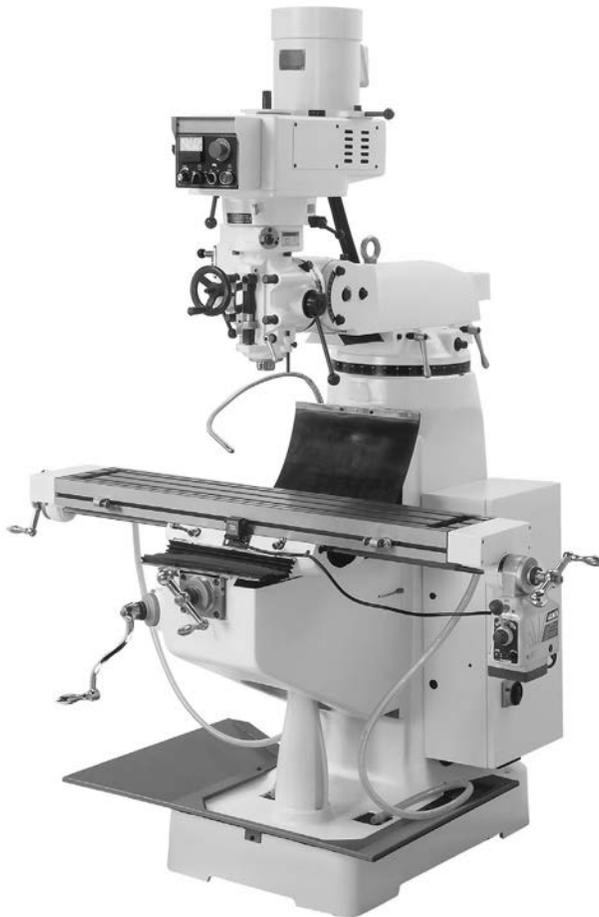


Grizzly *Industrial, Inc.*®

MODEL G0667X HIGH PRECISION VARIABLE SPEED 9" X 48" VERTICAL MILL w/POWER FEED

OWNER'S MANUAL



COPYRIGHT © MAY, 2008 BY GRIZZLY INDUSTRIAL, INC., REVISED APRIL, 2010 (TS)
**WARNING: NO PORTION OF THIS MANUAL MAY BE REPRODUCED IN ANY SHAPE
OR FORM WITHOUT THE WRITTEN APPROVAL OF GRIZZLY INDUSTRIAL, INC.**

#TS10451 PRINTED IN TAIWAN

 **WARNING!**

This manual provides critical safety instructions on the proper setup, operation, maintenance and service of this machine/equipment.

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

The owner of this machine/equipment 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, blade/cutter 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.

Table of Contents

INTRODUCTION	2	SECTION 5: ACCESSORIES	34
Foreword.....	2	SECTION 6: MAINTENANCE	36
Contact Info.....	2	Schedule.....	36
Functional Overview	2	Cleaning and Protecting	36
Identification.....	3	Lubrication	37
Machine Data Sheet	6	Coolant Reservoir	39
SECTION 1: SAFETY	9	Drive Belt Tensioning.....	41
Safety Instructions for Machinery	9	SECTION 7: SERVICE	42
Additional Safety Instructions For Mills.....	11	Troubleshooting	42
SECTION 2: CIRCUIT REQUIREMENTS	12	Adjusting Gibs.....	45
220V Operation.....	12	Adjusting Backlash.....	46
SECTION 3: SETUP	13	SECTION 8: ELECTRICAL	48
Setup Safety	13	Electrical Safety Instructions.....	48
Items Needed for Setup.....	13	Electrical Panel Wiring.....	49
Unpacking.....	13	Frequency Drive Wiring Diagram.....	51
Inventory	14	Control Panel Wiring Diagram	52
Clean Up.....	14	Electrical Component Wiring Diagram.....	53
Site Considerations.....	15	SECTION 9: PARTS	54
Moving & Placing Base Unit	15	Quill Assembly	54
Mounting to Shop Floor	17	Head	55
Assembly	18	Drive System.....	58
Test Run	20	Ram	61
Spindle Break-In	22	Column, Knee & Saddle	62
Recommended Adjustments.....	22	Table.....	64
SECTION 4: OPERATIONS	23	Accessories.....	66
Operation Safety	23	Electrical Cabinet.....	67
Control Panel	23	One-Shot Oiler	68
Table Movement.....	24	Coolant System.....	69
Head Movement.....	26	Label Placement	70
Ram Movement.....	27	WARRANTY AND RETURNS	73
Setting Spindle RPM.....	28		
Downfeed Controls	30		
Emergency Spindle Brake	32		
Loading/Unloading Tooling	33		

INTRODUCTION

Foreword

We are proud to offer the Model G0667X High Precision 9" x 48" Variable Speed Vertical Mill. This machine is part of a growing Grizzly family of fine metal-working machinery. When used according to the guidelines set forth in this manual, you can expect years of trouble-free, enjoyable operation and proof of Grizzly's commitment to customer satisfaction.

The specifications, drawings, and photographs illustrated in this manual represent the Model G0667X when the manual was prepared. However, owing to Grizzly's policy of continuous improvement, changes may be made at any time with no obligation on the part of Grizzly. For your convenience, we always keep current Grizzly manuals available on our website at www.grizzly.com. Any updates to your machine will be reflected in these manuals as soon as they are complete.

Contact Info

We stand behind our machines. If you have any service questions, parts requests or general questions about the machine, please call or write us at the location listed below.

Grizzly Industrial, Inc.
1203 Lycoming Mall Circle
Muncy, PA 17756
Phone: (570) 546-9663
Fax: (800) 438-5901
E-Mail: techsupport@grizzly.com

If you have any comments regarding this manual, please write to us at the address below:

Grizzly Industrial, Inc.
%o Technical Documentation Manager
P.O. Box 2069
Bellingham, WA 98227-2069
Email: manuals@grizzly.com

Functional Overview

The Model G0667X vertical mill is used to remove material from metal workpieces to form complex shapes. Tooling is inserted into the spindle of the head, which can be positioned in nearly any configuration above the table and workpiece.

During most operations, the tooling rotates in a stationary position while the operator moves the workpiece clamped to the table into the cutter in any combination of three paths—longitudinal (X-axis), cross (Y-axis), and vertical (Z-axis). The range of movement for the table is greater than that of the head and spindle. However some operations, such as drilling or tapping, are better accomplished using vertical quill (spindle) movement. There are coarse and fine manual controls for quill movement, and an auto-downfeed mechanism with adjustable speeds.

A power feed provides precision powered longitudinal table movement with adjustable limit stops for preset range of motion.

The coolant reservoir in the base of the column houses a pump that recycles the fluid back up to the workpiece, reducing friction and washing away the resulting swarf from the operation.

To enhance the already precise performance of this vertical mill, Grizzly offers a number of accessories such as digital read outs, table mounting devices, and automated drawbar systems (refer to **ACCESSORIES** on **Page 34**).



Identification

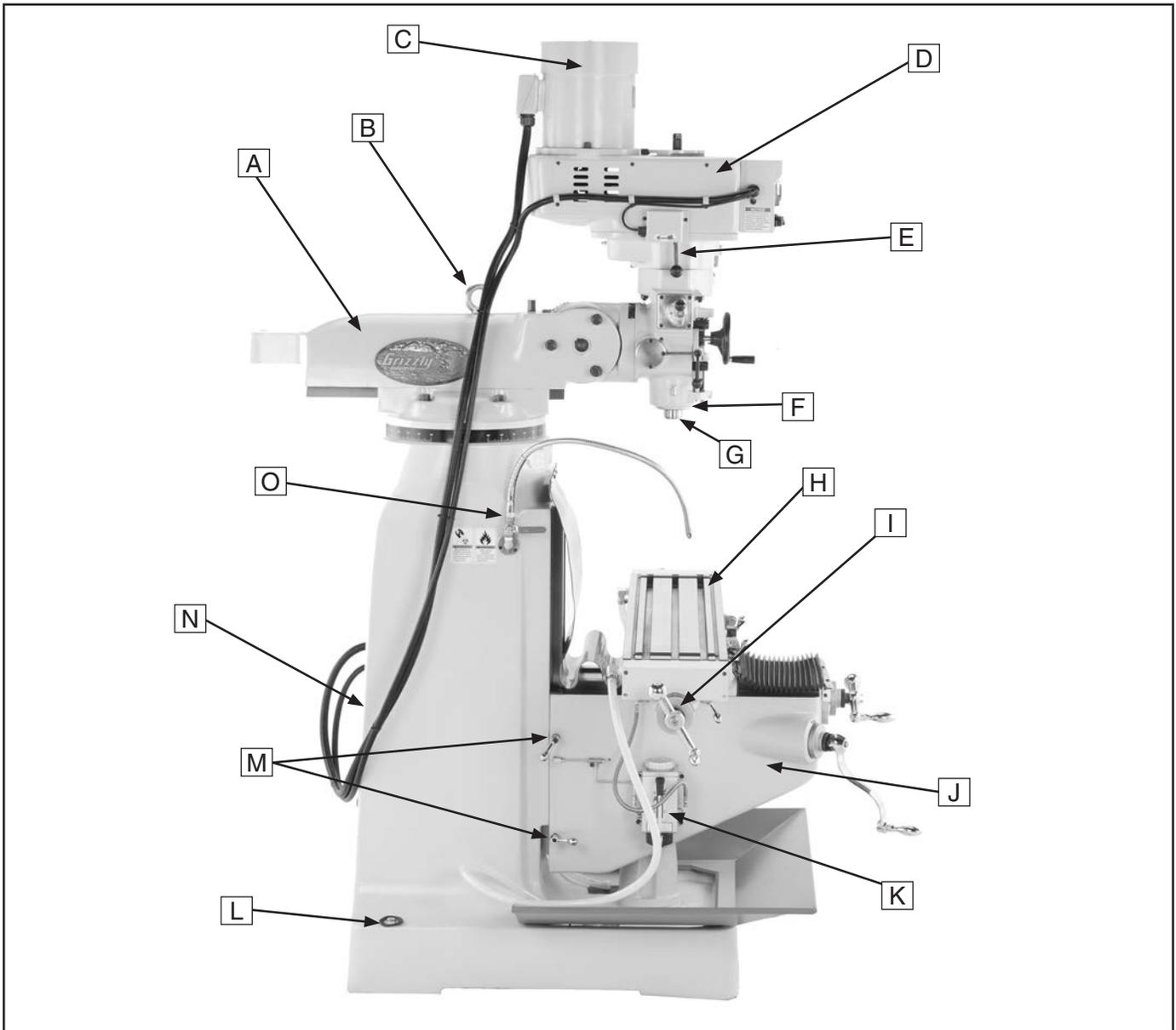


Figure 1. Left side identification.

- | | |
|-----------------------------------|--|
| A. Ram | I. Longitudinal (X-Axis) Ball Handle |
| B. Lifting Eye Bolt | J. Knee |
| C. Motor 3 HP 220V 3-Phase | K. One-Shot Oiler |
| D. Drive System | L. Machine Mounting Point (1 of 4) |
| E. Emergency Spindle Brake | M. Knee Locks |
| F. Quill | N. Coolant Pump Access Panel (Rear of Column) |
| G. Spindle | O. Coolant Nozzle and Flow Control |
| H. Table | |



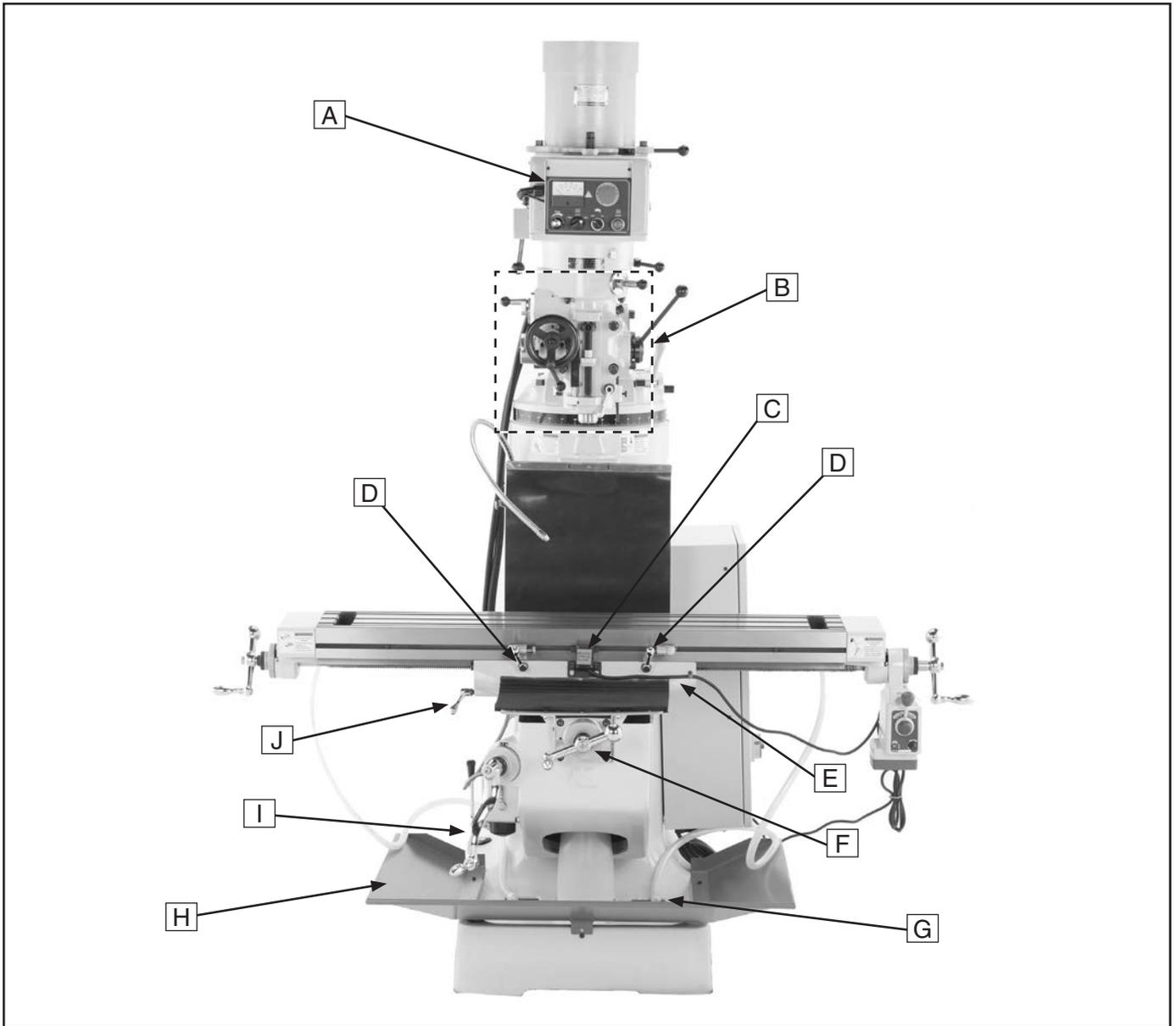


Figure 2. Front identification.

- | | |
|---|--|
| A. Control Panel (see Control Panel on Page 23 for more detail) | E. Saddle |
| B. Quill Auto-Downfeed Controls (see Fine & Auto-Downfeed Controls on Page 31 for more detail) | F. Cross Feed (Y-Axis) Ball Handle |
| C. Longitudinal Limit Switch | G. Coolant Return Hose and Reservoir Screen |
| D. Table Lock | H. Splash Pan |
| | I. Knee Crank |
| | J. Saddle Lock |



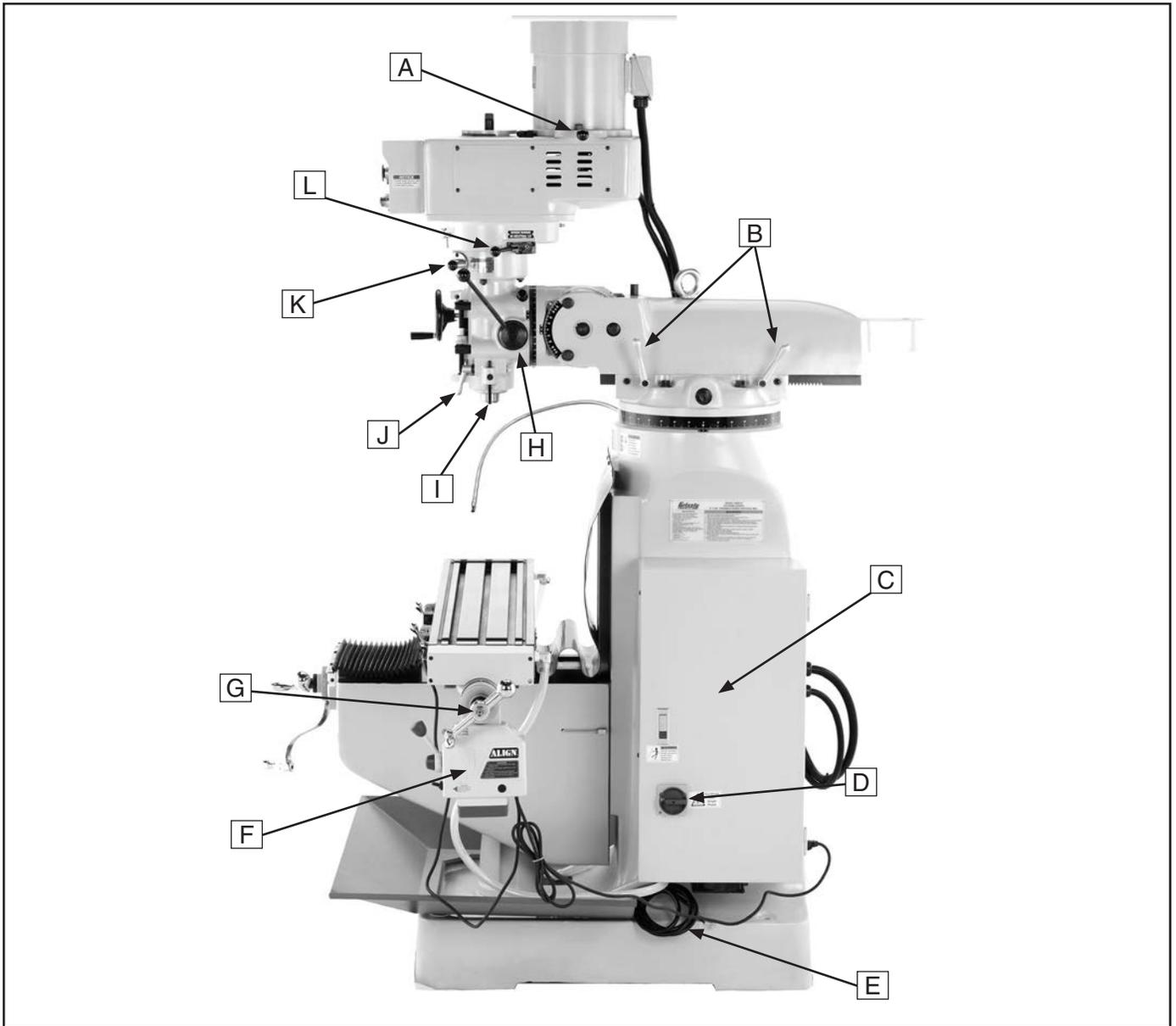


Figure 3. Right side identification.

- | | |
|--|--|
| A. Belt Tensioning Lever | G. Longitudinal Ball Handle |
| B. Ram Locks | H. Coarse Downfeed Handle |
| C. Electrical Cabinet | I. Dial Indicator Rod |
| D. Main Power Switch | J. Quill Lock |
| E. Power Cord | K. Quill Auto-Downfeed Selector |
| F. Longitudinal (X-Axis) Power Feed | L. Spindle Speed Range Selector |





MACHINE DATA SHEET

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

MODEL G0667X 9" X 48" 3 HP HIGH PRECISION VARIABLE-SPEED VERTICAL MILL

Product Dimensions:

Weight..... 2156 lbs.
 Width (side-to-side) x Depth (front-to-back) x Height..... 57 x 71 x 87-1/2 in.
 Footprint (Length x Width)..... 26 x 24 in.
 Space Required for Full Range of Movement (Width x Depth)..... 98-1/2 x 66-1/2 in.

Shipping Dimensions:

Type..... Wood Crate
 Content..... Machine
 Weight..... 2352 lbs.
 Length x Width x Height..... 54 x 59 x 74 in.
 Must Ship Upright..... Yes

Electrical:

Power Requirement..... 220V, Single-Phase, 60 Hz
 Prewired Voltage..... 220V
 Full-Load Current Rating..... 9.8A
 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..... 6-15
 Switch Type..... Control Panel w/Magnetic Switch Protection
 Inverter (VFD) Type..... Yaskawa V1000
 Inverter (VFD) Size..... 5 HP

Motors:

Main

Horsepower..... 3 HP
 Phase..... 3-Phase
 Amps..... 8.5A
 Speed..... 1725 RPM
 Type..... TEFC Induction
 Power Transfer Belt Drive
 Bearings..... Sealed & Permanently Lubricated
 Centrifugal Switch/Contacts Type..... N/A

Coolant Pump

Horsepower..... 1/8 HP
 Phase..... Single-Phase
 Amps..... 0.5A
 Speed..... 3450 RPM
 Type..... TEFC Capacitor-Start Induction
 Power Transfer Direct Drive
 Bearings..... Sealed & Permanently Lubricated
 Centrifugal Switch/Contacts Type..... N/A



Feed

Horsepower.....	1/10 HP
Phase.....	Single-Phase
Amps.....	0.8A
Speed.....	0 – 200 RPM
Type.....	Universal
Power Transfer	Direct Drive
Bearings.....	Shielded & Permanently Lubricated
Centrifugal Switch/Contacts Type.....	N/A

Main Specifications:

Operation Info

Spindle Travel.....	5 in.
Max Distance Spindle to Column.....	19 in.
Max Distance Spindle to Table.....	18 in.
Longitudinal Table Travel (X-Axis).....	29 in.
Cross Table Travel (Y-Axis).....	12 in.
Vertical Table Travel (Z-Axis).....	16 in.
Ram Travel.....	13 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 in.
Drilling Capacity for Steel.....	3/4 in.
End Milling Capacity.....	1 in.
Face Milling Capacity.....	4 in.

Table Info

Table Length.....	48 in.
Table Width.....	9 in.
Table Thickness.....	1-3/4 in.
Number of T-Slots.....	3
T-Slot Size.....	5/8 in.
T-Slots Centers.....	2-1/2 in.
Number of Longitudinal Feeds.....	Variable
X-Axis Table Power Feed Rate.....	0 – 2-5/8 FPM
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 – 5000 RPM
Quill Diameter.....	3.375 in.
Quill Feed Rates.....	0.0015, 0.003, 0.006 in./rev.
Drawbar Thread Size.....	7/16-20
Drawbar Length.....	18-1/2 in.
Spindle Bearings.....	Angular Contact P4 (ABEC-7)

Construction

Spindle Housing/Quill.....	Cast Iron
Table.....	Hardened & Precision-Ground Cast Iron
Head.....	Meehanite Cast Iron
Column/Base.....	Meehanite Cast Iron
Base.....	Cast Iron
Paint Type/Finish.....	Urethane



Lead Screw Info

Lead Screw Diameter..... 1.25 in.
Lead Screw TPI.....5
Lead Screw Length..... 64 in.

Construction

Spindle Housing Const..... Cast Iron
Table Const..... Hardened and Precision Ground Cast Iron
Head Const..... Meehanite Cast Iron
Column Const..... Meehanite Cast Iron
Base Const..... Meehanite Cast Iron
Paint..... Urethane

Other

Collars Calibrated..... 0.220 in./rev.

Other Specifications:

Country Of Origin Taiwan
Warranty 1 Year
Serial Number Location ID Label on Ride Side of Column
Assembly Time 2 hours

Features:

- Built-In Single Phase to 3 Phase Power Inverter
- One-Shot Pump Table Lubrication
- Auto Down Feed
- Auto Stop with Micro Adjustable Stop
- Longitudinal Power Feed with 550 In./Lbs. Of Torque
- Spindle & Headstock Components Dynamically Balanced for Precision Milling
- Built-In Coolant System
- Heavy-Duty Spindle Brake
- High Precision Spindle w/P4 Class Angular Contact Ball Bearings
- Double-Bronzed Nut on X & Y Leadscrews for Ultra-Smooth Movement w/Minimal Backlash



SECTION 1: SAFETY

WARNING

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.



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.

WARNING

Safety Instructions for Machinery

- 1. READ ENTIRE MANUAL BEFORE STARTING.** Operating machine before reading the manual greatly increases the risk of injury.
- 2. ALWAYS USE ANSI APPROVED SAFETY GLASSES WHEN OPERATING MACHINERY.** Everyday eyeglasses only have impact resistant lenses—they are NOT safety glasses.
- 3. ALWAYS WEAR A NIOSH APPROVED RESPIRATOR WHEN OPERATING MACHINERY THAT PRODUCES DUST.** Most types of dust (wood, metal, etc.) can cause severe respiratory illnesses.
- 4. ALWAYS USE HEARING PROTECTION WHEN OPERATING MACHINERY.** Machinery noise can cause permanent hearing loss.
- 5. WEAR PROPER APPAREL. DO NOT** wear loose clothing, gloves, neckties, rings, or jewelry that can catch in moving parts. Wear protective hair covering to contain long hair and wear non-slip footwear.
- 6. NEVER OPERATE MACHINERY WHEN TIRED OR UNDER THE INFLUENCE OF DRUGS OR ALCOHOL.** Be mentally alert at all times when running machinery.



WARNING

Safety Instructions for Machinery

7. **ONLY ALLOW TRAINED AND PROPERLY SUPERVISED PERSONNEL TO OPERATE MACHINERY.** Make sure operation instructions are safe and clearly understood.
8. **KEEP CHILDREN/VISITORS AWAY.** Keep all children and visitors away from machinery. When machine is not in use, disconnect it from power, lock it out, or disable the switch to make it difficult for unauthorized people to start the machine.
9. **UNATTENDED OPERATION.** Leaving machine unattended while its running greatly increases the risk of an accident or property damage. Turn machine **OFF** and allow all moving parts to come to a complete stop before walking away.
10. **DO NOT USE IN DANGEROUS ENVIRONMENTS.** DO NOT use machinery in damp, wet locations, or where any flammable or noxious fumes may exist.
11. **KEEP WORK AREA CLEAN AND WELL LIGHTED.** Clutter and dark shadows may cause accidents.
12. **USE A GROUNDED POWER SUPPLY RATED FOR THE MACHINE AMPERAGE.** Grounded cords minimize shock hazards. Operating machine on an incorrect size of circuit increases risk of fire.
13. **ALWAYS DISCONNECT FROM POWER SOURCE BEFORE SERVICING MACHINERY.** Make sure switch is in OFF position before reconnecting.
14. **MAINTAIN MACHINERY WITH CARE.** Keep blades sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
15. **MAKE SURE GUARDS ARE IN PLACE AND WORK CORRECTLY BEFORE USING MACHINERY.**
16. **REMOVE CHUCK KEYS OR ADJUSTING TOOLS.** Make a habit of never leaving chuck keys or other adjustment tools in/on the machine—especially near spindles!
17. **DAMAGED MACHINERY.** Check for binding or misaligned parts, broken parts, loose bolts, other conditions that may impair machine operation. Always repair or replace damaged parts before operation.
18. **DO NOT FORCE MACHINERY.** Work at the speed for which the machine or accessory was designed.
19. **SECURE WORKPIECE.** Use clamps or a vise to hold the workpiece when practical. A secured workpiece protects your hands and frees both hands to operate the machine.
20. **DO NOT OVERREACH.** Maintain stability and balance at all times when operating machine.
21. **MANY MACHINES CAN EJECT WORKPIECES TOWARD OPERATOR.** Know and avoid conditions that cause the workpiece to "kickback."
22. **STABLE MACHINE.** Machines that move during operations greatly increase the risk of injury and loss of control. Verify machines are stable/secure and mobile bases (if used) are locked before starting.
23. **CERTAIN DUST MAY BE HAZARDOUS** to the respiratory systems of people and animals, especially fine dust. Be aware of the type of dust you are exposed to and always wear a respirator designed to filter that type of dust.
24. **EXPERIENCING DIFFICULTIES.** If at any time you are experiencing difficulties performing the intended operation, stop using the machine! Contact our Technical Support Department at (570) 546-9663.



WARNING

Additional Safety Instructions For Mills

- 1. UNDERSTANDING CONTROLS.** Make sure you understand the use and operation of all controls.
- 2. SAFETY ACCESSORIES.** Always use a chip guard in addition to your safety glasses or use a face shield when milling to reduce the risk of injury from flying chips.
- 3. WORK HOLDING.** Before starting the machine, be certain the workpiece has been properly clamped to the table. NEVER hold the workpiece by hand during operation.
- 4. CHUCK KEY SAFETY.** Always remove chuck key, drawbar wrench, and any service tools immediately after use.
- 5. SPINDLE SPEEDS.** Select the spindle speed that is appropriate for the type of work and material. Allow the mill to gain full speed before beginning a cut.
- 6. POWER DISRUPTION.** In the event of a local power outage during operation, turn **OFF** all switches to avoid possible sudden start up once power is restored.
- 7. STOPPING SPINDLE.** DO NOT stop the spindle using your hand. Allow the spindle to stop on its own, or, in the case of an emergency, use the spindle brake.
- 8. CLEAN-UP.** DO NOT clear chips by hand or compressed air. Use a brush or vacuum, and never clear chips while the spindle is turning.
- 9. BE ATTENTIVE.** DO NOT leave mill running unattended for any reason.
- 10. MACHINE CARE AND MAINTENANCE.** Never operate the mill with damaged or worn parts. Maintain your mill in proper working condition. Perform routine inspections and maintenance promptly. Put away adjustment tools after use.
- 11. DISCONNECT POWER.** Make sure the mill is turned **OFF**, disconnected from its power source and all moving parts have come to a complete stop before changing cutting tools, starting any inspection, adjustment, or maintenance procedure.
- 12. AVOIDING ENTANGLEMENT.** DO NOT wear loose clothing, gloves, or jewelry when operating mill. Tie back long hair and roll up sleeves.
- 13. TOOLING.** Always use the proper tooling for your operation. Make sure tooling is held firmly in place.
- 14. CUTTING TOOL INSPECTION.** Inspect drills and end mills for sharpness, chips, or cracks before each use. Replace dull, chipped, or cracked cutting tools immediately. Handle new cutting tools with care. Leading edges are very sharp and can cause lacerations.
- 15. SPINDLE DIRECTION CHANGES.** To avoid damage to the gears, never reverse spindle direction while the spindle is in motion.
- 16. EXPERIENCING DIFFICULTIES.** If at any time you are experiencing difficulties performing the intended operation, stop using the machine! Contact our Technical Support at (570) 546-9663.

WARNING

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



SECTION 2: CIRCUIT REQUIREMENTS

220V Operation

!WARNING

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



!WARNING

Electrocution or fire could result if machine is not grounded and installed in compliance with electrical codes. Compliance **MUST** be verified by a qualified electrician!

NOTICE

The Model G0667X uses a 5 HP Yasakawa frequency drive to convert incoming single-phase power to 3-phase power for greater spindle motor performance.

Full Load Amperage Draw

This machine draws the following amps under maximum load:

Amp Draw..... 9 Amps

Power Supply Circuit Requirements

You **MUST** connect your machine to a grounded circuit that is rated for the amperage given below. Never replace a circuit breaker on an existing circuit with one of higher amperage without consulting a qualified electrician to ensure compliance with wiring codes. **If you are unsure about the wiring codes in your area or you plan to connect your machine to a shared circuit, consult a qualified electrician.**

Minimum Circuit Size..... 15 Amps

Power Connection Device

The type of plug required to connect your machine to power depends on the type of service you currently have or plan to install. We recommend using the plug shown in **Figure 4**.

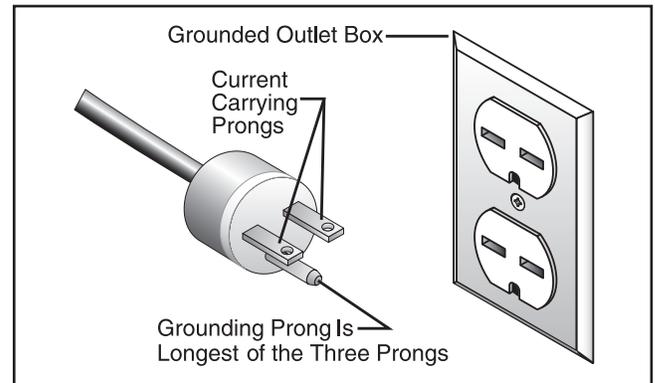


Figure 4. NEMA 6-15 plug and receptacle.

Extension Cords

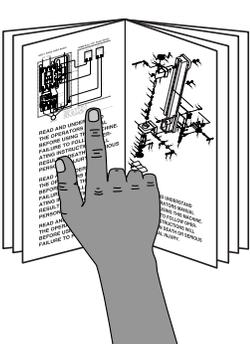
Using extension cords may reduce the life of the motor. Instead, place the machine near a power source. If you must use an extension cord:

- Use at least a 14 gauge cord that does not exceed 50 feet in length!
- The extension cord must also have a ground wire and plug pin.
- A qualified electrician **MUST** size cords over 50 feet long to prevent motor damage.



SECTION 3: SETUP

Setup Safety



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



!WARNING
 Wear safety glasses during the entire setup process!



!WARNING
 This machine and its components are very heavy. Get lifting help or use power lifting equipment such as a forklift to move heavy items.

Items Needed for Setup

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

Description	Qty
• Assistants	At Least 2
• Safety Glasses	1 for Each Person
• Precision Level	1
• Teflon Tape	As Needed
• Adjustable Wrench	1
• Safety Hook and Chain or Lifting Straps (rated for at least 3000 lbs.)	1
• Power Lifting Equipment (rated for at least 3000 lbs.)	1
• Floor Mounting Hardware	As Needed

Unpacking

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

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

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



!WARNING
SUFFOCATION HAZARD!
 Immediately discard all plastic bags and packing materials to eliminate choking/suffocation hazards for children and animals.



Inventory

The following is a description of the main components shipped with your machine. Lay the components out to inventory them.

Note: *If you can't find an item on this list, check the mounting location on the machine or examine the packaging materials carefully. Occasionally we pre-install certain components for shipping purposes.*

Inventory: (Figure 5)	Qty
A. Splash Pan.....	1
B. Coolant Return Hoses w/ Clamps.....	2
C. Rear Way Cover.....	1
D. Knee Crank.....	1
E. Fine Downfeed Handwheel.....	1
F. Coarse Downfeed Handle.....	1
G. Drawbar w/Spacer.....	1
H. Front Way Cover.....	1
I. Toolbox.....	1
J. Lubrication Squeeze Bottle.....	1
K. Touch-Up Paint.....	1
L. Coolant Hose Elbow Connections.....	2
M. Ball Handle Assemblies.....	3
N. Closed-End Wrench 19/21mm.....	1
O. Open-End Wrench 12/14mm.....	1
P. Power Feed Operation Manual.....	1
Q. Frequency Drive Instruction Manual.....	1
R. Hex Wrench Set 1.5-10mm.....	1
S. Screwdrivers Phillips, Slot.....	1 Each

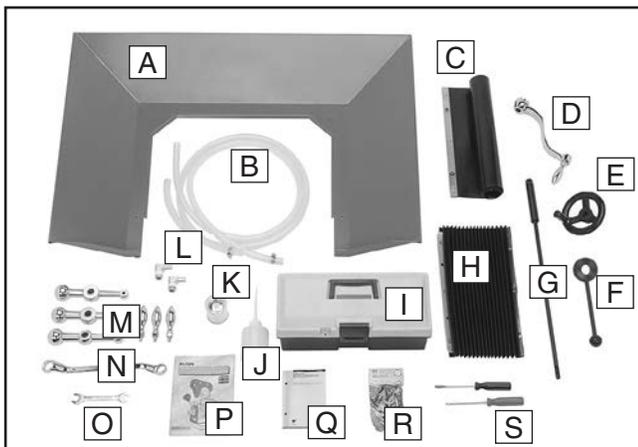
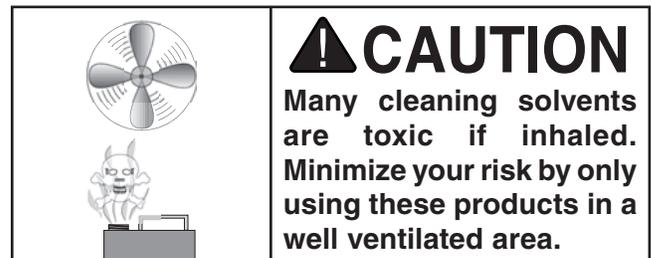


Figure 5. Model G0667X inventory.

If any nonproprietary 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.

Clean Up

The unpainted surfaces are coated with a waxy oil to prevent corrosion during shipment. Remove this protective coating with a solvent cleaner or degreaser shown in **Figure 6**. For thorough cleaning, some parts must be removed. **For optimum performance from your machine, clean all moving parts or sliding contact surfaces.** Avoid chlorine-based solvents, such as acetone or brake parts cleaner that may damage painted surfaces. Always follow the manufacturer's instructions when using any type of cleaning product.



G2544—Solvent Cleaner & Degreaser

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



Figure 6. Cleaner/degreaser available from Grizzly.



Site Considerations

Floor Load

Refer to the **Machine Data Sheet** on **Page 6** for the weight and footprint specifications of your machine. Some floors may require additional reinforcement to support both the machine and operator.

Placement Location

Consider existing and anticipated needs, size of material to be processed through each machine, and space for auxiliary stands, work tables or other machinery when establishing a location for your new machine. See **Figure 7** for the minimum working clearances.

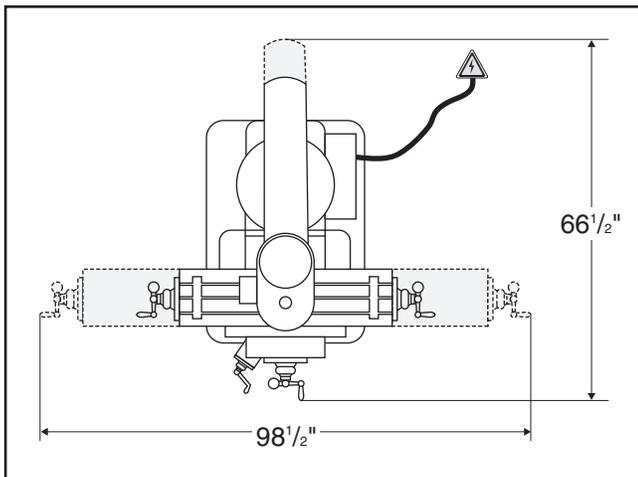
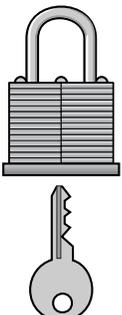
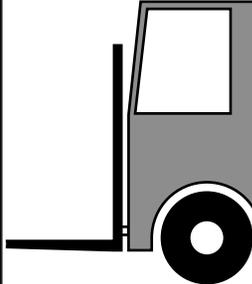


Figure 7. Minimum working clearances.

	<p>⚠ CAUTION</p> <p>Children and visitors may be seriously injured if unsupervised around this machine. Lock entrances to the shop or disable start switch or power connection to prevent unsupervised use.</p>
---	--

Moving & Placing Base Unit

	<p>⚠ WARNING</p> <p>The Model G0667X is a heavy machine. Serious personal injury may occur if safe moving methods are not used. To be safe, get assistance and use power equipment to move the shipping crate and remove the machine from the crate.</p>
--	---

The two methods of lifting and moving described below require at least two assistants, and power lifting equipment with a safety hook and chain or lifting straps rated for at least 3000 lbs.

Using the Lifting Eye Bolt

1. Keep the headstock in the same position it was shipped in, similar to **Figure 8**.

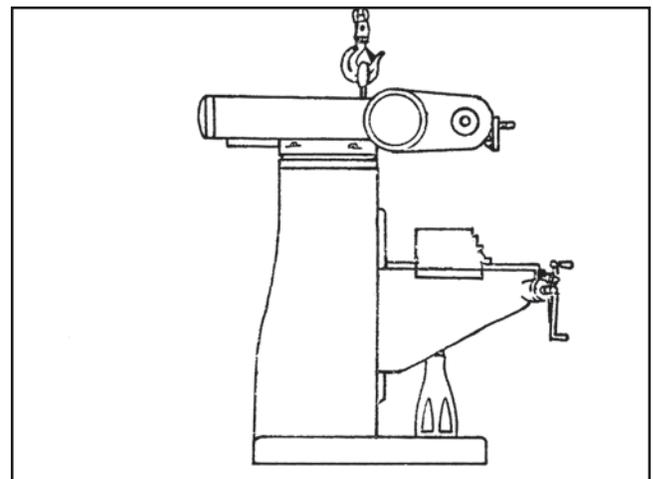


Figure 8. Using the eye bolt to lift the mill.



2. Move the ram until the eye bolt is aligned with the front edge of the column, then lock the ram in place (refer to **Ram Movement** on **Page 27** for detailed instructions).

3. Attach the safety hook to the lifting eye bolt, then lift the mill slowly to make sure the hook is secure and the mill is lifting evenly. Lift the mill only enough to clear the shipping pallet and floor obstacles.

—If the mill tips in one direction, lower the mill to the ground, then adjust the ram or table to balance the weight. Re-tighten all locks before lifting the mill again.

—If the mill lifts evenly, move it to its permanent location.

Note: Have your assistants steady the load as you move it to keep it from swinging.

Using Lifting Straps

1. Position the head in an upright position, swivel the ram 180°, as shown in **Figure 9**, then lock it in place (refer to **Head Movement** on **Page 26** and **Ram Movement** on **Page 27** for detailed instructions).

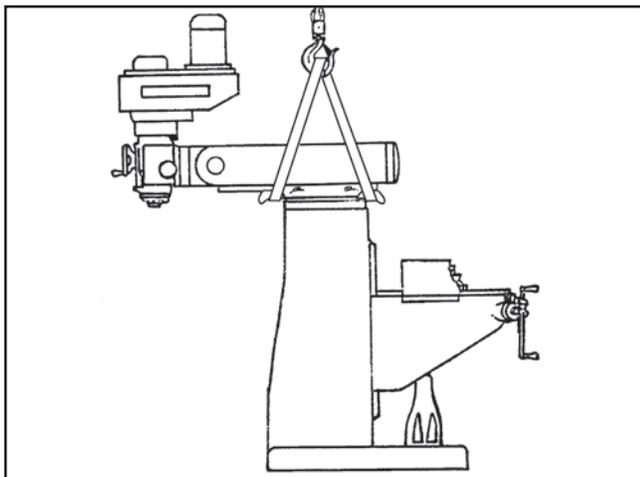


Figure 9. Using lifting straps to lift the mill.

2. Position the lifting straps under the ram, as shown in **Figure 9**, with padding between the straps and the mill to protect the ram way.

3. Lift the mill slowly to make sure the hook and lifting straps are secure and the mill is lifting evenly. Lift the mill only enough to clear the shipping pallet and floor obstacles.

—If the mill tips in one direction, lower the mill to the ground, then adjust the ram or table to balance the weight. Re-tighten all locks before lifting the mill again.

—If the mill lifts evenly, move it to its permanent location.

Note: Have your assistants steady the load as you move it to keep it from swinging.

⚠WARNING

Only use lifting safety hook, chain or lifting straps, and power lifting equipment rated for at least 3000 lbs. and in good working condition. Only raise the mill enough to clear shipping pallet and floor obstacles. If the mill falls or tips over while moving it, serious personal injury and property damage could result.



Mounting to Shop Floor

Although not required, we recommend that you mount your new machine to the floor. Because this is an optional step and floor materials may vary, floor mounting hardware is not included. Generally, you can either bolt your machine to the floor or mount it on machine mounts. Both options are described below. Whichever option you choose, it is necessary to level your machine with a precision level.

Bolting to Concrete Floors

Lag shield anchors with lag bolts and anchor studs (**Figure 10**) 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.

NOTICE

Anchor studs are stronger and more permanent alternatives to lag shield anchors; however, they will stick out of the floor, which may cause a tripping hazard if you decide to move your machine.

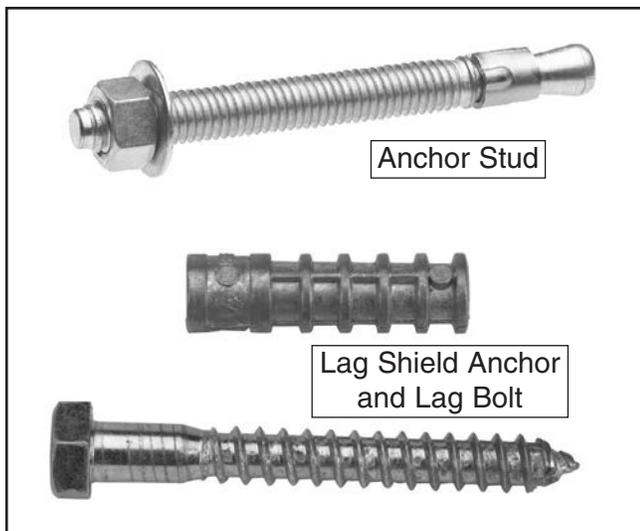


Figure 10. Typical fasteners for mounting to concrete floors.

Using Machine Mounts

Using machine mounts, shown in **Figure 11**, gives 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 11. Machine mount example.

NOTICE

We strongly recommend securing your machine to the floor if it is hardwired to the power source. Consult with your electrician to ensure compliance with local codes.



Assembly

To assemble the machine:

1. Rotate the head to an upright position (refer to **Head Movement** on **Page 26** for detailed instructions).
2. Thread the handles into the ball handles, then fully tighten them.

Note: There are two ball handle assemblies with a spring-loaded bushing—these are mounted on either end of the table leadscrew. The remaining ball handle assembly is installed on the cross feed leadscrew.

3. Align the key on the leadscrew with the key-way of the ball handle, slide the assembly onto the leadscrew, then secure it in place with the hex nut (see **Figure 12**).



Figure 12. Ball handle assembly installed on the leadscrew.

4. Remove the five button-head cap screws shown in **Figure 13** from the saddle and knee, position the front way cover in place, then secure it with the cap screws.



Figure 13. Front way cover installed.

5. Remove the four button-head cap screws shown in **Figure 14** from the column and the rear of the table, position the rear way cover in place, then secure it with the cap screws.

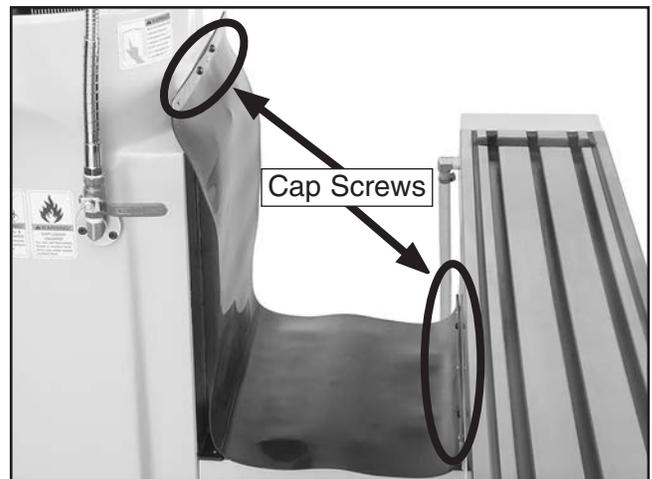


Figure 14. Rear way cover installed.



6. Remove the cap screws on the rim of the base, position the splash pan in place, and secure it with the cap screws (see **Figure 15**).

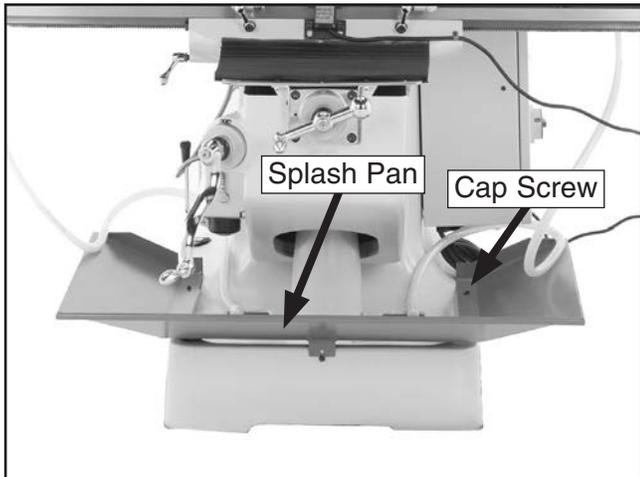


Figure 15. Splash pan installed.

7. Wrap the threads of the hose elbow connectors with Teflon tape, then thread them into holes located on either side of the table (see **Figure 16**).

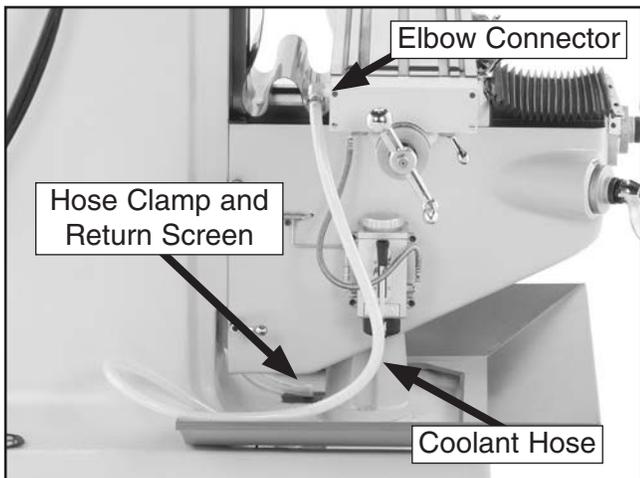


Figure 16. Coolant return hose installed.

8. Loosen the hose clamp, push the hose onto the elbow connector, then tighten the hose clamp around the hose and elbow connector.

Note: Tug the hose to make sure that it is firmly attached to the connector.

9. Insert the other end of the fluid return hose into the hose clamp mounted on the coolant return screen (see **Figure 16**).



Test Run

Once the assembly is complete, test run your machine to make sure it runs properly and is ready for regular operation.

The test run consists of verifying the following: 1) The motor powers up and runs correctly, 2) the emergency stop button safety feature works correctly, 3) the main power switch safety feature works correctly, and 4) emergency spindle brake works correctly.

If, during the test run, you cannot easily locate the source of an unusual noise or vibration, stop using the machine immediately, then review **Troubleshooting on Page 42**.

If you still cannot remedy a problem, contact our Tech Support at (570) 546-9663 for assistance.

!WARNING

Before starting the mill, make sure you have performed the preceding assembly and adjustment instructions, and you have read through the rest of the manual and are familiar with the various functions and safety features on this machine. Failure to follow this warning could result in serious personal injury or even death!

To test run the machine:

1. Make sure you understand the safety instructions at the beginning of the manual and that the machine is setup properly.
2. Make sure all tools and objects used during setup are cleared away from the machine.
3. Lubricate the mill, as explained in **Lubrication on Page 37**.
4. Fill the coolant reservoir (refer to **Coolant Reservoir on Page 39** for detailed instructions).
5. Connect the machine to the power source.
6. Make sure the electrical cabinet door is latched shut, then rotate the main power switch to the **ON** position (see **Figure 17**).
7. Push the emergency stop button in, then twist it clockwise so it pops out. When the emergency stop button pops out, the switch is reset and ready for operation (see **Figure 18**).
8. Rotate the spindle speed dial all the way to the left.
9. Push the motor start button in, then turn the spindle direction switch to FWD or REV to start the spindle rotating.
10. Test the variable speed dial by turning the speed all the way up for a few seconds, then all the way down.

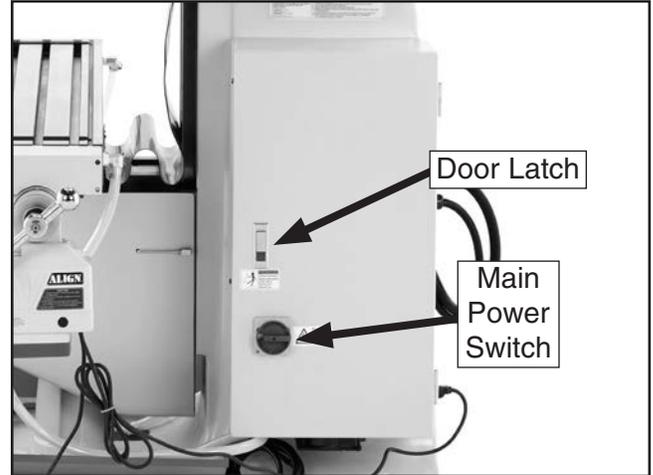


Figure 17. Electrical cabinet door latch and main power switch.

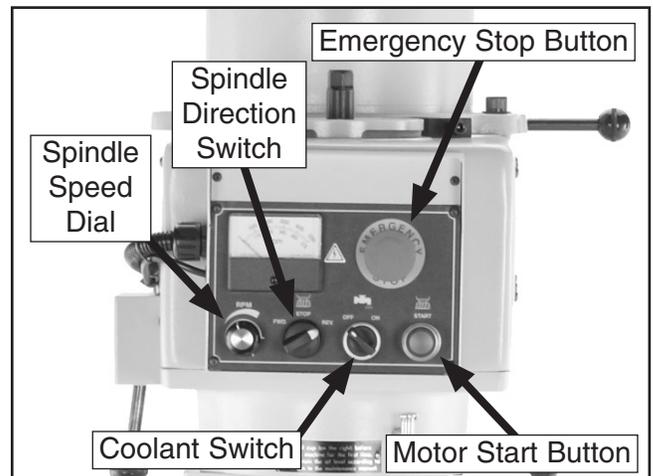


Figure 18. Control panel.



11. Verify that the machine is operating correctly.

—When operating correctly, the machine runs smoothly with little or no vibration or rubbing noises.

—Investigate and correct strange or unusual noises or vibrations before operating the machine further. Always stop the machine and disconnect it from power before investigating or correcting potential problems.

12. Press the emergency stop button to turn the machine **OFF**, then wait for the spindle to stop on its own.

13. WITHOUT resetting the emergency stop button, press the motor start button. The machine should not start.

—If the machine does not start, the emergency stop button safety feature is working correctly.

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

14. Reset the emergency stop button, turn the main power switch on the electrical cabinet door to **OFF**, then press the motor start button.

—If the machine does not start, the main power switch safety feature is working correctly.

—If the machine does start (with the main power switch turned to **OFF**), immediately disconnect power to the machine. The main power switch safety feature is not working correctly. This safety feature must work properly before proceeding with regular operations. Call Tech Support for help.

15. Turn the main power switch to **ON**, start the spindle rotating, then push the emergency spindle brake (see **Figure 19**).

—If the machine turns **OFF** and the spindle stops, the emergency spindle brake is working properly.

—If the machine does not turn **OFF** or the spindle does not stop, immediately disconnect power to the machine. The emergency spindle brake safety feature is not working correctly. This safety feature must work properly before proceeding with regular operations. Call Tech Support for help.



Figure 19. Emergency spindle brake.

16. Point the coolant nozzle onto the table, turn the coolant switch to **ON**, then use the valve lever at the base of the nozzle hose to check for proper operation of the coolant system.

When all of the procedures of the **Test Run** are completed successfully, your mill is ready for the **Spindle Break-In** procedure.

⚠️ WARNING

Continuous operation of this mill without properly and successfully completing all procedures of the *Test Run* could lead to personal injury or machine damage, and could void the warranty.



Spindle Break-In

NOTICE

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

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

To perform the spindle break-in procedure:

1. Make sure the mill is turned **OFF** and the spindle is stopped.
2. Move the spindle speed range selector to the LOW position (refer to **Selecting Spindle Speed Range** on **Page 29** for detailed instructions).
3. Turn the machine **ON**, use the spindle direction selector to start the spindle rotating, then adjust the spindle speed dial for a speed of approximately 280 RPM.
4. Let the mill run at this speed for 20 minutes, then turn the mill **OFF** and wait for the spindle to stop.
5. Move the spindle speed range selector to the HIGH position, then turn the machine and spindle **ON**.
6. Set the spindle speed at approximately 2500 RPM, then let the mill run for 20 minutes.
7. Turn the mill **OFF**. The spindle break-in is now complete and your mill is ready for operation.

Recommended Adjustments

For your convenience, the adjustments listed below have been performed at the factory.

However, because of the many variables involved with shipping, we recommend that you at least verify the following adjustments to ensure the best possible results from your new machine.

Step-by-step instructions for these adjustments can be found in the **SERVICE** section starting on **Page 42**.

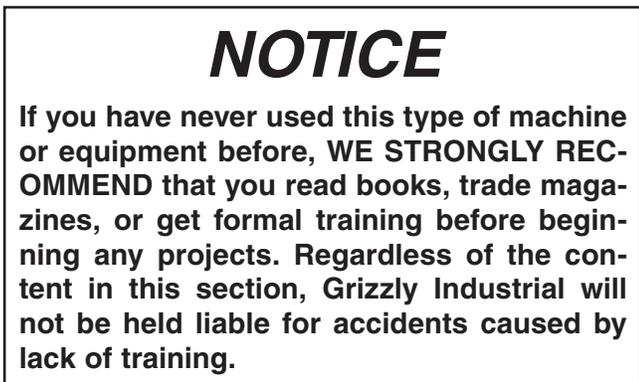
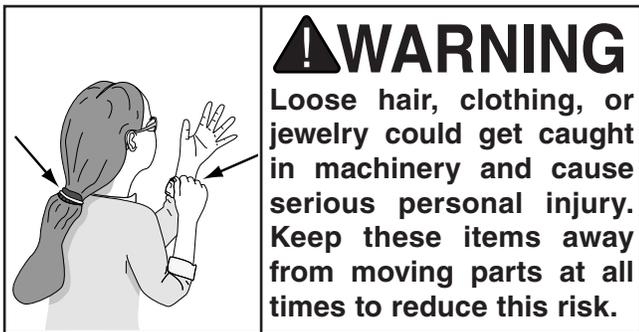
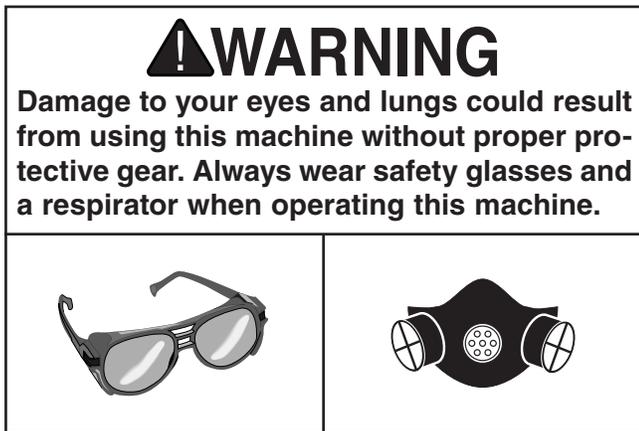
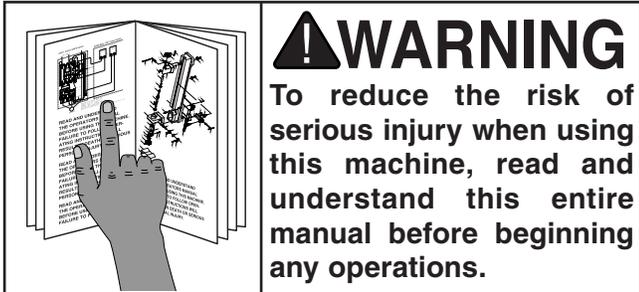
Factory adjustments that should be verified:

1. Gib adjustment (**Page 45**).
2. Leadscrew backlash adjustment (**Page 46**).



SECTION 4: OPERATIONS

Operation Safety



Control Panel

Refer to **Figure 20** and the descriptions below to understand the different functions of the control panel.

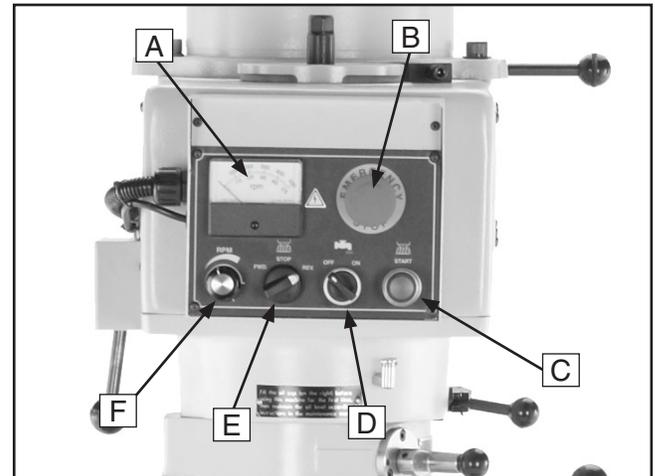


Figure 20. Control panel identification.

- A. Spindle Speed Readout:** Displays the spindle speed—top numbers are for the high speed range, and the bottom numbers are for the low speed range.
- B. Emergency Stop Button:** Disconnects power to the spindle and coolant pump motors. This button DOES NOT disconnect the machine from power.
- C. Motor Start Button:** Starts the spindle motor only—use the spindle direction selector to start spindle rotation.
- D. Coolant Switch:** Turns the coolant pump ON/OFF.
- E. Spindle Direction Switch:** Starts spindle rotation, changes spindle direction, and stops spindle rotation.
- F. Spindle Speed Dial:** Controls the variable speed of the spindle.



Table Movement

The mill table has three paths of movement (see **Figure 21**): 1) Longitudinal (X-axis) controlled by ball handles and the power feed, 2) cross feed (Y-axis) controlled by a ball handle, and 3) vertical (Z-axis) controlled by the knee crank.

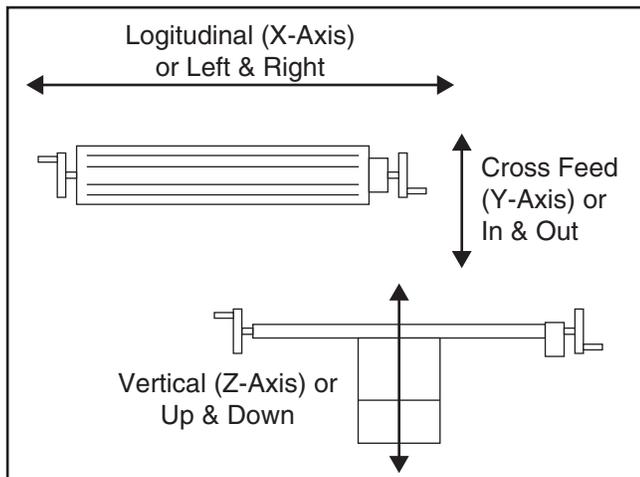


Figure 21. The three paths of the mill table movement.

The increments of the graduated dials above the longitudinal and cross feed ball handles are 0.001". The table moves 0.200" with each full revolution of the ball handles.

The graduated dial above the knee crank is in increments of 0.001", and the knee will move vertically 0.100" with each full revolution of the crank.

⚠ CAUTION

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

Use the table, saddle, and knee locks shown in **Figures 22–23** to secure the table position.

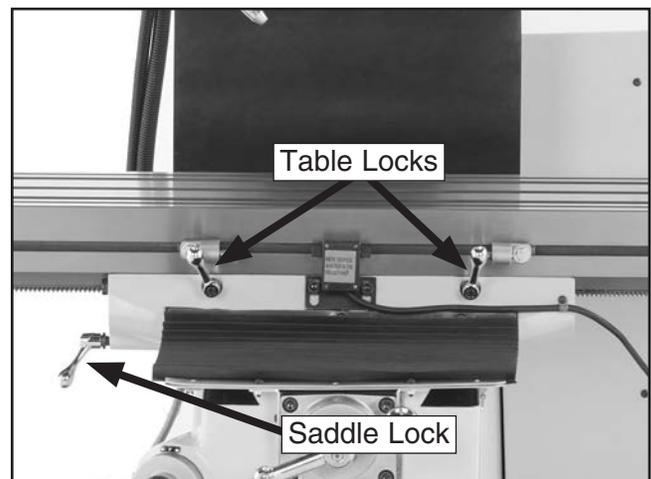


Figure 22. Table and saddle locks.

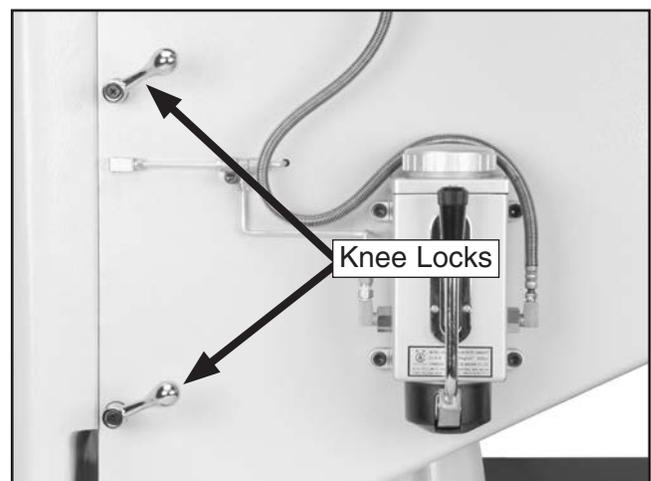


Figure 23. Knee locks.



Longitudinal Power Feed System

Your mill is equipped with a longitudinal power feed and limit switch for controlled X-axis table movement. Refer to **Figure 24** and the descriptions below to understand the functions of these devices.

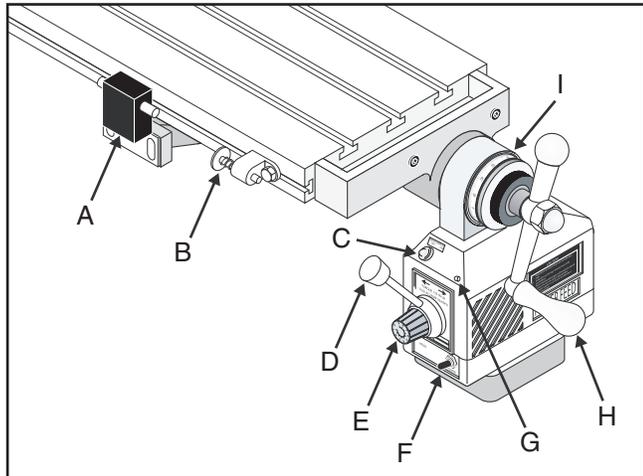


Figure 24. Longitudinal power feed system.

- A. Limit Switch:** Stops powered table movement when either limit stop presses a plunger on the switch.
- B. Limit Stop:** Activates the limit switch. Secure these devices along the table to limit longitudinal movement.
- C. Rapid Movement Button:** When pressed, moves the table at the maximum speed in the direction selected.
- D. Direction Lever:** Starts, reverses, and stops longitudinal table movement.
- E. Speed Dial:** Controls the speed that the table moves—turn the dial clockwise to increase the speed.
- F. ON/OFF Switch:** The master power switch for the power feed.
- G. Power Lamp:** Lights when the power feed is turned **ON**.
- H. Ball Handle:** Manually positions the table.
- I. Graduated Dial:** Marked in 0.001" increments, each complete revolution is equal to 0.200" of longitudinal table travel.

⚠ CAUTION

Disengage the longitudinal ball handles before turning the power feed *ON* to avoid entanglement and personal injury.

Tools Needed

Qty

Wrench or Socket 12mm 1

To operate the longitudinal power feed:

1. Disengage the longitudinal ball handles to stop them from spinning with the leadscrew.
2. Loosen the table locks (see **Figure 25**).

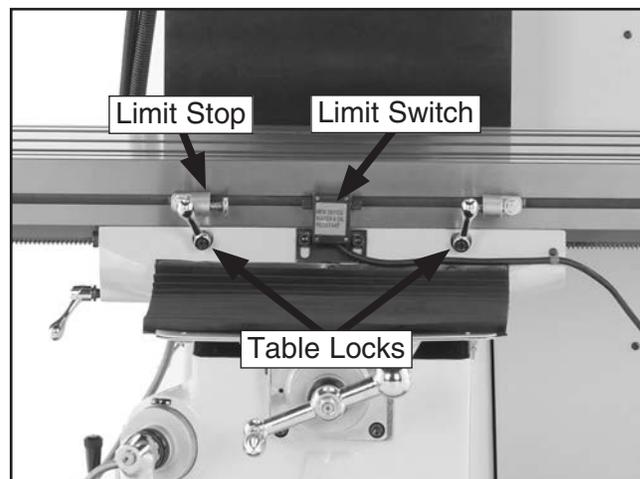


Figure 25. Table locks, limit switch, and limit stop.

3. Position the limit stops along the table to confine the longitudinal distance you want the table to travel, then tighten the hex bolts to secure them in place.
4. Move the power feed direction lever to the center or neutral position, then plug the power feed power cord into one of the 110V outlets on the back of the electrical cabinet.

⚠ CAUTION

Be sure there is enough running clearance between the table, spindle, vise/clamps, or jigs before turning the power feed *ON*. Be aware that all of these objects represent potential pinch points.



5. Rotate the speed dial all the way to the left, and use the direction lever to select the direction of table travel.
6. Flip the ON/OFF switch up to turn the power feed **ON**.
7. Adjust the speed dial to move the table at the correct speed for your operation.

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

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

Head Movement

The head tilts 45° back-and-forth, and rotates 90° from left-to-right (see **Figures 26–27**).

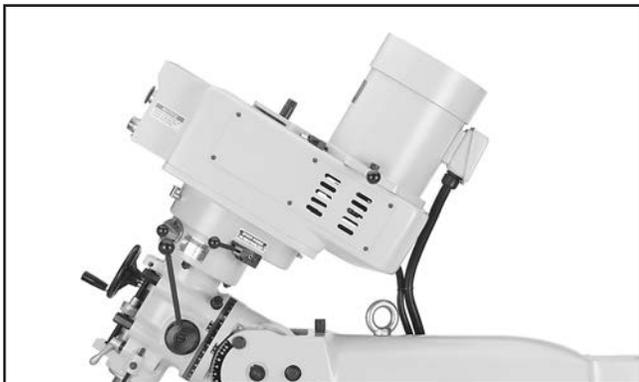


Figure 26. Head tilted 30° back.

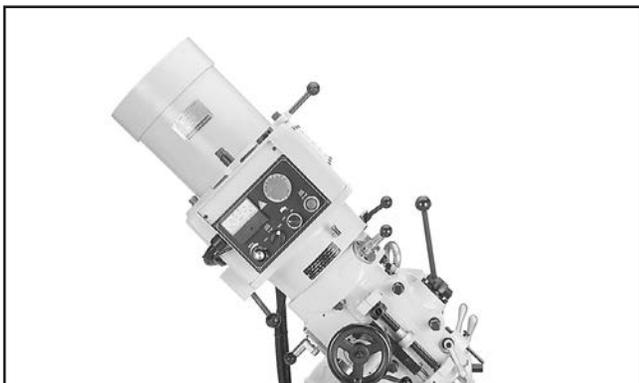


Figure 27. Head tilted 45° to the left.

Tools Needed	Qty
Wrench or Socket 19mm.....	2

Tilting Head Backward/Forward

1. DISCONNECT THE MILL FROM POWER!
2. Loosen the three tilt locking bolts shown in **Figure 28**.

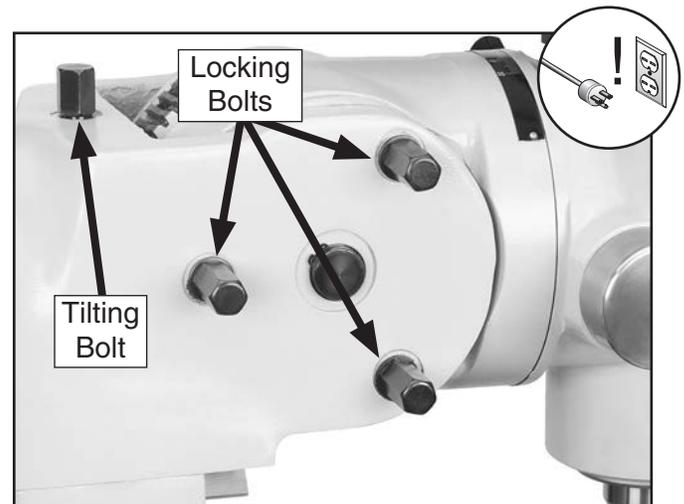


Figure 28. Head tilting bolts.

3. With one hand helping to support the weight of the head, slowly rotate the tilting bolt.

Note: Turn the tilting bolt clockwise to move the head forward and counterclockwise to tilt it back.

4. Re-tighten the locking bolts to secure the head in place.

CAUTION

Always lock the head firmly in place after adjusting the tilt or rotation. If the head unexpectedly moves during milling operations, the spinning cutter could bind with the workpiece and break apart, causing personal injury or property damage.



Rotating Head Left/Right

1. DISCONNECT THE MILL FROM POWER!
2. Loosen the four rotation locking bolts shown in **Figure 29**.

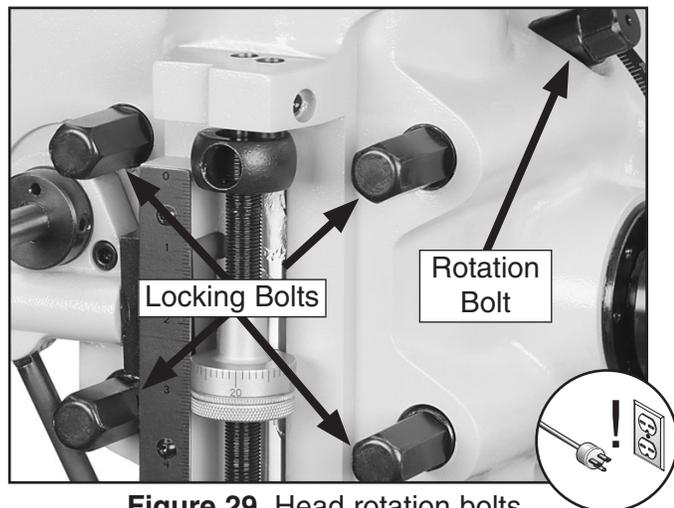


Figure 29. Head rotation bolts.

3. With one hand helping to support the weight of the head, slowly turn the rotation bolt.

Note: Turn the rotation bolt clockwise to move the head to the right and counterclockwise to move it to the left.

4. Re-tighten the locking bolts to secure the head in place.

Ram Movement

The ram moves back and forth horizontally, and rotates 360° around the column.

Tools Needed	Qty
Wrench or Socket 19mm	1

Tilting the Head Back and Forth

1. DISCONNECT THE MILL FROM POWER!
2. Loosen the two horizontal locks shown in **Figure 30**.

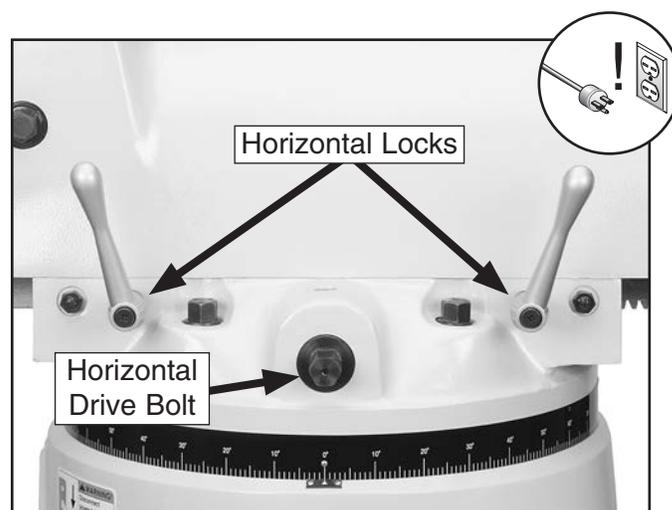


Figure 30. Ram horizontal locks and drive bolt.

3. Slowly turn the horizontal drive bolt to move the ram to the desired position.
4. Re-tighten the horizontal locks to secure the ram in place.

CAUTION

Always lock the ram firmly in place after adjusting its position. If the ram and head move unexpectedly during milling operations, the cutter could bind with the workpiece and break apart, resulting in personal injury or property damage.



Rotating the Head Left or Right

1. DISCONNECT THE MILL FROM POWER!
2. Loosen the four rotation locking bolts on top of the column shown in **Figure 31**.

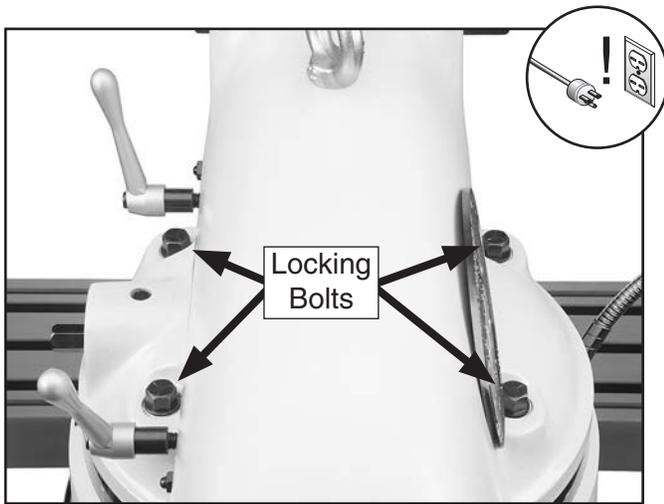


Figure 31. Ram rotation locking bolts.

3. Manually rotate the ram around the column to the desired position.

Note: Take care not to entangle or stretch the electrical cabling as you move the ram and head.

4. Re-tighten the four rotation locking bolts to hold the ram in place.

Setting Spindle RPM

To select the correct spindle RPM for your milling operation, you will need to: 1) Determine the RPM needed for your workpiece, 2) select the correct spindle speed range, and 3) configure the spindle speed controls for the calculated RPM.

Calculating RPM

1. Use the table in **Figure 32** to determine the cutting speed required for your workpiece material.

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

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

Figure 32. Cutting speed table for HSS cutting tools.



2. Measure the diameter of your cutting tool in inches.
3. Use the following formula to calculate the required RPM for your operation:

$$\frac{\text{Cutting Speed (SFM)} \times 4}{\text{Tool Diameter (in inches)}} = \text{RPM}$$

Selecting Spindle Speed Range

1. Make sure the mill is turned **OFF**, and the spindle is stopped.
2. Select the range in the chart below that includes the spindle speed that you have calculated for your workpiece.

Range	RPM
Low Range	60–575
High Range	575–5000

Figure 33. Spindle speed ranges.

NOTICE

To avoid damage to the drive system, make sure the mill is turned **OFF** and the spindle is stopped **BEFORE** you change the spindle speed range.

3. Move the spindle speed range selector to the desired position (see **Figure 34**).

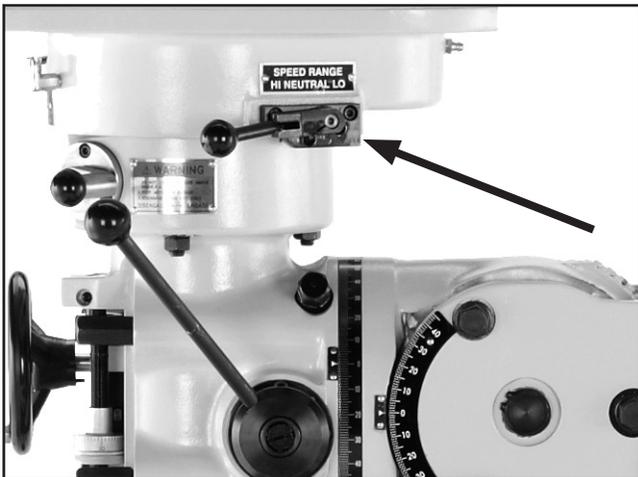


Figure 34. Spindle speed range selector in the HIGH position.

Note: You must press the selector handle in toward the head to retract the locking pin and move the handle. Make sure the locking pin is seated in the indent for the position you have chosen.

As you move the selector, it may be necessary to rotate the spindle by hand to jog and mesh the gearing.

Setting Spindle Variable Speed

1. With the spindle in motion, rotate the spindle speed dial on the control panel until the spindle has reached the desired speed as indicated by the spindle speed readout.

Note: The top numbers of the spindle speed readout are for the high speed range, and the bottom numbers are for the low speed range.

NOTICE

Always have the spindle in motion **BEFORE** using the spindle speed dial to avoid damage to the variable speed system.



Downfeed Controls

The quill downfeed movement is controlled by three mechanisms: 1) The coarse downfeed handle, 2) the fine downfeed handwheel, and 3) the quill auto-downfeed system.

Coarse Downfeed Handle

1. Turn the mill **OFF** and wait for the spindle to stop.
2. Pull the knob of the quill auto-downfeed selector out and rotate it clockwise to the forward **DISENGAGE** (manual) position (see **Figure 35**).

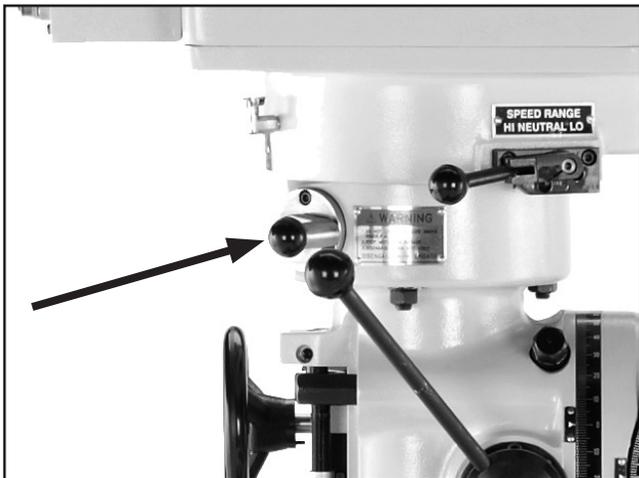


Figure 35. Quill auto-downfeed selector.

NOTICE

To avoid damage to the quill auto-downfeed gearing, always rotate the selector clockwise.

3. Align the pin in the handle hub with one of the holes in the handle base, then firmly seat the handle onto the base (see **Figure 36**).

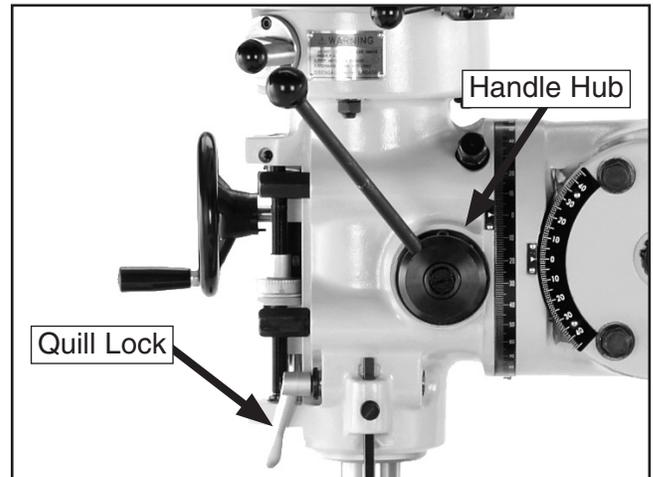


Figure 36. Coarse downfeed handle installed.

4. Make sure the quill lock is loose (see **Figure 36**), then rotate the coarse downfeed handle around its hub to control the depth of the spindle.



Fine & Auto-Downfeed Components

There are a number of devices that are used for fine downfeed and quill auto-downfeed control. Use **Figure 37** and the descriptions below to understand the functions of these devices.

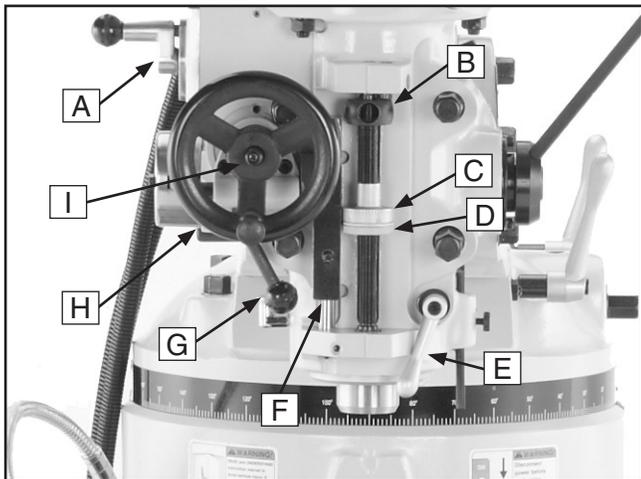


Figure 37. Fine downfeed and quill auto-downfeed system components.

- A. Auto-Downfeed Rate Selector:** Selects one of three auto-downfeed rates.
- B. Quill Dog:** As it moves with the quill, disengages the auto-downfeed clutch lever to stop or reverse quill movement.
- C. Auto-Downfeed Stop:** Sets the depth of the quill.
- D. Auto-Downfeed Stop Lock:** Locks the auto-downfeed stop in position.
- E. Quill Lock:** Locks the quill in position.
- F. Auto-Downfeed Scale:** Shows the position of the auto-downfeed stop (marked in inches).
- G. Auto-Downfeed Clutch Lever:** Engages the auto-downfeed gearing to move the quill down.
- H. Fine Downfeed Handwheel:** Moves the quill approximately $\frac{1}{30}$ of the distance that the coarse downfeed handle moves it.
- I. Auto-Downfeed Direction Pin:** Starts (in or out), stops (middle), or reverses direction of the quill when in auto-downfeed mode.

Quill Auto-Downfeed

1. Turn the mill **OFF** and wait for the spindle to stop.
2. Rotate the quill auto-downfeed selector clockwise to the rear **ENGAGE** (auto-downfeed) position.
3. Adjust the auto-downfeed stop to the desired depth, then lock it in place.

Note: The increments marked on the auto-downfeed stop represent 0.001" of quill movement, with one full revolution equal to 0.010" of quill movement.

4. Move the auto-downfeed direction pin to the center (neutral) position.

Note: The auto-downfeed direction pin has three positions—in, center, and out. Moving the pin to the in or out positions will start quill movement or reverse the direction of the quill. Move it to the center position to stop the quill and spindle rotation.

5. Make sure the auto-downfeed clutch lever is to the right so that the gearing is disengaged.
6. Turn the mill **ON** and start spindle rotation.
7. Refer to the chart below for auto-downfeed rates.

Note: The rates are expressed in inches of vertical quill movement per revolution of the spindle.

Selector Marking	Rate
H (High)	0.006 in./rev.
L (Low)	0.0015 in./rev.
M (Middle)	0.003 in./rev.

Figure 38. Auto-downfeed rates.

8. Move the auto-downfeed rate selector to the setting that is correct for your operation.



9. Push or pull the auto-downfeed direction pin to select the desired direction of quill movement.

NOTICE

When the spindle speed range is changed, the rotation direction of the spindle will reverse and so will the vertical direction of the quill when it is in auto-downfeed mode.

10. Move the auto-downfeed clutch lever to the left to engage the auto-downfeed gears and start the quill moving.

Note: If the quill movement is downward, the quill will automatically return to the top when the quill dog engages the auto-downfeed stop and disengages the gearing. If the quill movement is reversed with the direction pin, quill movement will stop when the quill dog reaches the top.

NOTICE

Never use the quill auto-downfeed for spindle speeds over 2500 RPM to avoid damage to the system gearing.

Emergency Spindle Brake

Press the emergency spindle brake handle backwards to turn the spindle motor **OFF** and stop spindle rotation (see **Figure 39**).



Figure 39. Emergency spindle brake on the left side of the head.

⚠️ WARNING

Using the emergency spindle brake **DOES NOT** disconnect the mill from power! To avoid the risk of serious personal injury from electric shock, you must pull the plug or use the circuit breaker to disconnect the mill from power before performing adjustments, setup, or service.



Loading/Unloading Tooling

Your mill is equipped with a 7/16"-20 x 18 1/2" drawbar that includes one spacer for tool attachment flexibility (see **Figure 40**).



Figure 40. Drawbar and spacer.

Tools Needed	Qty
Wrench or Socket 19mm.....	1

Loading Tooling

1. DISCONNECT THE MILL FROM POWER!
2. Clean any debris or oily substances from the tapered mating surfaces of the spindle and tool.
3. Tighten the quill lock to keep the spindle from rotating.
4. Align the keyway of the tool with the protruding set screw inside the spindle, then push the tool firmly into the spindle taper to seat it.



CAUTION

The edges of cutting tools are very sharp and can quickly cut fingers and hands. Always wear heavy leather gloves when handling tooling to avoid injury.

5. Holding the tool in place, insert the drawbar into the top of the head, as shown in **Figure 41**, then thread it into the tool.

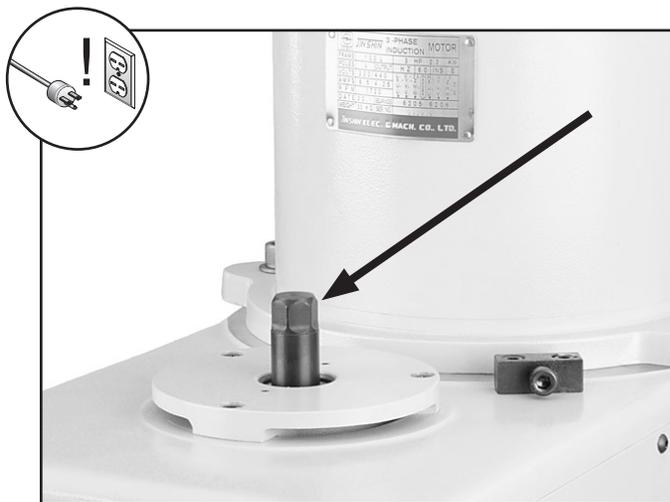


Figure 41. Drawbar inserted into the head.

6. Tighten the drawbar into the tool only until it is snug.

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

Unloading Tooling

1. DISCONNECT THE MILL FROM POWER!
2. Tighten the quill lock to keep the spindle from rotating.
3. Keep one hand on the tool, then completely unthread the drawbar.

Note: *If the tool does not immediately release from the spindle when the drawbar is first loosened, you may need to tap the top of the drawbar with a dead-blow hammer or rubber mallet.*



SECTION 5: ACCESSORIES

**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 16³/₄")**

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.

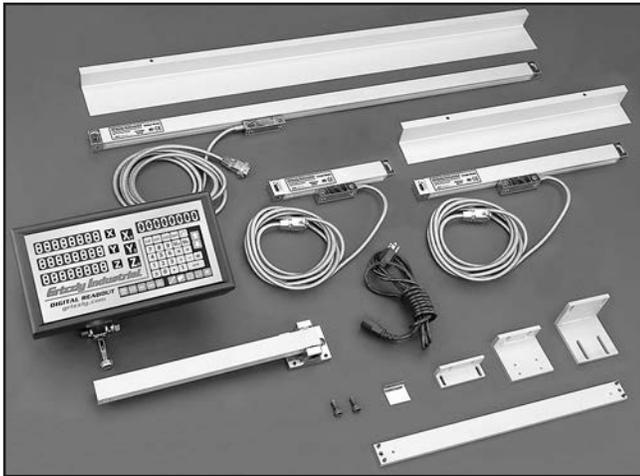


Figure 42. 3 Axis Digital Read Out.

G1076—52-PC. Clamping Kit

This clamping kit includes 24 studs, 6 step block pairs, 6 T-nuts, 6 flange nuts, 4 coupling nuts, and 6 end hold-downs. The rack is slotted so it can be mounted close to the machine for easy access. Made for 5/8" T-slots.

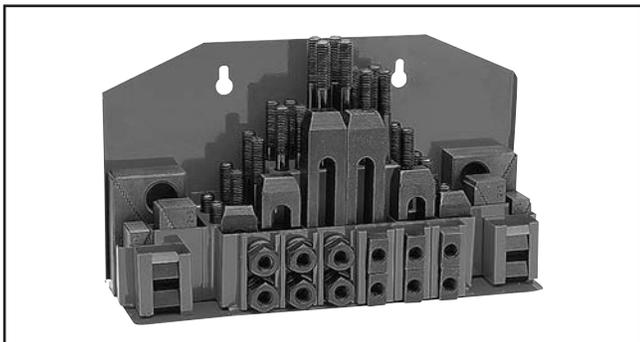


Figure 43. G1076 52-PC. Clamping Kit.

H8257—Primrose Armor Plate with Moly-D Machine and Way Oil 1-Quart

- Prevents stick slip and chatter due to superior anti-friction capabilities resulting in greater precision.
- Provides the thinnest oil film possible while effectively providing needed lubrication.
- Superior rust and corrosion protection.
- Adhesive/cohesive additive components for vertical surfaces.
- Resists squeeze out, running, dripping, and is non-gumming.



Figure 44. H8257 Primrose Armor Plate with Moly-D.

H8368—Electric Power Drawbar

Reduce your tool changing time to a fraction. This easy-to-use Power Drawbar kit will enable you to make tool changes in a flash on both manual and CNC milling machines. It has enough torque for tapers ranging from R-8 to NT50 and simple installation is supported by complete instructions. Specifications: Motor 220V, 7.5 maximum amperage draw, 2100 RPM, and 240 ft/lbs.



Figure 45. H8368 electric power drawbar.

Call 1-800-523-4777 To Order



T10063—Milling Vise 12⁵/₁₆" x 6⁹/₁₆"

T10064—Milling Vise 17¹/₈" x 8³/₄"

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



Figure 46. T10064 Milling vise (handle included, but not shown).

G9299—10" Yuasa-Type Rotary Table

This high precision 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. See the current Grizzly catalog for full specifications. Features: 4.330" overall height (horizontal), 6.750" height to center hole (vertical), #3 Morse Taper, 0.465" T-slot width, and 117 lb approximate shipping weight.

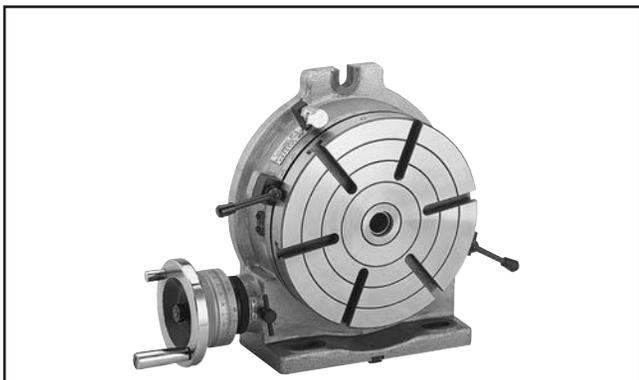


Figure 47. G9299 10" Yuasa-Type Rotary Table.

Call 1-800-523-4777 To Order

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 48. Recommended products for protecting unpainted cast iron/steel part on machinery.

Basic Eye Protection

T20501—Face Shield Crown Protector 4"

T20502—Face Shield Crown Protector 7"

T20503—Face Shield Window

T20452—"Kirova" Anti-Reflective S. Glasses

T20451—"Kirova" Clear Safety Glasses

H0736—Shop Fox® Safety Glasses

H7194—Bifocal Safety Glasses 1.5

H7195—Bifocal Safety Glasses 2.0

H7196—Bifocal Safety Glasses 2.5



Figure 49. Our most popular eye protection.



SECTION 6: MAINTENANCE



Quarterly Maintenance:

- Lubricate power feed gearing (**Page 39**).
- Empty/clean coolant reservoir (**Page 39**).
- Check/tension high range drive belt (**Page 41**).

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

Schedule

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

Before Daily Operation:

- Check/tighten loose mounting bolts.
- Check/replace damaged tooling.
- Check/repair/replace worn or damaged wires.
- Use one-shot oiler (**Page 37**).
- Check/fill coolant reservoir (**Page 39**).
- Clean the mill of debris and built-up grime.
- Check for any other unsafe condition.

Every 8 Hours of Operation:

- Use one-shot oiler (**Page 37**).

Every 24 Hours of Operation:

- Lubricate the quill (**Page 37**).

Every 40 Hours of Operation:

- Lubricate speed range gearing (**Page 37**).
- Lubricate bull gear (**Page 38**).
- Lubricate elevation leadscrew (**Page 38**).
- Lubricate ram way (**Page 38**).

Cleaning and Protecting

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

Clean debris and grime from the coolant return screens on the base of the machine and the fluid slots in the table.

Wipe built-up grime from the mill—use a light application of solvent or mineral spirits if necessary. Remove any rust build-up from the unpainted cast iron surfaces of your mill, and treat them with regular applications of products like G96® Gun Treatment, SLIPIT®, or Boeshield® T-9 (see **Section 5: Accessories** on **Page 34** for more details).



Lubrication

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

Other than 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.

NOTICE

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

One-Shot Oiler

Lubricant	Frequency	Qty
Primrose Armor Plate Moly-D, or ISO 68 SAE 20W equivalent	Every 8 Hours of Operation	1 Pump

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

Pull the handle (see **Figure 50**) and release it to send the lubricant through the lines.

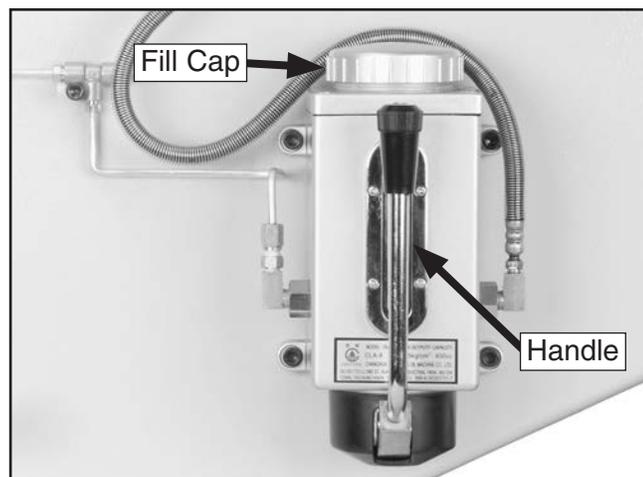


Figure 50. One-shot oiler (on left side of knee).

Quill

Lubricant	Frequency	Qty
ISO 68 SAE 20W R&O Gear & Bearing Lubricant	Every 24 Hours of Operation	10 Drops

Clean debris and grime from the quill oil cup (see **Figure 51**), then lift the cap and add the correct amount of lubricant to the cup.

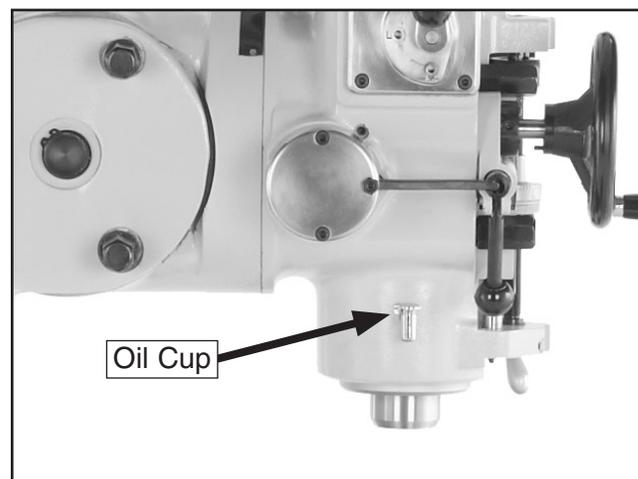


Figure 51. Quill oil cup (on left side of the head).

Speed Range Gearing

Lubricant	Frequency	Qty
ISO 68 SAE 20W R&O Gear & Bearing Lubricant	Every 40 Hours of Operation	5 Drops

Clean debris and grime from the speed range gearing oil cup (see **Figure 52**), then lift the cap and add the correct amount of lubricant to the cup.



Figure 52. Speed range gearing oil cup.



Bull Gear

Lubricant	Frequency	Qty
Multi-Purpose Gear Grease	Every 40 Hours of Operation	5 Pumps from Grease Gun

Clean debris and grime from bull gear grease fitting on the rear of the head (see **Figure 53**) and the surrounding area, then use a grease gun to add the correct amount of lubricant to the grease fitting. Clean off the fitting afterward to keep debris from accumulating around the fitting.

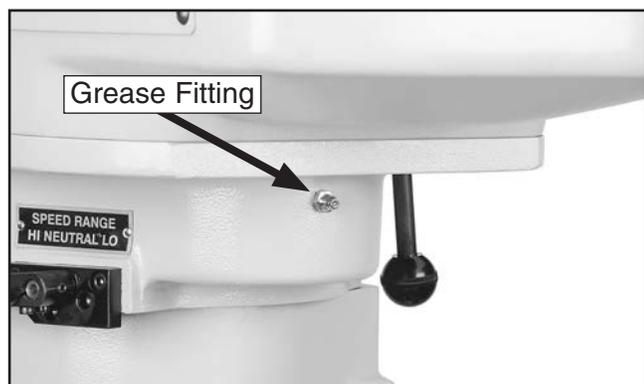


Figure 53. Bull gear grease fitting.

Elevation Leadscrew

Lubricant	Frequency	Qty
Multi-Purpose Gear Grease	Every 40 Hours of Operation	3 Pumps from Grease Gun

Loosen the knee locks and raise the knee up to expose the elevation leadscrew and grease fitting (see **Figure 54**).

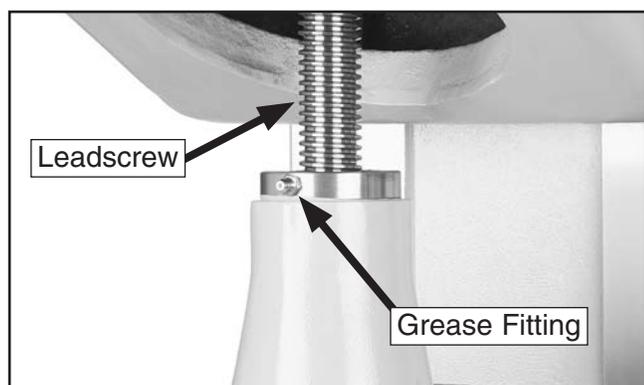


Figure 54. Elevation leadscrew and grease fitting.

Use mineral spirits and a shop rag to wipe the old grease and debris from the elevation leadscrew, the grease fitting, and the surrounding area. Use a grease gun to add the correct amount of lubricant to the grease fitting. Clean off the fitting afterward to keep debris from accumulating around the fitting.

Ram Way

Lubricant	Frequency	Qty
Primrose Armor Plate Moly-D, or ISO 68 SAE 20W equivalent	Every 40 Hours of Operation	Thin Coat

Loosen the ram locks and move the ram forward and backward as necessary to access the entire length of the way (see **Figure 55**). Use mineral spirits and a shop rag to wipe the old lubricant and debris from the surfaces, then brush on a thin coat of oil.

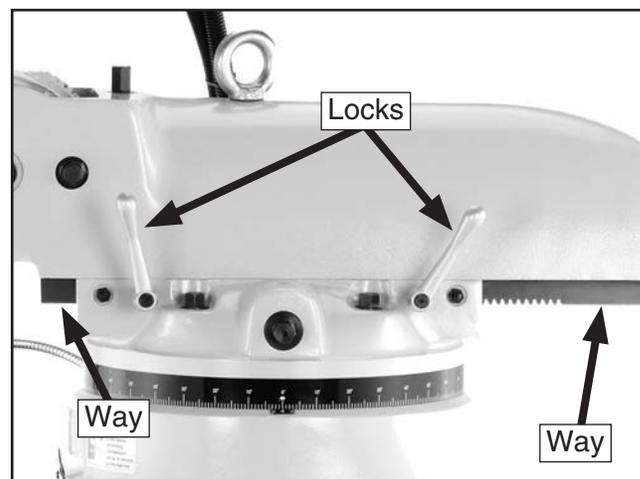


Figure 55. Ram locks and way.



Power Feed Gearing

Lubricant	Frequency	Qty
Multi-Purpose Gear Grease	Every 3 Months	Thin Coat

Remove the longitudinal ball handle, then remove the slotted flat washers from the leadscrew. Slide the graduated dial assembly to the end of the leadscrew, taking care not to misplace the keys shown in **Figure 56**. Apply a thin coat of general purpose light grease to the drive gear and brass gear, then reinstall the parts in reverse order.

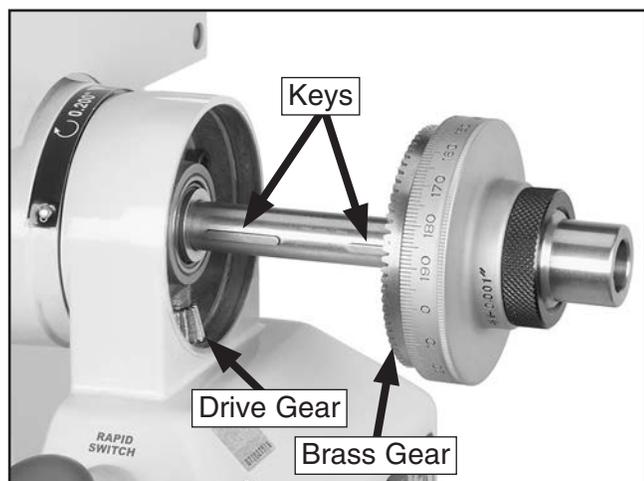


Figure 56. Power feed gearing.

Coolant Reservoir



!WARNING

Coolant is a potent and extremely poisonous solution to humans and animals. Use personal protective equipment when handling coolant to prevent infections or poisoning.

A small amount of coolant is lost during normal operation. Check the coolant reservoir regularly and fill it if necessary.

The Model G0667X coolant reservoir holds approximately 7 gallons (26 liters) of fluid. We recommend changing this fluid every three months or sooner if it develops an unpleasant odor.

Checking Coolant Level

Tools Needed	Qty
Hex Wrench 3mm.....	1

To check the coolant level:

1. DISCONNECT THE MILL FROM POWER!
2. Clean away debris and grime from the reservoir screen on the base of the mill, then remove it to inspect the level of coolant (see **Figure 57**).

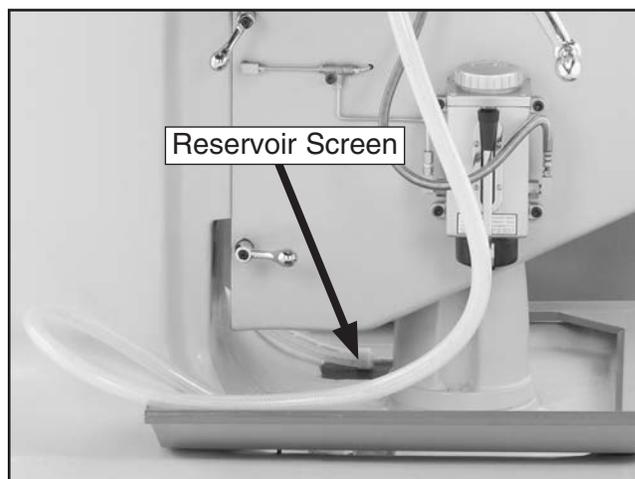


Figure 57. Reservoir screen on the base.



NOTICE

Running the coolant pump without adequate coolant in the reservoir may permanently damage the coolant system on your mill. This action is considered abuse and is not covered by the warranty.

3. If the level of coolant is more than 2" below the top of the reservoir, add more non-flammable water-based coolant to fill the tank.

WARNING

Always use non-flammable water based coolant to avoid explosions when the fluid comes in contact with hot metal chips from the milling operation. For the best protection and use, always follow the coolant manufacturer's recommendations for coolant/water ratios.

4. Replace the reservoir screen making sure the fluid return hose is secured in position.

WARNING

The coolant reservoir on this mill is designed to store only coolant. During storage some fluids grow dangerous microbes, or, due to the collection of toxic metal chips in the fluid, the fluid can become a potent and extremely poisonous solution to humans and animals.

Use the correct personal protection equipment when handling coolant to prevent infections and poisoning.

Follow Federal, State, and the coolant manufacturer's requirements to properly dispose of used coolant.

Changing Coolant

Tools Needed

	Qty
Hex Wrench 3, 5, 10mm.....	1 Each
Catch Pan.....	1

To change coolant:

1. DISCONNECT THE MILL FROM POWER!
2. Place a catch pan under the reservoir drain plug at the rear of the column (see **Figure 58**), remove the plug, and allow the coolant to completely drain.

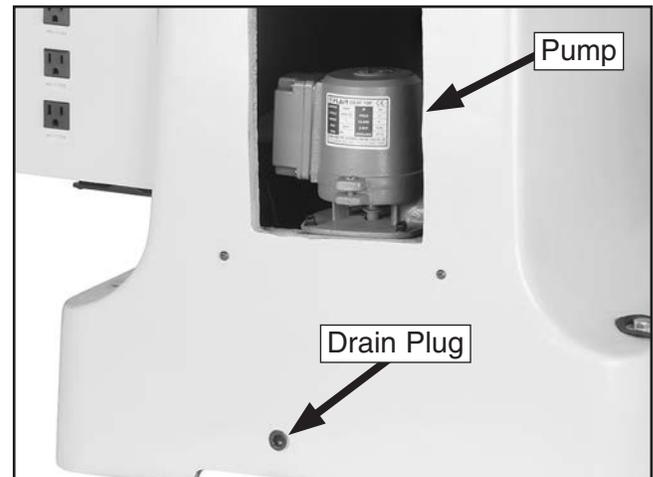


Figure 58. Coolant reservoir pump and drain plug.

3. Put on personal protective equipment and remove the pump access panel on the rear of the column.
4. Remove the two pump mounting cap screws and move the pump out of the way.
5. Clean any debris or sludge from the reservoir and from around the base of the pump.
6. Replace the pump, access panel, and drain plug.
7. Remove the reservoir screen on the base, fill the reservoir with non-flammable water-based coolant, then replace the screen.



Drive Belt Tensioning

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

Tools Needed Qty
 Hex Wrench 3, 6, 10mm..... 1 Each

To check/re-tension the drive belt:

1. DISCONNECT THE MILL FROM POWER!
2. Remove the belt access panel from the right side of the head (see **Figure 59**).

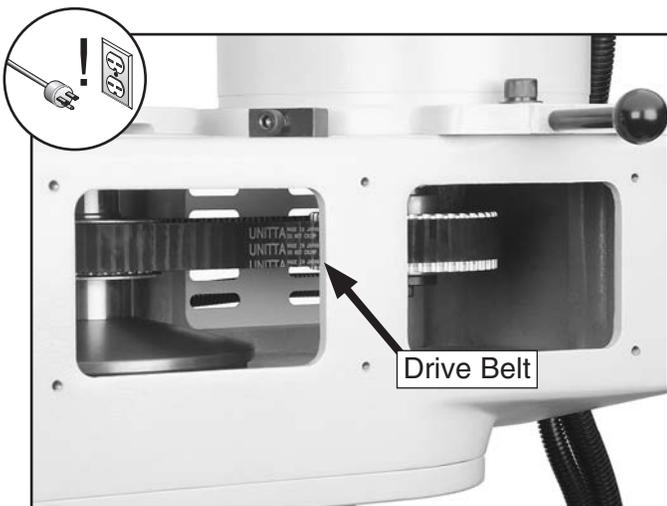


Figure 59. Access panel removed to access drive belt.

3. When moderate pressure is applied to the belt between the pulleys (see **Figure 60**), there should be approximately 1/2" of belt deflection.

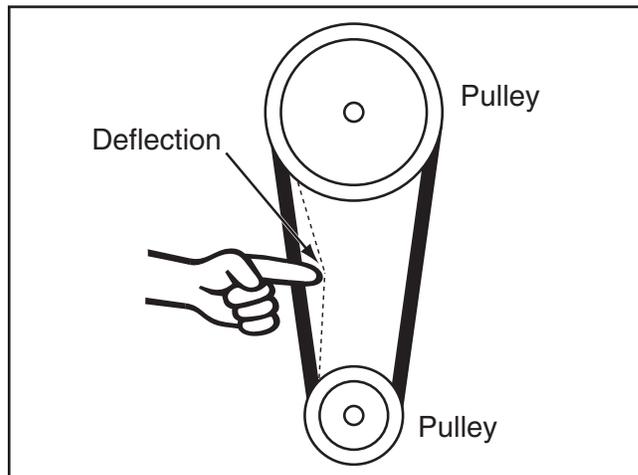


Figure 60. Checking for belt deflection.

4. Loosen the tension locking cap screw to the right side of the motor, as shown in **Figure 61**.

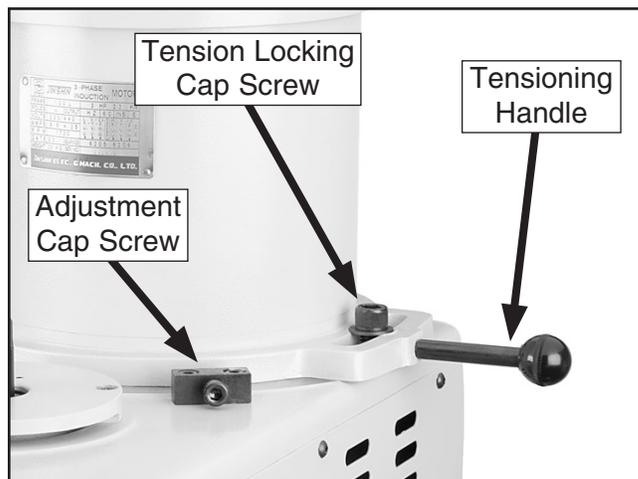


Figure 61. Drive belt tensioning controls.

5. Push back on the tensioning handle until there is the correct amount of belt deflection, then tighten the adjustment cap screw in and against the motor mounting plate to secure the setting.
6. Re-tighten the tension locking cap screw.
7. Re-install the drive belt access panel before beginning milling operations.



SECTION 7: SERVICE

Review the troubleshooting and procedures in this section to fix or adjust your machine if a problem develops. If you need replacement parts or you are unsure of your repair skills, then feel free to call our Technical Support at (570) 546-9663.

Troubleshooting

Motor & Electrical



Symptom	Possible Cause	Possible Solution
Machine does not start or a breaker trips.	<ol style="list-style-type: none"> Emergency stop push-button is engaged/at faulty. Main power switch on electrical cabinet door turned OFF or is at fault. Power supply switched OFF or is at fault. Plug/receptacle is at fault or wired incorrectly. Machine fuse has blown. Motor connection wired incorrectly. Relay switch at fault. Wall fuse/circuit breaker is blown/tripped. Contactors not getting energized/has burnt contacts. Wiring is open/has high resistance. Motor ON button switch is at fault. Table longitudinal limit switch is depressed/at fault. Transformer at fault. Motor is at fault. Frequency drive at fault. 	<ol style="list-style-type: none"> Rotate clockwise slightly until it pops out/replace it. Turn the main power switch ON; replace. Ensure power supply is switch on; ensure power supply has the correct voltage. Test for good contacts; correct the wiring. Replace fuse. Correct motor wiring connections (Page 53). Replace relay switch. Ensure circuit size is suitable for this machine; replace weak breaker. Test for power on all legs and contactor operation. Replace unit if faulty. Check for broken wires or disconnected/corroded connections, and repair/replace as necessary. Replace faulty ON button switch. Adjust limit stops to correct working range (Page 25); replace faulty limit switch. Test/repair/replace. Test/repair/replace. Test/replace.
Machine stalls or is overloaded.	<ol style="list-style-type: none"> Feed rate/cutting speed too fast for task. Workpiece alignment is poor. Dull or incorrect cutting tool. Gearbox is at fault. Motor connection is wired incorrectly. Plug/receptacle is at fault. Pulley/sprocket slipping on shaft. Motor bearings are at fault. Machine is undersized for the task. 	<ol style="list-style-type: none"> Decrease feed rate/cutting speed. Eliminate workpiece binding; use vise or clamps as required for workpiece alignment control. Use sharp and correct cutting tool for your type of machining. Select appropriate spindle speed range; replace broken or slipping gears. Correct motor wiring connections. Test for good contacts; correct the wiring. Replace loose pulley/shaft. Test by rotating shaft; rotational grinding/loose shaft requires bearing replacement. Use smaller sharp tooling; reduce the feed rate; reduce the spindle RPM; use coolant/cutting fluid.



Motor & Electrical (continued)



Symptom	Possible Cause	Possible Solution
Machine stalls or is overloaded.	<ol style="list-style-type: none"> 10. Contactor not getting energized or has poor contacts. 11. Motor has overheated. 12. Spindle rotation switch at fault. 13. Motor is at fault. 14. Frequency drive at fault. 	<ol style="list-style-type: none"> 10. Test for power on all legs and contactor operation. Replace if faulty. 11. Clean off motor, let cool, and reduce workload. 12. Turn switch to FWD/REV; replace bad switch. 13. Test/repair/replace. 14. Test/replace.
Machine has vibration or noisy operation.	<ol style="list-style-type: none"> 1. Motor or component is loose. 2. Pulley is loose. 3. Motor mount loose/broken. 4. Machine is incorrectly mounted or sits unevenly. 5. Motor fan is rubbing on fan cover. 6. Chuck or cutter is at fault. 7. Motor bearings are at fault. 8. Gearbox is at fault. 	<ol style="list-style-type: none"> 1. Inspect/replace stripped or damaged bolts/nuts, and re-tighten with thread locking fluid. 2. Realign/replace shaft, pulley, setscrew, and key as required. 3. Tighten/replace. 4. Tighten/replace anchor studs in floor; relocate/shim machine. 5. Replace dented fan cover; replace loose/damaged fan. 6. Replace out-of-round chuck; replace/resharpen cutter; use appropriate feed rate and cutting RPM. 7. Test by rotating shaft; rotational grinding/loose shaft requires bearing replacement. 8. Rebuild gearbox for bad gear(s)/bearing(s).



Operation



Symptom	Possible Cause	Possible Solution
Tool slips in collet.	<ol style="list-style-type: none"> 1. Collet is not fully drawn into spindle taper. 2. Wrong size collet. 3. Debris on collet or spindle mating surface. 4. Excessive depth of cut. 	<ol style="list-style-type: none"> 1. Snug up drawbar. 2. Use correct collet for shank diameter. 3. Remove oil and debris from collet and spindle mating surfaces, then re-install. 4. Decrease depth of cut and allow chips to clear.
Breaking tooling.	<ol style="list-style-type: none"> 1. Spindle speed/feed rate too fast. 2. Tooling getting too hot. 3. Excessive depth of cut. 	<ol style="list-style-type: none"> 1. Use correct spindle RPM and feed rate (Page 28). 2. Use coolant; reduce spindle RPM/feed rate. 3. Decrease depth of cut and allow chips to clear.
Machine is loud when cutting; overheats or bogs down in the cut.	<ol style="list-style-type: none"> 1. Excessive depth of cut. 2. Dull tooling. 	<ol style="list-style-type: none"> 1. Decrease depth of cut and allow chips to clear. 2. Use sharp tooling.
Workpiece vibrates or chatters during operation.	<ol style="list-style-type: none"> 1. Locks not tight. 2. Workpiece not securely clamped to table or mill vise. 3. Tooling not secure or is damaged. 4. Spindle speed/feed rate too fast. 5. Gibs are too loose. 	<ol style="list-style-type: none"> 1. Tighten all locks on mill that are not associated with movement for the operation. 2. Check that clamping is tight and sufficient for the operation; make sure mill vise is tight to table. 3. Secure tooling; replace if damaged. 4. Use correct spindle RPM and feed rate (Page 28). 5. Adjust gibs properly (Page 45).
Table hard to move.	<ol style="list-style-type: none"> 1. Locks are tightened down. 2. Chips have loaded up on the ways. 3. Ways are dry and in need of lubrication. 4. Gibs are too tight. 	<ol style="list-style-type: none"> 1. Fully loosen locks needed for movement. 2. Frequently clean away chips that load up during operations. 3. Lubricate ways (Page 37). 4. Adjust gibs properly (Page 45).
Bad surface finish.	<ol style="list-style-type: none"> 1. Wrong spindle speed/feed rate. 2. Dull/damaged tooling; wrong tooling for operation. 3. Wrong spindle rotation for tooling. 4. Workpiece not securely clamped to table or mill vise. 5. Gibs are too loose. 	<ol style="list-style-type: none"> 1. Use correct spindle RPM and feed rate (Page 28). 2. Sharpen/replace tooling; use correct tooling for operation. 3. Check for proper spindle rotation for tooling. 4. Check that clamping is tight and sufficient for the operation; make sure mill vise is tight to table. 5. Adjust gibs properly (Page 45).
Power feed chatters or grinds on operation.	<ol style="list-style-type: none"> 1. Bevel gear is loose. 2. Power feed unit is at fault. 	<ol style="list-style-type: none"> 1. Tighten ball handle hex nut. 2. Replace.



Adjusting Gibs

When adjusting the table, saddle and knee gibs (see **Figures 62–64**), keep in mind that the goal of gib adjustment is to remove unnecessary sloppiness without causing the ways to bind. Tight gibs make the movements more accurate, but harder to move. Loose gibs make the movements sloppy, but easier to move.

This machine has sliding tapered gibs which consist of a tapered piece of iron sandwiched between two sliding surfaces. The gib is held in position by two adjustment screws at opposing ends of the gib. When these adjustment screws are turned in opposite directions from each other, the gib will be pushed back (or forth) to fill the loose void, removing the play along the sliding surfaces. Adjust the gib until you feel a slight drag in the movement.

Note: To access the saddle and knee gib adjustment screws, you must remove the way covers and way wipers.

NOTICE

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

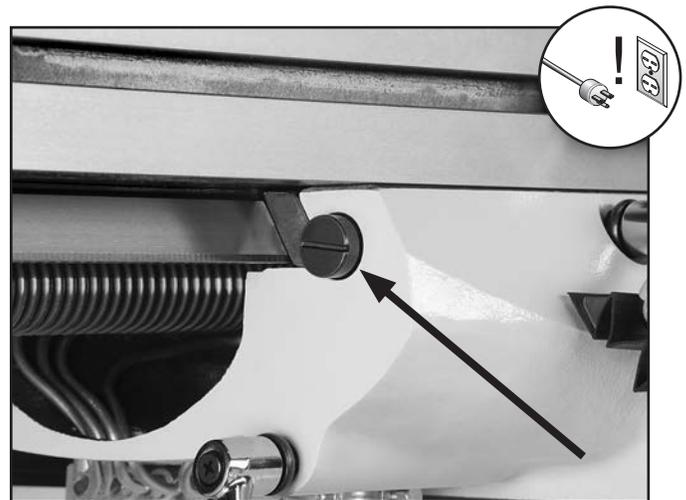


Figure 62. Table gib adjustment screw (left adjustment screw shown).



Figure 63. Saddle gib adjustment screw (front adjustment screw shown).

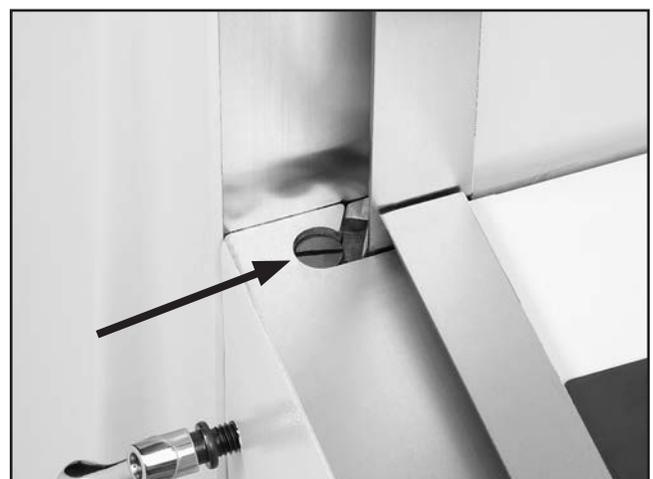


Figure 64. Knee gib adjustment screw (bottom adjustment screw shown).



Ram Gib

Like the other gibs on the mill, the ram has a tapered gib that is sandwiched between the column and moving ram surfaces. There are two ram gib adjustment jam nuts and set screws (see **Figure 65**).

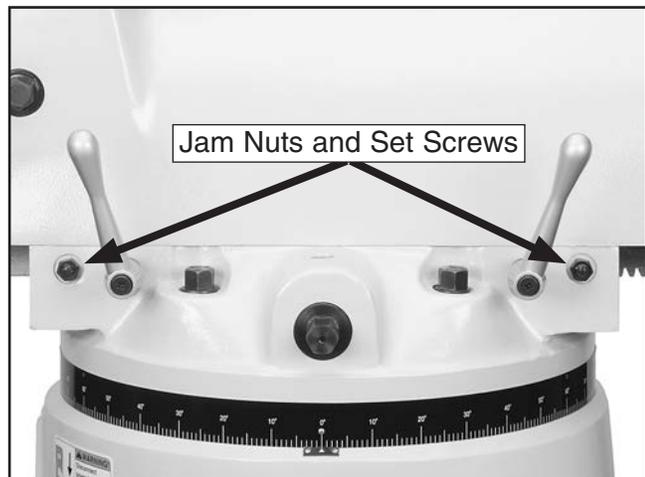


Figure 65. Ram gib adjustment lock nuts and set screws (right side of ram).

Loosen the jam nuts, adjust the set screws evenly until you feel a slight drag in the ram movement, then re-tighten the jam nuts.

Adjusting Backlash

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

Tools Needed	Qty
T-Handle Hex Wrench 5mm.....	1
Hex Wrench 8mm.....	1
Wrench or Socket 19mm.....	1

To adjust leadscrew backlash:

1. DISCONNECT THE MILL FROM POWER!
2. Remove the front way cover.

3. Move the table and saddle all the way forward, then remove the ball handle.
4. Remove the four cap screws shown in **Figure 66** that hold the bearing housing to the saddle.

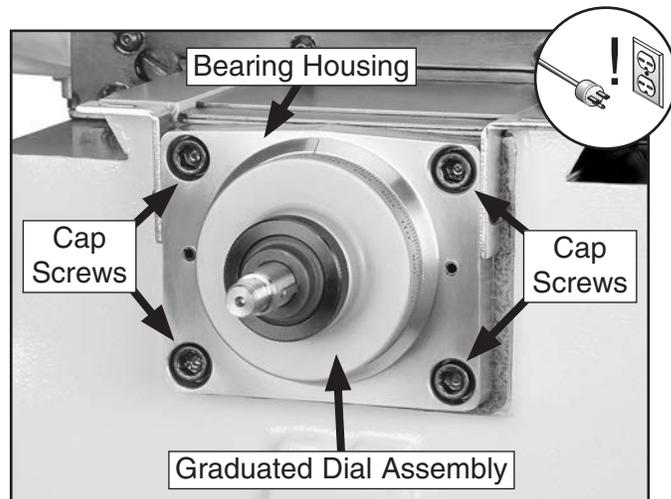


Figure 66. Cross feed graduated dial assembly and bearing housing with ball handle removed.

5. Slide the graduated dial assembly off the leadscrew, then remove the key from the end of the leadscrew.
6. Carefully loosen the bearing housing from the alignment pins, then remove it from the leadscrew (see **Figure 67**).

Note: If you need to pry the bearing housing loose, do so carefully and evenly from all sides to avoid damaging the bearing and leadscrew.

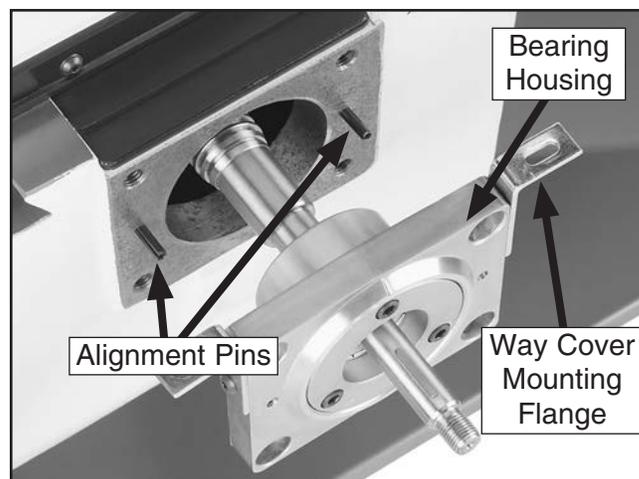


Figure 67. Cross feed bearing housing and alignment pins.



7. Use the T-handle 5mm hex wrench to loosen the two cap screws shown in **Figure 68**.

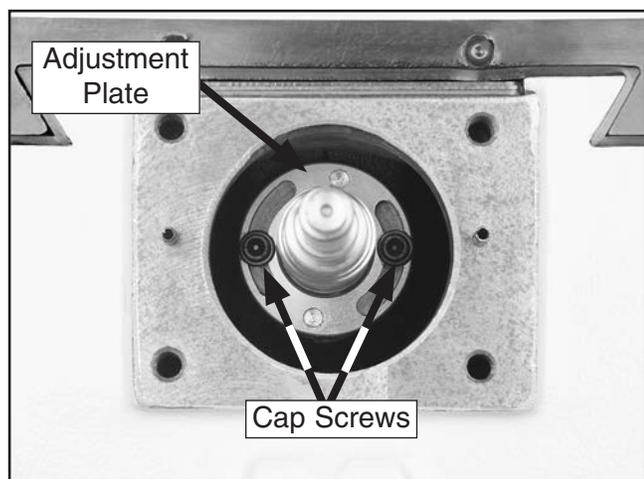


Figure 68. Cross feed leadscrew backlash adjustment plate and cap screws.

8. Rotate the adjustment plate in small increments, then test the backlash.

Note: To test the backlash, re-install the key and ball handle onto the leadscrew.

9. When you are satisfied with the amount of backlash, re-tighten the adjustment plate cap screws.

10. Make sure that all mating surfaces are clean from debris and oil, then re-install the bearing housing, key, graduated dial assembly, and ball handle.

Note: When re-installing the bearing housing, make sure the way cover mounting flanges (see **Figure 67**) are on the top for proper alignment.

If the bearing housing does not easily slip onto the alignment pins, use light taps from a dead-blow hammer or wooden mallet evenly on all sides of the housing to gradually seat it against the saddle.

The longitudinal leadscrew backlash is adjusted in the same manner as the cross feed. Refer to **Figure 69** for the location of the longitudinal backlash adjustment plate and cap screws.



Figure 69. Longitudinal leadscrew adjustment plate and cap screws as seen from the left underside of the table.



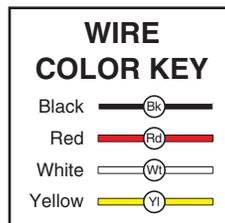
SECTION 8: ELECTRICAL

Review the photographs and wiring diagrams in this section to understand the electrical systems of your machine. If repairs are necessary and you need replacement parts or you are unsure of your repair skills, then feel free to call our Technical Support at (570) 546-9663.

WARNING

Electrical Safety Instructions

- 1. PRINTED INFORMATION.** The electrical information included in this section is current at the time of printing. However, in the spirit of improvement, we may make changes to the electrical system of future machines. Study the photos and diagrams in this section carefully. If you notice differences between your machine and these diagrams, call Technical Support at (570) 546-9663 for assistance.
- 2. FREQUENCY DRIVE.** The frequency drive inside the electrical cabinet was configured for your machine at the factory. It should not need any adjustment. Making changes to the frequency drive may cause damage to the machine and void the warranty.
- 3. 220V SINGLE-PHASE POWER.** This machine uses a frequency drive to convert incoming single-phase power to 3-phase for greater spindle motor performance. Attempting to change this design may result in serious personal injury, damage to the machine, and may void the warranty.
- 4. CIRCUIT REQUIREMENTS.** You **MUST** read and understand the **CIRCUIT REQUIREMENTS** section on **Page 12**. **If you are unsure about the wiring codes in your area or you plan to connect your machine to a shared circuit, consult a qualified electrician.**
- 5. SHOCK HAZARD.** Disconnect power from the machine before servicing electrical components. Touching electrified parts will result in personal injury including but not limited to severe burns, electrocution, or death.
- 6. MOTOR WIRING.** The motor wiring shown in these diagrams are current at the time of printing, but it may not match your machine. Always use the wiring diagram inside the motor junction box.
- 7. EXPERIENCING DIFFICULTIES.** If at any time you are experiencing difficulties understanding the information included in this section, contact our Technical Support at (570) 546-9663.



Electrical Panel Wiring

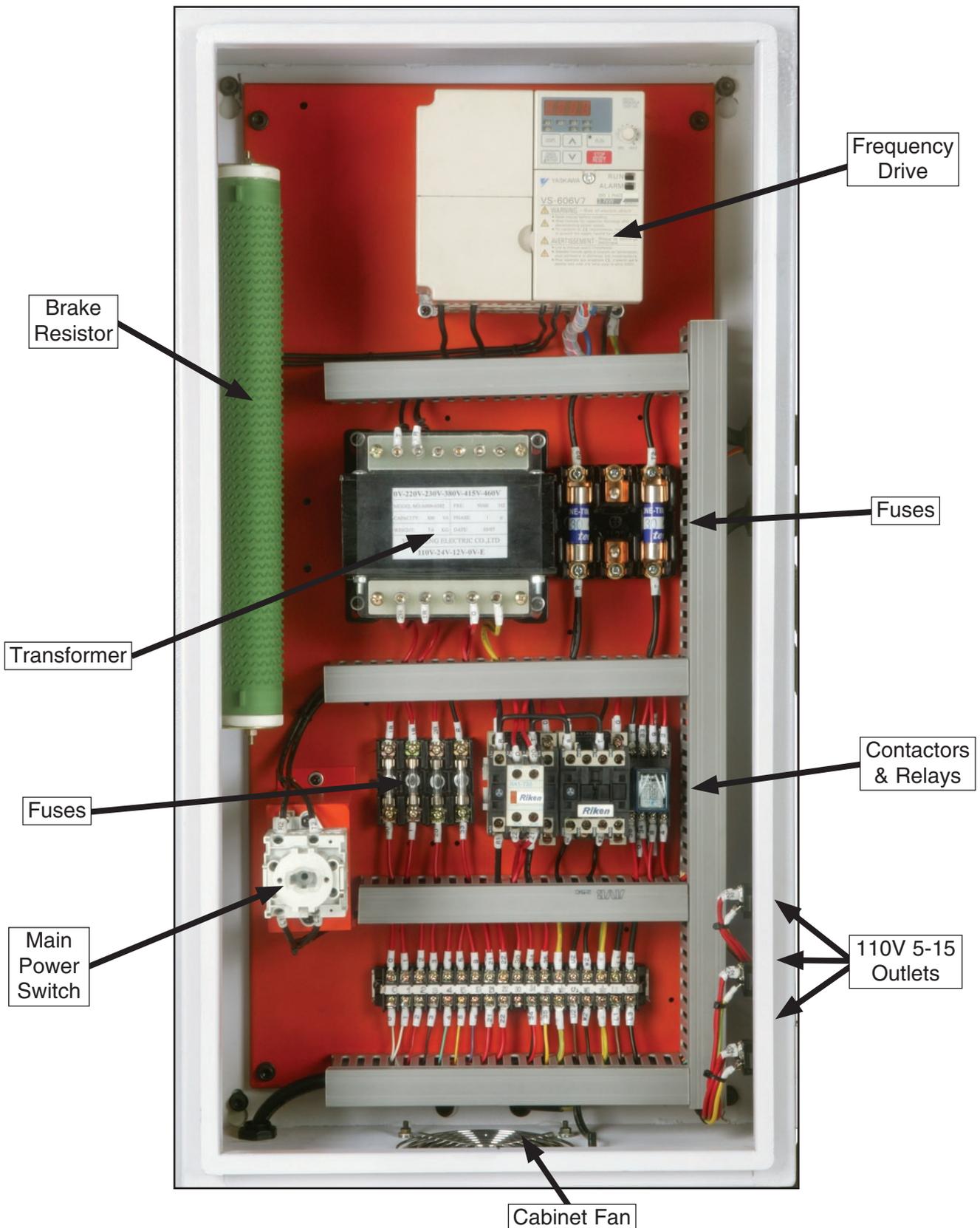


Figure 70. Electrical panel wiring (see **Wiring Diagrams** on Pages 50–51).

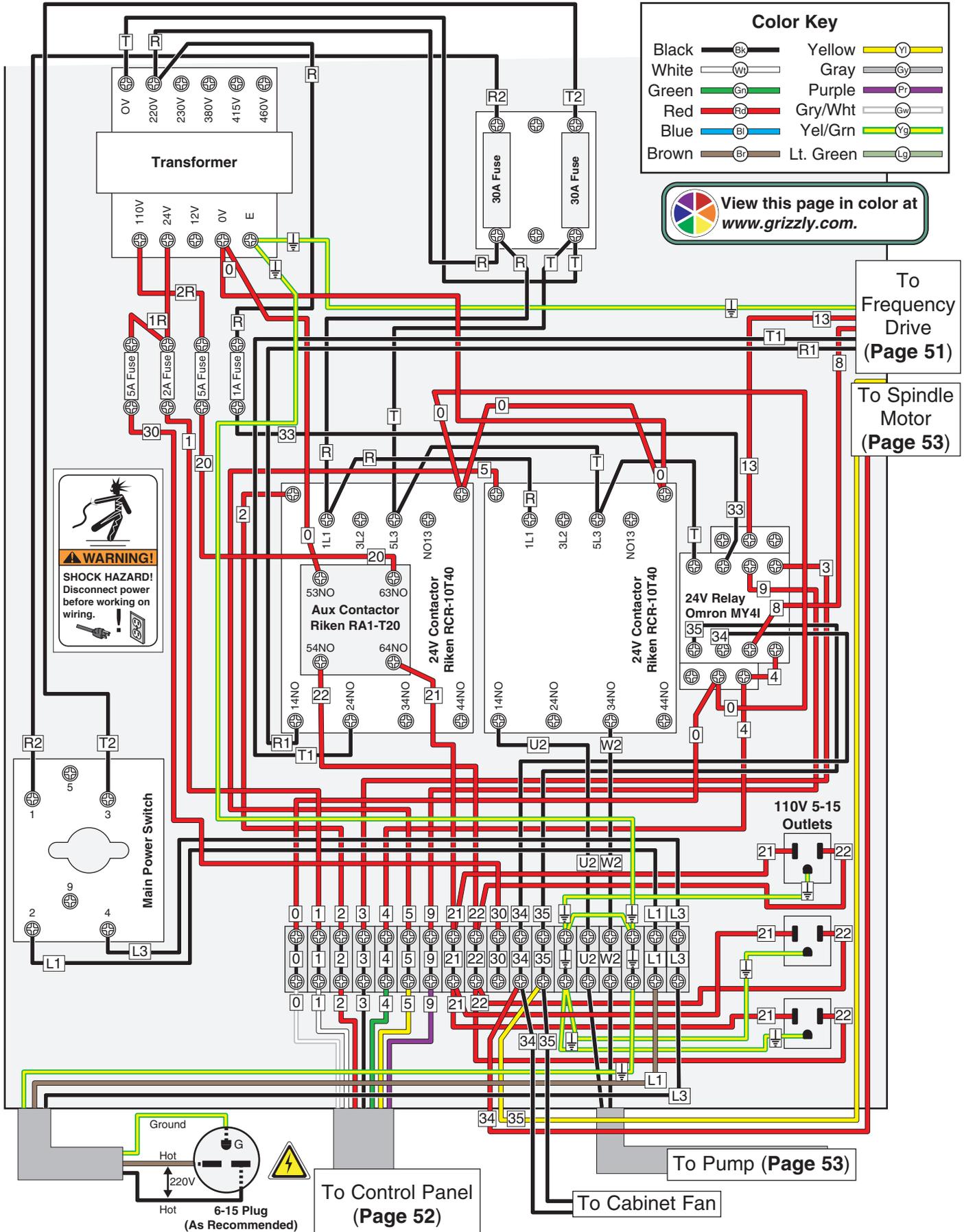


Electrical Panel Wiring Diagram

Color Key

Black	Yellow
White	Gray
Green	Purple
Red	Gry/Wht
Blue	Yel/Grn
Brown	Lt. Green

View this page in color at www.grizzly.com



Frequency Drive Wiring Diagram

Color Key			
Black		Yellow	
White		Gray	
Green		Lt. Red	
Red		Gry/Wht	
Blue		Yel/Grn	
Brown		Lt. Green	

View this page in color at www.grizzly.com.

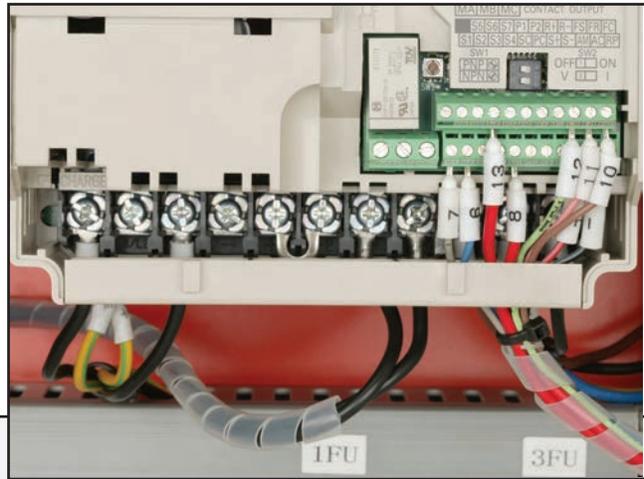
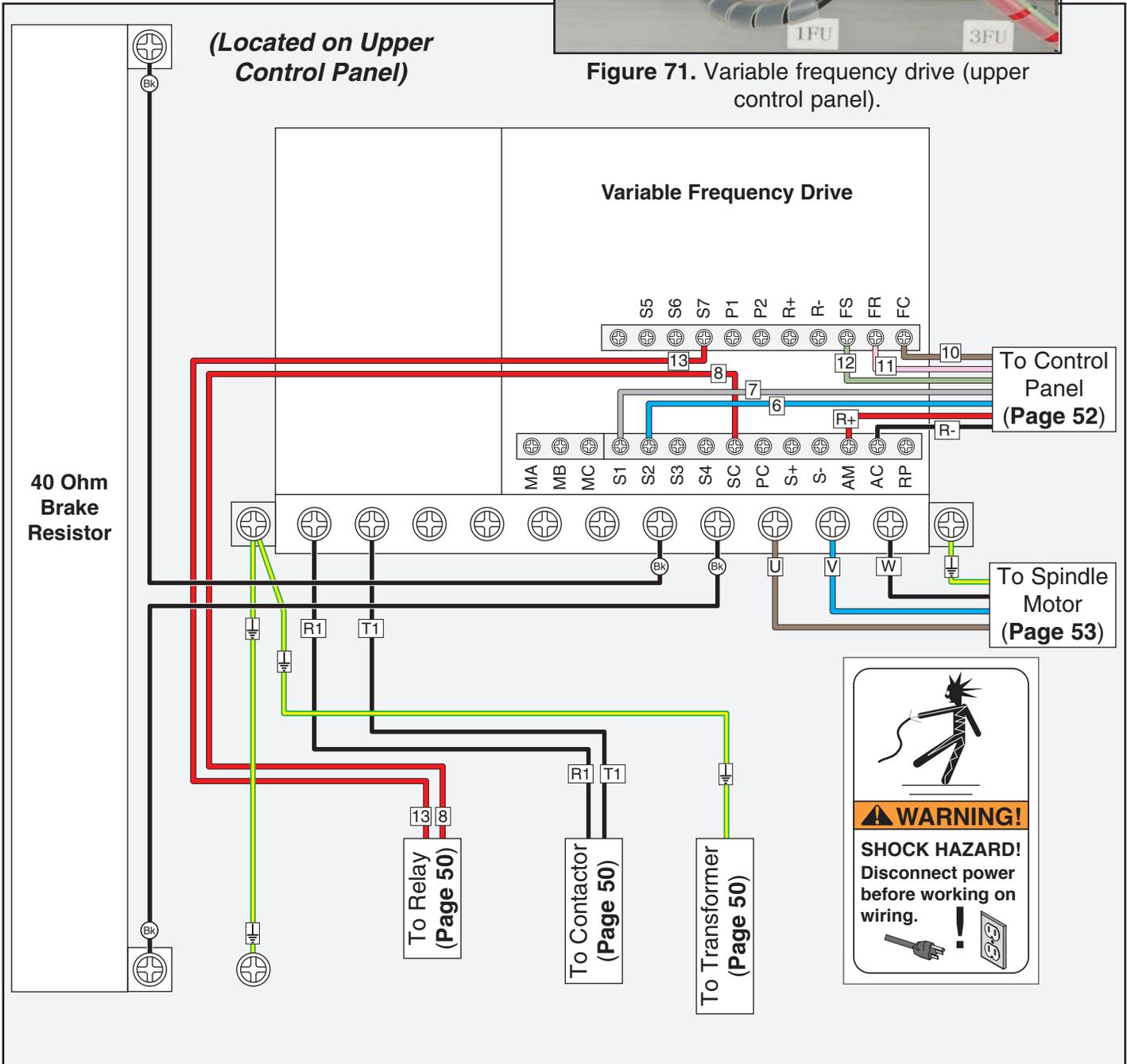


Figure 71. Variable frequency drive (upper control panel).



Control Panel Wiring Diagram

Color Key			
Black		Yellow	
White		Gray	
Green		Purple	
Red		Gry/Wht	
Blue		Lt. Red	
Brown		Lt. Green	

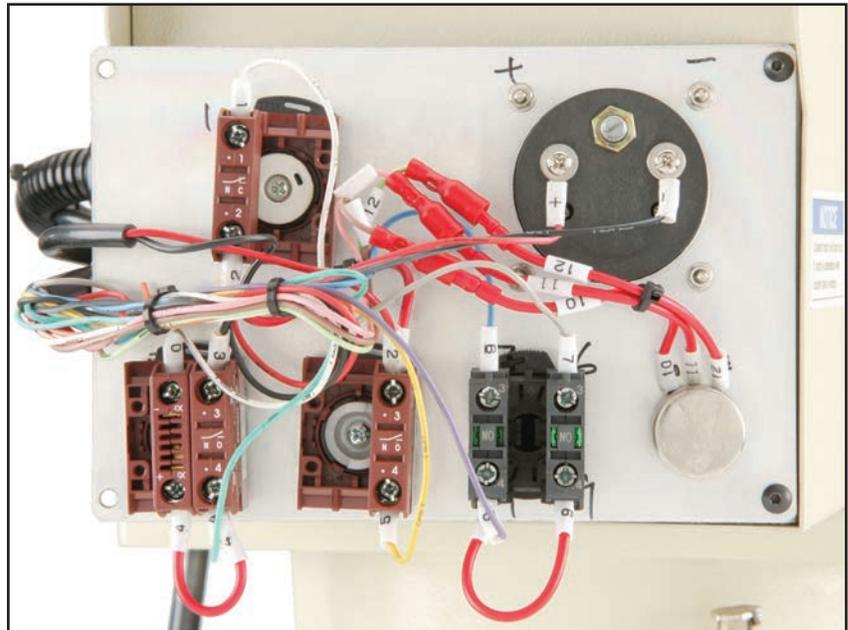
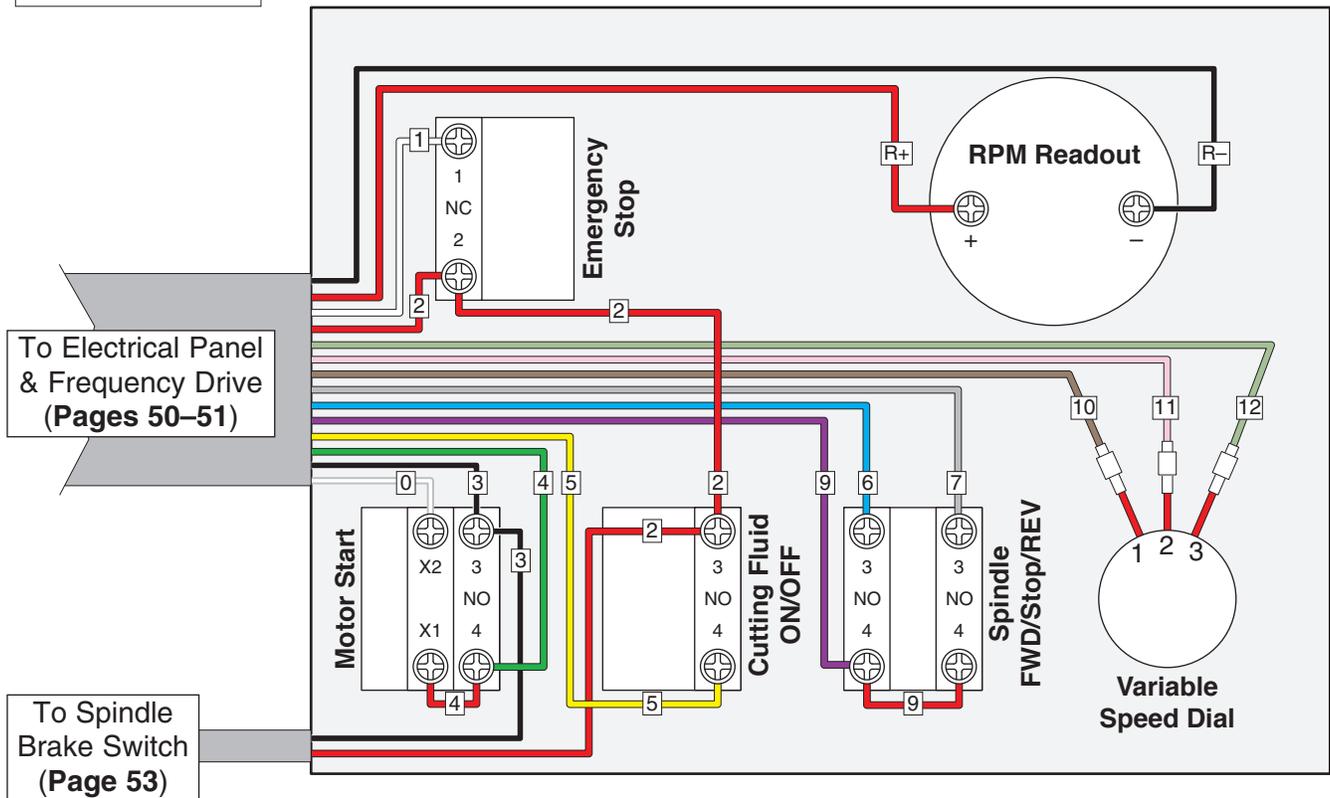


Figure 72. Control panel wiring (rear view).



View this page in color at www.grizzly.com.



Electrical Component Wiring Diagram

Color Key			
Black		Yellow	
White		Gray	
Green		Purple	
Red		Gry/Wht	
Blue		Yel/Grn	
Brown		Lt. Green	

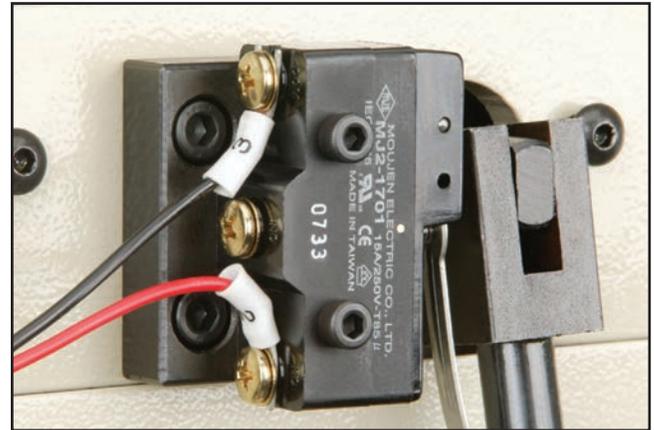


Figure 73. Spindle brake switch wiring.



Spindle Brake Switch

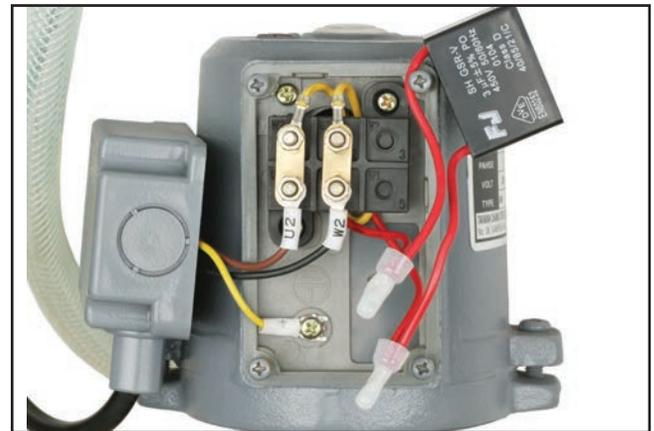
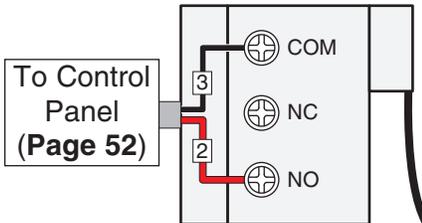
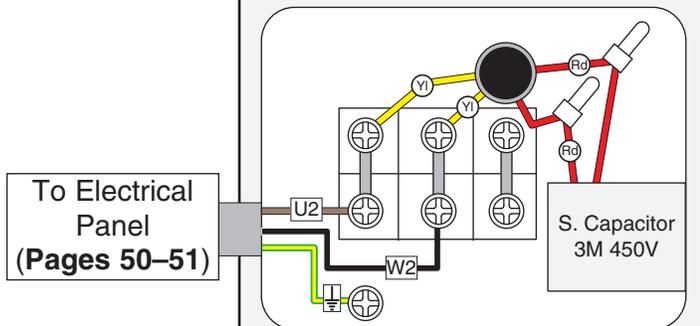


Figure 74. Coolant pump wiring.

Cutting Fluid Pump Motor



Spindle Motor 220V

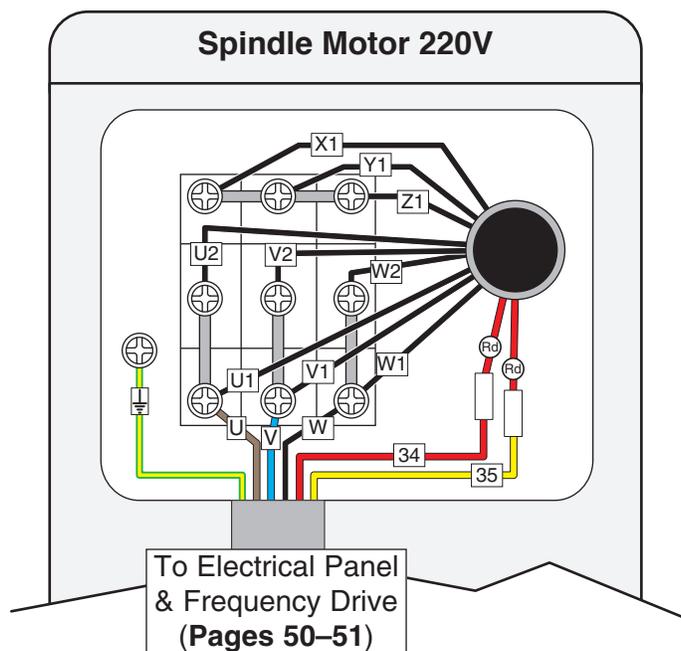


Figure 75. Spindle motor wiring.

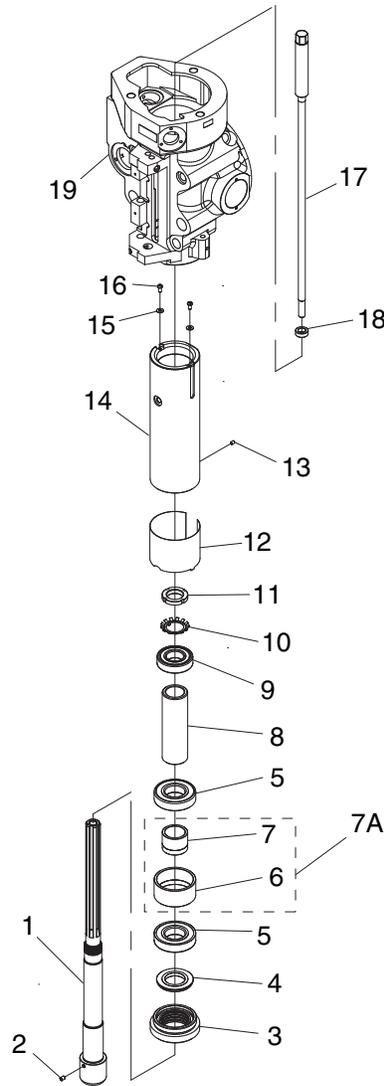
NOTICE

The motor wiring shown here is current at the time of printing, but it may not match your machine. Always use the wiring diagram inside the motor junction box.



SECTION 9: PARTS

Quill Assembly Breakdown & Parts List

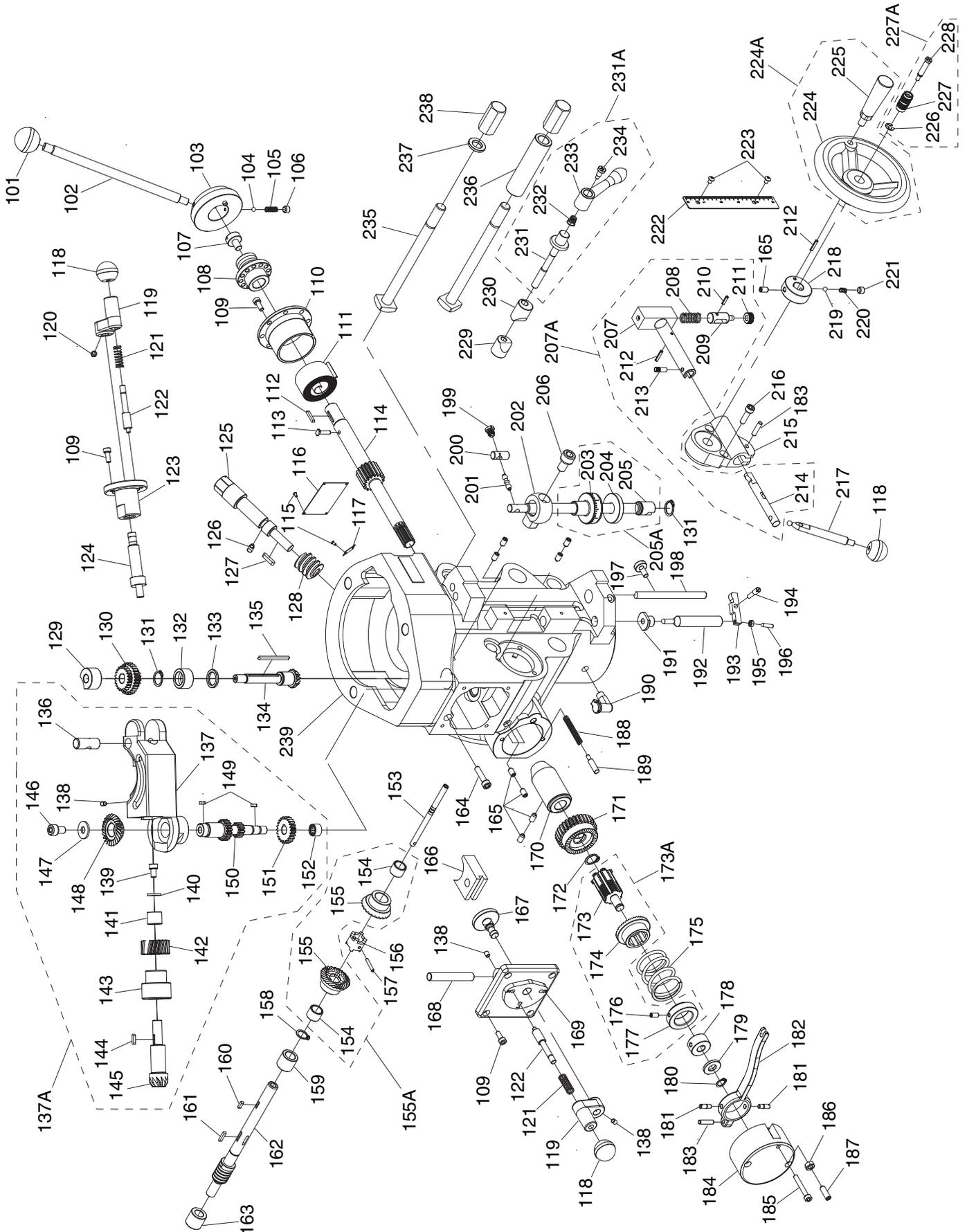


REF	PART #	DESCRIPTION
1	P0667X0001	SPINDLE R8
2	PSS03M	SET SCREW M6-1 X 8
3	P0667X0003	BEARING CAP
4	P0667X0004	SPACER
5	P7202	ANGULAR CONTACT BEARING 7207
6	P0667X0007A	BUSHING
7A	P0667X0007A	BEARING SUPPORT ASSEMBLY
7	P0667X0007A	BEARING SUPPORT
8	P0667X0008	SPINDLE SLEEVE
9	P6206	BALL BEARING 6206ZZ

REF	PART #	DESCRIPTION
10	P0667X0010	SPANNER NUT WASHER
11	P0667X0011	SPANNER NUT
12	P0667X0012	QUILL COVER
13	PSS26M	SET SCREW M5-.8 X 6
14	P0667X0014	QUILL
15	PW02M	FLAT WASHER 5MM
16	PS09M	PHLP HD SCR M5-.8 X 10
17	P0667X0017	DRAWBAR 1/2-20 X 18-1/2 R8
18	P0667X0018	DRAWBAR SPACER
19	P0667X0019	QUILL HOUSING



Head Breakdown



Head Parts List

REF	PART #	DESCRIPTION
101	P0667X0101	KNOB 3/8-16
102	P0667X0102	HANDLE
103	P0667X0103	HANDLE HUB
104	P0667X0104	STEEL BALL 3/16
105	P0667X0105	COMPRESSION SPRING
106	PSS05	SET SCREW 5/16-18 X 1/4
107	P0667X0107	PINION SHAFT SCREW
108	P0667X0108	PINION SHAFT HUB SLEEVE
109	PSB33M	CAP SCREW M5-.8 X 12
110	P0667X0110	SPRING COVER
111	P0667X0111	COILED SPRING
112	PK155M	KEY 3 X 3 X 18
113	P0667X0113	SPRING PIN
114	P0667X0114	PINION GEAR SHAFT 10/16T
115	PRIV001M	STEEL FLUTED RIVET 2 X 5MM
116	P0667X0116	DATA PLATE
117	P0667X0117	ZERO SCALE
118	P0667X0118	KNOB 1/4-20
119	P0667X0119	SHIFT CRANK
120	PSS11	SET SCREW 1/4-20 X 1/4
121	P0667X0121	COMPRESSION SPRING
122	P0667X0122	INDENT PIN
123	P0667X0123	SHIFT SLEEVE
124	P0667X0124	WORM GEAR CRADLE THROW-OUT
125	P0667X0125	WORM SHAFT
126	PSS01M	SET SCREW M6-1 X 10
127	PK102M	KEY 4 X 4 X 18
128	P0667X0128	WORM GEAR
129	P0667X0129	CLUSTER GEAR SHAFT CAP
130	P0667X0130	FEED CLUSTER GEAR 17/28/22T
131	PR06M	EXT RETAINING RING 16MM
132	P0667X0132	BEVEL GEAR BUSHING
133	P0667X0133	BEVEL GEAR THRUST BUSHING
134	P0667X0134	FEED REVERSE BEVEL PINION
135	PK53M	KEY 3 X 3 X 45
136	P0667X0137A	FEED ENGAGE PIN
137A	P0667X0137A	WORM GEAR CRADLE ASSEMBLY
137	P0667X0137A	WORM GEAR CRADLE
138	PSS26M	SET SCREW M5-.8 X 6
139	PSB04M	CAP SCREW M6-1 X 10
140	PW03M	FLAT WASHER 6MM
141	P0667X0137A	WORM GEAR SPACER
142	P0667X0137A	FEED DRIVE WORM GEAR 20T
143	P0667X0137A	WORM CRADLE BUSHING
144	PK103M	KEY 3 X 3 X 12
145	P0667X0137A	FEED REVERSE BEVEL PINION
146	PSB30	CAP SCREW 5/16-18 X 1/2
147	PW07	FLAT WASHER 5/16
148	P0667X0137A	FEED REVERSE BEVEL GEAR 24T
149	PK03M	KEY 3 X 3 X 8

REF	PART #	DESCRIPTION
150	P0667X0137A	CLUSTER GEAR SHAFT 18/12T
151	P0667X0137A	FEED DRIVE CLUSTER GEAR 23T
152	P0667X0155A	NEEDLE BEARING BZ66Z
153	P0667X0153	REVERSE CLUTCH ROD
154	P0667X0155A	FEED REVERSE BUSHING
155A	P0667X0155A	FEED REVERSE GEAR ASSEMBLY
155	P0667X0155A	FEED REVERSE BEVEL GEAR
156	P0667X0156	FEED REVERSE CLUTCH
157	P0667X0157	DOWEL PIN 3 X 20MM
158	PR03M	EXT RETAINING RING 12MM
159	P0667X0159	FEED WORM SHAFT BUSHING
160	PK39M	KEY 3 X 3 X 10
161	PK52M	KEY 3 X 3 X 15
162	P0667X0162	FEED WORM SHAFT
163	P0667X0163	FEED WORM SHAFT END CAP
164	PSB06M	CAP SCREW M6-1 X 25
165	PSS01M	SET SCREW M6-1 X 10
166	P0667X0166	FEED GEAR SHIFTER FORK
167	P0667X0167	CLUSTER GEAR SHIFT CRANK
168	P0667X0168	FEED SHIFT ROD
169	P0667X0169	CLUSTER GEAR COVER
170	P0667X0170	QUILL PINION SHAFT BUSHING
171	P0667X0171	OVERLOAD CLUTCH GEAR 30T
172	PR05M	EXT RETAINING RING 15MM
173A	P0667X0173A	OVERLOAD CLUTCH ASSEMBLY
173	P0667X0173A	OVERLOAD CLUTCH NUT
174	P0667X0173A	OVERLOAD CLUTCH
175	P0667X0175	CLUTCH SPRING
176	PSS05M	SET SCREW M5-.8 X 10
177	P0667X0173A	LOCK COLLAR
178	P0667X0178	CLUTCH RING
179	P0667X0179	CLUTCH WASHER
180	PR01M	EXT RETAINING RING 10MM
181	P0667X0181	CLUTCH RING SCREW
182	P0667X0182	OVERLOAD CLUTCH TRIP LEVER
183	PRP03M	ROLL PIN 5 X 20
184	P0667X0184	CLUTCH ARM COVER
185	PSB79M	CAP SCREW M5-.8 X 35
186	PN05	HEX NUT 1/4-20
187	PSS06	SET SCREW 1/4-20 X 3/4
188	P0667X0188	COMPRESSION SPRING
189	P0667X0189	OVERLOAD CLUTCH PLUNGER
190	P0667X0190	OIL CUP
191	P0667X0191	FEED TRIP PLUNGER BUSHING
192	P0667X0192	FEED TRIP PLUNGER
193	P0667X0193	FEED TRIP LEVER
194	P0667X0194	FEED TRIP LEVER PIN
195	PN04M	HEX NUT M4-.7
196	PSS49M	SET SCREW M4-.7 X 16



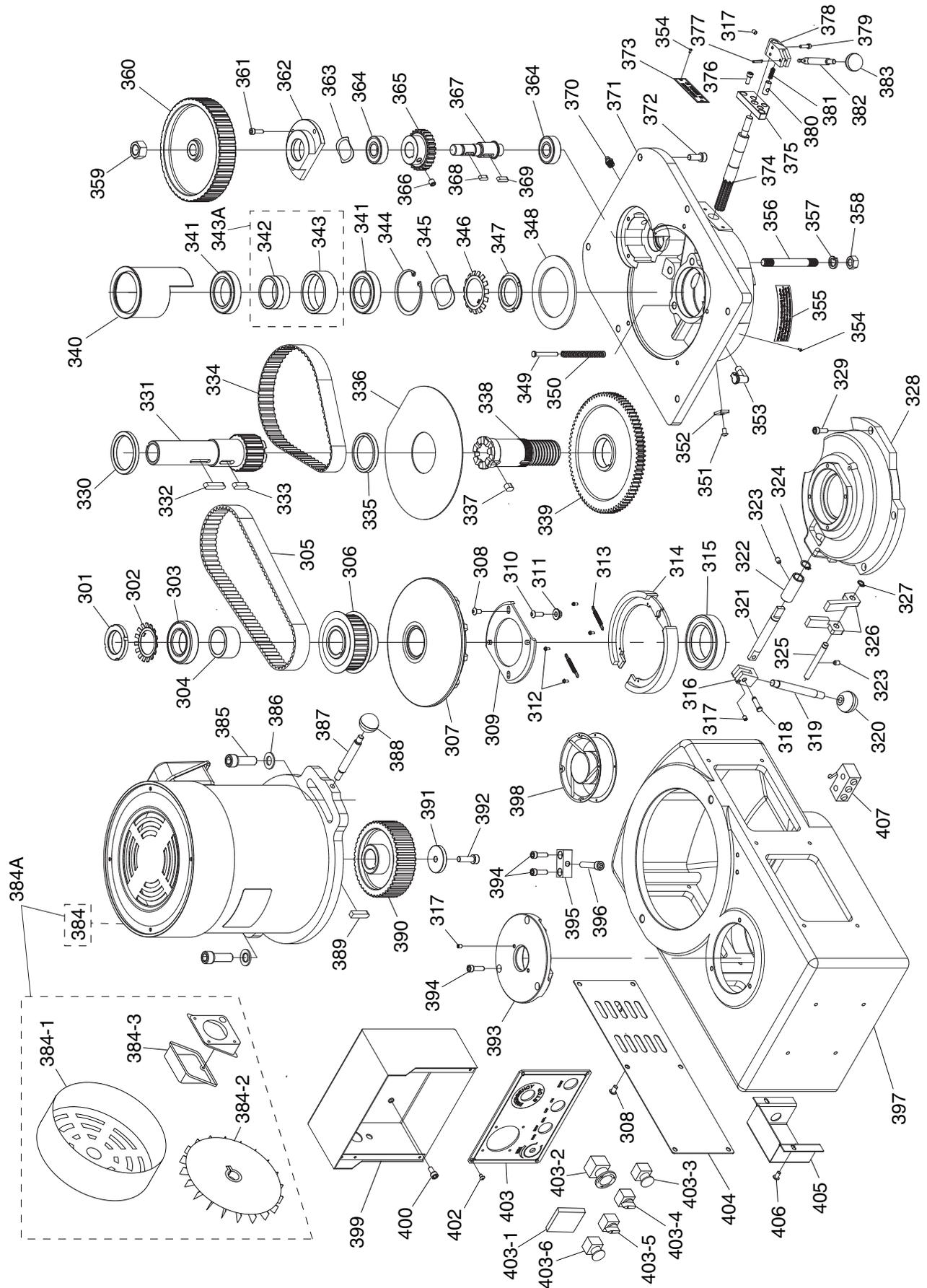
Head Parts List

REF	PART #	DESCRIPTION
197	P0667X0197	KNURLED SCREW
198	P0667X0198	INDICATOR ROD
199	P0667X0199	REVERSE TRIP LEVER SCREW
200	P0667X0200	FEED REVERSE TRIP PLUNGER
201	P0667X0201	REVERSE TRIP BALL LEVER
202	P0667X0202	QUILL DOG
203	P0667X0205A	AUTO-DOWNFEED STOP
204	P0667X0205A	AUTO-DOWNFEED STOP LOCK
205A	P0667X0205A	AUTO-DOWNFEED ROD ASSEMBLY
205	P0667X0205A	AUTO-DOWNFEED ROD
206	PSB105	CAP SCREW 3/8-16 X 5/8
207A	P0667X0207A	SHIFTING ARM ASSEMBLY
207	P0667X0207A	SHIFTING ARM
208	P0667X0207A	COMPRESSION SPRING
209	P0667X0207A	SHIFTER PIN
210	P0667X0207A	DOWEL PIN 3 X 12
211	P0667X0207A	SHIFTER PIN END CAP
212	P0667X0207A	DOWEL PIN 3 X 16
213	P0667X0207A	SHIFTING ROD SET SCREW
214	P0667X0207A	SHIFTING ROD
215	P0667X0215	FEED TRIP BRACKET
216	PSB02M	CAP SCREW M6-1 X 20
217	P0667X0217	HANDLE
218	P0667X0218	HANDWHEEL CLUTCH

REF	PART #	DESCRIPTION
219	P0667X0219	STEEL BALL 5MM
220	P0667X0220	COMPRESSION SPRING
221	PSS17M	SET SCREW M8-1.25 X 6
222	P0667X0222	SCALE
223	PS17M	PHLP HD SCR M4-.7 X 6
224A	P0667X0224A	HANDWHEEL ASSEMBLY
224	P0667X0224A	HANDWHEEL
225	P0667X0224A	HANDWHEEL HANDLE
226	PEC13M	E-CLIP 5MM
227A	P0667X0227A	DOWNFEED PIN ASSEMBLY
227	P0667X0227A	KNURLED SHAFT
228	P0667X0227A	SHAFT PHLP HD SCREW
229	P0667X0229	QUILL LOCK NUT
230	P0667X0230	QUILL LOCK SLEEVE
231	P0667X0231A	LOCKING SHAFT
231A	P0667X0231A	LOCK HANDLE ASSEMBLY
232	P0667X0231A	COMPRESSION SPRING
233	P0667X0231A	LOCK HANDLE
234	P0667X0231A	STEPPED PHLP HD SCREW
235	P0667X0235	CLAMPING BOLT
236	P0667X0236	LOWER CLAMPING BOLT SLEEVE
237	P0667X0237	CLAMPING BOLT FLAT WASHER
238	P0667X0238	CLAMPING BOLT HEX NUT
239	P0667X0239	HEADSTOCK CASTING



Drive System Breakdown



Drive System Parts List

REF	PART #	DESCRIPTION
301	P0667X0301	SPANNER NUT
302	P0667X0302	SPANNER NUT WASHER
303	P0667X0303	DEEP GRV BALL BEARING 6007VV
304	P0667X0304	BUSHING
305	P0667X0305	TIMING BELT 720-BYU-25
306	P0667X0306	SPINDLE PULLEY
307	P0667X0307	SPINDLE PULLEY BOTTOM CAP
308	PS68M	PHLP HD SCR M6-1 X 10
309	P0667X0309	BRAKE BEARING CAP
310	PS11M	PHLP HD SCR M6-1 X 16
311	P0667X0311	BRAKE SHOE PIVOT SLEEVE
312	PS12M	PHLP HD SCR M3-.5 X 6
313	P0667X0313	BRAKE SPRING
314	P0667X0314	BRAKE SHOE ASSEMBLY
315	P0667X0315	DEEP GRV BALL BEARING 6010VV
316	P0667X0316	BRAKE LOCK BRACKET
317	PSS26M	SET SCREW M5-.8 X 6
318	P0667X0318	BRAKE LOCK PIN
319	P0667X0319	BRAKE HANDLE
320	P0667X0101	KNOB 3/8-16
321	P0667X0321	BRAKE LOCK SHAFT
322	P0667X0322	SHAFT SLEEVE
323	PSS03M	SET SCREW M6-1 X 8
324	PR47M	EXT RETAINING RING 13MM
325	P0667X0325	BRAKE SHAFT
326	P0667X0326	BRAKE PIVOT BRACKET
327	PR36M	EXT RETAINING RING 7MM
328	P0667X0328	FEED TRIP BRACKET
329	PSB01M	CAP SCREW M6-1 X 16
330	P0667X0330	SPINDLE PULLEY SPACER
331	P0667X0331	SPINDLE PULLEY GEAR SHAFT 18T
332	PK109M	KEY 7 X 7 X 35
333	PK27M	KEY 7 X 7 X 25
334	P0667X0334	TIMING BELT 225L-100
335	P0667X0335	SPINDLE PULLEY HUB COLLAR
336	P0667X0336	GEAR HOUSING TOP CAP
337	PK70M	KEY 8 X 8 X 12
338	P0667X0338	SPLINE BULL GEAR HUB
339	P0667X0339	SPINDLE BULL GEAR 81T
340	P0667X0340	BEARING SLEEVE
341	P0667X0341	DEEP GRV BALL BEARING 6908VV
342	P0667X0343A	BULL GEAR BEARING BUSHING
343A	P0667X0343A	BEARING SLEEVE ASSEMBLY
343	P0667X0343A	BEARING SLEEVE
344	PR38M	INT RETAINING RING 62MM

REF	PART #	DESCRIPTION
345	P0667X0345	WAVY LOCK WASHER
346	P0667X0346	SPANNER NUT WASHER
347	P0667X0347	SPANNER NUT
348	P0667X0348	SPACER
349	P0667X0349	SPRING PIN
350	P0667X0350	COMPRESSION SPRING
351	PS05M	PHLP HD SCR M5-.8 X 8
352	P0667X0352	SQUARE WASHER
353	P0667X0353	OIL CUP 1/8"
354	P0667X0115	RIVET
355	P0667X0355	DATA PLATE
356	P0667X0356	DBLE END THREADED STUD 7/16-14
357	PLW05	LOCK WASHER 7/16
358	PN19	HEX NUT 7/16-14
359	P0667X0359	GEAR HEX NUT
360	P0667X0360	BELT PULLEY GEAR 50T
361	PSB24M	CAP SCREW M5-.8 X 16
362	P0667X0362	BULL GEAR PINION BEARING CAP
363	P0667X0363	WAVY LOCK WASHER
364	P0667X0364	DEEP GRV BALL BEARING 6203VV
365	P0667X0365	PINION GEAR 26T
366	PSS20M	SET SCREW M8-1.25 X 8
367	P0667X0367	PINION GEAR SHAFT
368	PK19M	KEY 5 X 5 X 14
369	PK14M	KEY 5 X 5 X 18
370	P0667X0370	GREASE FITTING 1/8"
371	P0667X0371	GEAR HOUSING
372	PSB14M	CAP SCREW M8-1.25 X 20
373	P0667X0373	DATA PLATE
374	P0667X0374	BULL BEAR SHIFT PINION
375	P0667X0375	HIGH/LOW DETENT PLATE
376	PSB33M	CAP SCREW M5-.8 X 12
377	PRP02M	ROLL PIN 3 X 16
378	P0667X0378	HIGH/LOW PINION BLOCK
379	PSB41M	CAP SCREW M4-.7 X 14
380	P0667X0380	HIGH/LOW DETENT PLUNGER
381	P0667X0381	COMPRESSION SPRING
382	P0667X0382	HANDLE
383	P0667X0118	KNOB 1/4-20
384A	P0667X0384A	SPINDLE MOTOR ASSEMBLY
384	P0667X0384A	SPINDLE MOTOR 3HP 220V 3-PH
384-1	P0667X0384A	MOTOR FAN COVER
384-2	P0667X0384A	MOTOR FAN
384-3	P0667X0384A	MOTOR WIRING JUNCTION BOX



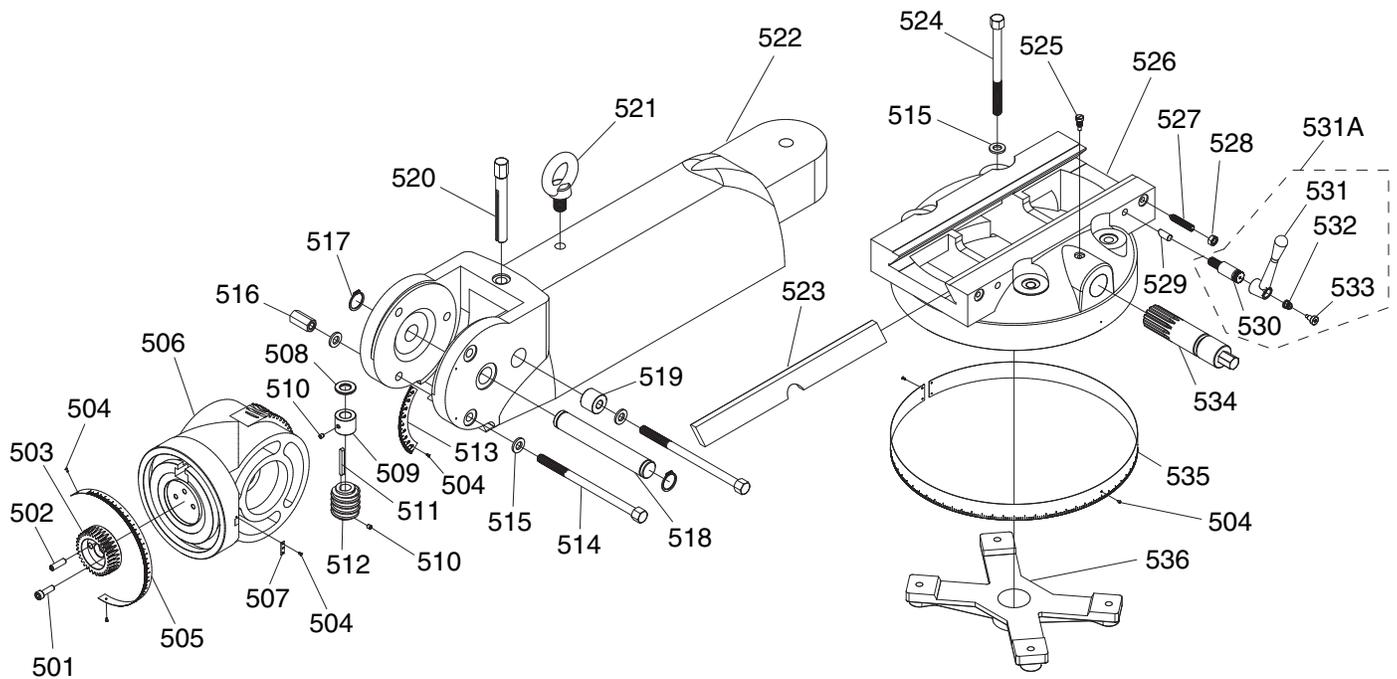
Drive System Parts List

REF	PART #	DESCRIPTION
385	PSB111M	CAP SCREW M12-1.75 X 35
386	PW06M	FLAT WASHER 12MM
387	P0667X0387	MOTOR ADJUSTMENT LEVER
388	P0667X0388	KNOB 5/16-18
389	P0667X0389	KEY 8 X 7 X 30
390	P0667X0390	MOTOR GEAR 44T
391	P0667X0391	GEAR FLAT WASHER
392	PSB31M	CAP SCREW M8-1.25 X 25
393	P0667X0393	TOP BEARING COVER
394	PSB02M	CAP SCREW M6-1 X 20
395	P0667X0395	MOTOR ADJUSTMENT BLOCK
396	PSB12M	CAP SCREW M8-1.25 X 40
397	P0667X0397	DRIVE SYSTEM HOUSING
398	P0667X0398	COOLING FAN ASSY

REF	PART #	DESCRIPTION
399	P0667X0399	CONTROL PANEL BOX
400	PSB26M	CAP SCREW M6-1 X 12
402	PS17M	PHLP HD SCR M4-.7 X 6
403	P0667X0403	CONTROL PANEL
403-1	P0667X0403-1	SPINDLE SPEED READOUT
403-2	P0667X0403-2	EMERGENCY STOP SWITCH
403-3	P0667X0403-3	MOTOR START SWITCH
403-4	P0667X0403-4	COOLANT SWITCH
403-5	P0667X0403-5	SPINDLE DIRECTION SWITCH
403-6	P0667X0403-6	SPINDLE SPEED CONTROL
404	P0667X0404	BELT COVER
405	P0667X0405	BRAKE SAFETY SWITCH COVER
406	PS09M	PHLP HD SCR M5-.8 X 10
407	P0667X0407	BRAKE SAFETY SWITCH



Ram Breakdown & Parts List

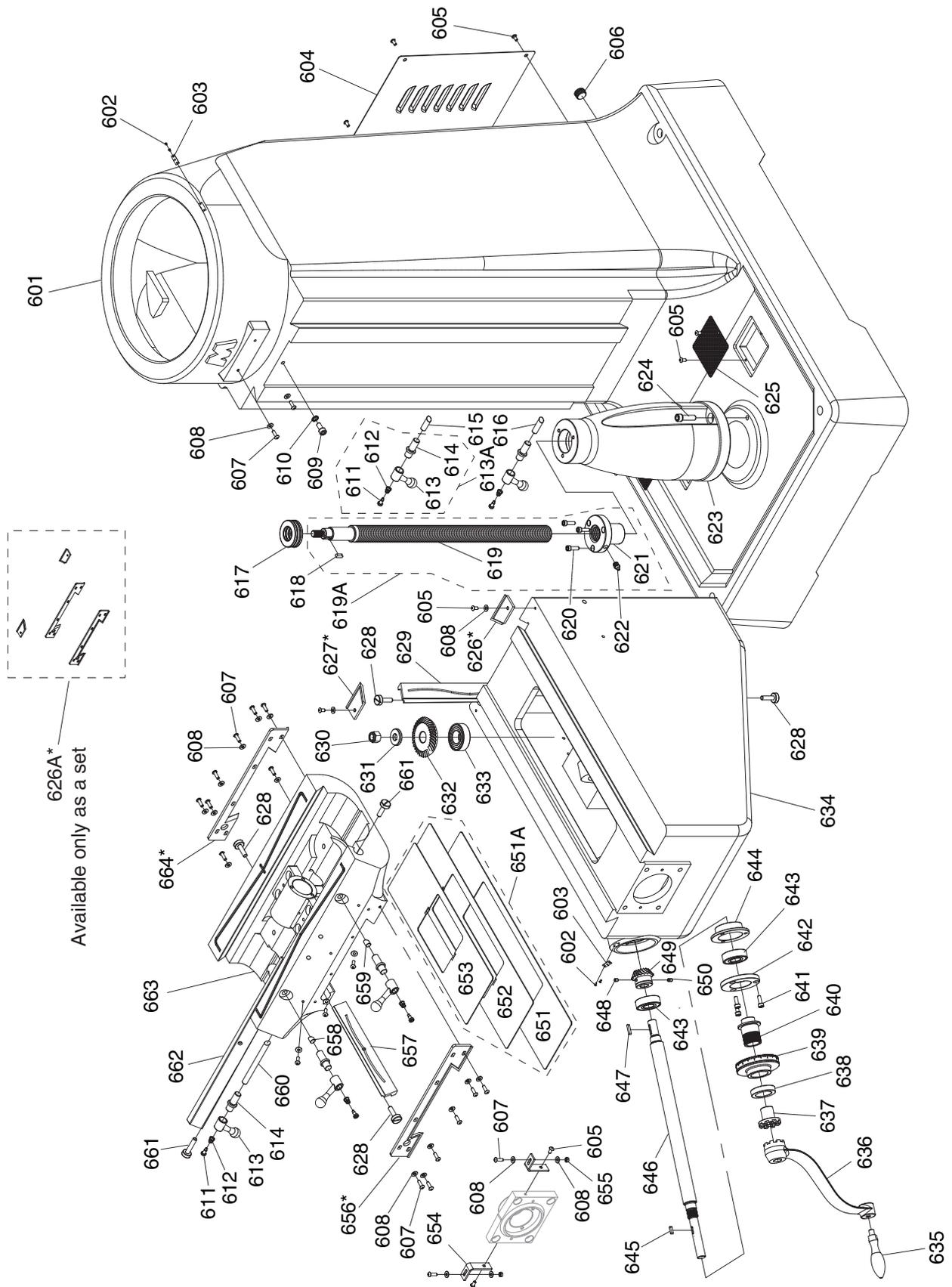


REF	PART #	DESCRIPTION
501	PSB31M	CAP SCREW M8-1.25 X 25
502	P0542112	DOWEL PIN 8 X 30MM
503	P0667X0503	GEAR 33T
504	P0667X0115	RIVET
505	P0667X0505	SCALE
506	P0667X0506	RAM ADAPTER
507	P0667X0507	INDICATOR PLATE
508	P0667X0508	WORM THRUST WASHER
509	P0667X0509	UPPER WORM LOCK COLLAR
510	PSS02M	SET SCREW M6-1 X 6
511	PK36M	KEY 5 X 5 X 50
512	P0667X0512	VERTICAL ADJUSTING WORM
513	P0667X0513	SCALE
514	P0667X0514	ADAPTER LOCKING BOLT
515	P0667X0515	FLAT WASHER 13MM
516	P0667X0516	LOCK BOLT HEX NUT
517	PR19M	EXT RETAINING RING 28MM
518	P0667X0518	ADAPTER PIVOT ROD
519	P0667X0519	BUSHING

REF	PART #	DESCRIPTION
520	P0667X0520	VERTICAL ADJ WORM SHAFT
521	P0667X0521	LIFTING EYE BOLT 3/4-10
522	P0667X0522	RAM
523	P0667X0523	RAM GIB
524	P0667X0524	TURRET CLAMP BOLT
525	P0667X0525	RAM PINION SCREW
526	P0667X0526	TURRET
527	P0667X0527	GIB ADJUSTMENT SET SCREW
528	PN08	HEX NUT 3/8-16
529	P0667X0529	RAM LOCKING PLUNGER
530	P0667X0531A	HANDLE SHAFT
531A	P0667X0531A	LOCK HANDLE ASSEMBLY
531	P0667X0531A	LOCK HANDLE
532	P0667X0531A	SCREW SLEEVE
533	P0667X0531A	LOCK HANDLE SCREW
534	P0667X0534	RAM PINION 13T
535	P0667X0535	SCALE
536	P0667X0536	TURRET SPINDLE



Column, Knee & Saddle Breakdown



Column, Knee & Saddle Parts List

REF	PART #	DESCRIPTION
601	P0667X0601	COLUMN
602	P0667X0115	RIVET
603	P0667X0603	INDICATOR PLATE
604	P0667X0604	COOLANT PUMP COVER
605	PS09M	PHLP HD SCR M5-.8 X 10
606	PSS49	SET SCREW 1/2-20 X 1/2
607	PS40M	PHLP HD SCR M5-.8 X 16
608	PW02M	FLAT WASHER 5MM
609	PSB11M	CAP SCREW M8-1.25 X 16
610	PLW04M	LOCK WASHER 8MM
611	P0667X0613A	LOCK HANDLE SCREW
612	P0667X0613A	COMPRESSION SPRING
613A	P0667X0613A	KNEE LOCK HANDLE ASSEMBLY
613	P0667X0613A	LOCK HANDLE
614	P0667X0613A	LOCK SHAFT
615	P0667X0615	KNEE LOCK PLUNGER
616	P0667X0615	KNEE LOCK PLUNGER
617	P51305	THRUST BEARING 51305
618	PK20M	KEY 5 X 5 X 15
619A	P0667X0619A	ELEVATION LDSCR W/NUT ASSY
619	P0667X0619A	ELEVATION LEADSCREW
620	PSB19	CAP SCREW 3/8-16 X 1-1/4
621	P0667X0619A	ELEVATION LEADSCREW NUT
622	P0667X0370	GREASE FITTING 1/8"
623	P0667X0623	ELEVATION LEADSCREW HOUSING
624	PSB19	CAP SCREW 3/8-16 X 1-1/4
625	P0667X0625	COOLANT SCREEN
626A	P0667X0626A	COLUMN/KNEE WIPER ASSEMBLY
626	P0667X0626A	COLUMN WAY WIPER RIGHT
627	P0667X0626A	COLUMN WAY WIPER LEFT
628	P0667X0628	GIB ADJUSTMENT SCREW
629	P0667X0629	KNEE GIB
630	PN06	HEX NUT 1/2-13
631	PW01	FLAT WASHER 1/2

REF	PART #	DESCRIPTION
632	P0667X0632	BEVEL GEAR
633	P6205	BALL BEARING 6205ZZ
634	P0667X0634	KNEE
635	P0667X0635	HANDLE
636	P0667X0636	KNEE CRANK
637	P0667X0637	CRANK CLUTCH
638	P0667X0638	DIAL RETAINER
639	P0667X0639	GRADUATED DIAL
640	P0667X0640	DIAL SLEEVE
641	PSB01M	CAP SCREW M6-1 X 16
642	P0667X0642	BEARING RETAINER RING
643	P6204	BALL BEARING 6204ZZ
644	P0667X0644	BEARING CAP
645	PK47M	KEY 4 X 4 X 15
646	P0667X0646	ELEVATION SHAFT
647	PK48M	KEY 4 X 4 X 20
648	PSS02M	SET SCREW M6-1 X 6
649	P0667X0649	BEVEL PINION
650	PSS03M	SET SCREW M6-1 X 8
651A	P0667X0651A	CHIP GUARD SET
651	P0667X0651A	CHIP GUARD LARGE
652	P0667X0651A	CHIP GUARD MEDIUM
653	P0667X0651A	CHIP GUARD SMALL
654	P0667X0654	WAY COVER BRACKET
655	PN06M	HEX NUT M5-.8
656	P0667X0626A	KNEE WAY WIPER FRONT
657	P0667X0657	SADDLE GIB
658	P0667X0658	TABLE LOCK PLUNGER
659	P0667X0658	TABLE LOCK PLUNGER
660	P0667X0660	SADDLE LOCK PLUNGER
661	P0667X0661	GIB ADJUSTMENT SCREW
662	P0667X0662	TABLE GIB
663	P0667X0663	SADDLE
664	P0667X0626A	KNEE WAY WIPER REAR



Table Breakdown

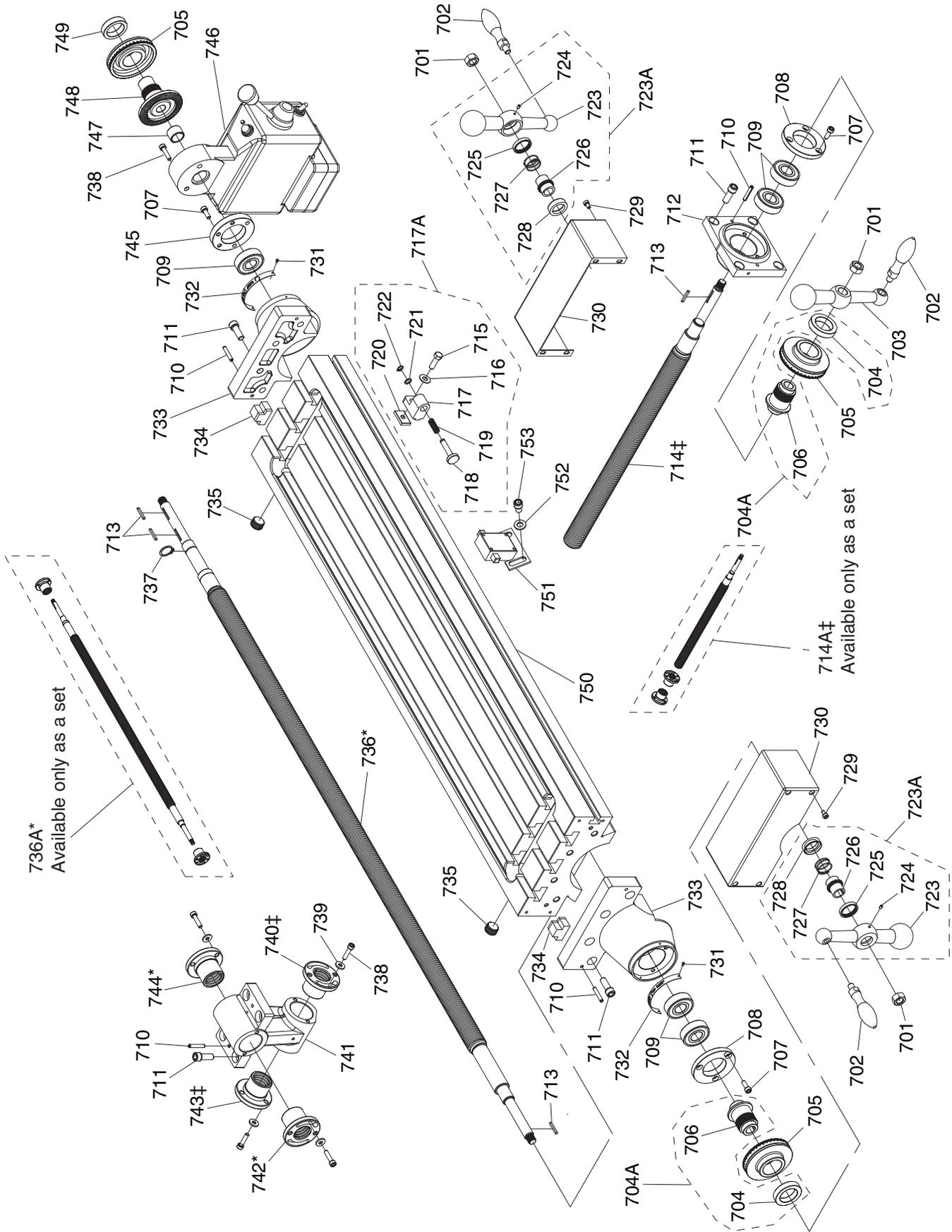


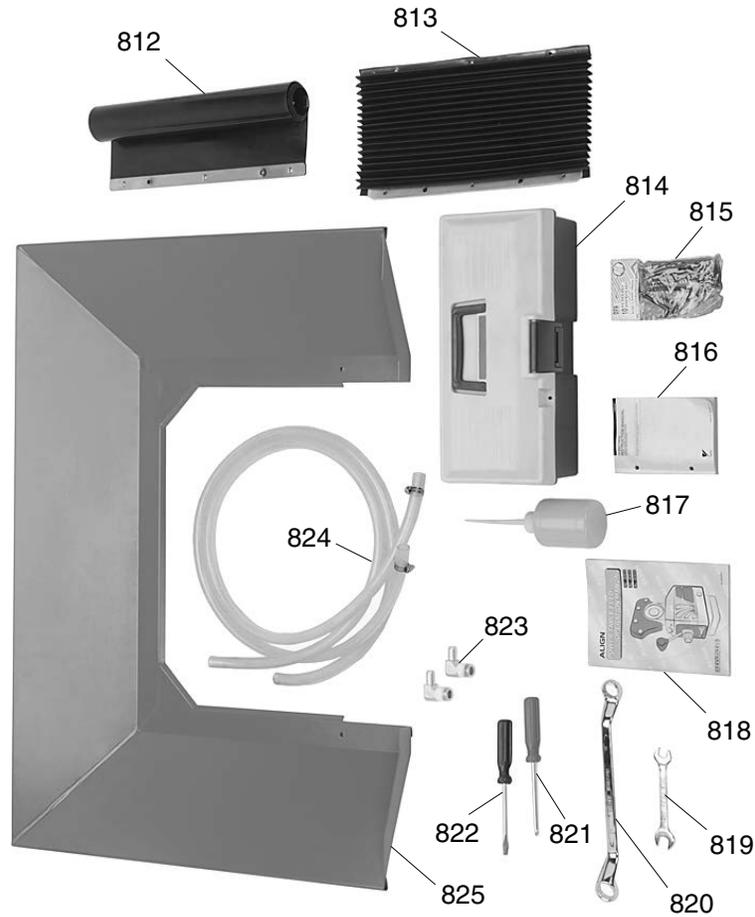
Table Parts List

REF	PART #	DESCRIPTION
701	PN01	HEX NUT 1/2-20
702	P0667X0702	HANDLE
703	P0667X0703	BALL CRANK HANDLE
704A	P0667X0704A	DIAL HOLDER ASSEMBLY
704	P0667X0704A	DIAL RETAINER
705	P0667X0705	GRADUATED DIAL
706	P0667X0704A	DIAL SLEEVE
707	PSB01M	CAP SCREW M6-1 X 16
708	P0667X0708	BEARING RETAINER RING
709	P6204	BALL BEARING 6204ZZ
710	PRP05M	ROLL PIN 5 X 30
711	PSB14	CAP SCREW 3/8-16 X 1
712	P0667X0712	CROSS FEED BEARING BRACKET
713	PK92M	KEY 3 X 3 X 25
714A	P0667X0714A	CROSS FEED LDSCR W/NUT ASSY
714	P0667X0714A	CROSS FEED LEADSCREW
715	PB03	HEX BOLT 5/16-18 X 1
716	PW07	FLAT WASHER 5/16
717A	P0667X0717A	LIMIT STOP ASSEMBLY
717	P0667X0717A	LIMIT STOP BRACKET
718	P0667X0717A	LIMIT STOP SHAFT
719	P0667X0717A	COMPRESSION SPRING
720	P0667X0717A	T-NUT
721	PW01M	FLAT WASHER 8MM
722	PR36M	EXT RETAINING RING 7MM
723A	P0667X0723A	BALL HANDLE ASSEMBLY
723	P0667X0723A	BALL HANDLE
724	PSS08M	SET SCREW M4-.7 X 5
725	P0667X0723A	CRANK BEARING

REF	PART #	DESCRIPTION
726	P0667X0723A	CRANK SLEEVE
727	P0667X0723A	COMPRESSION SPRING
728	P0667X0723A	BUSHING
729	PSB03M	CAP SCREW M5-.8 X 8
730	P0667X0730	TABLE END COVER
731	P0667X0115	RIVET
732	P0667X0732	INDICATOR PLATE
733	P0667X0733	TABLE BEARING BRACKET
734	P0667X0734	TABLE END PLUG
735	P0667X0735	TABLE COOLANT PLUG
736A	P0667X0736A	LONGITUDINAL LDSCR W/NUT ASSY
736	P0667X0736A	LONGITUDINAL LEADSCREW
737	PR09M	EXT RETAINING RING 20MM
738	PSB06M	CAP SCREW M6-1 X 25
739	PW03M	FLAT WASHER 6MM
740	P0667X0714A	CROSS FEED LDSCR NUT FRONT
741	P0667X0741	LEADSCREW NUT BRACKET
742	P0667X0736A	LONGITUDINAL LDSCR NUT LEFT
743	P0667X0714A	CROSS FEED LDSCR NUT REAR
744	P0667X0736A	LONGITUDINAL LDSCR NUT RIGHT
745	P0667X0745	POWER FEED MOUNTING RING
746	P0667X0746	LONGITUDINAL POWER FEED ASSY
747	P0667X0747	BUSHING
748	P0667X0748	POWER FEED BRASS BEVEL GEAR
749	P0667X0749	THREADED COLLAR
750	P0667X0750	TABLE
751	P0667X0751	LIMIT SWITCH ASSY
752	PW02	FLAT WASHER 3/8
753	PSB100	CAP SCREW 3/8-16 X 1/2



Accessories Breakdown & Parts List

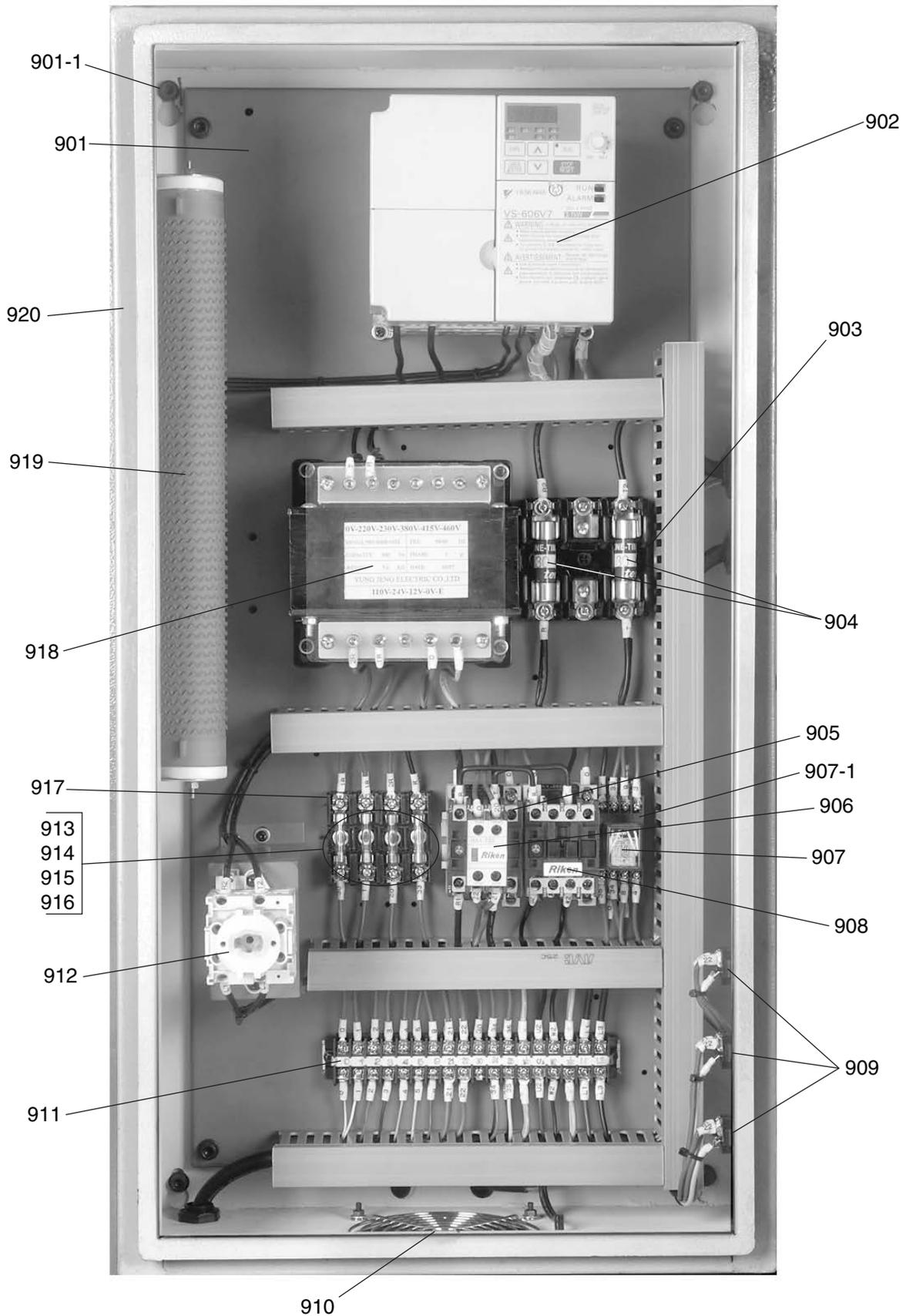


REF	PART #	DESCRIPTION
812	P0667X0812	WAY COVER REAR
813	P0667X0813	WAY COVER FRONT
814	P0667X0814	TOOL BOX
815	P0667X0815	HEX WRENCH SET 1.5-10MM
816	P0667X0816	FREQ DRIVE INSTRUCTION MANUAL
817	P0667X0817	LUBRICATION SQUEEZE BOTTLE

REF	PART #	DESCRIPTION
818	P0667X0818	POWER FEED OPERATION MANUAL
819	PWR1214	WRENCH 12/14MM
820	P0667X0820	CLOSED END WRENCH 19/21MM
821	PSDP2	PHLP HD SCREWDRIVER #2
822	PSDF2	SCREWDRIVER FLAT #2
825	P0667X0825	SPLASH PAN



Electrical Cabinet Breakdown

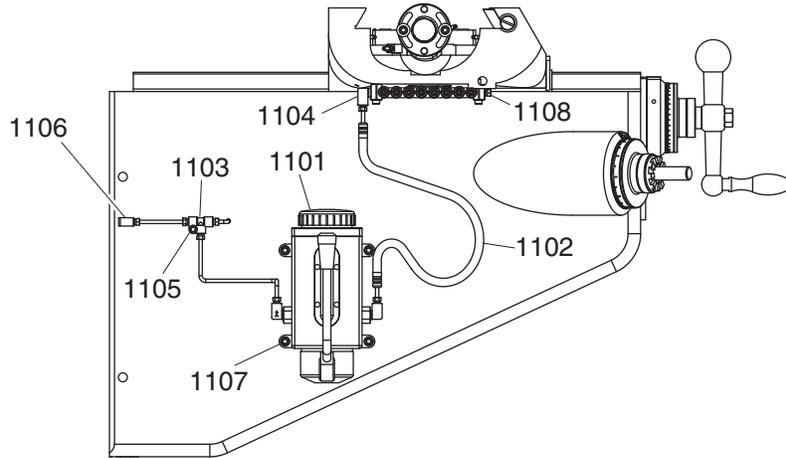


Electrical Cabinet Parts List

REF	PART #	DESCRIPTION
901	P0667X0901	ELECTRICAL CABINET PANEL
901-1	PSB15M	CAP SCREW M5-.8 X 20
902	P0667X0902	FREQUENCY DRIVE VS-606-V7
903	P0667X0903	FUSE HOLDER 3-POS
904	P0667X0904	FUSE 20A
905	P0667X0905	CONTACTOR RIKEN 09T10
906	P0667X0906	AUX CONTACTOR RIKEN RA1-T20
907	P0667X0907	RELAY OMRON MY4J 24V
907-1	P0667X0907-1	CONTROL RELAY SOCKET PYF-14A
908	P0667X0905	CONTACTOR RIKEN RCR-10T40
909	P0667X0909	ELECTRICAL RECEPTACLE 110V

REF	PART #	DESCRIPTION
910	P0667X0910	COOLING FAN ASSY
911	P0667X0911	TERMINAL BLOCK 18-POST
912	P0667X0912	MAIN POWER SWITCH
913	P0667X0913	FUSE 5A
914	P0667X0914	FUSE 2A
915	P0667X0913	FUSE 5A
916	P0667X0916	FUSE 1A
917	P0667X0917	FUSE HOLDER 4-POS
918	P0667X0918	TRANSFORMER 500V 1PH
919	P0667X0919	BRAKE RESISTER 40 OHM
920	P0667X0920	ELECT CABINET W/DOOR & LATCH

One-Shot Oiler Breakdown & Parts List

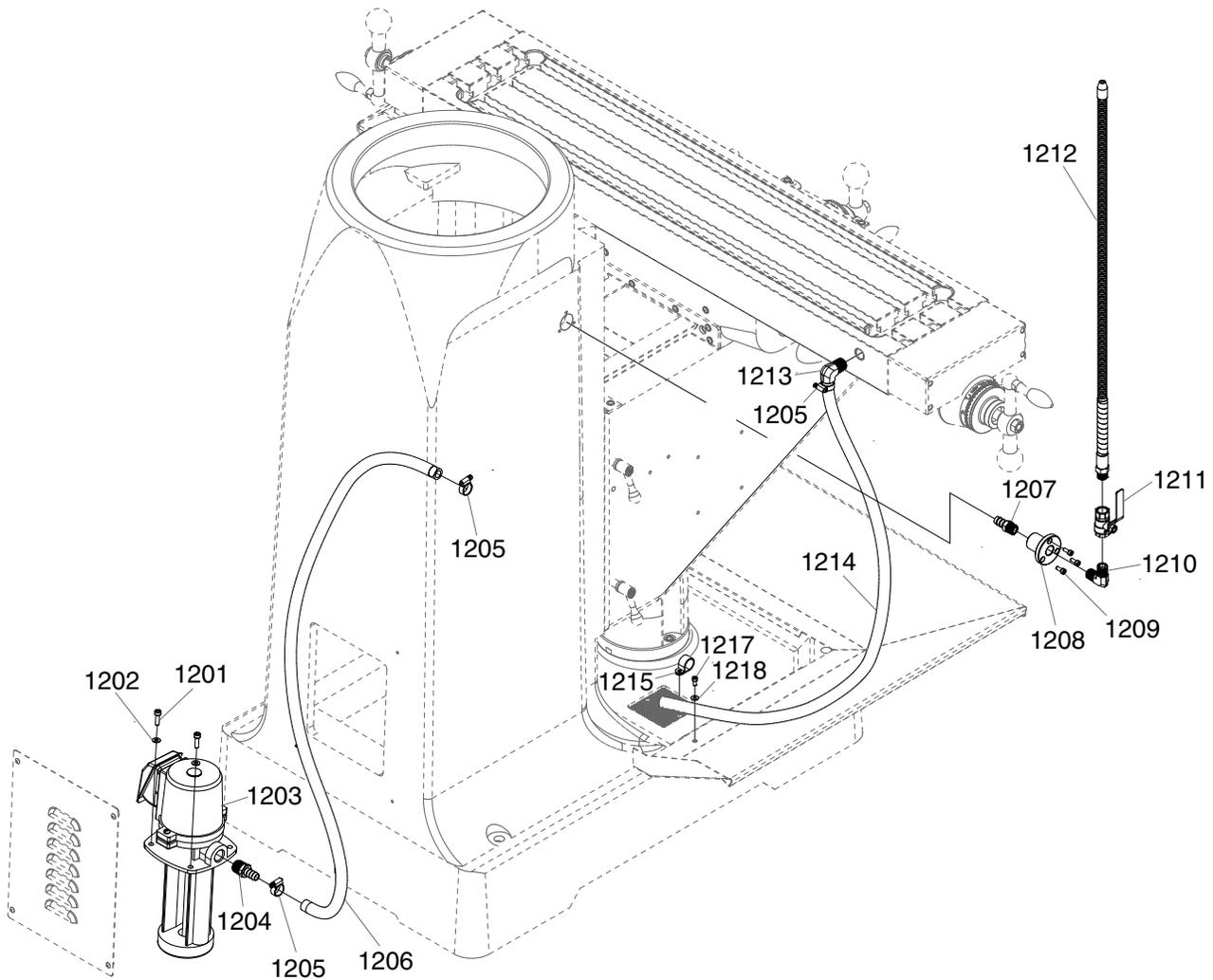


REF	PART #	DESCRIPTION
1101	P0667X1101	ONE SHOT OILER ASSEMBLY
1102	P0667X1102	FLEXIBLE STEEL TUBE 4 X 500MM
1103	P0667X1103	OIL DISTRIBUTOR 4 X 4MM
1104	P0667X1104	OIL DISTRIBUTOR A10/4 X 4MM

REF	PART #	DESCRIPTION
1105	PSB02M	CAP SCREW M6-1 X 20
1106	P0667X1106	ELBOW JOINT 4 X 1/8"
1107	PSB01M	CAP SCREW M6-1 X 16
1108	PSB38M	CAP SCREW M5-.8 X 25



Coolant System Breakdown & Parts List

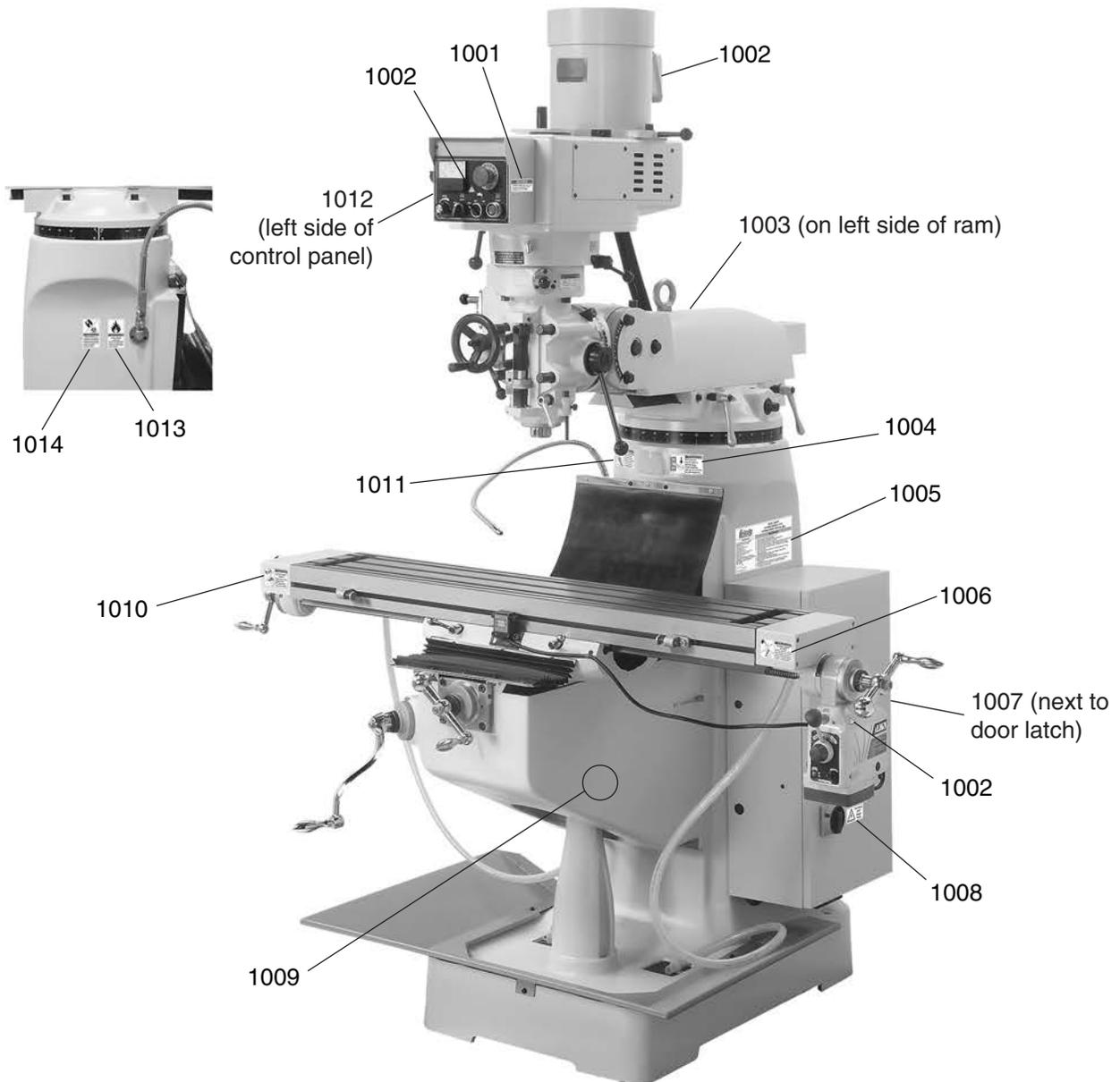


REF	PART #	DESCRIPTION
1201	PSB02M	CAP SCREW M6-1 X 20
1202	PW03M	FLAT WASHER 6MM
1203	P0667X1203	COOLANT PUMP 1/8HP 220V 1PH
1204	P0667X1204	HOSE FITTING
1205	P0667X1205	HOSE CLAMP 3/4"
1206	P0667X1206	HOSE 1/2" X 1100MM
1207	P0667X1207	HOSE CONNECTOR
1208	P0667X1208	BRACKET
1209	PSB33M	CAP SCREW M5-.8 X 12

REF	PART #	DESCRIPTION
1210	P0667X1210	PIPE ELBOW 3/8"
1211	P0667X1211	VALVE
1212	P0667X1212	COOLANT NOZZLE
1213	P0667X1213	ELBOW CONNECTOR 1/2"
1214	P0667X1214	HOSE 1/2" X 1500MM
1215	P0667X1205	HOSE CLAMP 3/4"
1217	PSB50M	CAP SCREW M5-.8 X 10
1218	PW02M	FLAT WASHER 5MM



Label Placement & List



REF	PART #	DESCRIPTION
1001	P0667X1001	COOLANT PUMP NOTICE LABEL
1002	PLABEL-14	ELECTRICITY LABEL
1003	G8588	GRIZZLY NAMEPLATE
1004	PLABEL-14	DISCONNECT POWER LABEL
1005	P0667X1005	MACHINE ID LABEL
1006	PLABEL-55	ENTANGLEMENT HAZARD LABEL
1007	PLABEL-64	SHOCK HAZARD LABEL

REF	PART #	DESCRIPTION
1008	P0667X1008	PREWIRED 220V LABEL
1009	PPAINT-23	GRIZZLY BEIGE TOUCH UP PAINT
1010	PLABEL-11C	EYE HAZARD LABEL HORIZ
1011	PLABEL-12B	READ MANUAL LABEL HORIZ
1012	P0667X1012	TRAINED PERSONNEL ONLY LABEL
1013	P0667X1013	EXPLOSION HAZARD LABEL
1014	P0667X1014	BIOLOGICAL HAZARD LABEL

WARNING

Safety labels warn about machine hazards and ways to prevent injury. The owner of this machine **MUST** maintain the original location and readability of the labels on the machine. If any label is removed or becomes unreadable, **REPLACE** that label before using the machine again. Contact Grizzly at (800) 523-4777 or www.grizzly.com to order new labels.





WARRANTY CARD

Name _____
 Street _____
 City _____ State _____ Zip _____
 Phone # _____ Email _____ Invoice # _____
 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?

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

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: _____

CUT ALONG DOTTED LINE

FOLD ALONG DOTTED LINE



Place Stamp Here



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



FOLD ALONG DOTTED LINE

Send a Grizzly Catalog to a friend:

Name _____
Street _____
City _____ State _____ Zip _____

TAPE ALONG EDGES--PLEASE DO NOT STAPLE

WARRANTY AND RETURNS

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

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

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

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

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

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

grizzly.com[®]

TOOL WEBSITE

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

*Visit Our Website Today For
Current Specials!*

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

