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Carter carter products

THE PERFECT SPHERE™ TOOL



WARNING: Cancer and Reproductive Harm www.P65Warnings.ca.gov

THE PERFECT SPHERE™ TOOL

ASSEMBLY INSTRUCTIONS

1. Loosen Cutting Bar Fine Adjustment Knob (1) and Rough Adjustment Setscrew (2). Insert Cutting Bar (7) into Rough Adjustment Cutting Bar (3) with flat of Cutting Bar (7) facing up. Lightly tighten Cutting Bar Fine Adjustment Knob (1) on flat of Cutting Bar (7) into the back threaded hole.

Note: There are two threaded holes in the Rough Adjustment Cutting Bar. You will mostly use the back hole for the Locking Nob to secure the Cutting Bar, but some projects may require you to use the front threaded hole. The front hole enables you to use the full length of the Cutting Bar.

CAUTION: The front threaded hole nearest the Carter 6mm Cutter (6) in the Rough Adjustment Cutting Bar (3) is NOT meant to align with the threaded hole in the Cutting Head (8) that has the Rough Adjustment Cutting Bar Locking Setscrew (2) installed in it. DO NOT try to thread the Setscrew (2) into the front hole of the Rough Adjustment Cutting Bar (3)! These two threaded holes intentionally have a different thread pattern. Make sure these two threaded holes do not align during operation of the Sphere Tool. There is a risk of damaging the threads of one of the threaded holes, and could cause the Adjustment Cutting Bar Locking Setscrew (2) to lock the Cutting Bar (7) in place making it impossible to adjust the Cutting Bar (7).

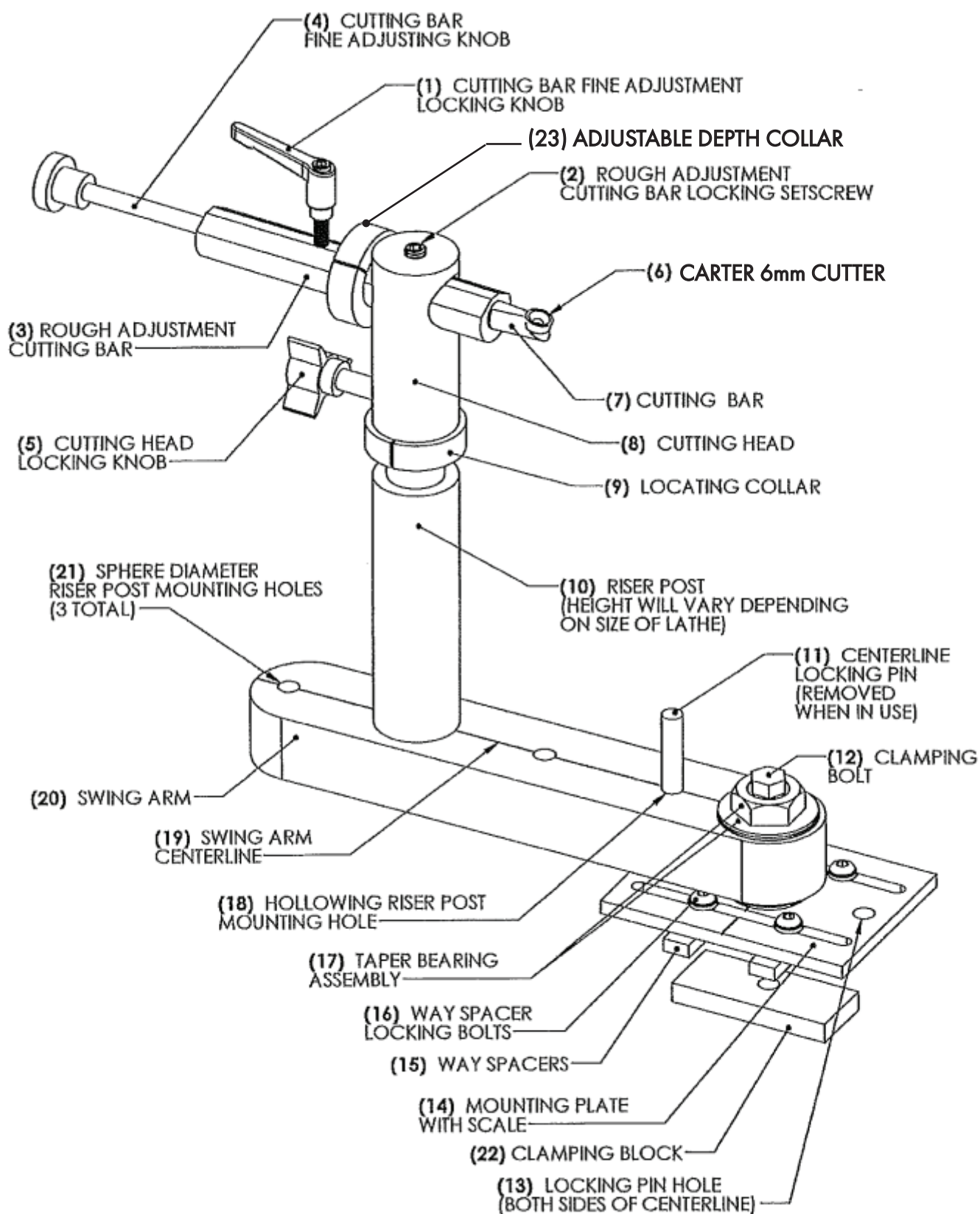
2. Thread Cutting Bar Fine Adjustment Knob (4) into back of Rough Adjustment Cutting Bar (3) until it contacts Cutting Bar (7).

3. Insert the bottom of the Swing Arm (20) the $\frac{3}{8}$ " x 2" Flat Head Screw (not shown) from hardware kit into appropriate Sphere Diameter Riser Post Mounting Hole (21) based on the diameter of sphere to be turned and thread Riser Post (10) onto screw and tighten in place.

4. Place Locating Collar (9) from hardware kit on Riser Post (10) for later adjustment.

5. Place Cutting Head (8) on Riser Post (10) and secure temporarily by lightly tightening Cutting Head Locking Knob (5).

Follow installation instructions for adjusting Way Spacers (15) and mounting the Perfect Sphere Tool on the lathe and adjusting Cutting Head (8) height and Locating Collar (9) and use of Centerline Locking Pin (11).



THE PERFECT SPHERE™ TOOL INSTALLATION INSTRUCTIONS

CAUTION: TURN OFF ALL ELECTRICAL POWER BEFORE MOUNTING OR ADJUSTING. NEVER USE THE PERFECT SPHERE TOOL TO ROUGH TURN WOOD. ALWAYS USE THE TAILSTOCK TO SUPPORT YOUR TURNING EXCEPT WHEN TURNING SMALL NUBS OF THE END OF SPHERE. ALWAYS USE APPROPRIATE SAFETY EQUIPMENT AND EYE PROTECTION.



1. Adjust the Way Spacers (15) to center the Mounting Plate With Scale (14) on your lathe (Fig.1). The Mounting Plate With Scale (14) has a scale marked on the outside of each of the slots in the Mounting Plate With Scale (14). Position the Way Spacer (15) so they contact each side of the lathe ways and so the outer edges of the Way Spacers are on the same marks on the scale from centerline of the mounting plate. Once the Way Spacers (15) are in contact with the inside edges of your lathe ways and centered on the Mounting Plate With Scale (14), tighten the Way Spacer Locking Bolts (16) to secure them in place (Fig. 2). This will make sure the Perfect Sphere Tool is always centered on your lathe and should only need to be done on the initial set up or when you want to use the Sphere Tool on a different lathe.

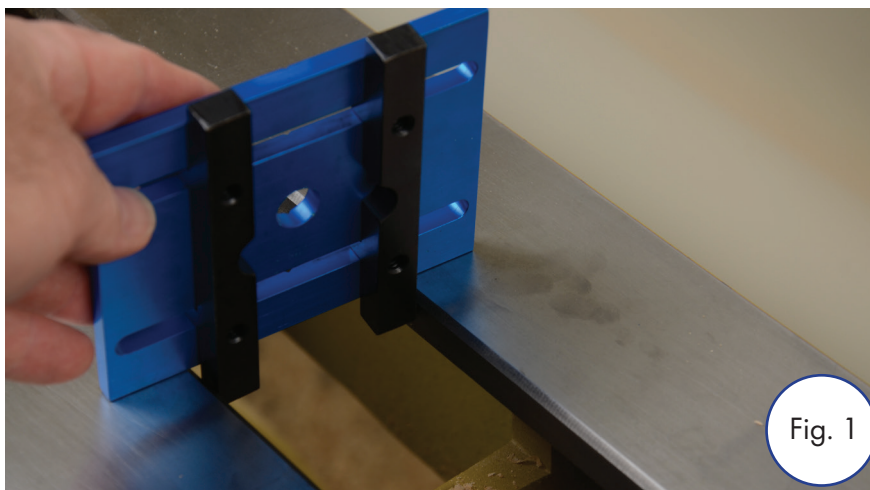
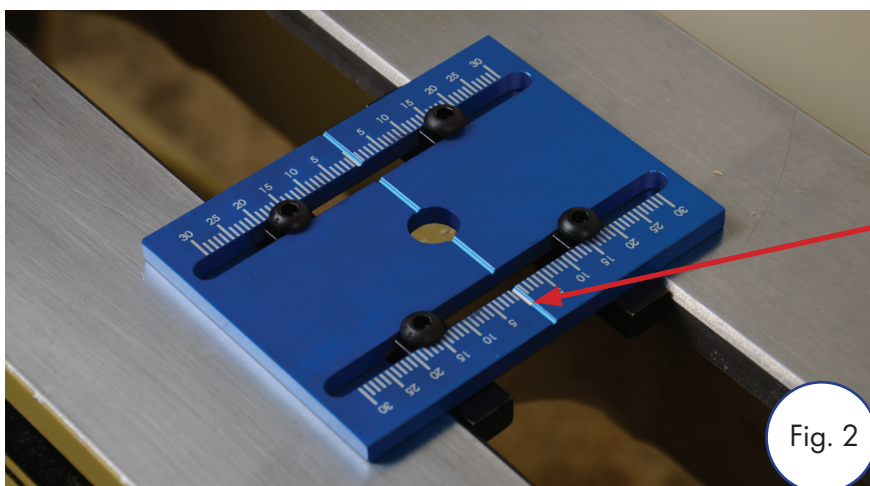


Fig. 1



Use scale to center this line between lathe ways.

Fig. 2

2. Insert (or move if you already assembled the Riser Post (10) onto the Swing Arm (20) the $\frac{3}{8}$ " x 2" Flat Head screw (not shown) from the hardware kit into the appropriate Sphere Diameter Riser Post Mounting Hole (21) based on the diameter of sphere to be turned and thread the Riser Post (10) onto the screw and tighten in place. Starting from the hole closest to the anchor end (end with bearing and nut assembly) the approximate sphere diameter that can be turned for each hole are as follows:

Hole #1 - Hollowing

Hole #2 - $\frac{1}{2}$ " to $4\frac{1}{2}$ "

Hole #3 - 4" to $9\frac{1}{2}$ "

Hole #4 - 9" to $14\frac{1}{2}$ "



3. Remove Mounting Plate With Scale (14) from the lathe bed. Insert Clamping Bolt (12) through Taper Bearing Assembly (17) and Mounting Plate with Scale (14) and thread Clamping Block (22) onto Clamping Bolt (12) only a few threads. Place Sphere tool assembly on the lathe bed with Way Spacers (15) in between lathe ways as shown in Fig. 4. Rotate Clamping Block (22) 90 degrees to lathe ways and tighten Clamping Bolt (12) to secure Sphere Tool to lathe (Fig. 5). It may be helpful to support the weight of the tool and Swing Arm (20) while tightening Sphere Tool to lathe with a ½" thick wood spacer between the Swing Arm (20) and the top of the lathe ways.

NOTE: The Taper Bearing Assembly (17) should not need adjustment and the large nut that is part of the Taper Bearing Assembly should not be tightened or loosened. The assembly has been adjusted at the factory to put a small amount of drag on the bearing when rotating the swing arm from side to side.

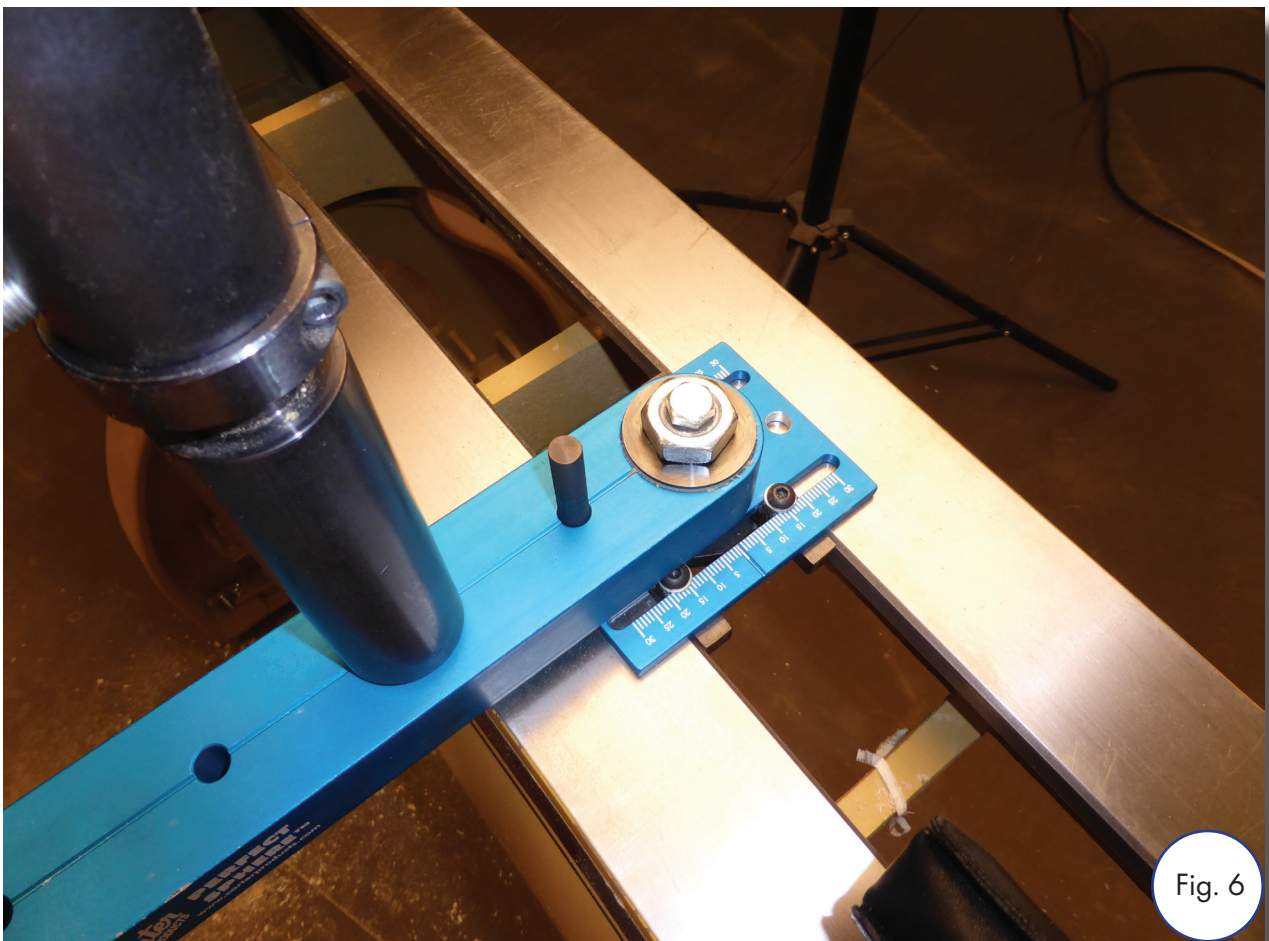


Fig. 4



Fig. 5

4. Slide 1" diameter Locating Collar (9) on the Riser Post (10) and leave loose for later adjustment if you have not already done this as indicated in the assembly instructions.
5. Rotate Swing Arm (20) so that it is 90 degrees to the lathe ways and the Taper Bearing Assembly (17) is farthest from you. Insert Centerline Locking Pin (11) into Hollowing Riser Mounting Hole (18) and adjust Swing Arm (20) left or right until Centerline Locking Pin (11) slips into Locking Pin Hole (13) on the same side as the Swing Arm (20). Tool should appear as shown in Fig. 6.



6. Adjust the height of the Cutting Head (8) so the Carter 6mm Cutter Cutter (6) is centered on the lathe centerline or spindle. It is helpful to install a spur center or other accessory that has a point on the centerline or center of the lathe to align the Carter 6mm Cutter Cutter (6) to the center of the lathe (Fig. 7). Once the #4 Carter 6mm Cutter Cutter (6) is centered on the lathe centerline, lock the Cutting Head (8) in place with the Cutting Head Locking Knob (5).



7. Slide the Locating Collar (9) which was mounted on the Riser Post (10) earlier, up to the bottom of the Cutting Head (8) and lock in place (Fig.8). This will allow the Cutting Head (8) to always return to the same height and will not need to be adjusted again.



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TURNING A SPHERE

NOTE: THIS IS A GENERAL OVERVIEW ON HOW TO TURN A SPHERE ON THE PERFECT SPHERE TOOL. FOR MORE DETAILED INSTRUCTIONS AND TURNING TIPS AS WELL AS INSTRUCTIONS ON HOW TO HOLLOW WITH THE SPHERE TOOL, PLEASE VISIT WWW.CARTERPRODUCTS.COM OR **SCAN THE QR CODE** FOR A SPHERE TURNING YouTube TUTORIAL.



Turning a Sphere with the Carter Perfect Sphere™ System

Before using the Perfect Sphere Tool, determine the size (diameter) of the sphere you want and make sure the Riser Post (10) is in the correct Sphere Diameter Rising Post Mounting Hole (21). (Refer to the step #2 of the installation instructions). We recommend turning a cylinder on the lathe to the rough outer dimensions of your sphere and using a tenon on the cylinder in a chuck to make it easier to finish the sphere. **(NOTE: NEVER USE THE SPHERE TOOL TO ROUGH TURN)**. Mark the centerline of the sphere and then measure half the diameter of the sphere to be turned and mark these points on the cylinder. With a parting tool, cut on the outside lines to approximately $\frac{1}{2}$ to $\frac{2}{3}$ of the cylinder diameter (Fig. 9). Then with a gouge turn the sides away to make space for the sphere tool to work. You may also save some time by turning or rounding a bit of top corners of where the sphere will be with your gouge.



1. Rough turn a cylinder as described previously with the Cutting Head (8) removed for easier turning of cylinder.
2. Unscrew the Cutting Bar Fine Adjustment Knob (4) while pushing the Cutting Bar (7) in toward the Cutting Bar Fine Adjustment Knob (4) until the Cutting Bar (7) is inside the Rough Adjustment Cutting Bar (3) as far as possible.
3. Move the Rough Adjustment Cutting Bar (3) as far back in the Cutting Head (8) as possible.
NOTE: There are two threaded holes in the Rough Adjustment Cutting Bar (3) so that no matter what position the rough Adjustment Cutting Bar (3) is in, there is always a threaded hole meant for the Cutting Bar Fine Adjustment Locking Knob (1).
4. Mount the Cutting Head (8) onto the Riser Post (10) and align the Cutting Bar (7) with the Swing Arm Centerline (19) and lock in place with the Cutting Head Locking Knob (5).
5. Align the sphere tool to the centerline of the sphere (marked earlier when preparing the cylinder) by aligning the Carter 6mm Cutter Cutter (6) with the centerline of the sphere while the Sphere Tool is locked at 90 degrees using the Centerline Locking Pin (11) explained in step #5 of the installation instructions. If you have not already done so in the earlier steps, (step #5): rotate Swing Arm (20) left or right until Centerline Locking Pin (11) slips into Locking Pin Hole (13) on the same side as the Swing Arm (20).
6. Rotate the sphere tool to make sure it does not contact the cylinder at any point and then slowly adjust the Rough Adjustment Cutting Bar (3) forward until the Carter 6mm Cutter Cutter (6) takes only a small amount of material on each pass and lock in place with the Rough Adjustment Cutting Bar Locking Knob (2). **NOTE:** Try to always keep the Cutting Bar (7) as close to the end of the Rough Adjustment Cutting Bar (3) to minimize vibration.
7. Once the Rough Adjustment Cutting Bar (3) is adjusted, and you are sure it won't gouge the cylinder on the first pass, turn on the lathe to a safe speed between 800 - 1000 rpm and start to cut the cylinder/sphere by swinging the cutting head side to side slowly starting from the centerline of the sphere and working toward the outside in each direction. Advance the Cutting Bar (7) slowly after each cut using the Cutting Bar Fine Adjustment Locking Knob (1) tight while turning/advancing the Cutting Bar (7) to help prevent adjusting the Cutting Bar (7) too much or too fast gouging the cylinder.
8. Turn off the lathe, check that the chuck is tight and remove the tail stock. Back up the Carter 6mm Cutter (6) bit fully and move the Swing Arm (20) to the tail end of the sphere.
9. Repeat step 7 to remove the tail side tenon until you have a slight high spot from the main diameter. This can be removed with sanding.

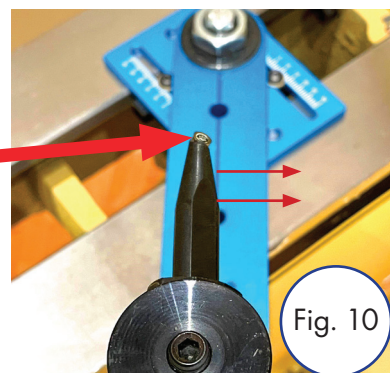
10. With the lathe off, remove The Perfect Sphere Tool.
11. With a parting tool, part off the sphere leaving enough of the tenon to complete the diameter of the sphere.
12. Mount the sphere between the jam with the tenon facing out. This make take several tries to get the sphere aligned with minimal wobble.
13. Here you can either use a hand tool or reinstall the Perfect Sphere Tool to remove the tenon. Remove it until you have a slight high spot from the main diameter. The same as you did for the tail side.
14. Remove the Perfect Sphere Tool if still installed. Begin sanding the sphere forward and backward, rotating the sphere often between the chucks until the high spots are gone and desired finish is reached.

TURNING TIPS:

- Keep a firm grip on the arm and the cutting head while turning for best control and to help eliminate any harmonic vibration.
- When moving the cutting head back to center to advance the cutter and take another small cut, use down pressure on the swing arm to avoid the cutter dragging on the outer diameter while returning back to center.
- The position of the cutting head can be straight on center or off to the side for smoother shear cuts but never turn the cutting head more than 25 degrees as the cutter heal will contact the turning.
- Keep the cutter close to the riser post as possible at all times.
- When turning side grain, run the lathe between 500 and 700 RPM and advance the cutter slowly on centerline of the sphere and swing the cutter in both directions before advancing the cutter in small increments.
- When turning close to the corner where the sphere meets the cylinder away from the sphere leaving a small nub on the sphere. Part off the nub close to the end of the sphere. Remove the tail stock and turn off the nub that is left using a shear cut with the cutting head turned. Use a cone in the tail stock until you are ready to part the sphere off the table.
- Jam chuck the sphere once it is parted off the lathe and realign the sphere tool to the centerline of the sphere to turn off the remaining nub or with some practice you want to turn it off with your gouge or simply sand it off.
- To finalize your sphere, the Rough Adjustment Cutting Bar (3) can be turned 30 degrees for shear cutting for a fine finish cut. Note that shear cuts can only be done in one direction based on rotation of the cutter as show in Fig. 10.



Only cut in the direction of the blade angle.



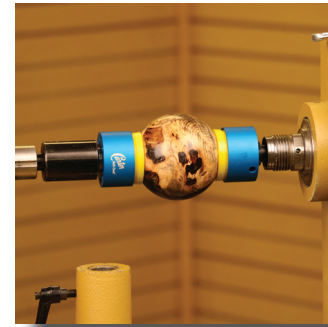
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ADDITIONAL TURNING TOOLS & ACCESSORIES FOR MORE EXTENSIVE PROJECT APPLICATIONS

1. M-Chuck™ Live Center Kit

Urethane based chucking system for completing spheres and spherical hollows created with the Perfect Sphere™ System.



2. The Perfect Hollower™

The articulated arm hollowing system allows you to safely hollow projects up to 8" deep. (Order the "Perfect Hollower™ Add-On Arm Only" for users who own the Perfect Sphere™ unit.)



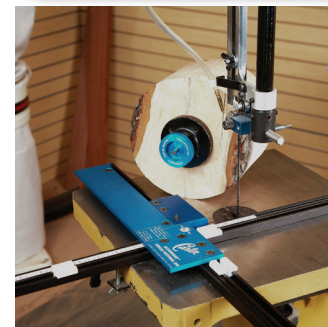
3. The AccuRight® Circle Cutting Jig™

Cut perfect circles up to 4 feet in diameter everytime with a tool that is compatible with almost any bandsaw. Great for cutting out bowls or turning blanks.



4. The AccuRight® Center Master™ Blank Creation System

Easily and consistently cut and mount circular lathe blanks for bowl turning or hollow form projects.



5. The Strongbore™ Modular Boring System

Multi-component system allows users to bore starting holes for deeper hollowing or turning.



6. Lathe MultiRest™ Work Support System

A steadyrest work support system for hollowing larger projects safely. Compatible with small to large sized lathes.

