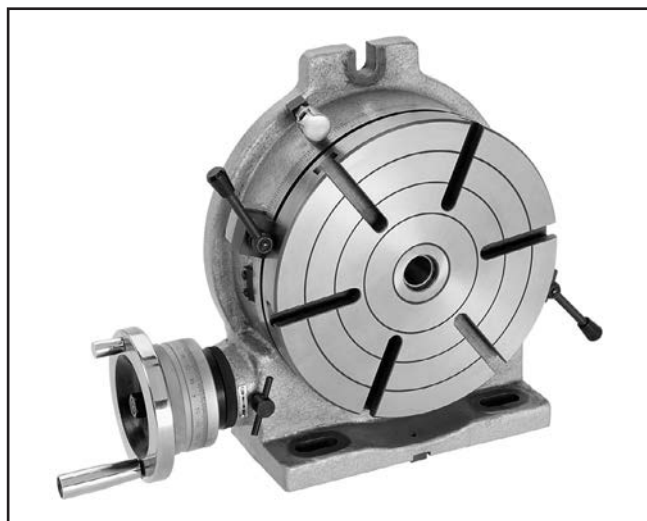


Figure 48. Model G9299 10" Yuasa-Type Rotary Table.

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

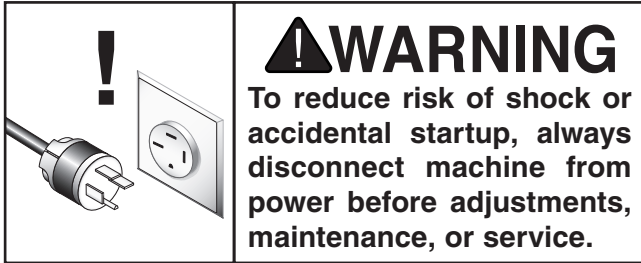


Figure 50. Recommended products for protecting unpainted cast iron/steel machinery parts.

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.

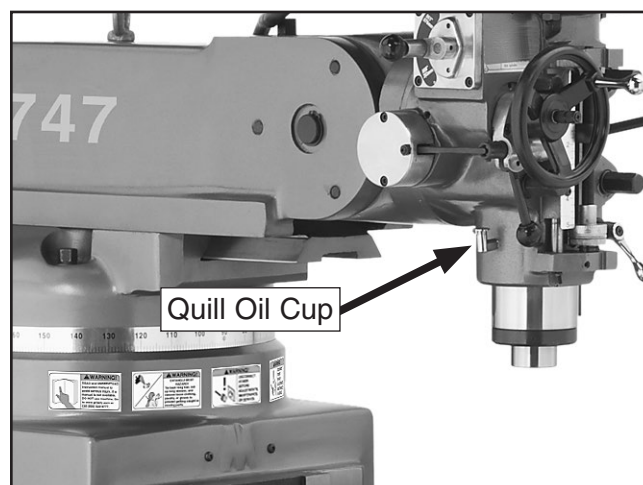


Figure 52. Quill oil cup.

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.

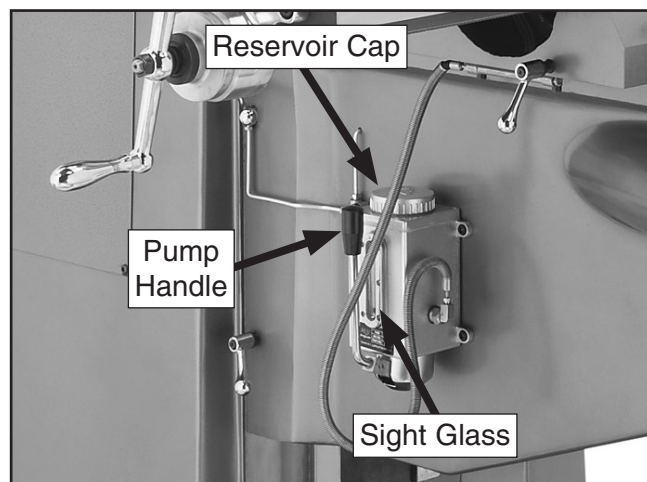


Figure 53. One-shot oiler.

Headstock Gearing

Grease Type NLGI 2 or Equivalent
Grease Amount Two 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**.

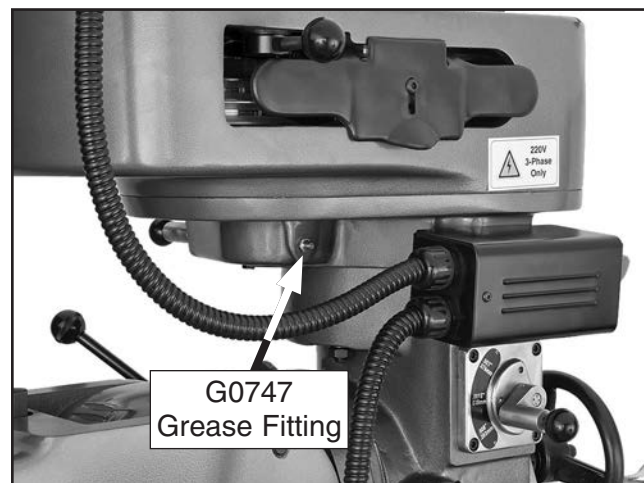


Figure 54. Model G0747 headstock gearing grease fitting.

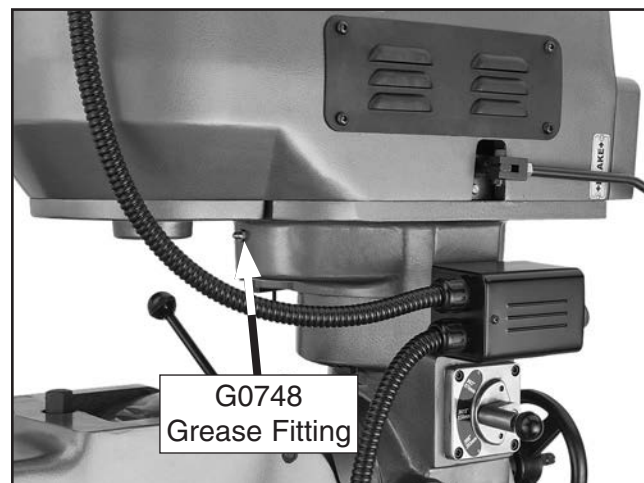


Figure 55. Model G0748 headstock gearing grease fitting.



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.

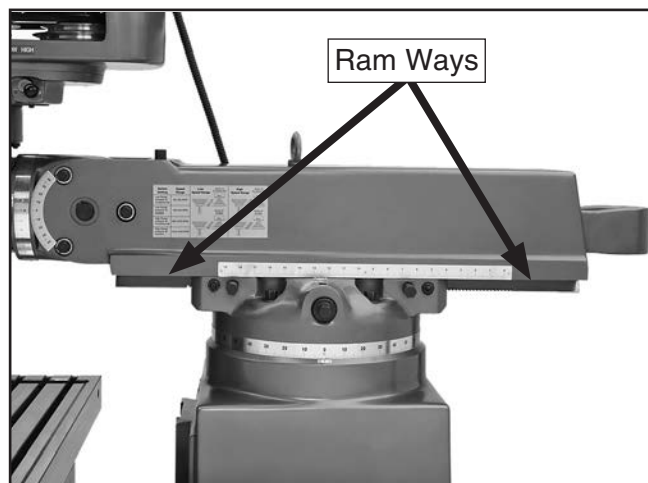


Figure 56. Ram ways.

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.

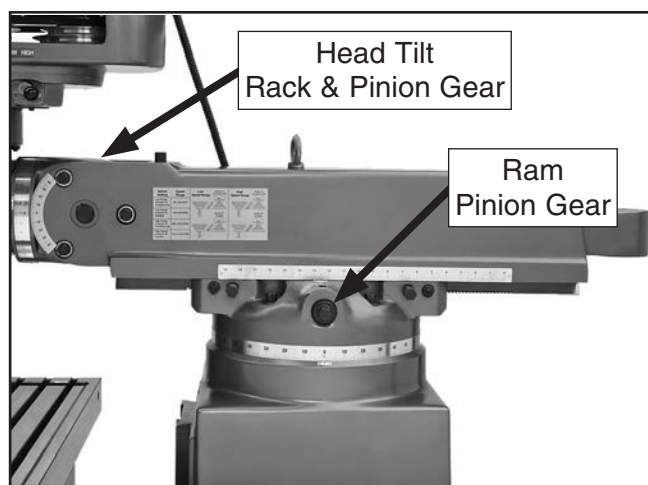


Figure 57. Head tilt and ram pinions.

Table Elevation Leadscrew

Grease Type NLGI 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.

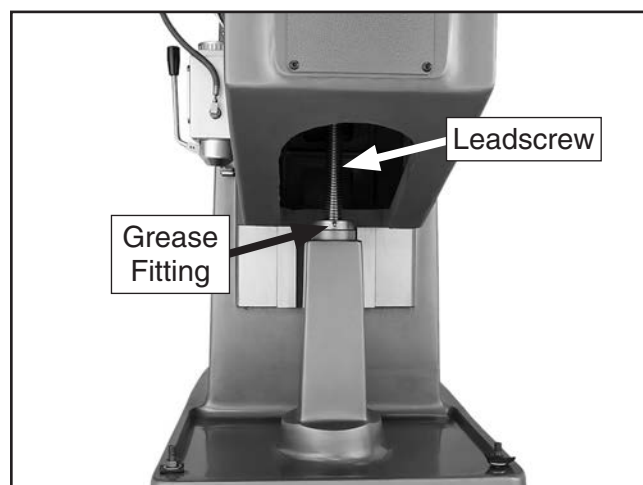


Figure 58. Elevation leadscrew grease fitting.



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**).

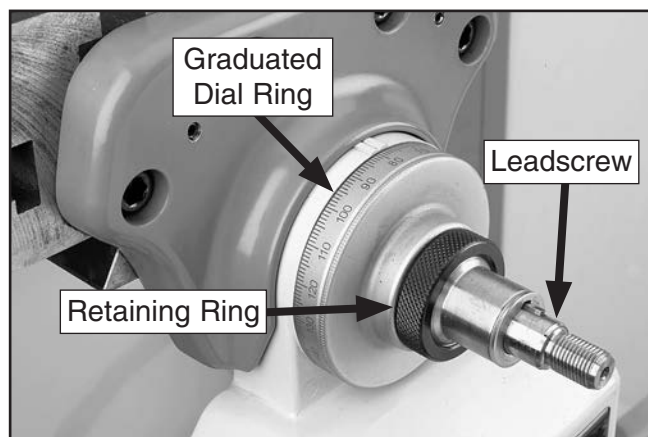


Figure 59. Power feed ball handle removed.

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**).

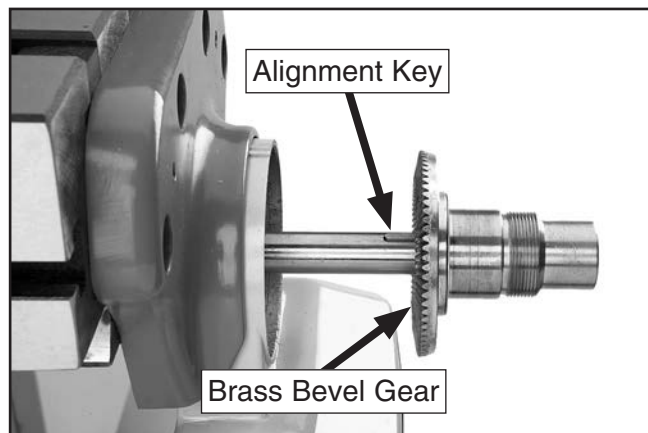


Figure 60. Power feed brass gear and leadscrew alignment key.

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

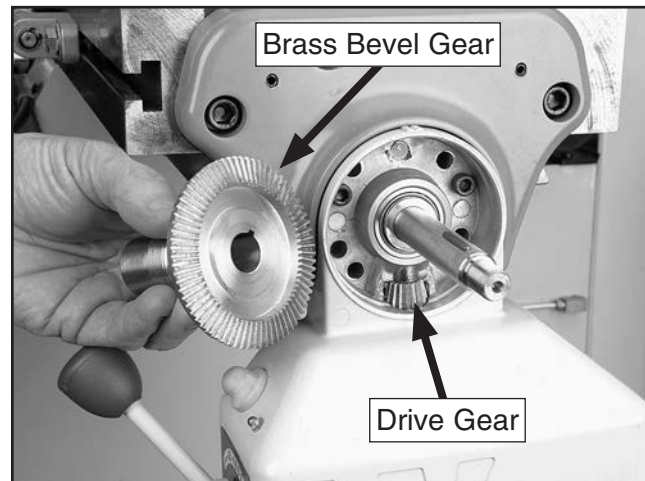


Figure 61. Power feed brass bevel gear and drive gear.

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.

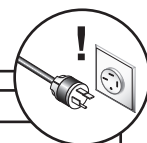


SECTION 7: SERVICE

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 at (570) 546-9663.

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.*

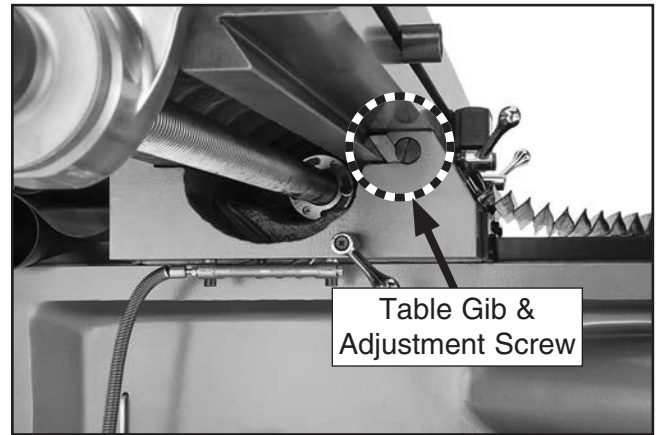


Figure 62. Table gib and adjustment screw underneath left side of table.



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**).

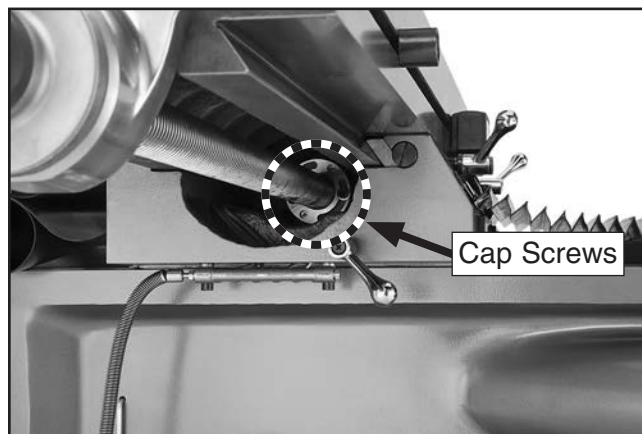


Figure 65. X-axis leadscrew nut cap screws (viewed from underneath left side of table).

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**).

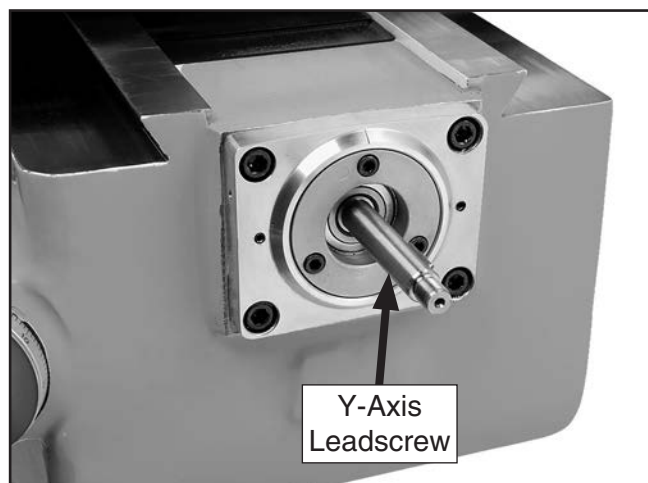


Figure 66. Ball handle, ring, and key removed from Y-axis leadscrew.

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.

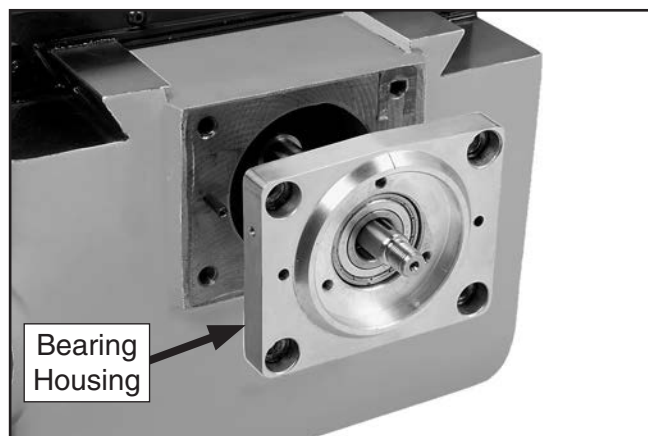


Figure 67. Y-axis bearing housing.

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

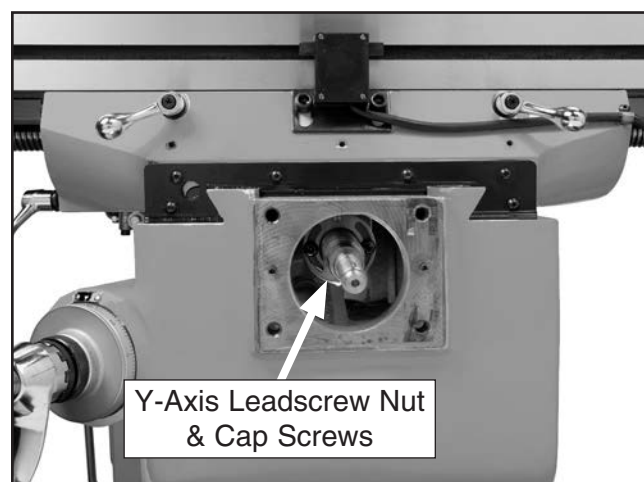


Figure 68. Y-axis leadscrew nut and cap screws.

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**.

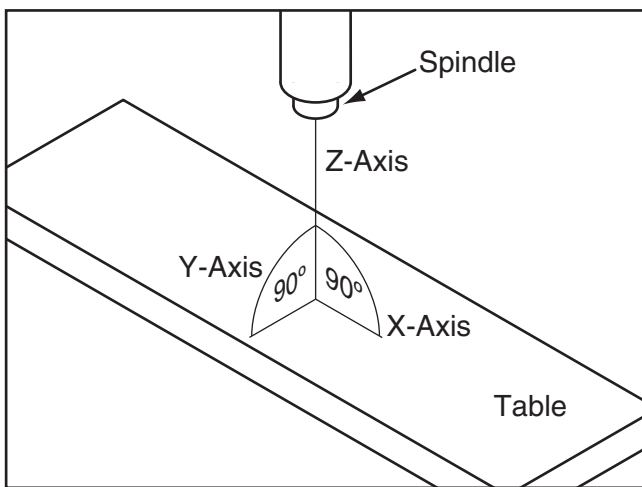


Figure 69. Spindle Z-axis perpendicular to the table X- and Y-axis.

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

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

Tools Needed

Qty

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

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

To tram the spindle to the table:

1. DISCONNECT MILL FROM POWER!
2. Prepare the mill for tramming 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 tramming—preferably centered with the saddle.
 - Tighten any table, knee, quill, or ram locks that should be tight during the intended milling operation.
3. Place 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**).

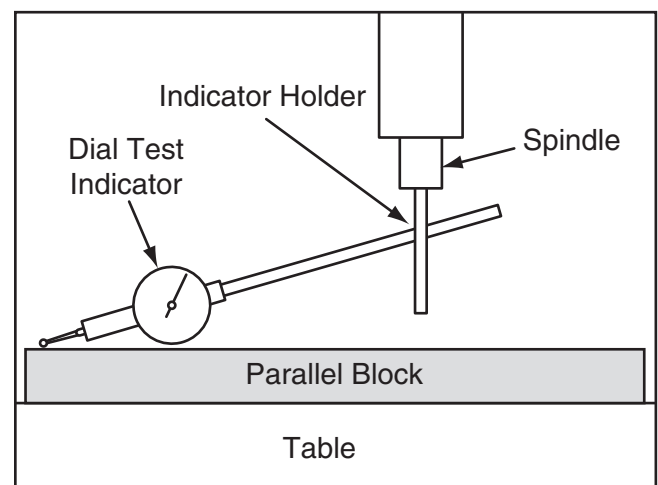


Figure 70. Dial test indicator mounted.



5. 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.

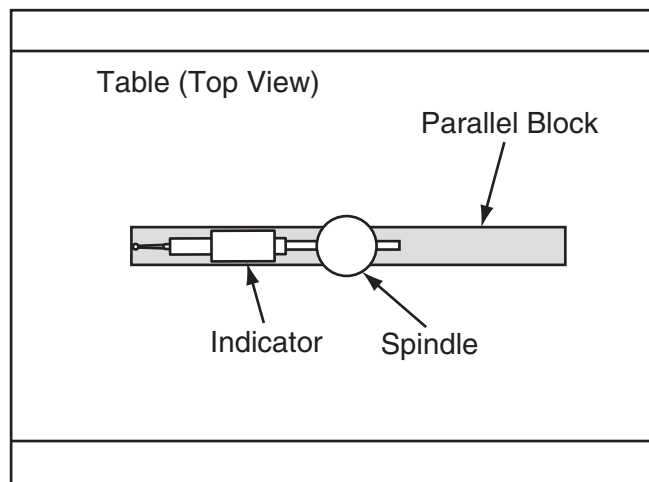


Figure 71. Parallel block and indicator positioned for the X-axis measurement (top view).

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.

6. 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.
7. 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.

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

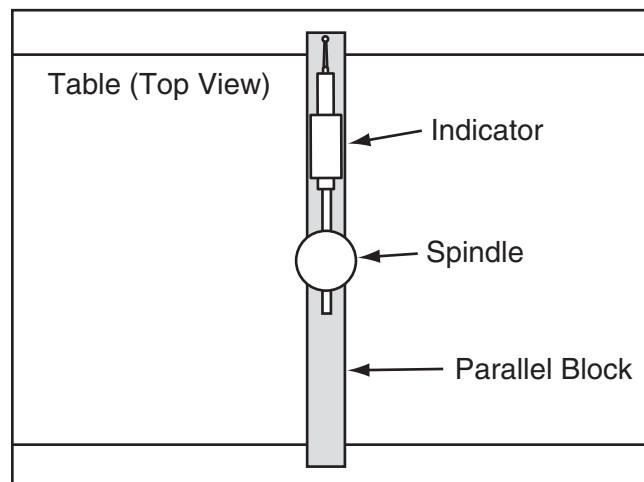


Figure 72. Parallel block and indicator positioned for the Y-axis measurement (top view).

9. Rotate the spindle so the indicator point rests on the parallel bar, as illustrated in **Figure 72**, then zero the dial.
10. 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

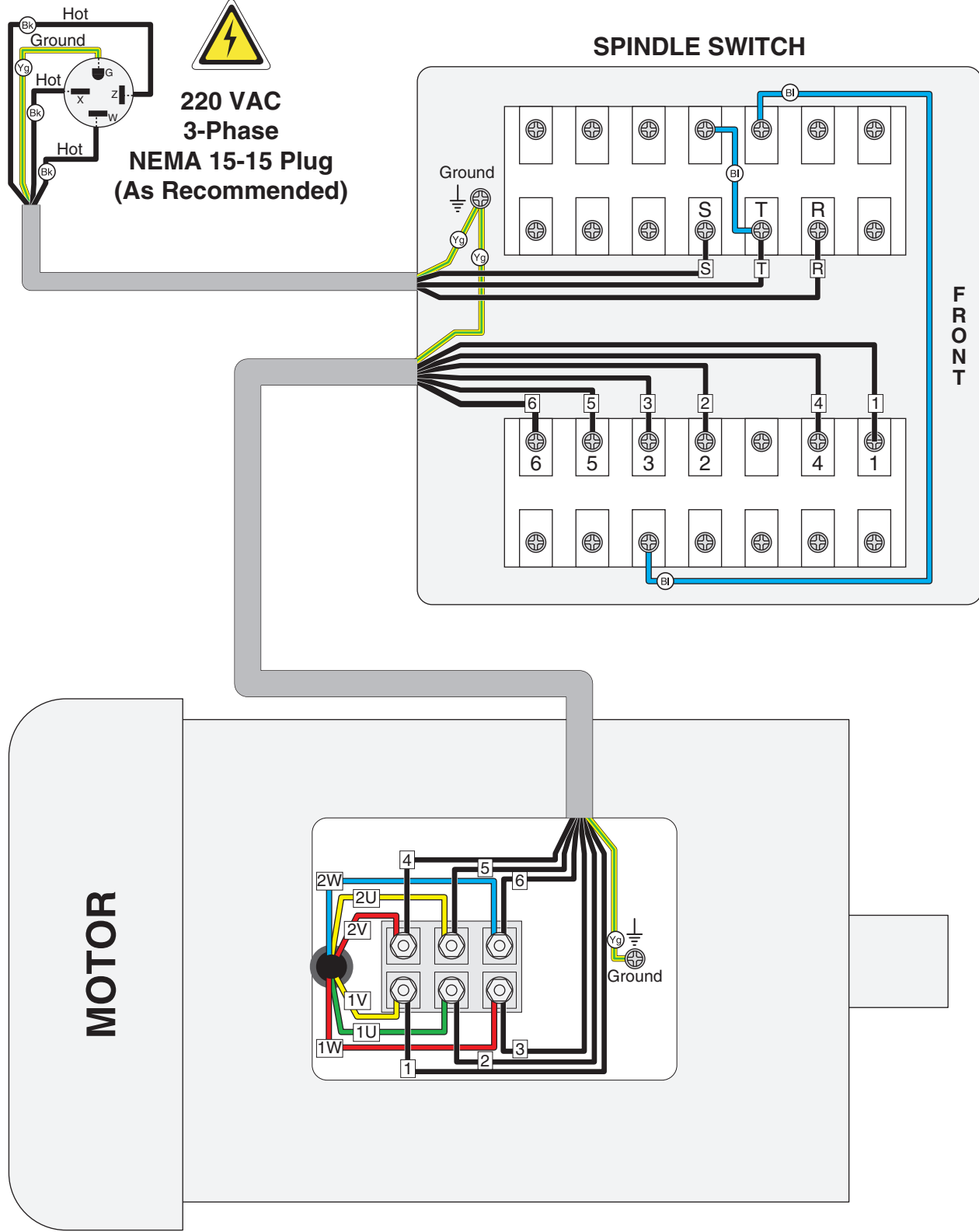
The photos and diagrams included in this section are best viewed in color. You can view these pages in color at www.grizzly.com.

COLOR KEY

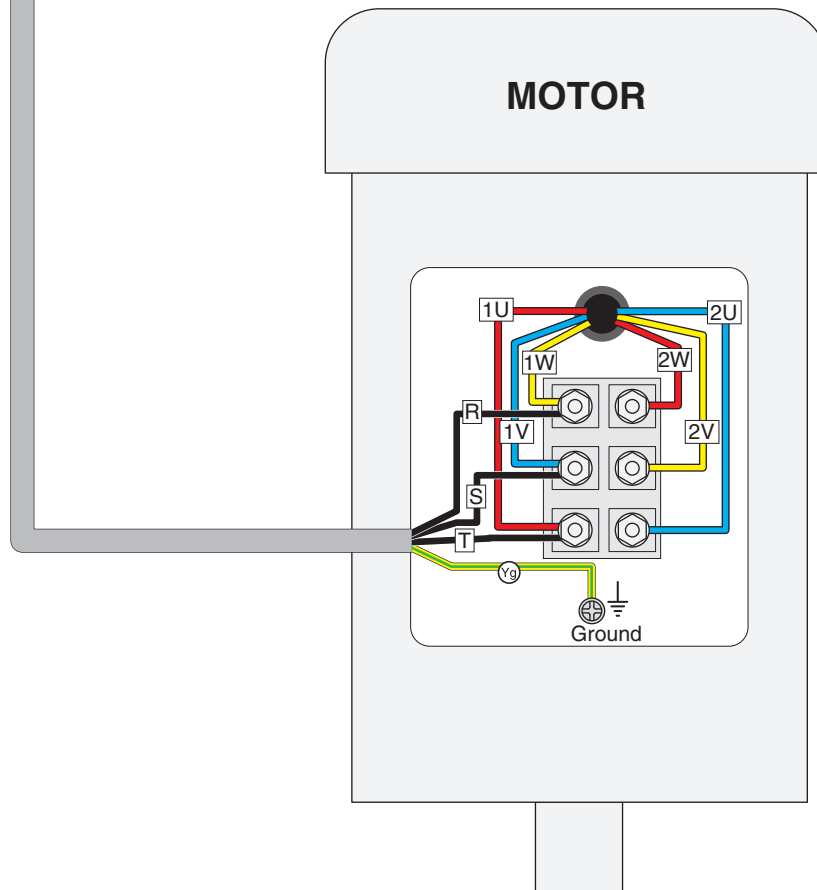
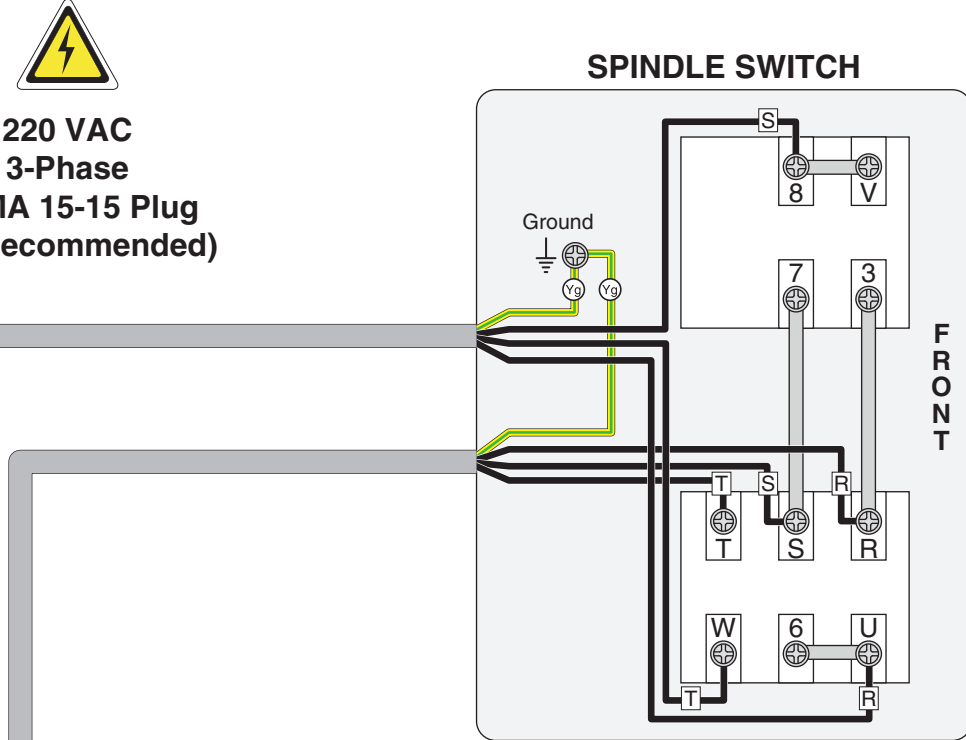
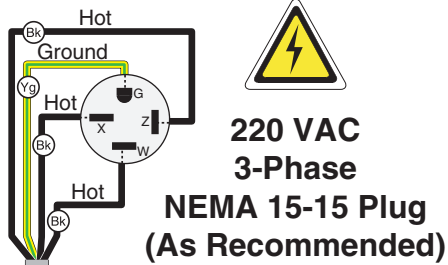
BLACK		BLUE		YELLOW		LIGHT BLUE	
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GREEN		GRAY		PURPLE		TURQUOISE	
RED		ORANGE		PINK			



G0747 Wiring Diagram

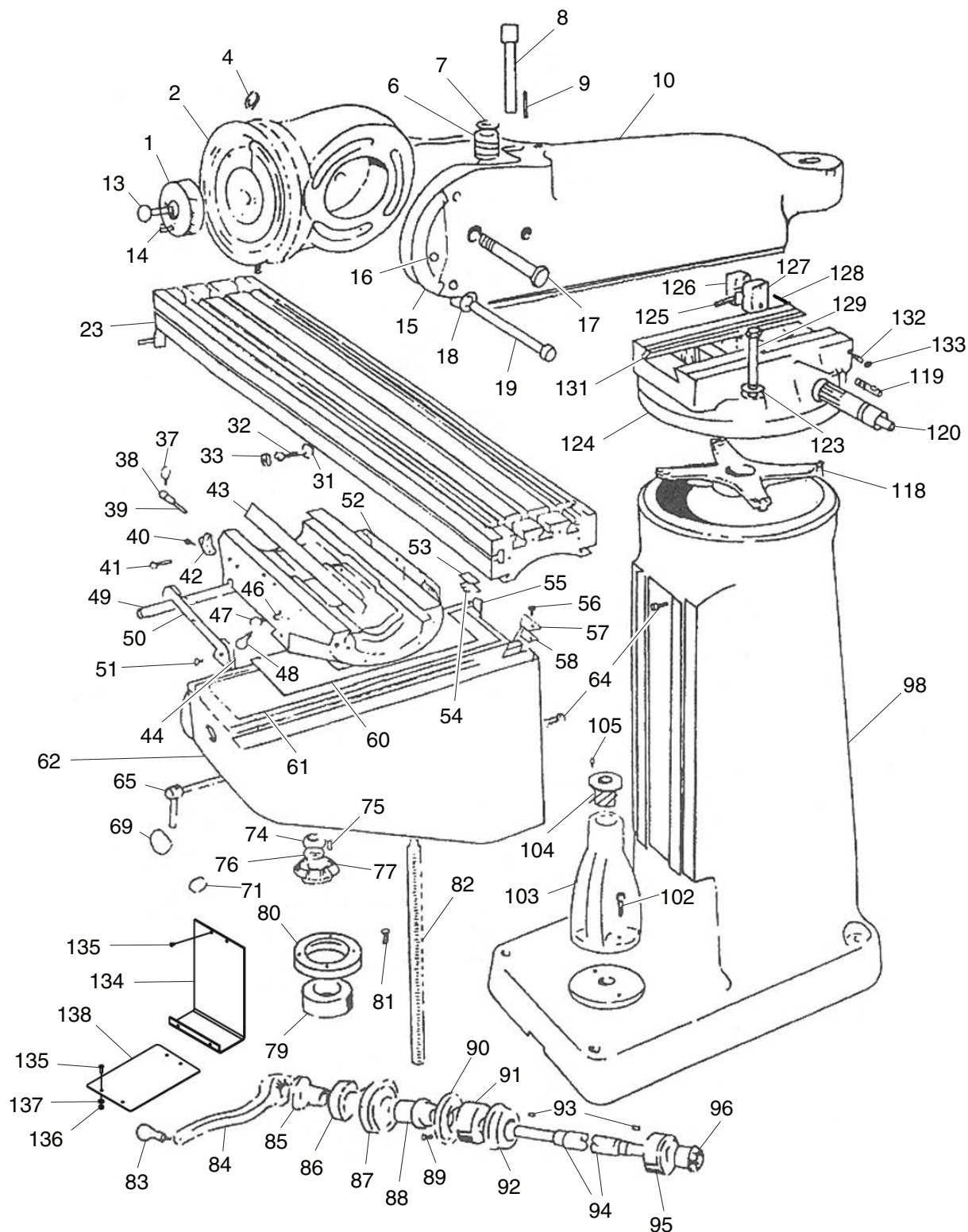


G0748 Wiring Diagram



SECTION 9: PARTS

Main



Please Note: We do our best to stock replacement parts whenever possible, but we cannot guarantee that all parts shown here are available for purchase. Call (800) 523-4777 or visit our online parts store at www.grizzly.com to check for availability.



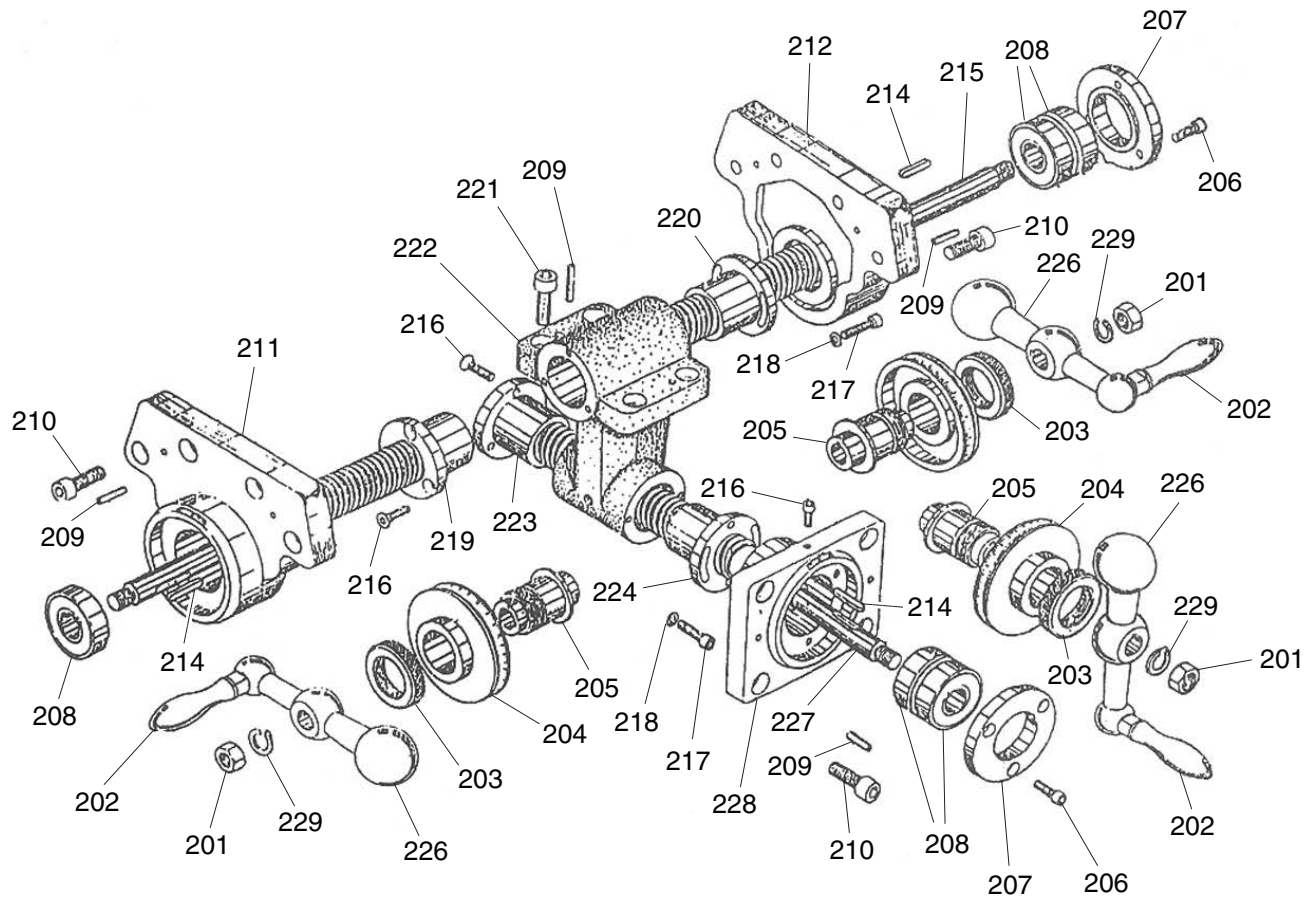
Main Parts List

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	PK36M	KEY 5 X 5 X 50
10	P07470010	RAM CASTING
13	PCAP13M	CAP SCREW M8-1.25 X 30
14	PRP08M	ROLL PIN 6 X 30
15	P07470015	HEAD TILT SCALE
16	PRIV001M	STEEL FLUTED RIVET 2 X 5MM
17	P07470017	RAM ADAPTER PIVOT BOLT M28.5 X 181.5
18	PW10M	FLAT WASHER 14MM
19	PB197M	HEX BOLT M14-2 X 190
23	P07470023	TABLE 10" X 50"
31	P07470031	LIMIT STOP T-BOLT
32	P07470032	LIMIT STOP
33	PN09M	HEX NUT M12-1.75
37	P07470037	SADDLE LOCK BOLT HANDLE
38	P07470038	SADDLE LOCK BOLT
39	P07470039	SADDLE LOCK BOLT PLUNGER
40	PCAP146M	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	PS14M	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	PCAP26M	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	PN13	HEX NUT 1/2-13
75	PK34M	KEY 5 X 5 X 20
76	PW01	FLAT WASHER 1/2
77	P07470077	Z-AXIS BEVEL GEAR
79	P3305	ANGULAR CONTACT BEARING 3305
80	P07470080	BEARING RETAINER RING
81	PCAP02M	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	PCAP02M	CAP SCREW M6-1 X 20
90	P07470090	BEARING RETAINER RING
91	P6204ZZ	BALL BEARING 6204ZZ
92	P07470092	BEARING CAP
93	PK102M	KEY 4 X 4 X 18
94	P07470094	Z-AXIS SHAFT
95	P6204ZZ	BALL BEARING 6204ZZ
96	P07470096	BEVELED PINION GEAR
98	P07470098	COLUMN CASTING
102	PCAP47M	CAP SCREW M10-1.5 X 40
103	P07470103	Z-AXIS PEDESTAL
104	P07470104	Z-AXIS LEADSCREW NUT
105	PCAP02M	CAP SCREW M6-1 X 20
118	P07470118	RAM SWIVEL
119	P07470119	RAM LOCK BOLT M16-2 X 35
120	P07470120	RAM PINION
123	PW06M	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	PN02M	HEX NUT M10-1.5
134	P07470134	COLUMN WAY COVER
135	PBHS13M	BUTTON HED CAP SCR M5-.8 X 18
136	PN06M	HEX NUT M5-.8
137	PW02M	FLAT WASHER 5MM
138	P07470138	FRONT SADDLE WAY COVER



X- & Y-Axis Leadscrews

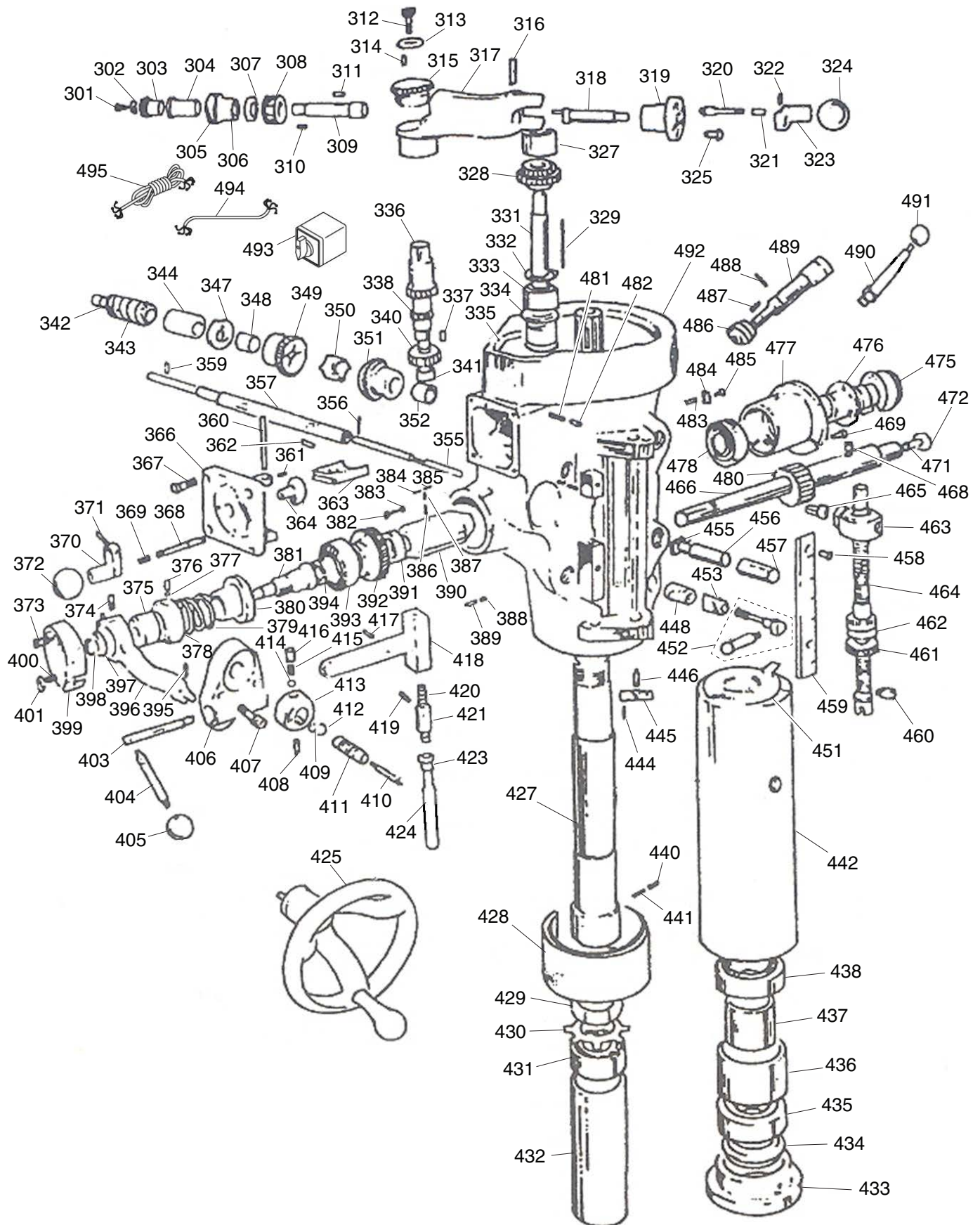


REF	PART #	DESCRIPTION
201	PN13	HEX NUT 1/2-13
202	P07470202	BALL CRANK HANDLE
203	P07470203	DIAL LOCK NUT
204	P07470204	GRADUATED DIAL
205	P07470205	DIAL HOLDER
206	PCAP01M	CAP SCREW M6-1 X 16
207	P07470207	BEARING RETAINER RING
208	P6204ZZ	BALL BEARING 6204ZZ
209	PRP05M	ROLL PIN 5 X 30
210	PCAP64M	CAP SCREW M10-1.5 X 25
211	P07470211	LEFT X-AXIS LEADSCREW BRACKET
212	P07470212	RIGHT X-AXIS LEADSCREW BRACKET
214	PK92M	KEY 3 X 3 X 25
215	P07470215	X-AXIS LEADSCREW

REF	PART #	DESCRIPTION
216	PFH73M	FLAT HD CAP SCR M6-1 X 12
217	PCAP06M	CAP SCREW M6-1 X 25
218	PW03M	FLAT WASHER 6MM
219	P07470219	LEFT X-AXIS LEADSCREW NUT
220	P07470220	RIGHT X-AXIS LEADSCREW NUT
221	PCAP64M	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	PLW07	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	PK39M	KEY 3 X 3 X 10
311	PK98M	KEY 3 X 3 X 16
312	P07470312	BEVEL GEAR LOCK BOLT
313	PW01M	FLAT WASHER 8MM
314	PK39M	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	PRP42M	ROLL PIN 3 X 20
323	P07470323	SHIFT CRANK
324	P07470324	ROUND PLASTIC KNOB 1/4-20 1" OD
325	PCAP33M	CAP SCREW M5-.8 X 12
327	P07470327	CLUSTER GEAR SHAFT BRASS SLEEVE
328	P07470328	CLUSTER COMBO GEAR
329	PK53M	KEY 3 X 3 X 45
331	P07470331	CLUSTER GEAR SHAFT
332	PR06M	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	PK39M	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	PRP42M	ROLL PIN 3 X 20
357	P07470357	FEED WORM SHAFT
359	PRP61M	ROLL PIN 3 X 12
360	P07470360	FEED SHAFT ROD
361	PSS26M	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	P07470324	ROUND PLASTIC KNOB 1/4-20 1" OD
373	PCAP79M	CAP SCREW M5-.8 X 35
374	P07470374	CLUTCH RING PIN
375	P07470375	CLUTCH RING
376	PSS03M	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	PLW02M	LOCK WASHER 4MM
383	PS56M	PHLP HD SCR M4-.7 X 16
384	PSS04M	SET SCREW M6-1 X 12
385	PSS03M	SET SCREW M6-1 X 8
386	PSS02M	SET SCREW M6-1 X 6
387	PSS01M	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	PR02M	EXT RETAINING RING 14MM
395	P07470395	DOWEL PIN
396	P07470396	OVERLOAD CLUTCH TRIP LEVER
397	PW04M	FLAT WASHER 10MM
398	PR01M	EXT RETAINING RING 10MM
399	P07470399	CLUTCH ARM COVER
400	PSS02M	SET SCREW M6-1 X 6
401	PN01M	HEX NUT M6-1
403	P07470403	CAM ROD
404	P07470404	SPRING STUD 1/4-20 X 3-1/4, 3/8
405	P07470324	ROUND PLASTIC KNOB 1/4-20 1" OD
406	P07470406	FEED TRIP BRACKET
407	PCAP02M	CAP SCREW M6-1 X 20
408	PSS02M	SET SCREW M6-1 X 6
409	PK103M	KEY 3 X 3 X 12
410	P07470410	FEED REVERSE KNOB SHOULDER SCREW
411	P07470411	FEED REVERSE KNOB
412	PR02M	EXT RETAINING RING 14MM
413	P07470413	HANDWHEEL CLUTCH
414	PSTB004	STEEL BALL 3/16
415	P07470415	COMPRESSION SPRING
416	PSS20M	SET SCREW M8-1.25 X 8



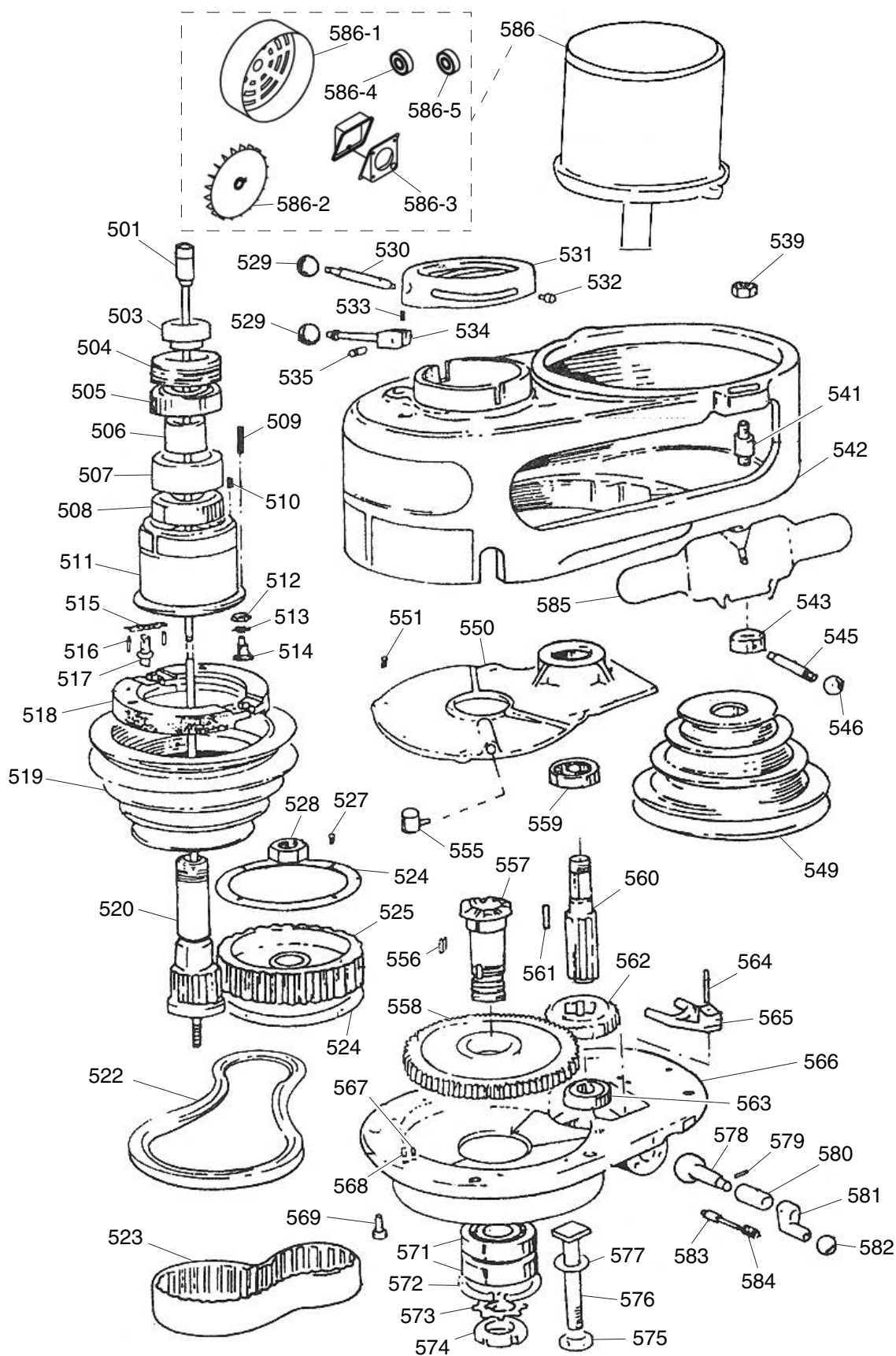
Downfeed System Parts List

REF	PART #	DESCRIPTION
417	PRP42M	ROLL PIN 3 X 20
418	P07470418	CAM ROD SLEEVE ASSEMBLY
419	PRP61M	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	P6206ZZ	BALL BEARING 6206ZZ
432	P07470432	SPINDLE SLEEVE
433	P07470433	QUILL NOSE PIECE
434	P07470434	LOWER SPINDLE SEAL 64 X 35MM
435	P7207	ANGULAR CONTACT BEARING 7207
436	P07470436	LARGE BEARING SPACER
437	P07470437	SMALL BEARING SPACER
438	P7207	ANGULAR CONTACT BEARING 7207
440	PSS03M	SET SCREW M6-1 X 8
441	PSS02M	SET SCREW M6-1 X 6
442	P07470442	QUILL
444	PSS49M	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	PS17M	PHLP HD SCR M4-.7 X 6

REF	PART #	DESCRIPTION
459	P07470459	QUILL TRAVEL SCALE
460	PR06M	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	PRP35M	ROLL PIN 5 X 10
469	PS40M	PHLP HD SCR M5-.8 X 16
471	PK96M	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	PSS02M	SET SCREW M6-1 X 6
482	PSS01M	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	PK102M	KEY 4 X 4 X 18
488	PSS03M	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 3-POS (G0747)
493	P07480493	POWER SWITCH YK 220V 8-POS (G0748)
494	P07470494	MOTOR CORD 14G 4W 36"
495	P07470495	POWER CORD 14G 4W 72"



G0747 Headstock



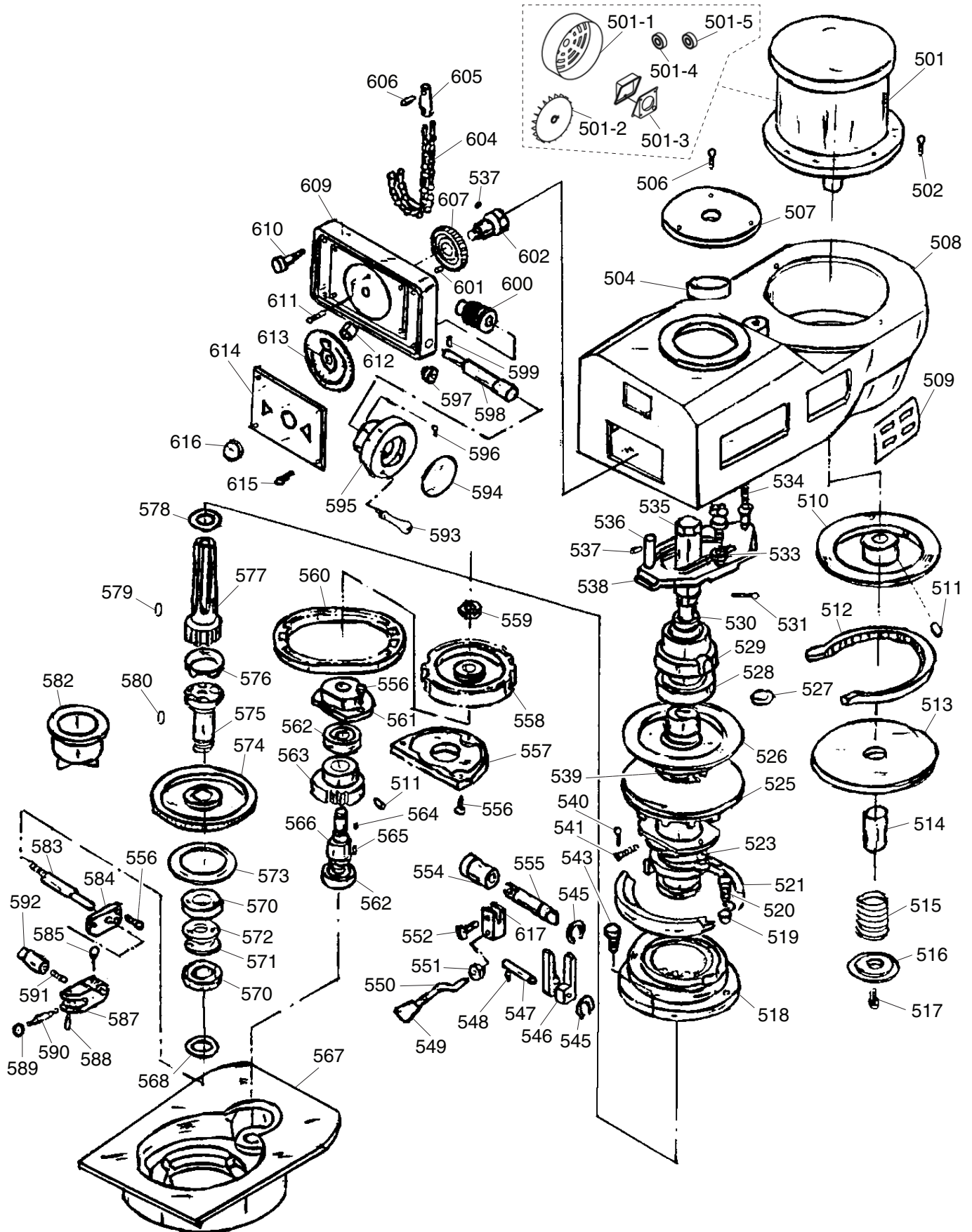
G0747 Headstock Parts List

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	P6207ZZ	BALL BEARING 6207ZZ
506	P07470506	SMALL UPPER BEARING SPACER
507	P07470507	LARGE UPPER BEARING SPACER
508	P6207ZZ	BALL BEARING 6207ZZ
509	P07470509	COMPRESSION SPRING
510	PSS04M	SET SCREW M6-1 X 12
511	P07470511	SPINDLE PULLEY BEARING SLEEVE
512	PN02	HEX NUT 5/16-18
513	PTLW02	EXT TOOTH WASHER 5/16
514	P07470514	BRAKE RING STEP SCREW
515	P07470515	EXTENSION SPRING
516	PS12M	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	PVA33	V-BELT A-33
523	P07470523	TIMING BELT 225L 1"W 60T
524	P07470524	TIMING PULLEY FLANGE
525	P07470525	TIMING PULLEY
527	PFH30M	FLAT HD SCR M5-.8 X 8
528	PN09	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	PSS31M	SET SCREW M5-.8 X 8
534	P07470534	BRAKE LEVER
535	P07470535	BRAKE LOCK PIN
539	PN02	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	P07470529	PLATIC ROUND KNOB 5/16-18 1-1/4" OD
549	P07470549	MOTOR PULLEY

REF	PART #	DESCRIPTION
550	P07470550	GEAR HOUSING COVER
551	PS08M	PHLP HD SCR M5-.8 X 12
555	P07470555	OIL CUP
556	PK40M	KEY 8 X 8 X 16
557	P07470557	SPLINED GEAR HUB
558	P07470558	SPLINED BULL GEAR 81T
559	P6203ZZ	BALL BEARING 6203ZZ
560	P07470560	BACK GEAR SHAFT
561	PK08M	KEY 5 X 5 X 16
562	P07470562	BACK GEAR 26T
563	P6203ZZ	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	PCAP06M	CAP SCREW M6-1 X 25
571	P6208ZZ	BALL BEARING 6208ZZ
572	PR50M	INT RETAINING RING 80MM
573	P07470573	SPANNER NUT LOCK WASHER
574	P07470574	SPANNER NUT
575	PN19	HEX NUT 7/16-14
576	P07470576	T-BOLT
577	P07470577	T-BOLT FLAT WASHER 7/16"
578	P07470578	HIGH-LOW SHIFT LEVER
579	PRP42M	ROLL PIN 3 X 20
580	P07470580	HIGH-LOW SHIFT BUSHING
581	P07470581	HIGH-LOW SHIFT CRANK
582	P07470324	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	P6205ZZ	BALL BEARING 6205ZZ
586-5	P6205ZZ	BALL BEARING 6205ZZ



G0748 Headstock



G0748 Headstock Parts List

REF	PART #	DESCRIPTION
501	P07480501	MOTOR 3HP 220V 3-PH AEFV 112-4
501-1	P07480501-1	MOTOR FAN COVER
501-2	P07480501-2	MOTOR FAN
501-3	P07480501-3	MOTOR JUNCTION BOX
501-4	P6205ZZ	BALL BEARING 6205ZZ
501-5	P6205ZZ	BALL BEARING 6205ZZ
502	P07480502	MOTOR MOUNT CAP SCREW 3/8-16
504	P6009ZZ	BALL BEARING 6009ZZ
506	PCAP02M	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	PCAP31M	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	PCAP68M	CAP SCREW M6-1 X 8
520	PS03M	PHLP HD SCR M6-1 X 8
521	P07480521	BRAKE SHOE 2-PC SET
523	P6012ZZ	BALL BEARING 6012ZZ
525	P07480525	LOWER SPINDLE PULLEY
526	P07480526	UPPER SPINDLE PULLEY
527	PR56M	EXT RETAINING RING 45MM
528	P6012ZZ	BALL BEARING 6012ZZ
529	P07480529	SLIDING SLEEVE, ALUMINUM
530	P07480530	DRAWBAR SPACER 22 X 13 X 8
531	PRP42M	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	PRP76M	ROLL PIN 4 X 16
538	P07480538	SPEED CHANGE PLATE
539	PR43M	EXT RETAINING RING 50MM
540	PS50	PHLP HD SCR 5-40 X 1/4
541	P07480541	BRAKE EXTENSION SPRING
543	PB09M	HEX BOLT M8-1.25 X 20
545	PEC04M	E-CLIP 13MM
546	P07480546	BRAKE PIVOT ARM 2-PC SET
547	P07480547	BRAKE PIVOT ROD
548	PCAP85M	CAP SCREW M6-1 X 6
549	P07480549	TAPERED KNOB 3/8-16
550	P07480550	BRAKE LEVER
551	PN08	HEX NUT 3/8-16
552	PCAP06M	CAP SCREW M6-1 X 25

REF	PART #	DESCRIPTION
554	P07480554	BRAKE SHAFT SLEEVE
555	P07480555	BRAKE SHAFT
556	PCAP01M	CAP SCREW M6-1 X 16
557	P07480557	PULLEY COVER
558	P07480558	TIMING BELT PULLEY
559	PN04	HEX NUT 5/8-11
560	P07480560	TIMING BELT 225L
561	P07480561	BEARING HOUSING
562	P6203ZZ	BALL BEARING 6203ZZ
563	P07480563	PINION GEAR
564	PK47M	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	SPLINE SHAFT
578	P07480578	SPACER
579	PK34M	KEY 5 X 5 X 20
580	PK70M	KEY 8 X 8 X 12
582	P07480582	BEARING HOUSING
583	P07480583	CLUTCH GEAR SHAFT
584	P07480584	SPEED RANGE POSITIONING PLATE
585	PCAP33M	CAP SCREW M5-.8 X 12
587	P07480587	PIVOT ARM
588	PRP07M	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	PSS02M	SET SCREW M6-1 X 6
597	P07480597	BRASS SLEEVE
598	P07480598	SPEED CHANGE SHAFT
599	PRP61M	ROLL PIN 3 X 12
600	P07480600	WORM
601	PRP115M	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

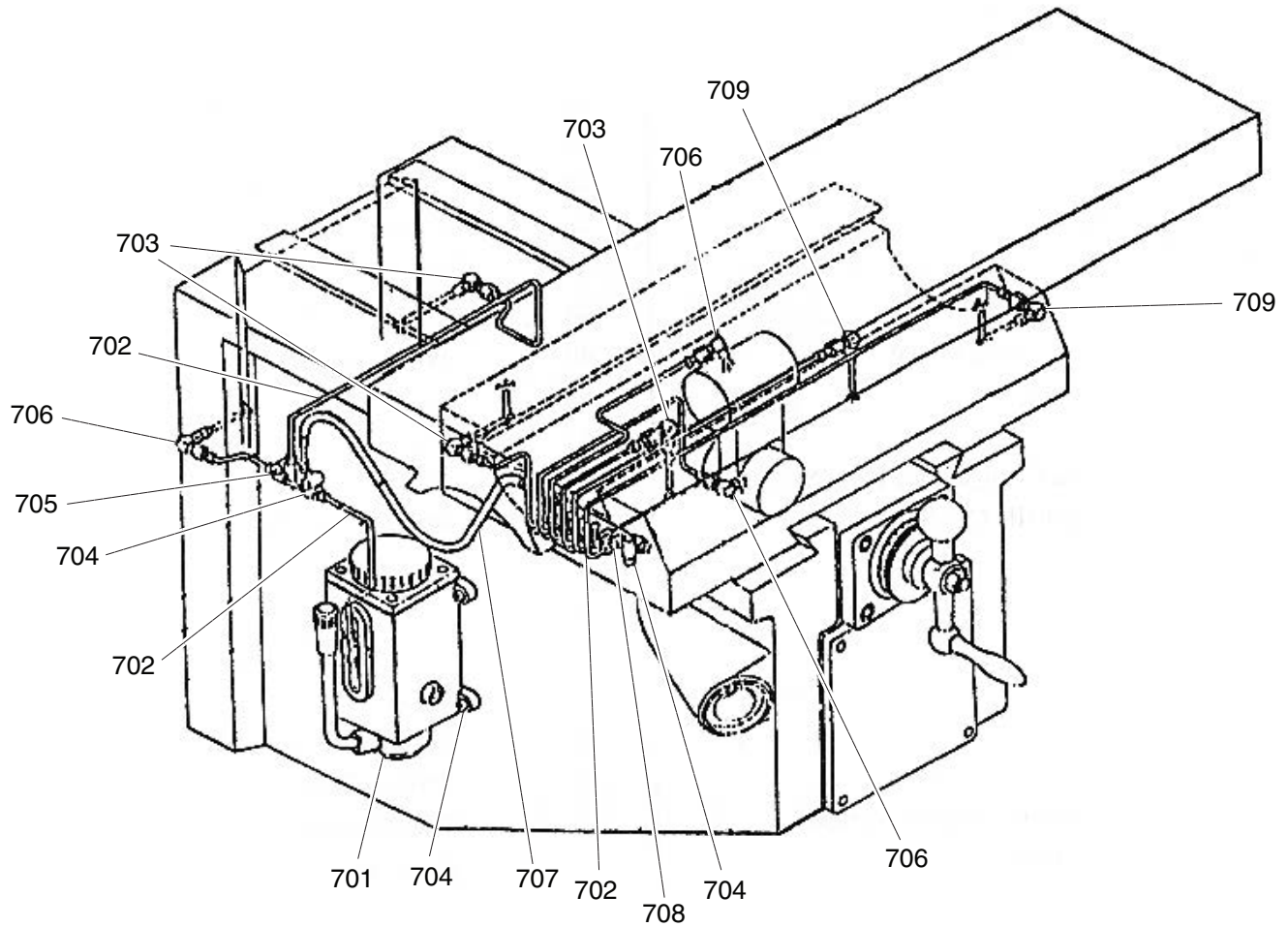
609	P07480609	HEADSTOCK FRONT COVER, ALUMINUM
610	PCAP07M	CAP SCREW M6-1 X 30
611	PCAP01M	CAP SCREW M6-1 X 16
612	P07480612	BRASS SLEEVE
613	P07480613	SPEED CHANGE DIAL

REF PART # DESCRIPTION

614	P07480614	SPEED CHANGE INDICATOR PLATE
615	PCAP26M	CAP SCREW M6-1 X 12
616	PN40	ACORN NUT 5/16-18
617	P07480617	BRAKE PIVOT ARM



One-Shot Oiler

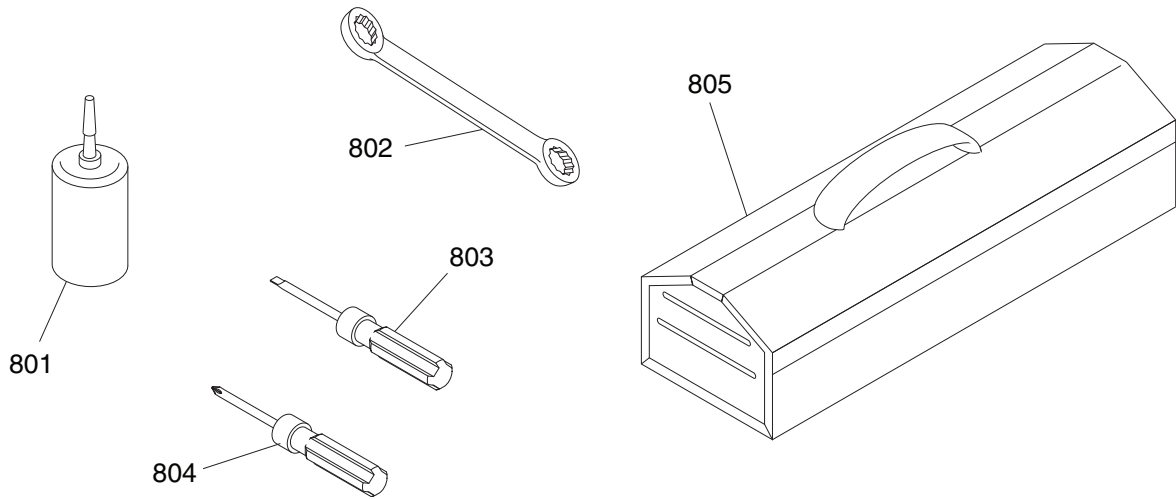


REF	PART #	DESCRIPTION
701	P07470701	OILER PUMP AND RESERVOIR
702	P07470702	ALUMINUM PIPE 4MM
703	P07470703	ELBOW OIL DISTRIBUTOR CPS4
704	PCAP02M	CAP SCREW M6-1 X 20
705	P07470705	A-TYPE OIL DISTRIBUTOR A4

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

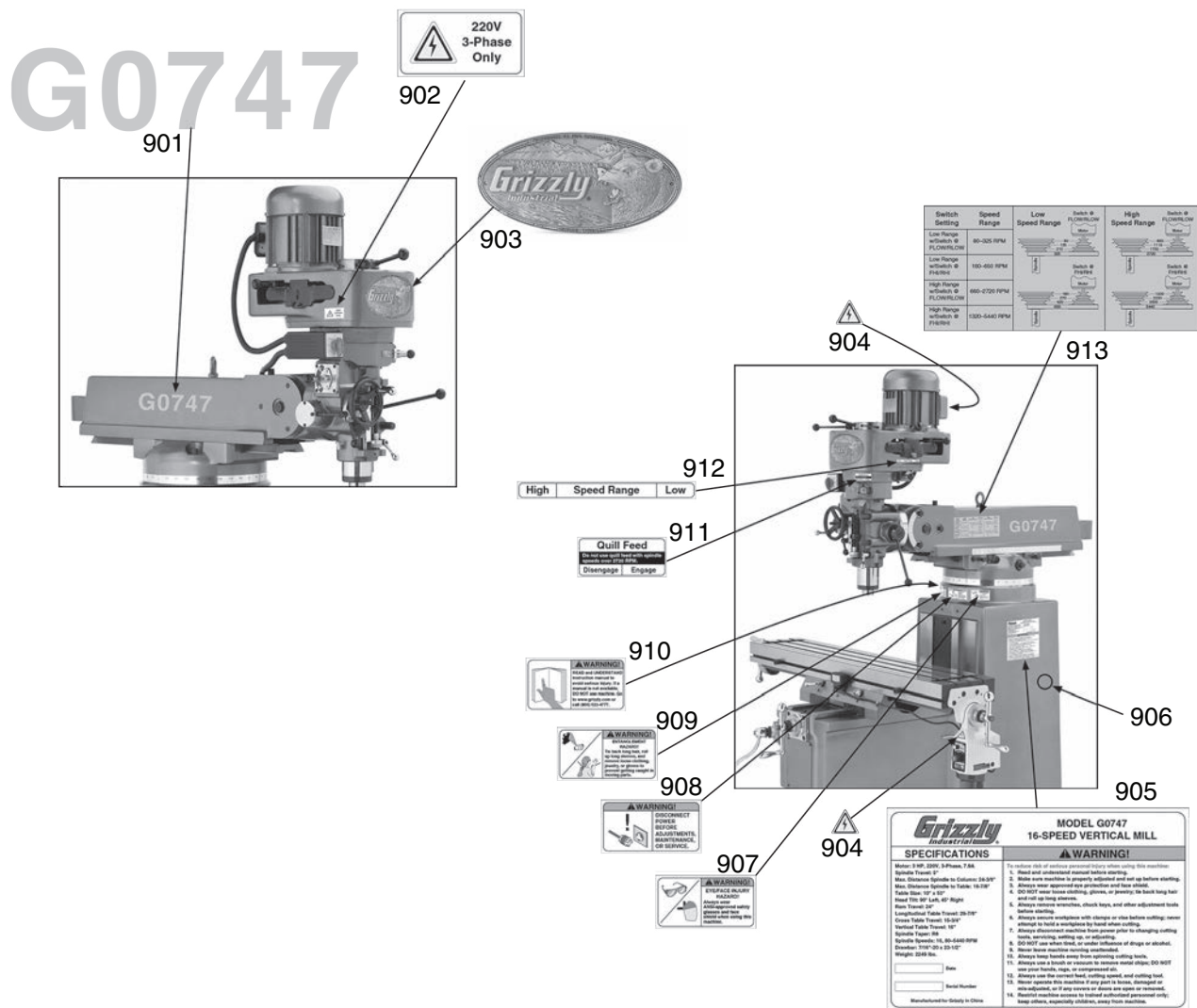


REF	PART #	DESCRIPTION
801	P07470801	BOTTLE FOR OIL
802	PWR1719C	WRENCH 17 X 19MM CLOSED ENDS
803	PSDF2	STANDARD SCREWDRIVER #2

REF	PART #	DESCRIPTION
804	PSDP2	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	G8588	SMALL GRIZZLY NAMEPLATE
904	PLABEL-14A	ELECTRICITY LABEL
905	P07470905	MACHINE ID LABEL
906	PPAINT-1	GRIZZLY GREEN TOUCH-UP PAINT
907	P07470907	GOGGLES/FACE SHIELD LABEL

REF	PART #	DESCRIPTION
908	PLABEL-52C	220V DISCONNECT LABEL
909	PLABEL-55C	ENTANGLEMENT LABEL
910	PLABEL-12D	READ MANUAL LABEL
911	P07470911	QUILL FEED LABEL
912	P07470912	SPEED RANGE LABEL
913	P07470913	SPINDLE SPEED LABEL

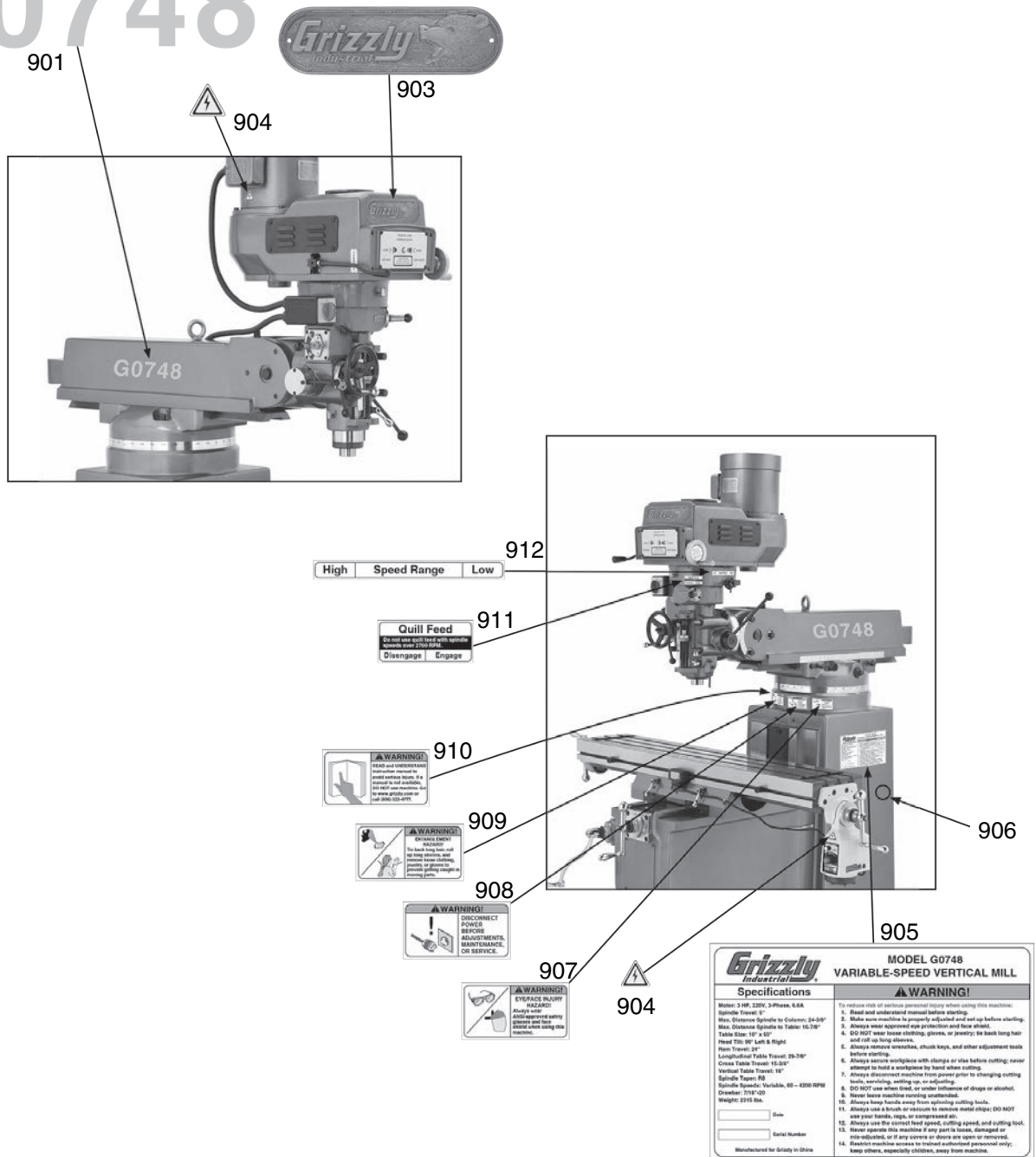
WARNING

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	H4609	SMALL OBLONG GRIZZLY NAMEPLATE
904	PLABEL-14A	ELECTRICITY LABEL
905	P07480905	MACHINE ID LABEL
906	PPAINT-1	GRIZZLY GREEN TOUCH-UP PAINT
907	P07471007	GOGGLES/FACE SHIELD LABEL

REF	PART #	DESCRIPTION
908	PLABEL-52C	220V DISCONNECT LABEL
909	PLABEL-55C	ENTANGLEMENT LABEL
910	PLABEL-12D	READ MANUAL LABEL
911	P07470911	QUILL FEED LABEL
912	P07470912	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.**

1. How did you learn about us?

_____ Advertisement _____ Friend _____ Catalog
_____ Card Deck _____ Website _____ Other:

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

_____ Cabinetmaker & FDM	_____ Popular Science	_____ Wooden Boat
_____ Family Handyman	_____ Popular Woodworking	_____ Woodshop News
_____ Hand Loader	_____ Precision Shooter	_____ Woodsmith
_____ Handy	_____ Projects in Metal	_____ Woodwork
_____ Home Shop Machinist	_____ RC Modeler	_____ Woodworker West
_____ Journal of Light Cont.	_____ Rifle	_____ Woodworker's Journal
_____ Live Steam	_____ Shop Notes	_____ Other:
_____ Model Airplane News	_____ Shotgun News	
_____ Old House Journal	_____ Today's Homeowner	
_____ Popular Mechanics	_____ Wood	

3. What is your annual household income?

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

4. What is your age group?

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

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

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

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

_____ 0-2 _____ 3-5 _____ 6-9 _____ 10+

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

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

9. Would you allow us to use your name as a reference for Grizzly customers in your area?

Note: We never use names more than 3 times. _____ Yes _____ No

10. Comments: _____

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.



Buy Direct and Save with Grizzly® – Trusted, Proven and a Great Value!
~Since 1983~

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Current Specials!*

**ORDER
24 HOURS A DAY!
1-800-523-4777**

