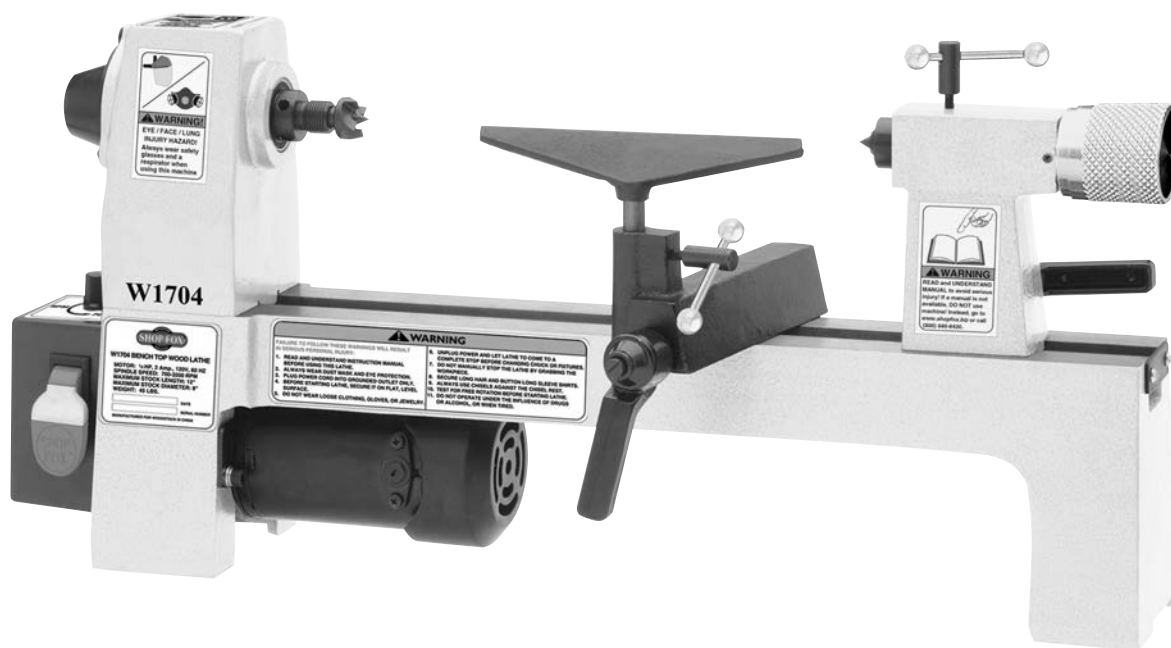


MODEL W1704 BENCH TOP LATHE



INSTRUCTION MANUAL

Phone: 1-360-734-3482 • On-Line Technical Support: tech-support@shopfox.biz

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WARNING: NO PORTION OF THIS MANUAL MAY BE REPRODUCED IN ANY SHAPE OR FORM WITHOUT

#5378TR

THE WRITTEN APPROVAL OF WOODSTOCK INTERNATIONAL, INC.

Printed in China



WARNING!

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

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

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

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



WARNING!

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

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

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

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





INTRODUCTION

Woodstock Technical Support

This machine 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

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.

Specifications

Motor Size	1/3 HP, 110V, Universal-Type Motor
Motor Speed	700-3200 RPM
Amp Draw	4 A
Distance Between Centers	13"
Turning Diameter	8"
Spindle Taper	MT #1
Tailstock Taper	MT #1
Spindle Size	3/4" x 16 TPI (RH)
Machine Weight	45 lbs
Footprint	23 1/2" X 5"

SAFETY

**READ MANUAL BEFORE OPERATING MACHINE.
FAILURE TO FOLLOW INSTRUCTIONS BELOW WILL
RESULT IN PERSONAL INJURY.**



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.

NOTICE

This symbol is used to alert the user to useful information about proper operation of the equipment, and/or a situation that may cause damage to the machinery.

Standard Safety Instructions

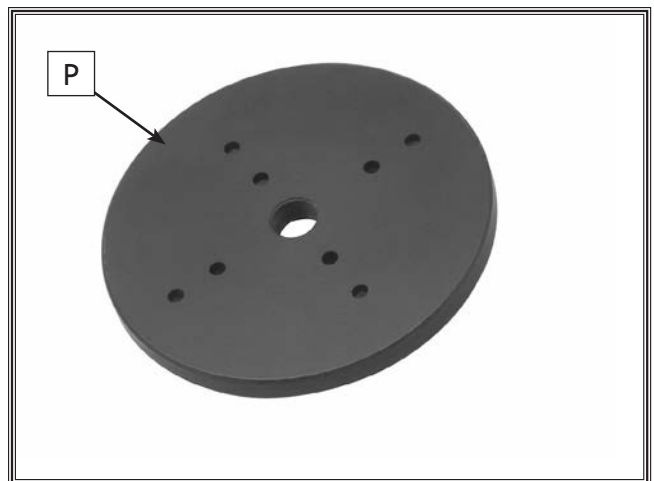
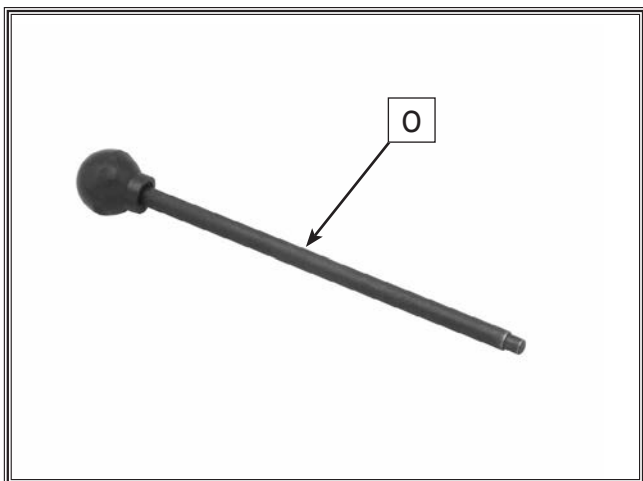
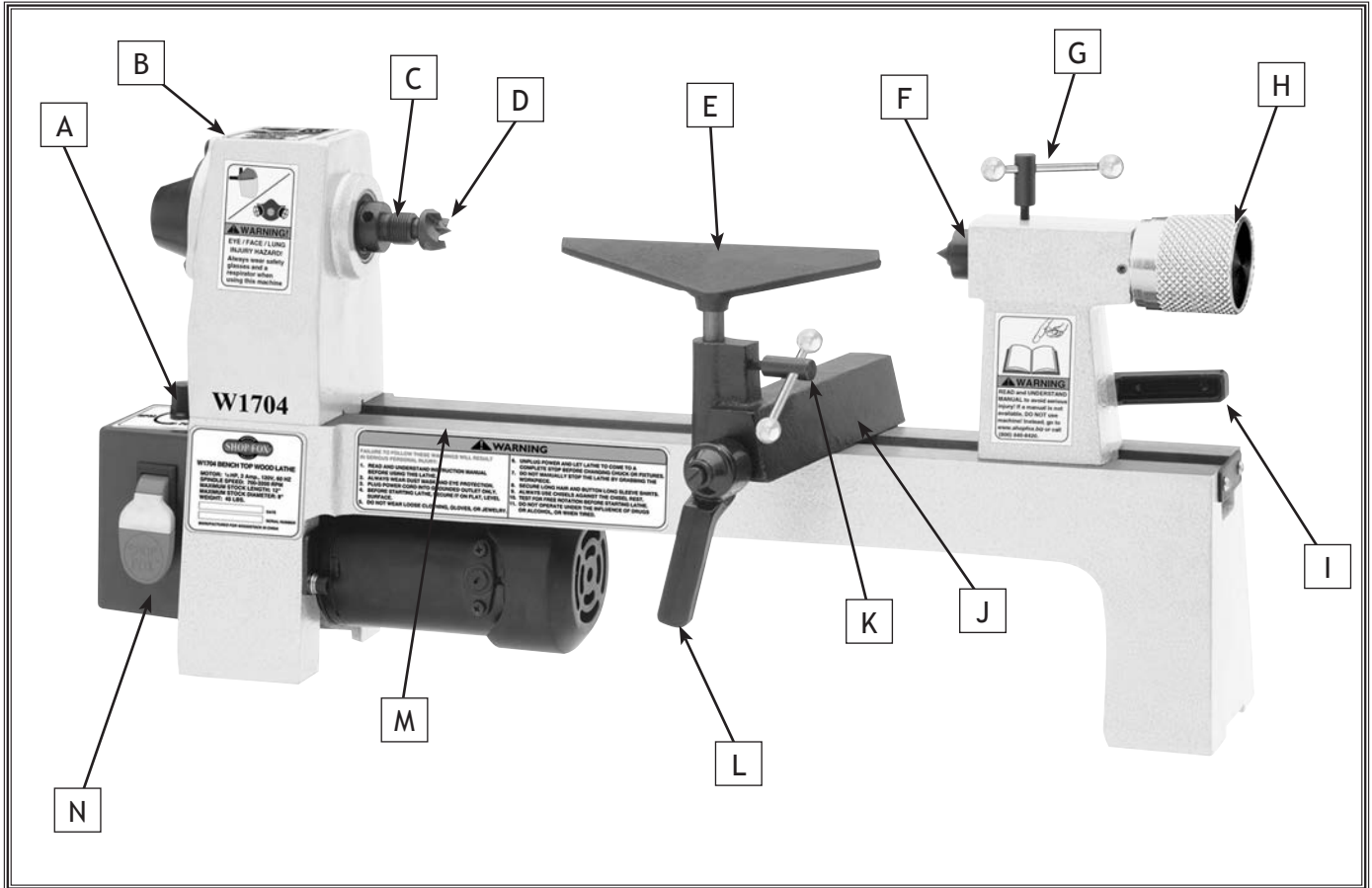
1. **READ THROUGH THE ENTIRE MANUAL BEFORE STARTING MACHINERY.** Machinery presents serious injury hazards to untrained users.
2. **ALWAYS USE ANSI APPROVED SAFETY GLASSES WHEN OPERATING MACHINERY.** Everyday eye-glasses only have impact resistant lenses—they are **NOT** safety glasses.
3. **ALWAYS WEAR A NIOSH 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 BEFORE 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. **USE RECOMMENDED ACCESSORIES.** Refer to the instruction manual for recommended accessories. The use of improper accessories may cause risk of injury.
20. **DO NOT FORCE MACHINERY.** Work at the speed for which the machine or accessory was designed.
21. **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.
22. **DO NOT OVERREACH.** Keep proper footing and balance at all times.
23. **MANY MACHINES WILL EJECT THE WORKPIECE TOWARD THE OPERATOR.** Know and avoid conditions that cause the workpiece to "kickback."
24. **ALWAYS LOCK MOBILE BASES (IF USED) BEFORE OPERATING MACHINERY.**
25. **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.

Know Your Machine

An important part of safety is knowing your machine and its components. Please take the time to learn the items shown in the pictures below. The letters in the picture correspond to the following descriptions in the text.

SAFETY



- A. **Variable Speed Control Dial**—Controls the speed of the lathe spindle. Always turn this dial to the lowest setting before starting the lathe.
- B. **Headstock**—The housing that holds the spindle on the lathe.
- C. **Headstock Spindle**—Tapered at the inside end to accept the shank of a Morse Taper #1 (MT#1) spur center and threaded on the outside end to accept the threads of a face plate. The headstock spindle is also hollow for easy removal of the spur center with a knock-out tool.
- D. **Spur Center**—Attaches the workpiece to the spindle for turning operations.
- E. **Tool Rest**—Supports tools used during turning operations.
- F. **Live Center**—Mounts in the tailstock barrel taper and supports the workpiece from the opposite side of the spur center by engaging in the workpiece and spinning freely.
- G. **Tailstock Barrel Lock**—Locks the tailstock barrel in place after being driven into the workpiece and before starting the lathe.
- H. **Tailstock Adjustment Knob**—Moves the tailstock barrel in/out to firmly embed the live center into the workpiece.
- I. **Tailstock Lock**—Locks the tailstock into position along the bed.
- J. **Tool Rest Holder**—Mounts the tool rest to the bed and adjusts perpendicular to the bed to bring the tool rest closer/farther from the workpiece.
- K. **Tool Rest Lock**—Secures the tool rest into position at the proper height needed for the workpiece.
- L. **Tool Rest Holder Lock**—Secures the tool rest holder when the tool rest is the proper distance from the workpiece.
- M. **Lathe Bed**—Provides a sliding surface for the tool rest holder and tailstock adjustments.
- N. **Lock-Out Paddle Switch**—Turns lathe ON/OFF only when the safety key is installed.
- O. **Knock-Out Tool**—Used to remove the spur and live centers from their tapered spindles.
- P. **Face Plate**—Threads onto the headstock spindle for non-spindle turning (usually used for making bowls or other items that cannot be supported from the tailstock).

Important Lathe Terms & Definitions

In order for the safety warnings and operation instructions to be fully understood, please take time to learn these important lathe terms and definitions.

Spindle Turning—When a workpiece is mounted between both spur (headstock) and live (tailstock) centers.

Face Plate Turning—When a workpiece is mounted to the face plate, which is mounted to the headstock spindle. The face plate has holes for attaching the workpiece or a backing block with screws.

Backing Block—A waste board that is screwed or bolted to the face plate, then centered and glued to the workpiece, so that the workpiece can be attached to the face plate without drilling or screwing marks.

Center Line—The imaginary line running from the center of the headstock spindle to the center of the tailstock barrel.

Rough Cutting—The initial stage of all turning operations when the workpiece still has corners and has not been rounded. Rough cutting strains the lathe and operator more than regular turning; therefore, special precautions will apply.

Additional Safety for Wood Lathes

1. **KEEPING GUARDS IN PLACE.** Make sure all guards are in place and that the lathe sits on a flat, stable surface.
2. **EYE/FACE PROTECTION.** Always wear eye protection or a face shield when operating the lathe.
3. **RESPIRATORY PROTECTION.** Always wear a respirator when using this machine. Wood dust may cause allergies or long-term respiratory health problems.
4. **MOUNTING WORKPIECE.** Before starting, be certain the workpiece has been properly imbedded on the headstock and tailstock centers and that there is adequate clearance for the full rotation.
5. **WORKPIECE CONDITION.** Always inspect the condition of your workpiece. **DO NOT** turn pieces with knots, splits, and other potentially dangerous conditions. Make sure joints of glued-up pieces have high quality bonds and won't fly apart during operation.
6. **ADJUSTING TOOL REST.** Adjust tool rest to provide proper support for the turning tool you will be using. Test tool rest clearance by rotating workpiece by hand before turning lathe **ON**.
7. **TURNING SPEED.** Select the correct turning speed for your work, and allow the lathe to gain full speed before using.
8. **USING SHARP CHISELS.** Keep lathe chisels properly sharpened and held firmly in position when turning.
9. **OPERATING DAMAGED LATHE.** Never operate the lathe with damaged or worn parts.
10. **ADJUSTMENTS/MAINTENANCE.** Make sure your wood lathe 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.
11. **STOPPING LATHE.** **DO NOT** stop the lathe by using your hand against the workpiece. Allow the lathe to stop on its own.
12. **AVOIDING ENTANGLEMENT.** Keep long hair and loose clothing articles such as sleeves, belts, and jewelry items away from the lathe spindle.
13. **FACEPLATE TURNING.** When face plate turning, use lathe chisels on the downward spinning side of the workpiece only.
14. **SANDING/POLISHING.** Remove the tool rest when performing sanding or polishing operations on the rotating spindle.
15. **MATERIAL REMOVAL RATE.** Removing too much material at once may cause workpiece to fly out of the lathe.
16. **REDUCING WORKPIECE VIBRATION.** If the workpiece vibrates, immediately turn the lathe **OFF**. Check to make sure the workpiece is centered and balanced. Trim excess waste off corners with a bandsaw or table saw to reduce vibration. Make sure workpiece is securely attached in setup.

Avoiding Potential Injuries



Figure 1. Center fully embedded in workpiece.



Figure 2. DO NOT operate without centers firmly embedded in workpiece.

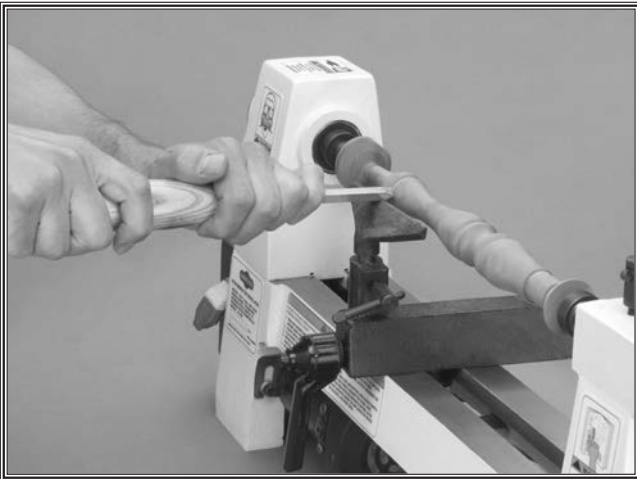


Figure 3. Sleeves rolled up and out of the way of the moving machinery.

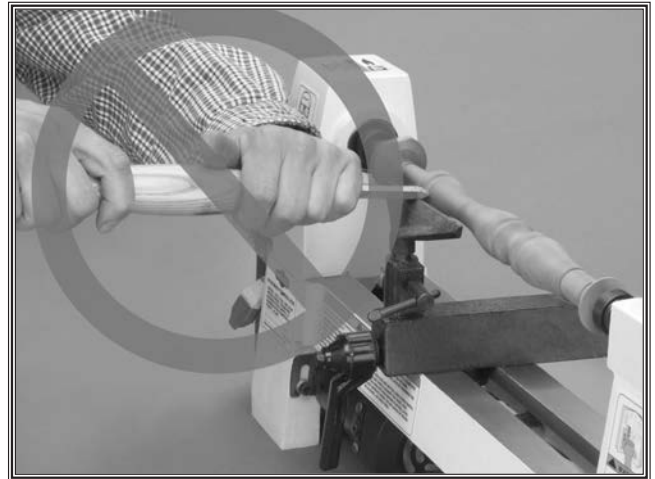


Figure 4. DO NOT operate with long sleeves rolled down near moving machinery.

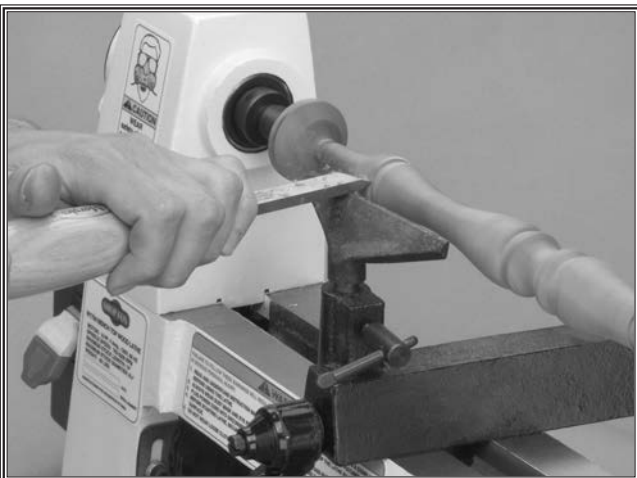


Figure 5. Always use the tool rest.



Figure 6. DO NOT cut without using tool rest.

ELECTRICAL

110V Operation

The Model W1704 is wired for 110V operation. Always connect this machine to a dedicated circuit (wire, breaker, plug, receptacle) with a verified ground, using the recommended circuit size and plugs/receptacles listed at the bottom of this page.

We recommend connecting this machine to a dedicated circuit with a verified ground, using the circuit size given below. 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.

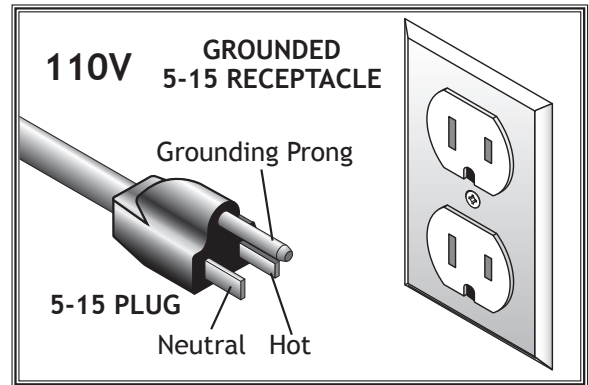


Figure 7. 5-15 plug and receptacle.

⚠ 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 a 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	4A	15A	NEMA 5-15	14 Gauge

ASSEMBLY



! WARNING
 Read and understand this entire instruction manual before performing any operations with your machine. Serious personal injury may occur if safety and operational information is not understood and followed.



! CAUTION
 The Model W1704 is a heavy machine at 46 lbs. Use assistance when lifting or moving the machine.

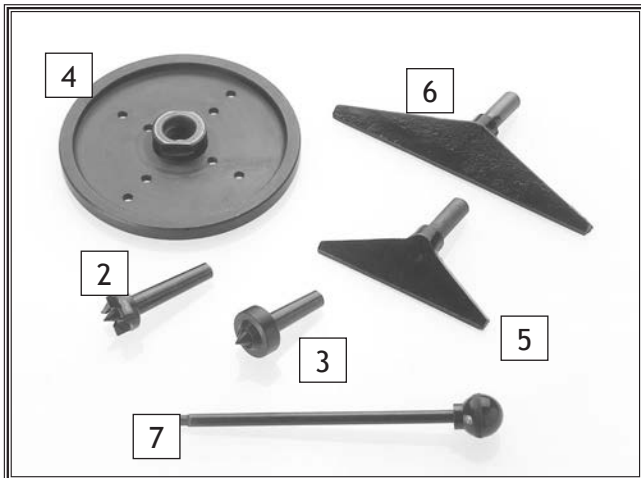


Figure 8. Loose parts shipped with the lathe.

Unpacking

The SHOP FOX® Model W1704 has been carefully packaged for safe transporting. If you notice the machine has been damaged, please contact your authorized SHOP FOX® dealer immediately.

Inventory

Layout and inventory the package contents listed below and familiarize yourself with the components shown in Figure 8 to ease assembly.

Note: Some parts and hardware may already be installed on the machine. Check the machine when you use this inventory list.

Item	Qty.
1. Lathe Unit (<i>not shown</i>).....	1
2. Spur Center.....	1
3. Live Center.....	1
4. Face Plate.....	1
5. 4 1/4" Tool Rest.....	1
6. 7" Tool Rest.....	1
7. Knock-Out Tool.....	1


Machine Placement

- **Floor Load:** Some workbenches may require additional reinforcement to support both the machine and the operator. Make sure you take these precautions.
- **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 lathe.
- **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.


Cleaning Machine

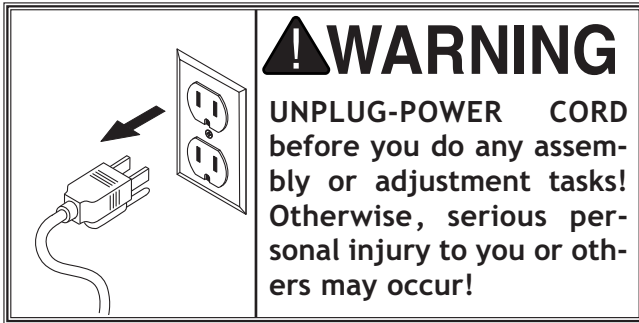
The bed and other unpainted parts of your lathe are coated with a waxy grease that protects them from corrosion during shipment. Clean this grease off with a solvent cleaner or citrus-based degreaser. **DO NOT** use chlorine-based solvents such as brake parts cleaner or acetone—if you happen to splash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

	<p>!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!</p>
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	<p>!WARNING The Model W1704 is a heavy machine. DO NOT over-exert yourself while unpacking or moving your machine—get assistance.</p>
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	<p>!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.</p>
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	<p>!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.</p>
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Installing Centers

The spur and live centers are taper-fit components that install in the same manner; however, the spur center always goes into the headstock spindle and the live center always goes into the tailstock barrel.

To install the centers, do these steps:

1. **UNPLUG THE LATHE!**
2. Insert the tapered end of the center into the spindle and push firmly, as shown in **Figure 9**.
3. Check that the center is securely installed by giving it a quick tug. (*A properly installed center will not pull out by hand.*)



Figure 9. Installing spur center into headstock spindle.

Removing Centers

A knock-out tool is included with your lathe to remove the spur and live centers.

To remove the centers with the knock-out tool, do these steps:

1. **UNPLUG THE LATHE!**
2. Hold a clean rag under the spindle to catch the center when you remove it.
3. Using the knock-out tool, tap the center from the outside end of the spindle (as shown in **Figure 10**) and catch the center as it falls out.



Figure 10. Removing spur center with knock-out tool.

Face Plate

The face plate can be installed only if the spur center has been removed from the headstock spindle.

To install the face plate, do these steps:

1. UNPLUG THE LATHE!
2. Thread the face plate onto the headstock spindle.
3. Tighten the face plate by placing a wrench on the spindle flats and inserting the knock-out tool into the spindle shoulder to hold it in position during tightening. See **Figure 11**.

Note: Reverse steps 2-3 to remove the face plate.

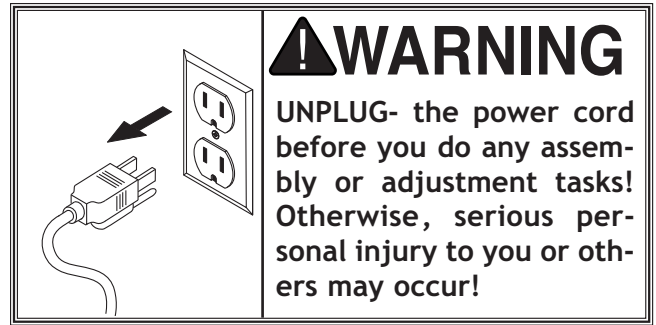


Figure 11. Tightening face plate to headstock spindle.

Tool Rest

Before installing a tool rest, decide which one will be best for your application. Unless workpiece clearance is an issue, install the larger tool rest to give yourself more room to work.

To install the tool rest, do these steps:

1. Insert the tool rest into the tool holder as shown in **Figure 12**.
2. Lock the tool rest in place with the tool rest lock.

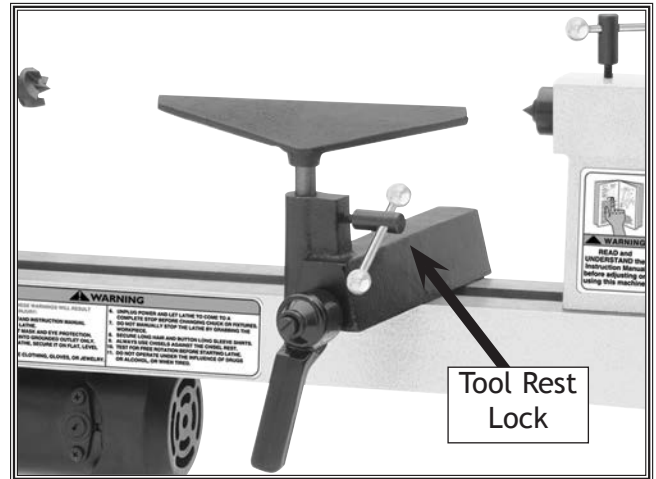


Figure 12. Tool rest installed on lathe bed.

ADJUSTMENTS

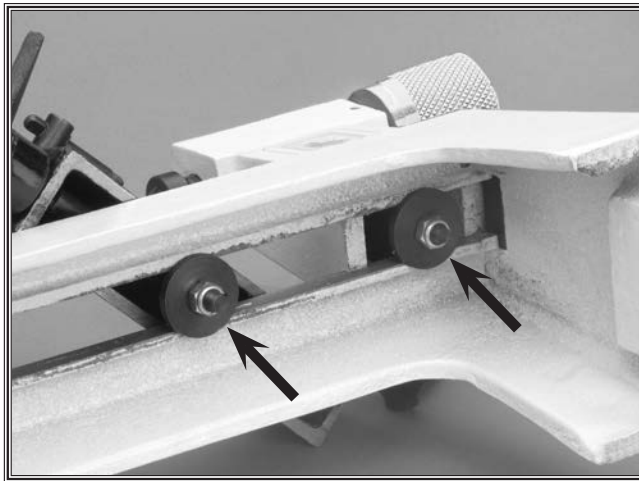
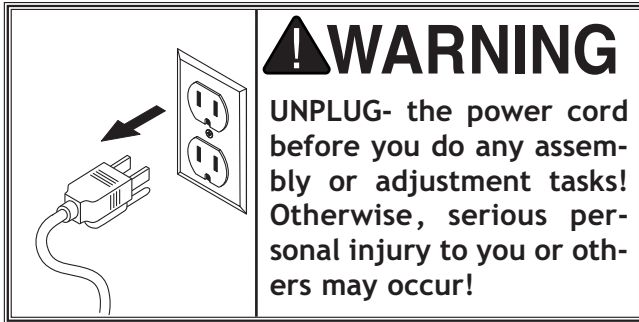


Figure 13. Tool rest holder and tailstock lock nuts for adjusting lock handles.



Figure 14. Tailstock barrel alignment slot.

Lock Handles

The lock handles on the tool rest holder and the tailstock can be tightened for a stronger locking action if the factory set locking action is not tight enough for your needs. However, take care not to over-tighten any of the parts.

To tighten the lock handles, do these steps:

1. **UNPLUG THE LATHE!**
2. Using a 12mm socket or wrench, tighten $\frac{1}{4}$ turn one of the lock nuts shown in **Figure 13**, depending on which component you wish to tighten.
3. Check the locking mechanism:
 - If it is satisfactory, no further adjustments are necessary.
 - If it is not satisfactory, repeat steps 2-3.

Tailstock Barrel

If you find that the tailstock adjustment handle spins without moving the tailstock barrel, the tailstock barrel lock may need to be re-aligned with the catch slot in the tailstock barrel.

To re-align tailstock barrel lock with the catch slot, do these steps:

1. **UNPLUG THE LATHE!**
2. Loosen the small setscrew from the side of the tailstock and loosen the tailstock barrel lock.
3. Pull the tailstock adjustment handle to slide the barrel out of the tailstock.
4. Locate the catch slot, shown in **Figure 14**, and align it with the barrel lock.
5. Insert the barrel, replace the setscrew, and barely tighten the barrel lock, then back it off $\frac{1}{4}$ to $\frac{1}{2}$ of a turn.

OPERATIONS

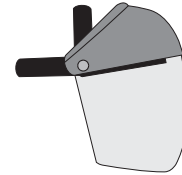
Test Run

The purpose of a test run is to identify any unusual noises and vibrations, as well as to confirm that the machine is performing as intended.

To test run the Model W1704, do these steps:

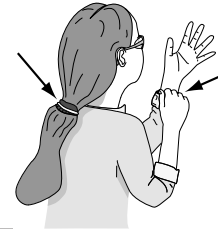
1. Turn the variable speed control knob all the way counter-clockwise or in the *LOW* direction as far as it will go.
2. Make sure that the spur center has been removed from the spindle.
3. Pull the paddle switch up to start the lathe. Once the lathe is running, listen for any unusual noises. The machine should run smoothly with little or no vibrations.
 - If there are any unusual noises or vibrations, STOP the lathe immediately by pushing the paddle switch down.
4. Unplug the lathe and investigate the source of the noise or vibration. DO NOT make any adjustments to the lathe while it is plugged in. The lathe should not be run any further until the problems are corrected.

WARNING



Projectiles thrown from the machine could cause serious eye/face injury. Wear a face shield during assembly and operation.

WARNING



Loose hair and clothing could get caught in machinery and cause serious personal injury. Keep loose clothing rolled up and long hair tied up and away from machinery.

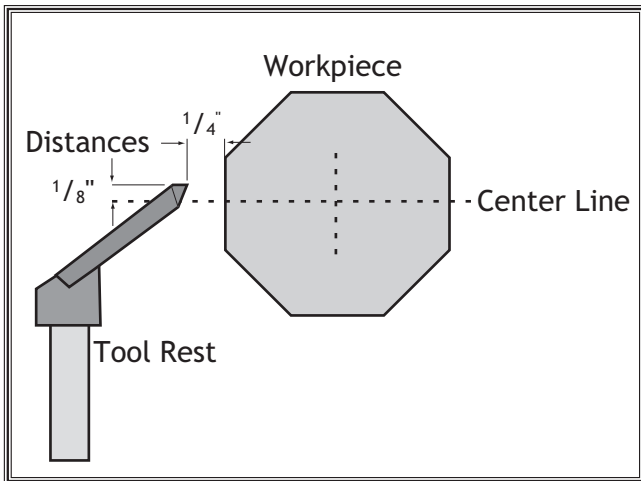


Figure 15. Tool rest set $\frac{1}{8}$ " above the centerline and $\frac{1}{4}$ " away from workpiece.



Figure 16. Speed dial turned all the way down to the lowest speed.



Figure 17. DO NOT attempt to turn workpieces thicker than 2" x 2" without first cutting the corners off!

Operation Tips

- Mount the workpiece correctly; otherwise, the operation may be difficult and dangerous. Read the “Spindle Turning” & “Face Plate Turning” instructions for ideas on how to set up your lathe correctly.
- Position the tool rest approximately $\frac{1}{8}$ " above the center line of the workpiece and approximately $\frac{1}{4}$ " away from the workpiece. See **Figure 15** for more details.
- When turning the lathe ON, stand to the side of the spinning direction until the lathe reaches full speed and you can verify that the lathe will not throw the workpiece.
- Always start the lathe and perform all rough cutting with the speed setting at the lowest point, as shown in **Figure 16**.
- Select the right speed for the size of workpiece you are turning. Use the slower range on the speed dial for large workpieces (4" diameter and over); use the middle range on the speed dial for medium sized workpieces (2" to 4" diameter); and use the faster range on the speed dial for small sized workpieces (under 2" in diameter).
- Keep the turning tool on the tool rest the ENTIRE time that it is in contact with the workpiece.
- When turning pieces thicker than 2" x 2", cut off the corners first (so the workpiece profile looks similar to the illustrated workpiece in **Figure 15**). **Figure 17** shows a workpiece too big for turning with the corners still on.
- When rough cutting face plate work, use the live center in the tailstock for support, as can be seen in the setup in **Figure 17**. After the rough cutting is complete, move the tailstock out of the way.
- Learn the correct techniques for each tool you will use. If you are unsure, read books or magazines about lathe techniques and seek training from experienced users.

Selecting Turning Tools

Lathe tools (Figure 18) come in a variety of shapes and sizes and usually fall into five major categories.

- **Gouges**—Mainly used for rough cutting, detail cutting, and cove profiles. The rough gouge is a hollow, double-ground tool with a round nose, and the detail gouge is a hollow, double-ground tool with either a round or pointed nose. Figure 19 shows an example of a gouge.
- **Skew Chisel**—A very versatile tool that can be used for planing, squaring, V-cutting, beading, and parting off. The skew chisel is flat, double-ground with one side higher than the other (usually at an angle of 20-40°). Figure 20 shows an example of a skew chisel.
- **Scrapers**—Mainly used where access for other tools is limited, such as hollowing operations. This is a flat, double-ground tool that comes in a variety of profiles (Round Nose, Spear Point, Square Nose, etc.) to match many different contours. Figure 21 shows an example of a round nose scraper.
- **Parting Tools**—Used for sizing and cutting off work. This is a flat tool with a sharp pointed nose that may be single- or double-ground. Figure 22 shows an example of a parting tool.
- **Specialty Tools**—These are the unique, special function tools to aid in hollowing, bowl making, cutting profiles, etc.



Figure 18. Basic set of lathe turning tools.

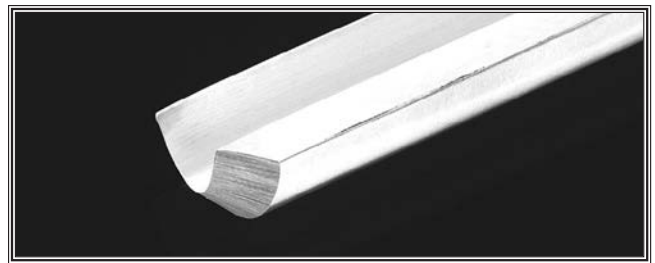


Figure 19. Gouge.

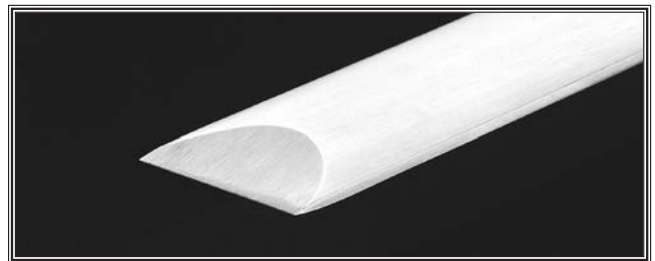


Figure 20. Skew chisel.

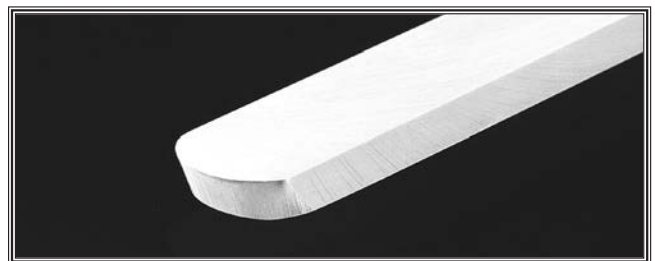


Figure 21. Round nose scraper.

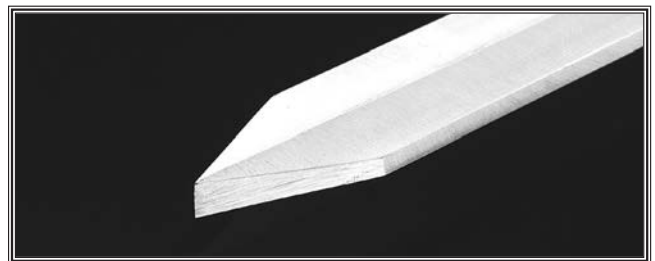


Figure 22. Parting tool.

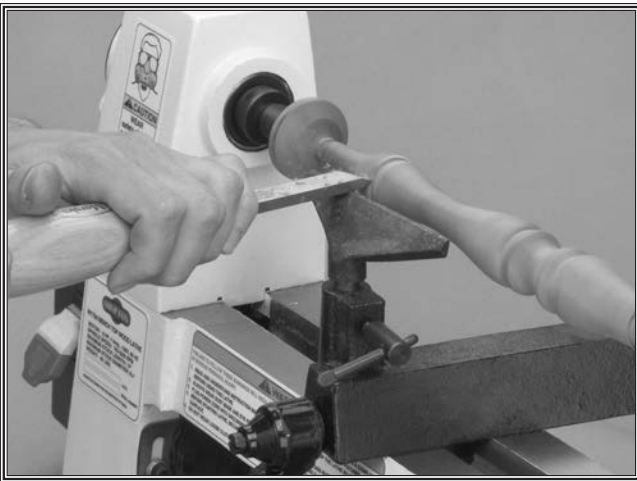


Figure 23. Typical spindle turning operation.

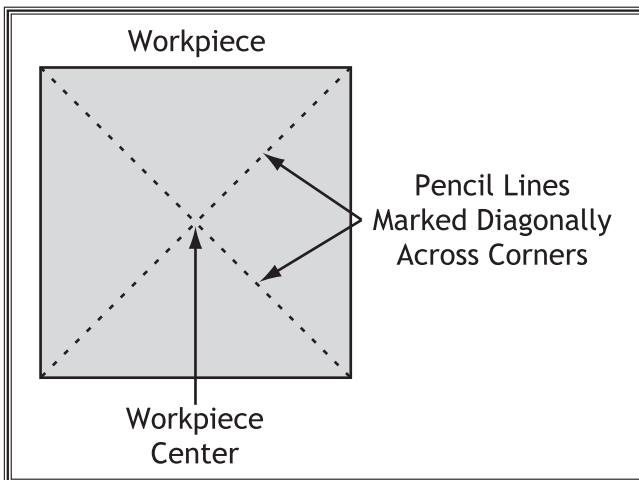


Figure 24. Workpiece marked diagonally from corner to corner to determine the center.



Figure 25. Spur center properly embedded into workpiece.

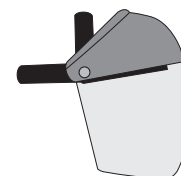
Spindle Turning

Spindle turning (Figure 23) is the operation performed when a workpiece is mounted between the headstock and the tailstock.

To set up a spindle turning operation, do these steps:

1. Mark both ends of your workpiece by drawing diagonal lines from corner to corner. The intersection point of these lines will show you the center of your workpiece. See Figure 24 for details.
2. Using a wood mallet, tap the point of the spur center into the center of the workpiece, so that it leaves a center mark, then remove the spur center.
3. Using a $\frac{1}{4}$ " drill bit, drill a $\frac{1}{4}$ " deep hole at the center mark. (Additionally, if the end of your workpiece is square, cut $\frac{1}{8}$ " deep saw kerfs across the corners to help embed the spur center.)
4. Drive the spur center into the center of the workpiece with the wood mallet to embed it at least $\frac{1}{4}$ ", as shown in Figure 25.
5. With the workpiece still attached, insert the spur center into the headstock spindle.
6. With the live center installed in the tailstock, slide the tailstock toward the workpiece until the live center touches the workpiece, then lock the tailstock in this position.
7. Use the tailstock adjustment knob to push the live center into the workpiece at least a $\frac{1}{4}$ ".

WARNING



Projectiles thrown from the machine could cause serious eye/face injury. Wear a face shield during assembly and operation.

Face Plate Turning

Face Plate turning (**Figure 26**) is when a workpiece is mounted to the face plate, which is mounted to the headstock spindle.

To mount your workpiece to the face plate, do these steps:

1. Find the center of your workpiece by drawing diagonal lines from corner to corner on the side of the workpiece that will be mounted to the face plate. The intersection point of these lines will show you the center of your workpiece.
2. Cut off the corners of the workpiece if it is thicker than 2" x 2".
3. Center the face plate on the workpiece and attach it through the face plate holes with wood screws, as shown in **Figure 27**.

NOTICE: Only use tap screws or wood screws with non-tapered heads (**Figure 27**) to attach the face plate to the workpiece. Do NOT use drywall screws or screws with tapered heads because these can split the face plate, or the screws may snap off during operation.

4. Thread the face plate onto the headstock spindle and tighten securely.

Note: If screws cannot be placed in the workpiece, then a backing block can be glued to the workpiece then attached to the face plate with screws.

To mount your workpiece to a backing block, do these steps:

1. Make the backing block from a piece of scrap wood that is flat on both sides.
2. Locate and mark the center of both the workpiece and the backing block.
3. Drill a 1/4" hole in the center of the backing block.
4. Glue the center of the backing block to the center of the workpiece (look through the drilled hole to line up centers), clamp the backing block to the workpiece, and wait for the glue to cure according to the manufacturer's recommendation.

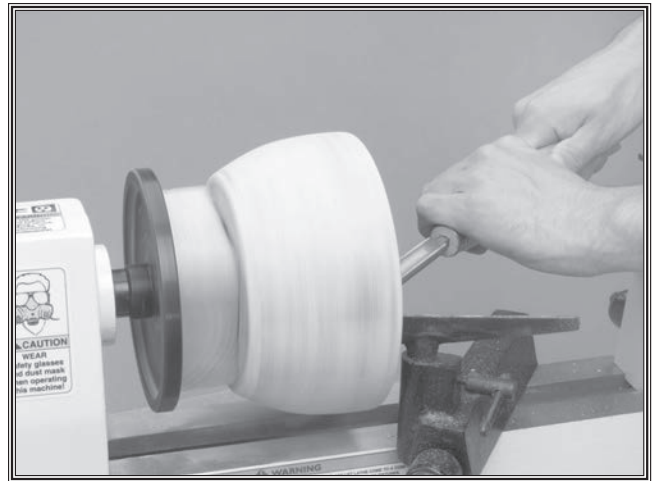


Figure 26. Typical face plate turning operation.



Figure 27. Mounting face plate to a backing block, which is glued to the workpiece.

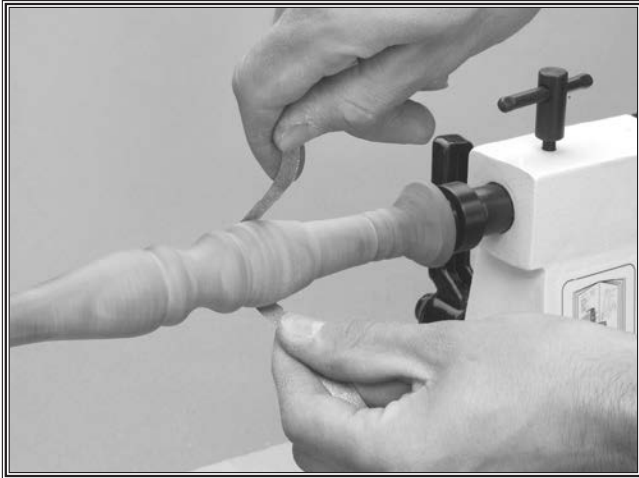


Figure 28. Typical spindle sanding operation.



Figure 29. Removing tool rest.

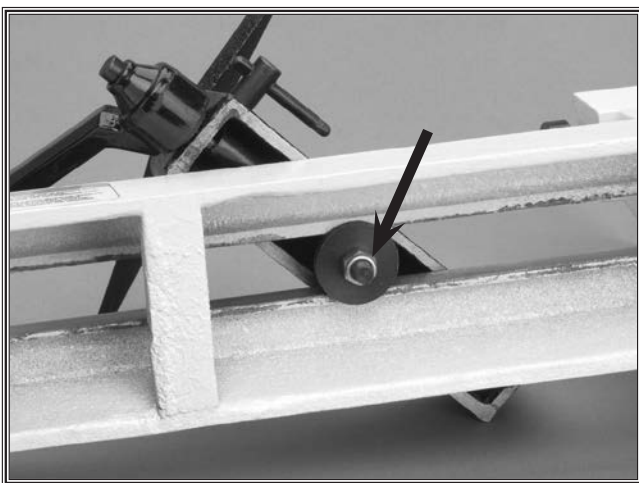


Figure 30. Lock nut that secures the tool holder to the bed (lathe turned upside-down for clarity).

Sanding/Finishing

After turning, the workpiece can be sanded (see example in Figure 28) and finished before removing it from the lathe.

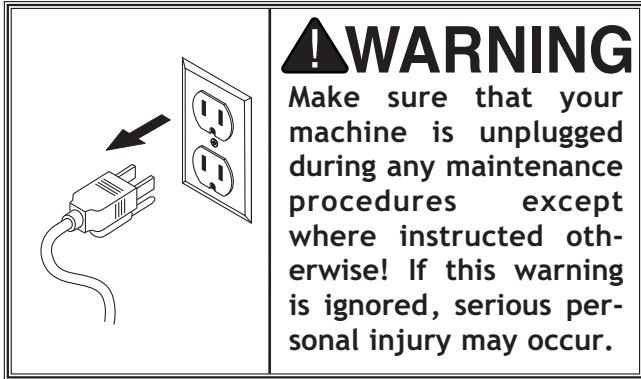
	<p>⚠ CAUTION Wrapping the sandpaper completely around the workpiece, will pull your hands into the moving workpiece and may cause injury. Never wrap sandpaper completely around the workpiece!</p>
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Whenever sanding or finishing on the Model W1704, remove the tool rest holder to increase personal safety and gain adequate working room.

To remove the tool rest holder, do these steps:

1. **UNPLUG THE LATHE!**
2. Remove the tool rest from the holder, as shown in Figure 29.
3. Using a 12mm socket or wrench, remove the lock nut (Figure 30) that is located under the tool rest holder on the bottom side of the bed.
4. Pull the tool rest holder off the bed and replace the lock nut on the threads, so that it does not get lost.

MAINTENANCE



General

To ensure optimum performance from your lathe, make a habit of inspecting it before each use. Check for the following conditions and repair or replace when necessary:

- Loose mounting bolts.
- Worn switch.
- Worn or damaged cords and plugs.
- Any other condition that could hamper the safe operation of this machine.

Lubrication

Since all bearings are shielded and permanently lubricated, simply leave them alone until they need to be replaced. DO NOT lubricate them.

Lubricate the unpainted parts of the bed regularly (Figure 31) to prevent rust and ensure a smooth sliding action from the tool post holder and the tailstock. Your goal is to achieve adequate lubrication. However, too much lubrication will attract dirt and sawdust, which may cause these components to lose their freedom of movement.

In addition, clean the headstock and tailstock barrel tapers (Figure 32) on a regular basis.

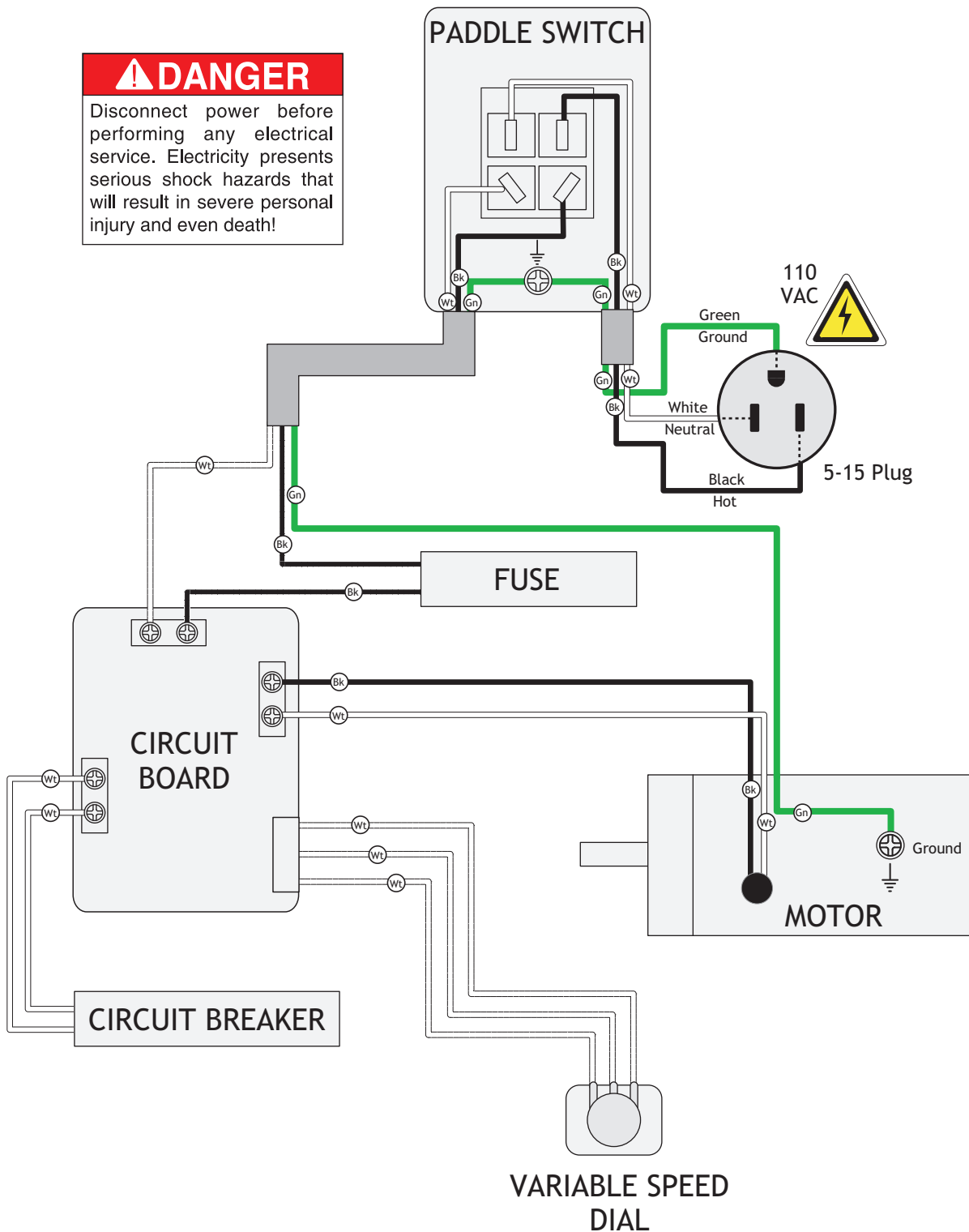


Figure 31. Cleaning/lubricating unpainted part of the bed.

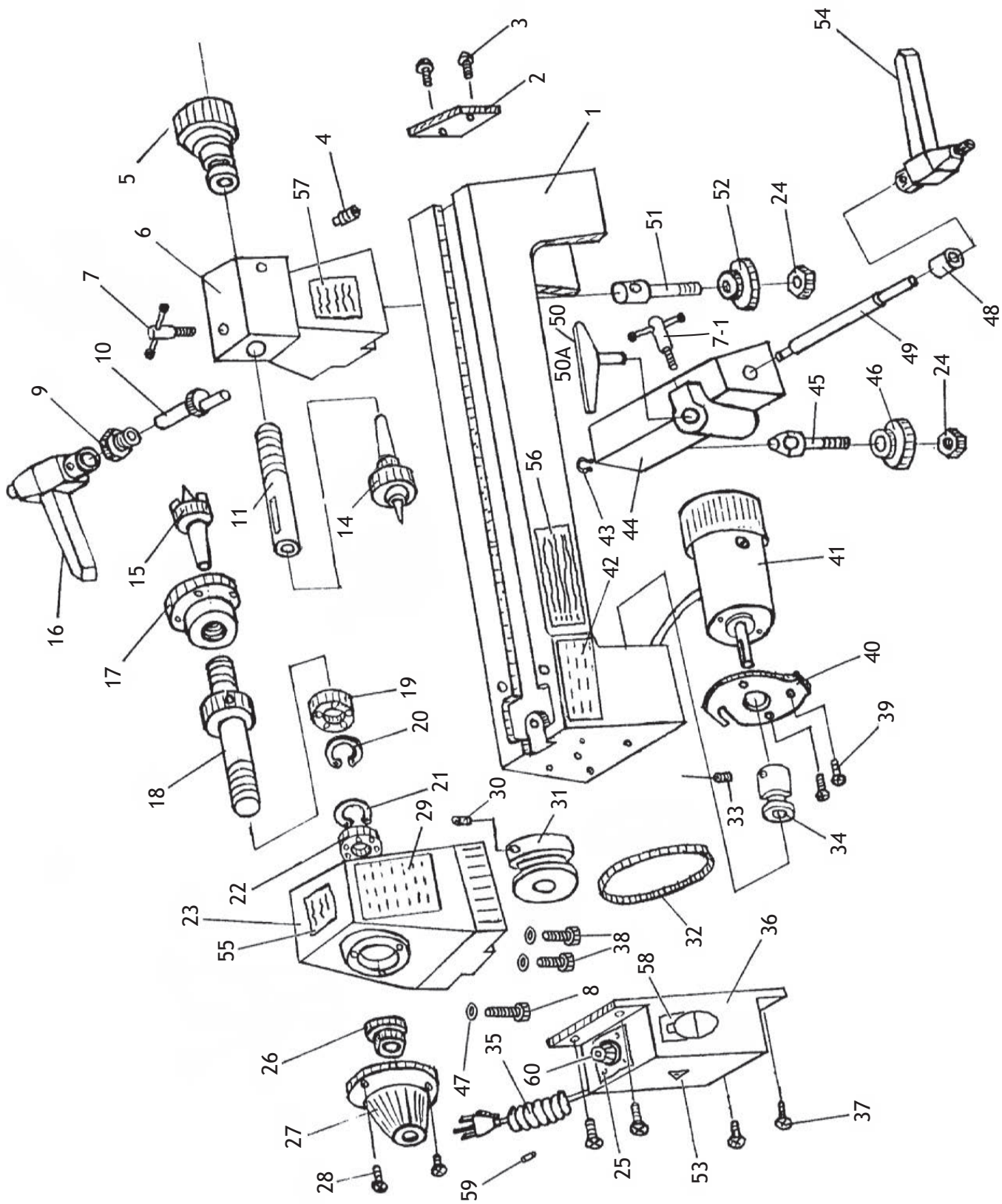


Figure 32. Cleaning spindle tapers.

WIRING DIAGRAM



PARTS



REF	PART #	DESCRIPTION
1	X1704001	BED
2	X1704002	RETAINING PLATE
3	XPS05M	PHLP HD SCR M5-.8 X 8
4	XPSS03M	SET SCREW M6-1 X 8
5	X1704005	HANDWHEEL
6	X1704006	TAILSTOCK
7	X1704007	T-LOCK KNOB BOLT M6-1 X 28
7-1	X1704007-1	T-LOCK KNOB BOLT M6-1 X 18
8	XPSB35M	CAP SCREW M8-1.25 X 60
9	X1704009	SLEEVE
10	X1704010	ECCENTRIC AXIS
11	X1704011	TAILSTOCK
14	X1704014	LIVE CENTER ASSEMBLY
15	X1704015	SPUR CENTER
16	X1704016	LOCK HANDLE
17	X1704017	FACE PLATE
18	X1704018	HEADSTOCK SPINDLE
19	XP6004	BALL BEARING 6004ZZ
20	XPR34M	EXT RETAINING RING 40MM
21	XPR34M	EXT RETAINING RING 40MM
22	XP6004	BALL BEARING 6004ZZ
23	X1704023	HEADSTOCK
24	XPLN04M	LOCK NUT M8-1.25
25	X1704025	SPEED DIAL LABEL
26	X1704026	HEADSTOCK SPINDLE NUT
27	X1704027	OUTBOARD SPINDLE COVER
28	XPS07M	PHLP HD SCR M4-.7 X 8
29	X1704029	DUST MASK WARNING LABEL
30	XPSS01M	SET SCREW M6-1 X 10
31	X1704031	DRIVE PULLEY
32	X1704032	BELT K-516
33	XPSS01M	SET SCREW M6-1 X 10
34	X1704034	MOTOR PULLEY

REF	PART #	DESCRIPTION
35	X1704035	POWER CORD
36	X1704036	CIRCUIT BOARD W/BOX
37	XPS07M	PHLP HD SCR M4-.7 X 8
38	XPSB40M	CAP SCREW M8-1.25 X 35
39	XPSB74M	CAP SCREW M6-1 X 18
40	X1704040	MOTOR PLATE
41	X1704041	MOTOR
42	X1704042	MACHINE NAMEPLATE LABEL
43	XPR39M	EXT RETAINING RING 8MM
44	X1704044	TOOL REST BASE
45	X1704045	SPECIAL BOLT M8-1.25 X 32
46	X1704046	PLATE
47	XPLW04M	LOCK WASHER 8MM
48	X1704048	SLEEVE
49	X1704049	ECCENTRIC ROD
50	X1704050	TOOL REST 7" (LARGE)
50A	X1704050A	TOOL REST 4-1/2" (SMALL)
51	X1704051	SPECIAL BOLT M8-1.25 X 32
52	X1704052	PLATE
53	X1704053	ELECTRICITY LABEL
54	X1704016	LOCK HANDLE
55	X1704055	UNPLUG MACHINE LABEL
56	X1704056	LATHE WARNING LIST LABEL
57	X1704057	READ MANUAL LABEL
58	XPSW09	SHOP FOX PADDLE SWITCH
59	X1704059	FUSE 8A
60	X1704060	VARIABLE SPEED DIAL SWITCH
61	XPW01M	FLAT WASHER 8MM
62	XPW04M	FLAT WASHER 10MM
63	XPSB100M	CAP SCREW M8-1.25 X 15
64	XPS74M	PHLP HD SCR M4-.7 X 14
65	X1704065	CABLE HOLDER

TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	HOW TO REMEDY
Motor will not start.	<ol style="list-style-type: none"> 1. Low voltage. 2. Open circuit in motor or loose connections. 3. Lathe switch fuse blown. 	<ol style="list-style-type: none"> 1. Check power line for proper voltage. 2. Inspect all lead connections on motor for loose or open connections. 3. Replace switch fuse located under threaded cap on the backside of the switch box.
Motor will not start; fuses or circuit breakers blow.	<ol style="list-style-type: none"> 1. Short circuit in line cord or plug. 2. Short circuit in motor or loose connections. 3. Incorrect fuses or circuit breakers in power line. 	<ol style="list-style-type: none"> 1. Inspect cord or plug for damaged insulation and shorted wires. 2. Inspect all connections on motor for loose or shorted terminals or worn insulation. 3. Install correct fuses or circuit breakers.
Motor overheats.	<ol style="list-style-type: none"> 1. Motor overloaded. 2. Air circulation through the motor restricted. 	<ol style="list-style-type: none"> 1. Reduce load on motor. 2. Clean out motor to provide normal air circulation.
Motor stalls, resulting in blown fuses or tripped circuit.	<ol style="list-style-type: none"> 1. Short circuit in motor or loose connections. 2. Low voltage. 3. Incorrect fuses or circuit breakers in power line. 4. Motor overloaded. 	<ol style="list-style-type: none"> 1. Inspect connections on motor for loose or shorted terminals or worn insulation. 2. Correct the low voltage conditions. 3. Install correct fuses or circuit breakers. 4. Reduce load on motor.
Machine slows or bogs down when operating.	<ol style="list-style-type: none"> 1. Motor overloaded. 2. Brushes worn. 	<ol style="list-style-type: none"> 1. Reduce load on motor. 2. Replace motor brushes.
Loud, repetitious noise coming from machine	<ol style="list-style-type: none"> 1. Pulley set screws are missing or loose. 2. Motor fan is hitting the cover. 3. V-belt is defective. 	<ol style="list-style-type: none"> 1. Inspect pulley set screws. Replace or tighten if necessary. 2. Tighten fan or shim cover. 3. Replace V-belt.
Motor sounds like it is running, but headstock spindle does not spin.	<ol style="list-style-type: none"> 1. V-belt broken or slipped off pulleys. 	<ol style="list-style-type: none"> 1. Inspect/replace the V-belt.
Tailstock will not push into workpiece when handle is turned.	<ol style="list-style-type: none"> 1. Tailstock barrel lock not aligned with catch slot in tailstock barrel. 	<ol style="list-style-type: none"> 1. Re-align tailstock barrel lock with catch slot in tailstock barrel, as described on page 15.
Tailstock or tool rest holder will not lock down tight enough.	<ol style="list-style-type: none"> 1. Lock nut needs to be tightened. 	<ol style="list-style-type: none"> 1. Tighten the lock nut as described on page 15.

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.

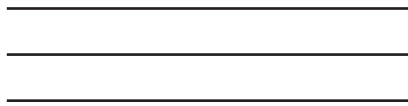
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3. How many of your machines or tools are Shop Fox®?
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<input type="checkbox"/> Home Shop Machinist	<input type="checkbox"/> Precision Shooter	<input type="checkbox"/> Woodsmith
<input type="checkbox"/> Journal of Light Cont.	<input type="checkbox"/> Projects in Metal	<input type="checkbox"/> Woodwork
<input type="checkbox"/> Live Steam	<input type="checkbox"/> RC Modeler	<input type="checkbox"/> Woodworker West
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<input type="checkbox"/> Modeltec	<input type="checkbox"/> Shop Notes	<input type="checkbox"/> Other:
<input type="checkbox"/> Old House Journal	<input type="checkbox"/> Shotgun News	

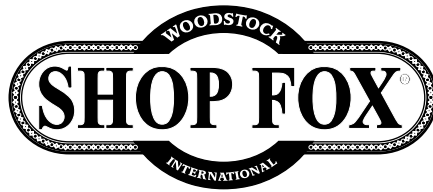
9. Comments: _____

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