

Now, let's take a moment to discuss our machining strategy for this part.

We'll start with a block of material that is 8 x 5 x 1.75 high.

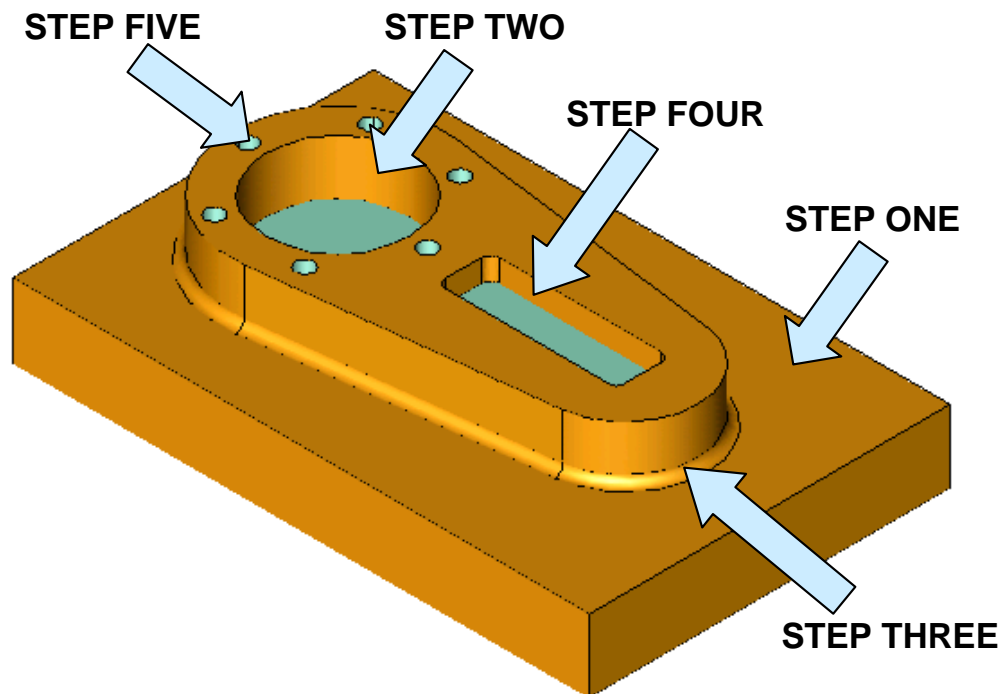
Step One: We'll use a 0.5 inch diameter flat end mill to rough machine the material outside of the raised area. We'll leave 0.125 stock on the walls.

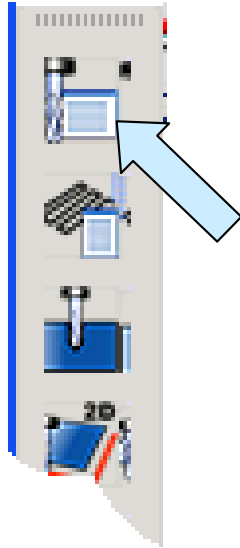
Step Two: We'll use the same 0.5 inch diameter flat end mill to finish machine the 2 inch circular pocket and to remove the bulk of the material in the rectangular pocket.

Step Three: We'll use a 0.5 diameter x 0.125 Fillet Mill to finish the outside of the raised boss area.

Step Four: We'll use a 0.250 diameter flat end mill to finish the wall of the rectangular pocket.

Step Five: We'll use a 0.25 diameter drill to machine the six holes on the raised boss area.



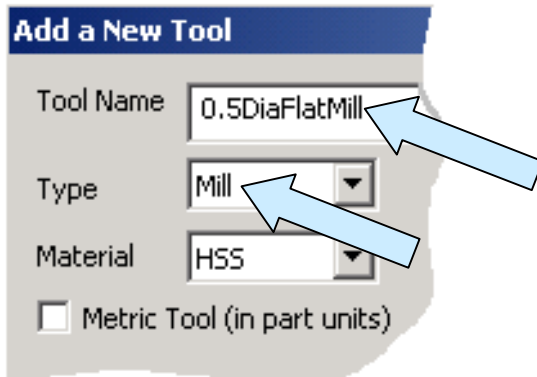
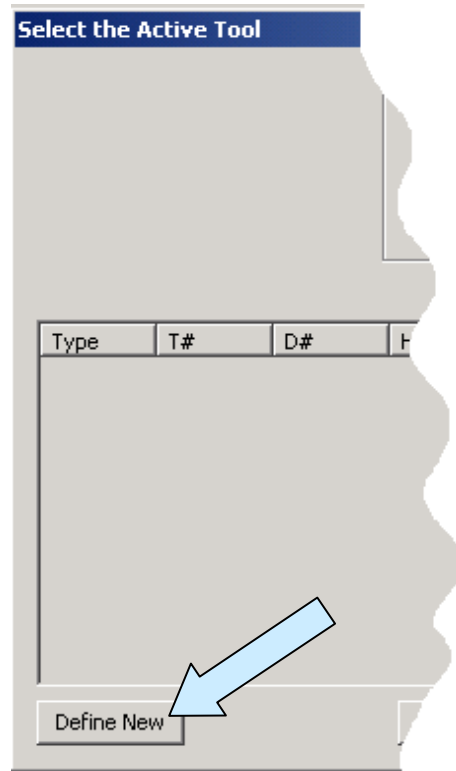


Let's start by creating a tool list that contains each of the tools needed to make the part.

Click on the TOOL LIST Icon.

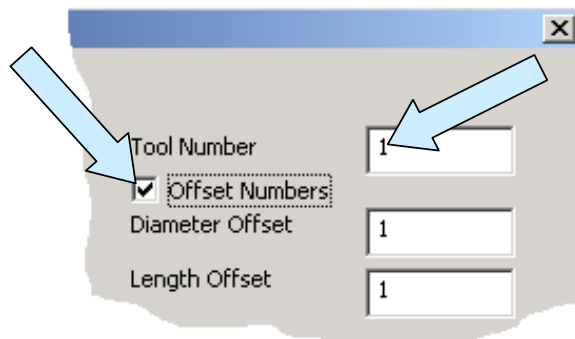
A Dialog Box appears.

Click on the Define New Button at the bottom of the box.



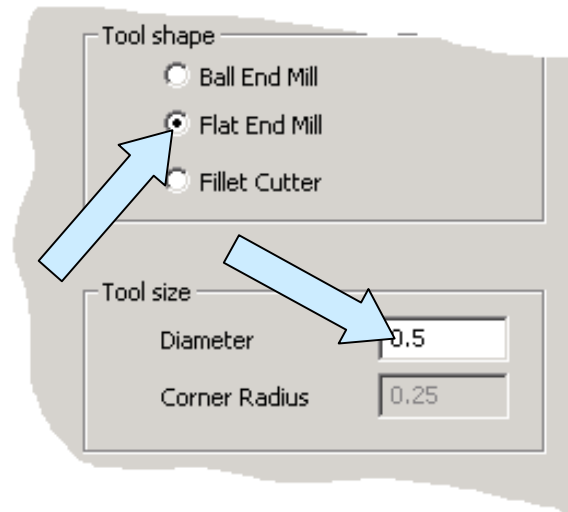
Type "0.5 DiaFlatMill" for the Tool Name and select the Mill Type.

Type "1" for the Tool Number and click on the Offset Numbers Option.

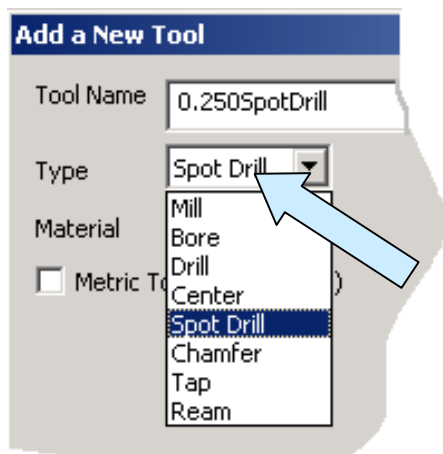
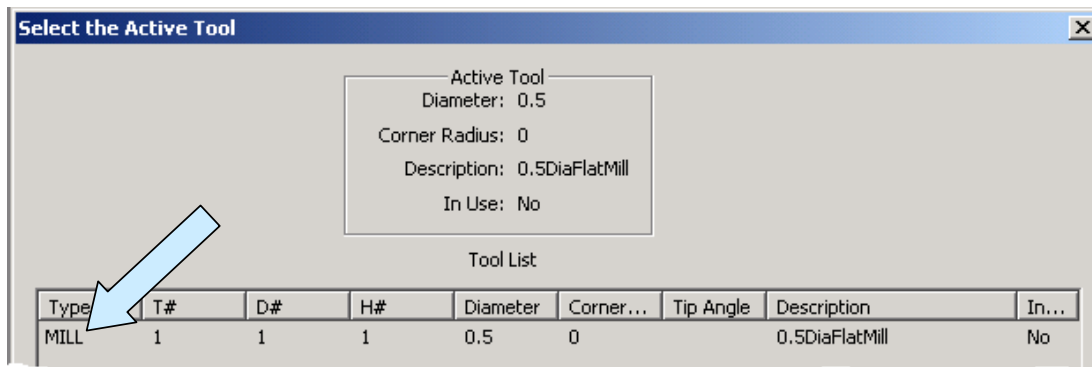


Click on the Flat End Mill Option and type 0.5 for the Diameter.

Then, click on the OK Button.

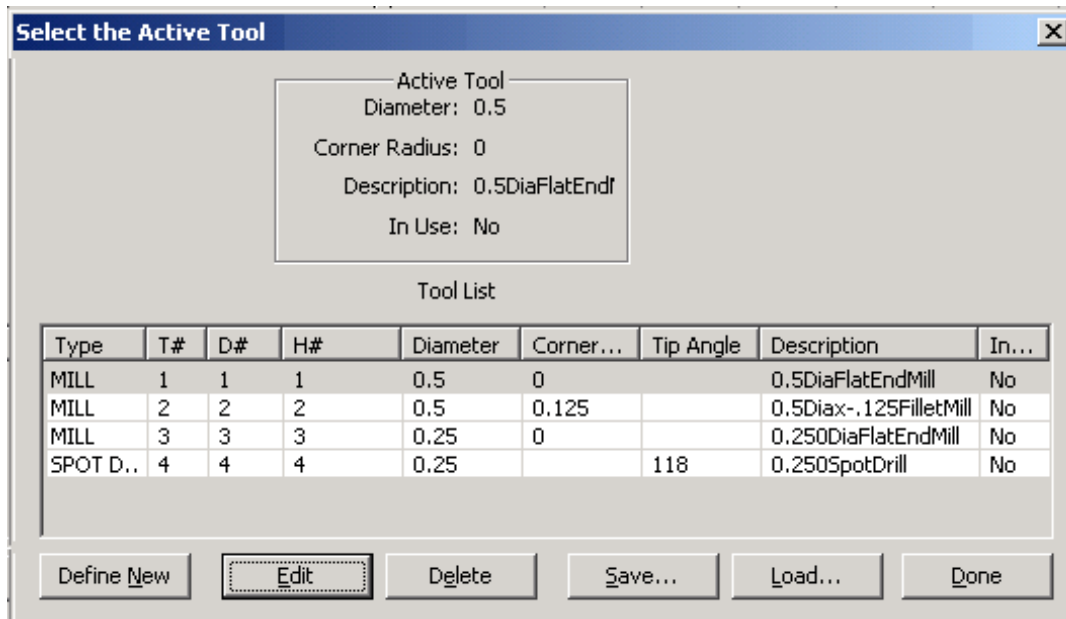


Notice that the tool has been added to the tool list.



Now, click again on the DEFINE NEW Button and create the 0.5 diameter x 0.125 fillet mill. After you finish creating that tool, create the 0.250 flat end mill and the 0.250 Spot Drill.

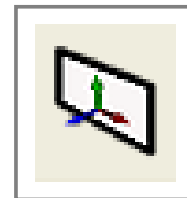
The tool list should look like this when you are done.



You can click on the SAVE Button if you want to use this set of tools in the future for another machining job.

Now, let's start on our first tool path. Our initial task is to remove the material from the block outside of the raised area. In order to do this, we have to create perimeter containment geometry.

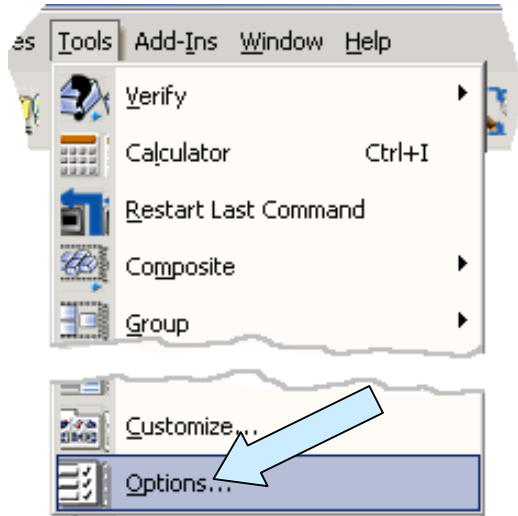
Start by clicking on the CONSTRUCTION PLANE Icon.



Then, touch on the top surface of the rectangular area.



Next, select GREEN for the construction color.

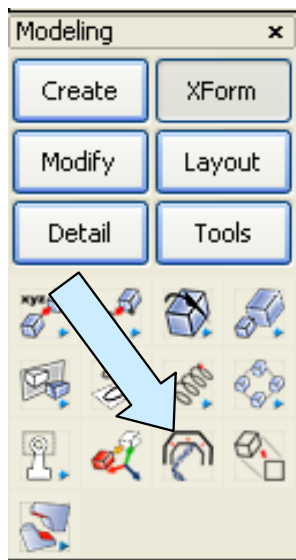
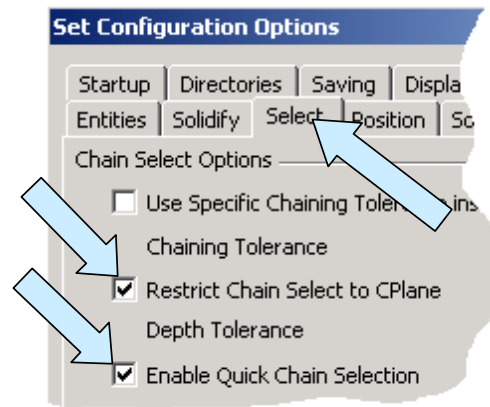


Before we proceed to the next step, click on the TOOLS Pulldown Menu and then on OPTIONS.

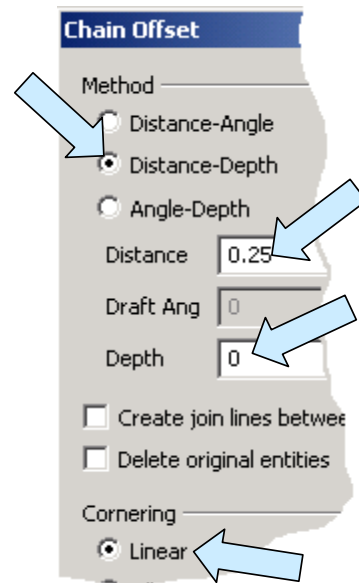
Next, click on the SELECT Tab.

Make sure that the Restrict Chain Select to CPlane and Enable Quick Chain Select Options are both checked.

Then, click on the OK Button.

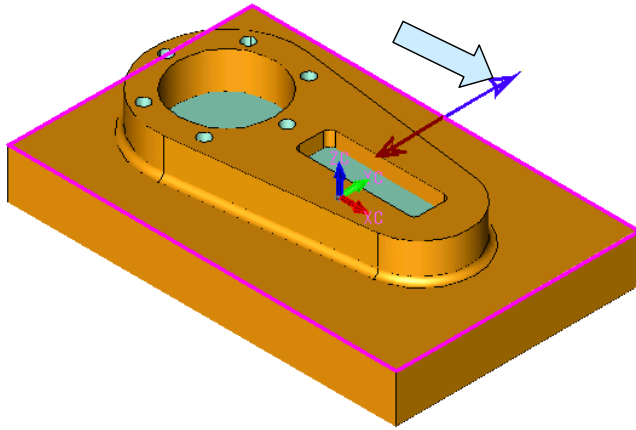


Click on the CHAIN OFFSET Icon.



A Dialog Box appears. Click on the Distance-Depth Option.

Type 0.25 for the Distance and 0 for the Depth. Click on the Linear Option for Cornering and then on the OK Button.



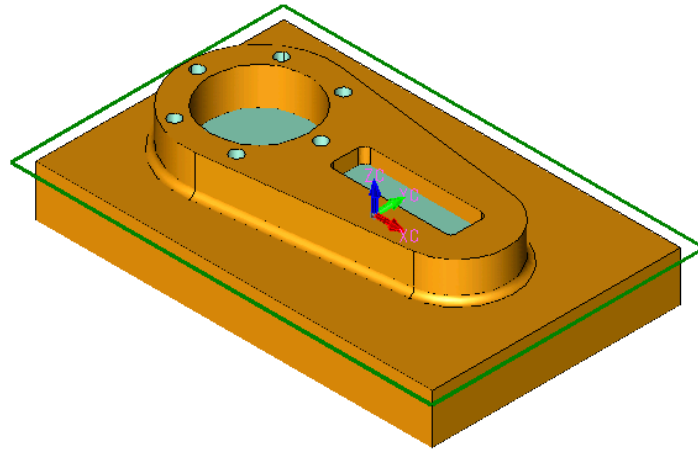
Now, move the cursor over the upper, rectangular edge of the part and click on it when it highlights.

A double-headed vector appears on the selected edge.

Click on the outward-facing vector.

You will now have a green rectangle like the one in the illustration to the right.

We are going to use this rectangle as a containment boundary for the first toolpath that we generate. Then, I'll show you an alternate approach.

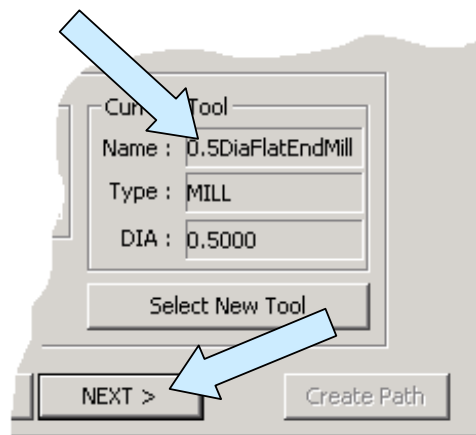


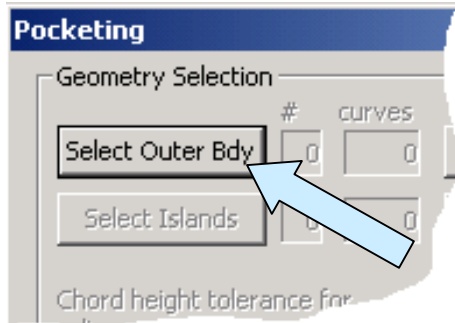
Click on the 2D POCKET Icon.



A Dialog Box appears. We'll use the 0.5 Diameter Flat End Mill for the tool.

Click on the NEXT Button.



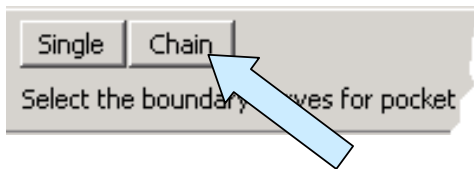
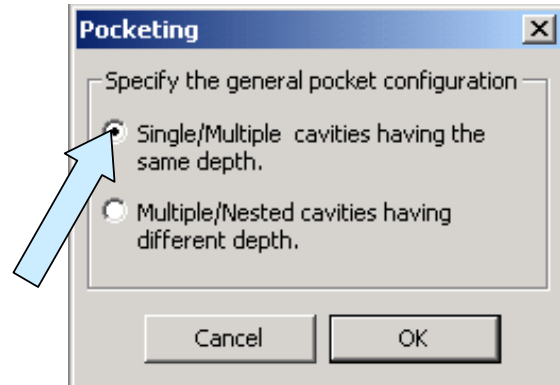


A new Dialog Box appears.

Click on the Select Outer Body Button at the top of the box.

A small Dialog Box appears.

Click on the Single/Multiple cavities having the same depth option and then on the OK Button.



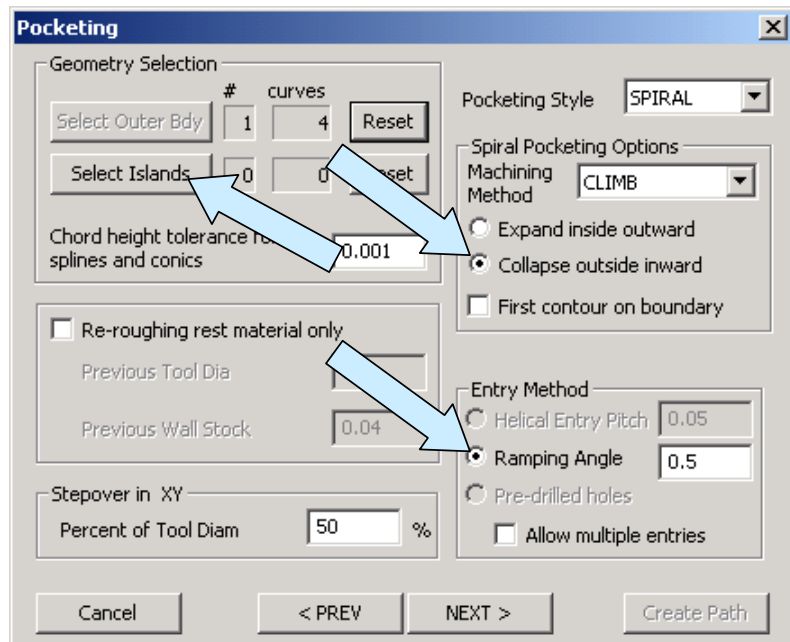
The Conversation Bar prompts you to use either a single or chain selection.

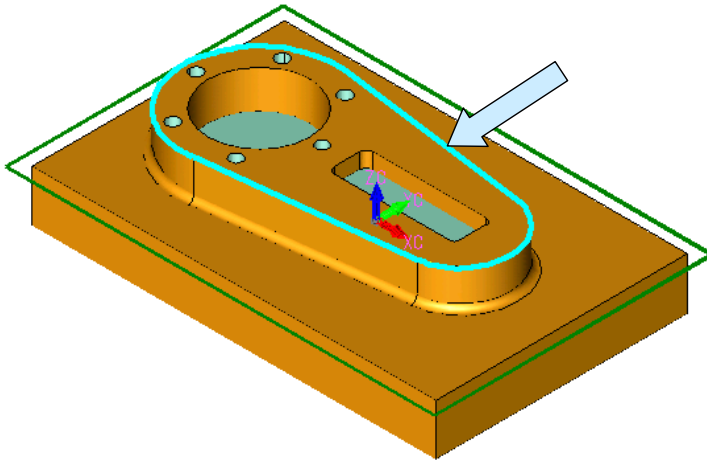
Click on the CHAIN Option. Move the cursor over the green rectangle and click on it when it highlights. Hit the ENTER Key.

Click on the Collapse Outside Inward option. This will cause the cutter to machine inward from the perimeter of the part.

Next, click on the Ramping Angle Option and use a value of 0.5.

Click on the Select Islands Button.



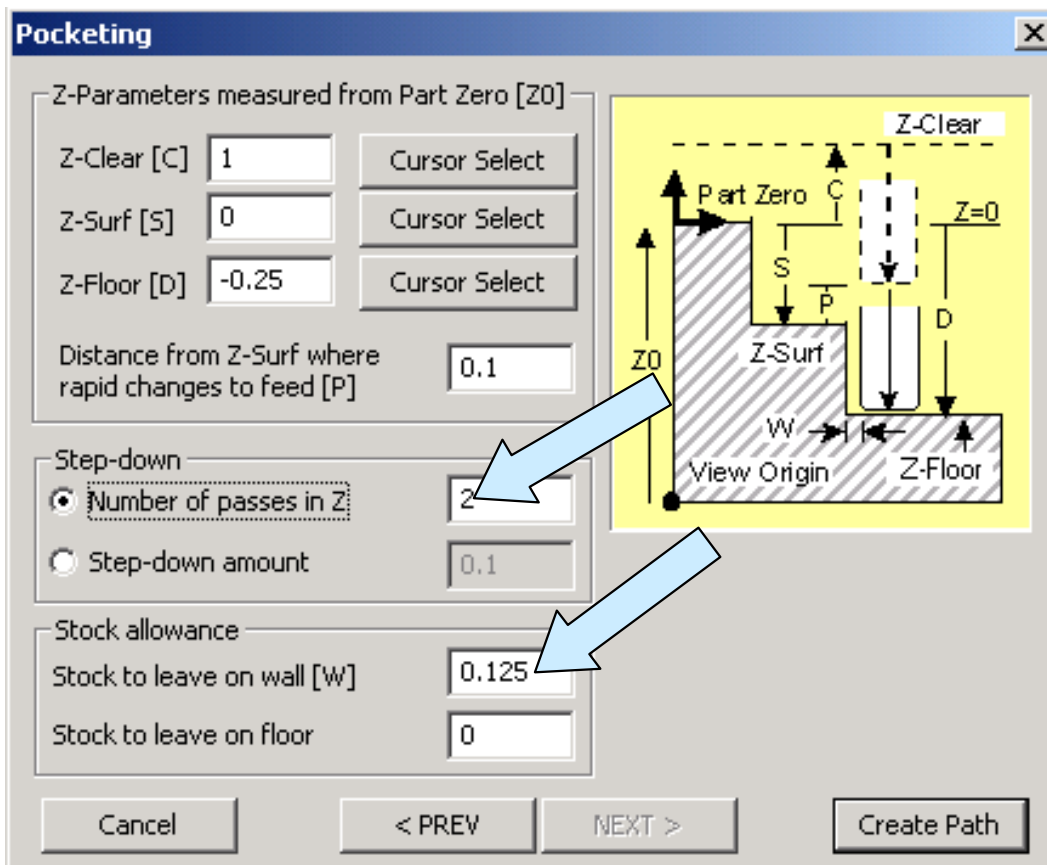


The Conversation Bar again prompts you to single select or chain select. Click on the CHAIN Option. Then, move the cursor over the top, outside edge of the raised boss area and click on it when it highlights.

Hit the ENTER Key.

The Dialog Box reappears. Click on the NEXT Button.

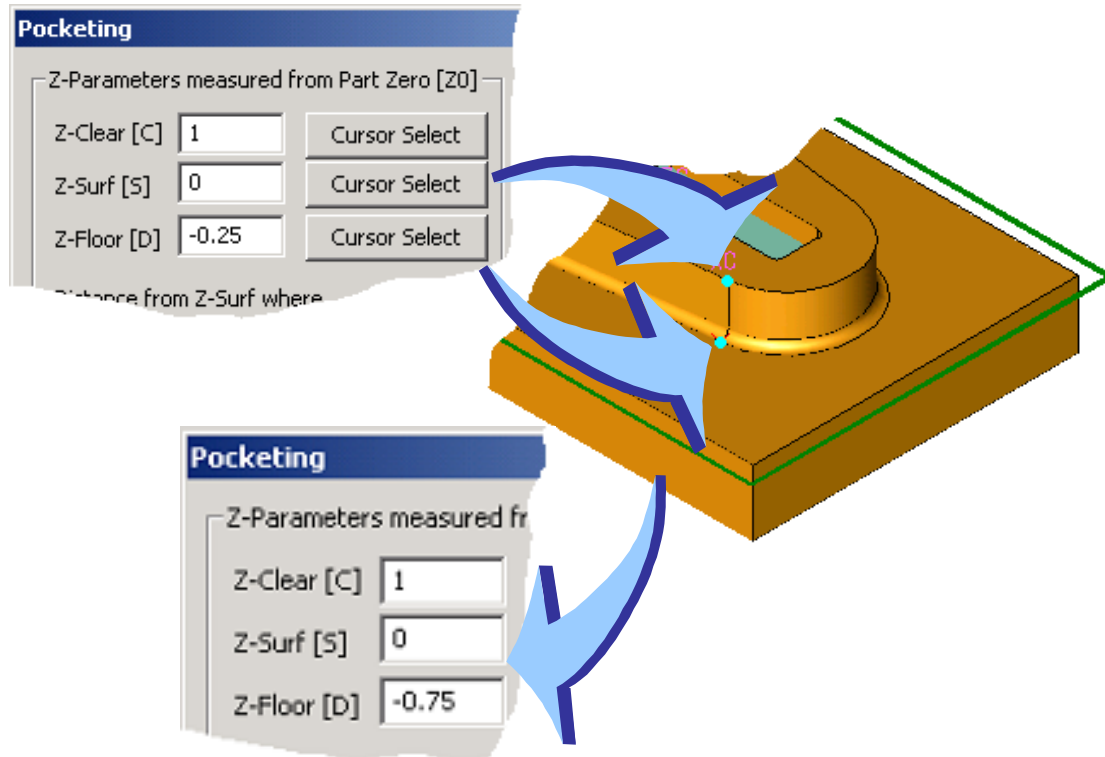
Another Dialog Box appears. Type 2 for the Number of Passes and type 0.125 for the Stock to Leave on Wall. (In step three, we'll use the 0.125 fillet mill to create the root blend on the boss.)



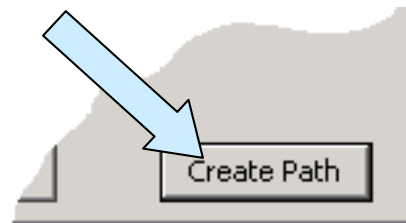
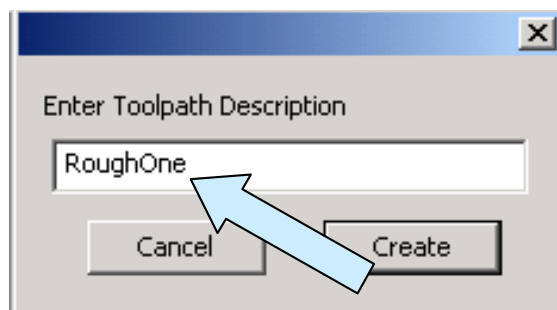
Next, let's establish the vertical limits of the pocket. Click on the Cursor Select Button to the right of the Z-Surf Field. Then, using the ENDENT Option, click on the top end of one of the vertical tiebars on the boss.

Next, click on the Cursor Select Button to the right of the Z-Floor Field. Then, using the ENDENT Option, click on the lower end of one of the root fillets. (The selected points do not have to align. We are only interested in the Z values.)

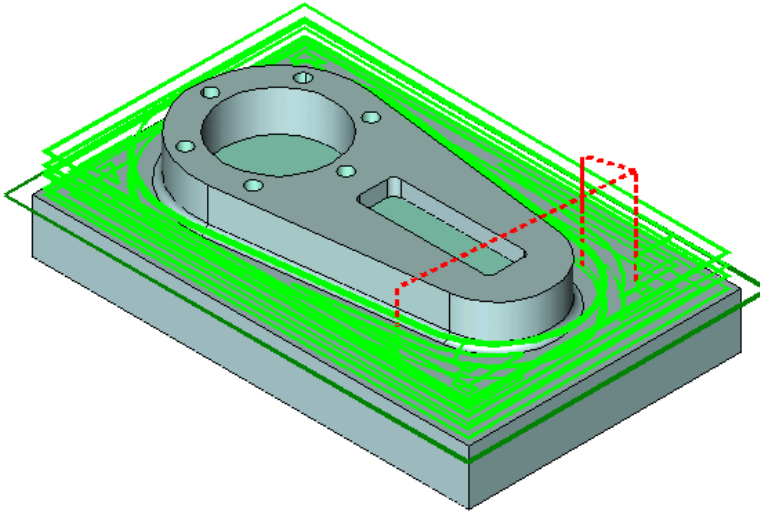
Notice that the values in the fields now represent the pocket limits.



Click on the CREATE PATH Button at the bottom of the Dialog Box.



A small Dialog Box appears. Type "RoughOne" for the path name and then click on the CREATE Button.

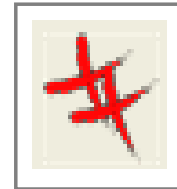


The toolpath is created. Notice that since our construction color was green, the toolpath is in green and the lead-in/lead-out tracks are in red. (The next color in the system attributes grid.)

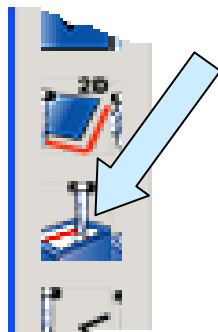
Note: I've cheated in the illustration above and used a slightly different shade of green for the containment rectangle to differentiate it from the toolpath for illustration purposes.

Now in this toolpath, we used the rectangle created with the Chain Offset Function as a containment boundary for the operation. Let's look at a different approach that eliminates the need for the rectangle created by the Chain Offset Function.

Click on the DELETE Icon and then on the toolpath that you just made.



Click on the 2D POCKET Icon.



A Dialog Box appears. We'll use the 0.5 Diameter Flat End Mill for the tool.

Click on the NEXT Button.

