

# #749-011-558 Sinclair Neck Turning Tool

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*Congratulations on your purchase of another fine Sinclair reloading product. Please take a few moments to read the following instructions on how to set up and use your new Sinclair Neck Turning Tool.*

## Prior to Turning Case Necks

Before turning your cases, all necks should be expanded so that the inside diameter of the case neck is compatible with the neck turning mandrel you are using. The neck turning mandrels for this tool have a diameter that is .002" under bullet diameter, the mandrels used in our expander die are .001" under bullet diameter. Using our expander mandrel is the preferred method to prepare your case necks for turning.

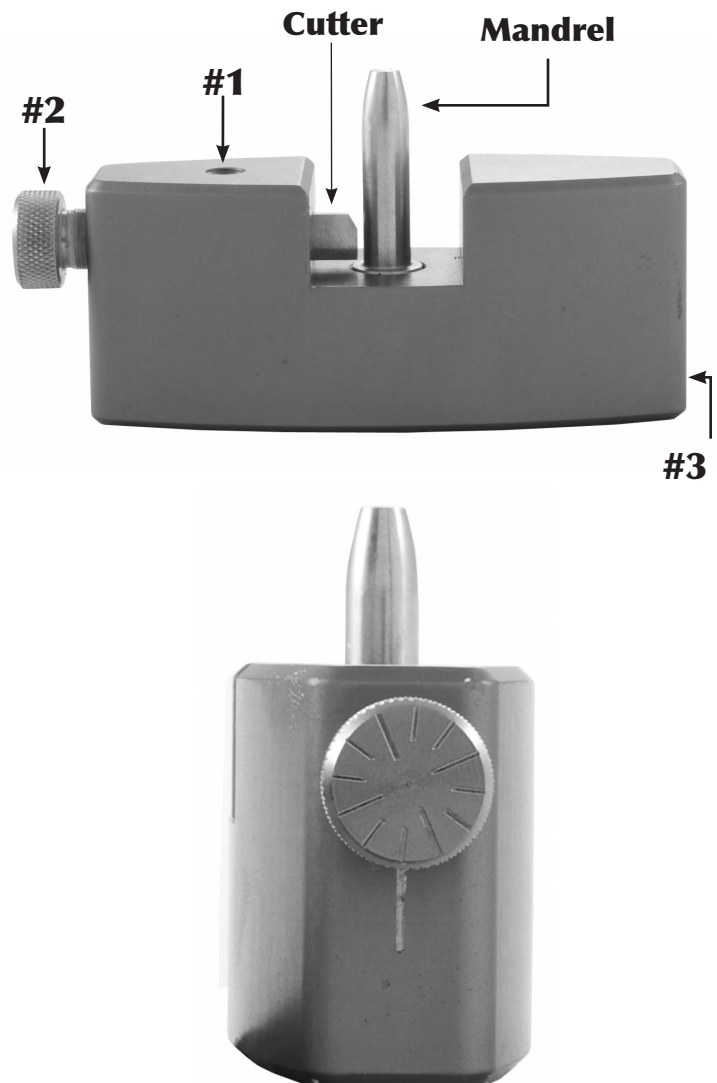
## Neck Turning Tool Setup

The only additional tools you will need to use this Sinclair Neck Turning tool are a  $\frac{3}{32}$ " and a  $\frac{1}{8}$ " hex wrench. The photo at right shows the tool with arrows pointing to set screw locations.

- 1) Loosen set screw #1 a quarter turn using a  $\frac{3}{32}$ " hex wrench (not included).
- 2) Retract the cutter until there is enough room to insert the mandrel from the back of the tool. Do this by threading the knurled adjustment knob #2 counter-clockwise, while pushing the cutter away from the center of the tool. When you have retracted the cutter enough to allow clearance for the mandrel, lightly re-lock set screw #1.
- 3) Insert the mandrel from the back end of the tool body, making sure that the flat on the mandrel is facing set screw #3, to do this you may need to loosen set screw #3 using a  $\frac{3}{32}$ " hex wrench. When the shoulder of the mandrel is about a  $\frac{1}{4}$ " below the underside of the cutter, lock the mandrel in place using set screw #3.

**NOTE:** The cutter blade should be backed up enough so that it will not contact a case neck at this time.

- 1) Loosen the screws in the neck turning handle and insert a case which has had its neck expanded until the head of the case is flush or just past flush with the back side of the handle. Tighten both the button head screw ( $\frac{1}{8}$ " hex wrench) and the thumb screw equally, keeping the handle halves as parallel as possible. Once the handle has been set up on this first case, you should be able to insert and remove cases from the handle and lock into place using just the thumb screw.
- 2) Lubricate either the mandrel or the inside of the case mouth using Sinclair Neck Turning Lube, Shooters Choice FP-10, STP, Imperial Sizing Die Wax or most any squirt type case sizing lube. Start the case onto the mandrel by turning the handle clockwise slowly and steadily while feeding the case towards the cutter blade. Turn the case onto the mandrel until the case mouth stops on the shoulder of the mandrel.



- 3) Adjust the cutter blade down by loosening set screw #1 a quarter turn and turning set screw #2 until the cutting blade just clears the case neck. Set the cutter as close to the case neck as possible without touching it. Lock the cutter in place using set screw #1.
- 4) With the case mouth stopped against the shoulder of the mandrel, adjust the location of the mandrel by loosening set screw #3 and adjusting the mandrel in or out of the tool body until the cutting point of the cutter is just below the neck/shoulder junction of the case (when you are actually turning necks the cutter should just barely cut on the shoulder of the case). Lock the mandrel in place using set screw #3. This step sets the shoulder of the mandrel as a stop for the case mouth, insuring uniformity from case to case.
- 5) Turn the case off of the mandrel using the same slow, steady clockwise motion. You are now ready to adjust the depth of cut.

### **Adjusting the Depth of Cut**

You will notice that the body of your neck turning tool is engraved on one end with a single mark and that the knurled cutter adjustment knob (#2) has 12 equally spaced marks. The mark on the body is to reference the location of the marks on the knurled adjustment knob. Each mark on the adjustment knob represents approximately one-thousandth (0.001") of cutter adjustment. **All adjustments should be made with set screw #1 lightly tightened down on the cutter. Before cutting any necks, this set screw should be tightened securely.** Should you overshoot your desired thickness you will need to loosen set screw #1 and thread the adjustment knob counter-clockwise at least one engraved mark and re-adjust inward from there.

### **Neck Turning for Factory Chambers**

The goal for neck turning brass for a factory rifle chamber is to control shot to shot neck tension by making the neck wall thickness uniform within each piece of brass as well as piece to piece. For this purpose it is alright to have some dull spots on your case necks, you should set the cutter so that it is cutting 70-80% of the case neck surface.

- 1) Lubricate the mandrel or inside case mouth. Turn the case back onto the mandrel using the same slow, steady motion as above until the case mouth is just past the point of the cutter blade.
- 2) Turn the knurled knob #2 clockwise until the point of the cutter makes contact with the case neck.
- 3) Remove the case from the mandrel and turn the knurled knob #2 approximately 1/2 way to the next hash mark on the end of the knurled knob. Remember that each mark on the adjustment knob corresponds to one-thousandth (.001") of cutter adjustment.
- 4) Once again lubricate either the mandrel or the inside of the case mouth. Using the same case, turn the case onto the mandrel just as you did during setup. This time the cutter should be removing brass from the case neck. Turn the case until the case mouth stops against the shoulder of the mandrel then turn the case off of the mandrel using the same slow clockwise motion you used while turning the case onto the mandrel.
- 5) The cutter should have cut between 70 and 80% of the case neck along with between 1/16" and 1/8" of the case shoulder. The cut portion of the neck will appear shiny compared to the dull finish of the rest of the uncut areas. If you cut less than 70-80% of the case neck, you may wish to adjust the cutter inward a little to increase the depth of cut. Sinclair recommends adjusting the cut depth for factory chambers between one half and one-thousandth at a time or one half an engraved mark on the adjustment to a full mark until you reach 70-80% cut on the case neck.

### **Neck Turning for a Tight Neck Chambered Rifle**

When neck turning brass for a tight necked chamber, the engraved marks will help you to dial in the exact neck thickness your rifle requires. Follow the directions above, but use a case neck micrometer or tubing micrometer to measure the neck wall thickness after your initial adjustment. From the initial adjustment you can then easily adjust the cut depth in half thousandth (or finer) increments by using the engraved marks on the adjustment knob. Always double check the cutting depth of your set up case before neck turning any other cases. You should also check the neck wall thickness of your first two turned case necks after you have reached adjustment.

### **Notes on Neck Turning**

- 1) The fit of the case neck on the mandrel is critical to consistent neck turning. The case must be tight enough to give uniformity of cut, but not so tight that turning becomes a chore.
- 2) Clean the mandrel cutter area from chips and excess lube so that it doesn't build up under the cutter or in the mandrel shoulder area. If a chip gets caught it can ruin a case.