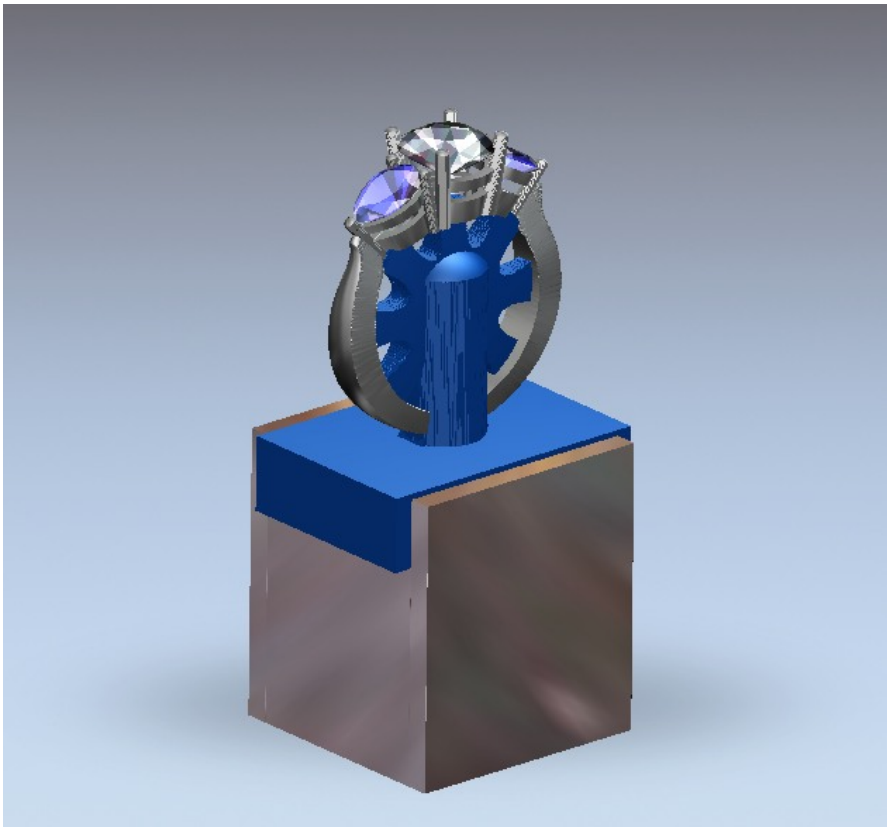
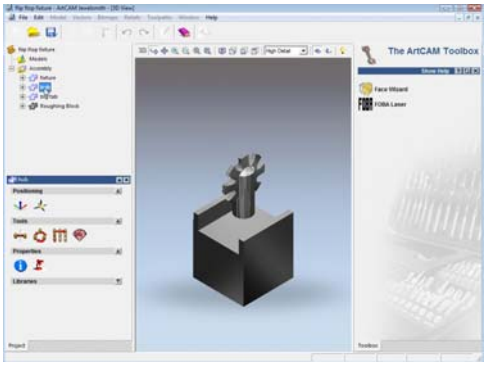
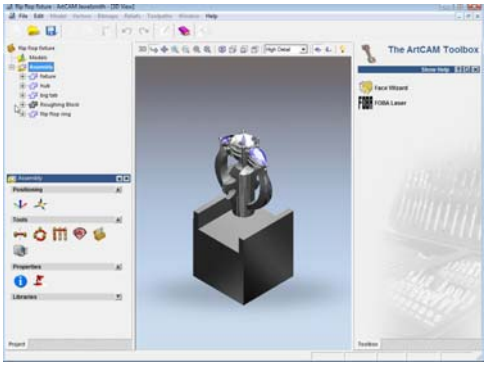
FLIP FLOP FIXTURE



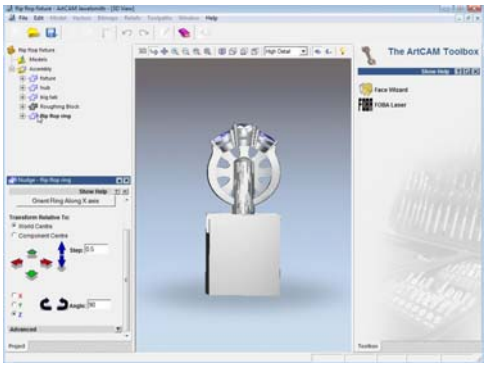
1. Load the flip-flop fixture project. The components in this project are all aligned around the origin and the dimensions of the fixture.



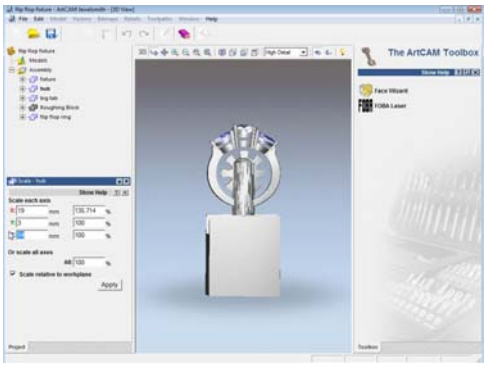
2. Import your ring. It will load in the conventional orientation to the rotary axis, and 90 degrees to the fixture components.



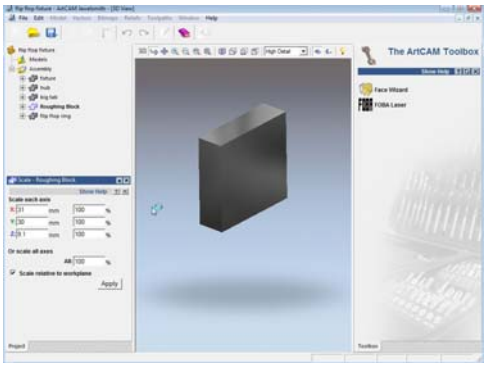
3. Rotate the ring 90 degrees around Z using the nudge tool. Under the advanced settings, select set world center. This will keep the machining wizard from rotating the model back to its original orientation.



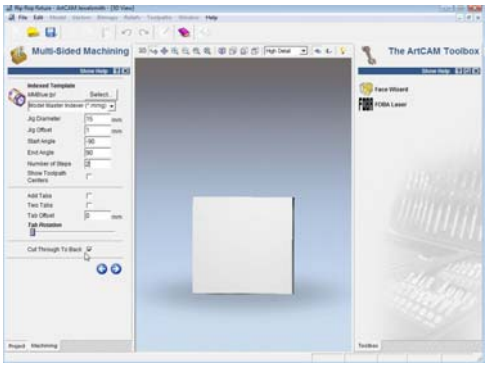
4. Scale the hub to match your ring size.



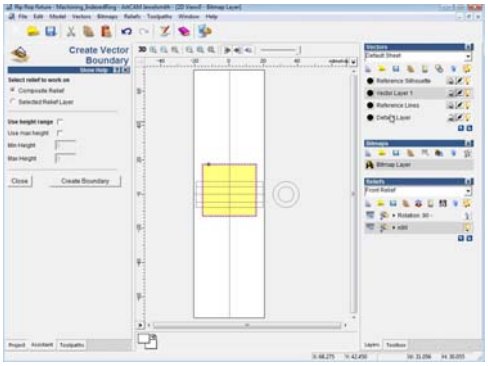
5. Unhide the roughing block and adjust the thickness and width to match your ring plus 1mm.



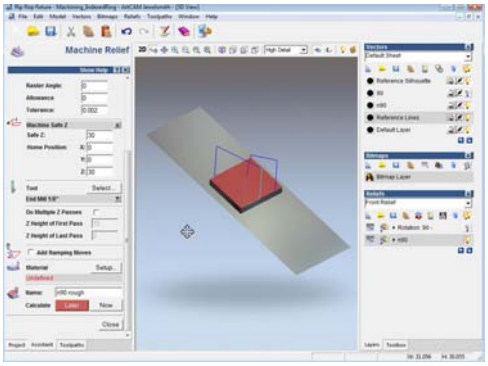
6. Run the multisided machining wizard in the index ring mode. Ignore the jig settings. Set a start angle of –90, and an end angle of 90 degrees. Number of steps is two. Check the cut through to back option and run the wizard. Do not calculate the toolpaths.



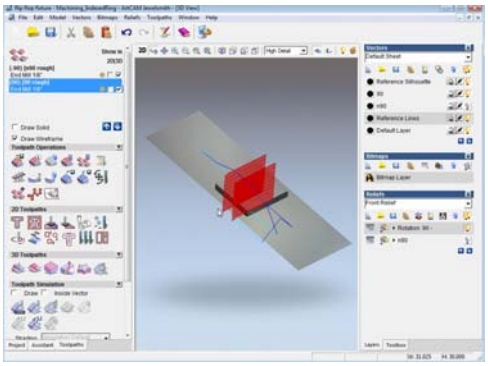
7. Discard the created vectors and replace them with the **Create Vector Boundary tool.** Do this for both relief layers. Name the layers N90 and 90.



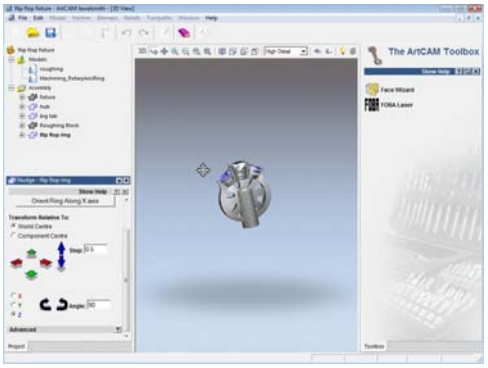
8. Run toolpaths for both reliefs. Name the toolpaths with the same names as the relief layers. Use your 1/8” end mill and machine to the vectors you created. **Use a safe height of 30mm.**



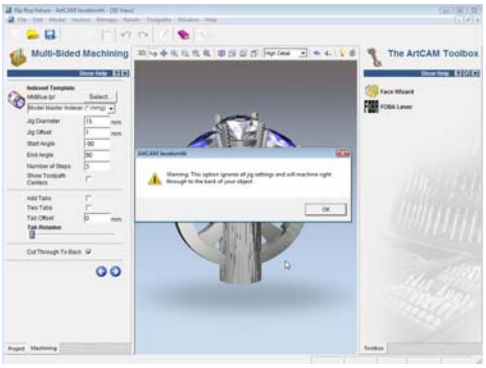
9. Click on **Edit Parameters** and change the A axis angle to match the name of the toolpath and relief. Save as a MM Indexer .mmg file.



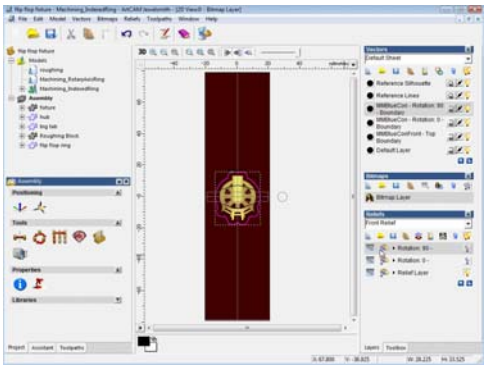
10. Hide the Roughing Block to reveal the ring, hub, and large tab.



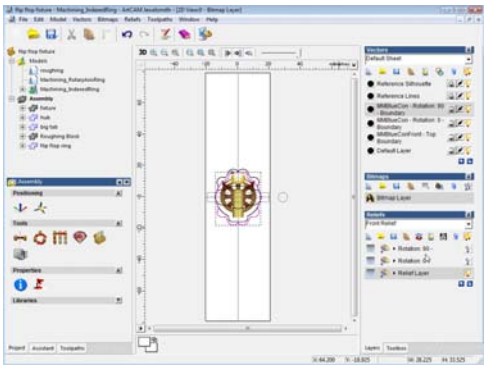
11. Use the **Machining Wizard** to create new reliefs. –90 tp 90 in three steps. Cut through to the back again.



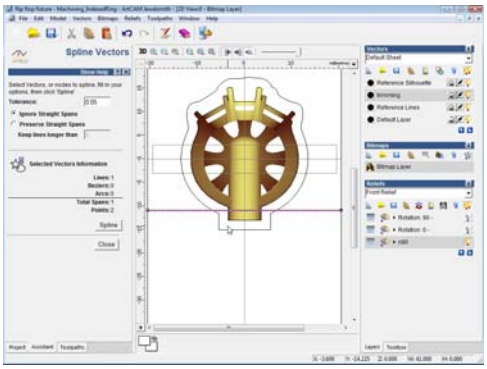
12. Use the **Shape Editor** to merge high white to zero to remove the areas below zero.



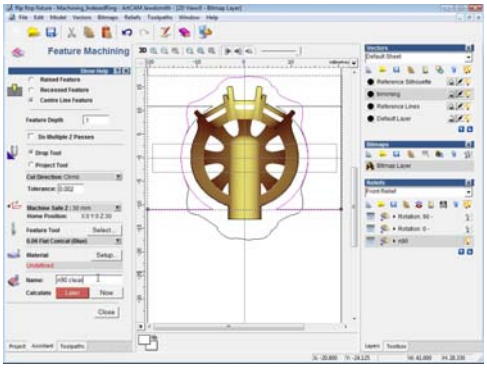
13. Clean up the offset vectors around the –90 degree relief.



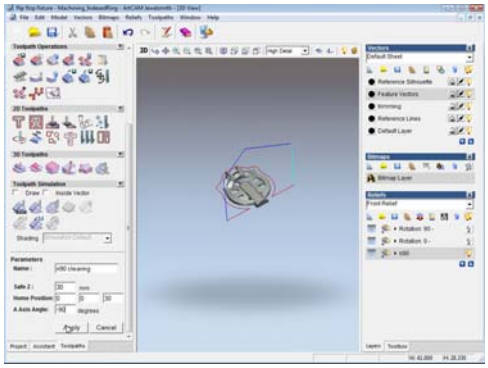
14. Copy your horizontal reference lines and move to the bottom of the ring. Cut and join it to the offset vector to create an open vector that travels from the edge of the work area to the other side of the work area around the ring.

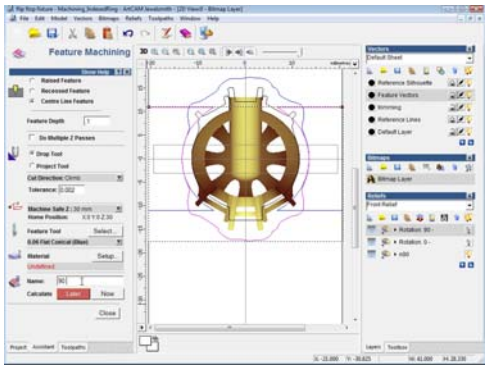


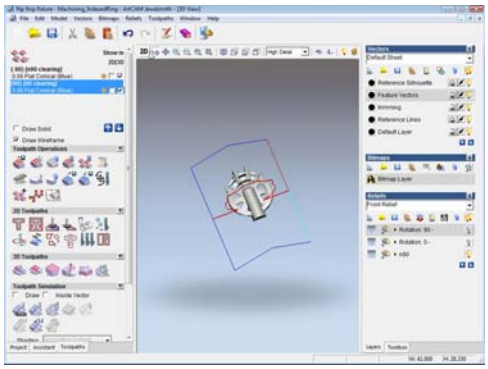
15. Mirror the vector around the reference line.



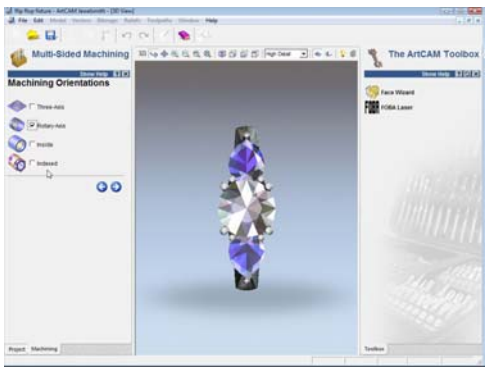
16. Use each vector to create centerline feature machining at a depth of .1mm. Adjust the A axis parameters to –90 and 90 and save the clearing toolpath.



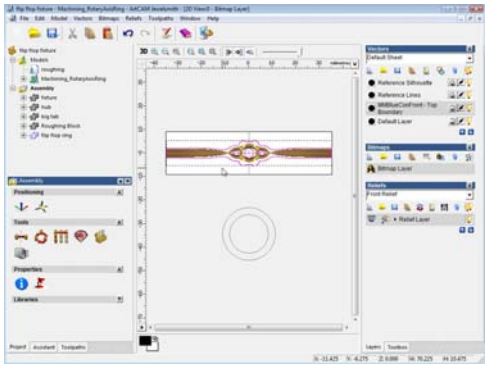




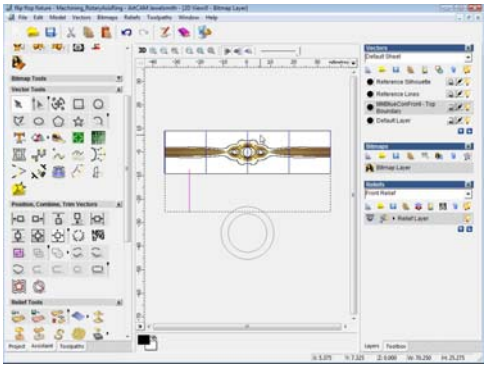
17. Rotate the ring back to it's original position.



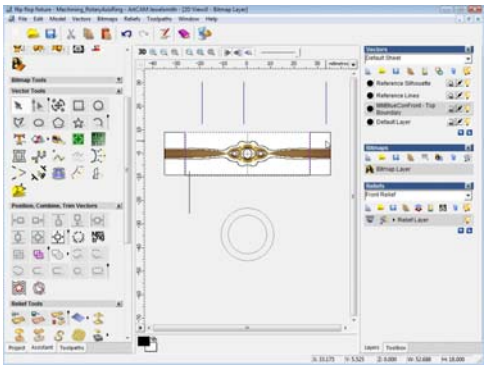
18. Use the machining wizard to layout a rotary toolpath relief. Do not run the toolpath.



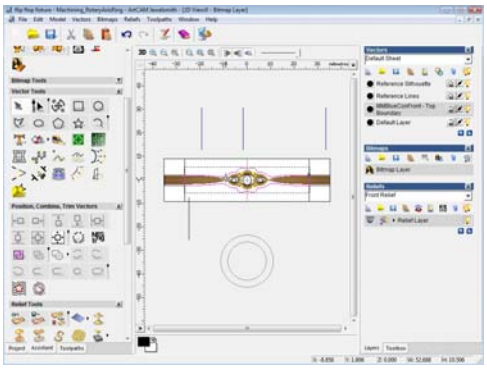
18. Copy the vertical reference line and paste it along the horizontal reference line 5 times.



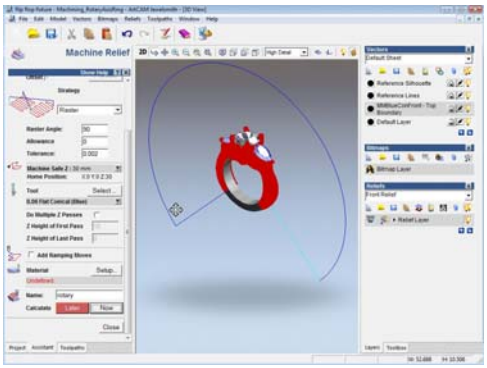
19. Move the lines out of the work area and select the first and the fourth segments. Group them together and center them.



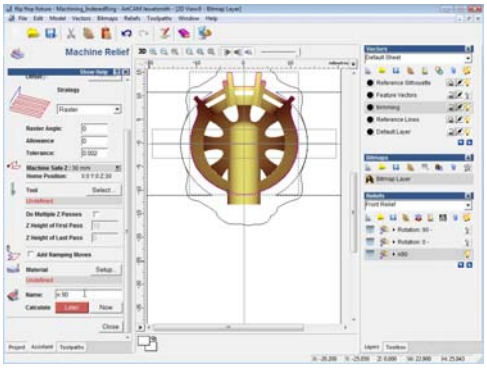
20. Use the trim tool to combine the machining boundary and our two lines to create a new vector that excludes the bottom quarter of the ring.



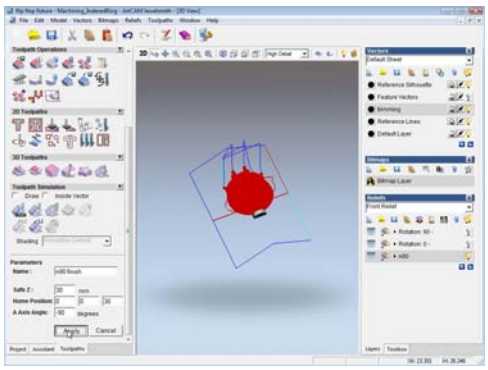
21. Create and save a rotary toolpath. **Change the safe height and start height to 10mm.**

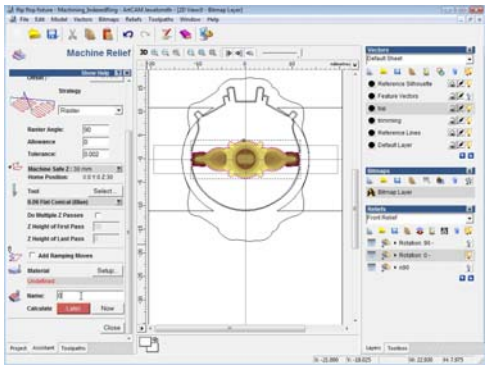


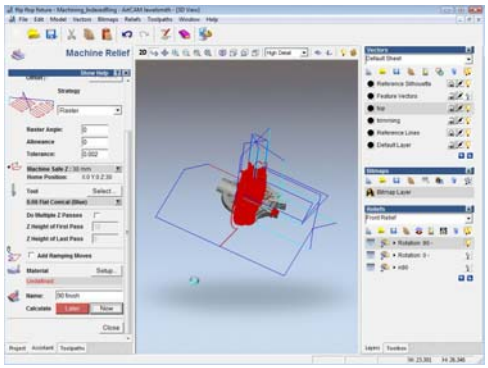
21. Reopen the index model and create vector boundries around each relief. Offset outwards .2mm and node edit to follow the ontours of the bottom of the shank instead of the large tab.

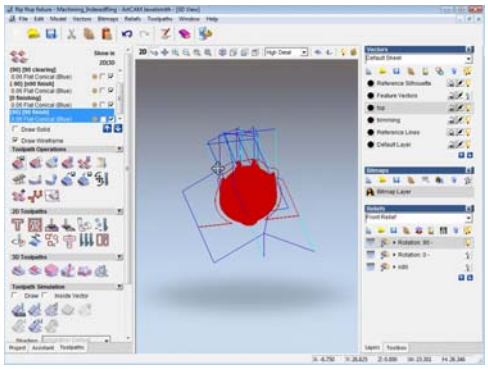


22. Create toolpaths for all three reliefs. Continue with the naming convention (-90, 0, 90) for the reliefs and toolpaths. Be sure to adjust the A axis parameters to match. **Make sure the safe height is 30mm.**

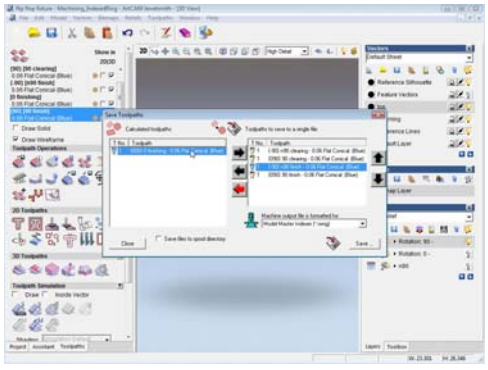




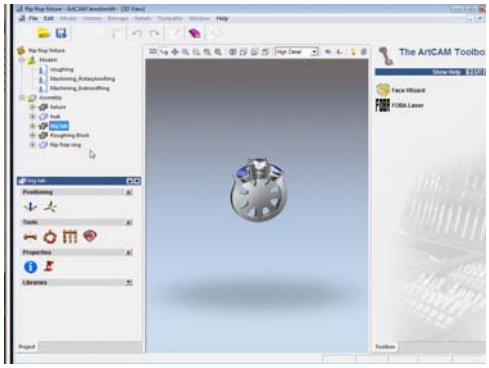


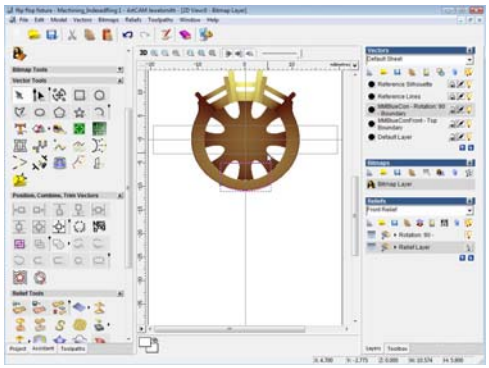


23. Be sure to save the toolpaths from –90 to 90 in that order.



24. Run the machining wizard one last time. This time hide the large tab. Create a vector at the bottom of the shank in the –90 and 90 degree positions. Create a shank trimming toolpath to remove the tab.





25. Cut your toolpaths in the following order:

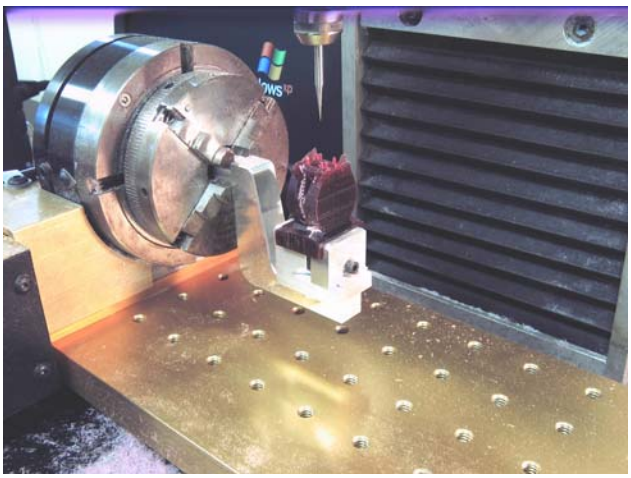
1/8” roughing

Clearing

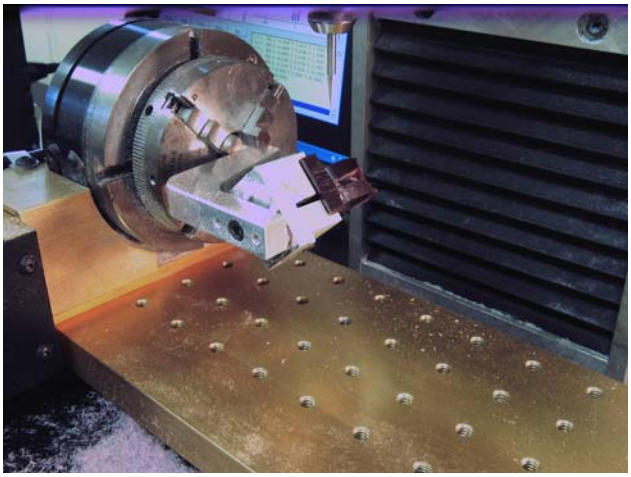
Rotary

Index

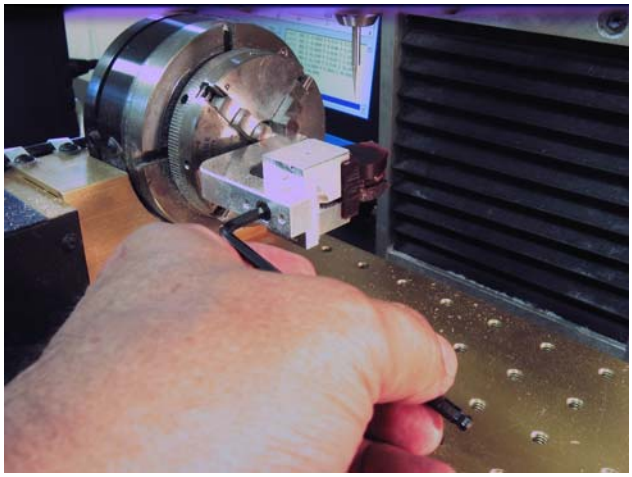
Shank Clearing



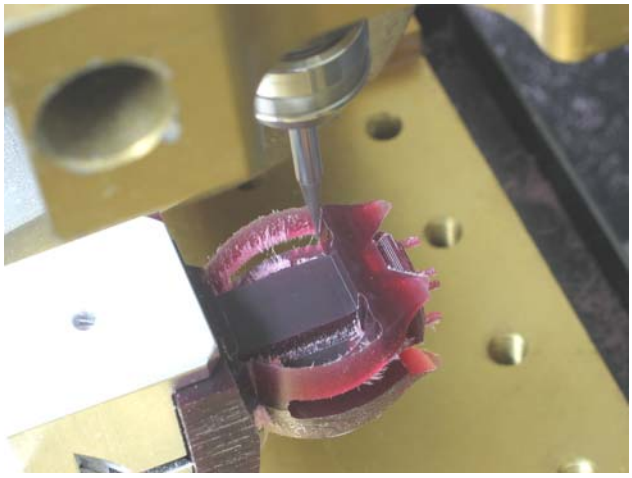
26. Rotate the fixture between the rotary and the other toolpaths.

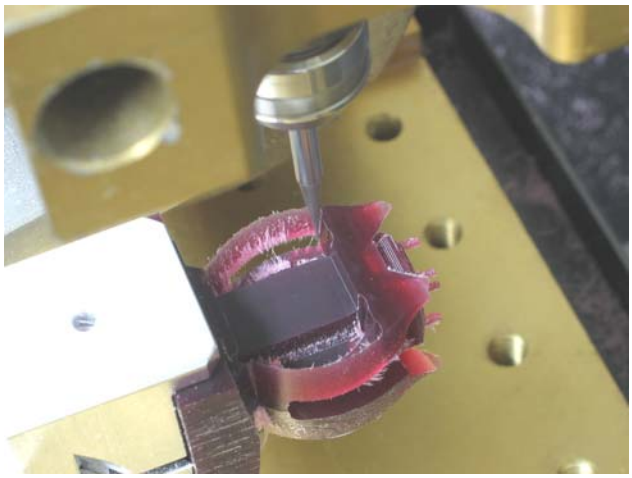


27. Retighten the fixture and return to the start position.



28. Cutting the indexing toolpath from – 90 to 90 degrees provides better structure to prevent broken waxes.





29. Add additional index angles to reach more areas of your model. Maximum angle is 120 degrees to avoid damaging the fixture.