

**Q - - - - - How do I get started with a basic Holtzapffel ornamental turning lathe?**

**A - - - - - Here are a few notes for setting up the lathe, using some of the basic apparatus and cutting simple patterns.**

**ORNAMENTAL TURNING – NOTES FOR BEGINNERS.**

1. **LEVEL** Put shims under the feet of the lathe so the bed is level both ways.
2. **LUBRICATION** Oil the headstock bearings and the cutting frame bearings every day. The headstock should not be run at more than about 800 –1000 r.p.m. About 500 r.p.m. is probably most comfortable.
3. **CHUCKING** Make chucking blocks from scrap wood and screw them to the brass chucks; then stick the workpiece to the chuck with a paper sandwich using PVA glue or, if in a hurry, super-glue. Screw the work chuck onto the headstock and face it off. Screw the Eccentric Chuck onto the headstock and the work chuck onto the Ecc.Chk. For work where you wish to leave some of the original surface you will need to face it off again but you must run the lathe slower when the Ecc.Chk is in use. A comfortable speed is when nothing vibrates.
4. **ALL-AT-CENTRE** Slacken the slide-rest clamping screw and set the slide-rest on the bed parallel to the face of the work (or a chuck) using the set-bevil to get it square. Put a slide-rest cutter in the tool-slide and face off the workpiece. Adjust centre height by loosening the slide-rest clamping screw and turning the raising ring: anti-clockwise to raise or clockwise to lower (NOTE: I think the raising ring may not lift the slide high enough so I will bring a disc to the next meeting to sit between the slide and the raising ring which will give about another 0.2” height). Turn the slide-rest handle until the carriage is in the middle of the main slide and the marker is on one of the ‘inch’ numbers and the handle is hanging down. This will be your datum point for centre. With a point tool in the tool-slide and the bow-nut slackened, slide the slide-rest pedestal carefully away from you until the point touches the exact centre of the workpiece; this will be evident by a centre pip, or it there is no pip, the swirl of the facing cut you have just made. Now you are on centre with the slide in a position that you can return to at will and you can set the carriage easily at any desired radius from centre by the calibrations on the main slide.
5. **ECCENTRIC CUTTING FRAME** Set the headstock index at 96. Loosen the bow-nut, pull the slide-rest to the right (towards the tailstock) and put the Eccentric Cutting Frame (ECF) with an obtuse point cutter in the tool-slide. Retract the tool-slide until the front of the ECF is just not quite fouling the front of the carriage, then set the ‘bridge’ piece so that the tool-slide cannot be retracted any further. Slide the slide-rest towards the workpiece until the cutter is almost touching the work (about 0.1” away) and then tighten the bow-nut. Slacken slightly the cutter-clamping-screw and wind the little lead-screw until the point of the cutter lines up with the centre of the workpiece. Check the number on the ECF micrometer; if you are fortunate it will be zero; otherwise make a note of the number as this is your datum point and you can calculate any desired radius from it. Set the cutter at, say, 0.500” radius, then set the slide-rest also at 0.500” radius to the left of centre. The cutter will then cut a circle of 1” diameter with its edge just touching the centre of the work. Set the depth stop when you have cut the circle to the depth you wish and re-cut to make sure the depth stop is reached. Make further cuts at different settings of the index (or the Chuck nose-wheel) until you have completed your pattern. See my website for more notes on ECF technique. [NOTE: *until you have*

*a proper index you can set the Eccentric Chuck level and clamp the headstock by tightening the tail bolt. Then you can use the Ecc.Chk nose-wheel for dividing your patterns.]*

6. **ECCENTRIC CHUCK** Start with the Eccentric Chuck in the horizontal position (using a spirit level) and adjust the index to a convenient hole in the 96 row (this is the most useful row as it gives the most scope for dividing). Turn the nose-wheel of the chuck to 96 or, if you are turning a faceted piece, turn it until one of the facets is level horizontally; and make a note of that division number as it will be your datum from which all other positions are to be measured. Then remove the centre-locating pin and extend the slide by the desired number of rotations (as the chuck lead-screw is 20 t.p.i., one rotation gives an eccentricity of 0.100"). This is your new centre and you can cut a pattern on this centre and then, after rotating the chuck nose-wheel to another position you can repeat the pattern (or make a contrasting pattern) on the new centre. In this way you can cut 3, 4 or 6 patterns at equal distances from each other and from the true centre of the workpiece. You can make different kinds of patterns with the Horizontal, Vertical or Universal Cutting Frames using the slide-rest to give the radius of the pattern, the Ecc.Chk to give multiple centres and orientation of cuts and the headstock division plate may be used in conjunction with the Chuck nose-wheel to do double-counted patterns (see my website). [**NOTE:** *While you have no index you can set the Chuck horizontal and measure the distance of a hole on the division plate to the bed of the lathe; then, for the next division, slacken the tail bolt and rotate the headstock until the next division point is at that same distance from the bed of the lathe; then re-tighten the tail bolt.*]
7. **ELLIPSE CHUCK** Lubricate freely both the slides and the cam-ring. On no account allow the cam-ring to become dry. Set the Chuck level as for the Ecc.Chk; withdraw the centre locating pin and set the cam-ring to the required eccentricity. An eccentricity of 0.250" will give an ellipse with the major axis ½" longer than the minor axis. If the workpiece starts off round just set the Chuck nose-wheel to 96; but if you require your ellipse to be orientated in a particular way, set the nose-wheel to orientate the work to the required level. This Chuck must be run slowly, at a speed where it doesn't clatter or rock the lathe; probably about 75-100 r.p.m. The cutter must be fed in very carefully, especially at first when it will be cutting intermittently. If you wish to make an elliptical hollow it will be made easier if you take out the centre beforehand, to a radius just slightly less than the minimum radius of the planned ellipse.
8. **SHARPENING CUTTERS.** Clamp the cutter in the goniostat then set the profile angle by loosening the short tommy-bar behind the tool-holder and set the rake angle by loosening the thumbscrew. Sight the bottom of the cutter with a flat sight board and adjust the angles until no light shows under the tool when the board is held up to the light. Then rest the two legs on a board the same thickness as the diamond lap; stroke the tool along the lap, in line with and not across its edge; as the latter would produce a ragged, saw-toothed edge, which gives a poor finish. If the tool has a second symmetrical cutting angle loosen the profile angle and re-set it to the same number of degrees on the opposite side of the goniostat; this will give you a symmetrical profile.

For round-nosed cutters: Use the honing guide with the peg leg; setting the rake angle with a sight board as before; then stroke on the diamond lap with a rolling motion to cut around the edge in a smooth curve. Sight the cutter against the light

to check that the roundness of the curve is preserved; if a bit one-sided, correct by honing away the high spot.

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**Holtzapffel Volume IV references:**

Fig.112 Headstock with division plate

Fig.120 Index

**Holtzapffel Volume V references:**

Fig. 14 Slide-rest

Figs. 15 & 16 Tool-slide clamps

Fig. 17 steel tool-slide filling piece and brass clamping bar

Fig. 48 Set bevil for setting slide-rest parallel to workpiece

Fig. 88 Vertical Cutting Frame

Fig. 89 Steel saddle for adapting ECF cutters to another cutting frame

Fig. 121 Horizontal Cutting Frame

Fig. 122 Adapter for honing ECF cutters (or for extending their radius in the HCF)

Fig. 135 Universal Cutting Frame

Fig. 193 Eccentric Cutting Frame

Fig. 410 Eccentric Chuck

Fig. 428 Ellipse Chuck

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