WOODSTOCK

SHOP FOX®

INTERNATIONAL

MODEL M1111

MILLING MACHINE W/DOVETAIL COLUMN

OWNER'S MANUAL

Phone: (360) 734-3482 • Online Technical Support: tech-support@shopfox.biz

#9074CR

Printed in China

⚠ 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.

Contents

USE THE QUICK GUIDE PAGE LABELS TO SEARCH OUT INFORMATION FAST!

INTRODUCTION

Woodstock Technical Support

Your new **SHOP FOX**® Mill with Dovetail Column has been specially designed to provide many years of trouble-free service. Close attention to detail, ruggedly built parts and a rigid quality control program assure safe and reliable operation.

Woodstock International, Inc. is committed to customer satisfaction. Our intent with this manual is to include the basic information for safety, setup, operation, maintenance, and service of this product.

We stand behind our machines! In the event that questions arise about your machine, please contact Woodstock International Technical Support at (360) 734-3482 or send e-mail to: **tech-support@shopfox.biz**. Our knowledgeable staff will help you troubleshoot problems and process warranty claims.

If you need the latest edition of this manual, you can download it from **http://www.shopfox.biz**.
If you have comments about this manual, please contact us at:

Woodstock International, Inc.
Attn: Technical Documentation Manager
P.O. Box 2309
Bellingham, WA 98227
Email: manuals@woodstockint.com

MACHINE SPECIFICATIONS

Phone #: (360) 734-3482 • Online Tech Support: tech-support@shopfox.biz • Web: www.shopfox.biz

MODEL M1111
MILLING MACHINE WITH DOVETAIL COLUMN

Motor:

Type	220V Brushless DC Motor (BLDC)
Horsepower	1HP
Amps	12 Amp
Phase	Single
Speed	3500 RPM
Cycle	60 Hz
Power Transfer	Cogged Belt
Bearings	Sealed, Permanently Lubricated

Product Dimensions:

Weight	364 lbs.
Length/Width/Height	27"L x 30"W x 33 3/4"H
Foot Print (Length/Width	16" x 13"

Shipping Dimensions:

Type	Wood Crate
Content	Machine
Weight	437 lbs.
Length/Width/Height	33"L x 32"W x 42"H

Electrical:

Switch	Forward/Reverse
Switch Voltage	110V
Cord Length	7 ft.
Cord Gauge	14 gauge
Recommended Circuit Size	15 Amp
Plug	NEMA 5-15
Power Supply	110V, Single-Phase
Power Inverter	110V to 220V

Continued on next page

General:

Spindle Travel	$2^{3}/_{4}$"
Drawbar	$^{7}/_{16}$" x 20 TPI
Spindle Taper	R8
Swing	18"
Longitudinal Table Travel	$15^{7}/_{8}$"
Cross Table Travel	$5^{3}/_{4}$"
Head Travel	$14^{7}/_{8}$"
Max. Distance Spindle To Column	8"
Max. Distance Spindle To Table	$14^{3}/_{4}$"
Max. Drilling Capacity	1"
Max. Tapping Capacity	$^{1}/_{2}$"
Max. End Mill Capacity	1"
Max. Face Mill Capacity	2"
Spindle Speed Range	100-1750 RPM, +/- 10%
Quill Diameter	2.362"

Table:

Table Length	$21^{5}/_{8}$"
Table Width	$6^{1}/_{4}$"
Table Thickness	$1^{1}/_{2}$"
No. of T-Slots	3
T-Slot Width	0.470"
T-Slot Height	0.750"
T-Slot Centers	$1^{11}/_{16}$"
Stud Size	$^{3}/_{8}$"
Lead Screw Diameter	$^{5}/_{8}$"
Lead Screw TPI	12
Lead Screw Length	26"

Construction:

Spindle Housing Construction	Cast Iron
Table Construction	Surface Ground Cast Iron
Head Construction	Cast Iron
Column Construction	Surface Ground Cast Iron
Base Construction	Cast Iron
Paint	Epoxy

Features:

3-16mm Drill Chuck with Key R-8/JT-6 Arbor
Leveling Feet
Digital RPM Readout
Digital Milling Depth Readout
Digital Tapping Controls and RPM Adjustment
Tapping Direction Quick-Shift Buttons on Quill Levers
Manual Micro Depth Adjustment
Dovetailed Table Ways
Dovetailed Column Ways

Identification

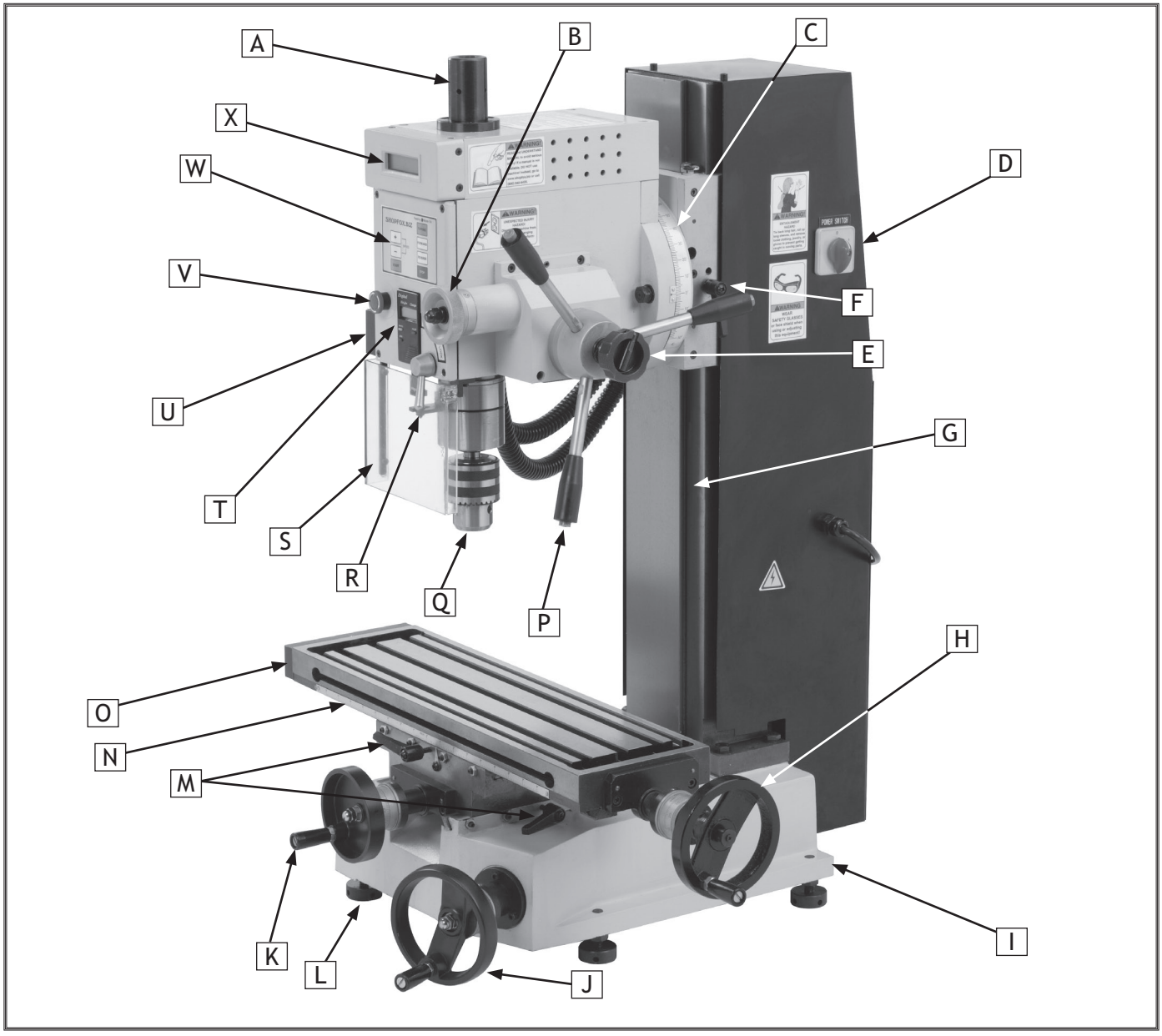


Figure 1. M1111 Identification.

A. Safety Cap and Drawbar
B. Fine Feed Knob
C. Headstock Tilt Scale
D. Main Power Switch
E. Fine Feed Lock Knob w/Assist Lever
F. HHeadstock Lock Lever
G. Precision Dovetailed Column
H. Longitudinal (X-Axis) Handwheel
I. Cast-Iron Base
J. Vertical (Z-Axis) Handwheel
K. Cross (Y-Axis) Handwheel
L. Adjustable Foot
M. Table Locks
N. Longitudinal Scale
O. Milling Table
P. Quill Handle Tapping Button
Q. Drill Chuck
R. Spindle Lock Lever
S. Chip Guard
T. Digital Spindle Depth Unit and Readout
U. Chip Guard Safety Kill Switch
V. Emergency Stop Button
W. Control Panel
X. Digital Spindle RPM Readout

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 which are 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.

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

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

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

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

⚠WARNING

Safety Instructions for Machinery

1. **READ THROUGH THE ENTIRE MANUAL BEFORE STARTING MACHINERY.** Machinery presents serious injury hazards to untrained users.

2. **ALWAYS USE ANSI APPROVED SAFETY GOGGLES WHEN OPERATING** MACHINERY. Everyday eyeglasses only have impact resistant lenses, they are NOT safety goggles.

3. **ALWAYS WEAR AN ANSI APPROVED RESPIRATOR WHEN OPERATING MACHINERY THAT PRODUCES DUST.** Wood dust is a carcinogen and can cause cancer and severe respiratory illnesses.

4. **ALWAYS USE HEARING PROTECTION WHEN OPERATING MACHINERY.** Machinery noise can cause permanent hearing damage.

5. **WEAR PROPER APPAREL.** DO NOT wear loose clothing, gloves, neckties, rings, or jewelry which may get caught 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.

7. **ONLY ALLOW TRAINED AND PROPERLY SUPERVISED PERSONNEL TO OPERATE MACHINERY.** Make sure operation instructions are safe and clearly understood.

8. **KEEP CHILDREN AND VISITORS AWAY.** Keep all children and visitors a safe distance from the work area.

9. **MAKE WORKSHOP CHILD PROOF.** Use padlocks, master switches, and remove start switch keys.

10. **NEVER LEAVE WHEN MACHINE IS RUNNING.** Turn power off and allow all moving parts to come to a complete stop before leaving machine unattended.

11. **DO NOT USE IN DANGEROUS ENVIRONMENTS.** DO NOT use machinery in damp, wet locations, or where any flammable or noxious fumes may exist.

12. **KEEP WORK AREA CLEAN AND WELL LIT.** Clutter and dark shadows may cause accidents.

13. **USE A GROUNDED EXTENSION CORD RATED FOR THE MACHINE AMPERAGE.** Undersized cords overheat and lose power. Replace extension cords if they become damaged. DO NOT use extension cords for 220V machinery.

14. **ALWAYS DISCONNECT FROM POWER SOURCE BEFORE SERVICING MACHINERY**. Make sure switch is in ***OFF*** position before reconnecting.

15. **MAINTAIN MACHINERY WITH CARE.** Keep blades sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

16. **MAKE SURE GUARDS ARE IN PLACE AND WORK CORRECTLY BEFORE USING MACHINERY.**

17. **REMOVE ADJUSTING KEYS AND WRENCHES.** Make a habit of checking for keys and adjusting wrenches before turning machinery ***ON***.

18. **CHECK FOR DAMAGED PARTS** B**EFORE USING MACHINERY.** Check for binding and alignment of parts, broken parts, part mounting, loose bolts, and any other conditions that may affect machine operation. Repair or replace damaged parts.

19. **DO NOT FORCE MACHINERY.** Work at the speed for which the machine or accessory was designed.

20. **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.

21. **DO NOT OVERREACH.** Keep proper footing and balance at all times.

22. **MANY MACHINES WILL EJECT THE WORKPIECE TOWARD THE OPERATOR.** Know and avoid conditions that cause the workpiece to "kickback."

23. **BE AWARE THAT CERTAIN DUST MAY BE HAZARDOUS** to the respiratory systems of people and animals, especially fine dust. Make sure you know the hazards associated with the type of dust you will be exposed to and always wear a respirator approved for that type of dust.

⚠WARNING
Additional Safety for Milling Machines

⚠WARNING

READ and understand this entire instruction manual before using this machine. Serious personal injury may occur if safety and operational information is not understood and followed. DO NOT risk your safety by not reading!

⚠CAUTION

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

1. **UNDERSTANDING CONTROLS.** Make sure you understand the use and operation of all controls.

2. **SAFETY ACCESSORIES.** Always use the chip guard in addition to your safety goggles when milling to prevent bodily injury.

3. **HOLDING WORK**. Before starting the machine, be certain the workpiece has been properly clamped to the table. NEVER hold the workpiece by hand when using the mill.

4. **CHUCK KEY SAFETY**. Always remove your 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. **SPINDLE DIRECTION CHANGES**. Never reverse spindle direction when milling or boring.

7. **BE ATTENTIVE.** DO NOT leave mill running unattended for any reason.

8. **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.

9. **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 starting any inspection, adjustment, or maintenance procedure.

10. **AVOIDING ENTANGLEMENT.** Keep loose clothing articles such as sleeves, belts or jewelry items away from the mill spindle. Never wear gloves when operating the mill.

11. **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.

12. **EXPERIENCING DIFFICULTIES.** If at any time you are experiencing difficulties performing the intended operation, stop using the machine! Contact our Technical Support at (360) 734-3482.

ELECTRICAL

⚠WARNING

The machine must be properly set up before it is safe to operate. DO NOT connect this machine to the power source until instructed to do so in the "Test Run" portion of this manual.

110V Operation

The Model M1111 is designed for a 110V power supply; however, the motor receives 220V current from the built-in 110V-to-220V power inverter. We recommend connecting this machine to a dedicated circuit with a verified ground, using the circuit size below as a minium. Never replace a circuit breaker with one of higher amperage without consulting a qualified electrician to ensure compliance with wiring codes.

This machine must be grounded! The electrical cord supplied with this machine comes with a grounding pin. If your outlet does not accommodate a ground pin, have it replaced by a qualified electrician.

If you are unsure about the wiring codes in your area or you plan to connect your machine to a shared circuit, you may create a fire or circuit overload hazard—consult a qualified electrician to reduce this risk.

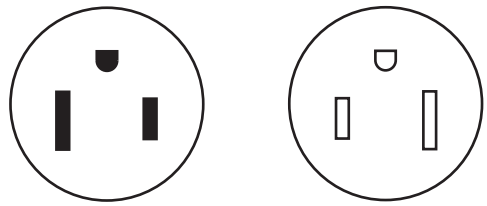


Figure 2. 5-15 plug and receptacle.

⚠WARNING

DO NOT work on your electrical system if you are unsure about electrical codes and wiring! Seek assistance from a qualified electrician. Ignoring this warning can cause electrocution, fire, or machine damage.

Extension Cords

We do not recommend using an extension cord; however, if you have no alternative, use the following guidelines:

- Use a cord rated for Standard Service (S).
- Do not use an extension cord longer than 50 feet.
- Ensure that the cord has a ground wire and pin.
- Use the gauge size listed below as a minimum.

Electrical Specifications

Operating Voltage	Amp Draw	Min. Circuit Size	Plug/Receptacle	Extension Cord
110V Operation	12 Amps	15A	NEMA 5-15	14 Gauge

SETUP

Unpacking

This machine has been carefully packaged for safe transportation. If you notice the machine has been damaged during shipping, please contact your authorized Shop Fox dealer immediately.

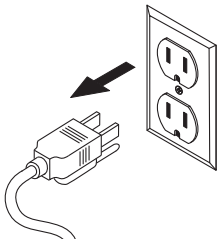
Inventory

The following is a description of the main components shipped with the Model M1111. 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 safer shipping.*

Box Inventory (Figures 3 & 4)	Qty
A. Assembled Mill/Drill	1
B. Drill Chuck and JT6 x R8 Arbor	1
C. Oil Bottle	1
D. T-Nuts	2
E. Open-End Wrenches 8-10, 12-14, 17-19mm	1 ea
F. Drawbar Hex Wrench	1
G. Spindle Spanner Wrench	1
H. Chuck Key	1
I. Hex Wrench Set 3, 4, 5, and 6mm	1 ea

WARNING



Keep machine disconnected from power until instructed otherwise.

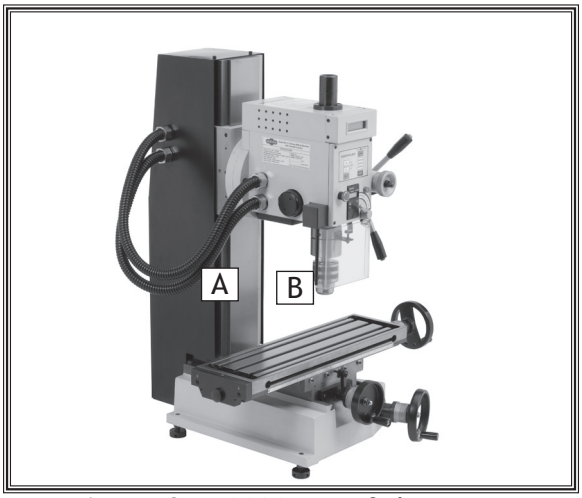


Figure 3. M1111 out of the crate.

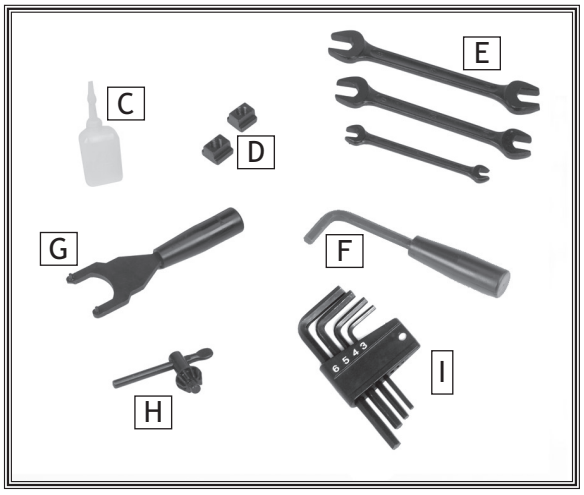


Figure 4. Inventory.

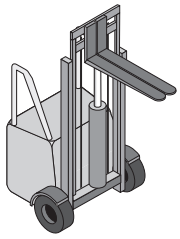
Machine Placement

- **Bench Load:** This machine distributes a heavy load in a small footprint. Some workbenches or tool tables may require additional bracing to support both machine and workpiece.

- **Working Clearances:** Consider existing and anticipated needs, size of material to be processed through the machine, and space for auxiliary stands, work tables or other machinery when establishing a location for your mill.

- **Lighting:** Lighting should be bright enough to eliminate shadow and prevent eye strain.

- **Electrical:** Electrical circuits must be dedicated or large enough to handle amperage requirements. Outlets must be located near each machine, so power or extension cords are clear of high-traffic areas. Follow local electrical codes for proper installation of new lighting, outlets, or circuits.



⚠WARNING

USE helpers or power lifting equipment to lift this mill. Otherwise, serious personal injury may occur.

⚠CAUTION

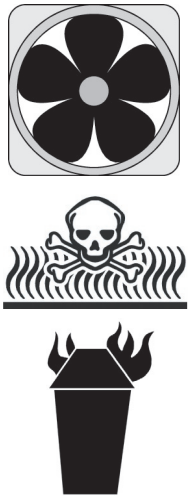
MAKE your shop "child safe." Ensure that your workplace is inaccessible to youngsters by closing and locking all entrances when you are away. NEVER allow untrained visitors in your shop when assembling, adjusting or operating equipment.

Cleaning Machine

The table and other unpainted parts of your machine type are coated with a waxy grease that protects them from corrosion during shipment. Clean this grease off with a solvent cleaner or citrus-based degreaser. DO NOT use chlorine-based solvents such as brake parts cleaner or acetone—if you happen to splash some onto a painted surface, you will ruin the finish.

⚠WARNING

NEVER use gasoline or other petroleum-based solvents to clean with. Most have low flash points, which make them extremely flammable. A risk of explosion and burning exists if these products are used. Serious personal injury may occur if this warning is ignored!



⚠CAUTION

ALWAYS work in well-ventilated areas far from possible ignition sources when using solvents to clean machinery. Many solvents are toxic when inhaled or ingested. Use care when disposing of waste rags and towels to be sure they DO NOT create fire or environmental hazards.

Bench Mounting

Four leveling feet have been included with your mill. However, for greater safety and better performance, your mill should be bolted to a workbench to provide maximum rigidity and safety.

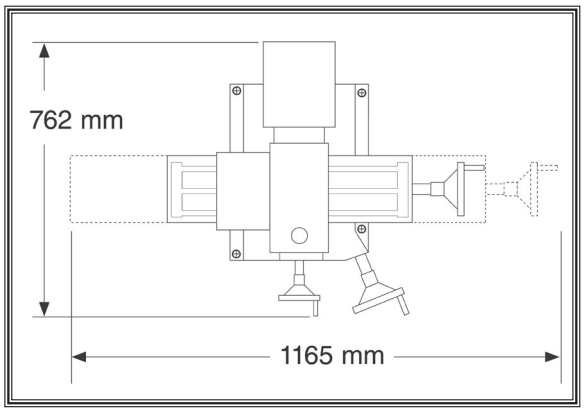


Figure 5. Minimum working clearances and mill mounting bolt pattern.

Secured Mounting

To mount the mill to the workbench, do these steps:

1. Determine the best position for the mill on the workbench.

   Note: *For the best performance, make sure the cross feed and the longitudinal handwheels extend out beyond the edge of the table surface. This will allow unrestricted handwheel operation.*

2. Mark your hole locations using the mounting holes in the base as a guide.

3. Drill the holes needed in the workbench.

4. Place a precision level on the mill table and shim the mill until it is level side-to-side and front-to-back.

5. Using appropriate power lifting equipment, place the mill on the workbench.

6. Bolt the mill base to the top of the workbench (**Figure 6**).

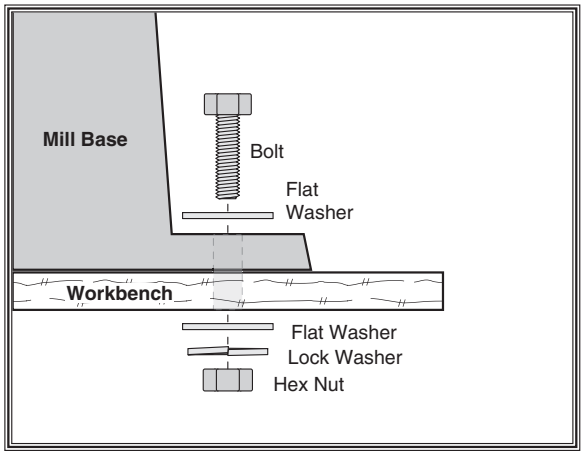


Figure 6. Example of a through mount setup.

Unsecured Mounting

To setup the mill for temporary mounting, do these steps:

1. Using appropriate power lifting equipment, tilt the mill and install the four feet into the base.

2. Place the mill on the workbench.

3. Place your precision level on the mill table.

4. Loosen the hex nut(s), as shown in **Figure 7**, and turn the feet until the mill is level side-to-side and front-to-back.

5. Retighten the hex nuts.

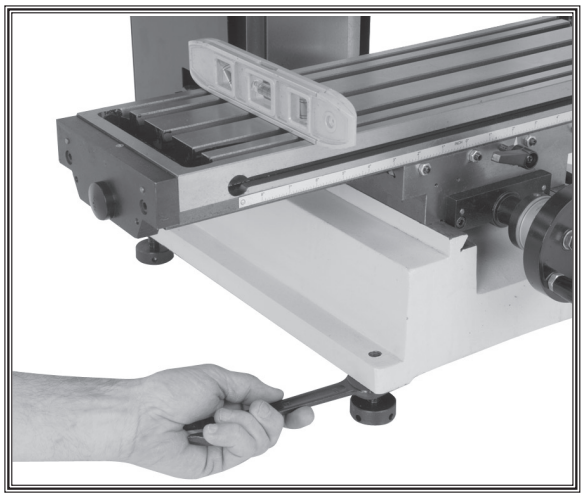


Figure 7. Leveling the mill.

Test Run and Spindle Break-In

The Model M1111 spindle speed can be set from 100–1750 RPM. You must follow the proper break-in procedures to ensure the spindle bearings break-in and seat before putting a load on the machine.

To test run and break-in the spindle bearings, do these steps:

1. Do all lubrication procedures highlighted in **Lubrication** in **MAINTENANCE** on **Page 24.**

2. Make sure there are no obstructions around or underneath the spindle.

3. Remove the drawbar if there is no arbor or collet in the spindle.

4. Make sure all switches are ***OFF*** and connect the mill to the power source.

5. Turn the main power switch ***ON***, and push the ***START*** button on the control panel. The spindle will begin to turn at a low RPM.

6. Now push the **+** button until the mill reaches approximately 600 RPM, then let it run for a minimum of 10 minutes.

   —If you suspect the mill is not working correctly, shut the mill ***OFF***, disconnect it from power, and use the **Troubleshooting** table on **Page 25** to correct the problem before proceeding further.

   —If the mill is running smoothly, proceed to **Step 7**.

7. Increase the speed to 1000 RPM and let it run for another ten minutes.

8. Increase the speed to 1750 RPM and let it run for another ten minutes.

9. Turn the mill ***OFF***.

10. Set the spindle to rotate in the opposite direction, and let it run at 1750 RPM for another ten minutes.

NOTICE

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

NOTICE

Failure to follow start up and spindle break-in procedures will likely cause rapid deterioration of spindle and other related parts.

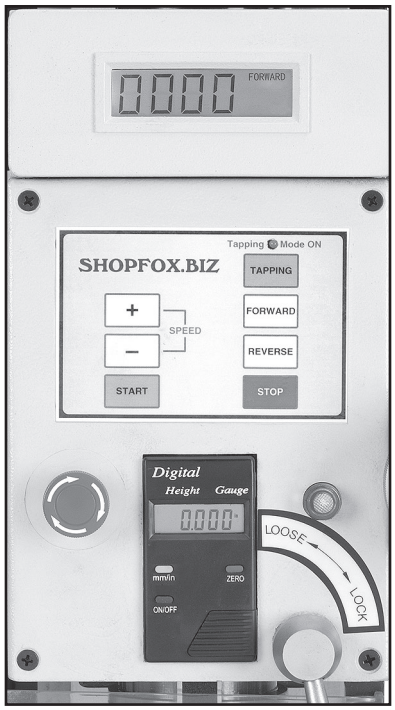


Figure 8. Control panel.

OPERATIONS

General

This machine will perform many types of operations that are beyond the scope of this manual. Many of these operations can be dangerous or deadly if performed incorrectly.

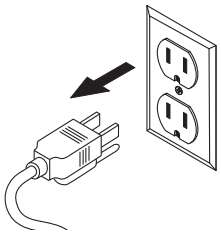
The instructions in this section are written with the understanding that the operator has the necessary knowledge and skills to operate this machine. **If at any time you are experiencing difficulties performing any operation, stop using the machine!**

If you are an inexperienced operator, we strongly recommend that you read books, trade articles, or seek training from an experienced mill operator before performing any unfamiliar operations. **Above all, your safety should come first!**

⚠WARNING

READ and understand this entire instruction manual before using this machine. Serious personal injury may occur if safety and operational information is not understood and followed. DO NOT risk your safety by not reading!

⚠WARNING



DO NOT investigate problems or adjust the machine while it is running. Wait until the machine is turned *OFF*, unplugged and all working parts have come to a complete stop before proceeding!

⚠WARNING

Always wear safety glasses when operating this machine. Failure to comply may result in serious personal injury.

Spindle Height Control

Spindle height is changed by unlocking the quill lock and using the down feed handles or the fine feed knob (**Figure 9**). The digital spindle height readout indicates the spindle height.

To change the spindle position, do these steps:

1. Unlock the quill lock lever and loosen the fine feed lock knob.

   Note: *Use the comfort lever (***Figure 9***) for additional leverage to unlock the fine feed lock knob if the knob is too tight. Do not use the comfort lever to tighten the knob.*

2. Pull down on the quill feed levers to lower or raise the spindle. Lock the quill lock to hold the spindle in a particular position if you choose.

   Note: *Milling with the quill fully extended, can cause tool chatter. For maximum spindle rigidity when milling, lower the headstock, keep the spindle retracted completely with the quill lock lever locked, and the fine feed lock knob tightened.*

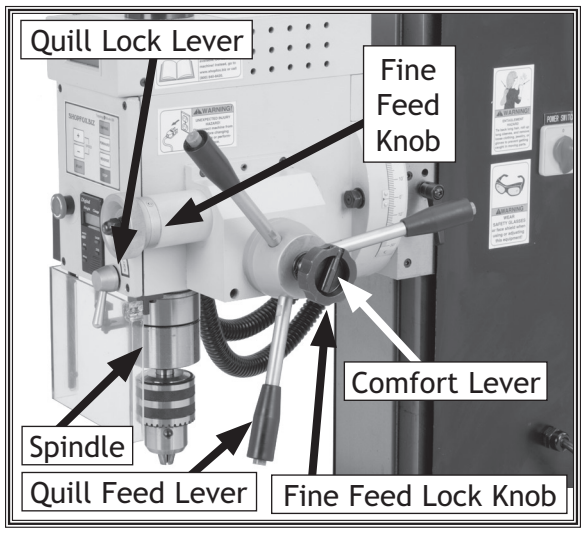


Figure 9. Spindle controls.

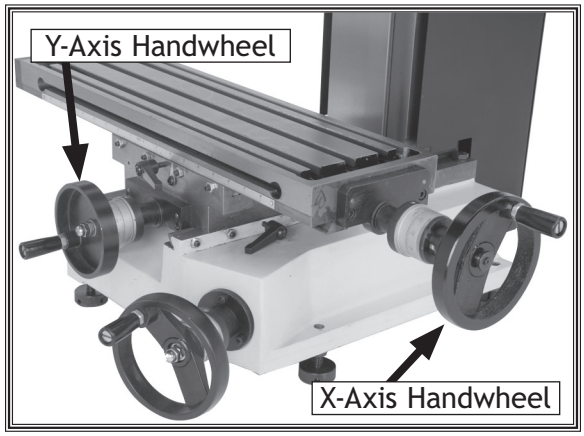


Figure 10. Table X and Y-axis controls.

Table Travel (X-Axis and Y-Axis)

Longitudinal Feed

The longitudinal feed, or X-axis is moved by the handwheel shown in **Figure 10** at the end of the table. The handwheel will move the table in both directions side-to-side. One complete revolution of the handwheel moves the longitudinal feed 0.100". There is also a scale on the front of the table for use when a tight tolerance is not required. The longitudinal feed can be locked in position by a table lock located on the front of the table (see **Figure 11**).

Cross Feed

The cross feed or Y-axis in **Figure 10**, is moved with the handwheel on the front of the table base. One complete revolution of the handwheel moves the cross slide 0.100". The cross feed can be locked into position by a table lock located on the right side of the cross slide underneath the table (see **Figure 11**).

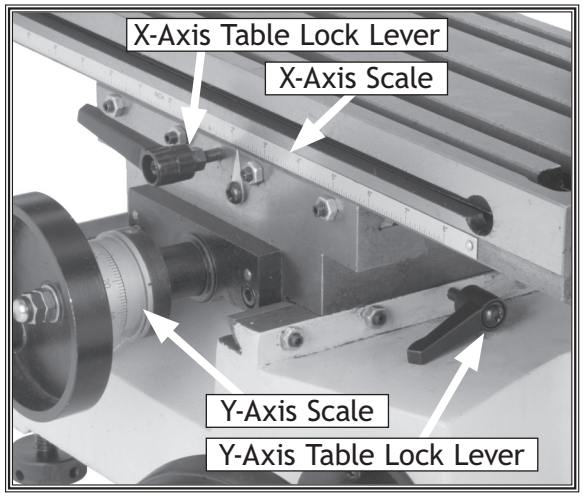


Figure 11. Table locks and scales.

Headstock Travel (Z-Axis and Rotation)

Headstock height is adjustable in the vertical Z-axis to accept large workpieces. For unique milling operations, the headstock can be tilted right or left between 0° and 90°. Your mill has a dovetailed slide that allows you to reposition the headstock and change tooling without losing your alignment with a hole or milling path.

To raise or lower the headstock, do these steps:

1. Unlock the headstock slide lock lever shown in **Figure 12**.

2. Turn the Z-axis handwheel shown in **Figure 13** to raise or lower the headstock, then lock the headstock slide lock lever.

   Note: *Milling with the quill fully extended, can cause tool chatter. For maximum spindle rigidity when milling, lower the headstock, keep the spindle retracted completely with the quill lock lever locked, and the fine feed lock knob tightened.*

To tilt the headstock to the left or right, do these steps:

1. DISCONNECT THE MILL FROM POWER!

2. Using a 17mm wrench, loosen both headstock tilt lock nuts (**Figure 14**).

3. Insert a 6mm hex wrench into the index pin release port (**Figure 14**), and turn the hex wrench clockwise to disengage the spring-loaded index pin from the headstock.

4. While watching the tilt scale, rotate the headstock to the required angle, and retighten the tilt lock nuts to hold the headstock in place.

   Note: *The index pin is spring loaded and serves only as a quick way to return the headstock close to zero. It is not intended to be an absolute zero degree stop. No other index holes exist at other angles in the headstock.*

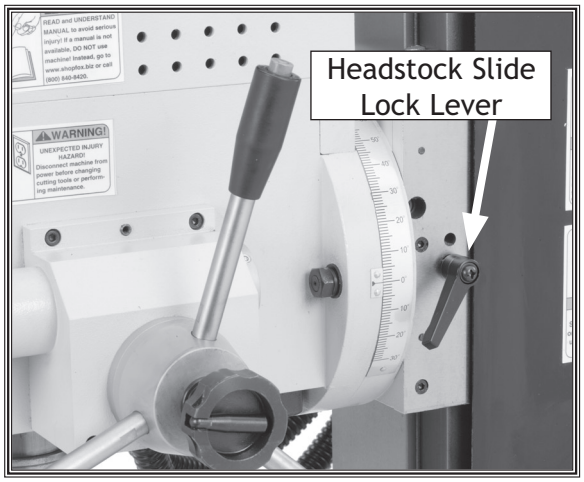


Figure 12. Headstock slide controls.

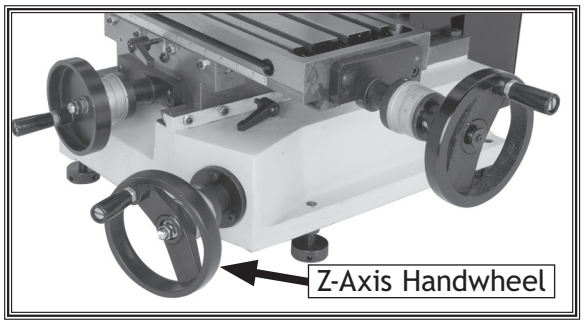


Figure 13. Z-axis control.

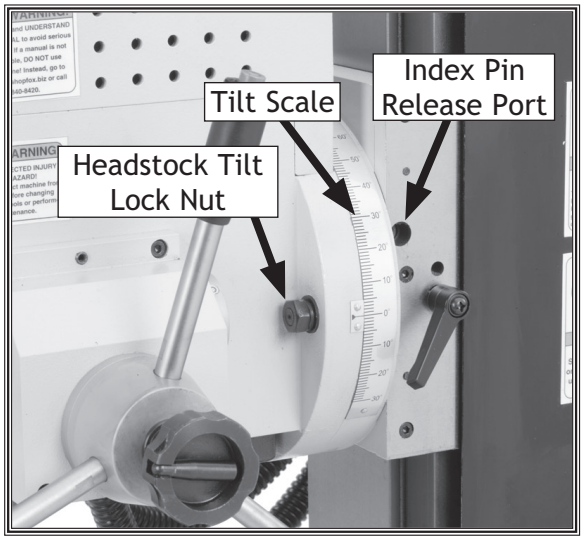


Figure 14. Headstock tilt controls.

Drill Chuck

To remove the chuck and arbor from the spindle, do these steps:

1. DISCONNECT THE MILL FROM POWER!

2. Remove the drawbar safety cap (**Figure 16**).

3. Lock the quill in place with the quill lock.

4. Insert the pin spanner (**Figure 15**) into the two holes at the bottom of the spindle and hold the spindle.

5. Using the 17mm wrench, loosen the drawbar one turn only. DO NOT remove it. DO NOT completely unscrew the drawbar before striking it with the hammer, or you will damage the threads on the drawbar and the arbor.

6. Tap the top of the drawbar with the hammer. This will unseat the taper of the arbor from the spindle (see **Figure 16**).

7. Hold one hand under the chuck and finish loosening the drawbar by hand until it falls out of the spindle.

Note: *The chuck is attached to the arbor using a JT6 taper. This attachment is considered to be semi-permanent. There should be no need to remove the chuck from the arbor. Inspect the chuck from time to time to make sure it is still tight on the arbor. If it is loose, use a dead-blow or other soft headed hammer to re-seat the taper.*

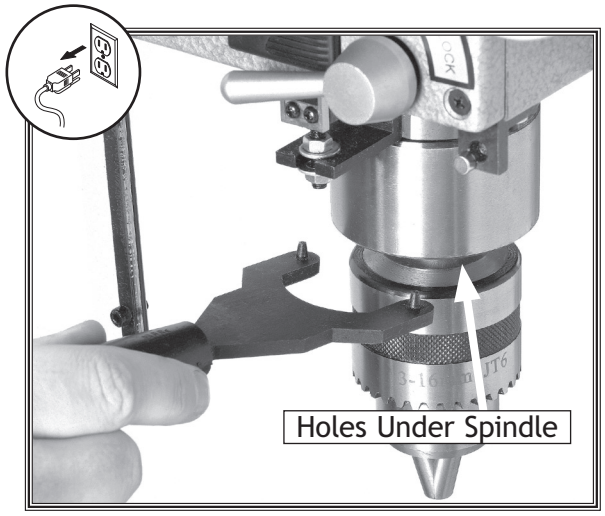


Figure 15. Spindle holes.

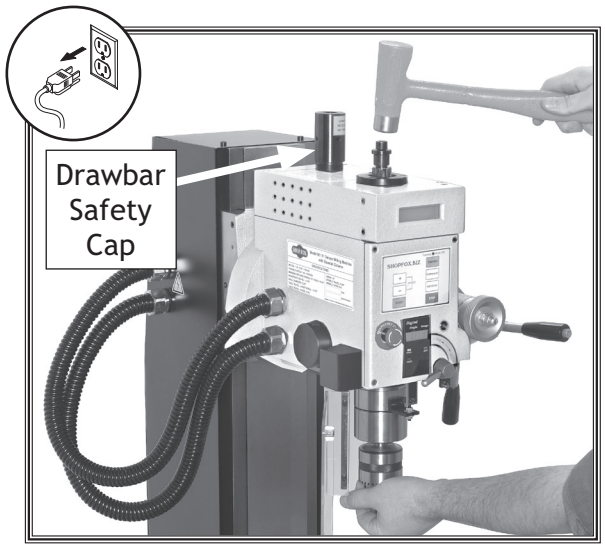


Figure 16. Tapping on the drawbar.

To install the drill chuck and arbor, do these steps:

1. DISCONNECT THE MILL FROM POWER!

2. Insert the chuck arbor into the spindle so it engages the alignment pin inside of the spindle and makes contact with the drawbar threads.

3. While supporting the chuck with one hand, thread the drawbar into the arbor until the arbor seated up into the spindle taper.

4. Snug the drawbar with the drawbar hex wrench.

Note: *Do not overtighten the drawbar. Overtightening makes arbor removal difficult and will damage the arbor and threads.*

5. Install the drawbar safety cap (**Figure 16**).

R-8 Collets

⚠CAUTION

LACERATION HAZARD! Leading edges of end mills and other cutting tools can be very sharp. Protect your hands with gloves or a shop towel when handling.

Your Model M1111 features an R-8 spindle taper, which gives the freedom to use standard R-8 collets.

To install the R-8 collet, do these steps:

1. DISCONNECT THE MILL FROM POWER!
2. Unscrew the drawbar cap.
3. Carefully clean the surface of the collet and spindle taper. Ensure that they are free of debris and are lightly oiled.
4. Insert the cutting tool into the collet, then insert the collet up into the spindle taper.
5. Rotate the collet so it engages the alignment pin inside of the spindle, then slide the collet upward until it makes contact with the drawbar threads.
6. While supporting the tool in the collet with one hand, thread the drawbar into the collet until the collet draws up into the spindle taper.
7. Snug the drawbar with the A 17MM wrench in your opposite hand.

   Note: *Do not overtighten the drawbar. Overtightening makes collet removal difficult and will damage the drawbar threads, collet, and the spindle taper. Keep in mind that the taper keeps the collet and tool in place. The drawbar simply aids in seating the taper.*

To remove the collet, do these steps:

1. DISCONNECT THE MILL FROM POWER!
2. Tighten the headstock lock.
3. Protect the table surface with a piece of cardboard or hold the cutter/tool with a shop towel to prevent it from falling out of the collet.
4. Using the drawbar hex wrench, loosen the drawbar but DO NOT remove it.
5. Using the brass hammer, tap the drawbar to unseat the taper.
6. Unscrew the rest of the drawbar by hand and remove the collet.

   Note: *When not in use, always remove collets and cutting tools from the spindle taper. Oxidation may cause the collet to seize and make it hard to remove later.*

Control Panel

It is vital that you become familiar with the power controls before operating the Model M1111 (see **Figure 17**).

A. Spindle RPM Display: Shows spindle RPM with an accuracy of **+/-** 10%.

B. Spindle Rotation Mode: Shows the direction the spindle is turning.

C. Spindle Mode: Shows STOP when the spindle is stopped. When spindle is rotating, the "STOP" indication disappears.

D. Spindle START Button: Press START, and the spindle will rotate at 200 RPM in the milling/drilling mode, and the spindle rotation buttons on the control panel are enabled. The Green LED tapping lamp will not glow, and the spindle rotation buttons on the ends of the rack handles are disabled.

E. SPEED Buttons: Press to select a milling/drilling or tapping RPM. In the milling/drilling mode the range is between 200 and 1750 RPM. In the tapping mode, the range is between 100 and 500 RPM.

F. Spindle Rotation Buttons: Press these buttons to change spindle rotation direction for milling/drilling operations. Spindle direction can be changed at any RPM without stopping the spindle first.

G. Spindle STOP Button: Stops spindle rotation. If you press the START button, the spindle speed will return to the last spindle RPM setting.

H. Tapping Button: Switches the mill into tapping mode only when the motor is running. When in tapping mode, the LED tapping lamp glows and the RPM automatically drops to approximately 500 RPM. The spindle rotation buttons on the ends of the rack handles are also enabled and the spindle rotation buttons on the control panel are disabled.

I. Green LED Lamp: Glows when the machine is in the tapping mode, and does not glow in the milling/drilling mode.

J. Emergency Stop Button: Stops the mill. Rotate the button clockwise until it pops back out to reset it.

K. Green Main Power Lamp: Glows when the main power switch is turned to the ***ON*** position.

L. Zero Button: Zeros the digital spindle scale.

M. Spindle Height Digital Display: Shows height of spindle.

N. mm/in Button: Toggles units of measure between metric and inch conventions.

O. Digital Spindle Scale ON/OFF Button: Turns the digital spindle scale ***ON*** or ***OFF***.

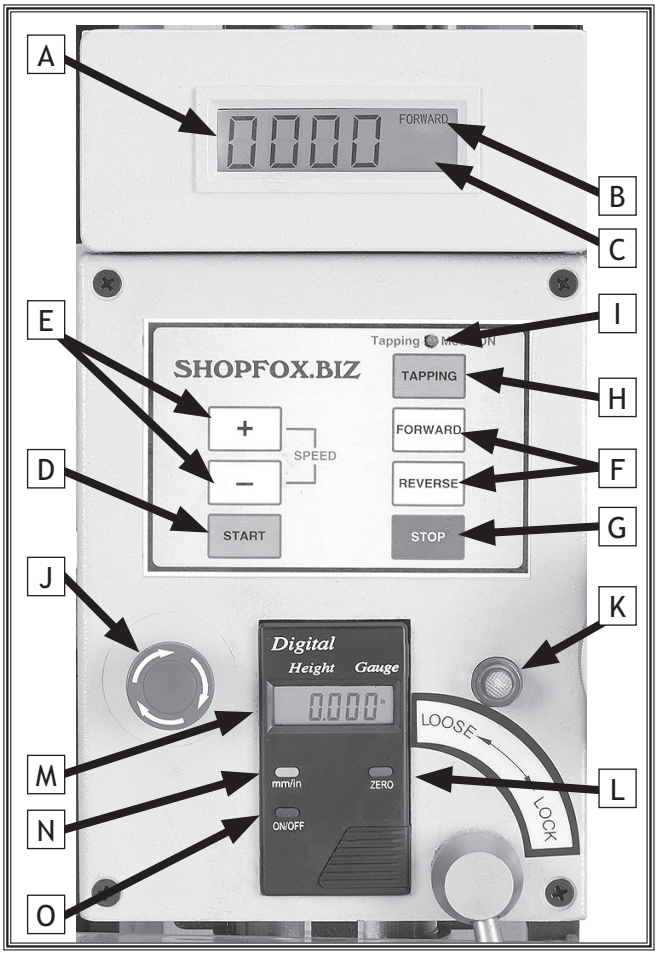


Figure 17. Control panel.

Calculating Spindle RPM

Closely follow the proper cutting speed and proper feed to reduce undue strain on all moving parts and increase operator safety.

Prior to milling, determine the RPM needed to cut your workpiece, then set the RPM on the machine.

To determine the needed RPM, do these steps:

1. Use the table in **Figure 18** to determine the cutting speed required for the material of your workpiece.

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

3. Use the following formula to determine the needed RPM for your operation:

   (Cutting Speed x 4) /Tool Diameter = RPM

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 18. Cutting speed table for HSS cutting tools.

Milling/Drilling Mode

This mill is designed to use most end mills, drill bits, and face cutters that are 2" in diameter or less. The milling table has a coolant trough with drain for an optional cutting fluid system.

⚠WARNING

Failure to follow RPM and Feed Rate Guidelines may threaten operator safety from ejected parts or broken tools.

To mill a workpiece, do these steps:

1. Refer to **Control Panel** on **Page 19**, and learn the how to use the machine controls.

2. Zero the spindle height scale and select units of measure.

3. Clamp the workpiece to the milling table, and adjust the headstock to the needed height, depth of cut, and milling path.

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

4. Refer to **Calculating Spindle RPM** on **Page 20** to find the best spindle RPM.

5. Put on your safety goggles, turn the power switch ***ON***, and press the START button.

6. Push the FORWARD or REVERSE button to select the appropriate cutting direction for the type of cutter that you are using.

7. Press the SPEED button to select the appropriate milling speed for the diameter of cutter and type of material to be cut.

8. Use the X-axis or Y-axis handwheels to feed the workpiece into the cutter slowly. If you are only milling in one direction, lock the unused table slide in place. Refer to **Table Travel** on **Page 15** for lock lever location.

Tapping Mode

This mill is designed to change spindle direction without stopping the spindle first. The wayed column allows for drill and tap changes and headstock repositioning without loosing the tool registration. Using the mill in the tapping mode takes some level of skill, so make sure to practice using this feature. Avoid cutting threads in blind holes where the tap may bottom out and break before you can push the REVERSE button.

⚠WARNING

Failure to follow RPM and Feed Rate Guidelines may threaten operator safety from ejected parts or broken tools.

To drill and thread a hole, do these steps:

1. Refer to **Control Panel** on **Page 19,** and learn how to use the machine controls.

2. Zero the spindle height scale and select units of measure, and calculate your maximum tapping depth without bottoming-out the tap.

3. Clamp the workpiece to the milling table, and adjust the headstock to the needed height for drilling and tapping.

4. Put on your safety goggles, turn the power switch ***ON***, and press the START button.

5. Drill your hole with the appropriate speed and drill bit size for the tap. For large holes you may have to drill a pilot hole.

6. Install the tap, and apply tapping fluid or oil when needed.

7. Push START, then the TAPPING button, and then the SPEED button. The safest tapping speed is 100 RPM.

8. Begin threading, but without disengaging the threads, frequently push the FORWARD and REVERSE buttons on the downfeed handles to cut and back-out the tap to eject the chips from the hole and prevent thread galling.

Accessories

The following M1111 milling machine accessories may be available through your local Woodstock International Inc. Dealer. If you do not have a dealer in your area, these products are also available through online dealers. Please call or e-mail Woodstock International Inc. Customer Service to get a current listing of dealers at: 1-800-545-8420 or at sales@woodstockint.com.

The Shop Fox D3694—Variable Speed Power Feed Kit For those repetitive power-fed milling operations, this fantastic 110V power feed retrofit kit offers consistent speed control in both left and right directions for your Model M1111 milling machine. Let it do your work!

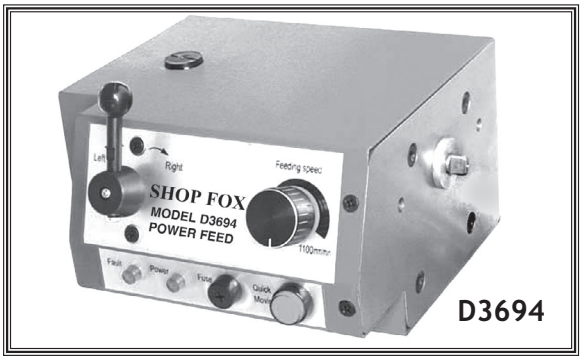


Figure 19. Variable speed power feed kit.

The Shop Fox D3695—Horizontal Milling Table Take advantage of the Model M1111 mill 90° tilting headstock feature. Install this lifted cast-iron horizontal milling table for the correct clearance when making those side-milling operations.

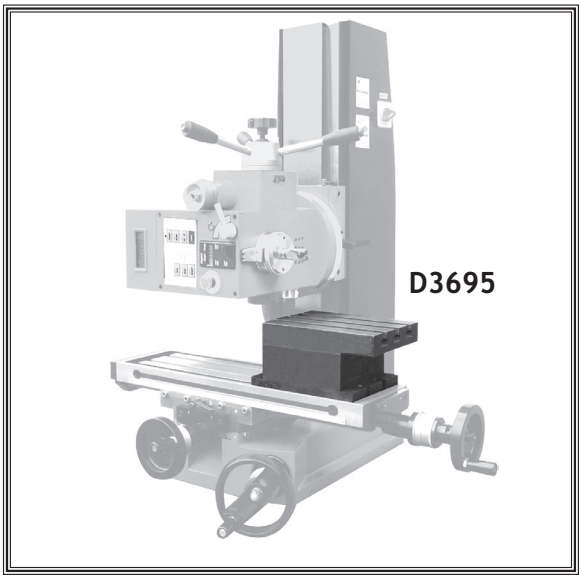


Figure 20. Horizontal milling worktable.

The Shop Fox D3693—Worktable with Angle Enjoy having an economical way to support your workpiece at an array of angles. This high-quality tilting worktable is quick and easy to setup and use.

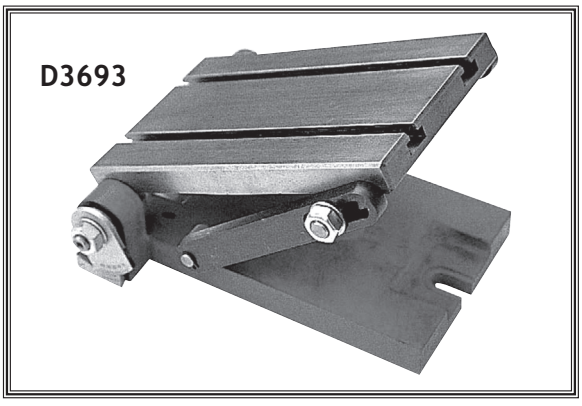


Figure 21. Worktable with angle.

Accessories

The Shop Fox M1078—6" Precision Rotary Table
Has the following great features: 4 T-slots for 3/8" studs, 4° per rotation of the hand wheel, 10 minute vernier resolution, whole degree marks on table, coolant trough and the worm gear can be easily disengaged for quick setting angles, an MT#2 center hole, and weighs approximately 49 lbs.

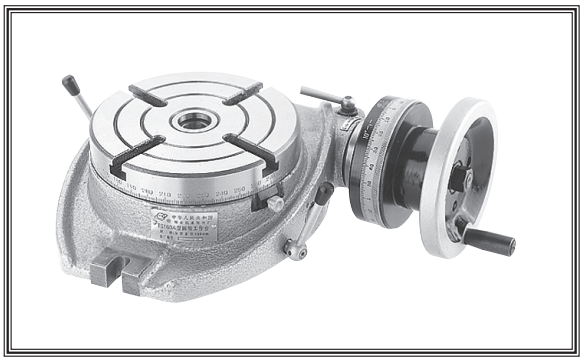


Figure 22. 6" Precision rotary table.

The Shop Fox M1079—Precision R-8 Collets
These R-8 Collets are precision ground to very close tolerances and will maximize your milling rigidity. Sizes include: 1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 9/16", 5/8", 11/16", 3/4" and 7/8."

Figure 23. Precision R-8 collets.

The Shop Fox M1080—52-pc. Clamping Kit
The kit includes: Case hardened blocks, bolts, nuts and hold-downs. Each Clamping Kit includes: 24 studs, 6 step block pairs, 6 T-nuts, 6 flange nuts, 4 coupling nuts and 6 end hold-downs. We offer the two most popular sizes: 3/8" and 1/2". Racks can be bolted to the wall or on the side of a machine for easy access.

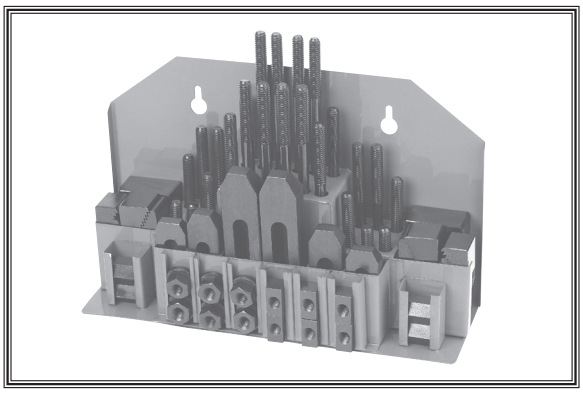


Figure 24. Clamping kit.

The Shop Fox M1091—18-pc. R-8 Boring Head Set
The set includes: 2" boring head, 9 carbide tipped boring bars with 1/2" shanks. 2 facing tools with 3/16" square HSS cutting tools. Dial graduated in 0.001", 0.050" per revolution/0.025" actual motion. R-8 shank with 7/8"-20 mounting threads. Stand included.

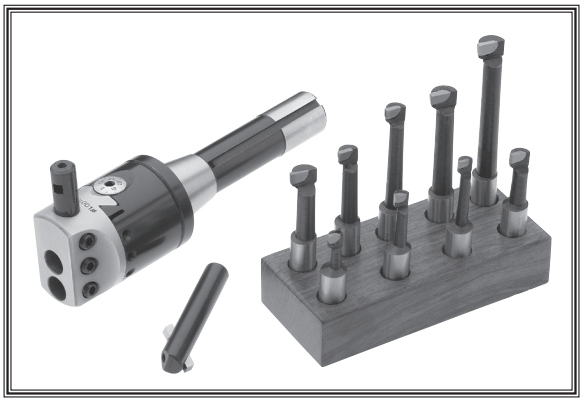
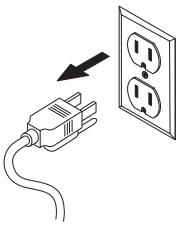


Figure 25. R-8 boring head set.

MAINTENANCE



⚠WARNING

Always disconnect power to the machine before performing maintenance. Failure to do this may result in serious personal injury.

Schedule

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

Daily Check:
- Mill is disconnected from power when not in use.
- Loose mounting bolts.
- Mill is clean and lubricated.
- Worn or damaged wires.
- Any other unsafe condition.

Monthly Check:
- Gibs are adjusted properly.

Annual or Biannual Check:
- Lubricate headstock lead screw and gears.

Lubrication

Regular lubrication will ensure your mill performs at its highest potential. Place two to three drops of a general machine oil directly on the ways of the cross slide and saddle. An oil bottle has been provided for this purpose. Nine ball oilers (**Figures 26**–**28**) should be lubricated daily with several drops of oil.

Protect the unpainted cast iron surfaces with regular applications of light machine oil, and periodically clean and lubricate all lead screws with white lithium grease.

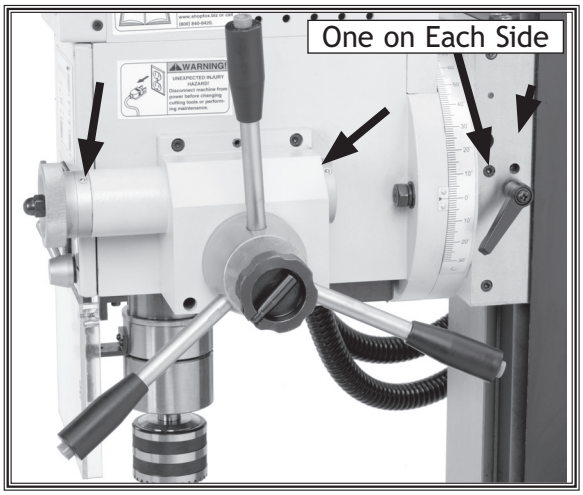


Figure 26. Headstock ball oiler locations.

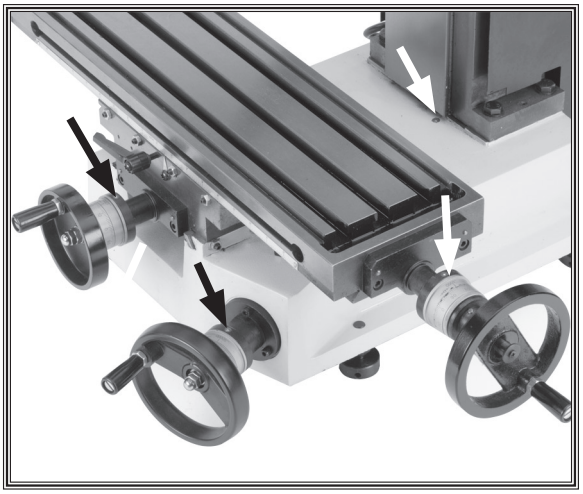


Figure 27. Table and base ball oiler locations.

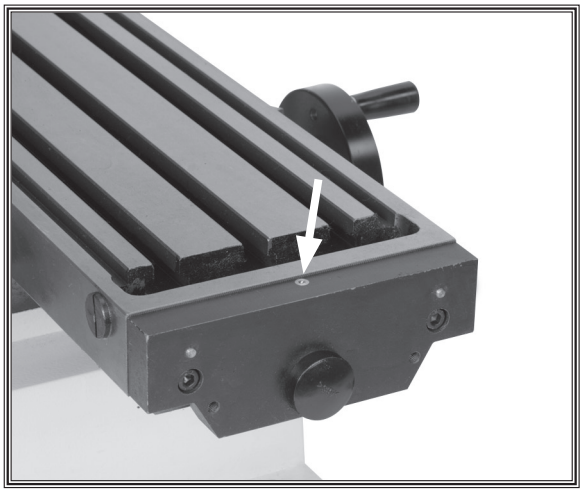
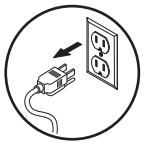


Figure 28. Table ball oiler location.

SERVICE

Troubleshooting

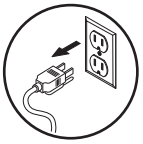


This section covers the most common problems and corrections with this type of machine. **WARNING! DO NOT make any adjustments until power is disconnected and moving parts have come to a complete stop!**

General Operation

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Motor will not start.	1. Control system delay operating.	1. Push and hold the START button for 2-seconds or until a beep is heard, a quick tap of the finger will not start the mill or operate controls.
	2. Shop power supply is at fault.	2. Correct any shop power supply problems causing breakers or fuses to trip and reconnect mill to power supply.
	3. Chip guard switch at fault (**Figure 37**).	3. Fully close chip guard, or replace bad switch.
	4. Blown inverter fuse (**Figure 34**).	4. Repair for cause of short and replace 20A fuse.
	5. Blown power supply fuse (**Figure 35**).	5. Repair for cause of short and replace 20A fuse.
	6. Emergency stop button is pressed.	6. Reset switch or replace bad switch.
	7. Main power switch at fault (**Figure 35**).	7. Turn dial on, or replace bad switch.
	8. Shorted capacitor (**Figure 34**).	8. Replace capacitor.
	9. Shorted inverter (**Figure 34**).	9. Replace inverter unit.
	10. Loose connections, open wiring.	10. Inspect wiring connections, plugs, and repair/replace as required (**Page 32**).
	11. Motor is at fault.	11. Inspect motor and repair/replace as required (**Page 32**).
Feed handle tapping button does not work.	1. Machine is not in "**Tapping Mode**."	1. Press the START and then the TAPPING button (**Page 19**).
	2. Tapping button slip ring switch is at fault (**Figure 37**).	2. Replace tapping button slip ring switch.
	3. General electrical problem.	3. Inspect circuit boards, wiring connections, plugs, and repair/replace as required (**Page 32**).
Control panel FORWARD and REVERSE buttons do not work.	1. Machine is not in "**Milling Mode**."	1. Holding for 2-seconds each or until a beep is heard, press the STOP and then the START buttons (**Page 19**).
	2. General electrical problem.	2. Inspect circuit boards, wiring connections, plugs, and repair/replace as required (**Page 32**).

Troubleshooting



This section covers the most common problems and corrections with this type of machine. **WARNING! DO NOT make any adjustments until power is disconnected and moving parts have come to a complete stop!**

Milling Operation and Finish Results

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Poor surface finishes.	1. Feed rate too fast. 2. Dull or bent cutter. 3. Spindle speed incorrect. 4. Lock lever(s) loose. 5. Spindle is extended too far down. 6. Gibs loose.	1. Slow feed rate. 2. Replace or sharpen cutter. 3. Recalculate and reset spindle RPM (**Page 20**). 4. Tighten column and table locks when possible to maintain rigidity. 5. Retract the spindle into the headstock completely, and lower headstock to the work area to maintain maximum rigidity. 6. Adjust the gibs (**Pages 27 & 28**).
Vibration when running or cutting.	1. Feed rate too high. 2. Spindle is extended too far down. 3. Loose table. 4. Loose gibs.	1. Slow feed rate or adjust RPM. 2. Retract the spindle into the headstock completely, and lower headstock to the work area to maintain maximum rigidity. 3. Tighten table locks. 4. Adjust the gibs (**Pages 27 & 28**).
Headstock hard to raise.	1. Headstock lock or gib is at fault. 2. Dovetail is binding. 3. Headstock lead screw is binding.	1. Loosen/replace lock lever and adjust gib Adjust the gibs (**Page 28**). 2. Clean and relubricate dovetail and ways (**Page 29**). 3. Clean and relubricate headstock leadscrew and gears (**Page 29**).

SERVICE

Gibs and Backlash

During the life of your mill drill, you may have to adjust the gibs and the handwheels to remove any lash or looseness that is a result of normal wear. Do not overtighten the gibs or half-nuts, or premature wear will occur.

To adjust the table gibs and the handwheel backlash, do these steps:

1. DISCONNECT THE MILL FROM POWER!

2. Loosen the four lock nuts (**Figure 29**).

3. When properly adjusted, the table should move with slight resistance as felt in the handwheel. Each gib has multiple lock nuts and set screws that must also be adjusted. Make your adjustments equally and in small increments.

4. Tighten the lock nuts.

5. Remove the table end plate cap screws and the end plate (**Figure 30**).

6. Locate the X-axis lead screw half-nut (**Figure 31**), and adjust both cap screws until the handwheel has approximately 0.003" backlash as shown by the dial.

7. Repeat **Step 6** on the Y-axis leadscrew half-nut and lubricate the lead screws and gibs.

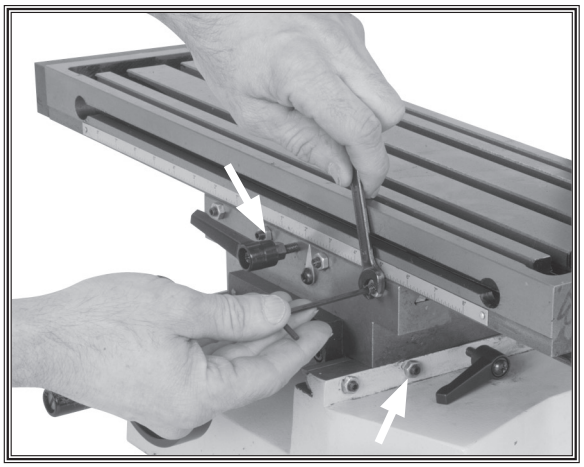


Figure 29. Gib screws and adjustment.

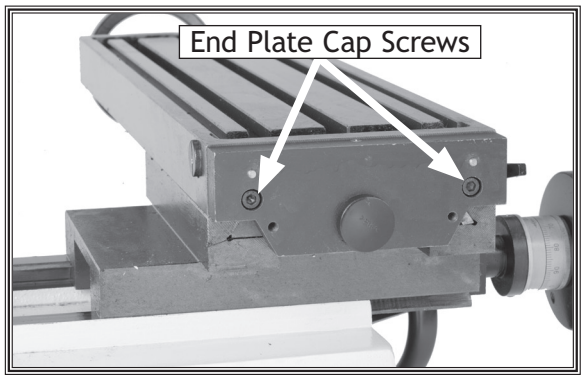


Figure 30. Table end plate.

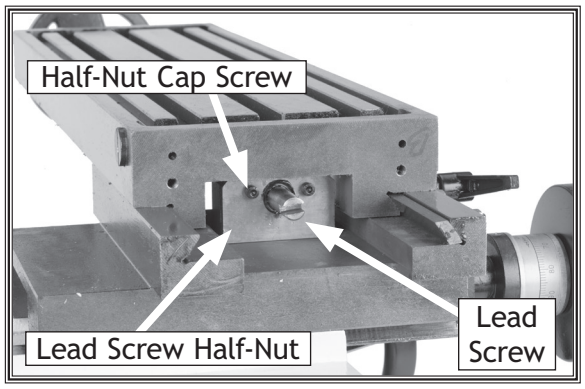


Figure 31. Handwheel backlash adjustment.

SERVICE

To adjust the headstock gibs, do these steps:

1. DISCONNECT THE MILL FROM POWER!

2. Loosen the headstock lock lever (**Figure 32**).

3. Loosen or tighten the upper and lower gib screws (**Figure 32**) in an alternating manner to adjust the headstock gib.

The headstock should slide smoothly with no play or looseness. Do not overtighten the gibs or premature slide and gib wear will occur.

4. Lubricate the headstock way and gib.

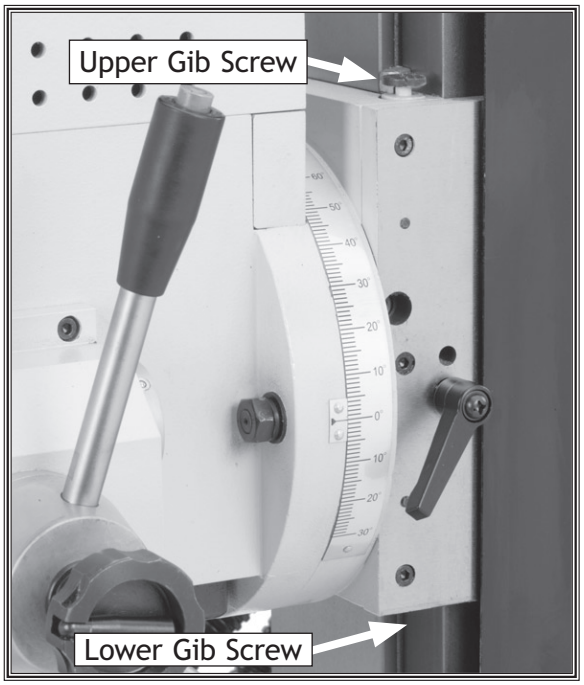


Figure 32. Headstock gib adjustment.

Service Lubrication

On an annual basis, or every six months under heavy use, we recommend that you clean and lubricate the headstock leadscrew and gears with white lithium grease and a light machine oil.

To lubricate the leadscrew and gears, do these steps:

1. DISCONNECT THE MILL FROM POWER!
2. Use the hex wrench to remove the two lower cap screws from the cabinet assembly (see **Figure 33**).
3. Hold the cabinet assembly, and remove the two upper cap screws (see **Figure 33**).
4. Carefully lift and swing the cabinet assembly out of the way from the column, and rest it aside.
5. Using mineral spirits, a toothbrush, and rags, thoroughly clean the leadscrew and gears.
6. Paint the headstock leadscrew and gear teeth with lithium grease, and oil the bearings as outlined in **Figure 33**.
7. Reinstall the cabinet assembly on the column.

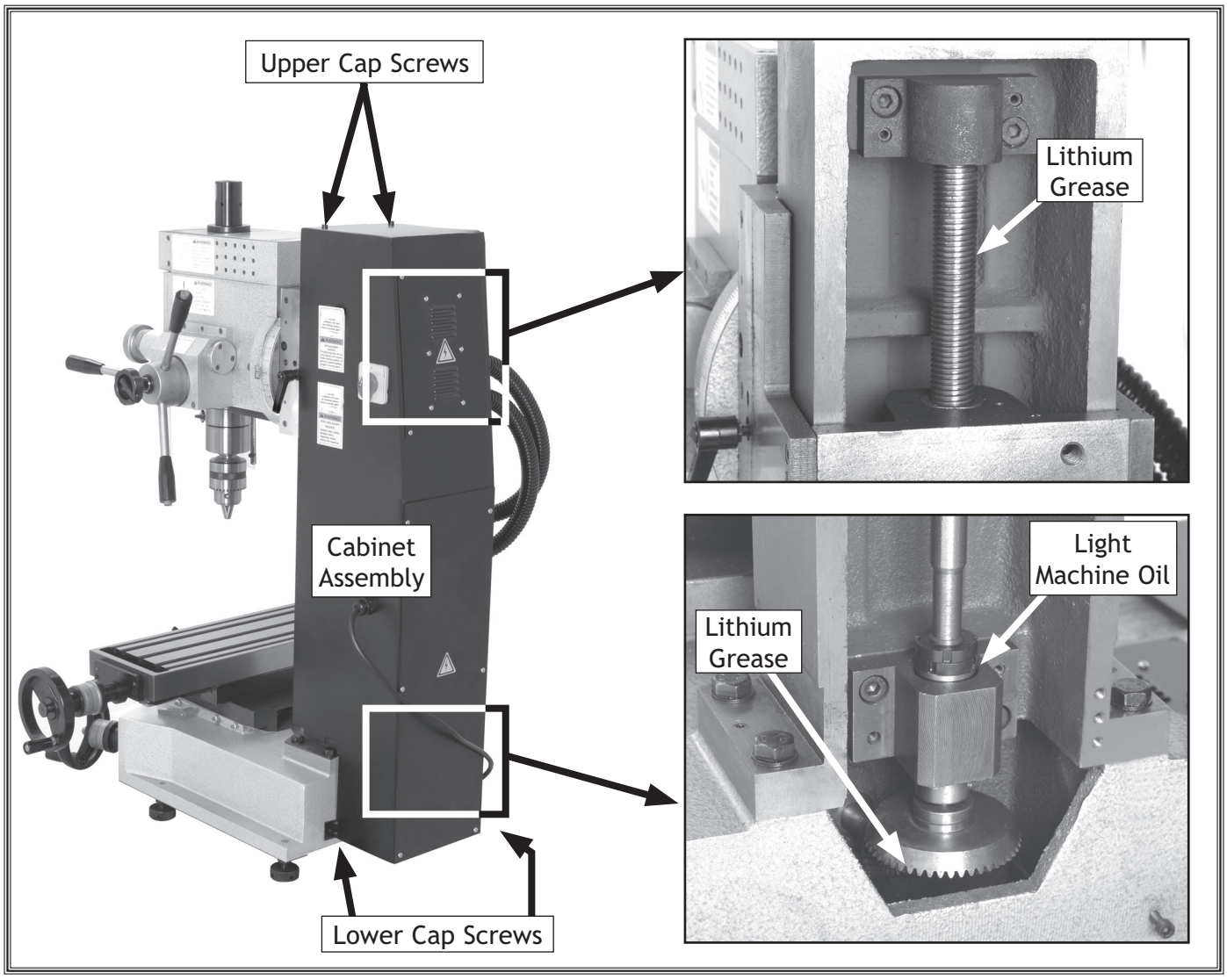


Figure 33. Headstock leadscrew access and lubrication.

Electrical Components

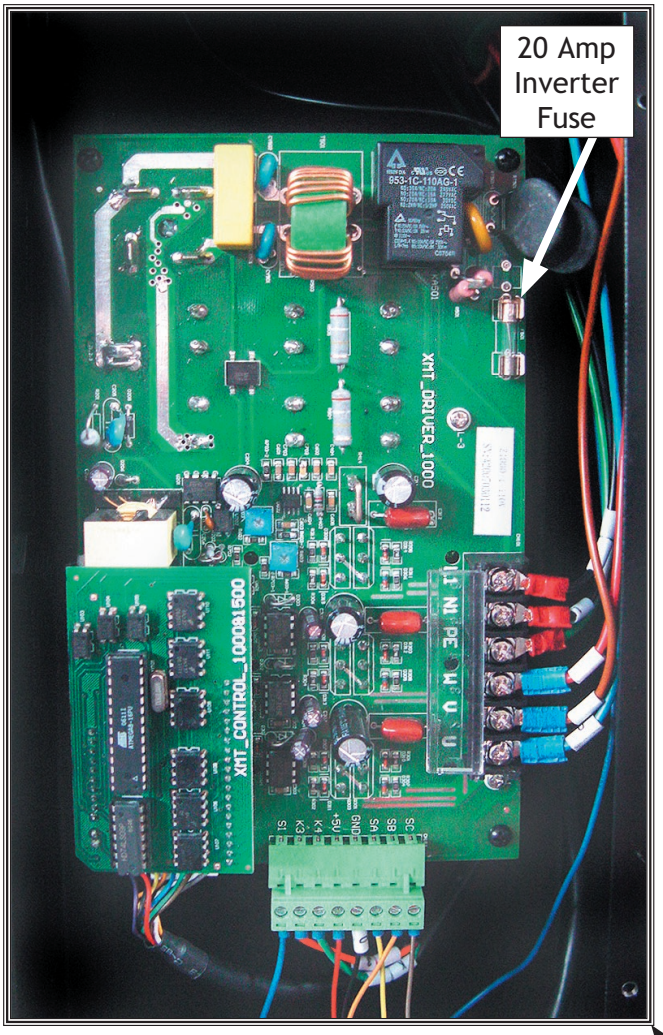


Figure 34. Motor power supply circuit board.

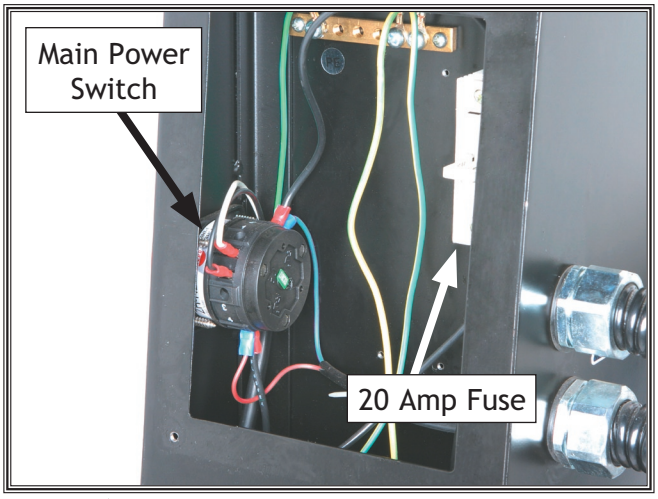
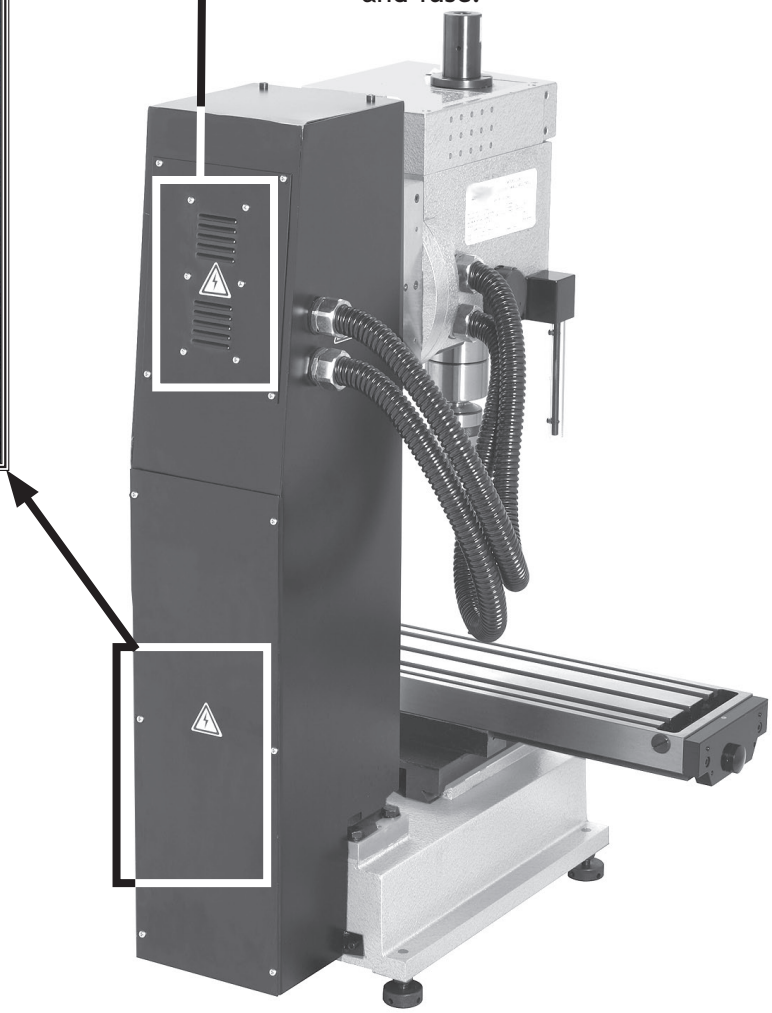


Figure 35. Main power switch and fuse.



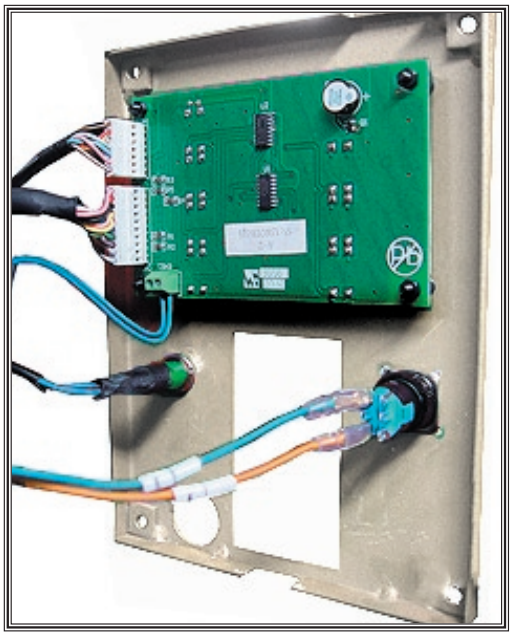


Figure 36. Control panel electrical.

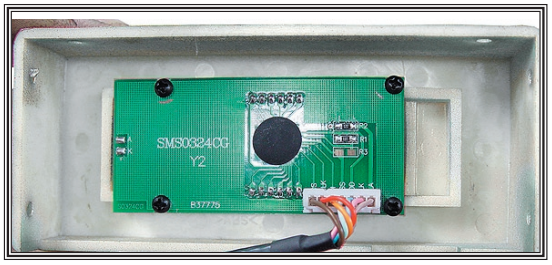


Figure 39. Tachometer electrical.

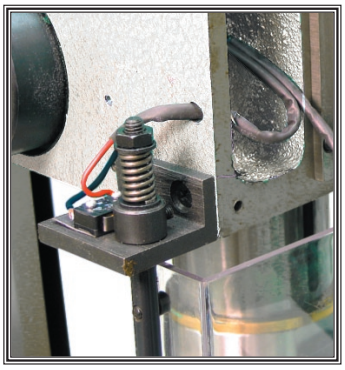
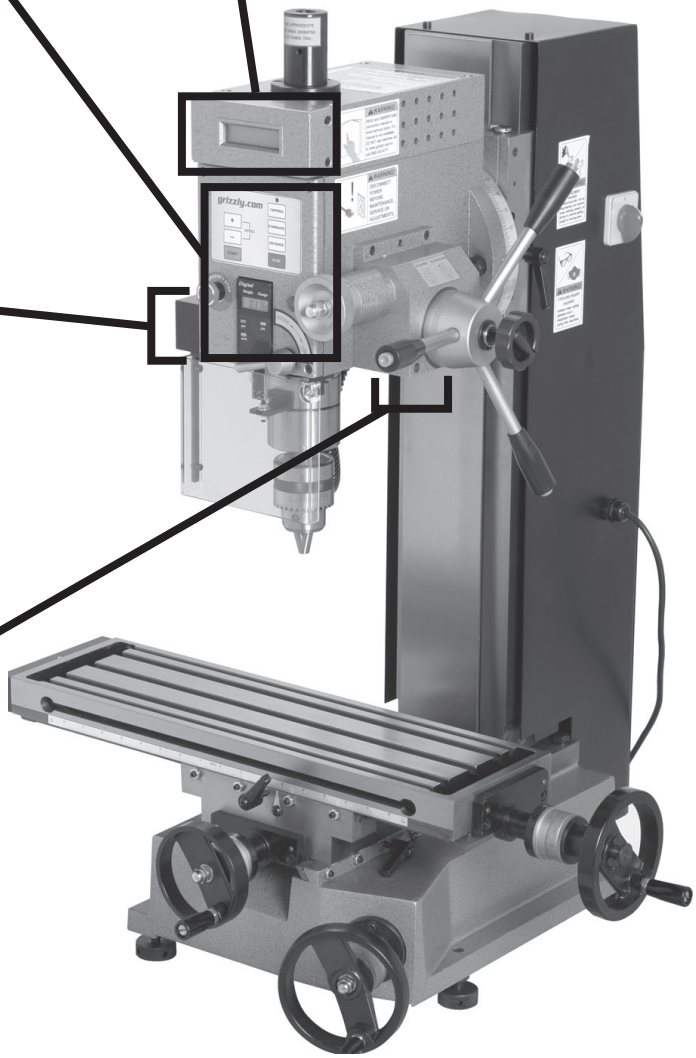
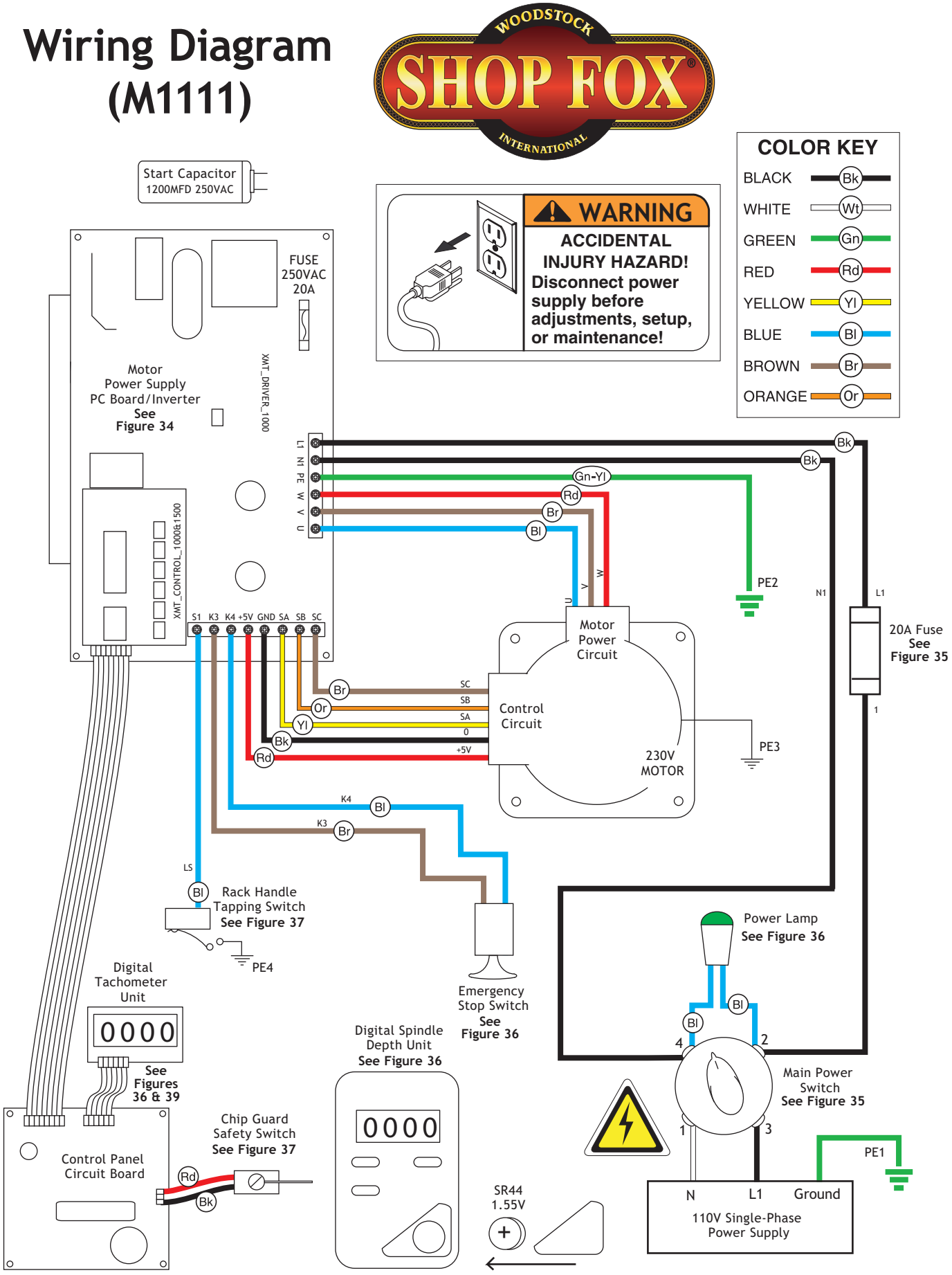


Figure 37. Chip guard safety switch.

Figure 38. Tapping button slip ring contact.

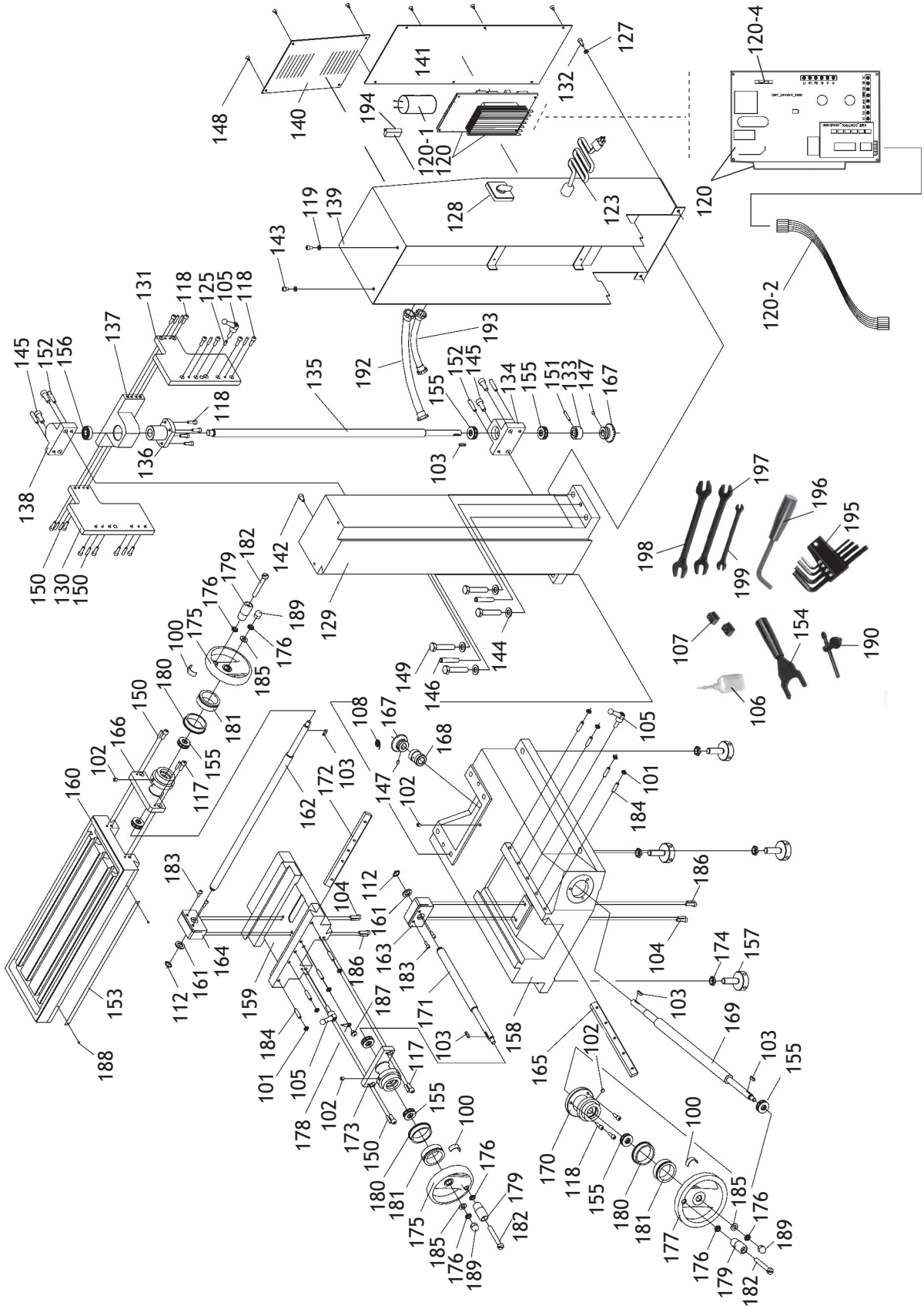


Wiring Diagram (M1111)



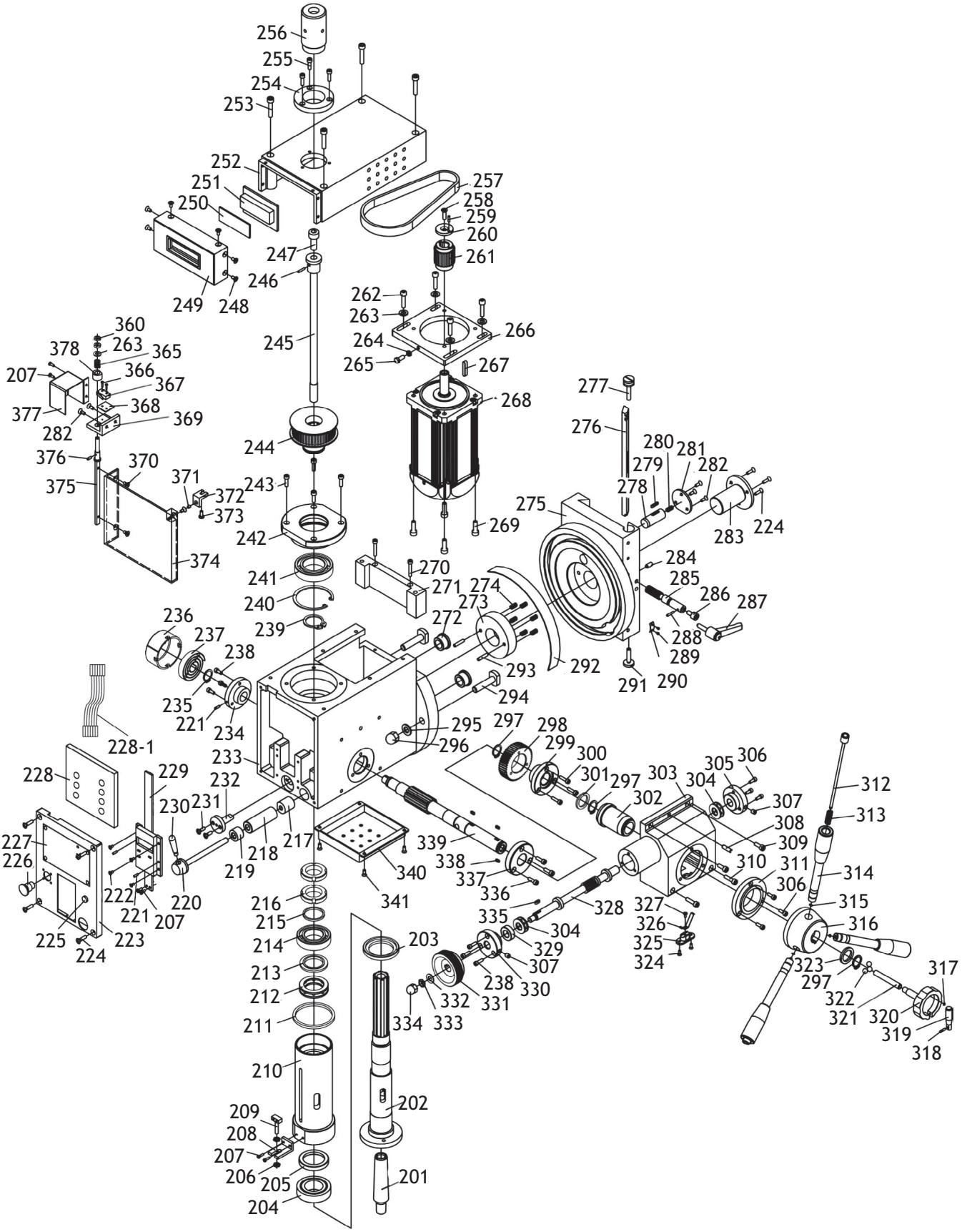
SERVICE

PARTS
Column, Table, and Inverter



REF	PART #	DESCRIPTION
100	XM1111100	FLAT SPRING
101	XPN01M	HEX NUT M6-1
102	XM1111102	BALL OILER
103	XPK37M	KEY 4 X 4 X 16
104	XPSB15M	CAP SCREW M5-.8 X 20
105	XM1111105	UNIVERSAL LEVER
106	XM1111106	OIL BOTTLE
107	XM1111107	T-NUTS
108	XPR01M	EXT RETAINING RING 10MM
112	XPR06M	EXT RETAINING RING 16MM
117	XPSB01M	CAP SCREW M6-1 X 16
118	XPSB24M	CAP SCREW M5-.8 X 16
119	XPW02M	FLAT WASHER 5MM
120	XM1111120	MOTOR PC BOARD/INVERTER
120-1	XM1111120-1	CAPACITOR 1200MFD 250VAC
120-2	XM1111120-2	HARNESS WITH PLUGS
120-4	XM1111120-4	FUSE 20A 250VAC
123	XM1111123	POWER CORD
125	XPRP35M	ROLL PIN 5 X 10
127	XPW02M	FLAT WASHER 5MM
128	XM1111128	MAIN POWER SWITCH
129	XM1111129	COLUMN
130	XM1111130	LEFT SIDE PLATE
131	XM1111131	RIGHT SIDE PLATE
132	XPSB33M	CAP SCREW M5-.8 X 12
133	XM1111133	LIMIT SLEEVE
134	XM1111134	LOWER BEARING SEAT
135	XM1111135	VERTICAL LEAD SCREW
136	XM1111136	VERTICAL LEAD NUT
137	XM1111137	SUPPORT
138	XM1111138	UPPER BEARING SEAT
139	XM1111139	REAR CABINET
140	XM1111140	VENTED COVER
141	XM1111141	LARGE COVER
142	XPSB04M	CAP SCREW M6-1 X 10
143	XPSB03M	CAP SCREW M5-.8 X 8
144	XPW04M	FLAT WASHER 10MM
145	XPSB14M	CAP SCREW M8-1.25 X 20
146	XPRP86M	ROLL PIN 8 X 45
147	XPSS31M	SET SCREW M5-.8 X 8
148	XPS17M	PHLP HD SCR M4-.7 X 6
149	XPB73M	HEX BOLT M10-1.5 X 50
150	XPRP39M	ROLL PIN 4 X 20
151	XPRP56M	ROLL PIN 4 X 25
152	XPRP73M	ROLL PIN 4 X 30
153	XM1111153	RULER
154	XM1111154	SPINDLE SPANNER WRENCH
155	XP51101	THRUST BEARING 51101
156	XP6001	BALL BEARING 6001
157	XM1111157	ADJUSTABLE FOOT
158	XM1111158	BASE
159	XM1111159	SADDLE
160	XM1111160	WORKTABLE
161	XM1111161	SPACER
162	XM1111162	Y-AXIS FEED SCREW
163	XM1111163	X-AXIS FEED SCREW NUT
164	XM1111164	Y-AXIS FEED SCREW NUT
165	XM1111165	X-AXIS GIB
166	XM1111166	Y-AXIS BEARING SEAT
167	XM1111167	GEAR
168	XM1111168	SLEEVE
169	XM1111169	Z-AXIS SHAFT
170	XM1111170	SUPPORT FLANGE
171	XM1111171	X-AXIS FEED SCREW
172	XM1111172	Y-AXIS GIB
173	XM1111173	X-AXIS BEARING SEAT
174	XPN09M	HEX NUT M12-1.75
175	XM1111175	HANDWHEEL
176	XPN03M	HEX NUT M8-1.25
177	XM1111177	HANDWHEEL
178	XM1111178	POINTER
179	XM1111179	HANDLE SLEEVE
180	XM1111180	INLAY RING
181	XM1111181	GRADUATED DIAL
182	XM1111182	SHOULDER SCR M8-1.25 X 55
183	XPSB23M	CAP SCREW M4-.7 X 12
184	XPSS12M	SET SCREW M6-1 X 25
185	XPW01M	FLAT WASHER 8MM
186	XPRP42M	ROLL PIN 3 X 20
187	XPS37M	PHLP HD SCR M6-1 X 6
188	XM1111188	RIVET
189	XPN18M	ACORN NUT M8-1.25
190	XM1111190	CHUCK KEY
192	XM1111192	SEALED FLEX CONDUIT (LONG)
193	XM1111193	SEALED FLEX CONDUIT (SHORT)
194	XM1111194	FUSE HOUSING ASSEMBLY
195	XM1111195	HEX WRENCH SET 3, 4, 5, & 6
196	XM1111196	DRAWBAR HEX WRENCH
197	XPWR1214	END WRENCH 12/14
198	XPWR1719	END WRENCH 17/19
199	XPWR810	END WRENCH 8/10

Headstock and Controls



REF	PART #	DESCRIPTION
201	XM1111201	ARBOR (R-8/JT-6)
202	XM1111202	SPINDLE
203	XM1111203	OIL SEAL
204	XM1111204	TAPER ROLLER BEARING 32907
205	XM1111205	OIL SEAL
206	XPN06M	HEX NUT M5-.8
207	XPS79M	PHLP HD SCR M3-.5 X 8
208	XM1111208	DISPLAY BRACKET
209	XM1111209	BLOCK AND STUD
210	XM1111210	SPINDLE SLEEVE
211	XM1111211	SLEEVE LIMIT PAD
212	XP6006	BALL BEARING 6006
213	XM1111213	THRUST WASHER
214	XP80106	BALL BEARING 80106
215	XM1111215	THRUST WASHER
216	XM1111216	SPANNER NUT M2-.4 X 1.5
217	XM1111217	SHORT LOCK SLEEVE
218	XM1111218	LONG LOCK SLEEVE
219	XM1111219	LOCK SPACER
220	XM1111220	HUB AND LOCK BOLT
221	XPRP15M	ROLL PIN 3 X 8
222	XPS79M	PHLP HD SCR M3-.5 X 8
223	XM1111223	CONTROL PANEL
224	XPFH41M	FLAT HD SCR M4-.7 X 16
225	XM1111225	INDICATOR LIGHT
226	XM1111226	EMERGENCY STOP SWITCH
227	XM1111227	TOUCH PANEL
228	XM1111228	CONTROL PANEL PC BOARD
228-1	XM1111228-1	HARNESS WITH PLUGS
229	XM1111229	DIGITAL SPINDLE DEPTH UNIT
230	XM1111230	LEVER
231	XPFH13M	FLAT HD SCR M3-.5 X 10
232	XM1111232	SPINDLE ORIENTATION SHAFT
233	XM1111233	HEADSTOCK
234	XM1111234	SUPPORT FLANGE
235	XPR06M	EXT RETAINING RING 16MM
236	XM1111236	TORSION SPRING COVER
237	XM1111237	TORSION SPRING
238	XPSB23M	CAP SCREW M4-.7 X 12
239	XPR12M	EXT RETAINING RING 35MM
240	XPR63M	INT RETAINING RING 65MM
241	XP6007	BALL BEARING 6007
242	XM1111242	BEARING HOUSING
243	XPSB24M	CAP SCREW M5-.8 X 16
244	XM1111244	COGGED PULLEY
245	XM1111245	DRAWBAR 7/16-20 TPI
246	XM1111246	TAPER PIN 3 X 18
247	XPSB130M	CAP SCREW M10-1.5 X 16
248	XPFH32M	FLAT HD SCR M4-.7 X 6
249	XM1111249	DISPLAY HOUSING

REF	PART #	DESCRIPTION
250	XM1111250	LENSE
251	XM1111251	DIGITAL SPEED DISPLAY UNIT
252	XM1111252	BELT COVER
253	XPSB29M	CAP SCREW M6-1 X 40
254	XM1111254	SPINDLE COVER BASE
255	XPSB17M	CAP SCREW M4-.7 X 10
256	XM1111256	SPINDLE COVER
257	XM1111257	COGGED BELT 5M400
258	XM1111258	SPECIAL SCREW M6-1 X 16
259	XPRP44M	ROLL PIN 3 X 10
260	XM1111260	PINNED WASHER
261	XM1111261	COGGED DRIVE PULLY
262	XPSB02M	CAP SCREW M6-1 X 20
263	XPW03M	FLAT WASHER 6MM
264	XPN06M	HEX NUT M5-.8
265	XPB94M	HEX BOLT M5-.8 X 25
266	XM1111266	MOTOR SUPPORT PLATE
267	XPK23M	KEY 5 X 5 X 25
268	XM1111268	MOTOR 230V
269	XPSB15M	CAP SCREW M5-.8 X 20
270	XPSB22M	CAP SCREW M4-.7 X 35
271	XM1111271	GUIDE
272	XM1111272	SLEEVE
273	XM1111273	FRICTION DISC
274	XM1111274	COMPRESSION SPRING
275	XM1111275	VERTICAL SLIDE
276	XM1111276	GIB
277	XM1111277	ADJUSTING SCREW
278	XM1111278	SHORT GEAR SHAFT
279	XPK69M	KEY 4 X 4 X 12
280	XM1111280	COMPRESSION SPRING
281	XM1111281	PLATE
282	XPFH19M	FLAT HD SCR M4-.7 X 10
283	XM1111283	PIVIOT HUB
284	XPSS03M	SET SCREW M6-1 X 8
285	XM1111285	INLAY SHAFT
286	XM1111286	END SHAFT
287	XM1111287	LEVER ASSEMBLY
288	XM1111288	TAPER PIN 3 X 10MM
289	XM1111289	RIVET
290	XM1111290	POINTER PLATE
291	XM1111291	ADJUST SCREW
292	XM1111292	ANGLE GAUGE
293	XPRP03M	ROLL PIN 5 X 20
294	XM1111294	T-BOLT
295	XPW04M	FLAT WASHER 10MM
296	XPN41M	ACORN NUT M10-1.5
297	XPR09M	EXT RETAINING RING 20MM
298	XM1111298	PINION GEAR
299	XM1111299	PINION FLANGE

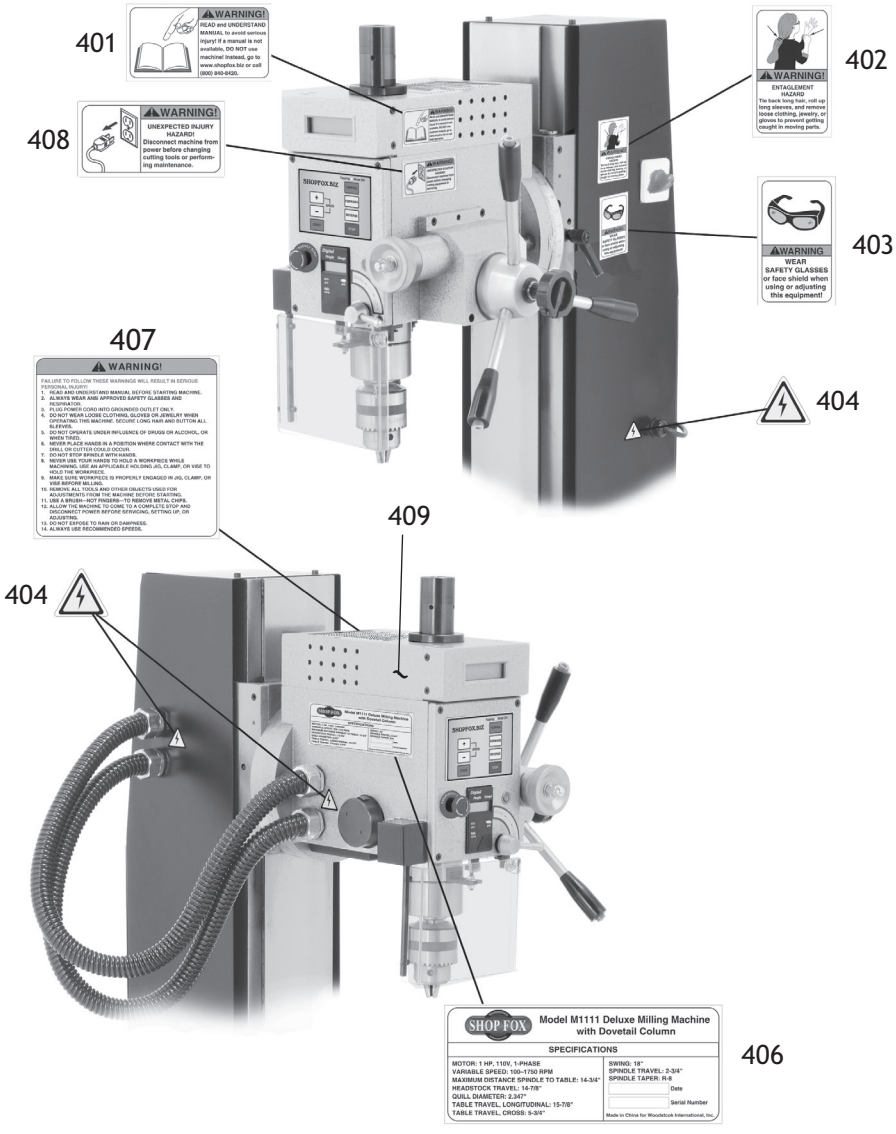
REF	PART #	DESCRIPTION
300	XPSB16M	CAP SCREW M4-.7 X 16
301	XM1111301	THRUST WASHER
302	XM1111302	SLIP-RING ASSEMBLY
303	XM1111303	WORM HOUSING
304	XP8101	BALL BEARING 8101
305	XM1111305	SUPPORT FLANGE
306	XPSB17M	CAP SCREW M4-.7 X 10
307	XM1111307	BALL OILER
308	XM1111308	SCREW LOCK SLEEVE 6 X 20
309	XPSB24M	CAP SCREW M5-.8 X 16
310	XPSB15M	CAP SCREW M5-.8 X 20
311	XM1111311	FLANGE
312	XM1111312	BUTTON CONTROL ROD
313	XM1111313	COMPRESSION SPRING
314	XM1111314	HANDLE ASSEMBLY
315	XPR80M	EXT RETAINING RING 4MM
316	XM1111316	RACK HUB
317	XPRP37M	ROLL PIN 3 X 14
318	XM1111318	SMALL MAGNETIC BLOCK
319	XM1111319	UNIVERSAL HANDLE
320	XM1111320	SPINDLE LOCK HANDKNOB
321	XM1111321	LOCK SHAFT
322	XM1111322	STEEL BALL 8MM
323	XM1111323	RING
324	XPS12M	PHLP HD SCR M3-.5 X 6
325	XM1111325	LIMIT SWITCH
326	XM1111326	CONTACT ARM
327	XPS12M	PHLP HD SCR M3-.5 X 6
328	XM1111328	WORM SHAFT

REF	PART #	DESCRIPTION
329	XM1111329	SPACER
330	XM1111330	SUPPORT FLANGE
331	XM1111331	WORM HANDWHEEL
332	XPW01M	FLAT WASHER 8MM
333	XPN03M	HEX NUT M8-1.25
334	XPN18M	ACORN NUT M8-1.25
335	XPK05M	KEY 4 X 4 X 10
336	XPSB33M	CAP SCREW M5-.8 X 12
337	XM1111337	SUPPORT FLANGE
338	XPK46M	KEY 6 X 6 X 8
339	XM1111339	GEAR SHAFT
340	XM1111340	VENT COVER
341	XPSB17M	CAP SCREW M4-.7 X 10
360	XPN01M	HEX NUT M6-1
365	XM1111365	COMPRESSION SPRING
366	XPFH56M	PHLP HD SCR M2-.4 X 10
367	XM1111367	LIMIT SWITCH
368	XM1111368	INSULATION WASHER
369	XM1111369	SUPPORT PLATE
370	XPSB18M	CAP SCREW M4-.7 X 8
371	XM1111371	MAGNET
372	XM1111372	BLOCK
373	XPS38M	PHLP HD SCR M4-.7 X 10
374	XM1111374	SAFETY LENSE
375	XM1111375	SHAFT
376	XPRP15M	ROLL PIN 3 X 8
377	XM1111377	COVER
378	XM1111378	SPACER

Label Placement

⚠WARNING

Safety labels warn about machine hazards and how to prevent machine damage or injury. The owner of this machine MUST maintain the original location and readability of all labels on this machine. If any label is removed or becomes unreadable, REPLACE that label before allowing the machine to enter service again. Contact Woodstock International, Inc. at (360) 734-3482 or www.shopfoxtools.com to order new labels.



REF	PART #	DESCRIPTION
401	XLABEL-08H	READ MANUAL LABEL
402	XM1015239	ENTANGLEMENT HAZARD LABEL
403	XLABEL-01	SAFETY GLASSES LABEL
404	XLABEL-14	ELECTRICITY LABEL

REF	PART #	DESCRIPTION
406	XM1111406	DATA LABEL
407	XM1111407	GENERAL WARNING LABEL
408	XLABEL-02A	UNPLUG POWER 110V LABEL
409	XPPAINT-9	SHOP FOX LIGHT GREY PAINT

Warranty

Woodstock International, Inc. warrants all **SHOP FOX**® machinery to be free of defects from workmanship and materials for a period of two years from the date of original purchase by the original owner. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence or accidents, lack of maintenance, or reimbursement of third party expenses incurred.

Woodstock International, Inc. will repair or replace, at its expense and at its option, the **SHOP FOX**® machine or machine part which in normal use has proven to be defective, provided that the original owner returns the product prepaid to a **SHOP FOX**® factory service center with proof of their purchase of the product within two years, and provides Woodstock International, Inc. reasonable opportunity to verify the alleged defect through inspection. If it is determined there is no defect, or that the defect resulted from causes not within the scope of Woodstock International Inc.'s warranty, then the original owner must bear the cost of storing and returning the product.

This is Woodstock International, Inc.'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 that **SHOP FOX**® machinery complies with the provisions of any law or acts. In no event shall Woodstock International, Inc.'s liability under this warranty exceed the purchase price paid for the product, and any legal actions brought against Woodstock International, Inc. 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.

Every effort has been made to ensure that all **SHOP FOX**® machinery meets high quality and durability standards. We reserve the right to change specifications at any time because of our commitment to continuously improve the quality of our products.

Warranty Registration

Name_____

Street _____

City _____ State_____ Zip_____

Phone #_____ Email _____ Invoice #_____

Model #_____ Serial #_____ Dealer Name_____ Purchase Date_____

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 ____ Local Store
_____ Mail Order Catalog ____ Website ____ Other:

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

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

3. How many of your machines or tools are **Shop Fox®**?

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

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

5. Would you recommend **Shop Fox®** products to a friend? _____ Yes ____ No

6. What is your age group?

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

7. 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+

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

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

9. Comments:_____

_____

_____

_____

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