






Owner Manual

Sweet Sixteen Version 2.0



Before starting your
Sweet 16:



<p>Plug your lathe into a working outlet of the proper voltage. If 110 volts, use the standard household grounded outlet. If 220 volts, use a NEMA 6-20 outlet, rated for 250 volts and 20 Amps. Available at any hardware store.</p> <p>Note: GFI circuits are NOT compatible with your lathe.</p>	 <p>NEMA 5-15, 110 volt NEMA 6-20, 220 volt</p> <p>DO NOT USE GFI CIRCUITS</p>
<p>Be sure the spindle lock is all the way down – engaging the spindle lock disconnects the controls. Please note, the spindle lock might be only part way up – not enough to lock the spindle, but enough to disconnect the controls.</p> <p>X DO NOT use the key pad on the inverter to run the lathe. Use the magnetic backed controller.</p> <p>When plugged in, the display will read “Stop”. When running, the spindle RPM is displayed.</p> <p>Your inverter may be beige or blue. Both work the same.</p>	 <p>Push it all the way down</p> <p>X</p>
<p>For safety sake, turn the speed dial to the lowest setting every time you start the lathe.</p> <p>This is a great habit to get into.</p>	 <p>Spindle Speed</p> <p>Forward/Reverse</p> <p>Spindle Stop</p>


Robust Tools, LLC 101 Business ID Barneveld, Wisconsin 53507

Please read the trouble shooting section. Phone: 608-924-1133 Email: info@turnrobust.com

ROBUST LATHES HAVE BEEN TESTED TO UL STD. 987 and CSA STD. C22.2 No. 105 AND ARE CE COMPLIANT

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WOODTURNING SAFETY

 Failure to follow safety rules may result in serious personal injury.

1. **READ AND UNDERSTAND** the entire owner's manual before attempting assembly or operation.
2. **READ AND UNDERSTAND** the warnings posted on the machine and in this manual. Failure to comply with all of these warnings may cause serious injury. Replace the warning labels if they become obscured or removed.
3. **GET TRAINING:** This Lathe is designed and intended for use by properly trained and experienced personnel only. If you are not familiar with the proper and safe operation of a Lathe, do not use until proper training and knowledge have been obtained.
4. **DO NOT USE THIS LATHE FOR OTHER THAN ITS INTENDED USE.** If used for other purposes, Robust Tools LLC disclaims any real or implied warranty and holds itself harmless from any injury that may result from that use.
5. **KEEP GUARDS IN PLACE** and in working order.
6. **REMOVE ADJUSTING KEYS AND WRENCHES.** Form the habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.
7. **KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents. Keep shop floor free of tripping hazards. Woodturning generates chips and sawdust. Clean up debris and keep your work area clean. Sawdust is a fire hazard.
8. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well lighted.
9. **KEEP CHILDREN AWAY.** All visitors should be kept a safe distance from work area.
10. **MAKE WORKSHOP KID PROOF** with padlocks, master switches, or by removing starter keys.
11. **DON'T FORCE TOOL.** It will do the job better and safer at the rate for which it was designed.
12. **USE RIGHT TOOL.** Don't force tool or attachment to do a job for which it was not designed.
13. **USE PROPER EXTENSION CORD.** Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage resulting in loss of power, overheating or malfunction. If in doubt, use the next heavier gage. The smaller the gage number, the heavier the cord. See table below:

Recommended wire size for extension cords based on length	25 feet	50 feet	100 feet
	14 AWG	14 AWG	12 AWG
NOTE: Cords longer than 100 feet are not recommended			

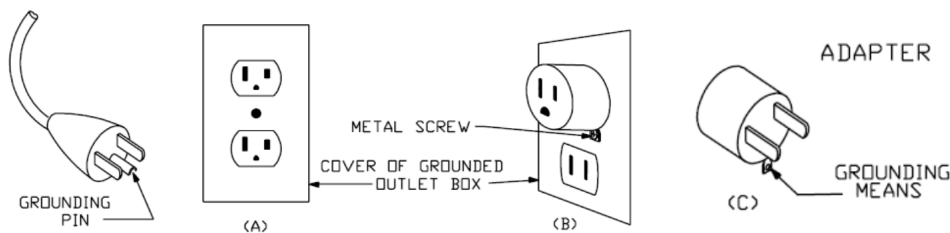
14. **WEAR PROPER APPAREL.** Do not wear loose clothing, gloves, neckties, rings, bracelets, or other jewelry which may get caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair, including beards.
15. **ALWAYS USE SAFETY GLASSES AND FACE SHIELD.** Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.
16. **SECURE WORK.** Use appropriate chucks, faceplates or other work holding devices to hold work when practical.
17. **DON'T OVERREACH.** Keep proper footing and balance at all times.
18. **MAINTAIN TOOLS WITH CARE.** Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
19. **DISCONNECT TOOLS** before servicing; when changing accessories, such as blades, bits, cutters, and the like.

20. **REDUCE THE RISK OF UNINTENTIONAL STARTING.** Make sure switch is in off position before plugging in.
21. **USE RECOMMENDED ACCESSORIES.** Improper accessories may be hazardous. Consult the accessory owner's manual before use. The use of improper accessories may cause risk of injury to persons.
22. **NEVER STAND ON TOOL.** Serious injury could occur if the tool is tipped or if the cutting tool is unintentionally contacted.
23. **CHECK DAMAGED PARTS.** Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function – check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.
24. **DO NOT MODIFY LATHE.** Do not modify lathe or use in a manner for which it was not designed.
25. **DUST WARNING.** The dust generated by some woods and wood products can cause health problems. Operate equipment in well ventilated areas and provide proper dust removal. Use a dust collection system whenever possible. Also use a dust mask or other personal protection.
26. **DISCONNECT FROM POWER.** Disconnect the equipment from power when assembling or maintaining.
27. **CHECK LATHE SET-UP WITH POWER OFF.** Examine the lathe set-up carefully and rotate the work piece by hand to check clearance before turning on power.
28. **NEVER LEAVE LATHE RUNNING UNATTENDED.** Do not leave lathe unless it is turned off and has come to a complete stop.
29. **MAKE ALL ADJUSTMENTS WITH POWER OFF.** Do not make adjustments when the lathe or work piece is turning. Make all adjustments with power off.
30. **TIGHTEN ALL CLAMPS BEFORE OPERATING LATHE.** All clamp handles on the banjo, toolrest, tailstock and auxiliary equipment should be tightened before operating lathe.
31. **CHECK THE WORKPIECE CAREFULLY** for splits, knots or other obstructions which may cause a safety risk while turning. Do not turn unsound wood.
32. **USE SLOW SPEED WHEN STARTING.** Always start out with slow speeds when turning a new or unbalanced work piece.
33. **ADJUST TOOLREST CLOSE TO THE WORK PIECE.** Before turning, rotate the work piece by hand to make sure it clears the toolrest. When turning, occasionally stop the lathe and readjust the toolrest to keep it close.
34. **KEEP TOOL ON TOOLREST.** Lathe tools should remain on the toolrest whenever the tool is in contact with the work piece.
35. **REMOVE TOOLREST WHEN SANDING OR FINISHING.** When sanding or finishing your work piece, remove the toolrest to prevent your fingers from getting pinched.
36. **FASTEN WORK PIECE SECURELY BETWEEN CENTERS.** When turning between centers, make sure the work piece is secure and that tailstock is locked before turning.
37. **USE CAUTION WHEN USING THE LATHE IN REVERSE.** When using reverse, be sure to secure the work holding device (chuck, faceplate, etc.) to the spindle with safety set screws. Reverse is generally only used when sanding.
38. **NEVER STOP A ROTATING WORKPIECE WITH YOUR HAND**
39. **IF GLUING UP A WORKPIECE:** always use a high-quality glue of the type necessary for that particular workpiece.
40. **FOLLOW LOCAL ELECTRICAL CODES.** Make sure wiring codes and recommended electrical connections are followed and that the machine is properly grounded

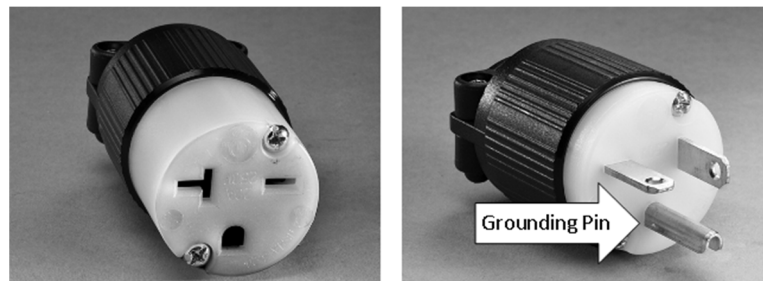
41. **GROUNDING INSTRUCTIONS:** In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. You lathe is equipped with an electric cord having an equipment grounding conductor and a grounding plug. The plug must be plugged into a matching outlet that is properly installed and grounded in accordance with all local codes and ordinances.

Do not modify the plug provided – if it will not fit the outlet, have the proper outlet installed by a qualified electrician. Improper connection of the equipment-grounding conductor can result in a risk of electric shock. The conductor with insulation having an outer surface that is green with or without yellow stripes is the equipment-grounding conductor. If repair or replacement of the electric cord or plug is necessary, do not connect the equipment-grounding conductor to a live terminal. Check with a qualified electrician or service personnel if the grounding instructions are not completely understood, or if in doubt as to whether the tool is properly grounded. Use only 3-wire extension cords that have 3-prong grounding plugs and 3-pole receptacles that accept the tool's plug. Repair or replace damaged or worn cord immediately.

Lathes wired to run on 110-120 volt circuits are intended for use on a circuit that has an outlet (NEMA 5-15) that looks like the one illustrated in Sketch A in the figure below. The tool has a grounding plug that looks like the plug also illustrated in the figure. A temporary adapter, which looks like the adapter illustrated in Sketches B and C, may be used to connect this plug to a 2-pole receptacle as shown in Sketch B if a properly grounded outlet is not available. The temporary adapter should be used only until a properly grounded outlet can be installed by a qualified electrician. The green-colored rigid ear, lug, and the like, extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box.





Lathes wired for operation on a 220-240 volt circuit are intended for use on a circuit that has an grounded outlet and plug that looks like those illustrated below (NEMA 6-20).




***** SAVE THESE INSTRUCTIONS *****

Installation

Consideration	Recommendation
Unpacking	Your lathe is shipped fully assembled. Robust lathes are heavy. Get help. Use care when removing the lathe from the pallet. Use a 2x4 under the ways to lift one end of the lathe at a time off of the pallet. Remove any packing grease with a rag.
Lathe Location	The best location is on a level concrete floor close to a power source in an area with good lighting. Provide clearance on all sides of the lathe. Other machines in your shop should not interfere with the operation of the lathe.
Lighting	Your shop and the work area around the lathe should have adequate lighting. A movable spotlight may be helpful. A light stand-off mount is included on top of the headstock for easy light mounting.
Bolting to Floor	If you do not plan to move your lathe, you might consider bolting it to the floor. First make sure it is level and settled per other instructions in this manual and then use any good quality anchor. If you are bolting to concrete, make sure there are no expansion joints or cracks between the legs. If bolting to a wooden floor, it is best to get over the joists. Settle the lathe both before and after bolting.
Ventilation	Your shop should be adequately ventilated. The amount of ventilation needed varies based on the size of the shop and the amount of work done. The use of dust collectors and filters will minimize risks to your health. Some woods are toxic or will cause allergic reactions.
Electrical	<p>Most Robust lathes are wired for 220V. An isolated 220VAC, 20 amp circuit is required. Wiring and outlets should adhere to local electrical codes.</p> <p>Lathes wired for 110 (1.5HP only) should be on a dedicated 110 volt 20 amp circuit.</p> <p>Avoid using extension cords.</p>
	<p>Required 220 Volt <u>NEMA 6-20</u> Receptacle</p>  <p> If you are in doubt about the power connection, seek advice from a qualified electrician.</p>
Lathe Height	Most turners like to adjust the height of the lathe legs so the centerline of the lathe spindle is at the elbow height of the turner. Adjust up or down from there to where it is comfortable for you. See instructions for this elsewhere in the manual.

Routine Maintenance

Interval	Maintenance
After each use	<p>Clean the work area and lathe. Clear dust from the inside the headstock, between the lathe bed rails, and under the banjo and tailstock. Clean up any finish or glue from ways.</p> <p> Some solvents and glues will affect the painted surfaces. Cover up the paint if you don't want it affected by solvent and glues.</p>
Monthly	Remove the banjo and clean and lightly lubricate the cam shaft and cam shaft follower. Lubricate the bed ways with paste wax. Clean and lubricate with one or two drops of light-weight oil the outside of the quill and the tailstock cam shaft. Loosen belt and clean its contact side and the grooves in the pulleys. Recheck belt tension. Remove tool rest clamp from banjo and clean and lubricate bushings and holes.
6 Months	Clean and grease tailstock quill threads-- screw the quill all the way out, grease the nut in the quill and crank the quill back in; wipe off excess. Any general purpose grease is fine
Never	The spindle and motor bearings are permanently lubricated and need no maintenance.

⚠ Do not leave the lathe unattended with power on. It is recommended that you unplug the lathe when you take an extended break or are finished with your turning session. This also gives you maximum protection against power surges and lightning strikes.

Electric Motor

Your lathe is equipped with a 3 phase AC industrial grade motor. The motor is fan cooled and there is an overheat protection circuit built into the inverter.

Variable Frequency Drive or “Inverter”

Your lathe is equipped with an industrial grade variable frequency drive (VFD), also known as an “inverter”. The drive takes normal household current and converts it to industrial 3 phase power. When you change the spindle speed dial on the pendant controller, the drive changes the frequency sent to the motor which changes the motor speed. The drive also calculates the spindle RPM and shows the results on its display.

The drive is factory set with parameters that most turners will like. The drive manual, included with the lathe, shows how to change the settings. Changing certain settings will prevent your lathe from running properly, if at all. Other settings, such as ramp up and ramp down speeds can be set to your liking.

⚠ It is strongly recommended not to change any parameters until you are very familiar with your lathe. If you are unhappy with your changes, contact Robust Tools for the default parameters.

VFD (aka “inverter”) located on the side of the headstock




Pendant Controller

The corded pendant controller is used to control major functions of your lathe. It has strong rare earth magnets on the back so it can be moved and attached to sections of your lathe as needed.

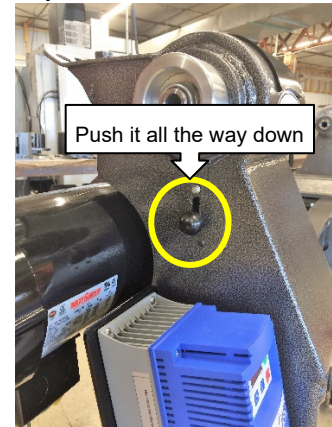
Control	Function	<div>CONTROLLER</div>
Spindle Speed Dial	Determines speed (rpm) of lathe: 0- slowest, 10- fastest. ⚠ It is a good idea to set the speed to 0 and gradually increase to the desired level every time you mount a new work piece or turn on your lathe.	
Spindle Direction Switch	Determines rotational direction of spindle: Left- Reverse - Right- Forward ⚠ To change rotation, turn the switch, even when the lathe is running. The lathe will slow down, stop, and then reverse direction. This will not harm the drive or motor. ⚠ Use caution when running the lathe in reverse. Your work holding device (chuck, faceplate, etc.) should be secured to the spindle if reverse is used.	
Stop Button	Press to stop spindle rotation.	

Spindle Lock Knob

The Spindle Lock Knob is located under the handwheel. Slide it up to engage the spindle lock. Slide it down to disengage.


 The lathe cannot be operated when the Spindle Lock Knob is in the up position. This serves as a safety interlock. Please note that the Spindle Lock Knob must be all the way down for the lathe to start and run in a normal fashion. Sometimes the knob will jiggle up just enough to open the internal switch and the lathe will not run until the knob is pushed all the way down.

Spindle Lock Sweet 16




Mounting a Faceplate or Chuck

1. Turn off the lathe.
2. Move the Spindle Lock Knob to the up position to secure the spindle.

 For safe operation, the faceplate or chuck body must contact the shoulder on the spindle.

3. Screw the faceplate or chuck onto the spindle threads. Some turners like to use a spindle washer before installing a faceplate or chuck.
4. Push the Spindle Lock Knob down to release the spindle.


 Some faceplates and chucks are equipped with a set screw to secure them to the spindle. Before tightening this set screw, ensure that it lines up with the groove provided on the spindle.

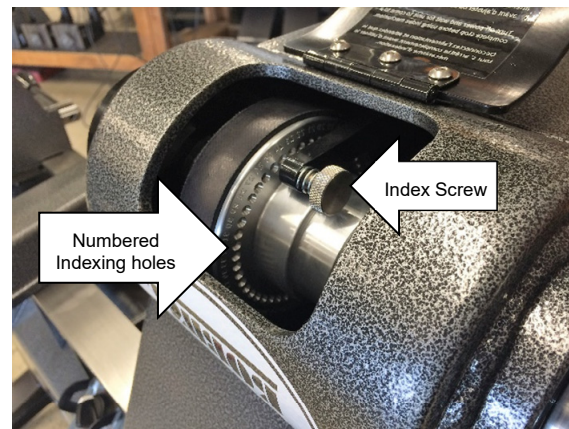
Lathe Spindle




Using the Spindle Index

The spindle index screw is used to position the headstock spindle in discrete increments. It is selectable in 7.5 degree increments. This can be used to divide 360 degrees into 2, 3, 4, 6, 8, 12, 24, or 48 divisions.

1.  Turn off the lathe. For extra safety, unplug it too.
2. Open the top headstock cover to gain access to the Spindle Index Screw.
3. Turn the spindle handwheel to align the screw to the desired hole and finger-tighten the Spindle Index Screw



 Make sure the spindle index screw is disengaged before operating the lathe.

Banjo and Toolrest Operation

BANJO: To move the banjo, move the Banjo Release Lever to a vertical position, slide the banjo to the desired position, then move the Banjo Release Lever left or right to lock the banjo in place.

When locked, the Banjo Release Lever should go just past horizontal: Apr. 4:00 when to the right and 8:00 if to the left.

Keep bottom of banjo and banjo shaft clean and only lightly oiled. This minimizes dust build up and dragging.

TOOLREST: To adjust the toolrest, loosen the Toolrest Clamp Handle, position the toolrest, and tighten the clamp handle.

TOOLREST CLAMP LEVER: The toolrest clamp can be adjusted to position in a convenient spot when the toolrest is clamped. To make the adjustment, first clamp a toolrest into the banjo. Then simply pull out on the handle, turn it to the desired spot and push it back in.

The toolrest clamp is also reversible. To reverse the tool rest clamp, loosen it and remove the tool rest. Pull the tool rest assembly straight out and insert from the other side. Make sure the bevels on the tool rest clamp bushings are located to accept the tool rest post.

- ⚠ Keep the toolrest close to the work. Stop the lathe to adjust the toolrest. Spin the work by hand before starting to make sure all parts of the work piece clear the toolrest.
- ⚠ Gouges and chisels should remain on the toolrest whenever the tool is in contact with the work piece.
- ⚠ Remove the toolrest when sanding or polishing so fingers do not get pinched.

Using the Banjo and Toolrest - American Beauty shown – S16 operates the same



Tailstock Operation

To move the tailstock along the bed, lift the handle to the unlock the tailstock and slide it to the desired spot. Then push the lever down to the lock the tailstock in place.

To move the tailstock quill in or out, loosen the Quill Lock and turn the Quill Handwheel. Lock the quill by tightening the quill lock.

HINT: adjust the Quill Lock so that it is level when locked, that way it only takes a ¼ turn to unlock it.

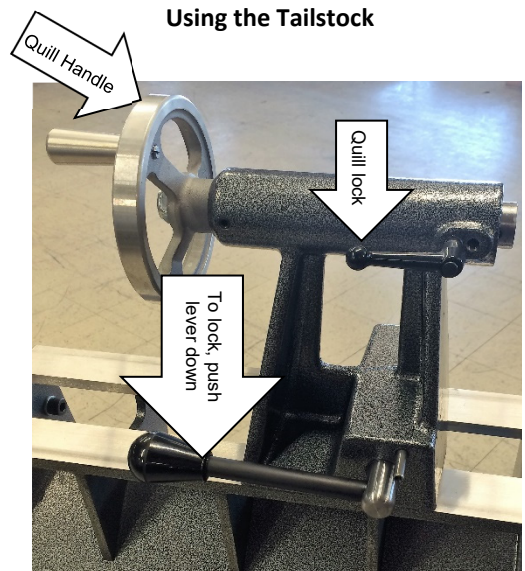
The tailstock quill accepts accessories with #2 Morse taper.

To install an accessory with a Morse taper, first clean the male and female parts. Use a quick, firm action by hand. Do not pound.

To remove the accessory, turn the Quill Handwheel to screw the quill back into the tailstock, and the accessory should self-eject. Please note, if your accessory is short, self-ejection may not work. Use your knock-out rod to remove those accessories.

- ⚠ Never loosen the tailstock while the work piece is turning.

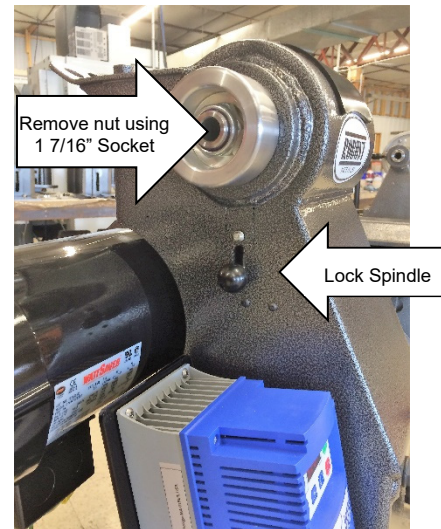
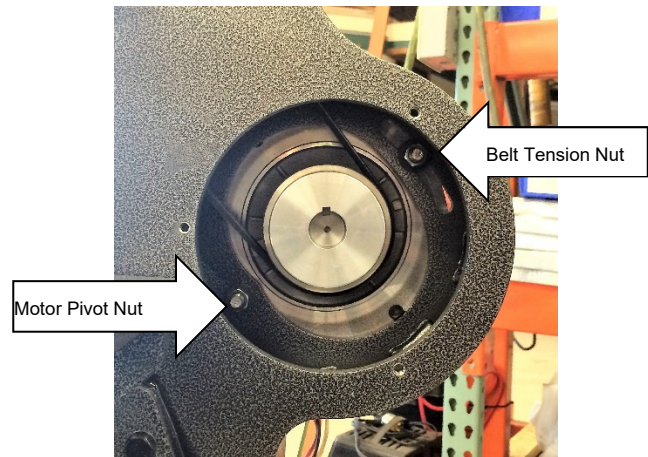
Using the Tailstock



Spindle Removal and/or Belt Replacement

Your lathe is equipped with a high quality ten groove Poly-V belt that is designed to provide years of service. If you should ever find a need to replace it, follow these instructions.

1. ⚠ Stop the lathe, **disconnect from power** and open top and front headstock covers.
2. Loosen the Belt Tension and Motor Pivot Nuts and raise the motor to loosen the belt. Snug the nuts once the belt is loose to hold the motor in place.
3. Lock the spindle using the spindle lock and remove the nut securing the handwheel using a 1-7/16" socket wrench. Then remove the handwheel and unlock the spindle.
4. Remove the index screw. OK to leave the bracket.
5. Using a 3/16 inch Allen wrench, remove the cap screws on the front spindle bearing boss.
6. The spindle comes out as a complete unit. To remove it, tap the handwheel end of the spindle with a block of wood. You can also screw two of the cap screws into the threaded jack screw holes in the boss to push the spindle assembly out. You may need to clean debris from the holes first.
7. Remove the old belt and replace with new belt.
8. If you used jack screws to extract the spindle, now is the time to remove them from the bearing boss.
9. Clean all mating parts before reassembly and clean the grooves in the pulleys. Clean the grooves in the belt too.
10. Insert the spindle assembly back into the headstock and replace and tighten the cap screws.
12. Reinstall the index screw.
13. Reinstall the spindle handwheel and nut. **The nut should be tightened until it just seats, and no more.**
14. Position the belt on the pulleys and tighten the belt.
15. Close the top and front headstock covers.



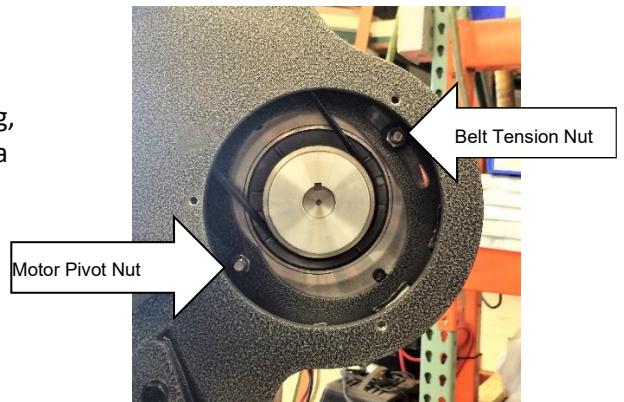
Lifting out the spindle



Adjusting Drive Belt Tension

The belt does not need to be overtight. Having the belt a bit loose is actually beneficial sometimes, like when you are coring, as the belt will slip instead of stalling the motor when you get a catch or overload the system.

To adjust the belt tension, remove the cover plate and loosen both the Motor Pivot and Belt Tension Nuts. You don't need anymore tension on the belt than you can apply by hand. Do not use a lever on the motor or pulley to increase tension. Doing so just puts needless stress on the motor bearings and will lead to their premature failure.



Optional Vacuum Adapter

The vacuum adapter simply slips into the spindle on the handwheel end.

Some lubricant on the O-rings makes this process easier and extends the life of the O-rings. If you do wear out the O-rings, they are a common size and found at any hardware store



Sweet 16 Recommended Woodturning Speeds		
Maximum Diameter in inches	Recommended starting speed for sound and balanced work	Recommended maximum speed for sound and balanced work
32	188	281
30	200	300
28	214	321
26	231	346
24	250	375
22	273	409
20	300	450
18	333	500
16	375	563
14	429	643
12	500	750
10	600	900
8	750	1125
6	1000	1500
4	1500	2250
2	2900	2900
Important Notes: Speeds in this chart are conservative guidelines for sound and balanced work. If your work is unbalanced or contains defects of any kind, much lower speeds should be used. If the wood has structural flaws, do not turn it!		

Mounting a Work Light

A light stand-off for mounting a work light is provided on top of the headstock. It accepts a 1/2 inch diameter stem, which is the standard size of most work lights, like the Robust lamp pictured.

Recommended bulbs include pig tail style fluorescents and LED lights. Both give higher energy efficiency and cooler operation than incandescents. A tungsten bulb can cause burns if touched.

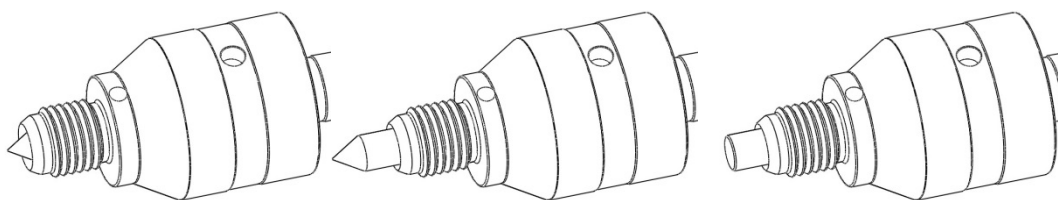
Light Stand-off



LIVE CENTER: A precision 40 degree angular contact ball bearing, sealed & lubricated for life, carries both the thrust load and rear radial load. It may feel loose when not under load. This is normal.

DRIVE CENTER: The cup style drive center is perfect for safely driving spindles and small bowls. To use it, tap it into the wood before mounting. If you get a catch, the wood just spins on the center. Like our Live Center, the tip is adjustable and reversible. The Bowl Drive threads onto the cup center and provides more surface area for driving larger work.

BOTH CENTERS: The contact rings of the centers are the same diameter so you can reverse your work and it should run true. The tips of the live and drive centers extend and reverse to accommodate your turning. Both are threaded 3/4-10 for standard accessories. A 5/16" thru hole accommodates drilling or for knocking the pin out.



Built-in Turning Tool Rack

The Sweet 16 has a built-in rack for turning tools. Some turners line the rack with 2" PVC pipe.



Optional 110 Volt E-Box and Tool/Tailstock Rack

Optional four outlet 110 volt electrical box and optional tool/tailstock rack are shown.



Tailstock Extension & Wedge

Used to extend the quill and especially useful when the S16's gap is removed. The male end goes in the quill, and the female end accepts your live center or other #2 Morse Taper accessory.



A wedge is also provided to assist removing the live center or other accessory from the extension.

Reversed Banjo



Reversing the Banjo

To reach across the gap it is sometimes beneficial to reverse the banjo.

The banjo can be reversed by unscrewing the black handle near the tool rest and threading it into the other end.

As mentioned previously the toolrest clamp can also be reversed.

In some cases, you may want to use the optional Tool Rest Dog Leg to get out over the exposed stem of the banjo when it is used in the reversed configuration. You will need to use Low Profile style rests to keep below the center line of the work.

Using the Optional Dog Leg

The Toolrest Dog Leg offsets the tool rest to reach tight spaces.



When the S16 banjo is reversed, use the Dog Leg to reach across the cam shaft stem.

Removing the Gap Bed

- 1) Loosen the two gap bed retaining bolts on top of the gap section with the provided $\frac{3}{4}$ " wrench or user supplied socket. They are captive and you will not be able to completely remove them.
- 2) Lift the gap bed up and out of the gap.
- 3) The gap bed can either be hung on the front of the lathe for turning large diameter work or hung on the end of the lathe for long spindle work.
- 4) Use the tailstock to align the gap bed with the ways when used for spindle turning. To do this, first hang the gap bed on the end. Then slide the tailstock so that the large keeper washer underneath the tailstock is centered on the gap between the lathe bed and gap bed. Tighten the tailstock and then tighten the nuts on the hanger studs.
- 5) When reinstalling the gap bed, be sure the mating surfaces are clean.

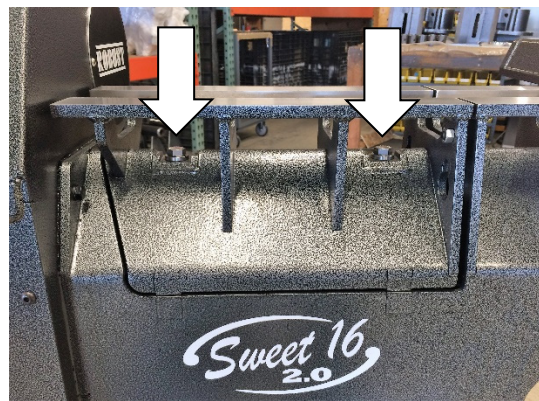
HINT: Watch the video on our website where this is demonstrated.



Be sure to tighten the bolts or nuts on the gap bed –regardless of where it is positioned, before you start to turn.



Clean the mating surfaces of sawdust or other debris before reinstalling the gap bed, otherwise mis-alignment will occur.



Gap Bed Positioned for Large Diameter Work
(earlier version of S16 shown)



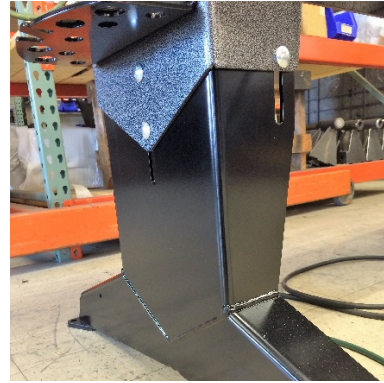
Gap Bed Positioned for Extended Spindle Turning
(earlier version of S16 shown)



Adjusting the Height

The headstock and tailstock legs are slotted so that the spindle height of the lathe can be adjusted.

Adjustments should be made one end at a time. **Support the lathe with a jack before loosening all four leg bolts.** Loosen all four bolts, adjust the jack so that the lathe is at the desired height and then tighten the bolts.



“Settling” the lathe

It is important that the weight of the lathe is supported evenly on all four feet. After adjusting the height or moving the lathe, you may find that the lathe is not setting evenly in its new location.

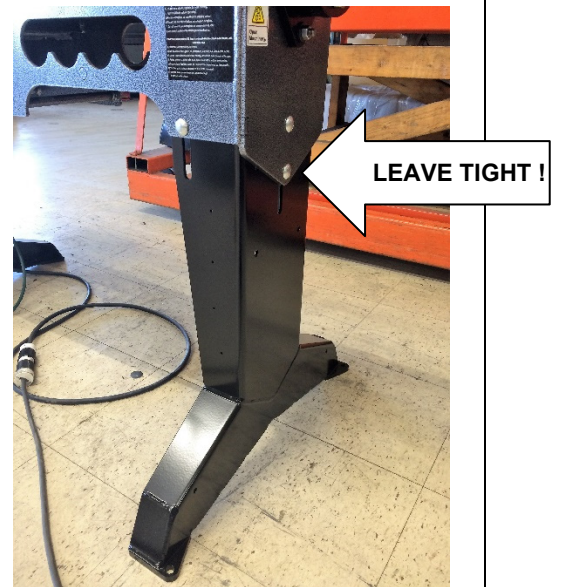
To settle the lathe evenly on the floor, loosen the two bolts on the sides and the top bolt on the end just enough to get the washers loose.



KEEP THE BOTTOM BOLT ON THE END OF THE LATHE TIGHT WHILE SETTLING THE LATHE.

Then rock the bed and let the lathe settle to your floor conditions. Go back and tighten the bolts you loosened. Your lathe should now be sitting with its weight evenly distributed on each foot.

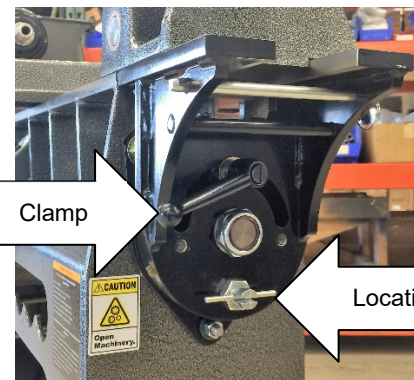
Having the lathe sitting evenly on the floor is more important than having the lathe perfectly level. Hard rubber pads are also provided. Put one under each foot after you have the lathe positioned.



Optional Tilt Away™

Follow the installation instructions that are provided if you ordered the optional Tilt-Away. To use it:

1. Slide the tailstock onto the Tilt Away and lock in position.
2. While holding onto the tailstock with one hand, loosen the black clamp handle and then pull out and rotate the locating pin with your other hand.
3. Carefully tilt the tailstock to the front or back to get it out of the way.
4. To bring the tailstock back up, unlock the locating pin and lift the tailstock up until the locating pin drops into place.
5. Slide the tailstock half way onto the lathe bed and lock the black handle.



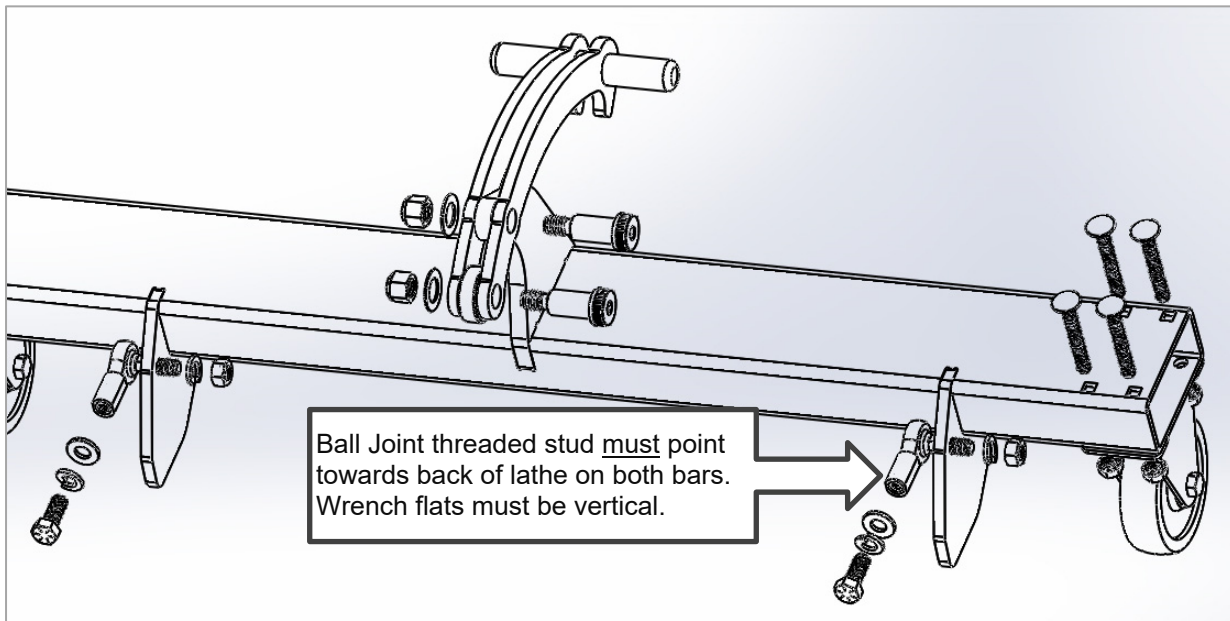
ASSEMBLING THE OPTIONAL CASTER KIT

Special Note: One bar gets two straight casters, put it on the headstock end. The other bar gets a single swivel caster in the center, it goes on the tailstock end.

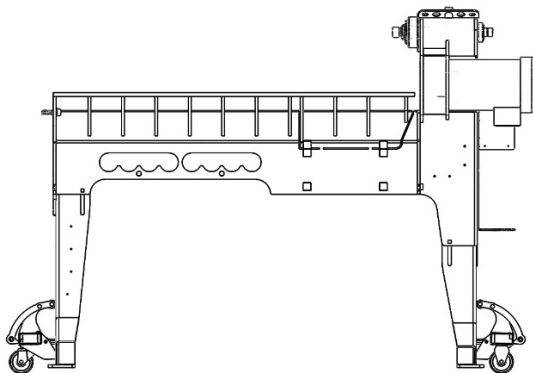
Assemble as shown in the picture below. Please note the orientation of the ball joints. The threaded studs must point towards the back of the lathe on both bars. Also, when attaching the ball joints to the frame, the wrench flats should be vertical.

 **Raise casters before turning.**

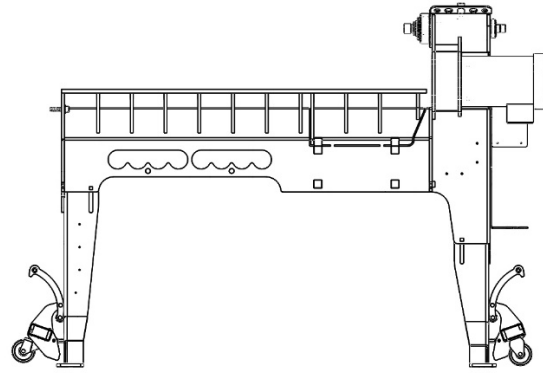
PARTS LIST	QTY.
Caster Bar, Double	1
Caster Bar, Single	1
Caster Handle	2
Roller Bearing	2
½ x 1" Shoulder Bolt	4
½" Washer	4
3/8" Lock Nut	4
Straight Caster	2
Swivel Caster	1
¼" - 20 x 2" Carriage Bolt	12
¼" - 20 toothed lock washer	12
Ball Joint	4
5/16" Flat Washer	4
5/16" Lock Washer	8
5/16"-24 Nuts	4
5/16"-24 x 7/8" Grade 8 Bolt	4



Using the Casters: Press down on the handle to engage the casters. Pull up on the handle to disengage.



Castors lowered for moving the lathe



Castors raised when turning

Trouble Shooting

FAILURE TO START: Try these steps in order:

1) Look at the inverter. Is the display lit up? If not, that means you don't have power. Check that the lathe is plugged in to a working outlet of the correct voltage and that that the circuit breaker has not tripped.

2) Does the inverter say "STOP"? If so, check your spindle lock: it may have jiggled or been bumped upward just enough to open the internal safety switch but not enough to lock the spindle. Push down on the spindle lock to close the internal switch. If the problem happens frequently, try tightening up the screw that puts tension on the spindle lock. You'll find it in the threaded hole directly below the spindle lock knob.

Also, look for dust or debris that might interfere with movement of the switches on the pendant controller. Disconnect power to the lathe, and then clean the switches with compressed air, paying extra attention to the small gap between the part of the switch that rotates and the bezel that surrounds it. Some disassembly may be required for especially dirty switches, like those contaminated by glue or finish.

3) Does the inverter say "FLF"? That indicates there is a GFI or GFCI somewhere on the circuit. They are not compatible with the lathe. Time to call an electrician.

4) If the inverter is lit up and says anything other than "STOP" it will be displaying an error code. You can look in the manual if you want to know the source. Common sources include overloading the machine when coring or taking heavy cuts and anomalies on the line like a lightning strike or power surge. The solution is simple:

Unplug the machine until the display goes completely blank. The error code will clear and reset the inverter (**a quick power down will not be sufficient**). If you are unable to resolve the situation, call Robust. **If it still will not run, DO NOT attempt to program the drive.**

INTERMITTENT STOPPING: If your lathe shuts down for no apparent reason while you are making cuts or turning out of balance work, but you can start it right back up, your spindle lock probably needs adjusting. See above.

ALIGNMENT: If your centers are out of line look for debris stuck to the bottom of the tailstock. A very small amount can make a big difference. If a thorough cleaning does not re-establish alignment, go through the settling procedure described elsewhere in the manual. If you have bolted your lathe down, it is especially important to go through the settling procedure beforehand to prevent twisting the lathe bed.

BANJO, TAILSTOCK OR HEADSTOCK WILL NOT SLIDE EASILY: Clean the bottoms and apply a light coating of wax. Also clean the cam shafts and cam sleeves and very lightly oil. Also make sure the clamp levers are vertical before you try to move the component.

VIBRATION: All lathes will vibrate if you have out of balance work and run the speed too fast. For systemic vibration problems, start with the feet. All four feet should be carrying about the same weight. This is more important than having your lathe level. Settle the lathe as described elsewhere. Also use the hard rubber pads supplied with your lathe.

Another source of vibration is loose mounting of your work. Chucks and faceplates must seat on the spindle shoulder. Use a thin nylon washer between the spindle shoulder and the chuck or faceplate. If your chucks or faceplate won't seat, see the next section on spindle maintenance.

SPINDLE THREAD MAINTENANCE: Your faceplates and chucks should spin on and off freely. To do so, the threads on your spindle, chucks and faceplates must be clean and burr-free. Every time you put something on the spindle you should clean the spindle threads and the accessory being mounted with compressed air and visually inspect both items for debris. Put a drop of mineral oil (won't stain wood) on the spindle every now and then.

MORSE TAPER MAINTENANCE: Morse tapers need to be clean and burr-free to work properly. If they are not, the inserted component can spin which may damage both the internal and external tapers. The "TaperMate" Morse Taper



Cleaner” available at many woodturning supply houses is a good at getting soft debris out of internal tapers. If your spindle or tailstock tapers have burrs or galls get a Morse taper hand reamer of the appropriate size. Do not attempt to fully restore a shiny internal surface with the reamer, just get the high spots off. Use cutting oil liberally. For the external surfaces, light passes with a smooth-cut file or a little sandpaper is usually all you need. Concentrate on the burrs, and leave good surfaces alone.

FINISH: The lathes are powder coated and the parts are either semi-gloss black or Silvervein. Powder coating is quite durable, but not indestructible. Certain solvents can negatively affect the finish. We have been told that Camphor, a wood common in the southeast, can also negatively affect the powder coat finishes. Silvervein is hard to touch up, so if you want to keep the lathe nice, cover surfaces when using glues and finishes.

TAILSTOCK QUILL: The tailstock quill should turn in and out easily. If your quill is not going in and out easily, remove the quill and clean and lubricate the mechanism. Spray grease is handy for the threads and inside of the quill hole. Sometimes burrs will form along the groove that the spindle lock rides in. It doesn’t take much of a burr to cause the quill to bind. Take a small file and remove the burr. Filing a small chamfer on the edge of the groove is also a good idea.

LATHE MAINTENANCE TOOL KIT: Here are a few things to have in your tool kit to keep your lathe in good order:

- Paraffin or paste wax for lathe bed and underside of banjo, tailstock and sliding headstock
- Sharp three corner file with one side ground safe for deburring spindle threads
- Bottoming tap the same size as your spindle for cleaning chuck and face plate internal threads
- Spray grease for quill
- Scotch Brite for cleaning lathe bed and underside of banjo, tailstock and sliding headstock
- Small stiff brush for cleaning belt and pulleys
- Mineral oil for lubricating spindle threads
- Light lube oil, like WD-40 or 3-in-1
- TaperMate Morse Taper Cleaner or similar
- Morse taper reamer
- Single cut file (aka: mill file or bastard file). A sharp one.
- General hand tools needed to maintain your lathe (wrenches, screwdrivers, Allen wrenches).

! Please see our website information section for a more complete discussion of lathe maintenance !

Robust Seven Year “Head to Tail” Lathe Warranty

WHAT IS COVERED: We will, at any time within seven years from the date of delivery, repair or replace (our option) any mechanical or electrical part which is defective in materials or workmanship on any of our lathes. This includes headstock bearings.

WHO IS COVERED: The initial purchaser and one subsequent owner.

IF YOU HAVE A WARRANTY CLAIM: In all cases, return authorization must first be obtained by calling us. At its option, Robust may send a service person to the owner’s location. If the tool must be returned to Robust, the customer is responsible for packaging, shipping and insurance expenses. Insurance on return shipments is important as Robust Tools, LLC cannot be responsible for items that do not arrive or were damaged in shipping. Robust will pay insurance and return shipping to the customer via the lowest cost means.

OTHER WARRANTY INFORMATION: This warranty does not cover failures due directly or indirectly to misuse, abuse, negligence or accidents, normal wear-and-tear, improper repair, alterations or lack of maintenance. Robust lathes are designed to turn wood. Working with other materials may void the warranty.

Robust Tools, LLC makes no other warranty, express or implied. No agent, representative, distributor, dealer, or employee of Robust Tools, LLC has the authority to increase or otherwise change the obligations or limitations of this warranty. The obligations of Robust Tools, LLC in its sole discretion under this warranty shall be limited to the repair or replacement of any Robust lathe, tool or accessory that is found to be defective.

Robust Tools, LLC. is not liable for incidental or consequential damages, including injury or death. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific rights, and you may also have other rights, which vary, from state to state, province to province, or country to country.

For your own records, you may want to record your information here:

Lathe Model _____ Serial Number _____ Purchase Date _____ Delivery Date _____

The serial # can be found on the back of the lathe on the tailstock end.