

# 20" WOODTURNING LATHE

## Model 3520A

Instruction Manual & Parts List

M-0460221



# **POWERMATIC**<sup>®</sup>

(800) 248-0144  
[www.powermatic.com](http://www.powermatic.com)

This manual has been prepared for the owner and operators of a Powermatic Model 3520A Lathe. Its purpose, aside from proper machine operation, is to promote safety through the use of accepted correct operating and maintenance procedures. Completely read the safety and maintenance instructions before operating or servicing the machine. To obtain maximum life and efficiency from your lathe, and to aid in using the machine safely, read this manual thoroughly and follow all instructions carefully.

## **Warranty & Service**

WMH Tool Group warrants every product it sells. If one of our tools needs service or repair, one of our Authorized Repair Stations located throughout the United States can give you quick service.

In most cases, any one of these WMH Tool Group Repair Stations can authorize warranty repair, assist you in obtaining parts, or perform routine maintenance and major repair on your JET, Performax, Powermatic or Wilton tools.

For the name of an Authorized Repair Station in your area, call 1-800-274-6848.

## **More Information**

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## **Limited Warranty**

WMH Tool Group (including JET, Performax, Powermatic and Wilton brands) makes every effort to assure that its products meet high quality and durability standards and warrants to the original retail consumer/purchaser of our products that each product be free from defects in materials and workmanship as follows: **2 YEAR LIMITED WARRANTY ON THIS POWERMATIC PRODUCT.** This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence or accidents, normal wear-and-tear, repair or alterations outside our facilities, or to a lack of maintenance.

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To take advantage of this warranty, the product or part must be returned for examination, postage prepaid, to an Authorized Repair Station designated by our office. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection discloses a defect, WMH Tool Group will either repair or replace the product, or refund the purchase price if we cannot readily and quickly provide a repair or replacement, if you are willing to accept a refund. WMH Tool Group will return repaired product or replacement at our expense, but if it is determined there is no defect, or that the defect resulted from causes not within the scope of our warranty, then the user must bear the cost of storing and returning the product. This warranty gives you specific legal rights; you may also have other rights, which vary from state to state.

WMH Tool Group sells through distributors only. WMH Tool Group reserves the right to effect at any time, without prior notice, those alterations to parts, fittings, and accessory equipment which they may deem necessary for any reason whatsoever.

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## SAFETY RULES

As with all machines, there is a certain amount of hazard involved with the use of this lathe. Use the machine with the respect and caution demanded where safety precautions are concerned. When normal safety precautions are overlooked or ignored, personal injury to the operator can result.

**Read, understand and follow** the safety and operating instructions found in this manual. Know the limitations and hazards associated with this machine. A warning decal is placed on each machine as a reminder of basic safety practice.

**Electrical grounding.** Make certain that the machine frame is electrically grounded and that a ground lead is included in the incoming electrical service. In cases where a cord and plug are used, make certain that the grounding plug connects to a suitable ground. Follow the grounding procedure indicated in the National Electrical Code.

**Eye safety.** Wear an approved safety shield, goggles, or glasses to protect eyes. (NOTE: Common eyeglasses are only impact-resistant, they are not safety glasses.)

**Personal protection.** Before operating the machine, remove tie, rings, watch and other jewelry and roll up sleeves above the elbows. Remove all loose outer clothing and confine long hair. Protective type footwear should be used. Where the noise exceeds the level of exposure allowed in Section 1910.95 of the OSHA Regulations, use hearing protective devices. Do not wear gloves.

**Guards.** Keep the machine guards in place, make certain they are operable, and use them at all times. DO NOT operate the machine with guards off.

**Don't Overreach.** Maintain a balanced stance and keep your body under control at all times. Do not overreach or use excessive force to perform any operation.

**Maintain Tools in Top Condition.** Keep tools sharp and clean for safe and best performance. Dull tools can grab in the work and be jerked from the operator's hands causing serious injury.

**Check the condition** of the stock to be turned. Make sure it is free of knots, warpage, checked ends, improperly made or cured glue joints and other conditions which can cause it to be thrown out of the lathe.

**Securely fasten spur centers** to the material being used.

**Check centers and center sockets** in the headstock and tailstock to be sure they are free of dirt or rust and oil lightly before inserting centers.

**Test each set-up** by revolving the work by hand to insure it clears the work rest and bed and check setup at the lowest speed before increasing it to the operating speed.

**Use the correct cutting tool** for the operation to be performed and keep all tools in a sharpened condition.

**Use low speeds** for roughing and for long or large diameter work. If vibration occurs, stop the machine and correct the cause. See Table on page 9 for speed recommendations.

**When sanding,** remove the tool rest from the machine, apply light pressure, and use a slow speed to avoid heat build up.

**When turning large diameter pieces, such as bowls,** always operate the lathe at low speeds. See Table 1 for speed recommendations.

**Never use dull turning tools** - sharp tools help to prevent the tool from grabbing in the work and being jerked from the operator's hands.

**Take measurements** on the part only with the spindle stopped.

**Do not attempt** to engage the spindle lock pin until the spindle has stopped. If leaving the machine area, turn it off and wait until the spindle stops before departing.

**Give the work you are doing your undivided attention.** Looking around, carrying on a conversation and "horseplay" are careless acts that can result in serious injury.

**Make no adjustments except speed change with the spindle rotating** and always disconnect machine from power source when performing maintenance to avoid accidental starting or electrical shock.

**Provide for adequate surrounding work space** and overhead non-glare lighting. Powermatic recommends the use of non-skid floor strips on the floor area where the operator normally stands and marking off a work area for each machine.

**Don't stand in line** with any large diameter part being turned or allow anyone else to do so.

**When stopping the lathe,** never grab the part or face plate to slow it down. Let the work coast to a stop.

**Use only Powermatic** or factory authorized replacement parts and accessories, otherwise the warranty and guarantee are null and void.

**Drugs, alcohol, medication.** Do not operate tool while under the influence of drugs, alcohol, or any medication.

**Do not use** this Powermatic wood lathe for other than its intended use. If used for other purposes, Powermatic disclaims any real or implied warranty and holds itself harmless from any injury that may result from that use.

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

- \* Lead from lead-based paint.
- \* Crystalline silica from bricks and 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 specifically designed to filter out microscopic particles.

Familiarize yourself with the following safety notices used in this manual:



**CAUTION:** (This means that if precautions are not heeded, it may result in minor or moderate injury and/or possible machine damage)



**WARNING:** (This means that if precautions are not heeded, it could result in serious injury or possibly even death).

## SAFETY: DECALS

Familiarize yourself with the location and content of this decal on your machine.



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## SPECIFICATIONS: 3520A Lathe

|                                       |                             |
|---------------------------------------|-----------------------------|
| Table with standard extensions.....   | 28" x 38"                   |
| Distance Between Centers.....         | 34-1/2"                     |
| Swing Over Bed .....                  | 20"                         |
| Overall Length.....                   | 50"                         |
| Spindle Speeds .....                  | 0-1200 / 0-3200 RPM         |
| Motor.....                            | 2HP, 220V                   |
| Lathe Power Requirements.....         | 220V, 3PH or 1PH            |
| Spindle Thread Size .....             | 1-1/4" x 8 T.P.I.           |
| Head/Tailstock Taper.....             | #2 Morse                    |
| Height.....                           | 44" (Adjustable)            |
| Weight.....                           | 650 lbs                     |
| Tailstock Quill Travel.....           | Over 4"                     |
| 3" Faceplate .....                    | standard                    |
| 14" Toolrest .....                    | standard                    |
| Drive System.....                     | Poly V Belt, Inverter Drive |
| Spindle Lock.....                     | standard                    |
| Knock Out Rod .....                   | standard                    |
| Drive Center .....                    | standard                    |
| Ball Bearing (live) Center.....       | standard                    |
| Hole through Tail Stock Spindle.....  | 3/8"                        |
| Hole through Head Stock Spindle ..... | 5/8"                        |
| Footprint of stand.....               | 50" L x 24" W               |

NOTE: The above specifications were current at the time this manual was published, but because of our policy of continuous improvement, Powermatic reserves the right to change specifications without notice and without incurring obligations.

## RECEIVING

Remove the lathe from the shipping container and check for damage. Report any damage to your distributor immediately. Accessories are packaged in a separate carton which will be on the shelf of the machine stand. Clean protective coating from the bed, spindles, work rest and face plate with kerosene or a good commercial solvent. Read the instruction manual thoroughly for assembly, maintenance, operation and safety instructions.

## INSTALLATION

Install the four leveling screws in the legs, adjust to a stable, level position and tighten the jam nuts to lock in place.

Insert the guard support rod in the guard mounting bracket at the rear of the headstock. Position a locking collar on each side of the mounting bracket so that the lock pin lines up with the holes in the guard pivot rod, one for guard position and one for load position. The spring loaded lock pin will hold the guard in each position.

### Power Connection

The lathe will operate on single phase or three phase 230 volt power supply. A three wire pigtail for use on 230 volt single phase power is attached to the inverter and may be hard wired to the power source or connected to a receptacle plug. Connect the 230 volt supply to the black and white leads and ground the green lead.

If three phase power is used, it will be necessary to replace the pigtail wire with a 12/4 wire and connect the three hot leads to the inverter at R, S and T as shown in the wiring diagram. Always connect the ground lead.

Before connecting to the power source make sure the on/off switch is in the off position and turn the speed dial counterclockwise. If the switch is in the on position when the power is connected, the inverter will trip out. If this happens, disconnect power, turn switch off, wait 30 seconds and then reconnect power.

**NOTICE: IF THERE IS A POWER OUTAGE WHILE OPERATING THE LATHE, TURN THE SWITCH TO THE OFF POSITION, DISCONNECT POWER SOURCE, WAIT 30 SECONDS THEN RECONNECT POWER SOURCE AND RESUME NORMAL OPERATION.**

### Inverter Drive System

The model 3520A lathe utilizes the latest technology in A.C. inverter drives to provide infinitely variable spindle speeds. The inverter controls the speed of the motor by varying the frequency of the voltage supplied to the motor. The inverter provides an

acceleration ramp that eliminates the shock of normal across the line starting. Also a braking feature eliminates long coasting periods when the lathe is turned off.

The 2 HP motor is specially designed for use with inverter drives, and is balanced to reduce noise and minimize vibration.

The A.C. Inverter does not require any programming, it is pre-programmed from the factory. **The buttons on the face of the inverter should never be pushed at any time.** Use only the controls on the front of the headstock.

## MAINTENANCE

Maintenance on the 3520A lathe should be performed at periodic intervals to insure that the machine is in proper working order, that all fasteners are tight, and the machine is in adjustment. The more use the machine is subjected to, the more often it should be inspected and maintained. Inspection and maintenance should be performed at least twice a year.



**WARNING: To prevent accidental starting or electrical shock, disconnect machine from power source before performing any maintenance.**

Periodic cleaning of the lathe is important to keep the lathe in proper working order. The lathe bed should be cleaned and oiled periodically so that headstock, tailstock, and tool support will slide properly. With air hose periodically blow out headstock to keep saw dust and chips from collecting on belt and sheaves, and blow off dust and chips that collect on inverter (DO NOT DISASSEMBLE INVERTER TO CLEAN).

## ADJUSTMENTS

### Belt Adjustment

The drive belt sheaves are initially aligned at the factory, but if any service is performed that affects their alignment it is very important that they be realigned. To realign them, loosen the two set screws on the spindle sheave and slide it in the proper position. Use of a straight edge along the edge of both sheaves will simplify the positioning. When properly aligned, there should be no pulsing sounds or noise coming from the belt.



## Tool Support

The tool support (shown in Figure 5), is designed to allow adjustment for height, position on the bed, and angle to the work. Your 3520A lathe comes standard with the 14" tool support. Other supports are available; consult the "Optional Equipment" list on page 24.

Periodically the tool rest should be disassembled and the parts cleaned and oiled to provide free movement of the parts to insure good clamp action.

## Spindle

The spindle bearing preload is set at the factory for general turning applications. There should be no "end play" of spindle looseness along its axis. If any looseness ever occurs it may be removed by tightening the bearing lock nut on the left end of the spindle. Be very careful not to overtighten the lock nut or the spindle bearings will overheat. It should be tightened just enough to remove the end play and the spindle should rotate very freely.

## Speed Range Adjustment

To provide the maximum horsepower to the spindle at the very slow speeds, set the drive belt in the low range.

To change speed ranges, open the access door in front of the headstock, loosen the pivot lock handle located in the motor tension slot, raise the motor up by lifting up on the motor plate handle and relock the lock handle to hold the motor up. There should be sufficient slack in the belt to reposition it to the other step. Loosen the tension lock handle and lower the motor to tension the belt. Be sure that the Poly-V grooves of the belt seat properly in the corresponding groove of the pulley. Do not overtension; a very light pressure on the motor plate handle is adequate to prevent belt slippage.

TABLE 1: WOOD TURNING LATHE SPEEDS

| DIAMETER OF WORK | ROUGHING RPM | GENERAL CUTTING RPM | FINISHING RPM |
|------------------|--------------|---------------------|---------------|
| Under 2"         | 1520         | 3000                | 3000          |
| 2 to 4"          | 760          | 1600                | 2480          |
| 4 to 6"          | 510          | 1080                | 1650          |
| 6 to 8"          | 380          | 810                 | 1240          |
| 8 to 10"         | 300          | 650                 | 1000          |
| 10 to 12"        | 255          | 540                 | 830           |
| 12 to 14"        | 220          | 460                 | 710           |
| 14 to 16"        | 190          | 400                 | 620           |
| 16" to 20"       | 175          | 325                 | 500           |
| 20" to 24"       | 175          | 260                 | 400           |

## TOOLS

If possible, select only quality, high speed steel turning tools. High speed tools hold an edge and last longer than ordinary carbon steel. As one becomes proficient in turning, a variety of specialty tools for specific applications can be acquired. The following tools provide the basics for most woodturning projects:

**Large Roughing Gouge** - 1" to 1-1/4", used to eliminate waste wood.

**Skews** - 1-1/2" and 1" or 1-1/4", used to make finishing cuts and details.

**Spindle Gouges** - 1/4", 3/8", 1/2", used to turn beads, coves and other details.

**Square Scraper** - 1/2", used to create square shoulders.

**Large Domed Scraper** - 1-1/2", used to reduce ridges on interior of bowls.

**Parting Tool** - 1/8", used to set diameters for sizing.

**Deep Fluted Bowl Gouge** - 1/4", 3/8" and 1/2", used for turning bowls & plates.

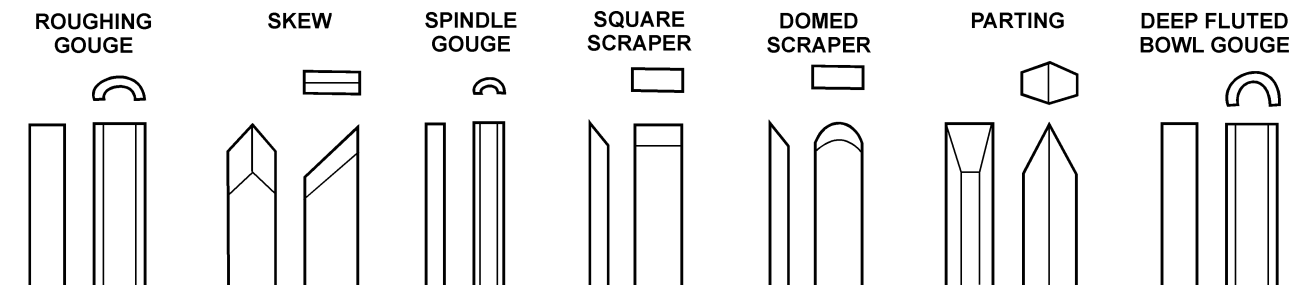


FIGURE 1

For safety and best performance, **keep tools sharp**. If a tool stops cutting or requires excessive pressure to make a cut, it needs to be sharpened. A number of brand name sharpening jigs and fixtures are available, however, a woodturner should learn to sharpen tools freehand. For best results, use a slow speed grinder (1800 rpm) fitted with a 60-grit wheel (for shaping) and a 100-grit wheel (for final sharpening and touchup). The grinder should be located near your lathe and at a comfortable height. A diamond dresser will keep the wheels true and eliminate glazing. Never allow the tool to rest in one place on the wheel, keep it moving and use a light touch.

Carbon steel tools can overheat easily and should be cooled frequently. If the edge turns blue, it has lost its temper and should be ground past the blue area. High-speed steel tools are not as likely to overheat, but can be damaged if allowed to get red hot. High speed steel tools should not be quenched for cooling. Honing with a diamond lap or slipstone will save trips to the grinder and keep the edge fresh.

## OPERATING INSTRUCTIONS

Before operating the lathe, check each time that everything is in proper working order:

1. Level your machine: use the adjustable levelers to help reduce vibration.
2. Check bearings: adjust only if endplay exists.
3. Check belts: should be snug but not overly tight.
4. Ways - keep clean, use steel wool and wax to prevent buildup of rust and finishes.
5. Toolrest - use mill file to remove nicks and dings.
6. Spindle tapers - should be clean and free of dust and chips for proper seating of tapers. Clean with scotchbrite or taper cleaner.
7. Tailstock - clean and lubricate ram and locking device.
8. Lighting - proper lighting is essential.
9. Dust extractor - to remove excess sanding dust.
10. Anti-fatigue mat - will help make long hours in front of the lathe more comfortable.

## SPINDLE TURNING

Spindle turning takes place between the centers of the lathe. It requires a spur or drive center in the headstock and a revolving or live center in the tailstock. A cup center rather than a cone center will reduce the risk of splitting the stock. Figure 2 shows the basic profile shapes in spindle turning.

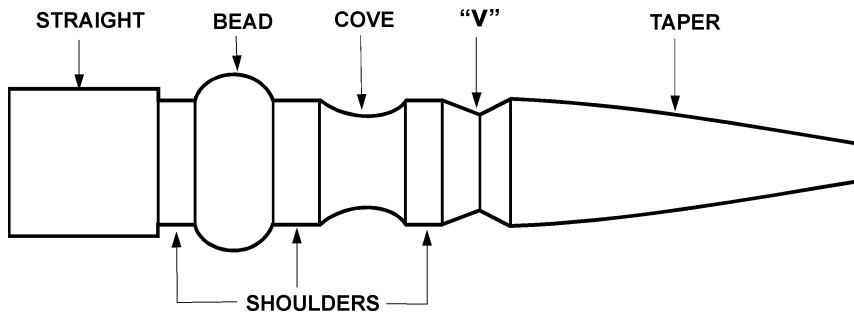


FIGURE 2

### STOCK SELECTION

Stock for spindles should be straight grained and free of checks, cracks, knots and other defects. It should be cut 1/8" to 1/4" larger than the finished diameter and may require additional length to remove ends if required. Larger stock should have the corners removed to produce an octagon making the piece easier to rough down to a cylinder.

1. With a combination square or plastic center finder, locate and mark center on each end of stock. Accuracy is not critical on full rounds but extremely important on stock where square sections are to remain. Put a dimple in the stock with an awl or nail, or use a spring-loaded automatic center punch.
2. Extremely hard woods may require kerfs cut into the spur drive end of stock, Figure 3, or may need to have the spur center driven into the stock with a wood mallet or dead blow hammer, Figure 4. **NOTE: Never use a steel face hammer and never drive stock onto spur while it is mounted in the lathe spindle.**

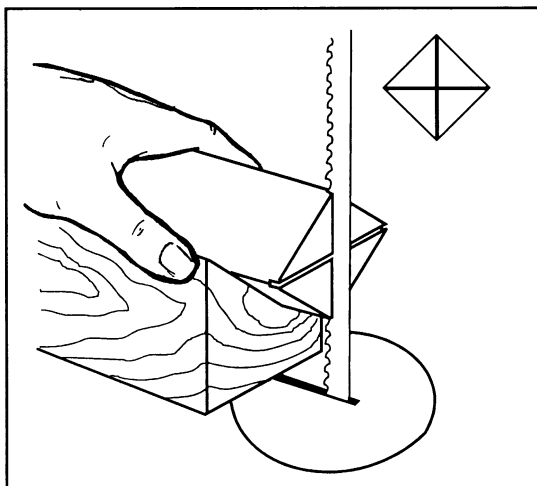


FIGURE 3

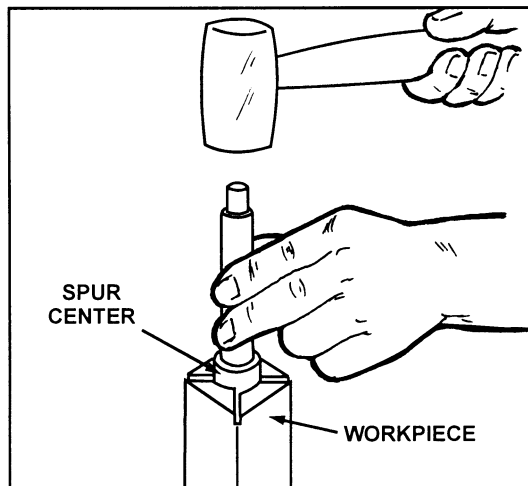


FIGURE 4

### MOUNTING STOCK

1. Install workpiece by inserting the attached spur center into the spindle taper on the headstock.
2. Bring tailstock into position, lock it to the bed, and advance the spindle with the handwheel in order to seat the cup center into the workpiece.
3. Move tool support into position. It should be parallel to the workpiece, just below the centerline and approximately 1/8" to 1/4" from the corners of the workpiece to be turned, as in Figure 5. Lock tool support to bed.

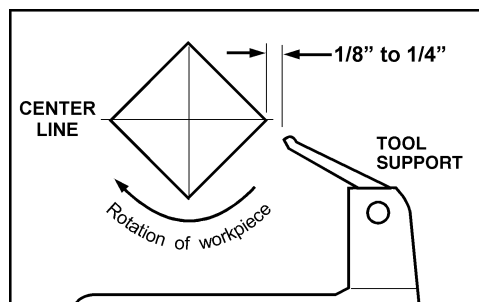


FIGURE 5

4. Rotate workpiece by hand to check for proper clearance.
5. Start lathe at lowest speed and bring it up to the appropriate RPM for the size of stock used (refer to table on page 9).

## CUTTING TECHNIQUES

### ROUGHING OUT:

1. Begin with a large roughing gouge. Place the tool on the tool support with the heel of the tool on the surface to be cut.
2. Slowly and gently raise tool handle until cutting edge comes into contact with the workpiece.
3. Beginning at the tailstock end of the workpiece, roll the flute (hollowed-out portion) of the tool in the direction of the cut, Figure 6. Make long sweeping cuts in a continuous motion to rough the piece down to a cylinder. Keep as much of the bevel of the tool as possible in contact with the workpiece to ensure control and avoid catches.

**NOTE: Always cut down-hill, or from large diameter to small diameter.**

**Always work toward the end of a workpiece, never start cutting at the end.**

4. Once the workpiece is roughed down to a cylinder, smooth it with a large skew. Keep the skew handle perpendicular to the spindle and use only the center third of the cutting edge for a long smoothing cut (touching one of the points of the skew to the spinning workpiece may cause a catch and ruin the workpiece).
6. Add details to the workpiece with skew, parting tool, scraper or spindle gouge.

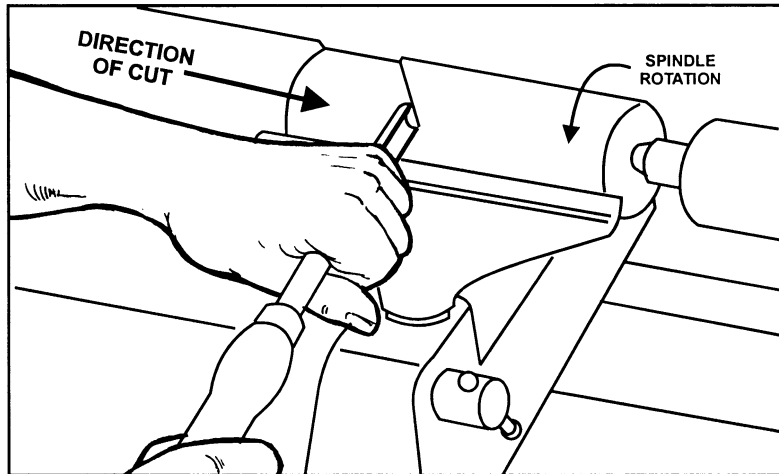


FIGURE 6

### BEADS:

1. Make a parting cut for what is to be a bead to the desired depth. Place the parting tool on the tool support and move tool forward to make the full bevel of the tool come in contact with the workpiece. Gently raise handle to make cut to the appropriate depth.
2. Repeat for other side of the bead.
3. Using a small skew or spindle gouge, start in the center between the two cuts and cut down each side to form the bead. Roll the tool in direction of cut.

### COVES:

1. Use a spindle gouge. With the flute of the tool at 90 degrees to the workpiece, touch the point of the tool to the workpiece and roll in towards the bottom of the cove, Figure 7. **Stop at the bottom; attempting to go up the opposite side may cause the tool to catch.**
2. Move the tool over the desired width of the cove.
3. With the flute facing the opposite direction, repeat step 1 for other side of cove. Stop at bottom of cut.

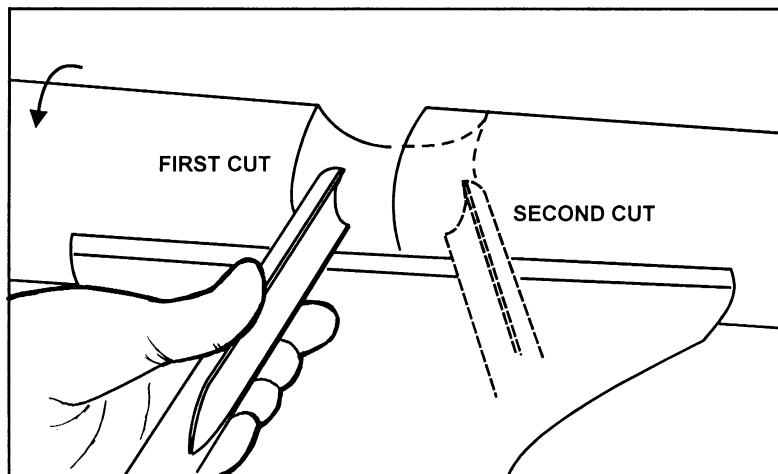


FIGURE 7

### "V" CUTS:

1. Use the long point of the skew. (NOTE: Do not press the long point of the skew directly into the workpiece to create the "V"; this will result in a burned or burnished "V" with fibers being rolled up at both sides.)

2. Lightly mark the center of the "V" with the tip of the skew.
3. Move the point of the skew to the right half of the desired width of your cut.
4. With the bevel parallel to the right side of the cut, raise the handle and push the tool in to the desired depth, as shown in Figure 8.
5. Repeat from the left side. The two cuts should meet at the bottom and leave a clean "V" cut.
6. Additional cuts may be taken to add to either the depth or width of the cut.

#### PARTING OFF:

1. Use parting tool.
2. Adjust lathe speed to lower RPM for parting through a workpiece.
3. Place tool on tool support and raise the handle until it starts to cut and continue to cut towards the center of the workpiece.
4. Loosely hold on to the piece in one hand as it separates from the waste wood.

#### SANDING & FINISHING:

Leaving clean cuts will reduce the amount of sanding required. Adjust the lathe to a **low speed**, and begin with fine sandpaper (120 grit or finer). Coarser sandpaper will leave deep scratches that are difficult to remove, and dull crisp details on the spindle. Progress through each grit without skipping grits (e.g., do not jump from 120 grit to 220 grit). Fold the sandpaper into a pad; do not wrap sandpaper around your fingers or the workpiece.

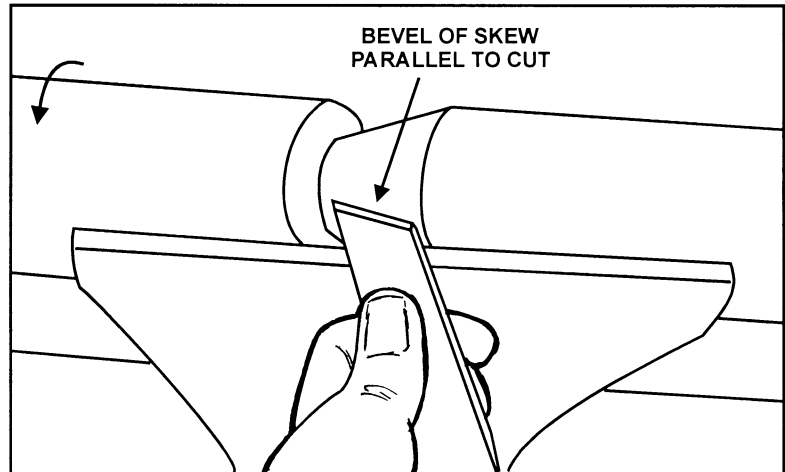


FIGURE 8

To apply a finish, the workpiece can be left on the lathe. Turn off the lathe and use a brush or paper towel to apply the finish. Remove excess finish before restarting lathe. Allow to dry and sand again with 320 or 400 grit sandpaper. Apply second coat of finish and buff.

## FACE PLATE & BOWL TURNING

Face plate turning is normally done on the inboard side of the headstock over the bed. Larger workpieces must be turned on the outboard side (remove tailstock and tool support, and move headstock to opposite end of bed).

### MOUNTING STOCK

Use of a face plate is the most common method for holding a block of wood for turning bowls and plates:

1. Select stock at least 1/8" to 1/4" larger than each dimension on the finished workpiece.
2. Always select the largest diameter face plate that can be used for the workpiece to be turned.
3. True one surface of the workpiece for mounting against the face plate.
4. Using the face plate as a template, mark the location of the mounting holes, and drill pilot holes of the appropriate size. Face plates are drilled for No. 12 screws. (Phillips and square drive screws will hold up better than slotted screws. Steel metal screws are case hardened with deeper and sharper threads than wood screws.)

If the mounting screws on the face plate interfere with the workpiece, a glue or waste block can be used:

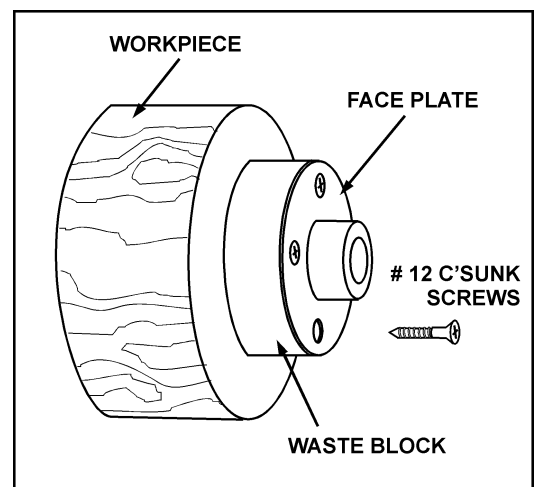


FIGURE 9

5. Make a block the same diameter as the face plate, Figure 9. Both glue block and workpiece should have good flat surfaces for gluing.

6. Glue the block to the workpiece. Avoid using brown paper or newspaper between the block and workpiece. It may work fine if you are using scrapers, but a slight catch with a bowl gouge can separate the two.

NOTE: When using a glue block, be careful with the adhesive you select. Dry workpieces can be bonded with ordinary white or yellow glue but must be clamped to ensure a good bond. Green workpieces require cyanoacrylate (super glue).

## **FACEPLATE OR CHUCK?**

While faceplates are the simplest, most reliable method of holding a block of wood for turning, chucks can also be used. As there are dozens of chucks to choose from, the woodturner should first consider all the different types of turning that will be done, and read reports or discuss with other turners who own chucks before making a decision. A chuck is not a requirement but is handy when working on more than one piece at a time. Rather than removing screws, you simply open the chuck and change workpieces. The most popular ones are four jaw scroll chucks with a variety of jaws to accommodate different size tenons. Most also come with a screw chuck as well.

## **WOOD SELECTION**

Firewood is the cheapest, most widely available stock to use while learning to turn bowls. Simply waste wood for a while practicing turning techniques. Develop skill with each tool before attempting to make a finished piece. It is best to start with dry wood, without worrying about drying or distortion. Once turning becomes comfortable, try green wood which cuts very easily. As the turner gains experience, he or she will find extraordinary grain and figure in the form of burls, crotches and bark inclusions.

## **CHECKS & CRACKS**

Green wood will check and crack. For best results, leave logs in as long lengths as you can handle. As the material starts to dry, surface cracks will develop on the ends of the log. Cut off two to three inches and you should find good, sound wood. Also cut the log in half along the pith to avoid having it in the finished piece. Most checks radiate from the pith. As you turn bowls from green wood, make sure you maintain a consistent wall thickness throughout the piece. Leaving a piece thick in some areas and thin in others will cause the wood to dry unevenly and promote checks and cracks.

## **DISTORTION**

Distortion is a problem associated with turning green wood. It will vary from one type of wood to the next. Typically, fruitwoods tend to distort more than others do. It also varies with the time of year the tree was cut and how the logs are stored.

## **TOOLS FOR BOWL TURNING**

The deep fluted bowl gouge is the most essential and versatile tool for most bowl and faceplate style turning. The bowl gouge is heavier and easier to control than other types of gouges. It also allows removal of wood much faster and with less vibration than other gouges. Most average sized bowl work can be accomplished with a 3/8" or 1/2" bowl gouge. A 1/4" bowl gouge is best suited for smaller bowls and light finishing cuts. Larger 3/4" and 1" bowl gouges are only used for extremely large pieces.

Large domed scrapers can also be used to help clean up the interior surfaces of bowls. A light touch with the scraper slightly tilted will eliminate some of the ridges occasionally left by an inexperienced bowl gouge.

## **BOWL TURNING TECHNIQUES**

### **TO SHAPE OUTSIDE OF BOWL:**

1. Odd shaped burls, crotches and other irregular shaped blanks require special preparation before mounting in a chuck or onto a faceplate. Remove the bark, if there is any, from what appears to be the center of the top of the workpiece.

2. Drive spur center into the top of the workpiece with a mallet or dead blow hammer.

3. Slip the spur center into the headstock taper and bring the tailstock with a live or ball bearing center into position. Lock the tailstock to the bed and advance the spindle in order to seat the cup center into the workpiece. Tighten the quill lock.

4. Position tool support below the centerline and about 1/4" from the workpiece. (NOTE: For larger outboard turning, an optional outboard turning stand is used to place the tool support; see your Powermatic dealer).

5. Turn workpiece by hand to ensure proper clearance.
6. Start lathe at lowest speed and bring it up to the maximum safe speed for the size of work to be turned (see chart on page 9). If the machine starts to vibrate, lower the speed until vibration stops.
7. Rough out the outside of the bowl with the 1/2" deep fluted bowl gouge, holding the tool firmly against your hip. For best control, use your whole body to move the gouge through the workpiece.
8. As bowl takes shape, work on the bottom (tailstock end) to accommodate attaching a face plate.
9. Turn a short tenon (about 1/8" long) the size of the hole in the faceplate, Figure 10. This will allow centering the workpiece when the faceplate is attached. (NOTE: If you plan to use a chuck, turn a tenon of the appropriate length and diameter to fit your chuck.)
10. Stop the lathe, remove workpiece and attach face plate or chuck (see "Mounting Stock" above).
11. Finish turning the outside of bowl with 1/2" or 3/8" bowl gouge. Leave additional material at base of bowl for support while turning interior. This will be removed later.

#### TO SHAPE INTERIOR OF BOWL:

1. Stop lathe and move tailstock away. Remove center from tailstock to prevent bumping it with elbow.
2. Adjust tool support in front of the bowl just below centerline, at a right angle to the lathe ways.
3. Rotate workpiece by hand to check clearance.
4. Face off top of bowl by making a light shearing cut across the top of workpiece, from rim to center.
5. Place 1/2" bowl gouge on toolrest at center of the workpiece with the flute facing top of bowl. The tool handle should be level and pointed toward four o'clock, as shown in Figure 11.
6. Use left hand to control cutting edge of gouge, while right hand swings tool handle around toward your body (see Figure 11). The flute should start out facing top of workpiece, and rotate upward as it moves deeper into the bowl to maintain a clean even curve. As tool goes deeper into bowl, progressively work out toward rim. It may be necessary to turn the toolrest into the piece as you get deeper into the bowl. (NOTE: Try to make one, very light continuous movement from the rim to the bottom of the bowl to ensure a clean, sweeping curve through the piece. Should there be a few small ridges left, a light cut with a large domed scraper can even out the surface.)

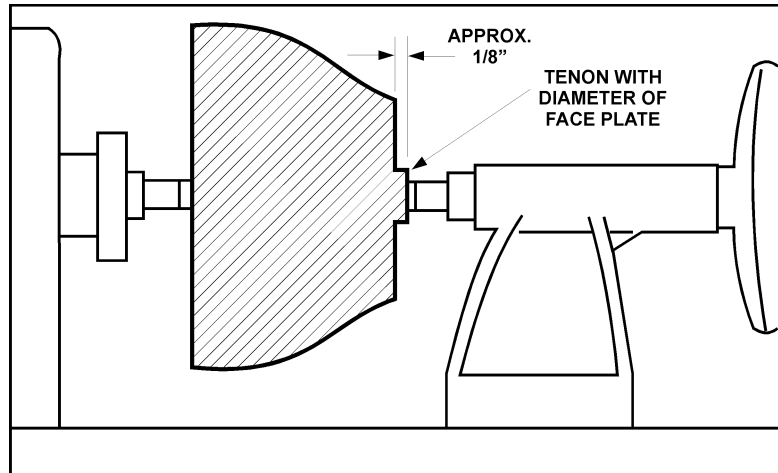


FIGURE 10

7. Develop wall thickness at the rim and maintain it as you work deeper into the bowl (Once the piece is thin toward the bottom, you cannot make it thinner at the rim). When the interior is finished, move tool support to exterior to re-define bottom of bowl. (General rule of thumb: the base should be approximately 1/3 the overall diameter of the bowl).
8. Work the tight area around faceplate or chuck with 1/4" bowl gouge.
9. Begin the separation with a parting tool, but do not cut all the way through yet.

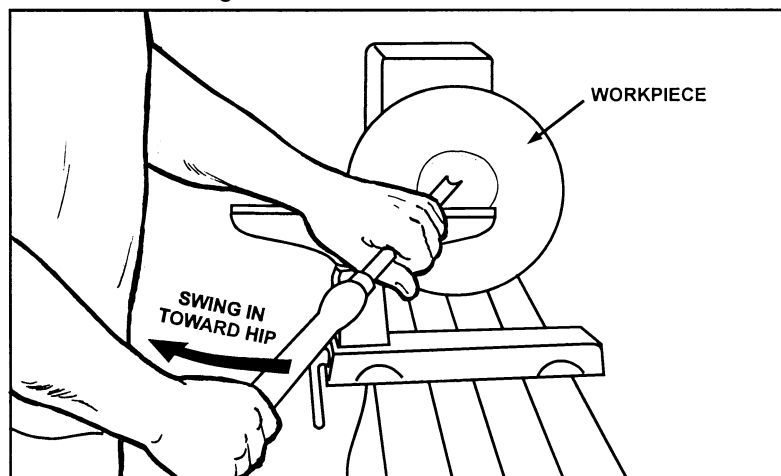


FIGURE 11

**SANDING AND FINISHING:**

1. Remove the toolrest and adjust lathe speed to approximately 500 RPM. High speed can build friction while sanding and cause heat check in some woods.
2. Begin with fine sandpaper (120 grit) and progress through each grit, using only light pressure. Coarser sandpaper tends to leave deep scratches that are hard to eliminate. Use power-sanding techniques to avoid concentric sanding marks around your finished piece. Avoid rounding over the rim and foot with sandpaper; try to keep details crisp. Finish sanding with 220 grit.
3. Remove sanding dust with tack rags or compressed air and, with lathe turned off, apply first coat of finish. Let stand for several minutes, wipe off excess. Allow to dry before sanding again with 320 or 400 grit sandpaper.
4. Turn lathe back on and continue the separation cut almost all the way through the base. Stop at about 3" and use a small fine tooth saw to separate the bowl from the waste.
5. Apply second finish coat and allow to dry before buffing.



## TROUBLE-SHOOTING (3520A Lathe)

| PROBLEM  | POSSIBLE CAUSE   | SOLUTION   |
|--|--|--|
| Excessive vibration.                                   | <ol style="list-style-type: none"> <li>1. Defective spindle bearings.</li> <li>2. Worm or defective belt.</li> <li>3. Defective motor.</li> <li>4. Workpiece warped, out-of-round, has major flaw, or was improperly prepared for turning.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Replace bearings.</li> <li>2. Replace belt.</li> <li>3. Replace motor.</li> <li>4. Correct problem by planing or sawing, or scrap workpiece.</li> </ol>  |
| Motor or spindle stalls.                               | <ol style="list-style-type: none"> <li>1. Excessive cut.</li> <li>2. Defective motor.</li> <li>3. Excessive belt wear.</li> <li>4. Improper belt adjustment.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Reduce cut depth.</li> <li>2. Replace motor.</li> <li>3. Replace belt.</li> <li>4. Readjust belt.</li> </ol>   |
| Motor overheats.                                       | <ol style="list-style-type: none"> <li>1. Motor overloaded.</li> <li>2. Improper cooling on motor.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Correct overload condition, such as reducing cut depth.</li> <li>2. Clean sawdust from fan and duct areas of motor.</li> </ol>   |
| Motor starts slowly or fails to come up to speed.      | <ol style="list-style-type: none"> <li>1. Low voltage.</li> <li>2. Defective motor.</li> </ol>   | <ol style="list-style-type: none"> <li>1. Request voltage check from power company and correct low voltage condition.</li> <li>2. Replace motor.</li> </ol>  |
| Motor fails to develop full power.                     | <ol style="list-style-type: none"> <li>1. Power line overloaded.</li> <li>2. Undersize wires in supply system.</li> <li>3. Low voltage.</li> <li>4. Defective motor.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Correct overload condition.</li> <li>2. Increase supply wire size.</li> <li>3. Request voltage check from power company and correct low voltage condition.</li> <li>4. Replace motor.</li> </ol> |
| Tools tend to grab or dig in.                          | <ol style="list-style-type: none"> <li>1. Dull tools.</li> <li>2. Tool support set too low.</li> <li>3. Tool support set too far from workpiece.</li> <li>4. Improper tool being used.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Sharpen tools.</li> <li>2. Reposition tool support height.</li> <li>3. Reposition tool support closer to workpiece.</li> <li>4. Use correct tool for operation.</li> </ol>                       |
| Lathe runs at one speed.                               | <ol style="list-style-type: none"> <li>1. Electronic AC inverter defective, not programmed properly or loose wiring.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Replace electronic AC inverter, reprogram, or check wiring.</li> </ol>   |
| Headstock moves when applying pressure with tailstock. | <ol style="list-style-type: none"> <li>1. Excessive pressure being applied by tailstock (more than 500 lbs. of force)<br/>NOTE: The screw action of the tailstock is capable of applying excessive pressure to workpiece and headstock. Apply only sufficient force by tailstock to hold workpiece securely in place. Excessive pressure can cause damage to machine.</li> </ol> | <ol style="list-style-type: none"> <li>1. Slide headstock down the left side of the lathe against the stop then apply pressure to workpiece with tailstock.</li> </ol>   |

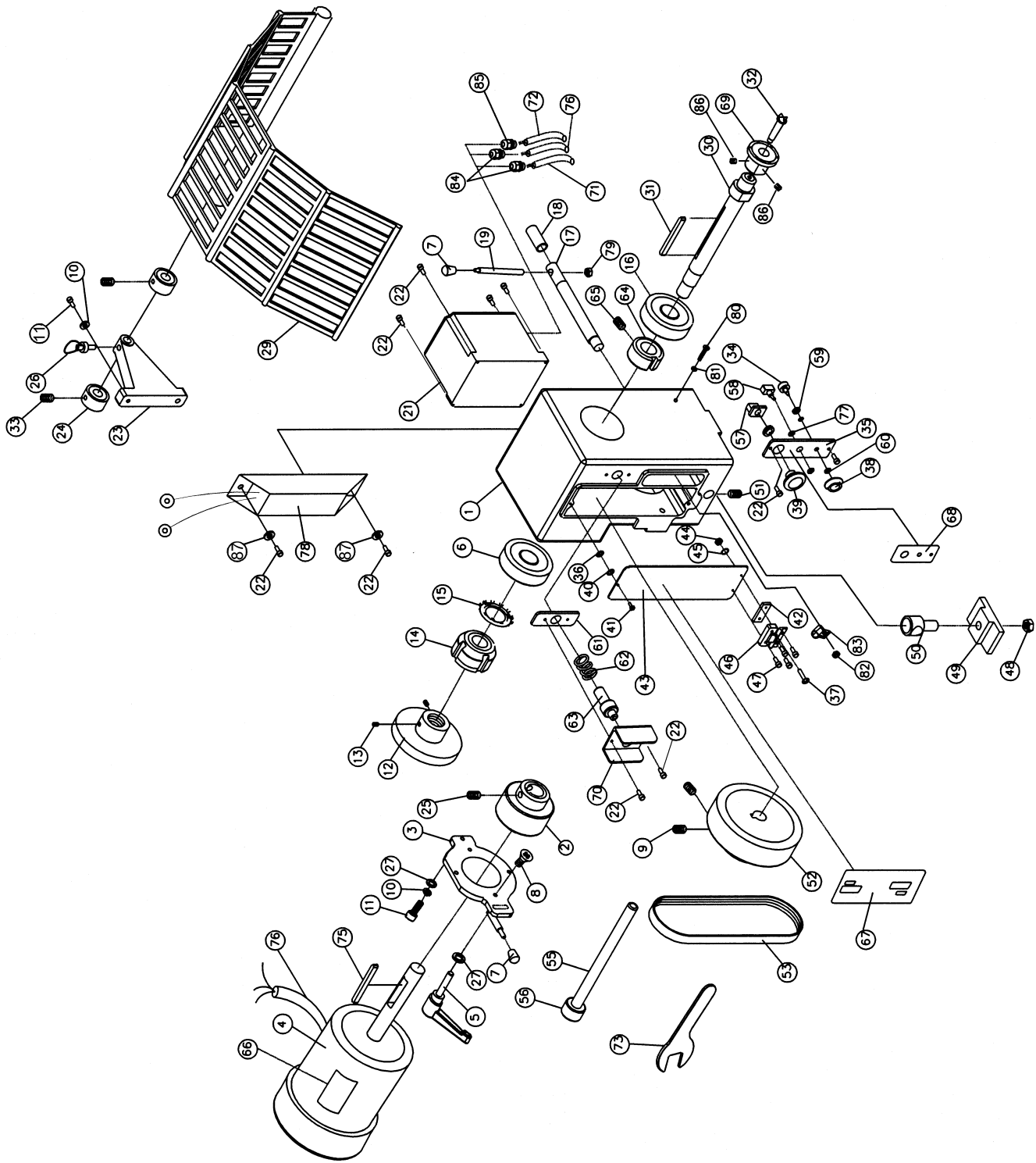
## PARTS LIST: Headstock Assembly (3520A Lathe)

| No. | Part No.   | Description                                      | Quantity |
|-----|------------|--|----------|
|     | 2277128    | Headstock Assembly .....                         | 1        |
| 1   | 6294792    | Headstock .....                                  | 1        |
| 2   | 3719189    | Motor Sheave .....                               | 1        |
| 3   | 2595036    | Motor Assembly Plate .....                       | 1        |
| 4   | 6294793    | Motor, 2HP, 220V, 60Hz .....                     | 1        |
| 5   | 6350031    | Motor Plate Locking Handle .....                 | 1        |
| 6   | 6060014    | Bearing.....                                     | 1        |
| 7   | 6430045    | Knob.....  | 2        |
| 8   | 6716139    | Flat Head Socket Screw, 3/8-16 x 1 .....         | 4        |
| 9   | 6714159    | Socket Set Screw, 1/4-20 x 3/8.....              | 2        |
| 10  | 6861300    | Lock Washer, 3/8.....                            | 3        |
| 11  | 6716012    | Socket Head Cap Screw, 3/8-16 x 1 .....          | 3        |
| 12  | 3271081    | Handwheel.....                                   | 1        |
| 13  | 6714160    | Slotted Head Steel Set Screw, 1/4-20 x 1/4 ..... | 2        |
| 14  | 6549006    | Bearing Lock Nut .....                           | 1        |
| 15  | 6864006    | Bearing Lock Washer .....                        | 1        |
| 16  | 6060185    | Bearing.....                                     | 1        |
| 17  | 3708013    | Headstock Clamping Shaft .....                   | 1        |
| 18  | 6095038    | Bushing .....                                    | 1        |
| 19  | 3268219    | Headstock Handle .....                           | 1        |
| 21  | 6294780    | Inverter (Programmed 3520A) .....                | 1        |
| 22  | 6760070    | Socket Head Cap Screw, 10/32 x 5/8.....          | 10       |
| 23  | 3064711    | Lathe Guard Bracket.....                         | 1        |
| 24  | 6143004    | Retaining Collar.....                            | 2        |
| 25  | 6714003    | Socket Set Screw, 1/4-20 x 3/8.....              | 2        |
| 26  | 6644005    | Plunger.....                                     | 1        |
| 27  | 6296165    | Flat Washer, 3/8 x 3/4 x 1/16 Thk.....           | 2        |
| 29  | 6294728    | Guard Assembly .....                             | 1        |
| 30  | 6295930    | Head Spindle.....                                | 1        |
| 31  | 3388100    | Key, 5/16 .....                                  | 1        |
| 32  | 6294725    | Spur Center 1", MT2.....                         | 1        |
| 33  | TS-0270011 | Socket Set Screw, 5/16-18 x 1/4 .....            | 2        |
| 34  | 6295915    | Control Pot .....                                | 1        |
| 35  | 3578349    | Control Panel.....                               | 1        |
| 36  | 6295923    | Clamp Washer.....                                | 1        |
| 37  | TS-0810012 | Pan Head Screw, #10-32 x 1/4 .....               | 1        |
| 38  | 6430047    | Control Panel Knob.....                          | 1        |
| 39  | 6294794    | Push/Pull Switch.....                            | 1        |
| 40  | 6601000    | "O" Ring .....                                   | 1        |
| 41  | 6294781    | Lock Knob .....                                  | 1        |
| 42  | 6295911    | Pad.....   | 1        |
| 43  | 3578348    | Door Panel .....                                 | 1        |
| 44  | 6508007    | Nut .....  | 2        |
| 45  | 6860704    | Lock Washer .....                                | 2        |
| 46  | 6365012    | Door Hinge .....                                 | 1        |
| 47  | 6708019    | Socket Head Cap Screw, 8/32 x 5/8.....           | 4        |
| 48  | 6520009    | Flex Lock Nut, 5/8-11 .....                      | 1        |
| 49  | 3092093    | Head Clamp .....                                 | 1        |
| 50  | 3058001    | Tool Support Clamp Bolt.....                     | 1        |
| 51  | 6760102    | Socket Set Screw, 10/32 x 1 .....                | 1        |
| 52  | 3719188    | Spindle Sheave .....                             | 1        |
| 53  | 6077228    | Micro V Belt.....                                | 1        |
|     | 6294743    | Knockout Rod Assembly (Items 55 & 56).....       | 1        |
| 55  | 3670021    | Knockout Rod .....                               | 1        |
| 56  | 3406201    | Teardrop Knob.....                               | 1        |
| 57  | 6083021    | Contact Block .....                              | 1        |

**PARTS LIST: Headstock Assembly (3520A Lathe) continued**

| No. | Part No.   | Description                               | Quantity |
|-----|------------|---|----------|
| 58  | 6821492    | FWD/REV Switch.....                       | 1        |
| 59  | 6860800    | Plain Flat Washer, #10.....               | 1        |
| 60  | 6294782    | Hex Nut.....                              | 1        |
| 61  | 3448048    | Lock Plate.....                           | 1        |
| 62  | 6813062    | Compression Spring.....                   | 1        |
| 63  | 3601006    | Spindle Lock Plunger.....                 | 1        |
| 64  | 3097007    | Locking Collar.....                       | 1        |
| 65  | 6715015    | Socket Head Set Screw, 5/16-18 x 1/4..... | 2        |
| 66  | 6294783    | Motor Label.....                          | 1        |
| 67  | 6294784    | Speed Label.....                          | 1        |
| 68  | 6294785    | Control Panel Label.....                  | 1        |
| 69  | 6294736    | 3" Face Plate, 1-1/4-8.....               | 1        |
| 70  | 6294786    | Spindle Lock Bracket.....                 | 1        |
| 71  | 6294787    | Power Cord.....                           | 1        |
| 72  | 6294788    | Control Cord.....                         | 1        |
| 73  | 6294744    | Face Plate Wrench.....                    | 1        |
| 75  | 6294789    | Motor Key.....                            | 1        |
| 76  | 6294790    | Motor Cord.....                           | 1        |
| 77  | 6294791    | Hex Nut.....                              | 2        |
| 78  | 6295733    | Brake Resistor.....                       | 1        |
| 79  | TS-0640091 | Nylon Lock Hex Nut, 3/8-16.....           | 1        |
| 80  | TS-1502071 | Socket Head Cap Screw, M5 x 30.....       | 1        |
| 81  | TS-1550031 | Flat Washer, M5.....                      | 1        |
| 82  | TS-1540031 | Nut, M5.....                              | 1        |
| 83  | 6295912    | Clamp.....                                | 1        |
| 84  | 6295913    | Clamp PG16.....                           | 2        |
| 85  | 6295914    | Clamp PG11.....                           | 1        |
| 86  | 6295796    | Nylon Set Screw, 1/4-20 x 3/8.....        | 2        |
| 87  | 6860802    | Lock Washer, #10.....                     | 2        |

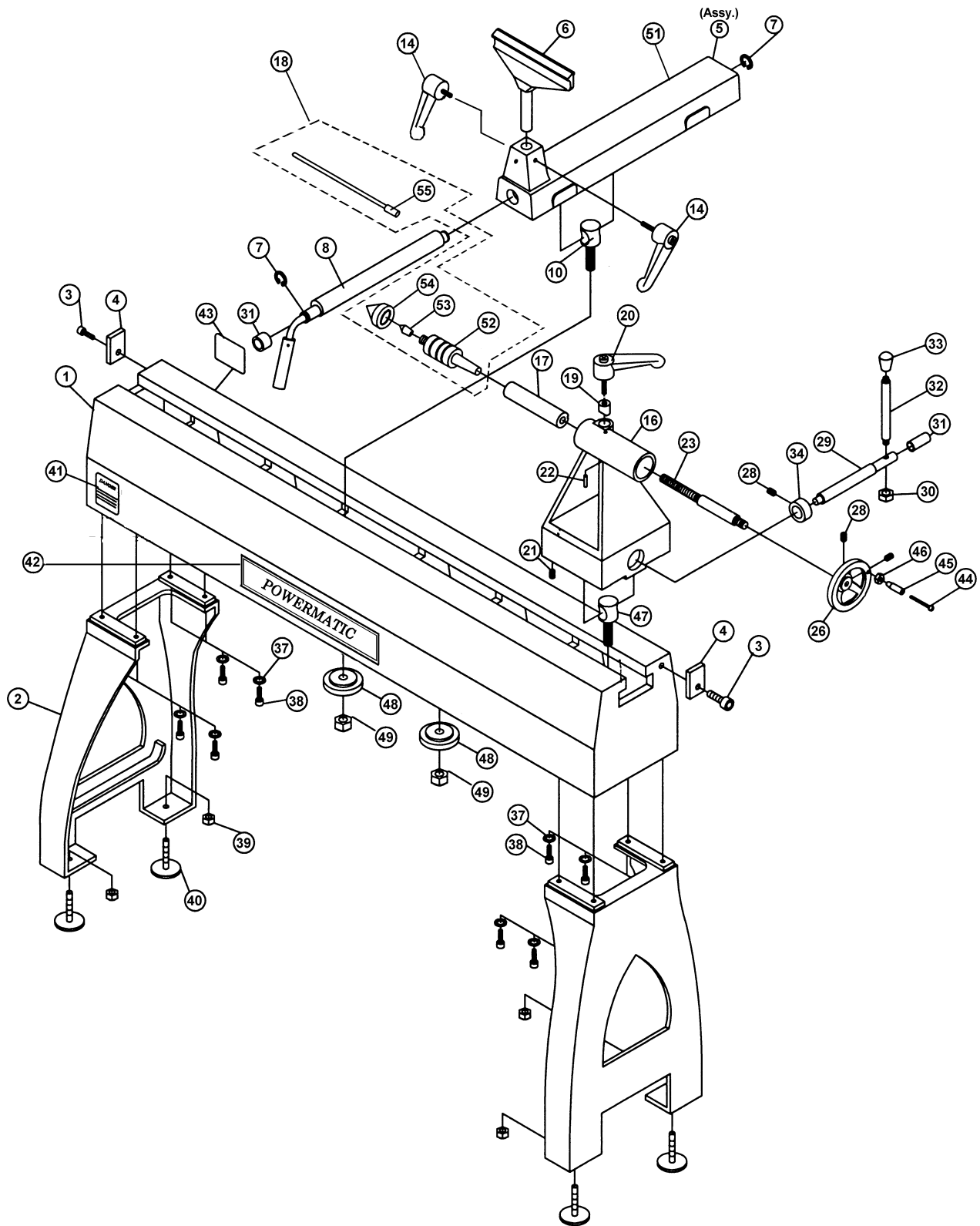
# Headstock Assembly (3520A Lathe)



## PARTS LIST: **Stand & Bed Assembly (3520A Lathe)**

| No. | Part No. | Description   | Quantity |
|-----|----------|---|----------|
| 1   | 6295920  | Bed .....   | 1        |
| 2   | 3423053  | Lathe Leg .....   | 2        |
| 3   | 6716012  | Socket Head Cap Screw.....  | 2        |
| 4   | 3761159  | Stop Block.....   | 2        |
| 5   | 6294752  | Tool Support Assembly (Consists of items 7, 8, 10, 14, 31, 48, 49, 51)..... | 1        |
| 6   | 6294742  | Tool Support 14" .....  | 1        |
| 7   | 6294756  | Snap Ring .....   | 2        |
| 8   | 6294757  | Tool Support Clamp Shaft .....  | 1        |
| 10  | 6294759  | Tool Support Clamp Bolt .....   | 1        |
| 14  | 6294763  | Tool Rest Handle.....   | 2        |
| 16  | 6295907  | Tailstock.....  | 1        |
| 17  | 6295908  | Tailstock Quill .....   | 1        |
| 18  | 6295902  | Live Center Assembly (Consists of items 52, 53, 54, 55) .....               | 1        |
| 19  | 3728005  | Quill Lock Sleeve .....   | 1        |
| 20  | 6295910  | Tailstock Quill Handle .....  | 1        |
| 21  | 6760102  | Socket Set Screw, 10/32 x 1.....  | 1        |
| 22  | 6623086  | Dowel Pin.....  | 1        |
| 23  | 6295909  | Quill Lead Screw .....  | 1        |
| 26  | 6295918  | Handwheel .....   | 1        |
| 28  | 6715013  | Socket Set Screw, 5/16-18 x 3/8.....  | 3        |
| 29  | 3708012  | Tailstock Clamping Shaft.....   | 1        |
| 30  | 6294769  | Hex Nut.....  | 1        |
| 31  | 6095038  | Bushing.....  | 2        |
| 32  | 3268217  | Tailstock Handle.....   | 1        |
| 33  | 6430045  | Black Knob.....   | 1        |
| 34  | 3096003  | Collar .....  | 1        |
| 37  | 6294772  | Lock Washer .....   | 8        |
| 38  | 6295792  | Socket Head Cap Screw, 3/8-16 x 1-1/4.....                                  | 8        |
| 39  | 6516009  | Hex Jam Nut Plain, 3/8-16 .....   | 4        |
| 40  | 6442000  | Reid Leveler.....   | 4        |
| 41  | 6294773  | Warning Label.....  | 1        |
| 42  | 6294774  | Powermatic Name Plate.....  | 1        |
| 43  | 6294775  | I.D. Label .....  | 1        |
| 44  | 6295751  | Handle .....  | 1        |
| 47  | 3058001  | Tailstock Clamp Bolt .....  | 1        |
| 48  | 3092095  | Tailstock/Toolrest Clamp.....   | 2        |
| 49  | 6520009  | Flex Lock Nut, 5/8-11 .....   | 2        |
| 51  | 6295899  | Tool Support Base.....  | 1        |
| 52  | 6295903  | Live Center Body.....   | 1        |
| 53  | 6295904  | Live Center Tip.....  | 1        |
| 54  | 6295905  | Live Center Cap .....   | 1        |
| 55  | 6295906  | Live Center Rod .....   | 1        |

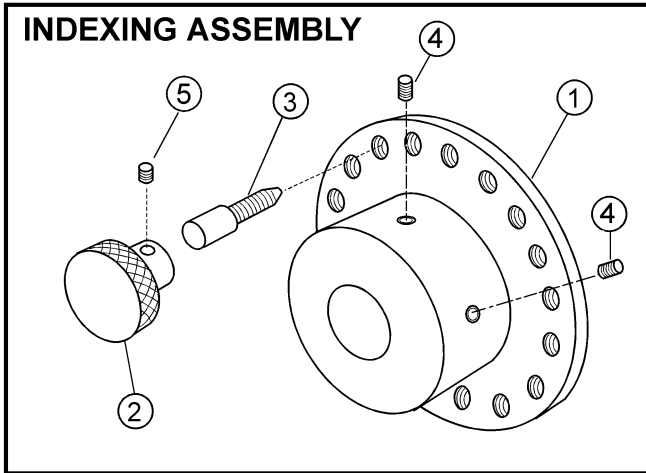
# Stand & Bed Assembly (3520A Lathe)



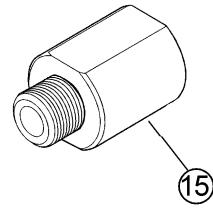
## OPTIONAL ACCESSORIES: Indexer & Bed Extensions (3520A Lathe)

| No. | Part No.   | Description                                  | Quantity |
|-----|------------|--|----------|
|     | 6294729    | Indexing Assembly (Items 1 thru 5)           |          |
| 1   | 3097006    | Indexing Collar.....                         | 1        |
| 2   | 3406005    | Adjusting Screw Knob.....                    | 1        |
| 3   | 3585220    | Indexing Pin.....                            | 1        |
| 4   | 6714139    | Socket Set Screw, 1/4-20 X 5/8.....          | 2        |
| 5   | TS-0267021 | Socket Set Screw, 1/4-20 x 1/4.....          | 1        |
|     | 6294727    | 18" Short Bed Extension (Items 6 thru 9)     |          |
| 6   | TS-0680041 | Flat Washer, 3/8.....                        | 3        |
| 7   | 6295921    | Short Bed.....                               | 1        |
| 8   | 6716017    | Socket Head Cap Screw, 3/8-16 x 1-3/4.....   | 3        |
| 9   | 6861300    | Lock Washer, 3/8.....                        | 3        |
|     | 6294726    | 50" Full Bed Extension (Items 6 & 8 thru 14) |          |
| 6   | TS-0680041 | Flat Washer, 3/8.....                        | 3        |
| 8   | 6716017    | Socket Head Cap Screw, 3/8-16 x 1-3/4.....   | 3        |
| 9   | 6861300    | Lock Washer, 3/8.....                        | 7        |
| 10  | 6516009    | Plain Hex Jam Nut, 3/8-16.....               | 2        |
| 11  | 6295920    | Long Bed.....                                | 1        |
| 12  | 3423053    | Lathe Leg.....                               | 1        |
| 13  | 6442000    | Leveler.....                                 | 2        |
| 14  | 6716015    | Socket Head Cap Screw, 3/8-16 x 1-1/2.....   | 4        |
| 15  | 6294734    | Spindle Adapter, 1-1/4"-8 to 1-1/2"-8        |          |
| 16  | 6294735    | 2" Spindle Extension                         |          |

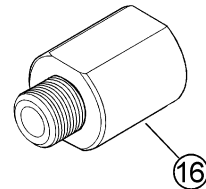
# OPTIONAL ACCESSORIES: Indexer & Bed Extensions (3520A Lathe)



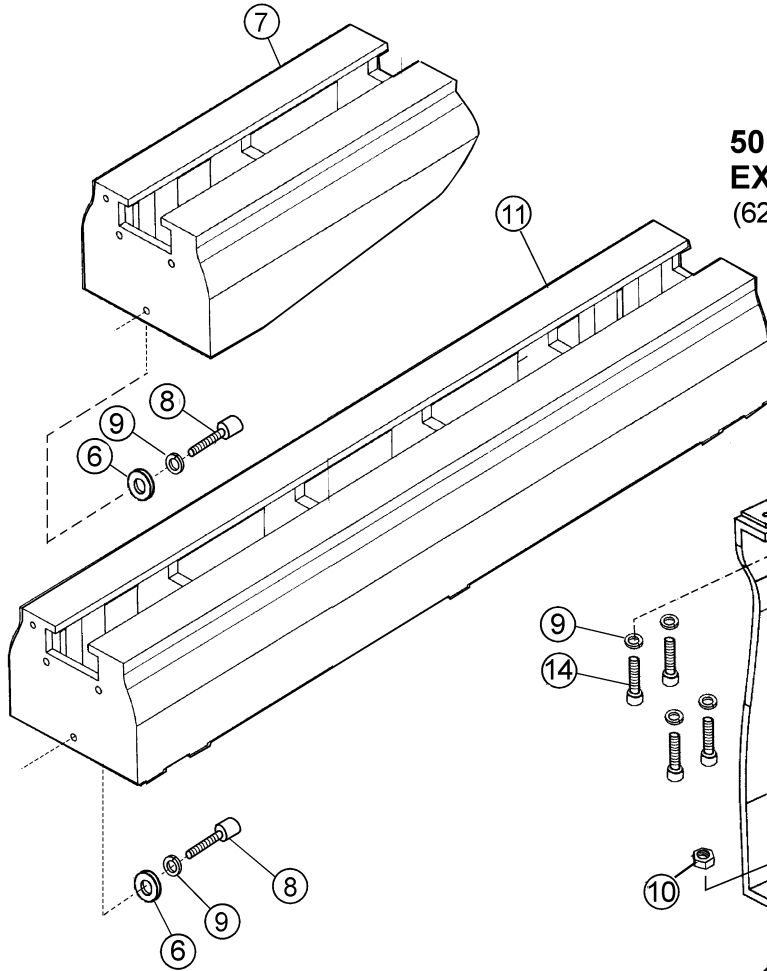
**SPINDLE ADAPTER**



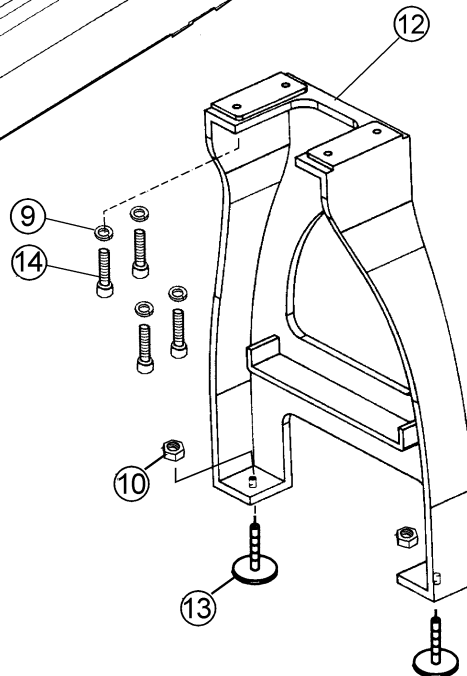
**2" SPINDLE EXTENSION**



**18" BED EXTENSION ASSEMBLY (6294727)**



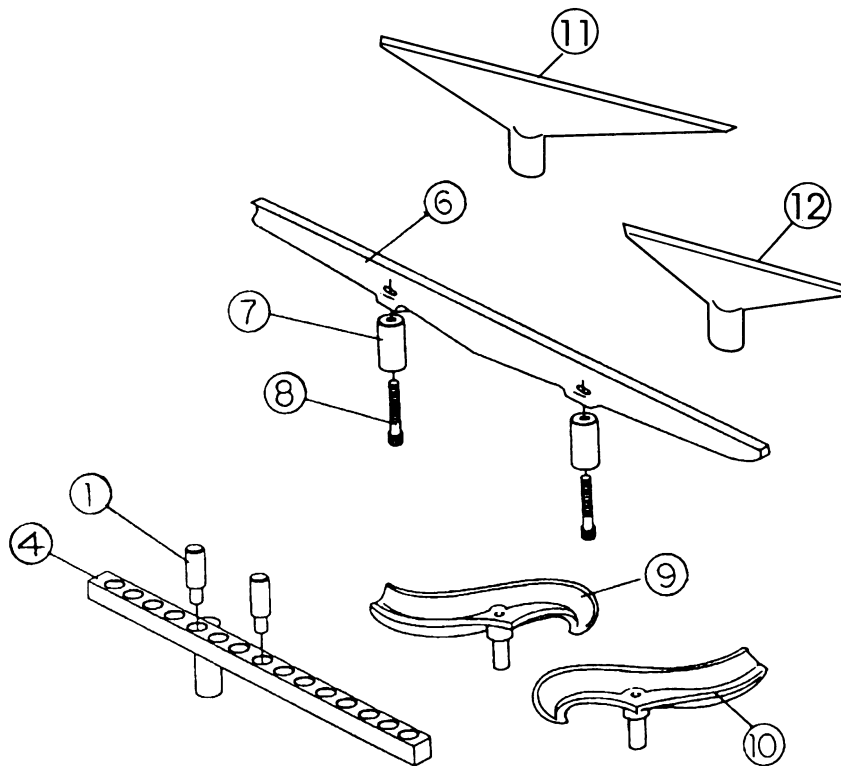
**50" BED EXTENSION ASSEMBLY (6294726)**





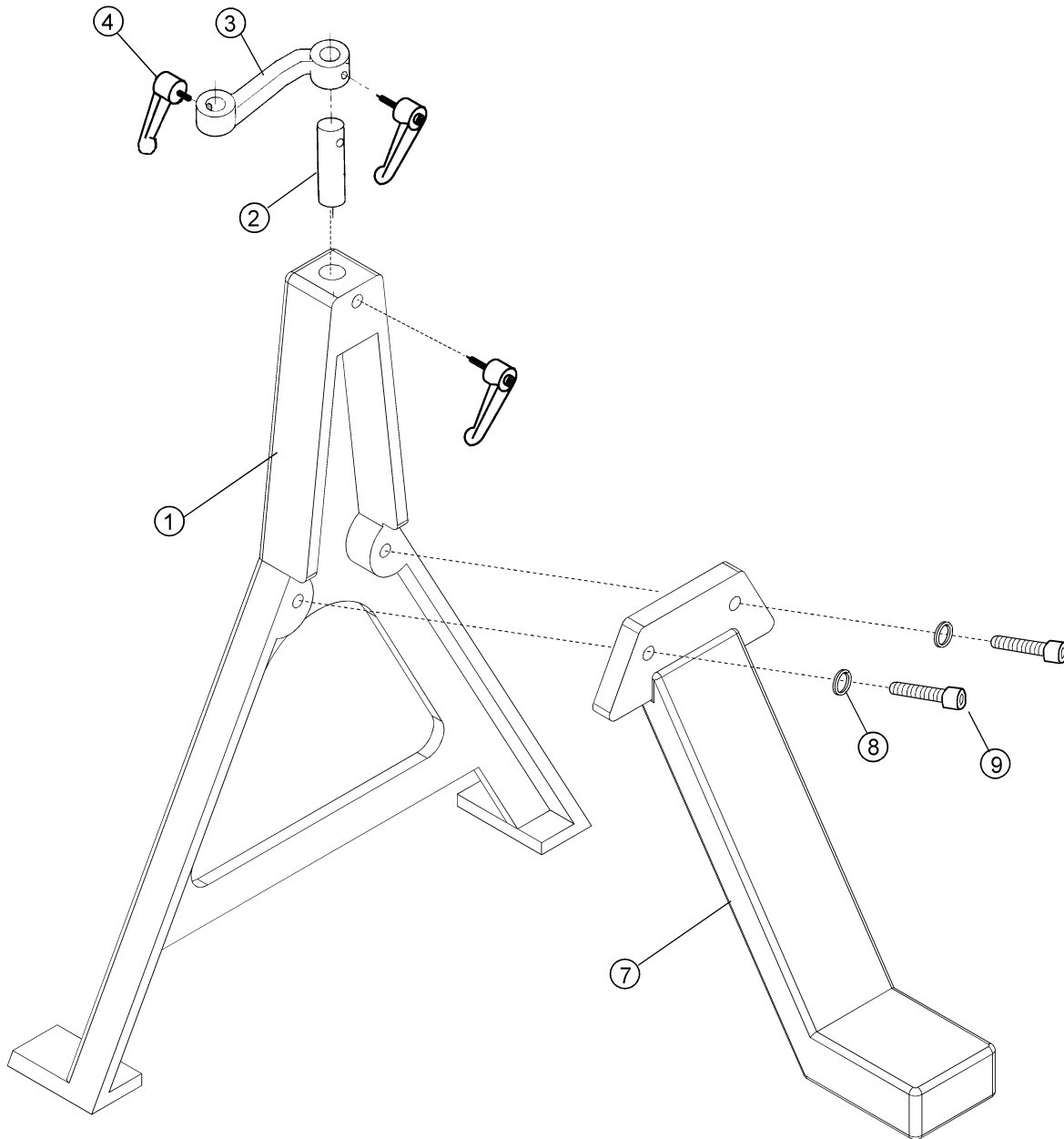
## OPTIONAL ACCESSORIES: Tool Supports (3520A Lathe)

| No. | Part No. | Description  |
|-----|----------|--|
| 1   | 3585011  | Tool Support Pin 5/8 X .495 X 3.50                       |
| 2   | 6294745  | Ball Bearing Tailstock Center (not shown)                |
| 4   | 6294730  | 12" Metal Spinning Tool Support Assembly (Items 1 and 4) |
|     | 6294731  | 26" Tool Support Assembly (Items 6 thru 8)               |
| 7   | 6294795  | Tool Support Post  |
| 8   | 6716219  | Socket Head Cap Screw, 3/8-16 x 6-1/4                    |
| 9   | 6294740  | Bowl Turning Tool Support, R.H.                          |
| 10  | 6294751  | Bowl Turning Tool Support, L.H.                          |
| 11  | 6294741  | 16" Tool Support   |
| 12  | 6294739  | 6" Tool Support  |
|     | 6294742  | 14" Tool Support   |



## OPTIONAL ACCESSORY: **Outboard Turning Stand (3520A Lathe)**

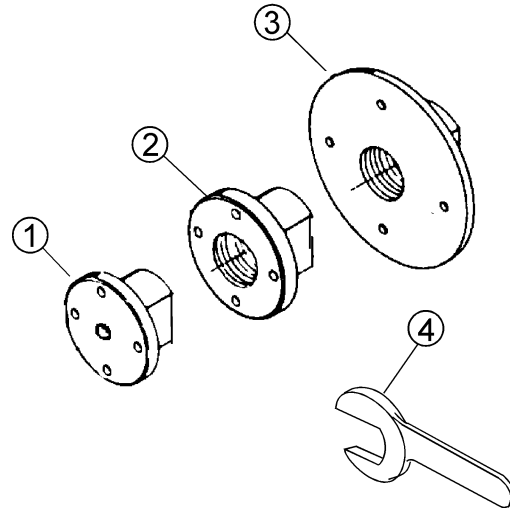
| No. | Part No. | Description  |
|-----|----------|--|
|     | 6294732  | Heavy Duty Outboard Turning Stand (Items 1 thru 9) |
| 1   | 3042503  | Turning Stand Base                                 |
| 2   | 6295897  | Offset Tool Support Pin, 1.00 dia.                 |
| 3   | 6295898  | Offset Tool Support Casting 1.00 hole              |
| 4   | 2695026  | Screw Lock Assembly                                |
| 7   | 3423055  | Turning Stand Screw Leg                            |
| 8   | 6861700  | Lock Washer, 5/8                                   |
| 9   | 6769002  | Socket Head Cap Screw, 5/8-18 x 2                  |



## OPTIONAL ACCESSORIES (3520A Lathe)

| No. | Part No. | Description |
|-----|----------|-------------|
|-----|----------|-------------|

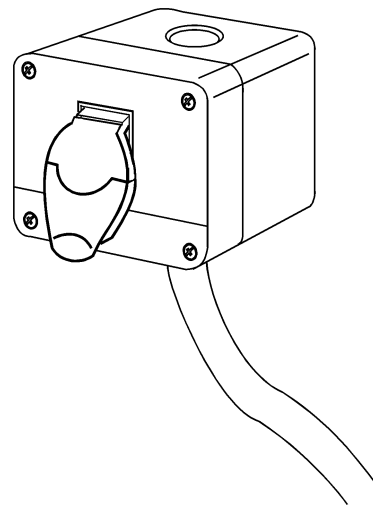
|   |         |                               |
|---|---------|-------------------------------|
| 1 | 6294736 | 3" Face Plate, 1-1/4-8 (STD.) |
| 2 | 6294737 | 4" Face Plate, 1-1/4-8 (OPT.) |
| 3 | 6294738 | 7" Face Plate, 1-1/4-8 (OPT.) |
| 4 | 6294744 | Face Plate Wrench             |



## OPTIONAL ACCESSORY

| Part No. | Description |
|----------|-------------|
|----------|-------------|

|         |                      |
|---------|----------------------|
| 6294733 | Remote ON/OFF Switch |
|---------|----------------------|



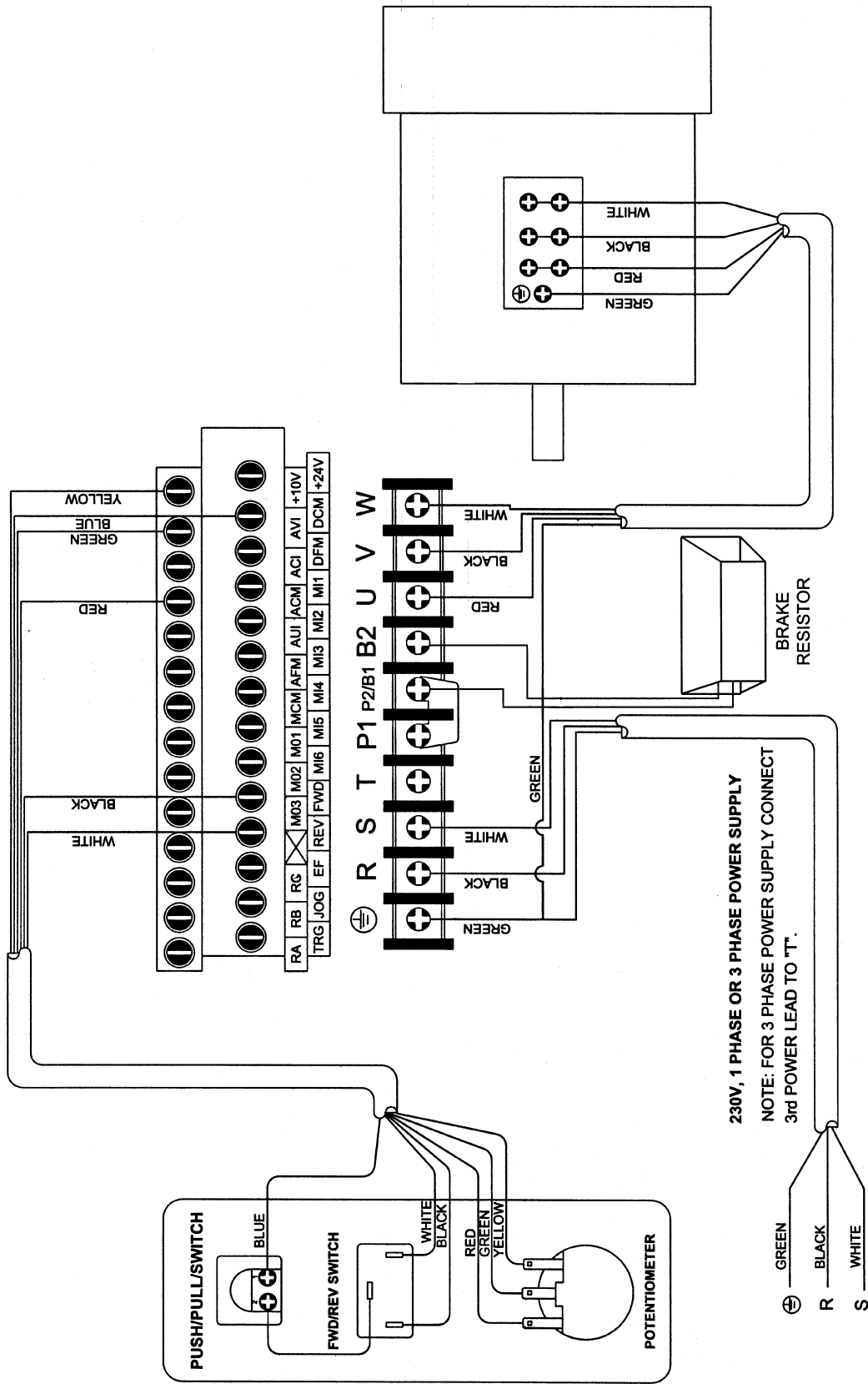
## OPTIONAL ACCESSORIES

| Part No. | Description |
|----------|-------------|
|----------|-------------|

|         |                 |
|---------|-----------------|
| 6294725 | Spur Center, 1" |
| 6294728 | Guard Assembly  |
| 6294743 | Knock Out Rod   |

# ELECTRICAL SCHEMATIC: 3520A Lathe

## ELECTRICAL SCHEMATIC



## **ELECTRICAL: Remote ON/OFF Switch (Optional)**

### **NOTE:**

The lathe can only operate when both the headstock and remote switches are in the "ON" position.

### **STEP 1:**

Disconnect all electrical power to lathe.

### **STEP 2:**

Remove the two screws from the control panel.  
Do NOT disconnect control panel from wiring harness.

### **STEP 3:**

Run the remote switch's wiring harness through the opening in the back of the headstock and out through the front of the headstock.

### **STEP 4:**

Connect the remote switch wiring harness to the back of the Push/Pull switch  
(Refer to the electrical schematic on page 29).

### **STEP 5:**

Reinstall the control panel to the headstock.  
From the back of the headstock, lightly pull out any excess wire that may be inside the headstock.

### **STEP 6:**

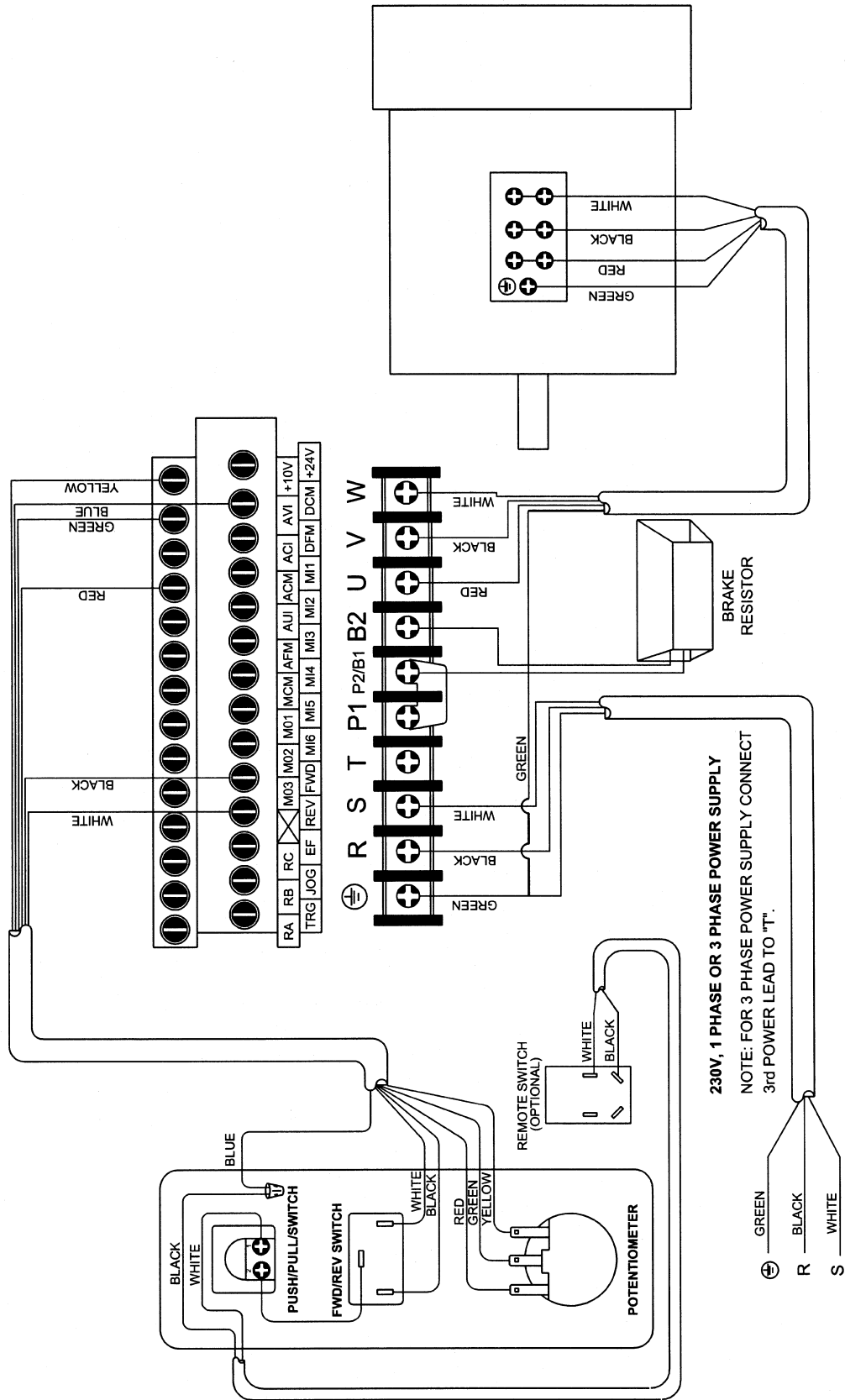
The magnetic back on the remote switch will allow the switch to be placed anywhere on the lathe.

### **STEP 7:**

Connect electrical power to the lathe and resume operation.

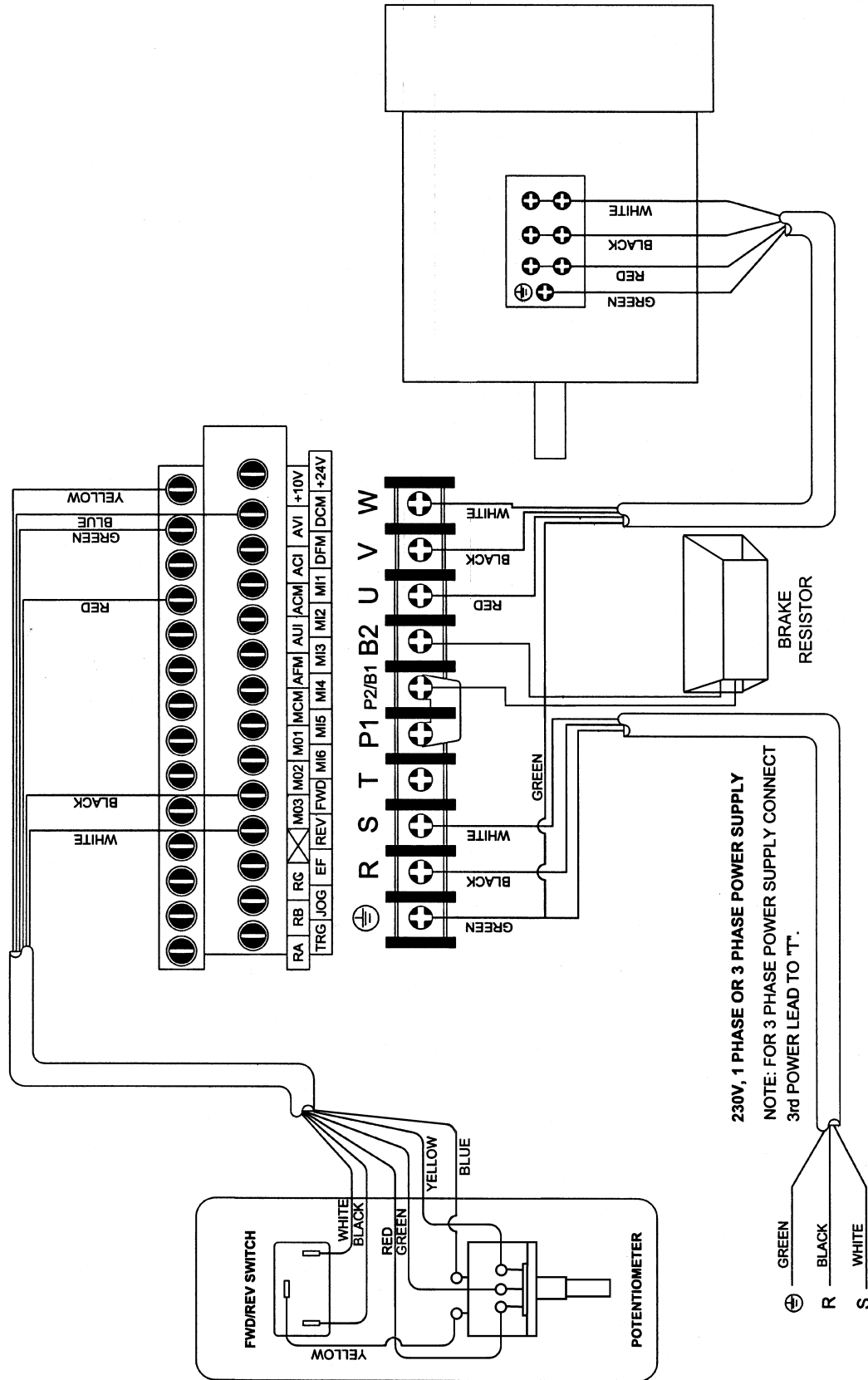
# ELECTRICAL SCHEMATIC: 3520A Lathe with Remote Switch (Optional)

## ELECTRICAL SCHEMATIC

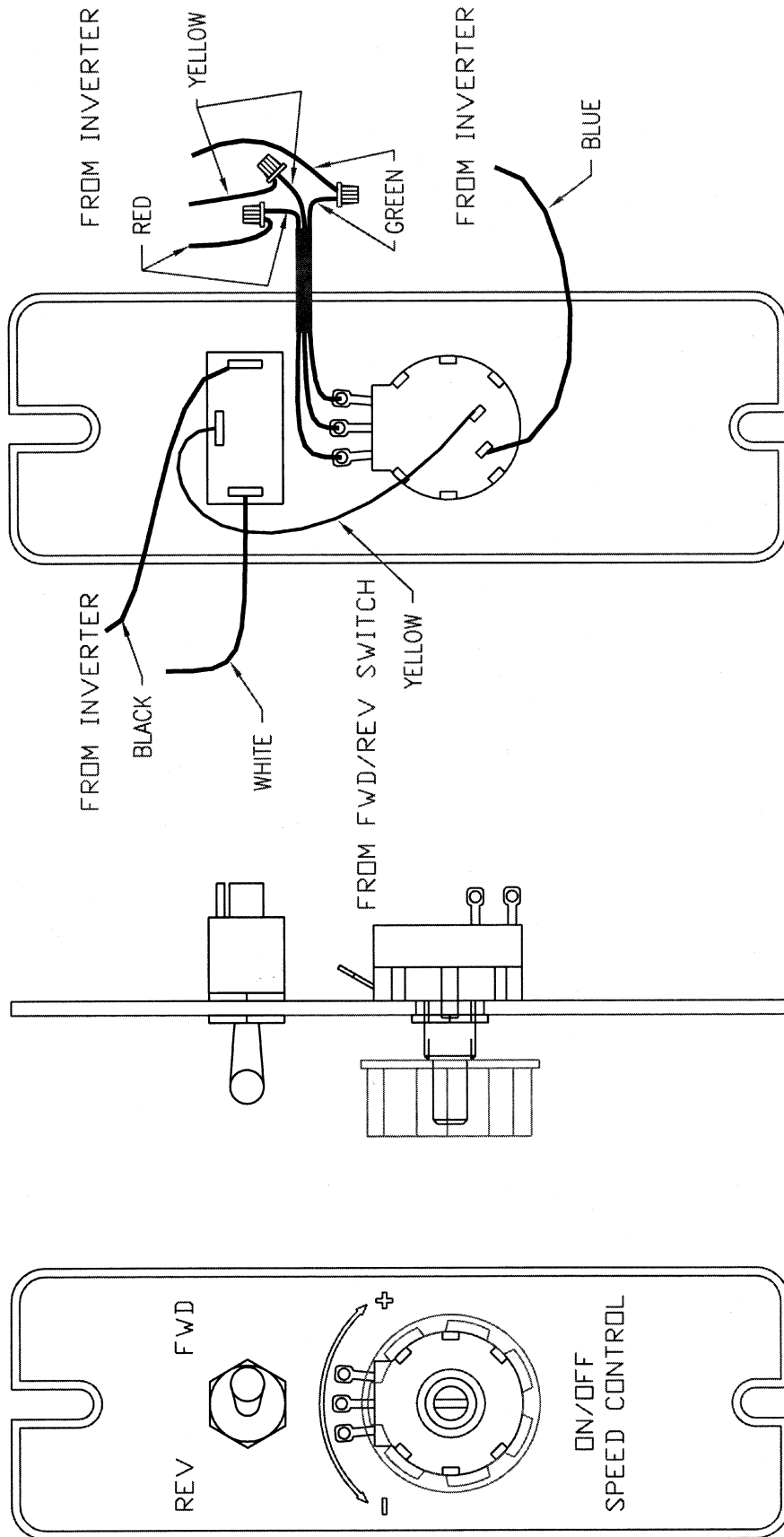


# ELECTRICAL SCHEMATIC: 3520A School Lathe (#1352002)

## ELECTRICAL SCHEMATIC



# ELECTRICAL SCHEMATIC: 3520A School Lathe - 2330009 Kit





## AC INVERTER READINGS: Lathe Speed Chart

| DIGITAL READOUT | SPINDLE SPEED |            |
|-----------------|---------------|------------|
|                 | LOW RANGE     | HIGH RANGE |
| 5               | 45            | 120        |
| 10              | 90            | 240        |
| 15              | 135           | 360        |
| 20              | 180           | 480        |
| 25              | 225           | 600        |
| 30              | 270           | 720        |
| 35              | 315           | 840        |
| 40              | 360           | 960        |
| 45              | 405           | 1080       |
| 50              | 450           | 1210       |
| 55              | 495           | 1330       |
| 60              | 540           | 1450       |
| 65              | 585           | 1570       |
| 70              | 630           | 1690       |
| 75              | 675           | 1815       |
| 80              | 720           | 1935       |
| 85              | 765           | 2055       |
| 90              | 810           | 2175       |
| 95              | 855           | 2295       |
| 100             | 900           | 2420       |
| 105             | 950           | 2540       |
| 110             | 1000          | 2660       |
| 115             | 1050          | 2780       |
| 120             | 1100          | 2900       |
| 125             | 1150          | 3025       |

## Instructions for Mounting Indexing Assembly (Optional Accessory)

1. Remove the handwheel. Loosen the two set screws and slide the handwheel off.
2. If your lathe was purchased before January 1998, you must drill a 1/4" hole into the headstock so that the indexer will work properly. Before the 1/4" hole can be drilled you must first make sure that the 1/4" hole will line up with the holes in the indexer. To do this you will need a small center punch that can be placed through one of the tapped holes in the indexer. Install the indexer onto the spindle. Slide the indexer up to the headstock leaving approximately an 1/8" gap between the face of the indexer and the headstock. (The hub of the indexer, which has the two set screw holes, should be pointing away from the headstock.) Using one of the tapped holes in the indexer as a guide, place the center punch through one of the holes in the indexer. With a hammer, strike the end of the center punch making a mark on the headstock.
3. Remove the indexer from the spindle.
4. Using a 1/4" drill bit, drill a hole at the mark made by the center punch.
5. Install the indexer onto the spindle. Slide the indexer up to the headstock leaving approximately an 1/8" gap between the face of the indexer and the headstock.
6. Locate one of the set screws on the indexer over the keyway slot on the spindle. Tighten securely both set screws.
7. Install indexing pin into the indexer by screwing it into one of the tapped holes. The indexing pin knob should be turned until the indexing pin engages the 1/4" drilled hole. Tighten indexing pin securely.
8. **Remove indexing pin from indexer before operating lathe!**

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