

## 12" x 16-1/2" Midi VSR Lathe



# Operator's Manual



Record the serial number and date of purchase in your manual for future reference.

The serial number can be found on the specification label on the rear of your machine.

Serial Number: \_\_\_\_\_ Date of purchase: \_\_\_\_\_

For technical support or parts questions, email [techsupport@rikontools.com](mailto:techsupport@rikontools.com) or call toll free at (877) 884-5167

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## SPECIFICATIONS # 70-1516VSR

|  |  |
|--|--|
| Motor .....  | 1.25 HP, DC, TEFC                            |
| Motor Speed (no load).....                         | 3,200 RPM                                    |
| Volts, Phase .....                                 | 115 V, 1 Ph                                  |
| Amps, Hertz .....                                  | 10 A, 60 Hz                                  |
| Recommended Breaker Size .....                     | 20 Amp                                       |
| Swing Over Bed .....                               | 12" (305 mm)                                 |
| Swing Over Tool Rest Base.....                     | 9-1/4" (235 mm)                              |
| Distance Between Centers.....                      | 16-1/2" (419 mm)                             |
| Electronic Variable Speeds .....                   | 250 - 3,200 RPM                              |
| Speed Ranges (3) .....                             | 250-850 / 430-1,450 / 950-3,200 RPM          |
| Spindle Rotation (2) .....                         | Forward (C-Clockwise) & Reverse (Clockwise)  |
| Spindle Nose Threading.....                        | 1" x 8 TPI                                   |
| Headstock Taper .....                              | MT-2   |
| Tailstock Taper .....                              | MT-2   |
| Hole Through Drive Spindle .....                   | 3/8" (10 mm)                                 |
| Hole Through Tailstock .....                       | 3/8" (10 mm)                                 |
| Tailstock Ram Travel .....                         | 3-1/2" (90 mm)                               |
| Number of Indexing Positions.....                  | 24   |
| Tool Rest Post Diameter .....                      | 1" (25.4 mm)                                 |
| Outboard Swing Over Extension Bed (optional) ..... | 15-1/4" (387 mm)                             |
| Outboard Swing Over Tool Rest Base .....           | 12-1/2" (317.5 mm)                           |
| Overall Size (LxWxH).....                          | 39" x 13-3/8" x 15-5/8" (991 x 340 x 397 mm) |
| Cast Base Size (LxW) .....                         | 31-13/16" x 7-7/32" (808 x 183.5 mm)         |
| Net Weight .....                                   | 95 lbs. (43 kg.)                             |

**NOTE:** The specifications, photographs, drawings and information in this manual represent the current model when the manual was prepared. Changes and improvements may be made at any time, with no obligation on the part of RIKON POWER TOOLS® to modify previously delivered units. Reasonable care has been taken to ensure that the information in this manual is correct, to provide you with the guidelines for the proper safety, assembly and operation of this machine.

# SAFETY INSTRUCTIONS

**IMPORTANT!** Safety is the single most important consideration in the operation of this equipment. **The following instructions must be followed at all times.** Failure to follow all instructions listed below may result in electric shock, fire, and/or serious personal injury.

There are certain applications for which this tool was designed. We strongly recommend that this tool not be modified and/or used for any other application other than that for which it was designed. If you have any questions about its application, do not use the tool until you have contacted us and we have advised you.

## SAFETY SYMBOLS



**SAFETY ALERT SYMBOL:** Indicates DANGER, WARNING, or CAUTION. This symbol may be used in conjunction with other symbols or pictographs.



Indicates an imminently hazardous situation, which, if not avoided, could 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, could result in minor or moderate injury.

**NOTICE:** Shown without Safety Alert Symbol indicates a situation that may result in property damage.

## GENERAL SAFETY

**KNOW YOUR POWER TOOL.** Read the owner's manual carefully. Learn the tool's applications, work capabilities, and its specific potential hazards.

### BEFORE USING YOUR MACHINE

To avoid serious injury and damage to the tool, read and follow all of the Safety and Operating Instructions before operating the machine.

1. **CAUTION** Some dust created by using power tools 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.

2. **READ** the entire Owner's Manual. **LEARN** how to use the tool for its intended applications.

3. **GROUND ALL TOOLS.** If the tool is supplied with a 3 prong plug, it must be plugged into a 3-contact electrical receptacle. The 3rd prong is used to ground the tool and provide protection against accidental electric shock. **DO NOT** remove the 3rd prong. See Grounding Instructions on the following pages.

4. **AVOID A DANGEROUS WORKING ENVIRONMENT.** **DO NOT** use electrical tools in a damp environment or expose them to rain.

5. **DO NOT** use electrical tools in the presence of flammable liquids or gasses.

6. **ALWAYS** keep the work area clean, well lit, and organized. **DO NOT** work in an environment with floor surfaces that are slippery from debris, grease, and wax.

7. **KEEP VISITORS AND CHILDREN AWAY. DO NOT** permit people to be in the immediate work area, especially when the electrical tool is operating.

8. **DO NOT FORCE THE TOOL** to perform an operation for which it was not designed. It will do a safer and higher quality job by only performing operations for which the tool was intended.

9. **WEAR PROPER CLOTHING. DO NOT** wear loose clothing, gloves, neckties, or jewelry. These items can get caught in the machine during operations and pull the operator into the moving parts. The user must wear a protective cover on their hair, if the hair is long, to prevent it from contacting any moving parts.

10. **CHILDPROOF THE WORKSHOP AREA** by removing switch keys, unplugging tools from the electrical receptacles, and using padlocks.

11. **ALWAYS UNPLUG THE TOOL FROM THE ELECTRICAL RECEPTACLE** when making adjustments, changing parts or performing any maintenance.

# SAFETY INSTRUCTIONS

**12. KEEP PROTECTIVE GUARDS IN PLACE AND IN WORKING ORDER.**

**13. AVOID ACCIDENTAL STARTING.** Make sure that the power switch is in the “OFF” position before plugging in the power cord to the electrical receptacle.

**14. REMOVE ALL MAINTENANCE TOOLS** from the immediate area prior to turning “ON” the machine.

**15. USE ONLY RECOMMENDED ACCESSORIES.** Use of incorrect or improper accessories could cause serious injury to the operator and cause damage to the tool. If in doubt, check the instruction manual that comes with that particular accessory.

**16. NEVER LEAVE A RUNNING TOOL UNATTENDED.** Turn the power switch to the “OFF” position. **DO NOT** leave the tool until it has come to a complete stop.

**17. DO NOT STAND ON A TOOL.** Serious injury could result if the tool tips over, or you accidentally contact the tool.

**18. DO NOT** store anything above or near the tool where anyone might try to stand on the tool to reach it.

**19. MAINTAIN YOUR BALANCE. DO NOT** extend yourself over the tool. Wear oil resistant rubber soled shoes. Keep floor clear of debris, grease, and wax.

**20. MAINTAIN TOOLS WITH CARE.** Always keep tools clean and in good working order. Keep all blades and tool bits sharp, dress grinding wheels and change other abrasive accessories when worn.

**21. EACH AND EVERY TIME, CHECK FOR DAMAGED PARTS PRIOR TO USING THE TOOL.** Carefully check all guards to see that they operate properly, are not damaged, and perform their intended functions. Check for alignment, binding or breaking of moving parts. A guard or other part that is damaged should be immediately repaired or replaced.

**22. DO NOT OPERATE TOOL WHILE TIRED, OR UNDER THE INFLUENCE OF DRUGS, MEDICATION OR ALCOHOL.**

**23. SECURE ALL WORK.** Use clamps or jigs to secure the workpiece. This is safer than attempting to hold the workpiece with your hands.

**24. STAY ALERT, WATCH WHAT YOU ARE DOING, AND USE COMMON SENSE WHEN OPERATING A POWER TOOL.**

A moment of inattention while operating power tools may result in serious personal injury.

**25. ALWAYS WEAR A DUST MASK TO PREVENT INHALING DANGEROUS DUST OR AIRBORNE PARTICLES,** including wood dust, crystalline silica dust and asbestos dust. Direct particles away from face and body. Always operate tool in well ventilated area and provide for proper dust removal. Use dust collection system wherever possible. Exposure to the dust may cause serious and permanent respiratory or other injury, including silicosis (a serious lung disease), cancer, and death. Avoid breathing the dust, and avoid prolonged contact with dust. Allowing dust to get into your mouth or eyes, or lay on your skin may promote absorption of harmful material. Always use properly fitting NIOSH/OSHA approved respiratory protection appropriate for the dust exposure, and wash exposed areas with soap and water.

**26. USE A PROPER EXTENSION CORD IN GOOD CONDITION.** When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. The table on the following page shows the correct size to use depending on cord length and nameplate amperage rating. If in doubt, use the next heavier gauge. The smaller the gauge number, the larger diameter of the extension cord. If in doubt of the proper size of an extension cord, use a shorter and thicker cord. An undersized cord will cause a drop in line voltage resulting in a loss of power and overheating.  
**USE ONLY A 3-WIRE EXTENSION CORD THAT HAS A 3-PRONG GROUNDING PLUG AND A 3-POLE RECEPTACLE THAT ACCEPTS THE TOOL’S PLUG.**

**27. ADDITIONAL INFORMATION** regarding the safe and proper operation of this product is available from:

- Power Tool Institute  
1300 Summer Avenue  
Cleveland, OH 44115-2851  
[www.powertoolinstitute.org](http://www.powertoolinstitute.org)
- National Safety Council  
1121 Spring Lake Drive  
Itasca, IL 60143-3201  
[www.nsc.org](http://www.nsc.org)
- American National Standards Institute  
25 West 43rd Street, 4th Floor  
New York, NY 10036  
[www.ansi.org](http://www.ansi.org)
- ANSI 01.1 Safety Requirements for Woodworking Machines and the U.S. Department of Labor regulations  
[www.osha.gov](http://www.osha.gov)

**28. SAVE THESE INSTRUCTIONS.** Refer to them frequently and use them to instruct others.

# SAFETY INSTRUCTIONS

## ELECTRICAL SAFETY

**⚠ WARNING:** THIS TOOL MUST BE GROUNDED WHILE IN USE TO PROTECT THE OPERATOR FROM ELECTRIC SHOCK.

**IN THE EVENT OF A MALFUNCTION OR BREAKDOWN,** grounding provides the path of least resistance for electric current and reduces the risk of electric shock. This tool is equipped with an electric cord that has an equipment grounding conductor and requires a grounding plug (not included). The plug **MUST** be plugged into a matching electrical receptacle that is properly installed and grounded in accordance with **ALL** local codes and ordinances.

**DO NOT MODIFY ANY PLUG.** If it will not fit the electrical receptacle, have the proper electrical receptacle installed by a qualified electrician.

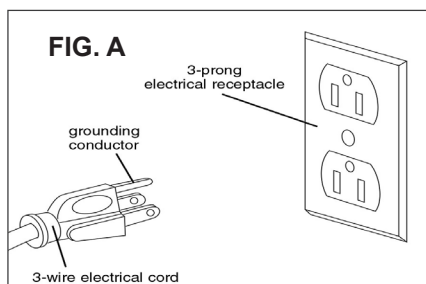
**IMPROPER ELECTRICAL CONNECTION** of the equipment grounding conductor can result in risk of electric shock. The conductor with the green insulation (with or without yellow stripes) is the equipment grounding conductor. **DO NOT** connect the equipment grounding conductor to a live terminal if repair or replacement of the electric cord or plug is necessary.

**CHECK** with a qualified electrician or service personnel if you do not completely understand the grounding instructions, or if you are not sure the tool is properly grounded when installing or replacing a plug.

**USE ONLY A 3-WIRE EXTENSION CORD THAT HAS THE PROPER TYPE OF A 3-PRONG GROUNDING PLUG THAT MATCHES THE MACHINE'S 3-PRONG PLUG AND ALSO THE 3-POLE RECEPTACLE THAT ACCEPTS THE TOOL'S PLUG. \***

**REPLACE A DAMAGED OR WORN CORD IMMEDIATELY.**

This tool is intended for use on a circuit that has an electrical receptacle as shown in **FIGURE A**. It shows a 3-wire electrical plug and electrical receptacle that has a grounding conductor. If a properly grounded electrical receptacle is not available, an adapter as shown in **FIGURE B** can be used to temporarily connect this plug to a 2-contact ungrounded receptacle. The adapter has a rigid lug extending from it that **MUST** be connected to a permanent earth ground, such as a properly grounded receptacle box. **THIS ADAPTER IS PROHIBITED IN CANADA.**



## EXTENSION CORDS

**⚠ WARNING:** THE USE OF AN EXTENSION CORD WITH THIS MACHINE IS NOT RECOMMENDED. For best power and safety, plug the machine directly into a dedicated, grounded electrical outlet that is within the supplied cord length of the machine.

If an extension cord needs to be used, it should only be for a limited operation of the machine. The extension cord should be as short as possible in length, and have a minimum gauge size of 14AWG.

**⚠ WARNING:** Check extension cords before each use. If damaged replace immediately. Never use a tool with a damaged cord, since touching the damaged area could cause electrical shock, resulting in serious injury.

Use a proper extension cord. Only use cords listed by Underwriters Laboratories (UL). Other extension cords can cause a drop in line voltage, resulting in a loss of power and overheating of tool. When operating a power tool outdoors, use an outdoor extension cord marked "W-A" or "W". These cords are rated for outdoor use and reduce the risk of electric shock.

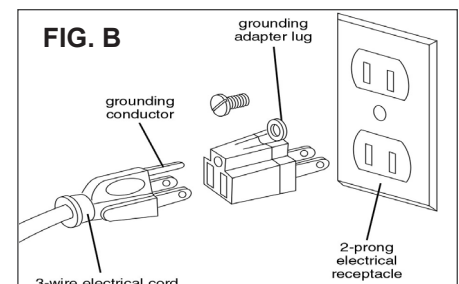
### MINIMUM RECOMMENDED GAUGE FOR EXTENSION CORDS (AWG)

| 120 VOLT OPERATION ONLY |          |          |           |           |
|-------------------------|----------|----------|-----------|-----------|
|                         | 25' LONG | 50' LONG | 100' LONG | 150' LONG |
| 0 to 6 Amps             | 18 AWG   | 16 AWG   | 16 AWG    | 14 AWG    |
| 6 to 10 Amps            | 18 AWG   | 16 AWG   | 14 AWG    | 12 AWG    |
| 10 to 12 Amps           | 16 AWG   | 16 AWG   | 14 AWG    | 12 AWG    |

**⚠ WARNING:** Keep the extension cord clear of the working area. Position the cord so that it will not get caught on lumber, tools or other obstructions while you are working with your power tool.

\* Canadian electrical codes require extension cords to be certified SJT type or better.

\*\* The use of an adapter in Canada is not acceptable.



# SAFETY INSTRUCTIONS

## SPECIFIC SAFETY INSTRUCTIONS FOR WOOD LATHES

This machine is intended for the shaping, smoothing and finishing of natural, solid woods. The permissible workpiece dimensions must be observed (see Technical Specification). Any other use not as specified, including modification of the machine or use of parts not tested and approved by the equipment manufacturer can cause unforeseen damage, and invalidate the warranty.

**ATTENTION:** Use of this lathe still presents risks that cannot be eliminated by the manufacturer. Therefore, the user must be aware that wood working machines are dangerous if not used with care and all safety precautions are adhered to.

1. Do not operate this machine until you have read all of the following instructions.
2. Do not attempt to operate this machine until it is completely assembled.
3. Do not turn ON this machine if any pieces are damaged or missing.
4. This machine must be properly grounded.
5. If you are not familiar with the operation of the machine, obtain assistance from a qualified person.
6. Always wear approved, safety protective eyewear and hearing protection when operating this machine.
7. Always wear a dust mask and use adequate dust collection and proper ventilation.
8. Do not wear loose clothing, neckties, jewelry or gloves when operating this machine. Tie back long hair.
9. Disconnect the power before servicing or making adjustments.
10. Do not change speeds until the machine comes to a full stop and unplug from power source.
11. Keep fingers, clothing and hair away from rotating stock.
12. The clearance between the workpiece and the tool rest should be only about 1/8".
13. Never adjust the tool rest while the lathe is turned on.
14. Tighten all locks and clamping devices before operating.
15. Turn off and unplug the lathe after use, to prevent accidental use.
16. Use only sharp lathe tools. Dull tools can damage your work and are unsafe to use.
17. Make sure workpiece is secure and centered before operating.
18. When face plate turning, rough-cut the workpiece close to the finished shape before screwing it to the face plate.
19. Never jam tools into the workpiece or take too big of a cut.
20. Make sure there are no loose knots, nails, staples, dirt or foreign objects in the workpiece to be turned.
21. Wood should not be warped, cracked or have improperly made or cured glue joints.
22. Rotate workpiece by hand before starting power to check for clearance.
23. Start the lathe at slow speeds to check the settings, then increase the speed to your desired level for working.
24. Low speeds are best for roughing stock, and for long or large diameter workpieces.
25. If excessive vibration occurs, stop the lathe to check the workpiece settings between centers or on face plates.
26. For sanding or applying finishes, remove the tool rest from the machine. Use low speeds to avoid heat build-up.
27. Do not engage the spindle lock when the lathe is turning, and be sure to disengage the spindle lock when done working to avoid damage to the machine next time the lathe is turned on.
28. Never stop the machine by grabbing the workpiece, faceplate or hand wheel. Let the machine stop on its own.
29. The use of any accessories or attachments not recommended may cause injury to you and damage your machine.
30. Remove material or debris from the work area. Keep the floor and work area neat and clean.
31. Keep these instructions for future reference.

**This owner's manual is not a teaching aid and is intended to show assembly, adjustments, and general use.**

### California Proposition 65 Warning

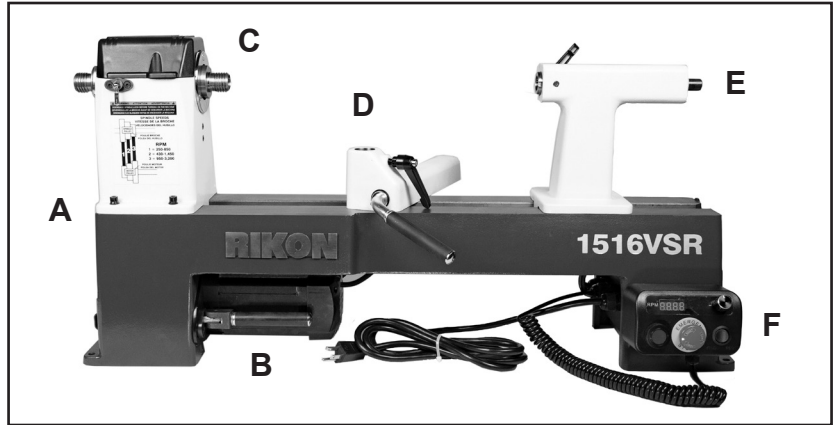


**WARNING:** Drilling, sawing, sanding or machining wood products can expose you to wood dust, a substance known to the State of California to cause cancer. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection. For more information go to [www.P65Warnings.ca.gov/wood](http://www.P65Warnings.ca.gov/wood).

# CONTENTS OF PACKAGE

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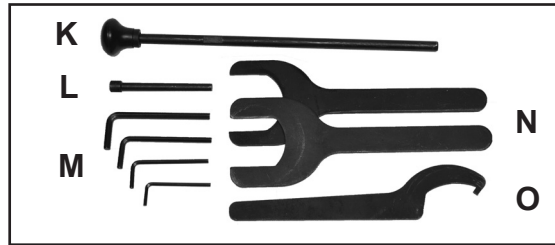
- A. Lathe Bed Assembly - including;
  - B. Motor Assembly
  - C. Headstock Assembly
  - D. Tool Rest Base Assembly
  - E. Tailstock Assembly
  - F. Electronic Controls



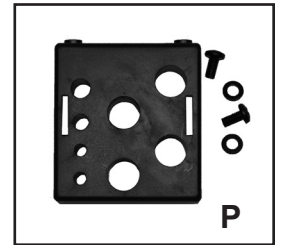
## LIST OF LOOSE PARTS



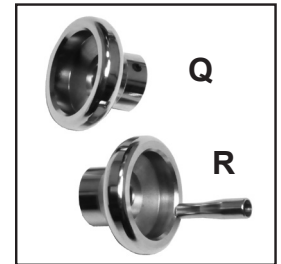
- G. 3" Faceplate
- H. 6" PRO Tool Rest
- I. Spur Center
- J. Live Center



- M. Hex Wrenches (2.5, 3, 4, 5 mm)
- N. Wrenches (38 & 46 mm)
- O. Spanner Wrench (35 mm)



- P. Tool Holder, Screws & Washers (2)



- Q. Outboard Hand Wheel
- R. Tailstock Hand Wheel

## ADDITIONAL TOOLS REQUIRED FOR ASSEMBLY & ADJUSTMENTS

#2 Phillips Screwdriver



Adjustable Wrench



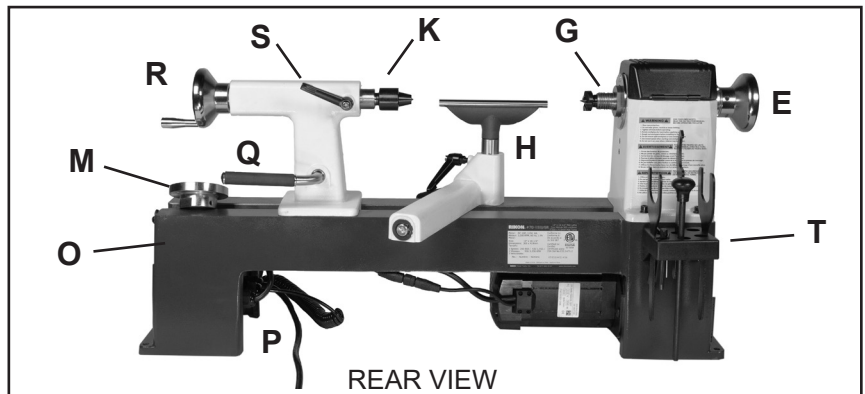
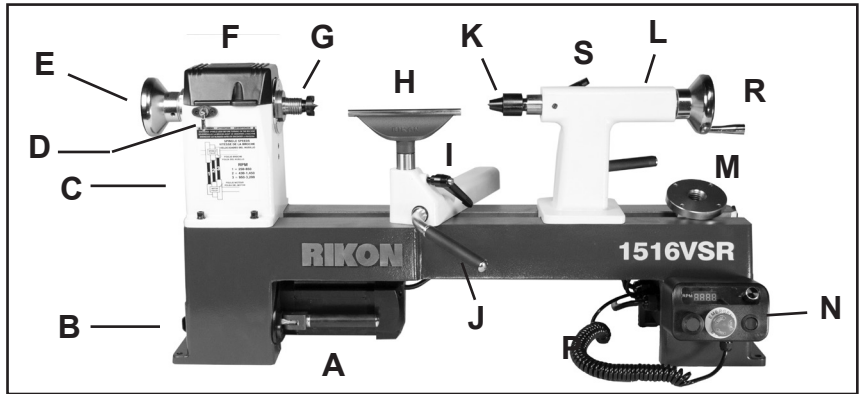
Model 70-1516VSR Wood Lathe is shipped complete in one box.

## Unpacking and Clean-up

1. Carefully remove all contents from the shipping carton. Compare the contents with the list of contents to make sure that all of the items are accounted for, before discarding any packing material. Place parts on a protected surface for easy identification and assembly. If any parts are missing or broken, please call RIKON Customer Service (877-884-5167) as soon as possible for replacements. **DO NOT** turn your machine ON if any of these items are missing. You may cause injury to yourself or damage to the machine.
2. Report any shipping damage to your local distributor. Take photographs for any possible insurance claims.
3. Clean all rust protected surfaces with ordinary household type grease or spot remover. Do not use flammables; gasoline, paint thinner, mineral spirits, etc. These may damage painted surfaces. Clean thoroughly under the headstock, tailstock and tool rest body. Then coat with a light film of dry lubricant spray, or wax, to enhance passage of the tool rest and tailstock on/over the bed. Refrain from using any water-based solvents as they will promote metal rusting.
4. Apply a coat of paste wax to any machined surfaces to prevent rust. Wipe all parts thoroughly with a clean dry cloth.
5. Set packing material and shipping carton aside. Do not discard the packing material until the machine has been set up and is running properly in case a return is necessary.

## GETTING TO KNOW YOUR MACHINE

- A. Motor, Mounting Plate & Locking Handle
- B. Outboard Bed Cover Plate Door
- C. Headstock
- D. Spindle Lock Knob / Index Pin
- E. Outboard Hand Wheel
- F. Headstock Cover
- G. Spindle with Spur Center
- H. Tool Rest & Base Assembly
- I. Tool Rest Locking Handle
- J. Tool Rest Base Locking Lever
- K. Live Center
- L. Tailstock Assembly
- M. Face Plate
- N. Electronic Controls
  - ON & OFF Switches
  - Forward / Reverse Switch
  - Speed Control Knob
  - Digital Speed Readout
- O. Lathe Bed
- P. Power & Controller Cords
- Q. Tailstock Locking Lever
- R. Tailstock Hand Wheel
- S. Tailstock Locking Handle
- T. Tool Holder & Tools



## INSTALLATION

### MOVING & INSTALLING THE LATHE

1. When moving the lathe, **DO NOT** use the headstock assembly, motor, tool rest or tailstock as this may damage the machine. Hold under the lathe's bed to lift and move the machine. Straps or battens placed under the lathe bed can also be used to move the machine.

2. Position the machine on a solid stand, or bench, that is located in an area that has ample space in front and in back of the lathe for working and moving around the lathe.

3. For best power and safety, the lathe should be plugged directly into a dedicated grounded electrical outlet that is

within the supplied cord length of the machine. The use of an extension cord is not recommended.

4. Align the machine so that during use, any turning debris or kickback will not face aisles, doorways, or other work areas that bystanders may be in. Do not locate or use the machine in damp or wet conditions.

5. Once in place in your shop, make sure that the machine is level. If possible, secure the machine, or stand to the floor, or bench, with lag screws (not supplied). This will reduce any possible vibration during use.

## ASSEMBLY

The 70-1516VSR Lathe requires only minor assembly to become operational. See the photos above for reference.

1. Install the Outboard Hand Wheel (E) on the Headstock. Tighten it in place on the spindle with the two set screws.

2. Install the Tailstock Hand Wheel (R) onto the tailstock spindle. Secure with the set screw on the flat spindle area.

3. Install the Tool Holder (T) onto the back of the headstock with the two Phillips head screws and washers provided.

4. Install the 6" Tool Rest (H) into the Tool Rest Base.

5. The Faceplate (M) may be shipped pre-installed on the headstock spindle. If plate or bowl turning is to be done, then the use of the faceplate is needed. To remove the faceplate, loosen the two set screws in the rear hub of the faceplate, then unscrew it from the spindle (counter-clockwise rotation). Two wrenches are supplied for this.

6. For spindle turning, remove the faceplate. Install the Spur Center (G) into the headstock spindle and Live Center (K) into the tailstock spindle. Both have #2 Morse Taper shanks.

7. Secure the lathe to a solid work surface or stand.



# OPERATION

## HEADSTOCK CONTROLS

1. **HEADSTOCK SPINDLE LOCK:** The spring loaded Index Pin Assembly (#29B, FIG. 1, A) is used to position the spindle for making accurate, spaced pattern work on projects such as straight fluting, grooving, drilling, detail carving, wood burning patterns and laying out designs. See page 14 for more information on indexing.

**NOTE: DO NOT** use the Index Pin to remove accessories from the lathe, or damage to the pin, or spindle pulley may result. Use the wrenches provided with the lathe.

The Index Pin is spring loaded. Rotate the index Lever (A) from its downward position, 180 degrees into the upward position to engage the indexing pin. This will insert the index pin's shaft end into one of the spindle pulley's 24 numbered holes (B), locking the spindle in place. To unlock the spindle, rotate the index lever to its down position.

2. **HEADSTOCK INDEXING HOLES:** (FIG. 1, B) The largest Spindle Pulley (#7B) has 24 positioning 'holes' located around its left side. Each index hole is 15° apart, and marked for reference around the pulley perimeter. Insert the Indexing Pin (A) into one of these holes, and the spindle will be locked so that work can be done on the workpiece. See page 14 for additional information.

**CAUTION** - Never start the lathe with the index pin engaged in the spindle, or damage to the lathe will result.  
 - Never engage the spindle lock while the spindle is turning, or damage to the lathe will result.

3. **HEADSTOCK FACEPLATE:** Faceplates (#22B, FIG. 2, C) are used for turning bowls and plates. The screw holes in the plate are for mounting the workpiece for turning.  
 - To install the faceplate, thread the faceplate onto the spindle in a clockwise direction, and secure it in place with the set screws that are located on the back hub of the faceplate.  
 - To remove the faceplate, loosen the set screws. Use the supplied 38mm Wrench on the flat portion of the spindle (FIG. 2, X) and the 46mm Wrench on flats of the faceplate's rear hub, then loosen the faceplate from the spindle. Rotate the faceplate counter-clockwise to fully remove it from the spindle.

4. **HEADSTOCK SPUR CENTER:** The Spur Center (#23B, FIG. 2, D) is used for turning between centers. It fits into the spindle. Both the spindle and spur center have matching MT-2 tapers. The spur center can be removed from the spindle with the long Knockout Bar (K) inserted through the outboard left end of the spindle. **NOTE:** Be careful and hold the spur center during this process so it does not fly out onto the floor. A short Knockout Bar (L) is supplied to remove the Spur Center's Center Point, if it needs replacing.

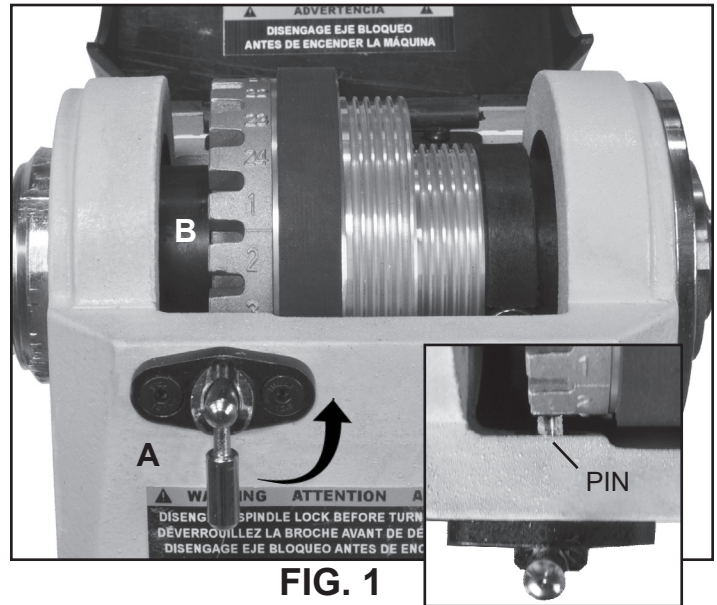


FIG. 1

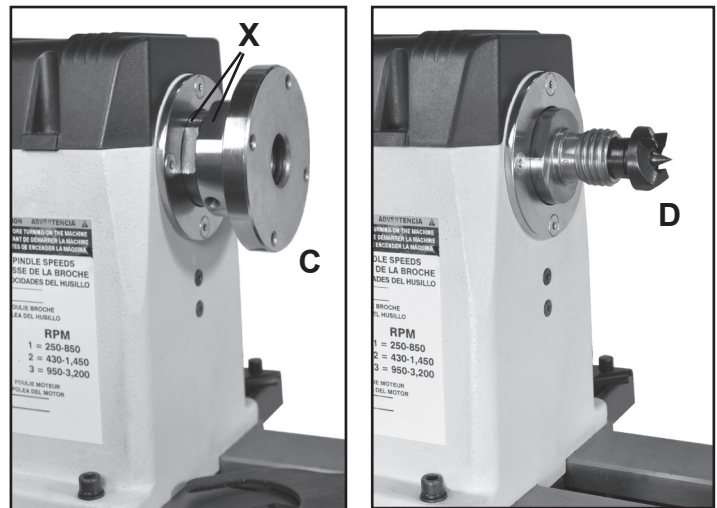


FIG. 2

GENERAL LATHE SPEEDS FOR WORKPIECE DIAMETERS

| DIAMETER OF WORK | ROUGHING RPM | GENERAL CUTTING RPM | FINISHING RPM |
|------------------|--------------|---------------------|---------------|
| Under 2"         | 1520         | 3200                | 3200          |
| 2 to 4"          | 750          | 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           |

FIG. 3

# OPERATION

## TOOL REST CONTROLS

1. **TOOL REST BODY LOCK HANDLE:** (FIG. 4, A) This cam action lever handle locks the tool rest base (B) down in position on the lathe bed. Unlock handle to position the tool rest in any location along the lathe bed. Tighten the handle when the tool rest is properly located for safe turning of the workpiece. See page 12 for adjusting clamping pressure.

2. **TOOL REST LOCK HANDLE:** (C) Locks the tool rest in position for supporting your tools during turning. Unlock the handle to adjust the tool rest at a specific angle, or height. Tighten handle when properly positioned.

**NOTE:** The handle is spring loaded on its internal bolt. To change the handle position, pull the handle out, rotate it to the position you desire, then release the handle and it will align itself back onto the bolt.

## TAILSTOCK CONTROLS

1. **TAILSTOCK LOCK HANDLE:** (FIG. 5, D) Locks the tailstock in position along the length of the lathe bed. Unlock the cam lever handle to position the tool rest to move the tailstock. Tighten handle when properly positioned. See page 12 for adjusting clamping pressure.

2. **TAILSTOCK QUILL LOCK HANDLE:** (E) Secures the tailstock quill in position. Unlock the handle to move the quill, with live center, forward or backwards. Tighten the locking handle when the quill is finally positioned.

3. **TAILSTOCK QUILL HANDWHEEL:** (F) The handwheel advances or retracts the quill 0 to 3-1/2". The tailstock quill lock handle (E) must be loose to move the quill.

4. **TAILSTOCK LIVE CENTER:** (G) Used for turning between centers. The Live Center (#20C) and the Quill (#6CA) have MT-2 tapers. Remove the live center by retracting the quill until the center loosens, or use the knockout bar.

## ELECTRONIC CONTROLS

The lathe features a corded Switch Box (FIG. 6) with magnets on its back that allow it to be positioned on the face of the headstock or anywhere along the lathe's bed! Wherever it is most comfortable for the turner to quickly access the controls to regulate turning speeds, direction of spindle rotation or to stop the lathe.

1. **'ON' BUTTON:** (FIG. 6, A) Push the green Button so that it turns the lathe ON. Push the red 'mushroom' Button (B) to turn the lathe OFF.

2. **'STOP' BUTTON:** (B) Push in the extended red Button to stop the lathe. To restart the lathe, rotate the OFF button clockwise and it will pop out to reset itself. Then press the 'ON' button to restart the lathe.

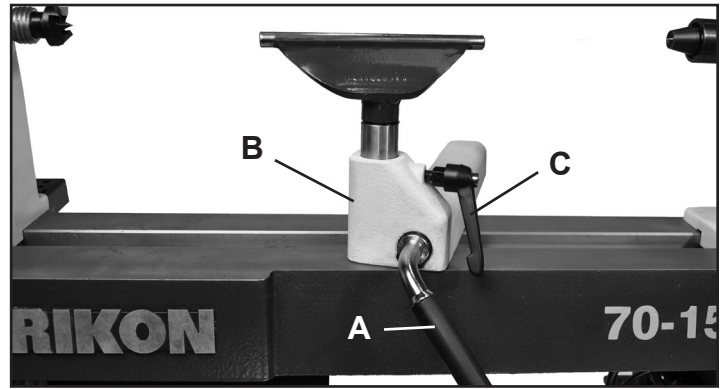


FIG. 4

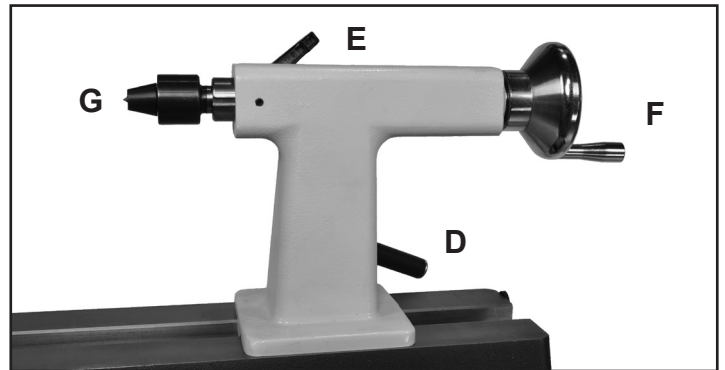


FIG. 5

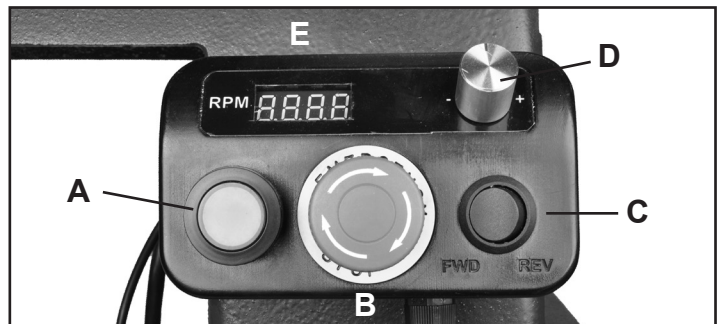


FIG. 6

3. **FORWARD / REVERSE SWITCH:** (FIG. 6, C) This selector switch will change the direction that the spindle turns - counter-clockwise (forward) or clockwise (reverse).

**CAUTION** Only change rotation direction when the spindle has completely stopped. Should the switch be changed while the lathe is operating, the machine will automatically turn off in 'protection' mode. The Digital Readout will show an error code reading.

Turn off the lathe by pushing the large red OFF button (B) and the digital reading will go out, and the control box will reset. Rotate the Off button clockwise and it will pop out to reset itself. Then put the forward/reverse switch to the desired setting (FWD or REV) and the lathe can be turned back on to continue your work.

**NOTE:** See page 16 for a list of Electronic Digital Codes.

CONTINUED ON PAGE 11

# OPERATION

CONTINUED FROM PAGE 10

4. **SPEED RPM KNOB:** (FIG. 6, D) This knob controls the desired spindle revolutions per minute (RPM). The lathe has three speed ranges - 250-850, 430-1450, 950-3200 RPM. Spindle speeds are shown on the LCD Display (E).

5. **SPEED RPM DIGITAL READOUT:** (E) Displays the spindle's RPM as set by the RPM Knob (D). **NOTE:** Speeds displayed may vary + - 5% due to difference in input voltage.

See the Speed Chart (FIG. 3, page 9) for recommended speeds based on the diameter of the workpieces.

## LATHE BED EXTENSIONS - (OPTIONAL)

The 70-1516VSR Lathe features a cast iron bed with both of its ends machined to add bed extensions which will expand the work capabilities for turning. Extensions easily bolt onto the lathe ends for solid support. Extensions and Stand accessories are sold separately.

**RIGHT BED END:** To extend the spindle turning length between centers, the addition of a lathe bed extension is needed. There are two extension options:

- **#70-903** (FIG. 7) This 13-1/2" Bed Extension extends the lathe's maximum spindle length from 16-1/2" to 30". If the lathe is mounted on a stand, a stand extension is not needed.

- **#70-904** This 24" Bed Extension expands the working spindle length from 16-1/2" to 40-1/2". If the lathe is mounted on a stand (#70-920), the lathe Stand Extension (#70-913) is needed to support the added bed length.

**LEFT BED END:** To extend the swing over the lathe bed for larger diameter turning of bowls and platters, the addition of a bed extension on the left end of the lathe is provided for outboard turning.

- **#70-903** (FIG. 8) This 13-1/2" Bed Extension will expand the lathe's swing from 12" over the lathe bed, to 15-1/4" over the outboard extension bed.

## OUTBOARD BOWL & PLATTER TURNING

With the optional #70-903 13-1/2" Extension mounted on the left, outboard end of the lathe (FIG. 8 & 9), faceplates or chucks can be mounted on the outboard end of the spindle. This end has the same 1" x 8TPI RH threading as the inboard spindle end. For outboard turning, the spindle needs to rotate in the REVERSE direction. For turning:

1. To remove the Handwheel (#1B), loosen the 2 Set Screws (#2B). Use the 38mm Wrench on the flat portion of the spindle, then loosen the faceplate from the spindle by hand. Rotate the handwheel counter-clockwise to fully remove it from the spindle.

2. Faceplates or Chucks holding workpieces can now be mounted on the outboard spindle for turning.

3. Remove the tool rest assembly from the lathe bed, and mount it on the lathe bed extension for turning. For this:  
- Loosen the lathe bed's end Screw (#10A) with the 5mm Hex Wrench then rotate the safety Washer (#11A) downward so the tailstock and tool rest can be removed.

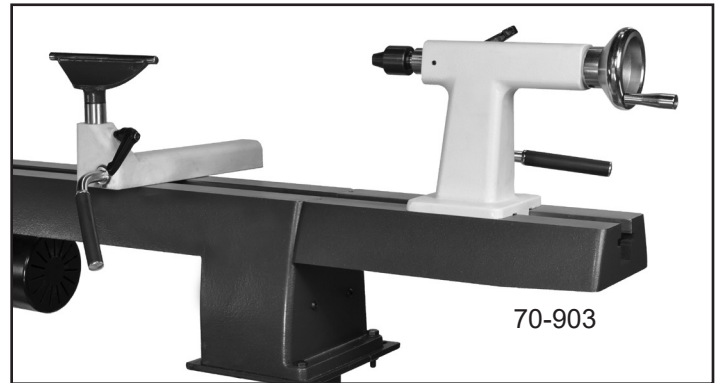


FIG. 7



FIG. 8



FIG. 9

- Release the tailstock's locking handle and slide the tailstock off of the lathe bed.
- Release the tool rest base's locking handle and slide the tool rest base assembly off of the lathe bed.
- Remount the tool rest base assembly with tool rest onto the 13-1/2" outboard extension so it can be used for turning.
- Remount the tailstock onto the lathe bed and reset the safety end washer in place for security.

# ADJUSTMENTS

**⚠ WARNING** THE MACHINE MUST NOT BE PLUGGED IN AND THE POWER SWITCH MUST BE IN THE OFF POSITION UNTIL ALL ADJUSTMENTS ARE COMPLETE.

## CHANGING BELT SPEEDS

1. Unplug the lathe from the power source.
2. Open the top Headstock Cover (#14BA, FIG. 10, A) and the left side, Bed Cover Plate Door (#4A, B) to gain access to the belt and pulleys that are inside of the headstock.
3. Loosen the motor mount locking cam-action Handle (#16A).
  - Pull the handle forward to unlock. FIG. 10, C.
  - Push the handle up to release the belt tension.

4. - Change the belt position on the two pulleys. The Poly-V-Belt (#38B) can now be re-positioned on the upper Spindle Pulley (#7B) and lower Motor Pulley (#24A, FIG. 10, D) for the desired speed range setting. FIG. 11 shows the belt positions for the three speeds.

**NOTE:** The 'High' speed range (950-3200 RPM) provides maximum speed. The 'Low' speed range (250-850 RPM) will provide maximum torque. See the Speed Chart on page 9, FIG. 3, for recommended speeds based on the diameter of the workpieces being turned.

5. With the Poly-V-Belt positioned on the pulleys, lower the Motor Connecting Plate so that the weight of the motor provides the needed tension on the belt. Then re-tighten the locking cam Handle that was loosened in step 3, above.
  - Push the handle down and then backward to set the belt tension and lock it in place.

6. Close the Headstock Cover and Bed Cover Plate Door to protect the belt, pulleys and internal working from dust.

## ADJUSTING THE LOCKING HANDLES

The locking handles on the Tailstock and Tool Rest Base are pre-set at the factory to give ample holding pressure against the lathe bed to keep these lathe assemblies positioned, so that they will not move during use.

If adjustments are needed, the clamping pressure can be changed by turning the large Hex Nuts (#16C & 11D) that are located under the lathe bed and below the assemblies. This is done with a 16mm (5/8") or adjustable wrench (not included). FIG. 12 shows the tool rest removed from the lathe bed to view the locking mechanism and Hex Nut (A).

1. Loosen the Locking Handle (B) so that there is no clamping pressure being exerted on the lathe assembly.
2. With a wrench, slightly turn the Hex Nut to loosen or tighten it on its Threaded Shaft (#19C & 9D).
3. Test the clamping pressure with the locking handle, and adjust the nut again, if needed, to set the right pressure.

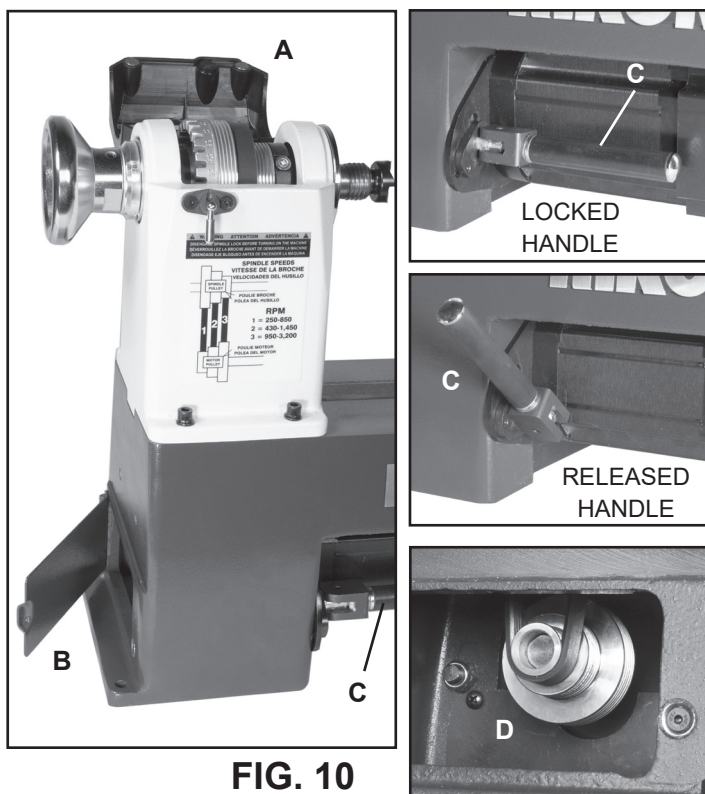


FIG. 10

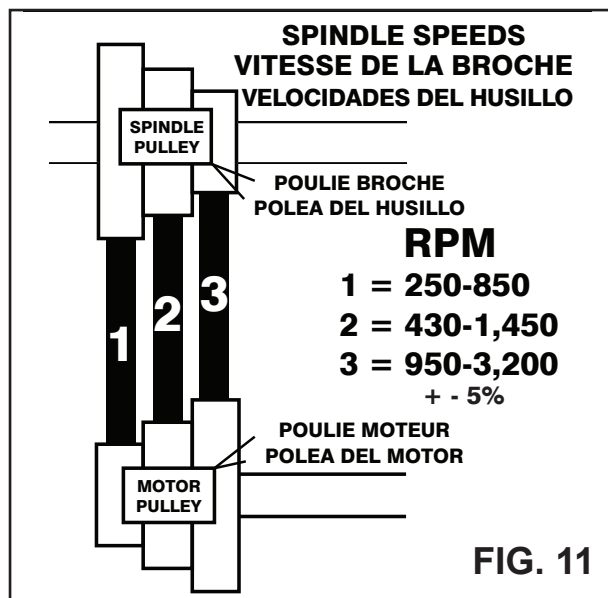


FIG. 11

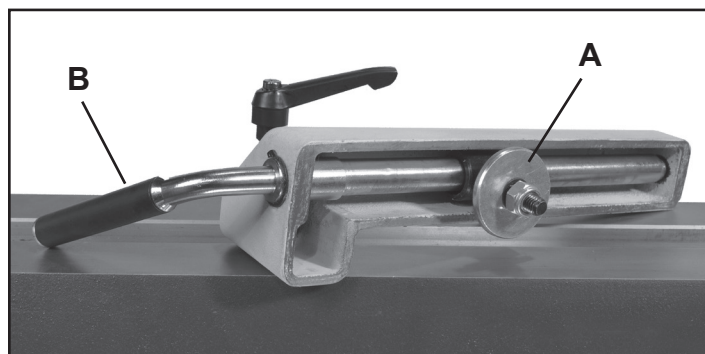


FIG. 12

# ADJUSTMENTS

## CHANGING THE BELT

Changing the belt requires that the headstock spindle be removed, or half removed, from the headstock casting. Then the new belt can be slipped over the spindle and down inside of the headstock to the motor pulley.

1. Unplug the lathe from the power source and remove any accessories from the spindle - spur center, face plate, etc..
2. Open the top Headstock Cover (#14BA, FIG. 13, A) and the left side, Bed Cover Plate Door (#4A, B) to gain access to the belt and pulleys that are inside of the headstock.
3. Loosen the motor mount locking cam-action Handle (#16A).
  - Pull the handle forward to unlock. FIG. 13, C.
  - Push up the handle to release the belt tension.
4. Remove the Belt (#38B) from the lower Motor Pulley (#24A; FIG. 13, D). **NOTE:** If the belt is not to be saved, the old belt can be cut off at this time.
5. To remove the Handwheel (#1B, FIG. 13, E), loosen the two (2) Set Screws (#2B). Then use the 38mm Wrench on the flat portion of the spindle, and loosen the faceplate from the spindle by hand. Rotate the handwheel counter-clockwise to fully remove it from the spindle.
6. Remove the large locking Nut (#3B) in a counterclockwise rotation with the supplied Spanner Wrench (page 7, O), and then remove the large Washer (#4B) behind the nut.
7. At the opposite inboard side of the headstock, remove the Bearing End Plate (#19B) by unscrewing the 3 hex head Screws (#20B) with a 3mm hex wrench. FIG. 14, P.
8. Remove and loosen the Set Screws (FIG. 14, H) that attach the Spindle Pulley (#7B) to the spindle. The pulley should now be loose on the spindle. **NOTE:** There are two (2) set screws, one on top of the other, in both of the two (2) threaded holes. This stacking keeps the set screws from loosening during use.
9. Carefully knock the spindle, towards the tailstock. Use a block of wood against the left spindle end to prevent any damage when it is hit with a mallet/hammer. The spindle pulley, spacers, sleeve and bearings will all slide along the spindle. See page 20 for the spindle diagram assembly.

Once there is enough space, the old drive belt can be removed around the spindle end, and replaced with the new belt. Figure 14.

10. Re-install the spindle and parts back into the headstock casting. As in step 9, very carefully knock the spindle and bearings back into place with a block of wood and mallet.

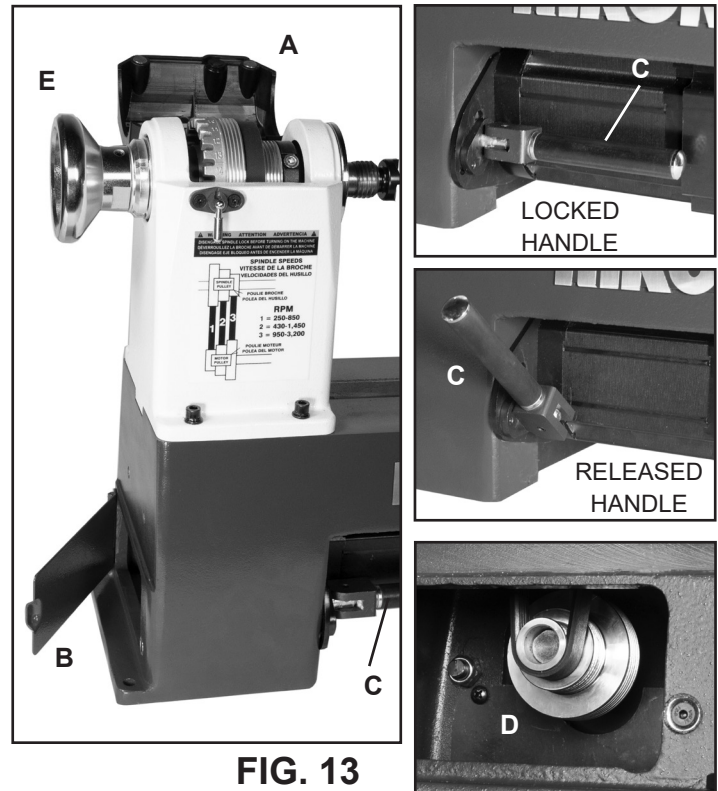


FIG. 13

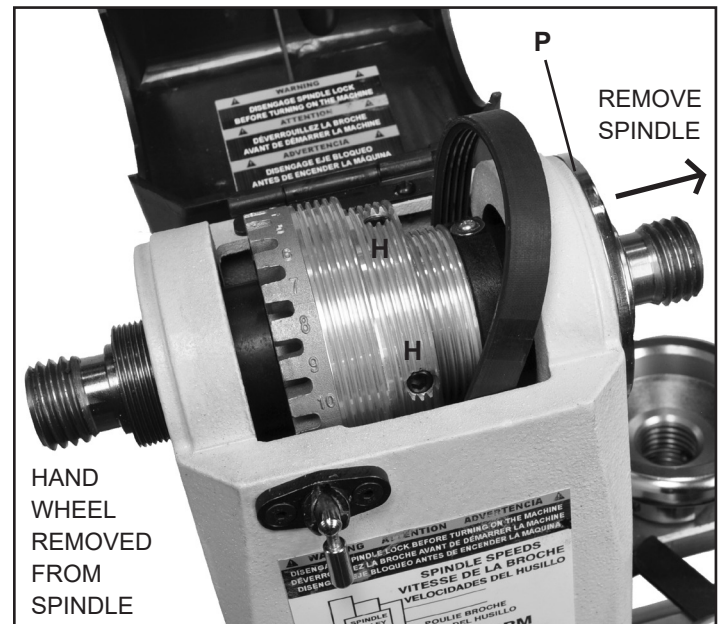


FIG. 14

11. Re-assemble the remaining headstock parts by reversing the procedure previously described.

12. Secure the spindle pulley in place on the spindle with the set screws. Make sure that the set screws engage back onto the flat sections on the spindle to eliminate slippage.

13. Position the new belt on the spindle and motor pulleys and set the tension as described on page 12 for 'Changing Belt Speeds'.

# ADJUSTMENTS

## CHANGING THE BEARINGS

To change the bearings, the whole spindle shaft needs to be shifted right, out of the headstock, towards the tailstock. Then the bearings can be removed from the headstock casting. With the new bearings in place, the spindle shaft assembly can be re-installed, so turning can be resumed.

1. Follow the steps 1-9 described in CHANGING THE BELT on page 13 to remove the spindle assembly from the headstock.

2. Carefully knock out the old bearings. Use a block of wood against the bearings to prevent any damage to the machine if mistakenly hit with a mallet/hammer. Bearings on the spindle can be removed with a gear pulley, if available.

**WARNING** THE MACHINE MUST NOT BE PLUGGED IN AND THE POWER SWITCH MUST BE IN THE OFF POSITION UNTIL ALL ADJUSTMENTS ARE COMPLETE.

3. Install the new Bearings (#5B) on the spindle or in the headstock casting, by carefully knocking them into position.

4. Re-assemble the lathe parts by reversing the procedure described in steps 10 - 13 as described in the CHANGING THE BELT instructions on page 13.

**NOTE:** The lathe's ball bearings are lifetime lubricated, sealed, and do not need any further care. To prevent slipping, keep the drive belt free of oil and grease.

## SPINDLE INDEXING ADJUSTMENTS

The Headstock Spindle has 24 indexing holes, each 15° apart, which allows accurate pattern work on projects such as straight fluting, grooving, drilling, detail carving, wood burning patterns, laying out designs and more.

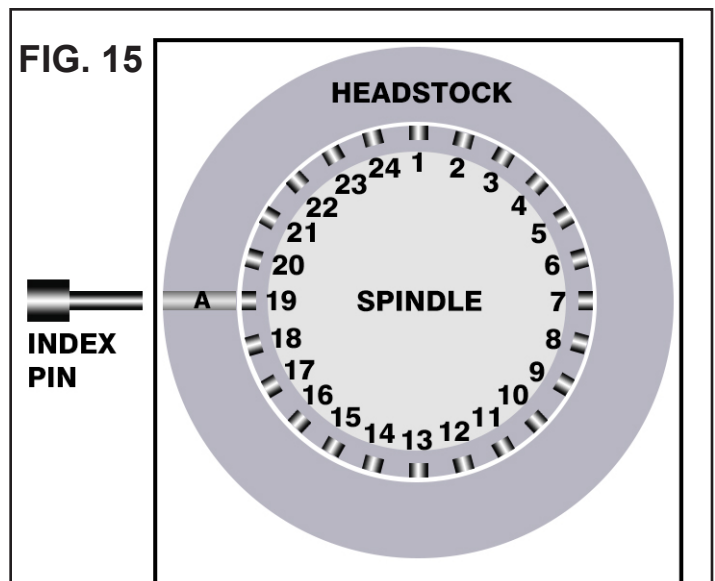
The Indexing Chart, FIG. 15, shows how to rotate the spindle to access any of the 24 indexing holes. The 8 primary settings are listed in FIG. 16, however, other indexing/design settings are possible. Vary the index combinations to make non-equal, spaced patterns. Also, by rotating/re-positioning your work while it is being held between centers, in a chuck or on a faceplate, new orientation points for the index holes will be set for your work.

To Use: Insert the Indexing Pin into one of the 24 spindle's positioning holes according to the chart, and the number of setting you need for your workpiece. Make sure that the pin locates and securely enters into one of the indexing holes so that there is no accidental slipping.

With the Indexing Pin in the first spindle hole setting, do your work (drilling /marking/etc.), then rotate the spindle to the next index setting noted on the chart. Work through all of the designated index setting numbered positions and complete the remaining markings, or work, on your workpiece.

**WARNING** NEVER START THE LATHE WITH THE INDEX PIN ENGAGED IN THE SPINDLE, OR DAMAGE TO THE MACHINE WILL RESULT.

See page 9 for additional information on the lathe's headstock and indexing.



| NUMBER OF INDEX POSITIONS | ANGLE BETWEEN POSITIONS | HEADSTOCK INDEX LETTER | SPINDLE INDEX NUMBER           |
|---------------------------|-------------------------|------------------------|--------------------------------|
| 1                         | 360°                    | A                      | 1                              |
| 2                         | 180°                    | A                      | 1,13                           |
| 3                         | 120°                    | A                      | 1,9,17                         |
| 4                         | 90°                     | A                      | 1,7,13,19                      |
| 6                         | 60°                     | A                      | 1,5,9,13,17,21                 |
| 8                         | 45°                     | A                      | 1,4,7,10,13,16,19,22           |
| 12                        | 30°                     | A                      | 1,3,5,7,9,11,13,15,17,19,21,23 |
| 24                        | 15°                     | A                      | 1 to 24                        |

**FIG. 16**

# ADJUSTMENTS

## CENTER POINT ALIGNMENT

The Spur and Live Centers points are pre-set at the factory, but, upon receipt of the lathe their alignment should be checked in case some movement during shipping has occurred.

- Rotate the centers to ensure that the points do not wobble.
- The tailstock should slide along the lathe bed without binding. The side clearance of the tailstock in the bed gap is absolutely minimal and so no adjustments to the tailstock are required.
- The headstock is fastened to the lathe bed with 4 bolts (#12B). By loosening these bolts, the headstock can be moved slightly to align the Spur Center point to the Live Center Point.

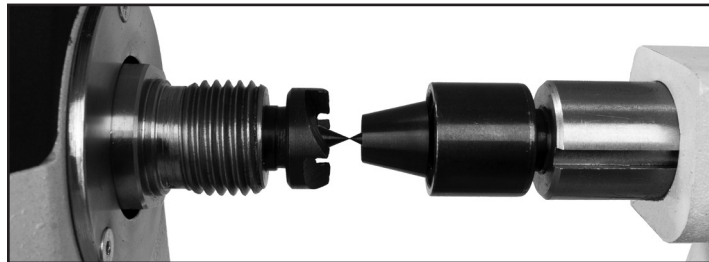


FIG. 17

- Once aligned, secure the headstock bolts.

**NOTE:** Periodically check the alignment of the centers to make sure there has been no movement from working.

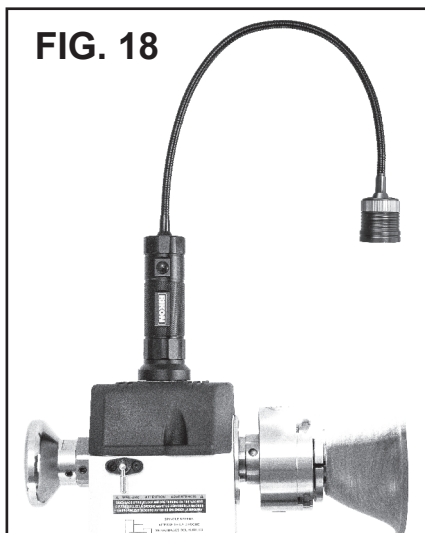
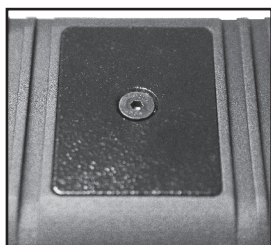


FIG. 18

## USING MAGNETIC BASE LIGHTS & ACCESSORIES

The 70-1516VSR lathe is designed with flat headstock and tailstock metal surfaces for attaching magnetic based lights, storage bowls or other accessories. The headstock lid is fitted with a steel plate just for this purpose. The cast iron tailstock's top surface offers a 6-7/8" (175mm) long x 13/16" (20mm) wide flat surface. See page 25 for the 12-202 LED Light shown.



Metal Plate on headstock lid

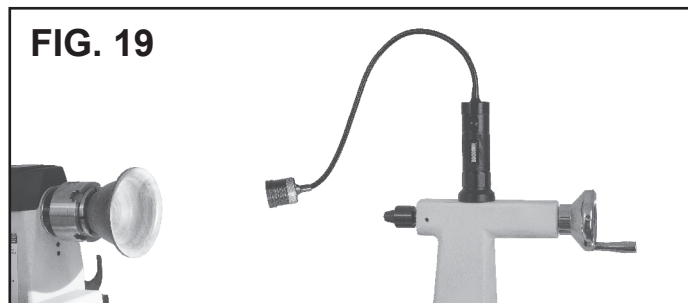


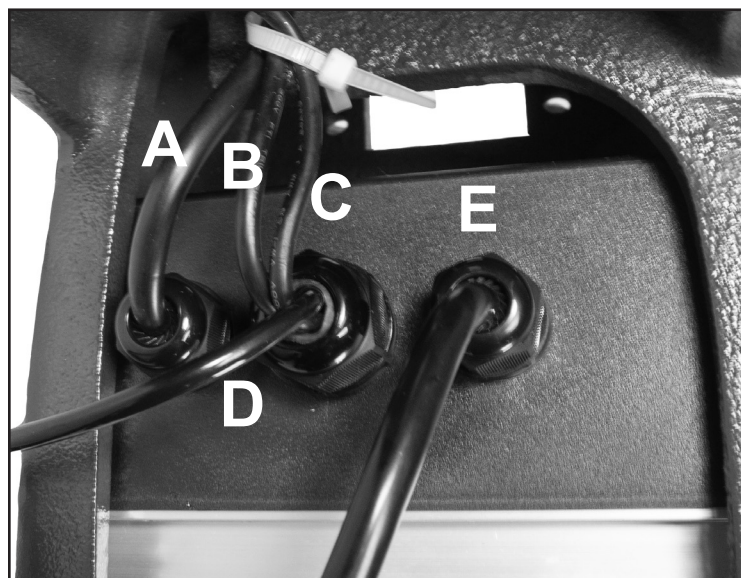
FIG. 19

# TROUBLESHOOTING - WIRE CONNECTORS

## 70-1516VSR CONTROL BOX CONNECTORS

The Control Box features quick-change wire fittings. The layout of the lathe's wiring connections are as follows;

- A Wire to the Motor has a wire connector
- 3 Wires from the strain relief fitting;
- B Thicker wire to motor has a wire connector
- C Thin wire to RPM Reader has a wire connector
- D Spring wire to Switch Box
- E Power cord with grounded plug to wall outlet



See page 24 for the 70-1516VSR Wiring Diagram.

# TROUBLESHOOTING - Electronic Speed Control ACTION CODES

| DISPLAY CODE | CONDITION   | ACTION   |
|--------------|---|--|
| 00           | Digital RPM Display is not operating.   | <ol style="list-style-type: none"><li>1. Check wiring connections to the RPM reader.</li><li>2. Check &amp; clean the RPM reader for any dust build-up.</li><li>3. Check drive belt. Adjust RPM reader or drive belt positions.</li></ol>  |
| 01           | Overload Protection mode.   | <ol style="list-style-type: none"><li>1. Check if the machine rotates smoothly.</li><li>2. Check that the motor wiring is not loose and wired correctly.</li><li>3. Turn off the machine and re-start once the digital display has cleared. If the error code still appears, the controller hardware may be damaged and Technical Support should be contacted.</li></ol> |
| 02           | Hall Signal Protection mode.  | <ol style="list-style-type: none"><li>1. Check that Hall wiring on the motor is not loose and wired correctly.</li><li>2. Turn off the machine and re-start once the digital display has cleared. If the error code still appears, the controller hardware may be damaged and Technical Support should be contacted.</li></ol>   |
| 03           | Over Current Protection mode.   | <ol style="list-style-type: none"><li>1. Check if the machine rotates smoothly.</li><li>2. Check that the motor wiring is not loose and wired correctly.</li><li>3. Turn off the machine and re-start once the digital display has cleared. If the error code still appears, the controller hardware may be damaged and Technical Support should be contacted.</li></ol> |
| 04           | Low Voltage Protection mode.  | <ol style="list-style-type: none"><li>1. Turn off and unplug the machine.</li><li>2. Check the input power supply. If the input power supply is normal, wait 15-30 seconds then plug it in again to restart.</li></ol>   |
| 05           | Over Voltage Protection mode.   | <ol style="list-style-type: none"><li>1. Turn off and unplug the machine.</li><li>2. Check the input power supply. If the input power supply is normal, wait 15-30 seconds then plug it in again to restart.</li></ol>   |
| 06           | Spindle Direction Protection mode - the spindle direction has changed during operation, | <ol style="list-style-type: none"><li>1. Turn off and unplug the machine.</li><li>2. Wait 15-30 seconds then plug it in again to restart.</li></ol>  |
| 08           | Motor Locked Rotor Protection mode.   | <ol style="list-style-type: none"><li>1. Check the head lock switch if is locked.</li><li>2. Check if the machine rotates smoothly.</li><li>3. Turn off the machine and re-start once the digital display has cleared. If the error code still appears, the controller hardware may be damaged and Technical Support should be contacted.</li></ol>                      |
| --           | There are no numbers displayed on the digital display.                                  | <ol style="list-style-type: none"><li>1. Check the communication cable of the display box.</li><li>2. Check the RPM speed reading cable.</li></ol>   |

---

See page 24 for the 70-1516VSR Wiring Diagram, and page 5 for additional electrical information.



# TROUBLESHOOTING

| PROBLEM  | PROBABLE CAUSE   | REMEDY  |
|--|--|---|
| Motor will not start                             | <ol style="list-style-type: none"> <li>1. Machine is not plugged in</li> <li>2. Low voltage</li> <li>3. Loose connection</li> </ol>  | <ol style="list-style-type: none"> <li>1. Plug in machine</li> <li>2. Check fuses</li> <li>3. Check plug and all connections</li> </ol>   |
| Motor fails to develop full power.               | <ol style="list-style-type: none"> <li>1. Power line is overloaded</li> <li>2. Undersize wires in supply system</li> <li>3. Drive belt tension is too high</li> <li>4. Low voltage</li> <li>5. Worn motor</li> </ol>   | <ol style="list-style-type: none"> <li>1. Correct the overload condition</li> <li>2. Increase supply wire size or eliminate extension cord if one is used</li> <li>3. Adjust belt tension</li> <li>4. Have voltage checked by an electrician and corrected, if necessary</li> <li>5. Replace the motor</li> </ol> |
| Motor or Spindle Stalls or will not start        | <ol style="list-style-type: none"> <li>1. Excessive depth of cut</li> <li>2. Loose or broken belt</li> <li>3. Worn spindle bearings</li> <li>4. Improper cooling of motor</li> <li>5. Worn motor</li> </ol>  | <ol style="list-style-type: none"> <li>1. Reduce cutting depth</li> <li>2. Check tension or replace drive belt</li> <li>3. Replace bearings</li> <li>4. Clean motor to increase air flow, or reduce motor running time</li> <li>5. Replace Motor</li> </ol>   |
| Motor overheats                                  | <ol style="list-style-type: none"> <li>1. Motor is overloaded</li> <li>2. Air flow restricted on the motor</li> </ol>  | <ol style="list-style-type: none"> <li>1. Reduce load on the motor</li> <li>2. Clean motor to increase air flow</li> </ol>  |
| Excessive Vibration.                             | <ol style="list-style-type: none"> <li>1. Workpiece is warped, out of round, has major flaw, or was improperly prepared or centered for turning</li> <li>2. Worn spindle bearings</li> <li>3. Worn belt</li> <li>4. Motor mount bolt or handles are loose</li> <li>5. Lathe is on an uneven surface</li> </ol> | <ol style="list-style-type: none"> <li>1. Correct problem by planing, band sawing, or discard the workpiece</li> <li>2. Replace the bearings</li> <li>3. Replace the belt</li> <li>4. Tighten all bolts or handles</li> <li>5. Shim the lathe stand, or adjust the feet on the stand for stability</li> </ol>     |
| Tailstock Moves when applying pressure           | <ol style="list-style-type: none"> <li>1. Excessive pressure being applied by the tailstock onto the workpiece</li> <li>2. Tailstock is not secured in place</li> <li>3. Lathe bed and tailstock mating surfaces are greasy or oily.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Apply only sufficient force with the tailstock to hold the workpiece securely between centers.</li> <li>2. Tighten tailstock locking lever</li> <li>3. Remove tailstock and clean bed surfaces with a cleaner degreaser</li> </ol>                                      |
| Tailstock or Tool Rest Base do not lock in place | <ol style="list-style-type: none"> <li>1. Incorrect adjustment on locking lever mechanism</li> </ol>   | <ol style="list-style-type: none"> <li>1. Adjust the nut under the clamping plate to increase (or decrease) the clamping pressure of the lock levers</li> </ol>   |
| Machine bogs down during cutting                 | <ol style="list-style-type: none"> <li>1. Excessive depth of cut is taken</li> <li>2. Turning tools are dull</li> <li>3. Drive belt is in wrong pulley position</li> </ol>   | <ol style="list-style-type: none"> <li>1. Decrease the depth of cut</li> <li>2. Sharpen the turning tools</li> <li>3. Change belt to 'Low' speed range</li> </ol>   |
| Tools tend to grab or dig in.                    | <ol style="list-style-type: none"> <li>1. Dull turning tools</li> <li>2. Tool rest is set too low</li> <li>3. Tool rest is set too far from the workpiece</li> <li>4. Improper turning tool is being used</li> </ol>   | <ol style="list-style-type: none"> <li>1. Sharpen the tools</li> <li>2. Reposition the tool rest height</li> <li>3. Set the tool rest closer to the workpiece</li> <li>4. Use the correct tool for operation</li> </ol>   |
| Digital readout does not work                    | <ol style="list-style-type: none"> <li>1. Digital readout sensor out of position</li> </ol>  | <ol style="list-style-type: none"> <li>1. See page 16 for information.</li> <li>2. Contact Technical Support at 877-884-5167 or email <a href="mailto:techsupport@rikontools.com">techsupport@rikontools.com</a></li> </ol>   |

For parts or technical questions contact: [techsupport@rikontools.com](mailto:techsupport@rikontools.com) or 877-884-5167.

# MAINTENANCE

**⚠ WARNING:** Turn the power switch “OFF” and disconnect the plug from the outlet prior to adjusting or maintaining the machine. DO NOT attempt to repair or maintain the electrical components of the motor. Contact a qualified service technician for this type of maintenance.

1. Before each use:

- Check the power cord and plug for any wear or damage.
- Check for any loose screws, hardware, locking handles, jigs or various lathe accessories.
- Check the area to make sure it is clear of any misplaced tools, lumber, cleaning supplies, etc. that could hamper the safe operation of the machine.

2. Avoid a build-up of wood shavings and dust. Regularly clean all parts of the machine using a soft cloth, brush or compressed air. A general cleaning should be done after every use to avoid future problems and ensure that the machine is in ready condition for its next use.

**WARNING:** If blowing sawdust, wear a proper dust mask and eye protection to prevent debris from being inhaled and blowing into your eyes.

3. Keep the lathe bed free of resin and rust. Clean it regularly with a non-flammable solvent, then coat with a light film of dry lubricant spray, or wax, to enhance passage of the tool rest and tailstock on/over the bed.

4. Keep the lathe tools sharp, and make sure the steel is not loose in the handles so that no accidents might occur. Making sure that tools are in proper operating condition will ensure that the quality of your turning will be the best possible.

5. Check all lathe accessories (spur centers, live centers, chucks, tool rests, etc.) to ensure that they are in perfect working condition.

6. The lathe’s ball bearings are lifetime lubricated, sealed, and do not need any further care. Keep the drive belt free of oil and grease to prevent slipping on the pulleys.

**WARNING:** Extreme drive belt tension and tailstock pressure when drilling or holding turning projects puts excessive demand on the bearings. This can cause grinding noise and high heat in the bearings and early failure may develop.

---

## TAILSTOCK MAINTENANCE

The occasional disassembly and cleaning/lubricating of the lathe’s quill and screw is proper regular maintenance of this machine. One of the common issues with lathe quills is that the 2 grooves in the quill sides get damaged by the tailstock’s positioning set screws from the rotational pressure from normal use, and especially by drilling. The sides of the grooves can expand up & out beyond the diameter of the quill, thus making it harder to slide through the tailstock casting from the resulting friction.

To solve this, just use a fine metal file to carefully take down the offending raised metal on the exterior of the quill’s grooves. Also make sure that the grooves’ slots inside walls are smooth. This process is also covered on many internet videos on tailstock maintenance.

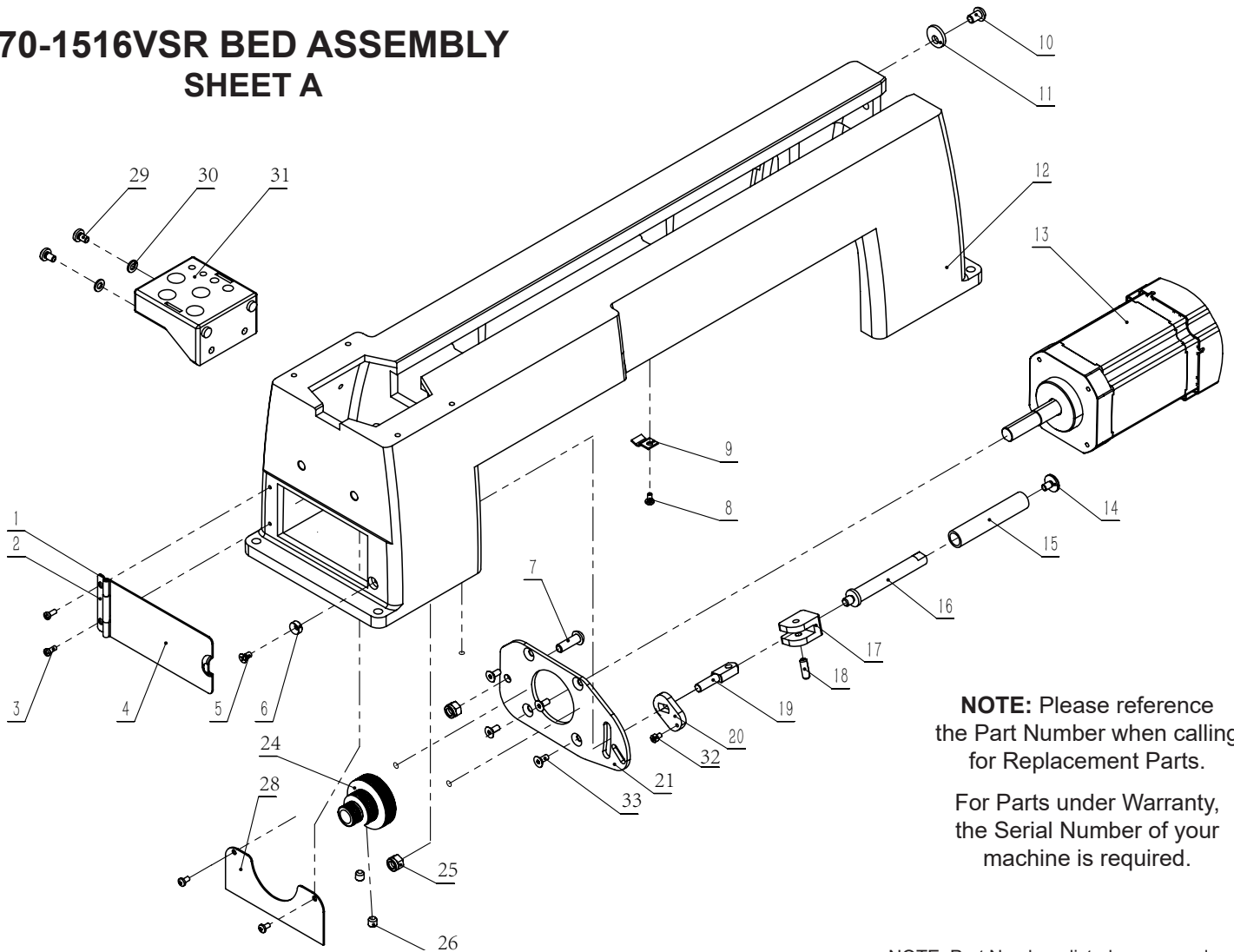
Another thing to check is the nub end on the hex screw of the rear locking handle. The round nub end could have expanded in diameter from the locking pressure that has been put on it, and thus contribute to its binding in the slot that it slides in. The nubs’ circumference can be carefully filed down so it is again narrower than the width of the quill slot. The quill’s front set screw has nubs with 2 flats for best sliding action in the forward quill slot. This should not expand under use or require any maintenance other than to make sure the flats are positioned parallel in the quill slot and lightly lubricated.

Lastly, the overall cleaning of the screw and other surfaces of any debris and old oil/grease should also be done, then reapply new grease or oil to lubricate the parts.

FYI, many turners find drilling with their tailstocks faster and with more control by not using the tailstock’s screw. They just slide the unlocked tailstock with drill bit forward-and-back by hand. They can better control the drilling of their holes and then remove the shavings inside of the turnings faster than by cranking the tailstock handwheel.

# PARTS DIAGRAM & PARTS LIST

## 70-1516VSR BED ASSEMBLY SHEET A



**NOTE:** Please reference the Part Number when calling for Replacement Parts.

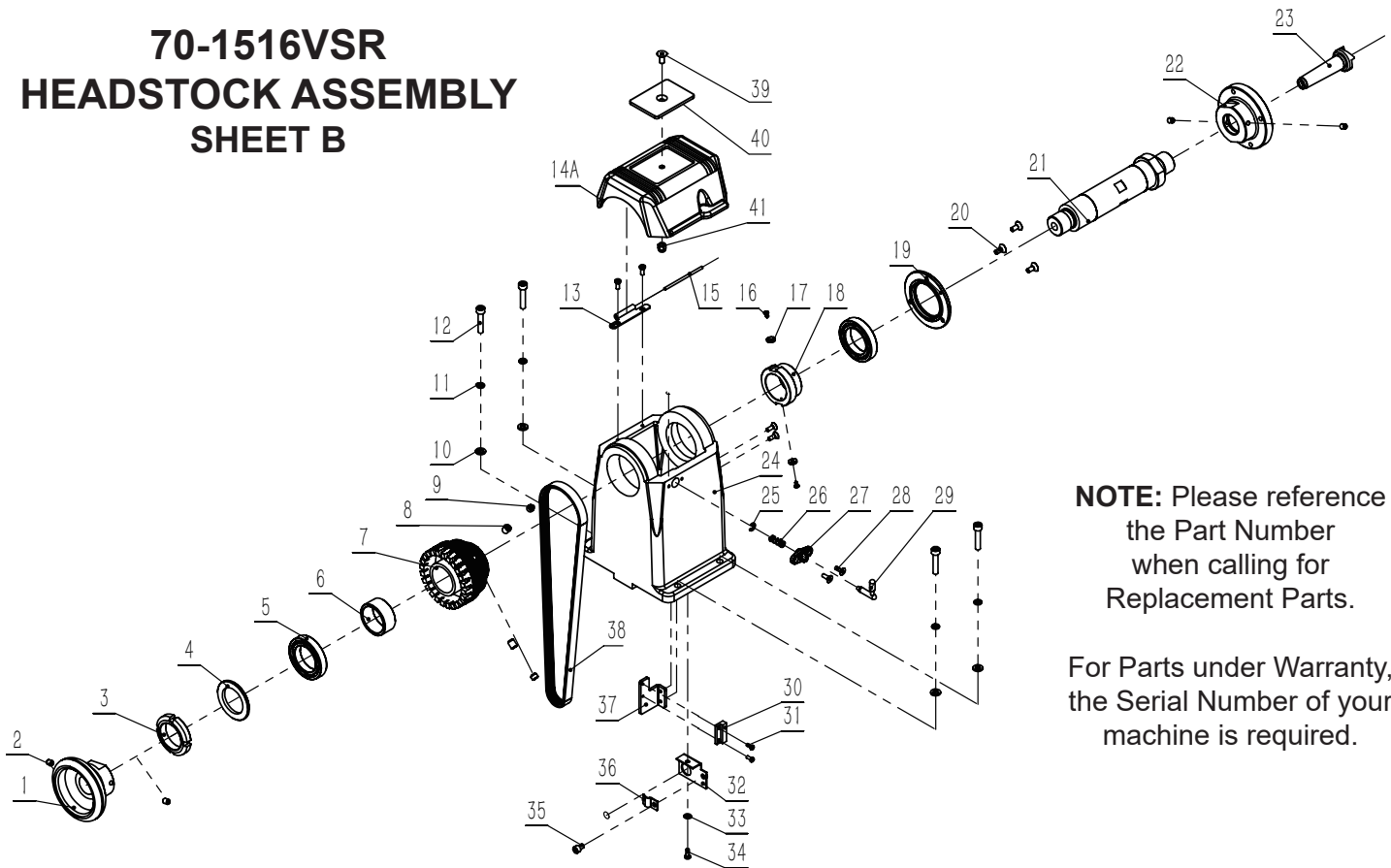
For Parts under Warranty, the Serial Number of your machine is required.

NOTE: Part Numbers listed may vary due to common parts with other machines.

| KEY NO. | DESCRIPTION                   | QTY | PART NO.        | KEY NO. | DESCRIPTION                | QTY | PART NO.        |
|---------|-------------------------------|-----|-----------------|---------|----------------------------|-----|-----------------|
| 1       | Hinge shaft                   | 1   | P70-150VSR-1A   | 16      | Tension handle             | 1   | P70-150VSR-16A  |
| 2       | Hinge                         | 1   | P70-150VSR-2A   | 17      | Locking cam                | 1   | P70-150VSR-17A  |
| 3       | Pan head screw M4x10          | 2   | P70-150VSR-3A   | 18      | Elastic cylindrical pin    | 1   | P70-150VSR-18A  |
| 4       | Bed cover plate door          | 1   | P70-150VSR-4A   | 19A     | Locating shaft             | 1   | P70-150VSR-19AA |
| 5       | Hex cntrsnk head screw M5x10  | 1   | P70-1516VSR-5A  | 20A     | Tensioning plate           | 1   | P70-150VSR-20AA |
| 6       | Magnet                        | 1   | P70-150VSR-6A   | 21      | Motor connecting plate     | 1   | P70-1516VSR-21A |
| 7A      | Hex sockt flat hd screw M8x25 | 1   | P70-150VSR-7AA  | 24      | Motor pulley               | 1   | P70-150VSR-24A  |
| 8       | Pan head screw M4x8           | 3   | P70-1516VSR-8A  | 25      | Hex locking nut M8         | 2   | P70-150VSR-25A  |
| 9       | Cable plate                   | 1   | P70-1516VSR-9A  | 26      | Set screw M8x8             | 2   | P70-1516VSR-26A |
| 10      | Hex button head screw M8x12   | 1   | P70-150VSR-10A  | 28      | Plate                      | 1   | P70-1516VSR-28A |
| 11      | Eccentric washer              | 1   | P70-150VSR-11A  | 29      | Pan head screw M6x12       | 2   | P70-150VSR-29A  |
| 12      | Bed                           | 1   | P70-150VSR-12A  | 30      | Washer 6                   | 2   | P70-150VSR-30A  |
| 13      | Motor DC                      | 1   | P70-1516VSR-13A | 31      | Tool holder                | 1   | P70-150VSR-31A  |
| 14      | Thread cap                    | 1   | P70-150VSR-14A  | 32      | Hex sockt hd cap scrw M4x5 | 1   | P70-150VSR-32A  |
| 15      | Handle sleeve                 | 1   | P70-150VSR-15A  | 33      | Hex cntrsnk hd screw M5x12 | 4   | P70-1516VSR-33A |

# PARTS LIST & PARTS LIST

## 70-1516VSR HEADSTOCK ASSEMBLY SHEET B



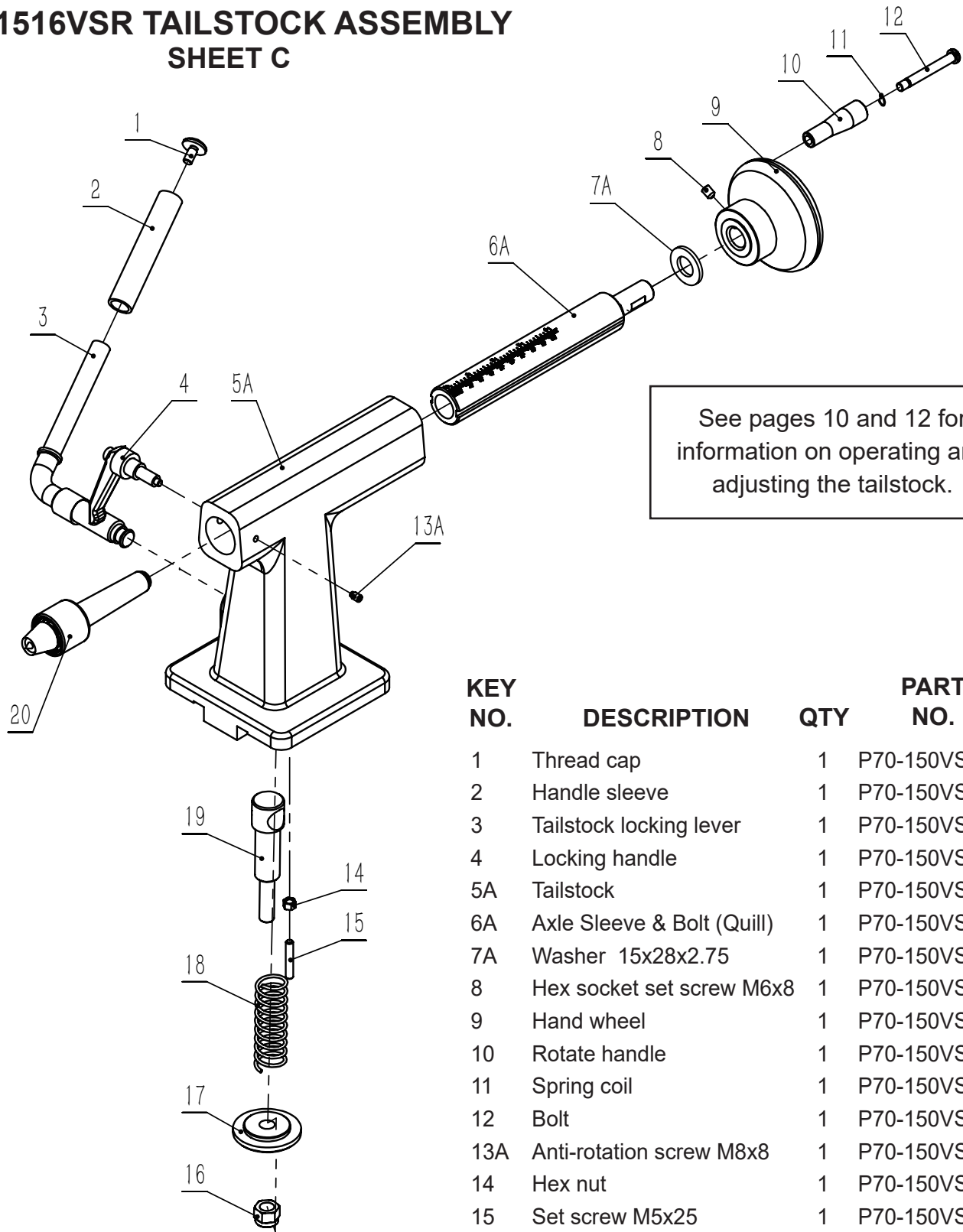
**NOTE:** Please reference the Part Number when calling for Replacement Parts.

For Parts under Warranty, the Serial Number of your machine is required.

| KEY NO. | DESCRIPTION                | QTY | PART NO.        | KEY NO. | DESCRIPTION                | QTY | PART NO.       |
|---------|----------------------------|-----|-----------------|---------|----------------------------|-----|----------------|
| 1       | Hand wheel                 | 1   | P70-150VSR-1B   | 22      | 3" faceplate               | 1   | 70-933         |
| 2       | Set screw M6x8             | 4   | P70-150VSR-2B   | 23      | Spur center                | 1   | 70-943         |
| 3       | Self-locking round nut     | 1   | P70-150VSR-3B   | 24      | Headstock                  | 1   | P70-150VSR-24B |
| 4       | Washer                     | 1   | P70-150VSR-4B   | 25      | Split washer               | 1   | P70-150VSR-25B |
| 5       | Ball bearing               | 2   | P70-150VSR-5B   | 26      | Spring                     | 1   | P70-150VSR-26B |
| 6       | Spacer bush                | 1   | P70-150VSR-6B   | 27      | Locating sleeve            | 1   | P70-150VSR-27B |
| 7       | Spindle pulley             | 1   | P70-150VSR-7B   | 28      | Hex cntrsnk hd screw M4x12 | 4   | P70-150VSR-28B |
| 8       | Set screw M8x10            | 2   | P70-150VSR-8B   | 29      | Locating pin assembly      | 1   | P70-150VSR-29B |
| 9       | Set screw M8x6             | 2   | P70-150VSR-9B   | 30      | Speed measuring head       | 1   | P70-150VSR-30B |
| 10      | Washer                     | 4   | P70-150VSR-10B  | 31      | Pan head screw M3x8        | 2   | P70-150VSR-31B |
| 11      | Spring washer              | 4   | P70-150VSR-11B  | 32      | Threading plate            | 1   | P70-150VSR-32B |
| 12      | Hex socket cap screw M6x30 | 4   | P70-150VSR-12B  | 33      | Washer                     | 1   | P70-150VSR-33B |
| 13      | Hinge                      | 1   | P70-150VSR-13B  | 34      | Pan head screw M4x10       | 3   | P70-150VSR-34B |
| 14A     | Headstock cover            | 1   | P70-150VSR-14BA | 35      | Hex socket cap screw M5x8  | 1   | P70-150VSR-35B |
| 15      | Hinge shaft                | 1   | P70-150VSR-15B  | 36      | Cable plate                | 1   | P70-150VSR-36B |
| 16      | Tapping screw              | 2   | P70-150VSR-16B  | 37      | Support bracket            | 1   | P70-150VSR-37B |
| 17      | Magnet                     | 2   | P70-150VSR-17B  | 38      | Poly-v-belt                | 1   | P70-150VSR-38B |
| 18      | Magnetic steel sleeve      | 1   | P70-150VSR-18B  | 39      | Hex cntrsnk hd screw M5x12 | 1   | P70-150VSR-39B |
| 19      | Bearing end plate          | 1   | P70-150VSR-19B  | 40      | Metal plate                | 1   | P70-150VSR-40B |
| 20      | Hex cntrsnk hd screw M5x12 | 3   | P70-150VSR-20B  | 41      | Self locking nut M5        | 1   | P70-150VSR-41B |
| 21      | Spindle                    | 1   | P70-150VSR-21B  |         |                            |     |                |

# PARTS DIAGRAM & PARTS LIST

## 70-1516VSR TAILSTOCK ASSEMBLY SHEET C



See pages 10 and 12 for information on operating and adjusting the tailstock.

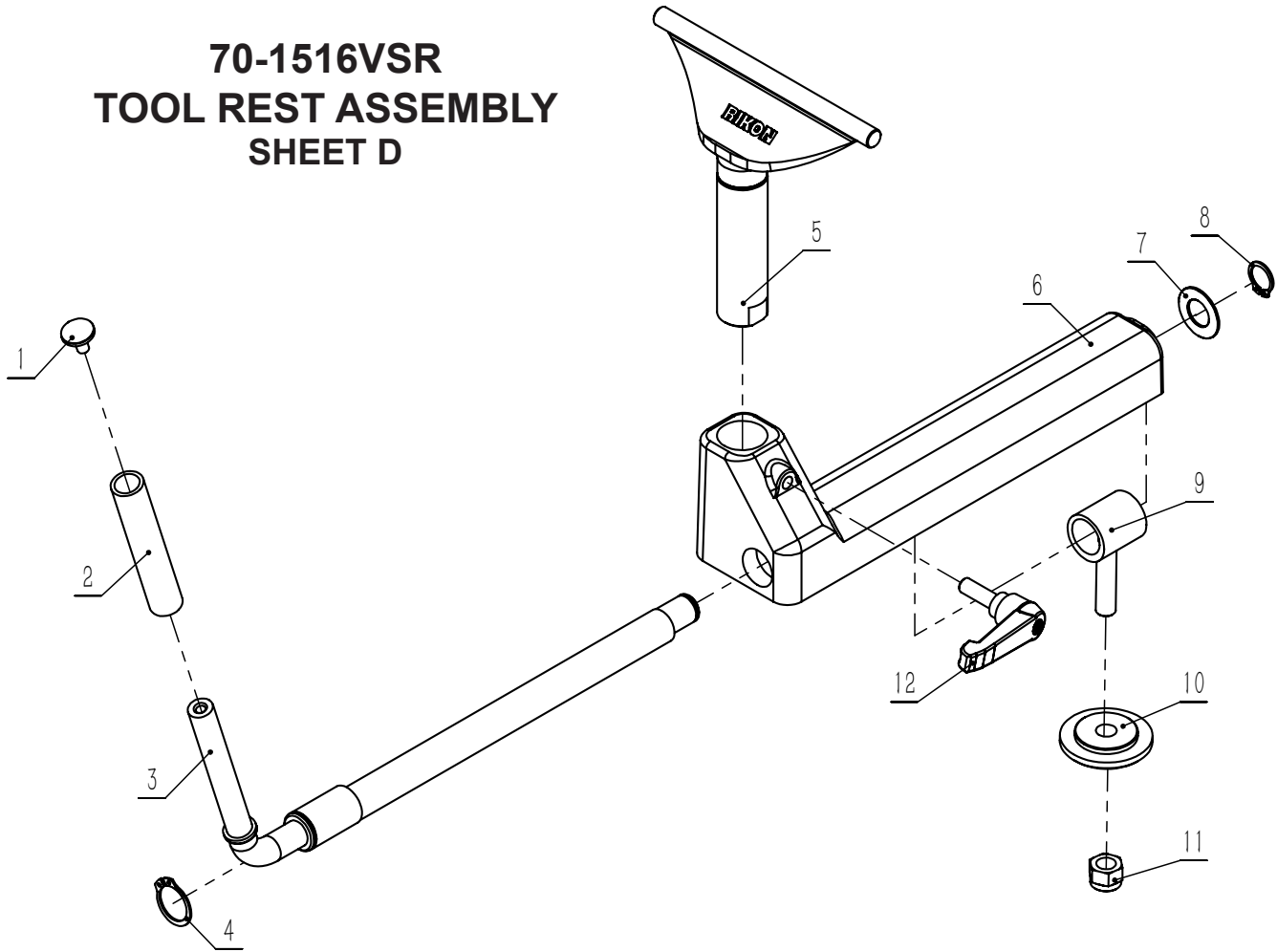
| KEY NO. | DESCRIPTION                | QTY | PART NO.        |
|---------|----------------------------|-----|-----------------|
| 1       | Thread cap                 | 1   | P70-150VSR-1C   |
| 2       | Handle sleeve              | 1   | P70-150VSR-2C   |
| 3       | Tailstock locking lever    | 1   | P70-150VSR-3C   |
| 4       | Locking handle             | 1   | P70-150VSR-4C   |
| 5A      | Tailstock                  | 1   | P70-150VSR-5CA  |
| 6A      | Axle Sleeve & Bolt (Quill) | 1   | P70-150VSR-6CA  |
| 7A      | Washer 15x28x2.75          | 1   | P70-150VSR-7CA  |
| 8       | Hex socket set screw M6x8  | 1   | P70-150VSR-8C   |
| 9       | Hand wheel                 | 1   | P70-150VSR-9C   |
| 10      | Rotate handle              | 1   | P70-150VSR-10C  |
| 11      | Spring coil                | 1   | P70-150VSR-11C  |
| 12      | Bolt                       | 1   | P70-150VSR-12C  |
| 13A     | Anti-rotation screw M8x8   | 1   | P70-150VSR-13CA |
| 14      | Hex nut                    | 1   | P70-150VSR-14C  |
| 15      | Set screw M5x25            | 1   | P70-150VSR-15C  |
| 16      | Locking nut                | 1   | P70-150VSR-16C  |
| 17      | Clamping plate             | 1   | P70-150VSR-17C  |
| 18      | Compression spring         | 1   | P70-150VSR-18C  |
| 19      | Threaded shaft             | 1   | P70-150VSR-19C  |
| 20      | Live center                | 1   | 70-945          |

**NOTE:** Please reference the Part Number when calling for Replacement Parts.

For Parts under Warranty, the Serial Number of your machine is required.

# PARTS DIAGRAMS & PARTS LISTS

## 70-1516VSR TOOL REST ASSEMBLY SHEET D



**NOTE:** Please reference the Part Number when calling for Replacement Parts.

For Parts under Warranty, the Serial Number of your machine is required.

| KEY NO. | DESCRIPTION                    | QTY | PART NO.       |
|---------|--------------------------------|-----|----------------|
| 1       | Threaded cap end               | 1   | P70-150VSR-1D  |
| 2       | Handle sleeve                  | 1   | P70-150VSR-2D  |
| 3       | Eccentric handle               | 1   | P70-150VSR-3D  |
| 4       | Circlip                        | 1   | P70-150VSR-4D  |
| 5       | Tool rest (parts listed below) | -   | -              |
|         | 6" PRO tool rest TOP           | 1   | 70-976         |
|         | Steel compression washer       | 1   | 70-970         |
|         | Tool rest Post 1" dia. x 85mm  | 1   | 70-969         |
| 6       | Tool rest base                 | 1   | P70-150VSR-6D  |
| 7       | Thrust bearing washer          | 1   | P70-150VSR-7D  |
| 8       | Circlip                        | 1   | P70-150VSR-8D  |
| 9       | Threaded shaft & sleeve        | 1   | P70-150VSR-9D  |
| 10      | Clamping plate                 | 1   | P70-150VSR-10D |
| 11      | Hex locking nut                | 1   | P70-150VSR-11D |
| 12      | Locking handle                 | 1   | P70-150VSR-12D |

### TOOLS NOT SHOWN BUT LISTED ON PAGE 7

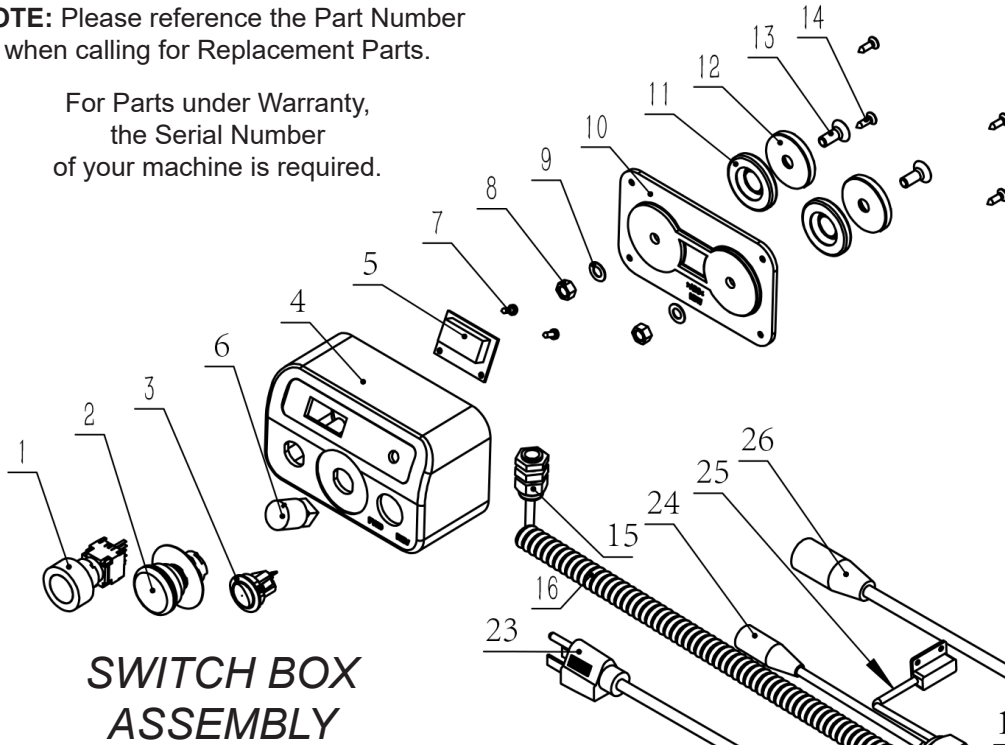
|                           |                |
|---------------------------|----------------|
| Hex Wrench - 2.5mm        | P-HEX2.5       |
| Hex Wrench - 3mm          | P-HEX3         |
| Hex Wrench - 4mm          | P-HEX4         |
| Hex Wrench - 5mm          | P-HEX5         |
| Wrench - 38mm             | 70-931         |
| Wrench - 46mm             | 70-932         |
| Spanner Wrench 35mm       | P-SP WRENCH    |
| Knockout Bar - Long       | P70-150VSR-32A |
| Knob end for long K/O bar | P70-150VSR-33A |
| Knockout Bar - Small      | P70-150VSR-34A |

# PARTS DIAGRAMS & PARTS LISTS

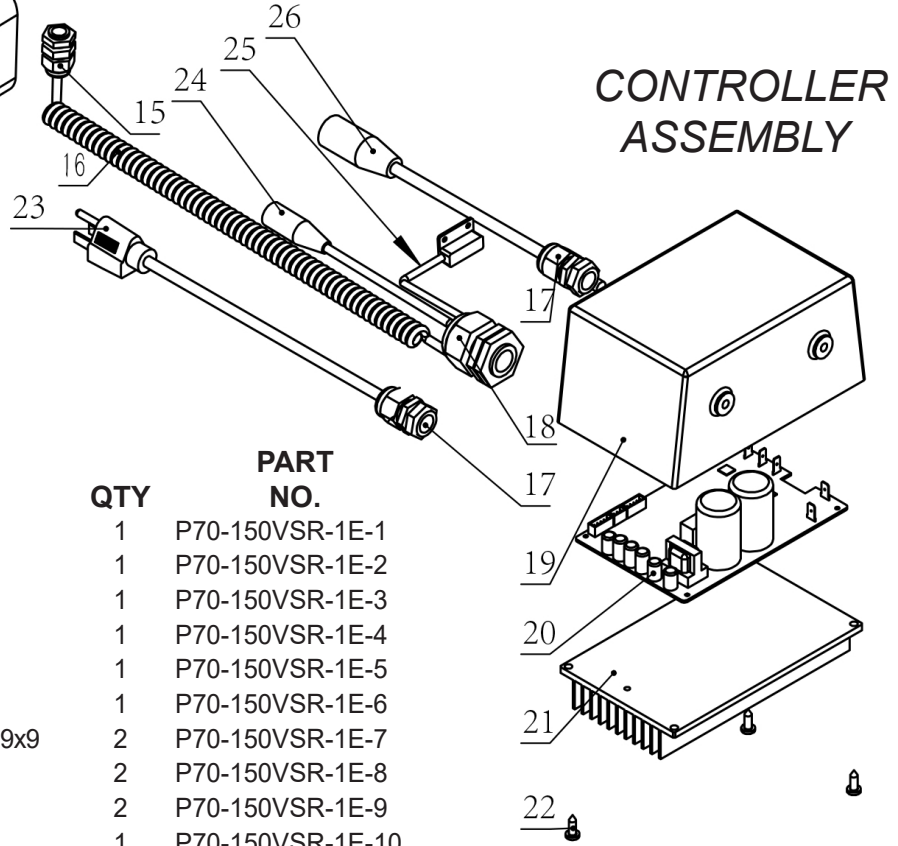
**NOTE:** Please reference the Part Number when calling for Replacement Parts.

For Parts under Warranty, the Serial Number of your machine is required.

## 70-1516VSR CONTROLLER ASSEMBLY SHEET E



**SWITCH BOX  
ASSEMBLY**



**CONTROLLER  
ASSEMBLY**

| KEY NO. | DESCRIPTION                               | QTY | PART NO.          |
|---------|---|-----|-------------------|
| 1       | Start button                              | 1   | P70-150VSR-1E-1   |
| 2       | Emergency stop button                     | 1   | P70-150VSR-1E-2   |
| 3       | Forward and reverse switch                | 1   | P70-150VSR-1E-3   |
| 4       | Switch box                                | 1   | P70-150VSR-1E-4   |
| 5       | Digital display board                     | 1   | P70-150VSR-1E-5   |
| 6       | Potentiometer knob                        | 1   | P70-150VSR-1E-6   |
| 7       | Cross pan head tapping screw ST2D9x9      | 2   | P70-150VSR-1E-7   |
| 8       | Hex nut M6                                | 2   | P70-150VSR-1E-8   |
| 9       | Washer 6                                  | 2   | P70-150VSR-1E-9   |
| 10      | Switch box cover                          | 1   | P70-150VSR-1E-10  |
| 11      | Magnet steel sleeve                       | 2   | P70-150VSR-1E-11  |
| 12      | Magnet steel                              | 2   | P70-150VSR-1E-12  |
| 13      | Hex socket countersink head screw M6x16   | 2   | P70-150VSR-1E-13  |
| 14      | Cross cntrsk head tapping screw ST3D5x13  | 4   | P70-150VSR-1E-14  |
| 15      | Cable strain relief M12                   | 1   | P70-150VSR-1E-15  |
| 16      | Spring cable to switch box                | 1   | P70-1516VSR-1E-16 |
| 17      | Cable strain relief M16                   | 2   | P70-150VSR-1E-17  |
| 18      | Cable strain relief M20x1.5               | 1   | P70-150VSR-1E-18  |
| 19      | Controller Assembly cover                 | 1   | P70-1516VSR-1E-19 |
| 20      | Controller circuit board                  | 1   | P70-1516VSR-1E-20 |
| 21      | Controller board base                     | 1   | P70-1516VSR-1E-21 |
| 22      | Cross cntrsk head tapping screw ST4D2x13  | 4   | P70-1516VSR-1E-22 |
| 23      | Power cable with plug                     | 1   | P70-1516VSR-1E-23 |
| 24      | Thick wire to motor with wire connector   | 1   | P70-1516VSR-1E-24 |
| 25      | Thin wire to RPM reader w/ wire connector | 1   | P70-1516VSR-1E-25 |
| 26      | Motor cable with wire connector           | 1   | P70-1516VSR-1E-26 |

Complete Controller Assembly (#1 to 26)  
P70-1516VSR-1EA

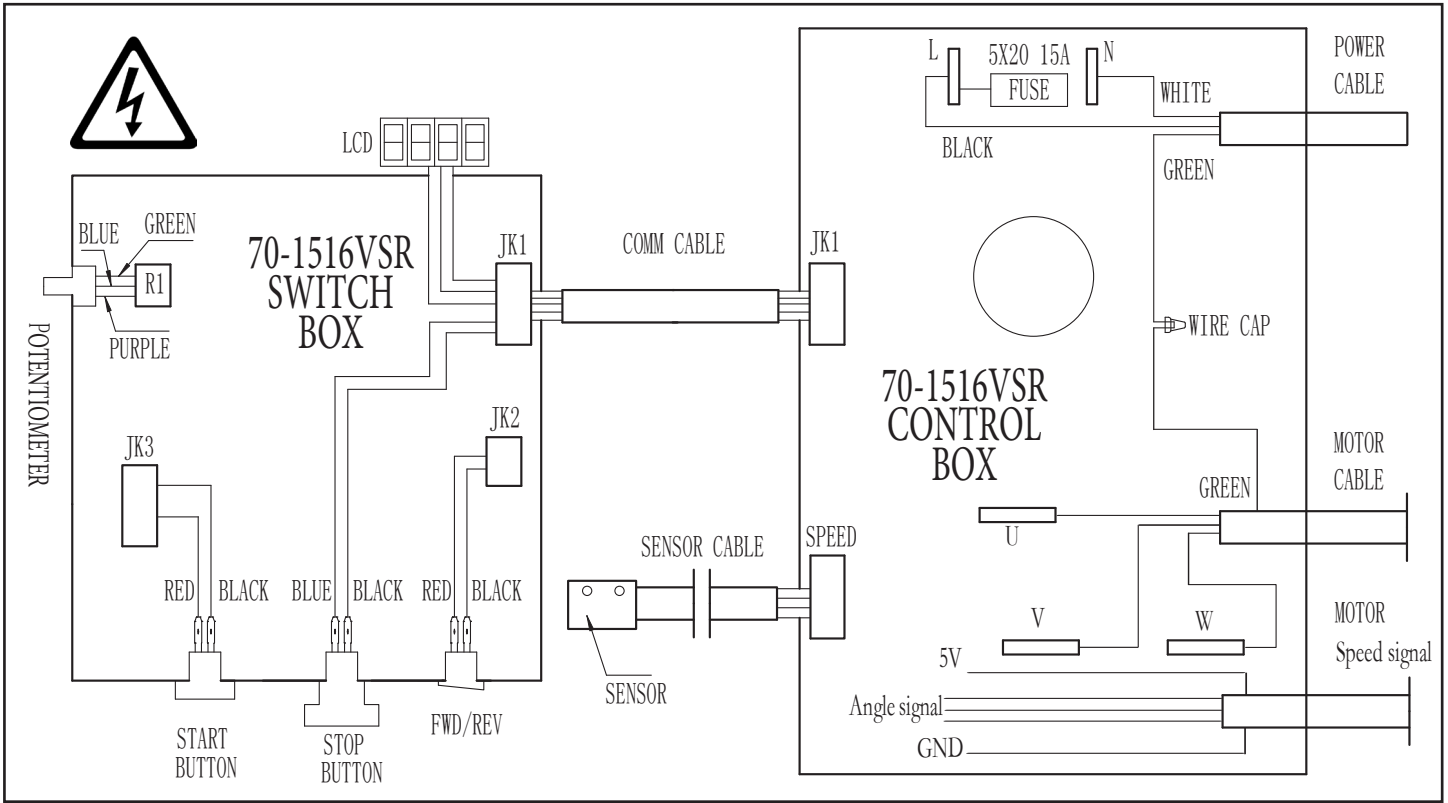
Controller Box Assembly (#19 to 22)  
P70-1516VSR-1E-CBA

See page 24 for the 70-1516VSR  
Wiring Diagram, page 16 for  
electronic trouble shooting codes  
and page 5 for additional electrical  
information.

# WIRING DIAGRAM

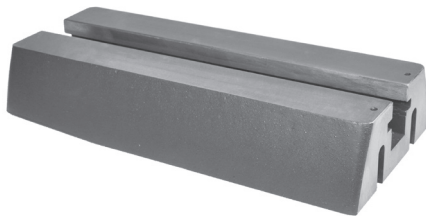


This machine must be grounded. Replacement of the power supply cable should only be done by a qualified electrician. See page 5 for additional electrical information.

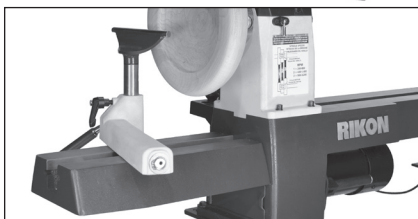


## ACCESSORIES

### 70-903 13-1/2" LATHE BED EXTENSION



This short, 13-1/2" cast iron extension bolts to the *left*, headstock end of the 70-150VSR and 70-1516VSR Lathes for outboard turning. It extends the lathes' swing diameter capacity from 12" to 15-1/4".



It also fits onto the *right*, tailstock end of the lathes to extend spindle length capacity to 30".

NOTE: If the lathe is on a stand, a stand extension is not needed for the 70-903.



### 70-904 24" LATHE BED EXTENSION

Made of heavy cast iron, it bolts to the right end of the 70-150VSR and 70-1516VSR Lathes to extend the working spindle length capacities to 44".



### 70-920 LATHE STAND

Universal, all-steel Stand adjusts from 23-1/4" to 37-1/4" long, and 24-1/2" to 34-1/2" working height.



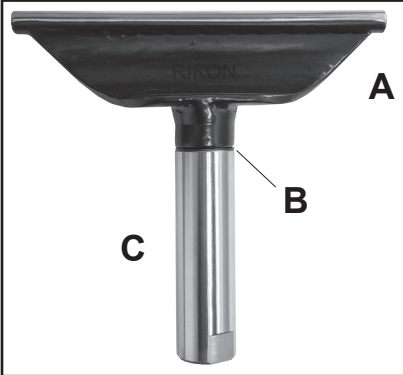
### 70-913 LATHE STAND EXTENSION

Universal, all-steel Stand Extension bolts onto the 70-910 and 70-920 stands to support lathes with Bed Extensions. The stand extension adjusts from 18-3/4" to 32-1/4" long, and 24-1/2" to 34-1/2" working height.





# ACCESSORIES



## RIKON PRO TOOL RESTS

Interchangeable turning Tool Rest Tops and Posts let you mix and match parts to meet the tool rest sizes that you need.

Posts have M12 x1.25 threaded ends that install into the base of the Tool Rest Tops.

The Spring Washer secures the post and top together.

### A. PRO Tool Rest Tops only

**70-975** 4" (102mm) Long

**70-976** 6" (152mm) Long

**70-977** 8" (203mm) Long

**70-978** 12" (305mm) Long

### B. Compression Spring Washer only

**70-970** 1" (25.4mm) diameter

### C. PRO Tool Rest Posts only (includes Washer)

**70-965** 4-5/16" (110mm) Long x 1" (25.4mm) diameter

**70-966** 5-1/8" (130mm) Long x 1" (25.4mm) diameter

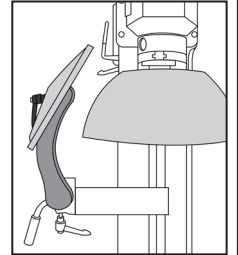
**70-967** 3-3/4" (95mm) Long x 1" (25.4mm) diameter

**70-969** 3-3/8" (85mm) Long x 1" (25.4mm) diameter

**70-968** 2-3/4" (70mm) Long x 5/8" (15.9mm) diameter

## 70-960 TOOL REST EXTENSION

Increases the reach of tool rests for turning surfaces not possible with standard tool rests. Has 1" post and hole, with 7-1/2" reach.



## 70-942 60° LIVE CENTER

Great for centering stock with 1/8" to 1-3/8" pre-drilled end holes for turning. Features sealed double ball bearings for smooth operation, #2 Morse Taper and alloy steel construction.



## 70-992 NYLON SPINDLE WASHER

Install on 1" x 8TPI lathe spindles for easier removal of faceplates and chucks.



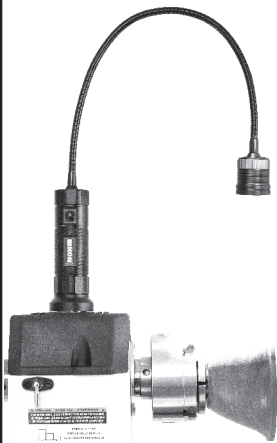
## FACE PLATES

Have holes for screw mounting of projects. For lathes with 1" x 8 TPI spindle threading.

**70-933** 3" Diameter

**70-936** 6" Diameter

## 12-202 LED WORK LIGHT WITH MAGNETIC BASE



LED bulb produces 500 lumens of light and the beam adjusts in size by focusing the magnifying lens. Flexible 18" long gooseneck bends to position the light right where you need it. The magnetic base holds firmly on any steel surface. Light runs on 3 AA batteries (not included), or with the supplied USB cord and electrical outlet converter (not included). Includes a side clip with magnetic back for alternative mounting options on steel products.

## 70-800 WOOD TURNING SYSTEM

RIKON's 4-piece turning set features tungsten carbide cutters that keep their sharp cutting edges longer than typical carbon or high speed steel tools. If a cutter becomes dull, just rotate it to work with another fresh new edge. Changes only take seconds. System includes a 16" long handle with anti-vibration grip and collet chuck. Three, 8-3/8" steel Shafts with Circle, Square or Diamond shaped carbide Insert Cutter. Packaged in a presentation storage box.



## 30-991 DRILL CHUCK & ARBOR SET

Set includes Keyed Chuck with 1/32" to 5/8" diameter holding capacity. Use on lathes with MT2 spindle holes.

## ADDITIONAL LATHE ACCESSORIES

For additional lathe accessories or replacement parts, contact your local RIKON distributor, or visit the RIKON website at [www.rikontools.com](http://www.rikontools.com).



# RIKON

## POWER TOOLS®

### 5-Year Limited Warranty

RIKON Power Tools Inc. ("Seller") warrants to only the original retail consumer/purchaser of our products that each product be free from defects in materials and workmanship for a period of five (5) years from the date the product was purchased at retail. This warranty may not be transferred.

This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence, accidents, repairs, alterations, lack of maintenance or normal wear and tear. Under no circumstances will Seller be liable for incidental or consequential damages resulting from defective products. All other warranties, expressed or implied, whether of merchantability, fitness for purpose, or otherwise are expressly disclaimed by Seller. This five-year warranty does not cover products used for commercial, industrial or educational purposes. The warranty term for these claims will be limited to a two-year period.

This limited warranty does not apply to accessory items such as blades, drill bits, sanding discs, grinding wheels, belts, guide bearings and other related items.

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

To take advantage of this warranty, proof of purchase documentation must be provided which has the date of purchase and an explanation of the complaint.

The Seller 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.

**To register your machine online, visit RIKON at [www.rikontools.com/warranty](http://www.rikontools.com/warranty)**

**To take advantage of this warranty, or if you have any questions,  
please contact us at 877-884-5167 or email [warranty@rikontools.com](mailto:warranty@rikontools.com)**



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LINK TO RIKON WEBSITE