

Mastercam Training Video Series

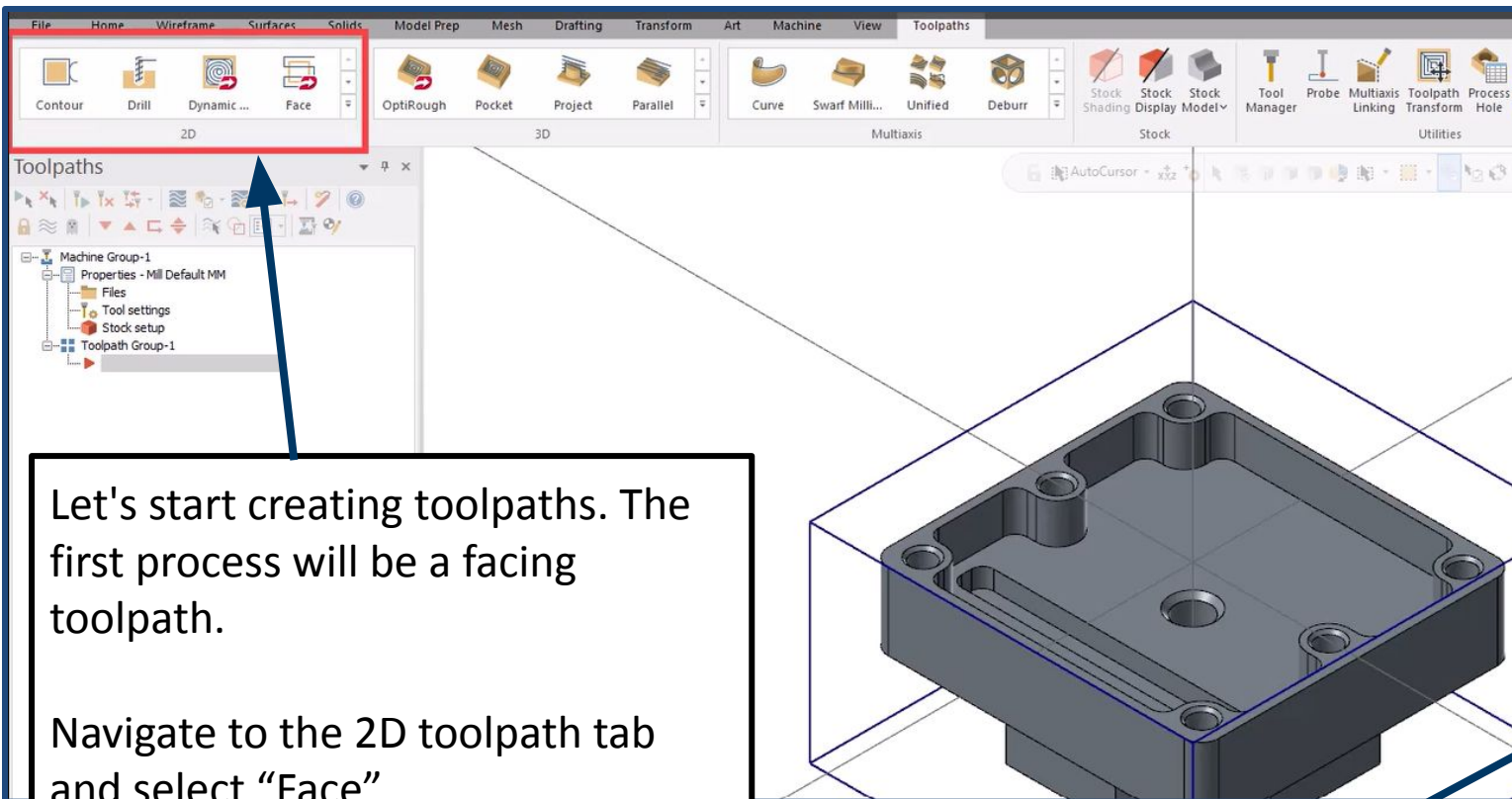
Video 2 - First side roughing operations

[Video Link](#)





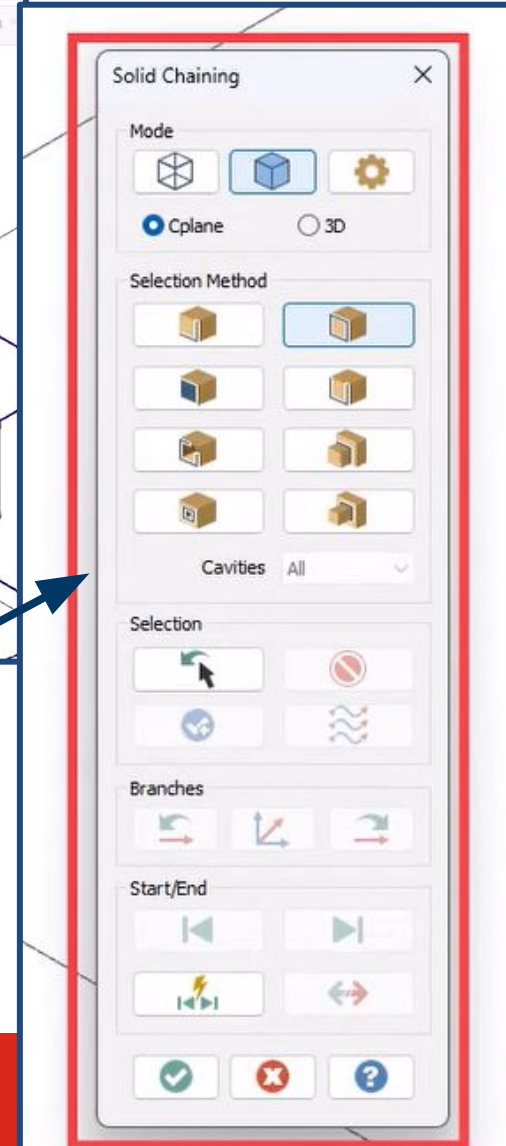
worldskillsuk
excellence at work



Let's start creating toolpaths. The first process will be a facing toolpath.

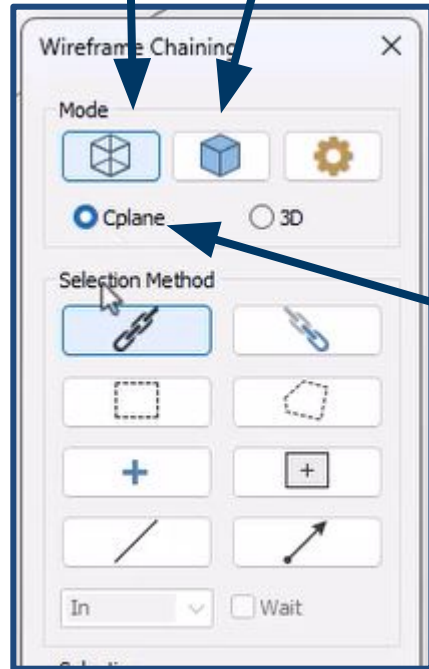
Navigate to the 2D toolpath tab and select "Face"

The chaining dialogue box will appear, this is used in 2D toolpaths to define geometry that will define or drive toolpaths



Wireframe Selection

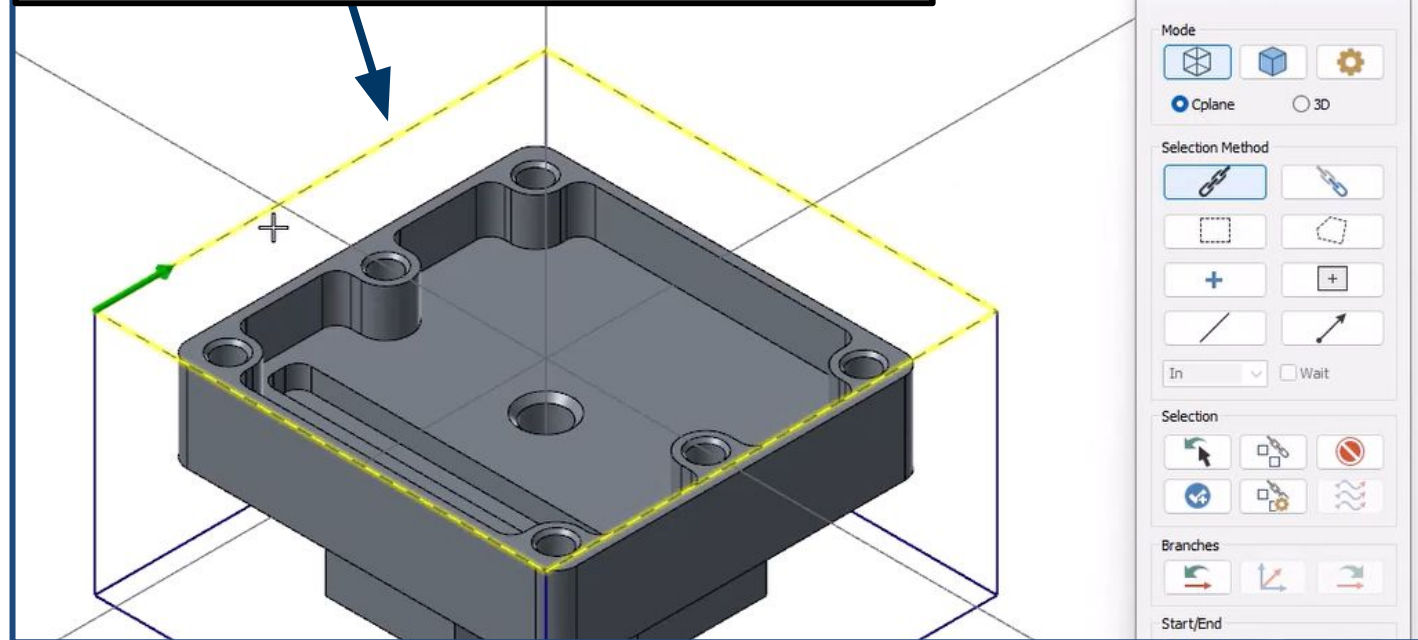
Solid Selection



Cplane selection
This only allows
selection of
wireframe in one
plane only - the
current selected
construction plane

Choose wireframe selection and Cplane
selection

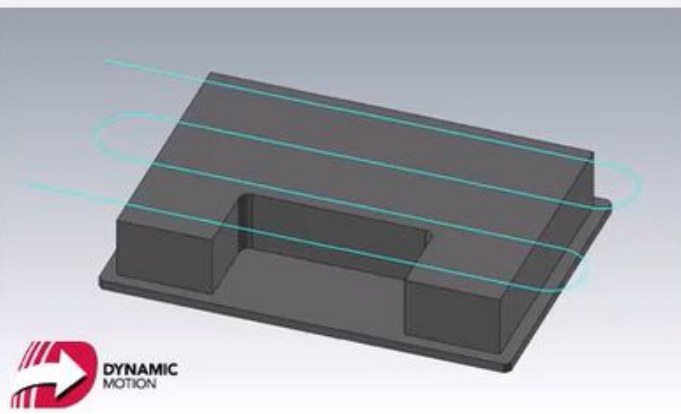
Now select the top edge of the wireframe
which represents the stock block.
This will now define the area that the facing
toolpath will machine within.
Click the green tick to accept.



- 2D Toolpaths - Facing
- Toolpath Type
 - Tool Holder
 - Cut Parameters
 - Depth Cuts
 - Linking Parameters
 - Home / Ref. Points
 - Arc Filter / Tolerance
 - Planes
 - Coolant
 - Canned Text
 - Misc Values
 - Axis Control
 - Axis Combination
 - Rotary Axis Control



The Facing Toolpath parameter box will appear. We will work through the options highlighted on the left adjusting the ones which are required



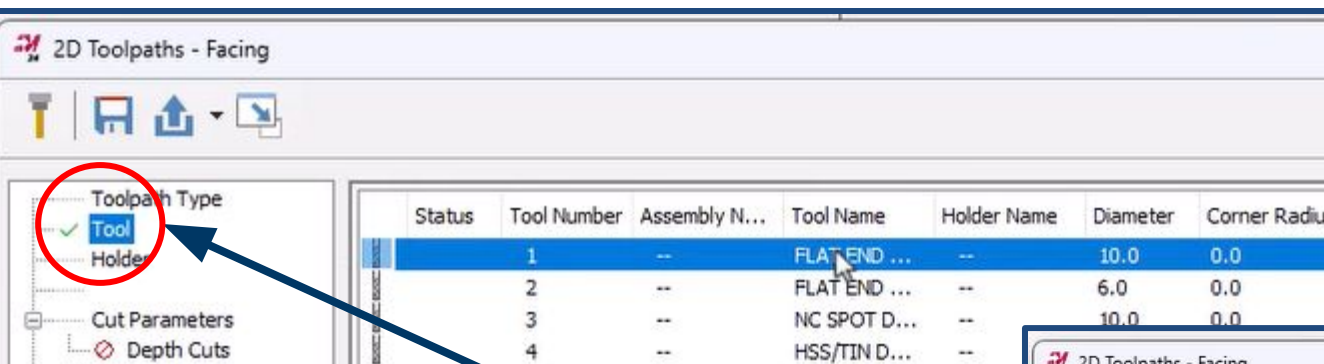
Avoidance model

Clearance

0.0

Quick View Settings

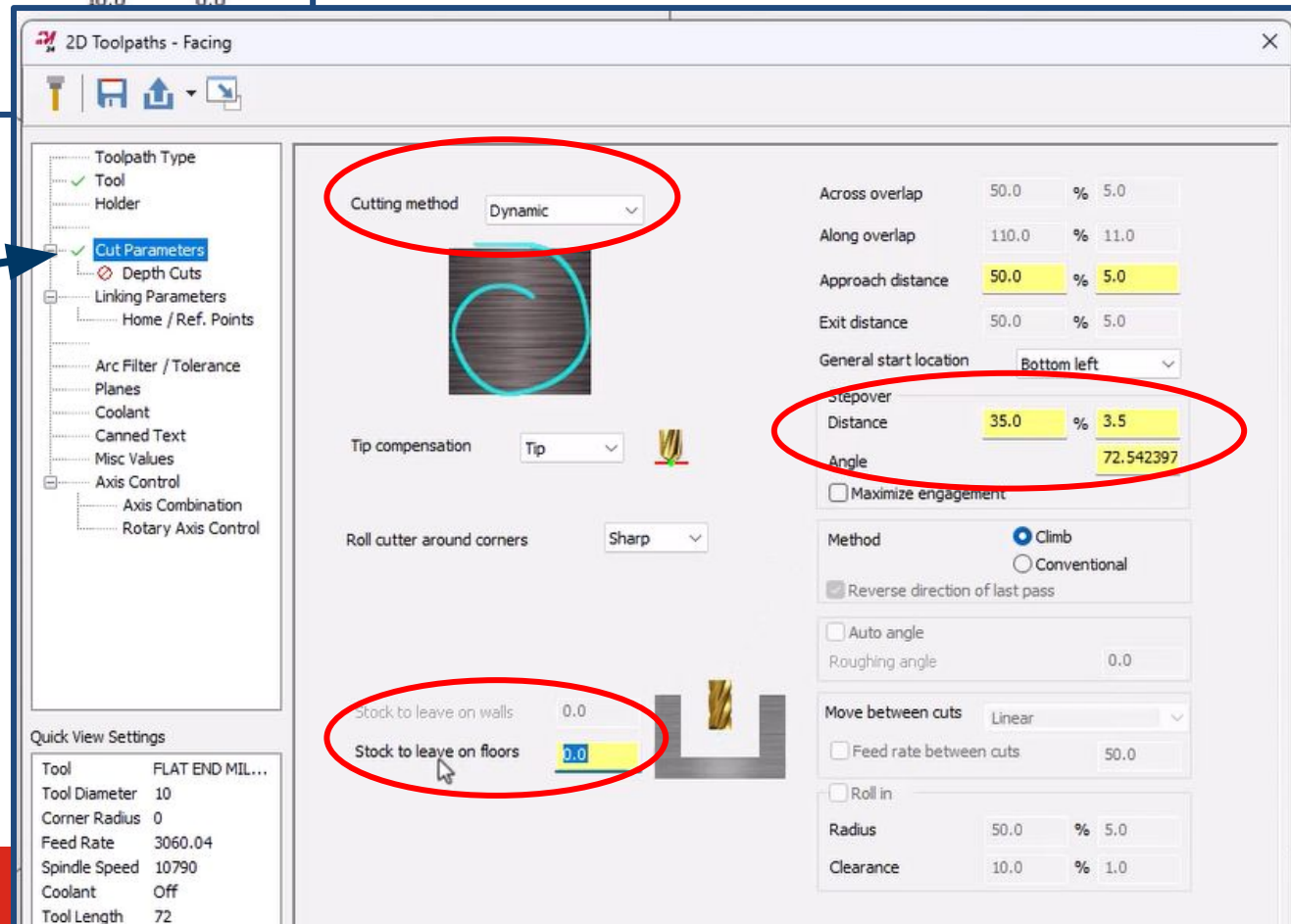
Tool	FLAT END MIL...
Tool Diameter	10
Corner Radius	0
Feed Rate	2870.14
Spindle Speed	5205

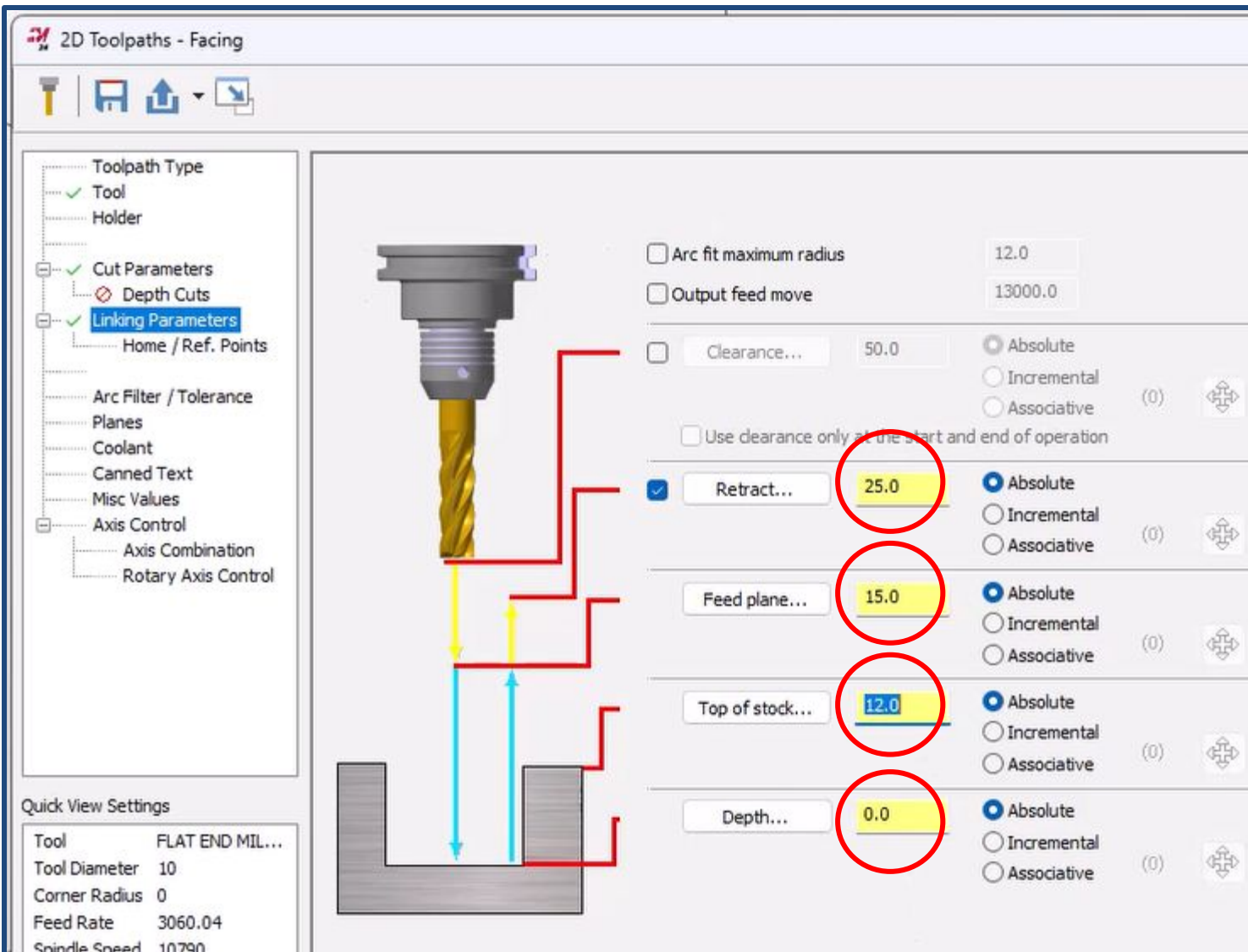


First, select the tool page and select the 10mm flat endmill - adjust speeds and feeds as necessary

Now select "Cut Parameters"

And change the following:
Cutting Method - Dynamic
Stepover - 35%
Stock to Leave on floors - 0.0mm





Now on the Linking Parameters page

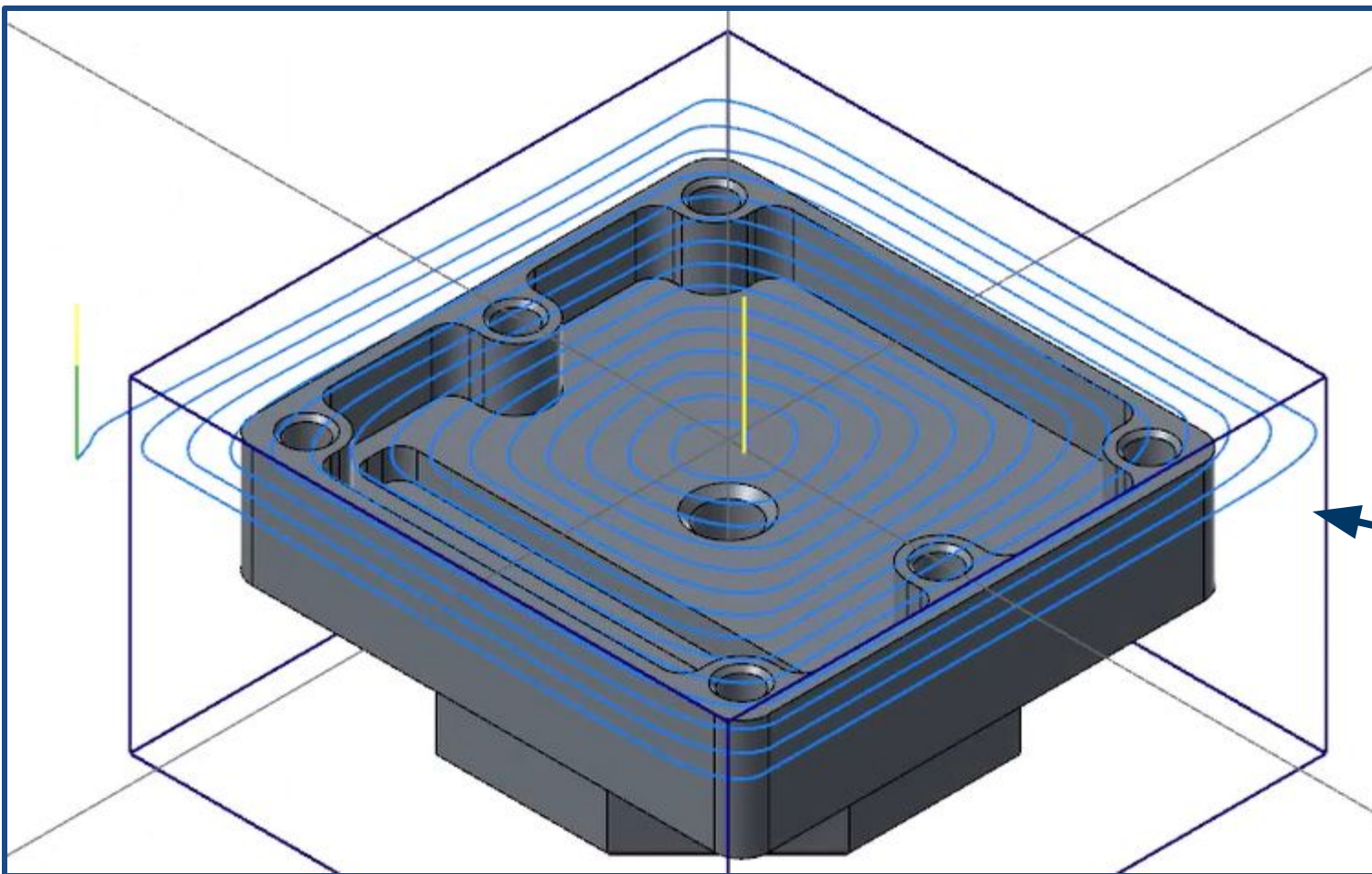
Adjust all the heights so they are using Absolute figures

Change the figures to match the ones shown in the diagram

Top Tip

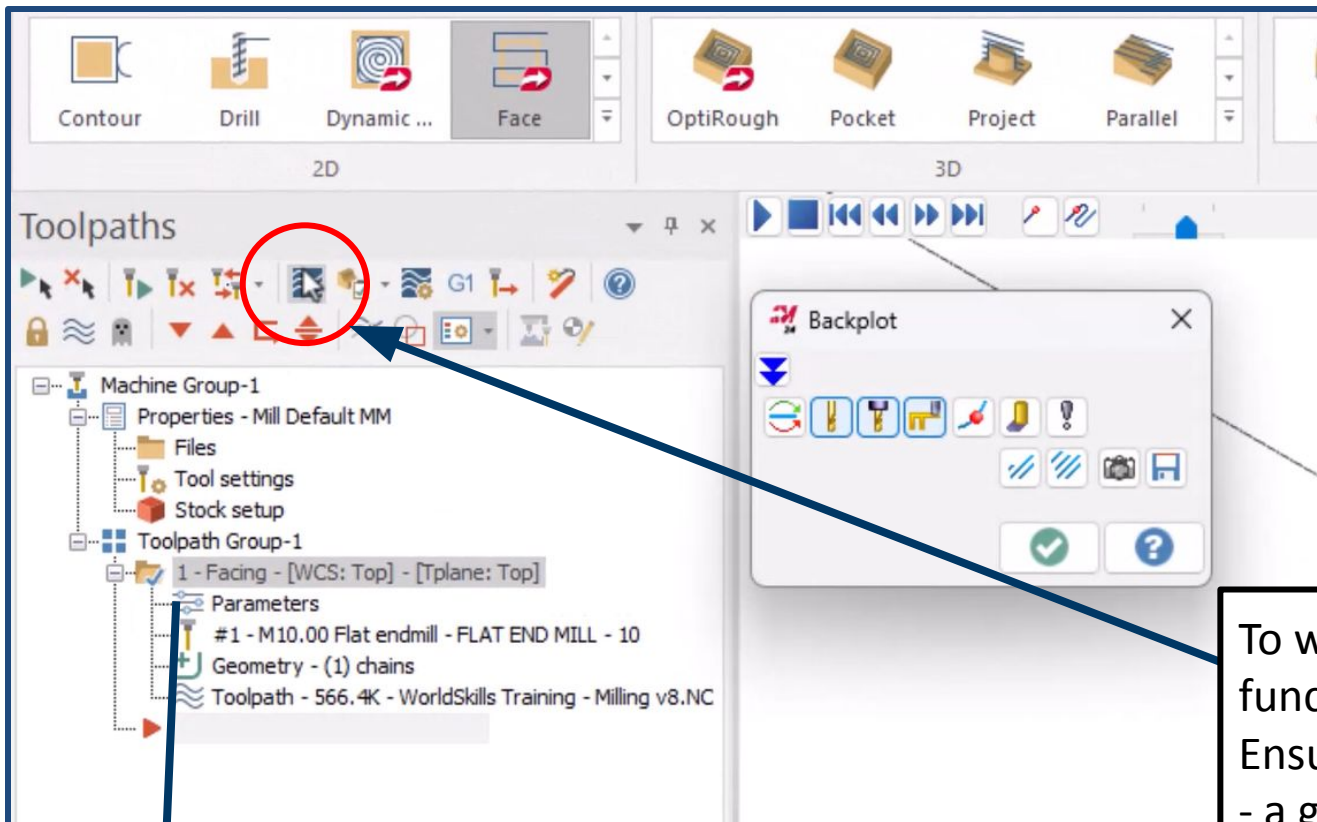
Absolute figures are relative to the selected plane (Datum)

Incremental Figures - Relate to the geometry that has been selected to define the toolpath. This could be a wireframe, solid edge, hole center, etc.



Press the green tick to accept parameters and generate this first toolpath.

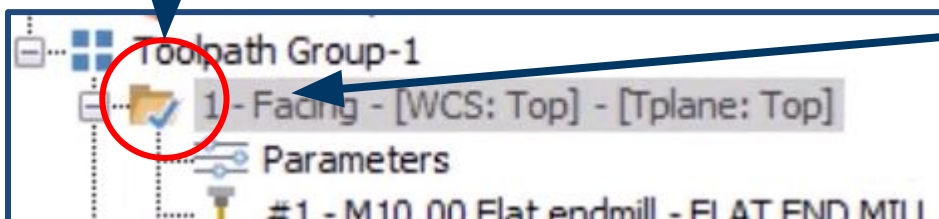
The toolpath should look like the one shown

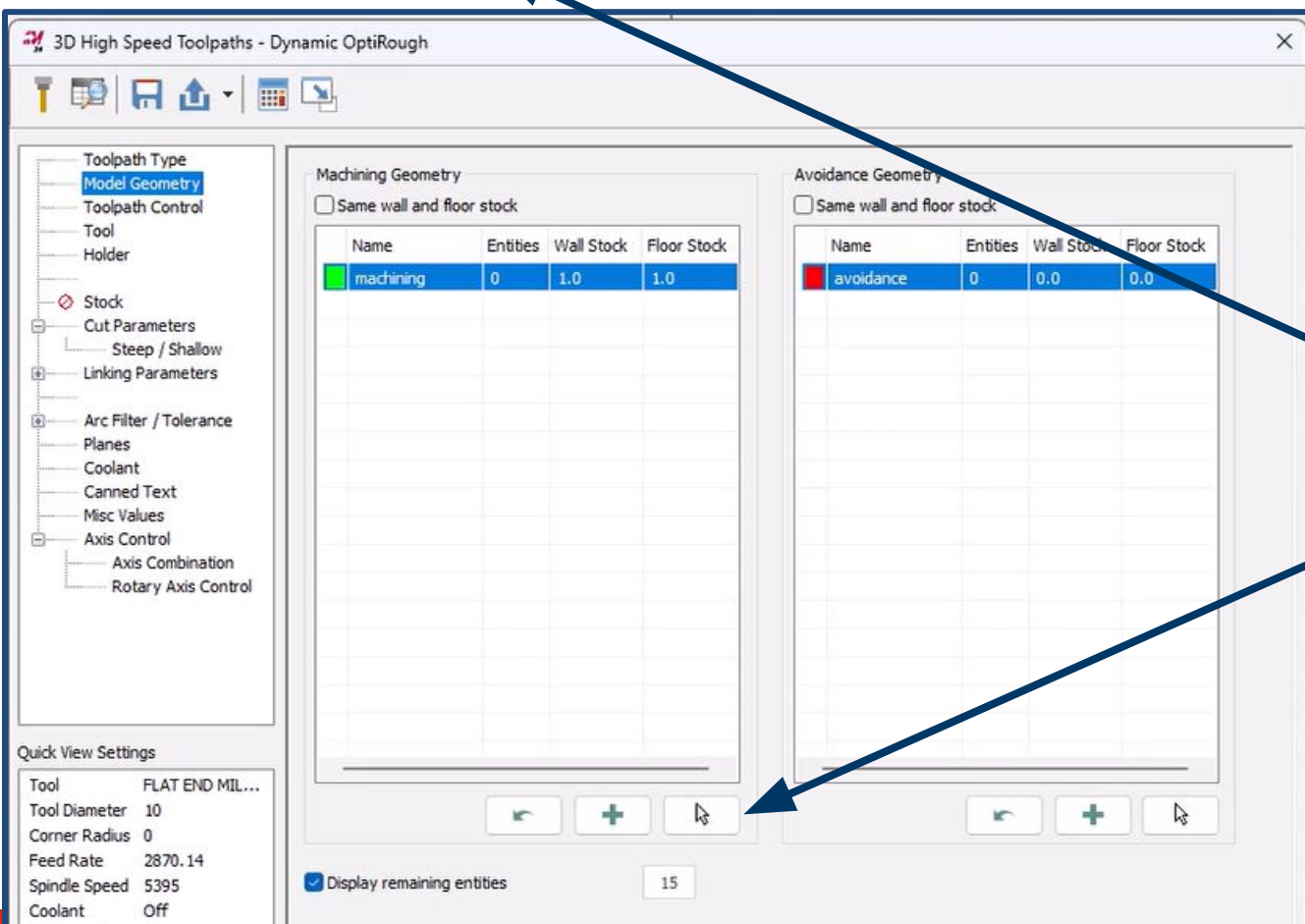
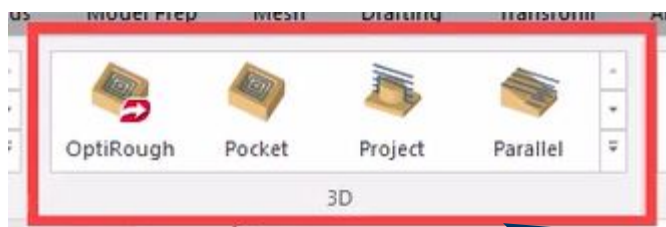


To watch this toolpath in action - the “Backplot” function can be used.

Ensure the toolpath is selected in the toolpath manager - a green tick on the folder designates a selected toolpath

Press the Backplot button and use the play button to start the simulation of the toolpath





Now we will use the Optirough toolpath strategy from the 3D toolpath suite

This toolpath will be used to rough out side 1 of this part

Select the OptiRough toolpath from the ribbon bar

Click on the cursor button to select the model geometry that requires machining - the screen will return to the graphics screen.

- Select Solid Face, Surface, or Mesh:
- [Shift+click] to select tangent faces.
 - [Alt+click] to vector select.
 - [Ctrl+click] to select matching fillets/holes.
 - [Ctrl+Shift+click] to select similar faces.
 - Double-click to select a feature.
 - [Ctrl+Shift+double-click] to select similar features.
 - Triple-click to select the solid body.

Pop-up describes selection methods

Now on the graphics screen drag a box around the whole model.
This selects all the geometry.
Alternatively use the triple click method as described in the pop-up
Press enter to accept and return to the model geometry page.
Use these figures
0.2mm for Wall Stock
0.1mm for Floor stock

3D High Speed Toolpaths - Dynamic OptiRough

Toolpath Type

- ✓ Model Geometry
- Toolpath Control
- Tool
- Holder
- Stock
- Cut Parameters
 - Steep / Shallow
- Linking Parameters
- Arc Filter / Tolerance
- Planes

Machining Geometry

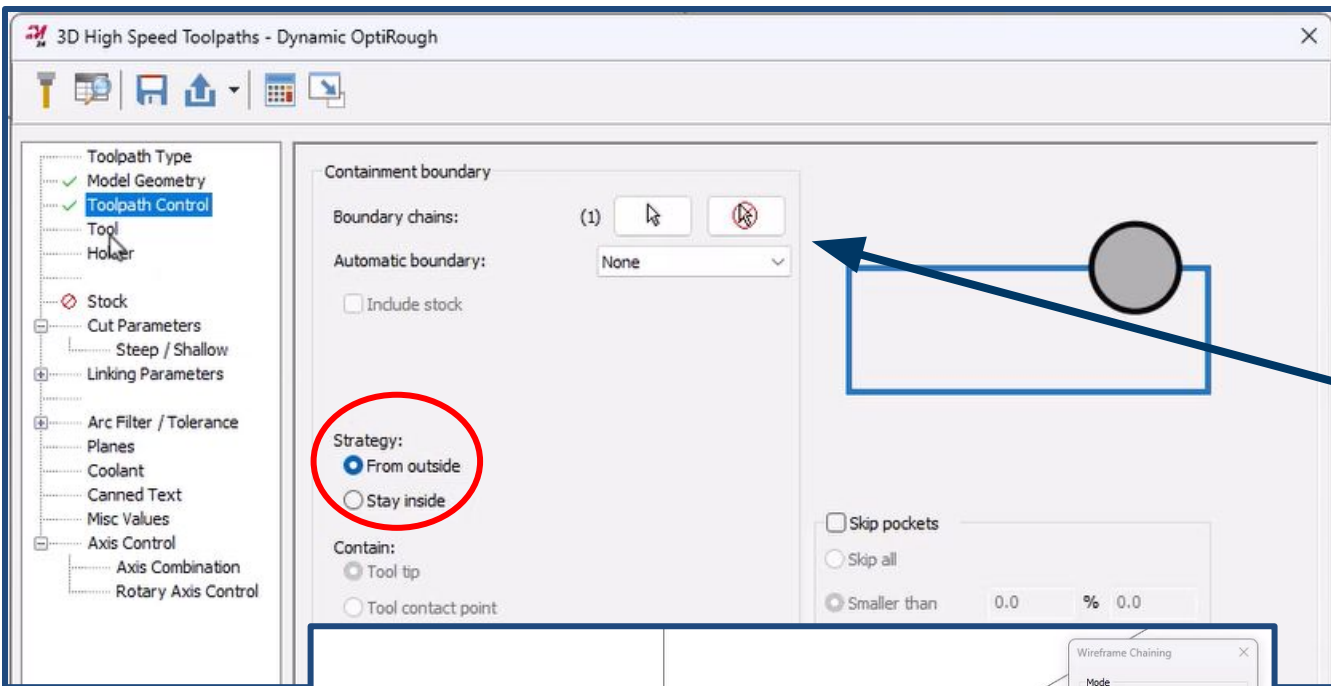
☐ Same wall and floor stock

Name	Entities	Wall Stock	Floor Stock
machining	96	0.2	0.1

Avoidance Geometry

☐ Same wall and floor stock

Name	Entities	Wall Stock	Floor Stock
avoidance	0	0.0	0.0



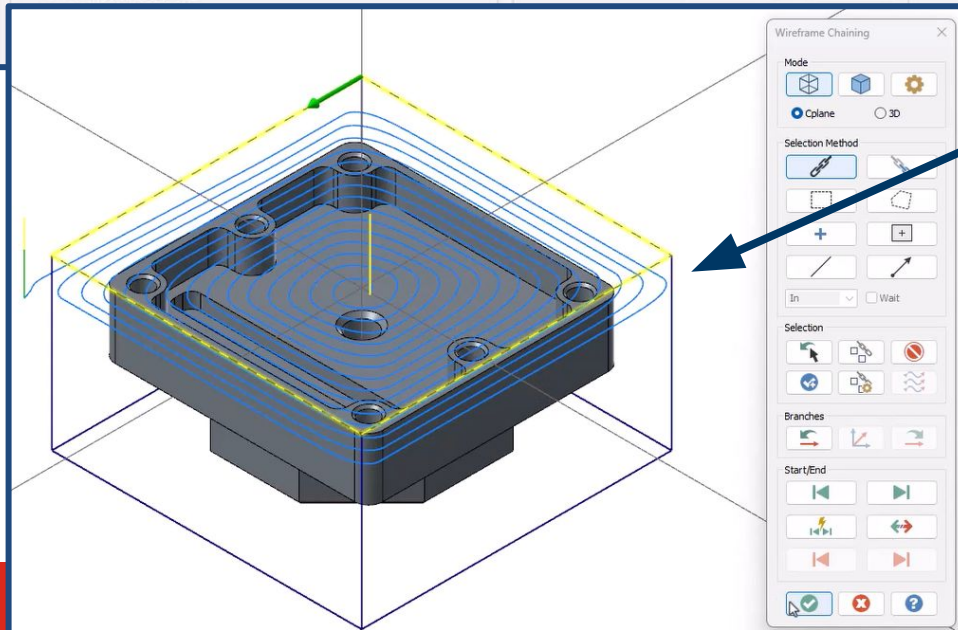
On toolpath control - click on the arrow select icon next to boundary chains

The graphics area is shown along with a chaining pop-up

Select the outside wireframe perimeter as shown highlighted - this contains the toolpath within this boundary

Green tick to accept

Back on the menu - ensure strategy is set to "From Outside"





- Toolpath Type
- ✓ Model Geometry
- ✓ Toolpath Control
- ✓ Tool
- Holder
- ✗ Stock
- ✓ **Cut Parameters**
 - Steep / Shallow
- Linking Parameters
- Arc Filter / Tolerance
- Planes
- Coolant
- Canned Text
- Misc Values
- Axis Control
 - Axis Combination
 - Rotary Axis Control

Quick View Settings

Cut style

Cutting method Climb

Conventional feed rate 100.0 % 3060.044

Tip compensation Tip

Optimize stepups Next closest

Optimize stepdowns Material

Stepover

Distance 25.0 % 2.5

Angle 60.0

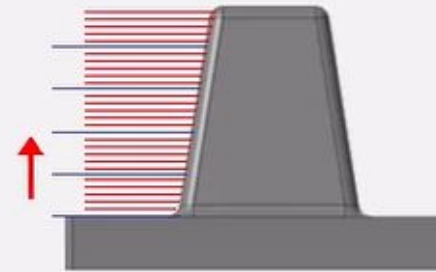
☐ Maximize engagement

Stepdown 100.0 % 10.0

☒ Stepup 10.0 % 1.0

☐ Mill vertical walls

Minimum toolpath radius 10.0 % 1.0



On the tool selection -
select the Ø10 Flat
endmill

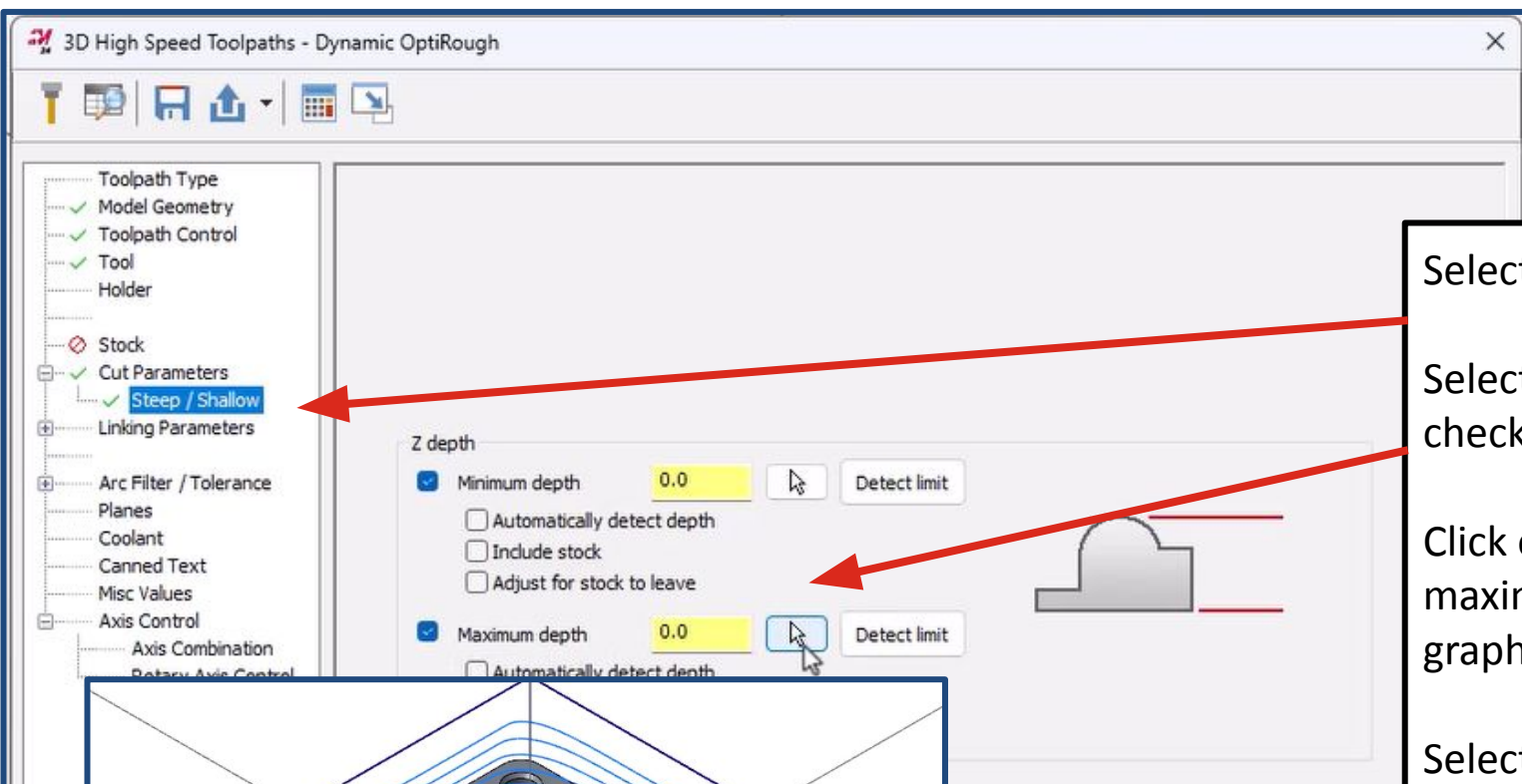
On Cut parameters set

Optimize Step-ups - Next Closest

Stepover - 25%

Stepdown - 100%

Step-up -10%



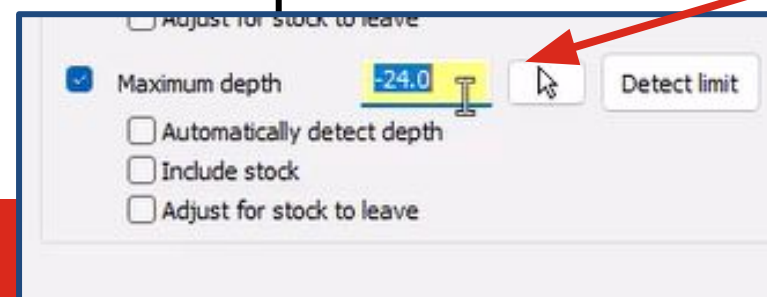
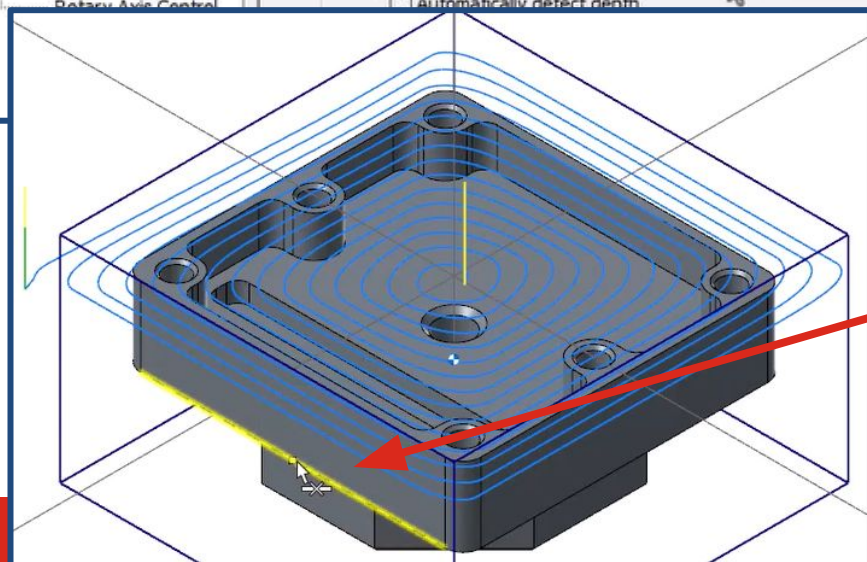
Select Steep/Shallow

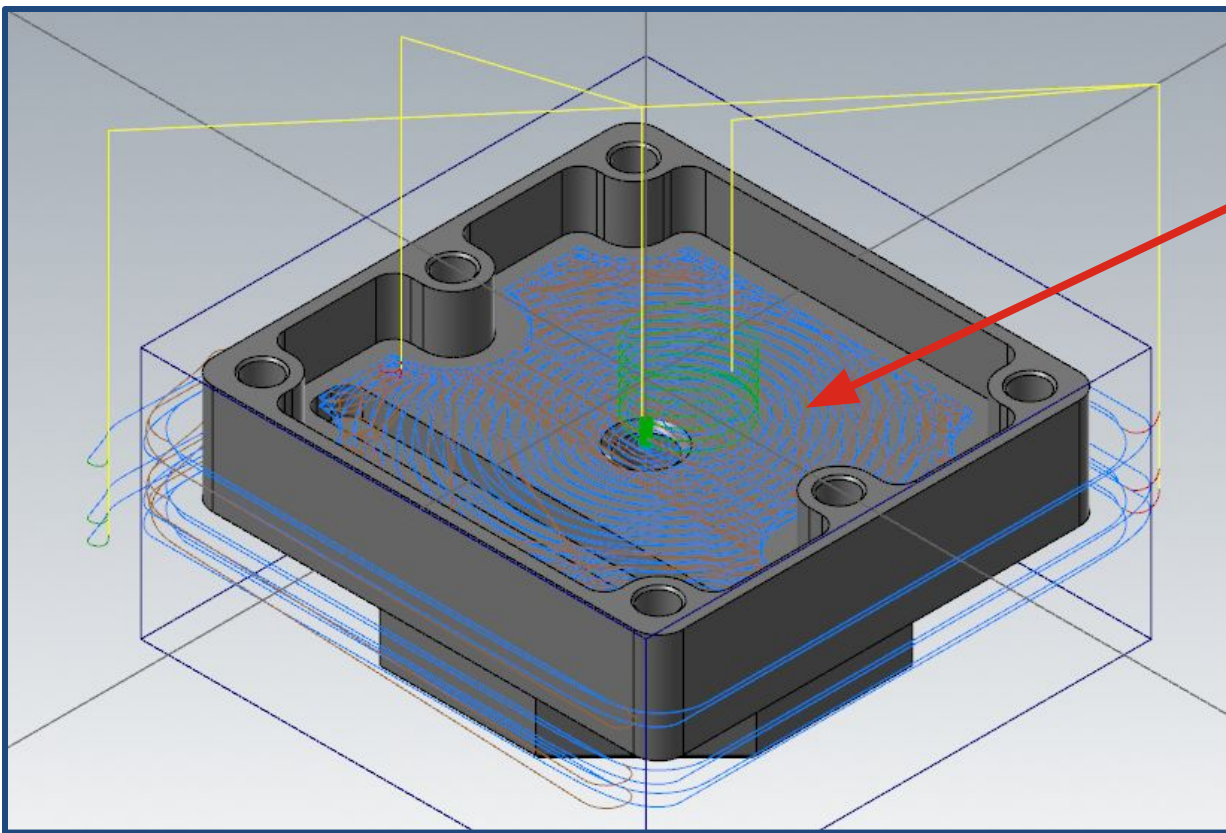
Select Minimum and Maximum depths
check boxes

Click on the selection arrow next to
maximum depth - this returns you to the
graphics area

Select the bottom edge of side 1, as
shown

Then update depth from -22 to -24mm
Green tick to accept





Toolpath should look like the one shown

We can see that there are areas that haven't been machined as the $\varnothing 10$ Endmill is tool big

The 9.2mm Slot has not been machined.

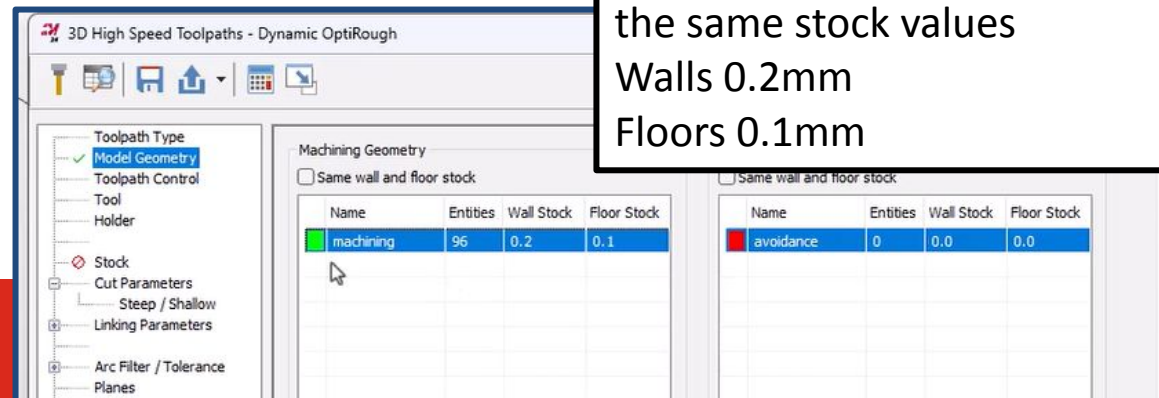
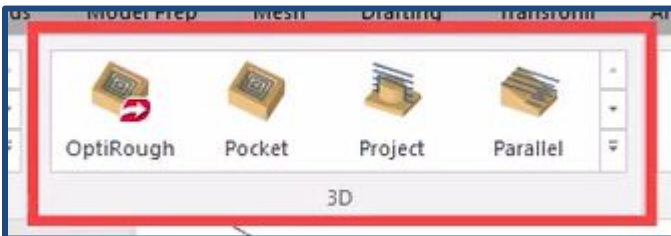
To machine these areas we will use a Optirest tool path.

Optirest toolpath

To do this select another Optirough toolpath and repeat the model selection process as before and leave the same stock values

Walls 0.2mm

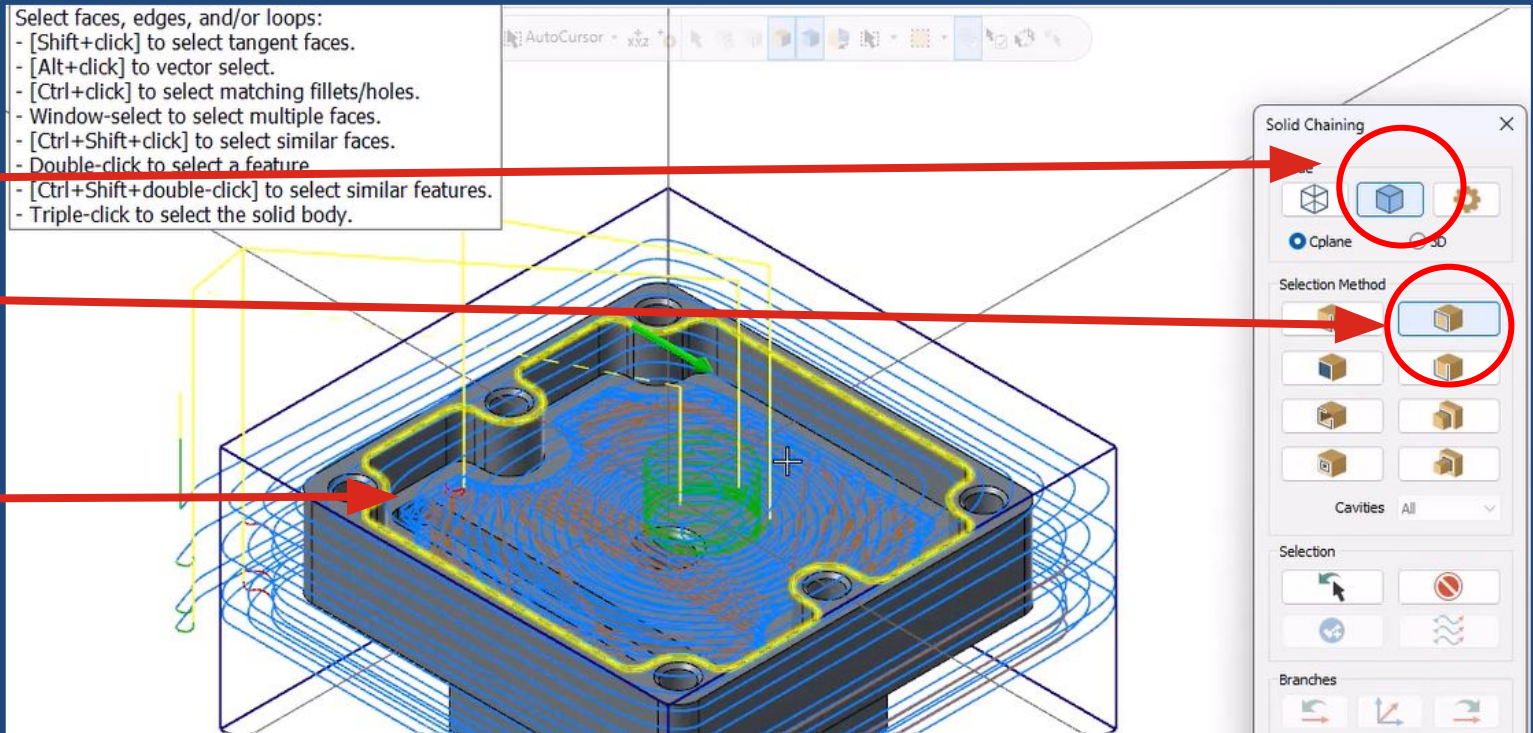
Floors 0.1mm

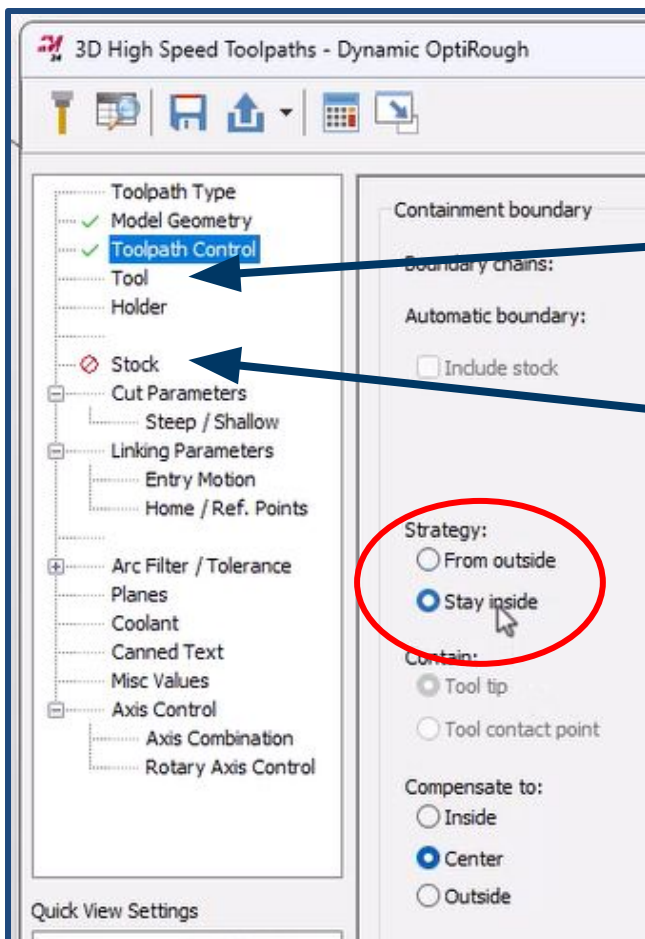


Move to "Toolpath Control"
Click - Boundary Chains

On the chaining dialogue box.
Choose Solid Selection
And Loop selection

Click on the inner edge of the
pocket as shown in yellow

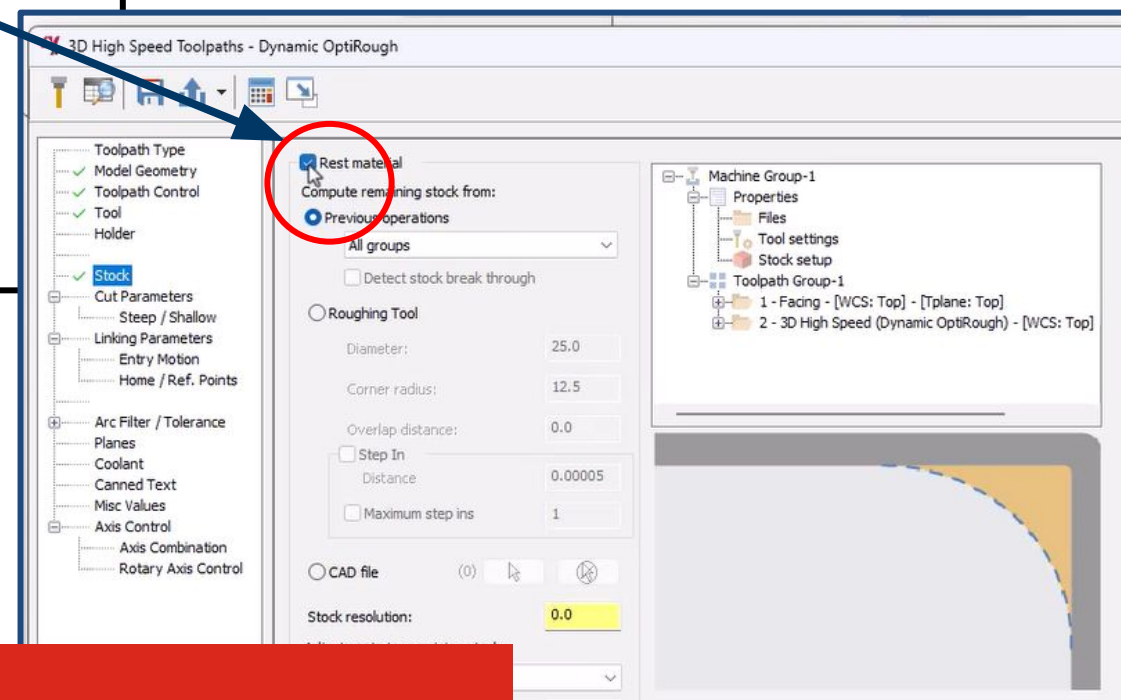


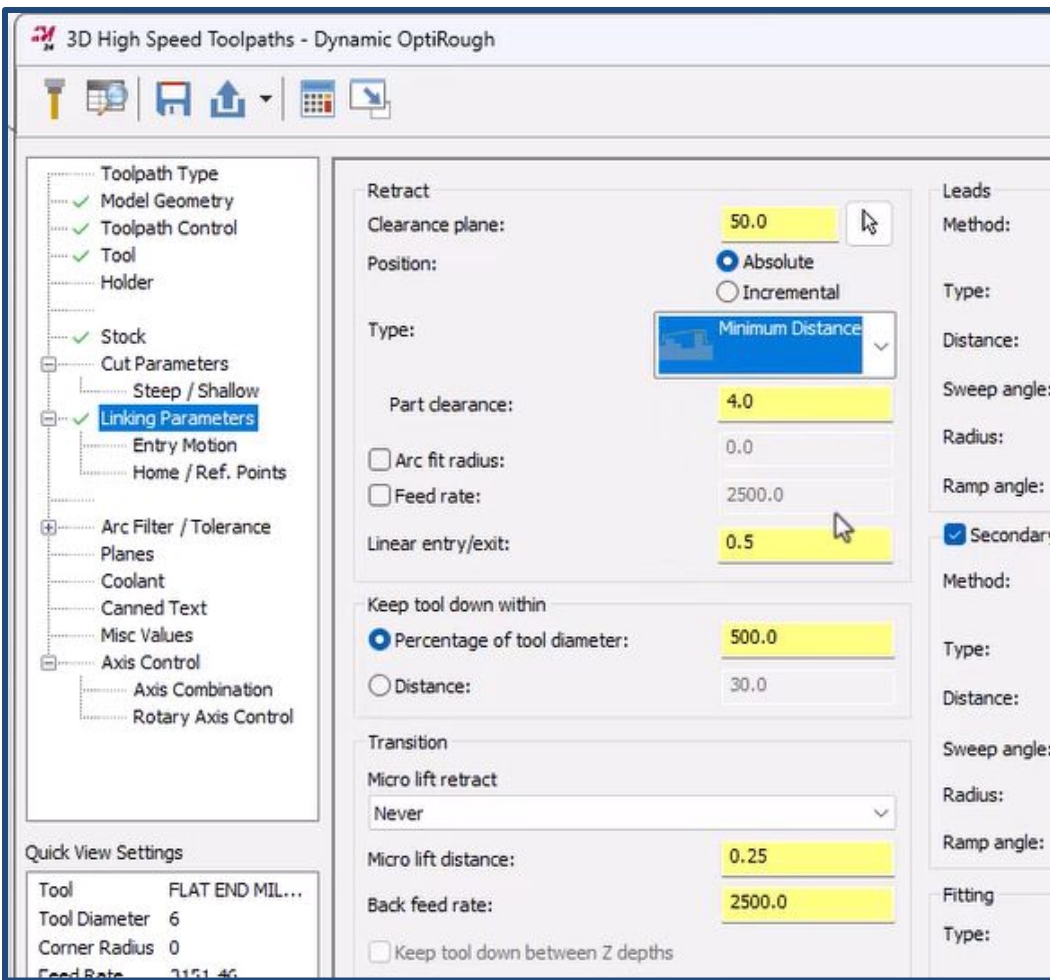


On Toolpath control ensure
Strategy is set to Stay Inside

On the tool page choose the
Ø6mm endmill

Then move to the stock page
Click Rest material to change the
toolpath from Optirough to a
Optirest strategy



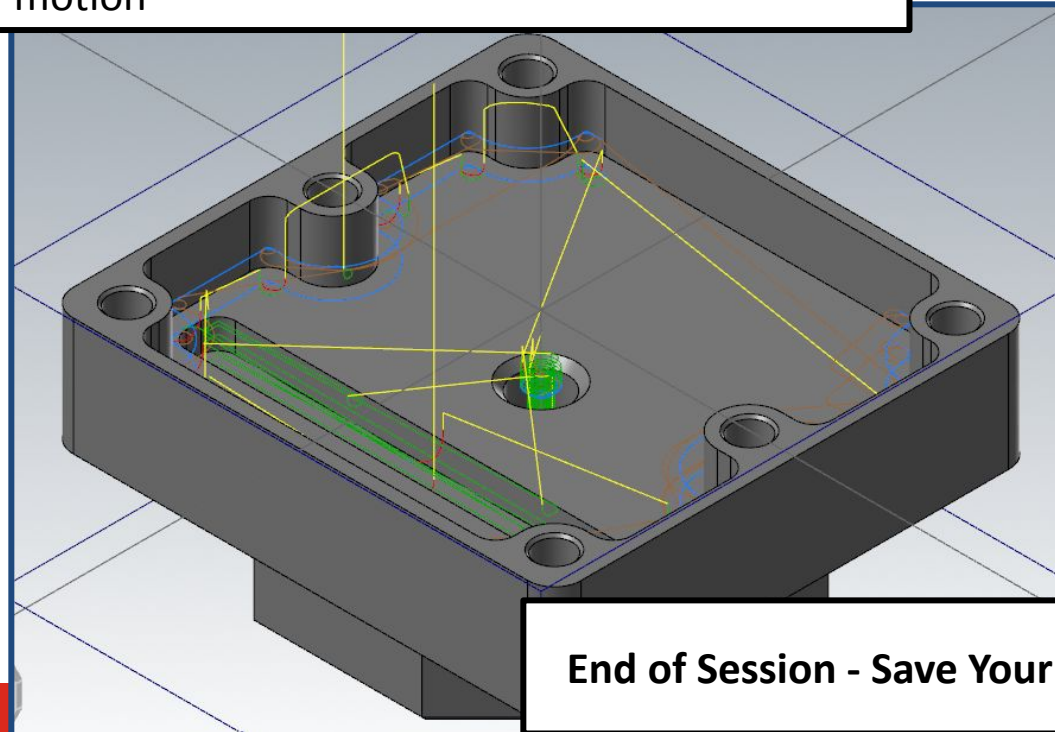


Finally adjust the linking parameters to minimum distance on retract type

Click ok to accept and generate the toolpath.

The toolpath should resemble the one shown.

Use the backplot feature to check toolpath motion



End of Session - Save Your Work