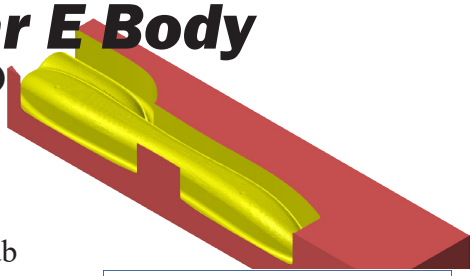
CO2 Rail Car E

Toolpaths for Rail Car E Body

Cut Body (Equal Scallop)



A. Machine Type and Stock Setup.

Step 1. If necessary, open your file from Chapter 17.

Step 2. If necessary, display Toolpaths Manager. On the View tab click Toolpaths (**Alt-O**).

Step 3. If Machine Group is **not** displayed in the Toolpaths Manager, **Fig. 1** on the Machine tab, click Mill > **Default** from the menu.

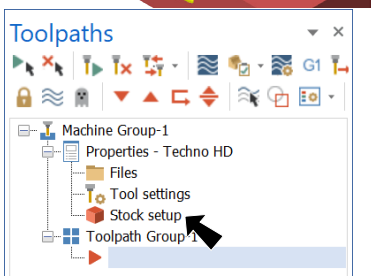


Fig. 1

Step 4. Expand **Properties** (click +) in Toolpaths Manager and click **Stock setup**, **Fig. 1**.

Step 5. In the Machine Group Setup on Stock Setup page set:

under Selection, **Fig. 2**

click **Add two corners**

sketch **a rectangular in the graphics area**

under Origin coordinates key-in:

X 0

Y -35

Z -13

under Anchor point

click **top left corner**

key-in X, Y and Z stock dimension:

X 305

Y 70

Z 42

under Stock Plane Transformation

Current **LEFT CUT**

click OK.

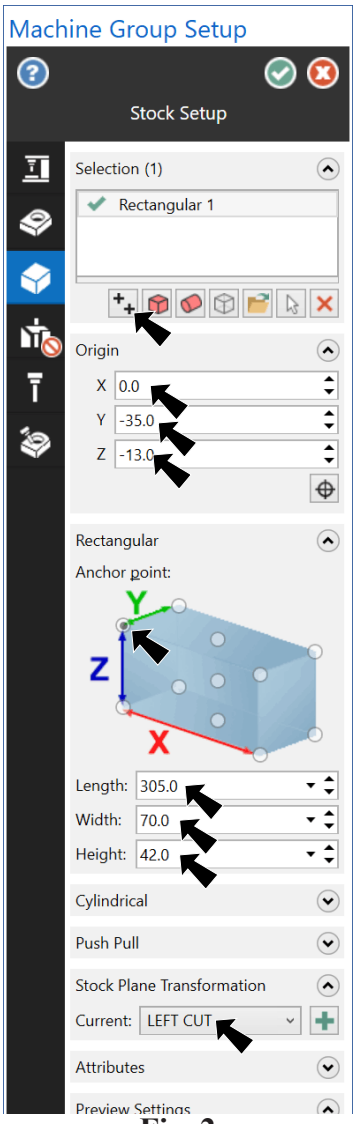


Fig. 2

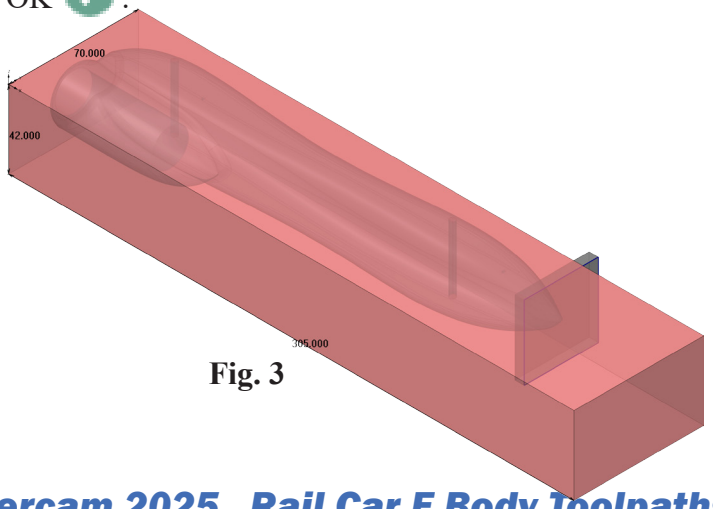
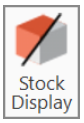


Fig. 3

http://www.cudacountry.net email:cudacountry@hotmail.com

B. Confirm WCS LEFT CUT.

Step 1. On the Toolpaths tab 

click **Stock Display** 

and Stock is displayed as red wireframe, **Fig. 4**.

Step 2. In Status bar at bottom of display, confirm **TPLANE**: **LEFT CUT**, **Fig. 4**.

Step 3. Confirm **Left Cut Origin**. Use **F9** to toggle axes.

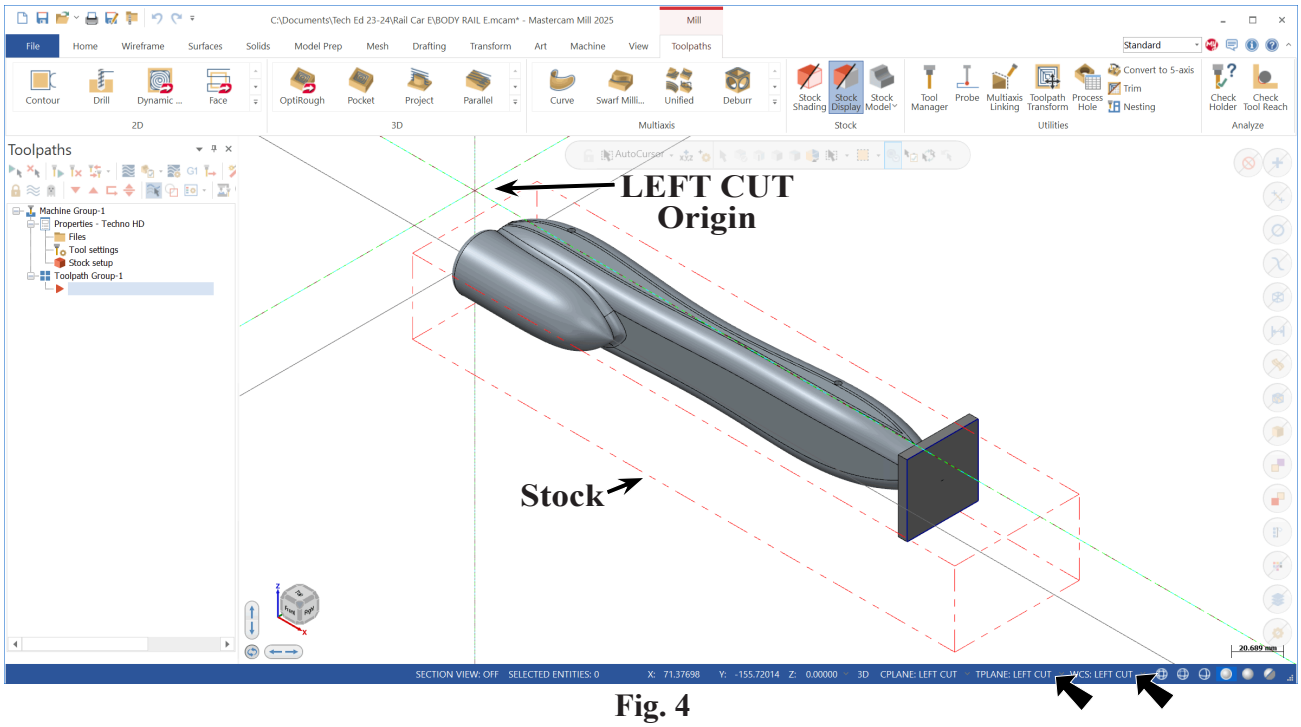
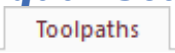


Fig. 4

C. Left Cut Finish Equal Scallop Toolpath.

Step 1. On the Toolpaths tab 

in the 3D group click **expand gallery** button and click **Equal Scallop** 

, **Fig. 5**.

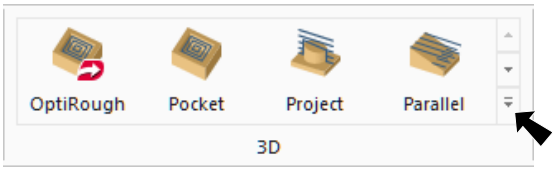
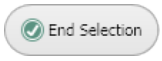


Fig. 5

Step 2. Select **Model Geometry** from the tree control and set:

Under **Machining Geometry** click **Select entities**  button **Fig. 6**.

Step 3. **Triple click** the **solid car body** to select as machine geometry and click **End Selection** 

(**ENTER**), **Fig 7**.

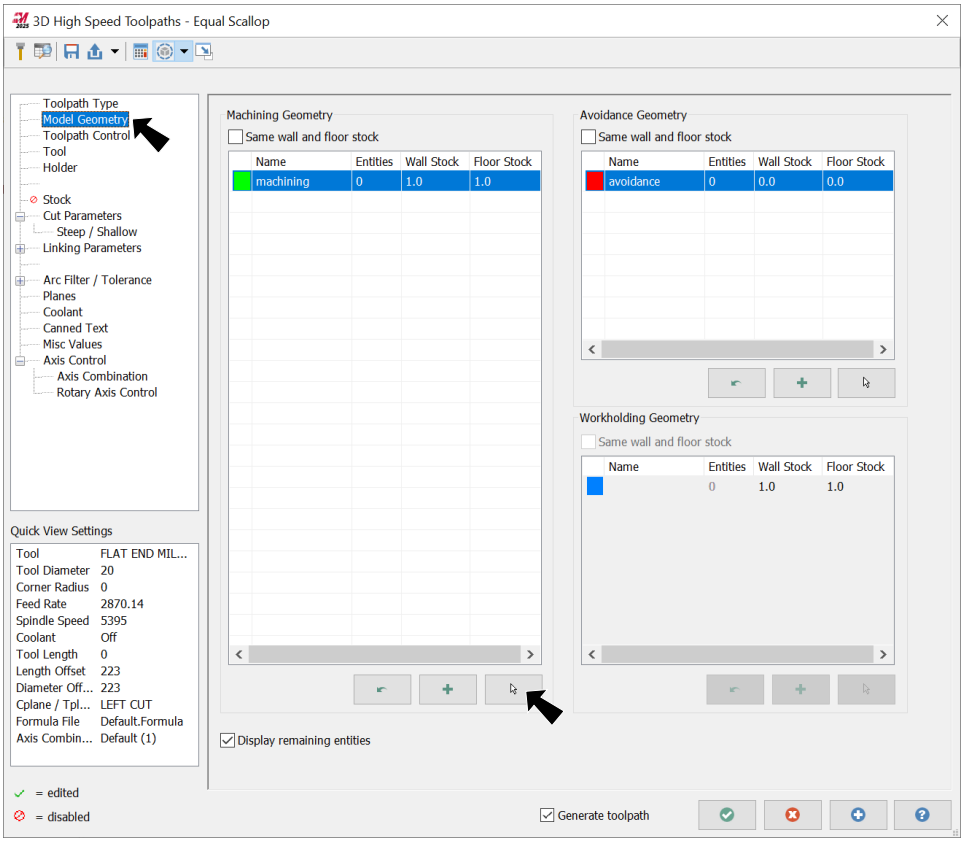


Fig. 6

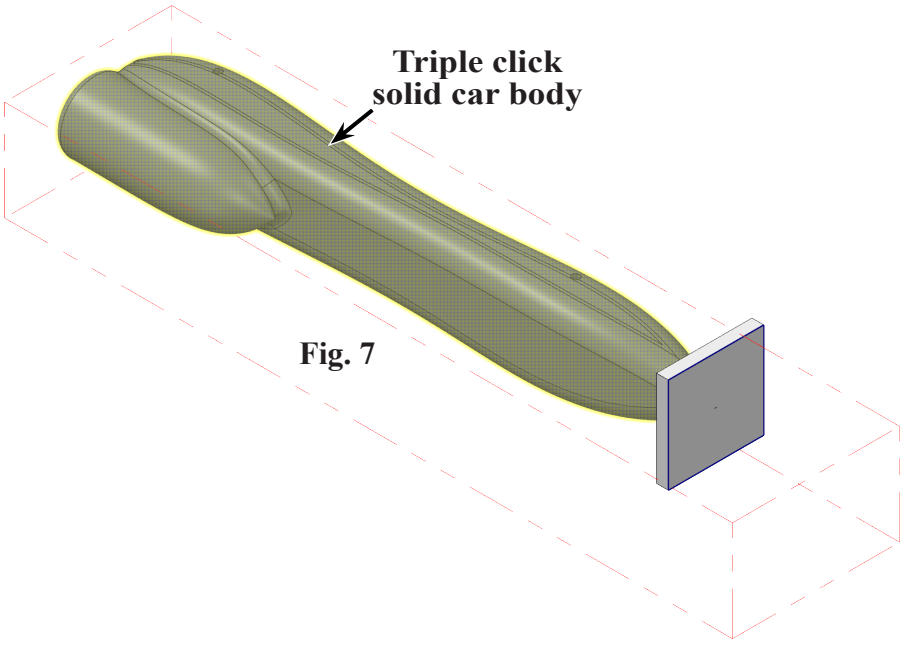


Fig. 7

Step 4. Back in **Model Geometry** page set:

Wall Stock 0
Floor Stock 0
To set, double click and key-in.

Under **Avoidance Geometry** click **Select entities**  button **Fig. 8**.

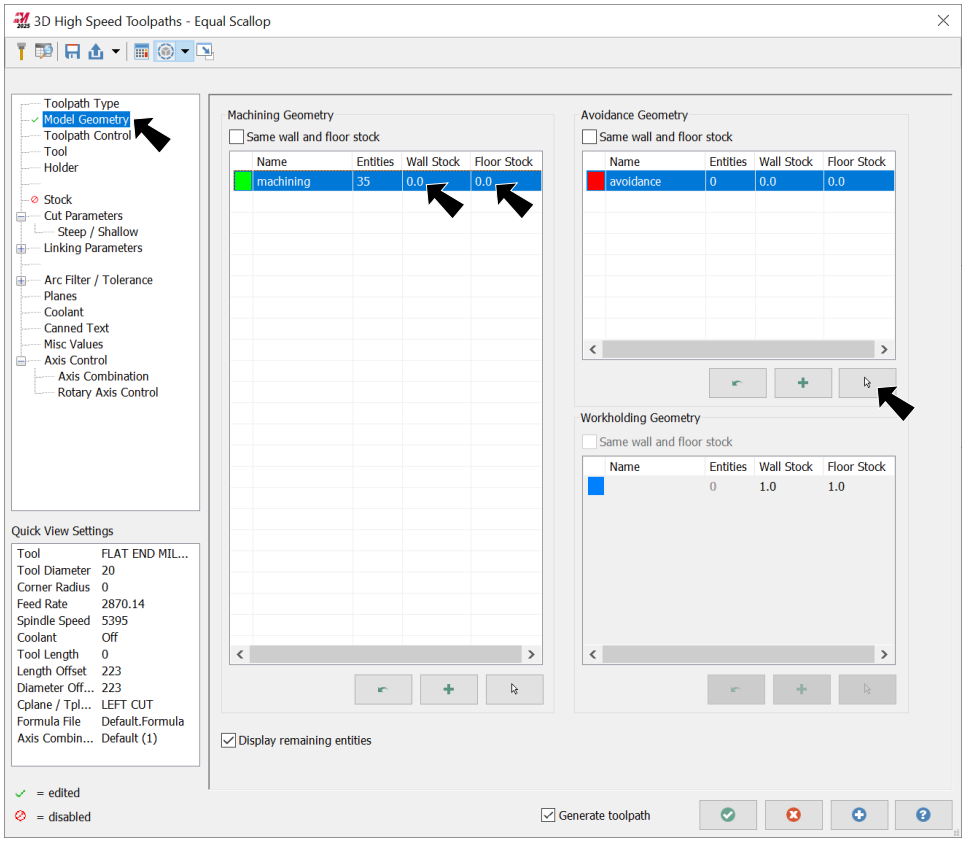
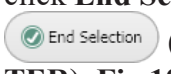


Fig. 8

Step 5. **Triple click** the **check body** to select as avoidance geometry, **Fig 9**.

Step 6. Rotate view to view **rear surface**, hold down middle mouse button (wheel) and drag to rotate view, **Fig. 10**.

Step 7. Click **rear surface** to select as avoidance geometry and click **End Selection**  **(ENTER)**, **Fig 10**.

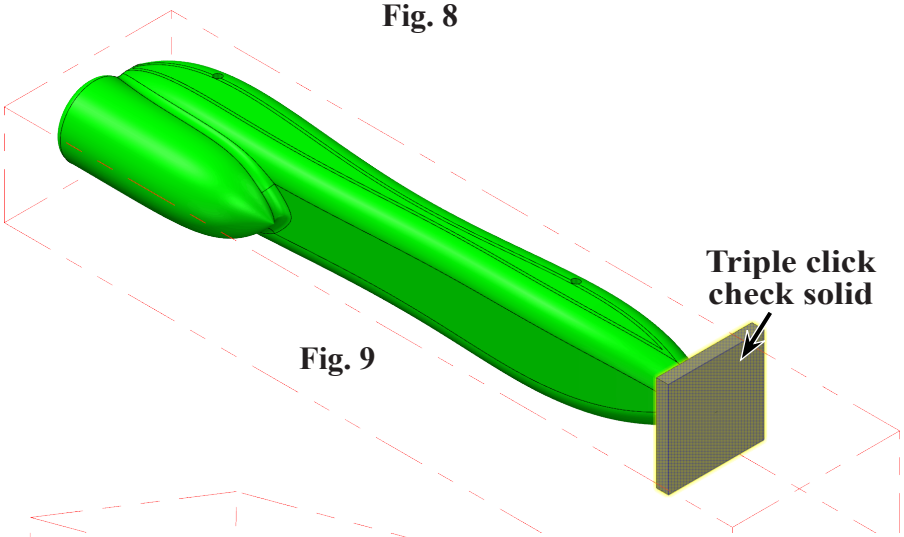


Fig. 9

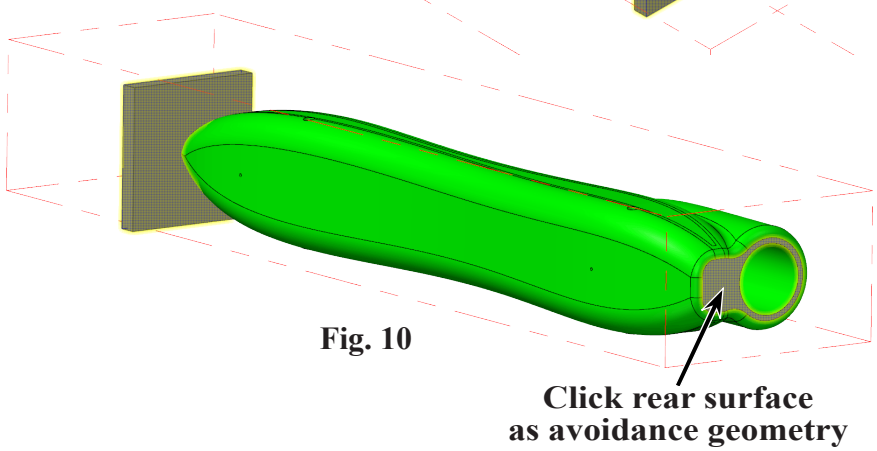


Fig. 10

Step 8. Back in **Model Geometry** page under **Avoidance Geometry** set:

Wall Stock 1.5

Confirm **7 Avoidance entities Fig. 11**.

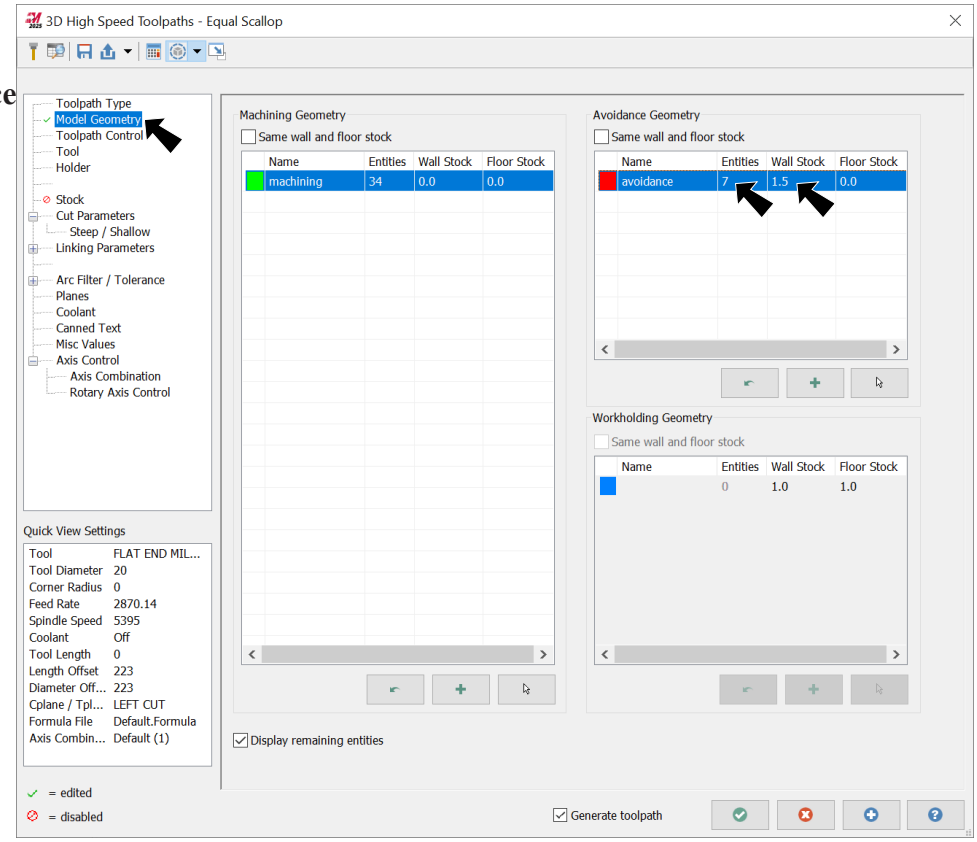


Fig. 11

Step 9. Select **Tool** from the tree control and:

click **Select library tool button**  **Fig. 12**.

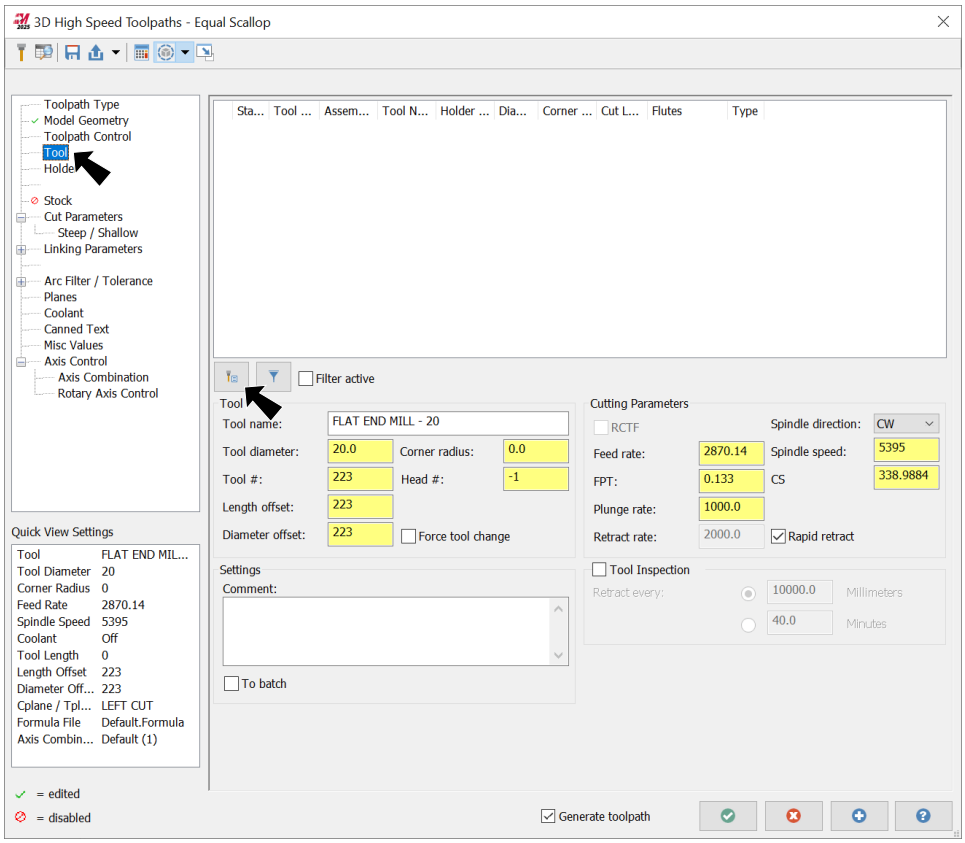


Fig. 12

Step 10. Click the **Filter** Filter... button **Fig. 13**.

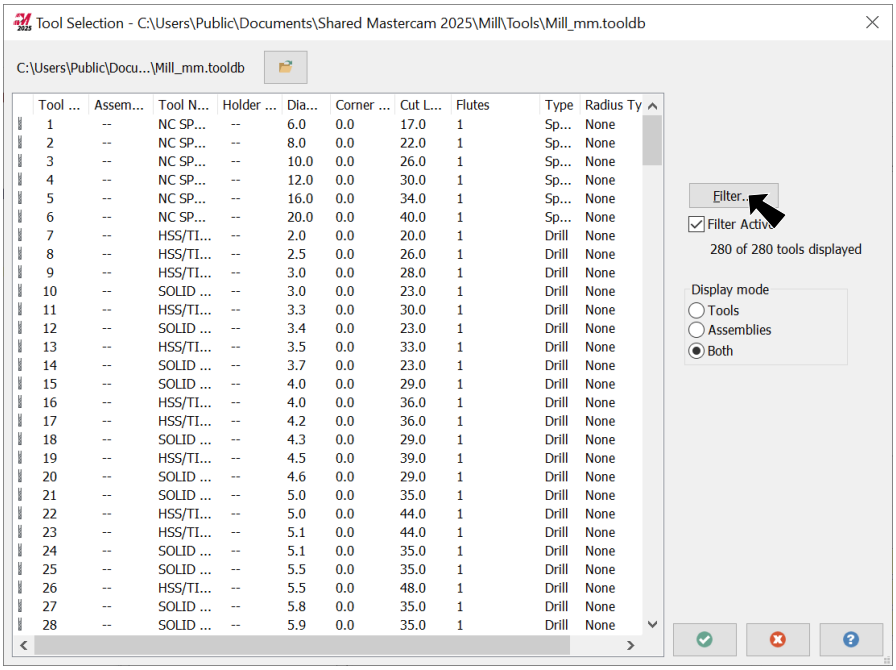


Fig. 13

Step 11. Click **None** None **button under Tool Types** **Fig. 14**.

Step 12. Click **Endmill2 Sphere** button (second button top row) and click OK **Fig. 14**.

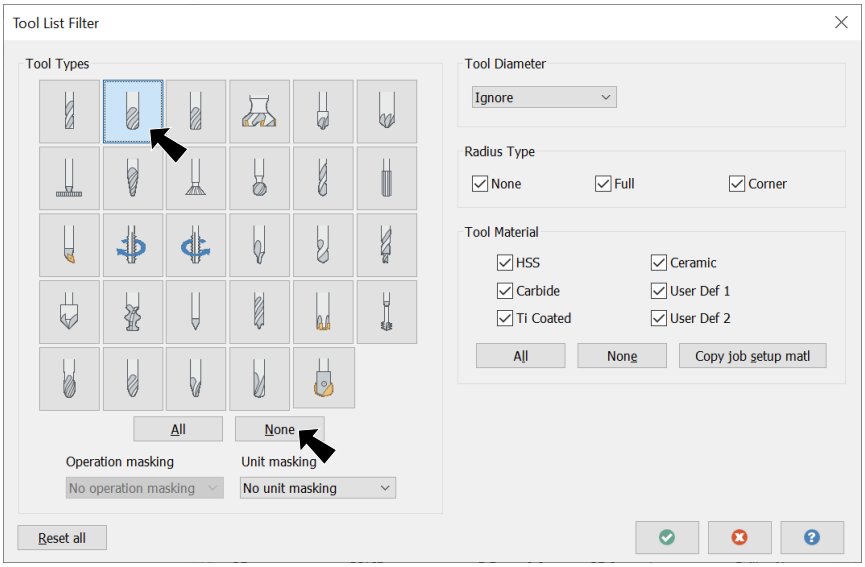


Fig. 14

Step 13. Select **BALL-NOSE END-MILL 6.0 mm Diameter** and click OK **Fig. 15**.

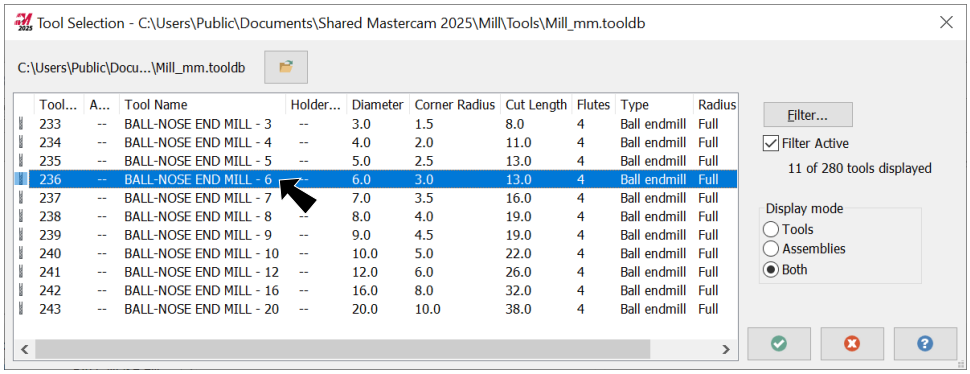


Fig. 15

Step 14. Back in **Tool** page set:

Feed rate 300

Plunge rate 200
Fig. 16.

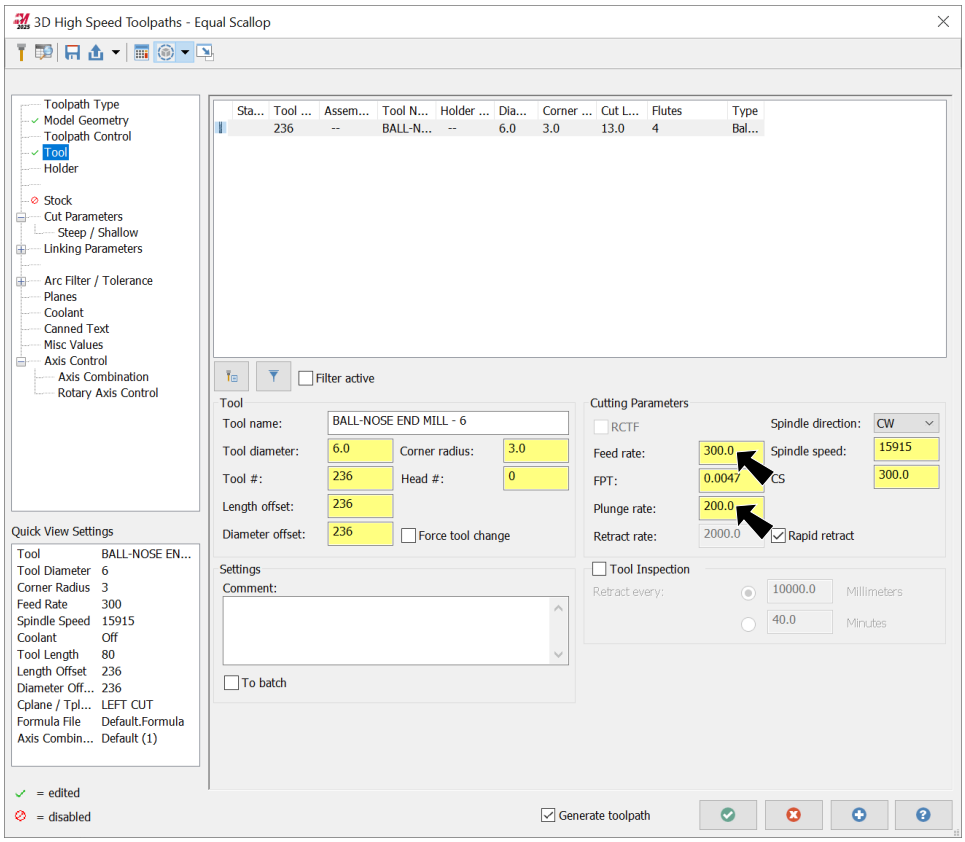


Fig. 16

Step 15. Select **Cut Parameters** from tree control and set:

Cut style
Closed Other Way

Open Other Way

Check **Optimize cut order**

Stepover 1
Fig. 17.

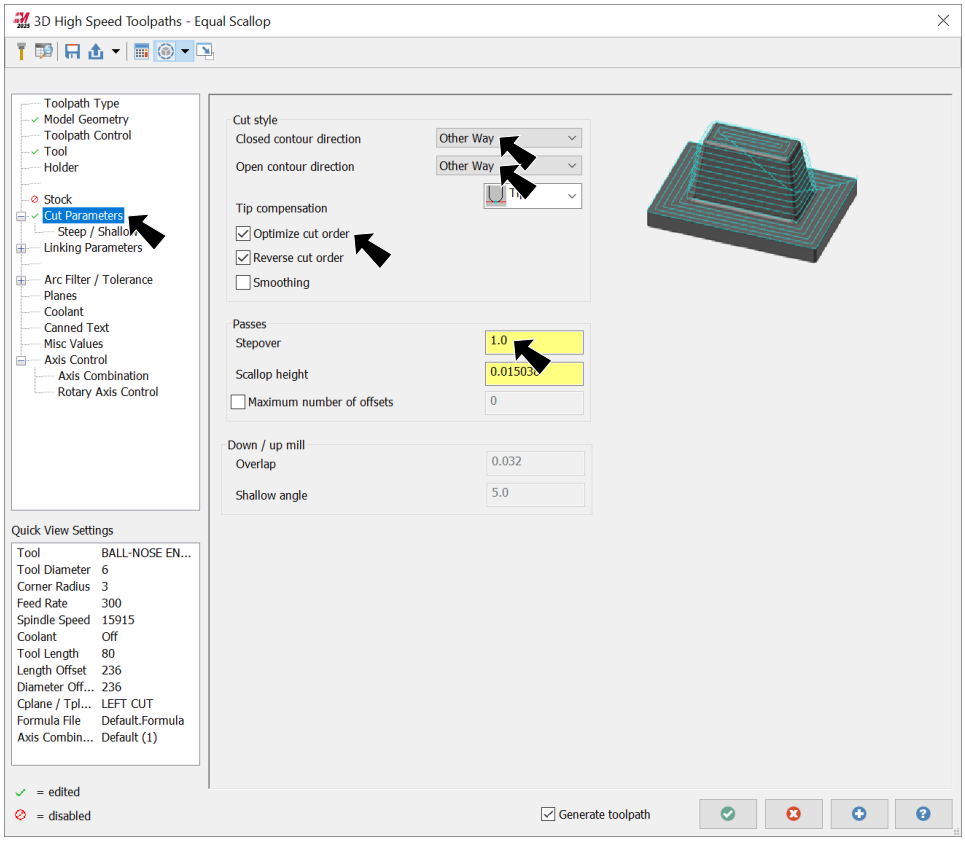


Fig. 17

Step 16. Select **Steep/ Shallow** from tree control and set:

Check **Minimum depth 0**

Check **Maximum depth -37**

Click **Apply**

Fig. 18.

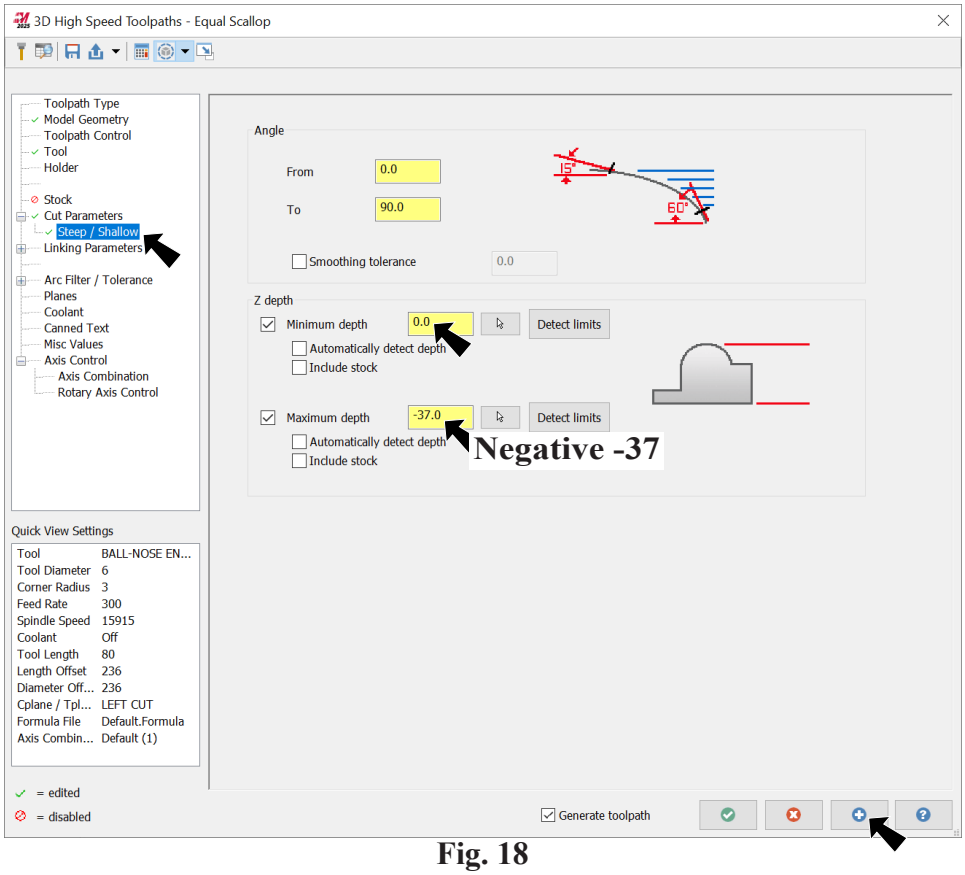


Fig. 18

Step 17. Select **Linking Parameters** from tree control and set:

Clearance plane 1

Select **Minimum Vertical Retract**

Part clearance 1

Keep tool down within 100%

All Leads 0

Fig. 19.

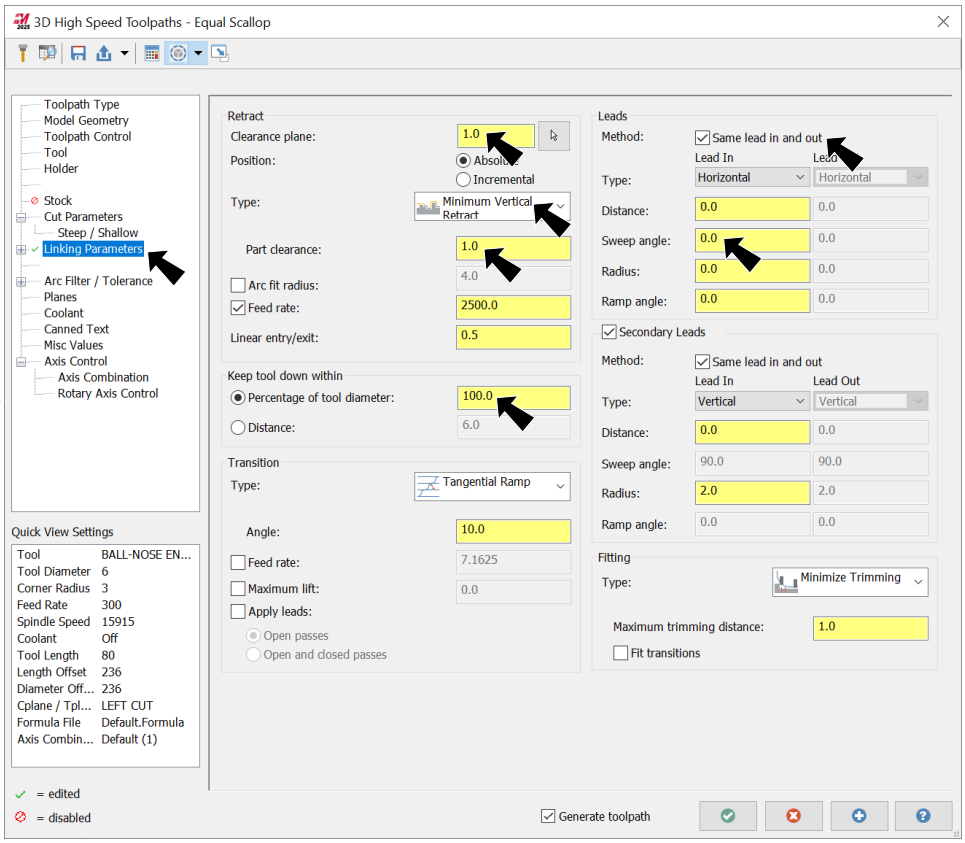


Fig. 19

Step 18. Select **Arc Filter/Tolerance** from tree control and set:

Total tolerance .0625

Check **Line/Arc Filtering Settings**

Uncheck **Create arcs in XY**

Check **One way filtering**

Set **Minimum arc radius .0625**

Cut tolerance 10% Fig. 20.

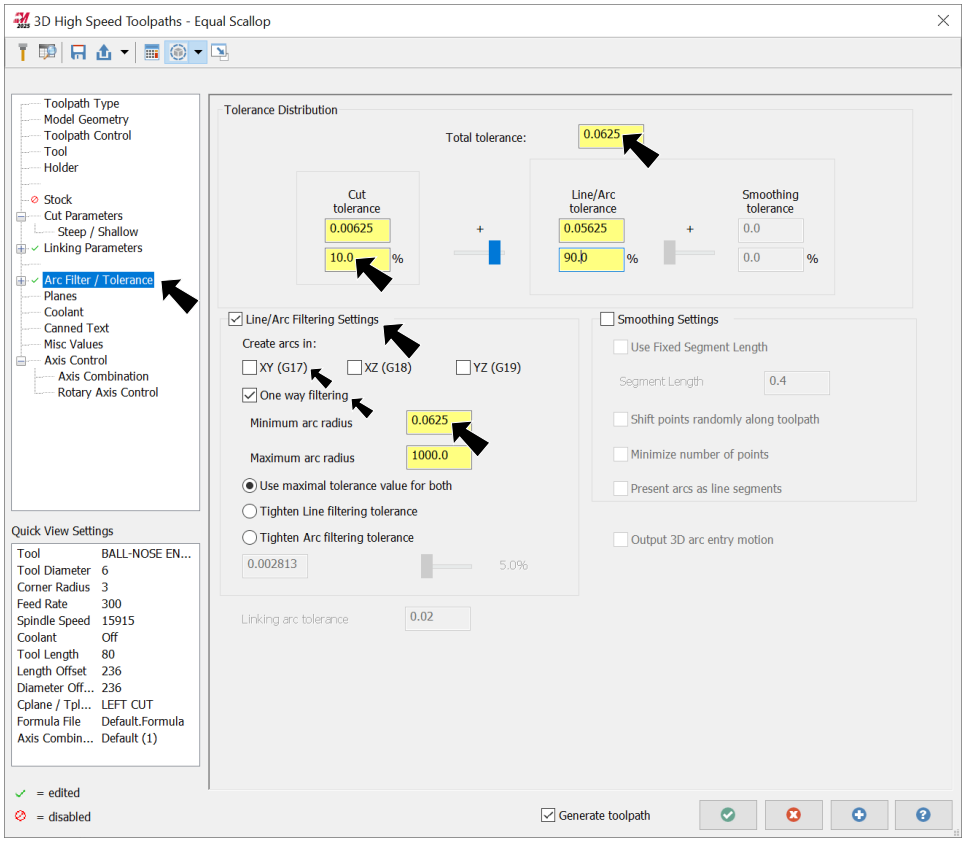


Fig. 20

Step 19. Click OK  in Equal Scallop dialog box.

Step 20. Confirm **toolpath avoids rear surface and doesn't pass across cartridge hole**, **Fig. 20**.
Use **Alt-T** to toggle on toolpath display.
Distance is controlled in Model Geometry under Avoidance Geometry Wall Stock (**Fig. 11**).

Step 21. Save  (**Ctrl-S**).

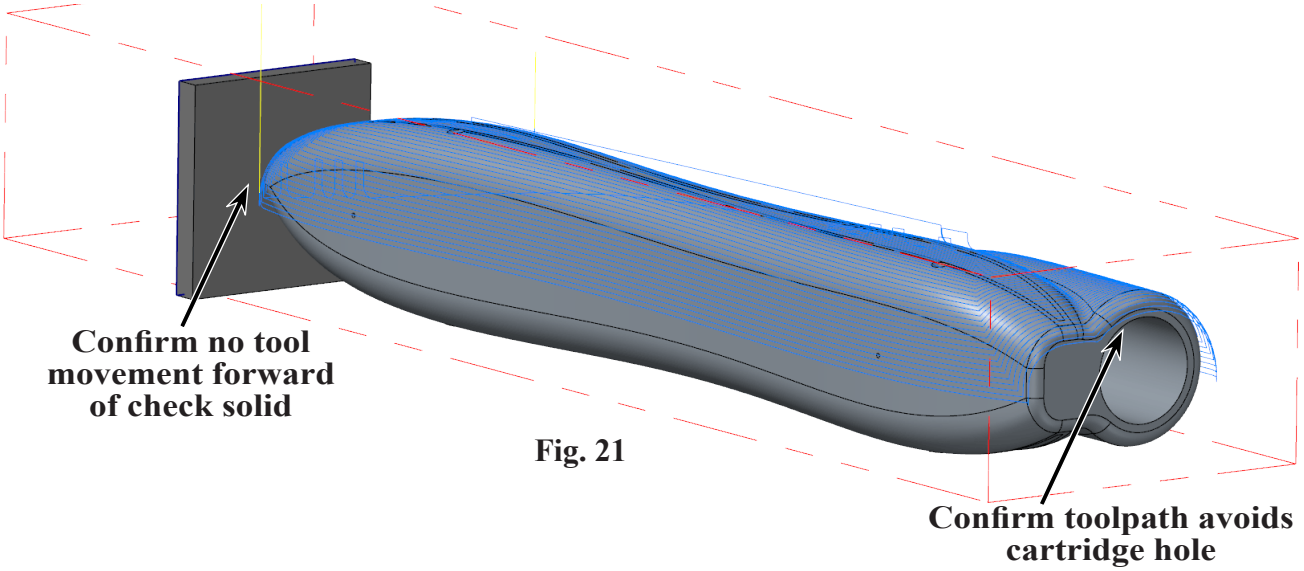


Fig. 21

D. Verify Left Cut.

Step 1. Change to the Isometric View. **Right click** in the graphics window and click Isometric (**Alt-7**).

Step 2. In the Toolpaths Manager **Verify** , **Fig. 22**.

Step 3. We like to **uncheck Wireframe** in the Visibility group on the Home tab, **Fig. 23**.

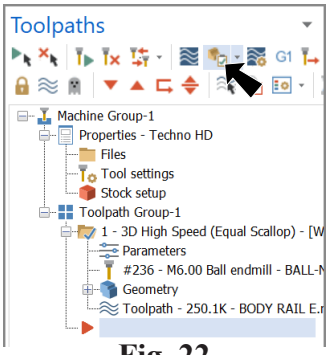


Fig. 22

Step 4. Click **Play** (**R**) in playback bar along bottom of the window, **Fig. 24**.

Step 5. Note **Total Time** to run program under Toolpath Info in Move List panel (**51min 53.14s**), **Fig. 26**.

Step 6. Switch back to Mastercam (**Alt-Tab**).

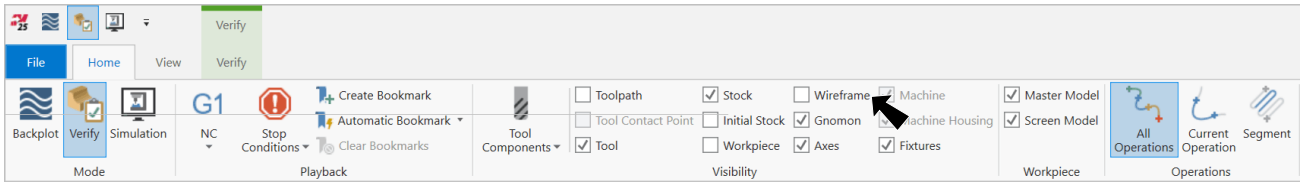


Fig. 23

Fig. 24

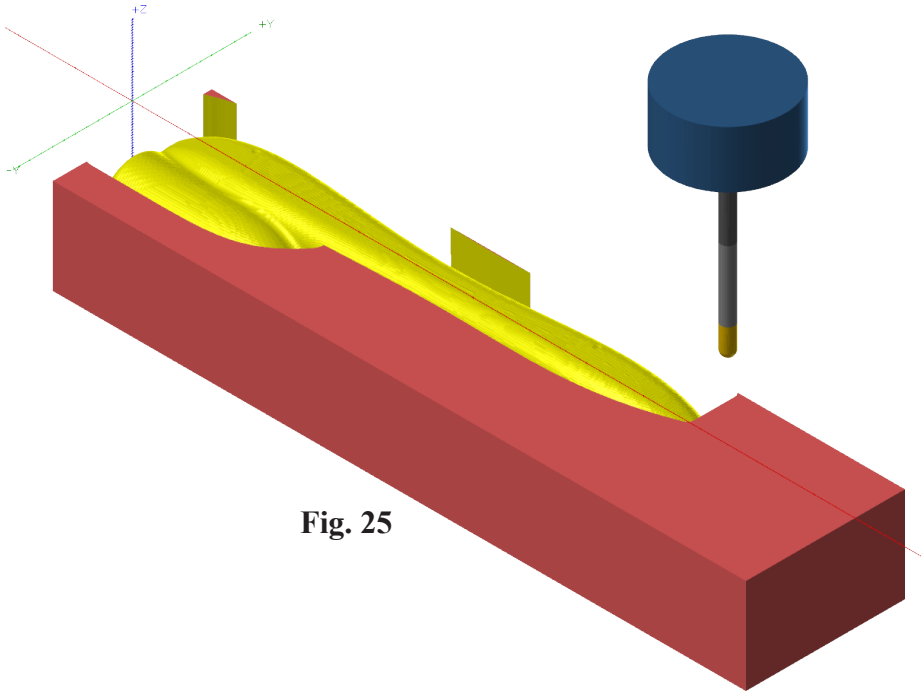


Fig. 25

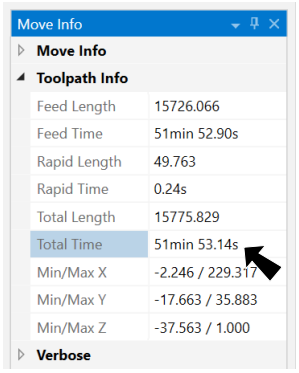
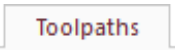
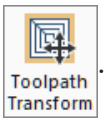


Fig. 26

E. Mirror LEFT CUT to RIGHT CUT Toolpath.

Step 1. On the Toolpaths tab 

click **Toolpath Transform** 

.

Step 2. In the Transform Operation Parameters dialog box:
under Type, **Fig. 27**
select **Mirror**
under Source
select **NCI**
under Source operations
select **Surface High Speed (Equal Scallop)**.

Step 3. Click the **Mirror tab** at top of dialog box, **Fig. 28**.
under Method
select **Mirror about X axis** 
Click OK 
.

Step 4. Allow Mastercam to calculate toolpath.

Step 5. Save  **(Ctrl-S)**.

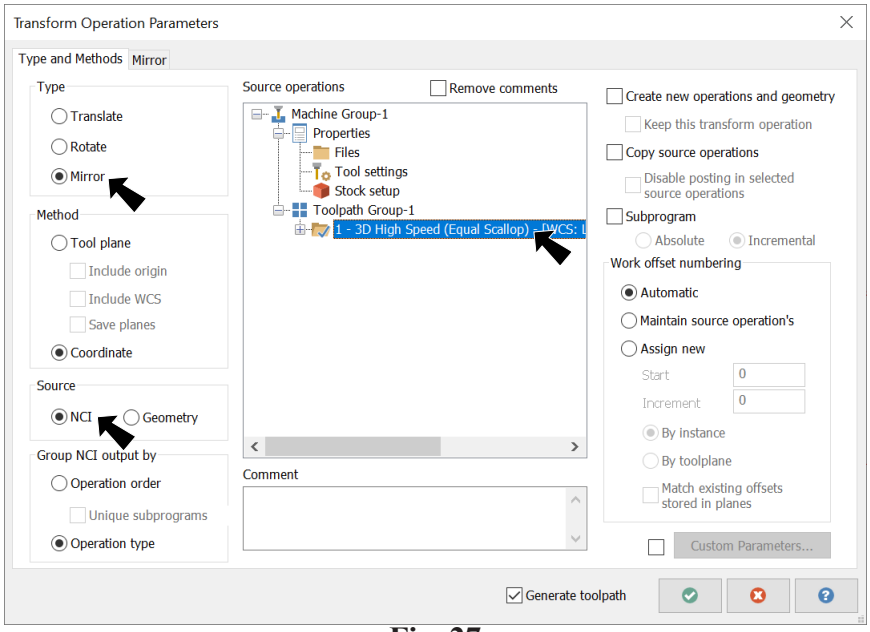


Fig. 27

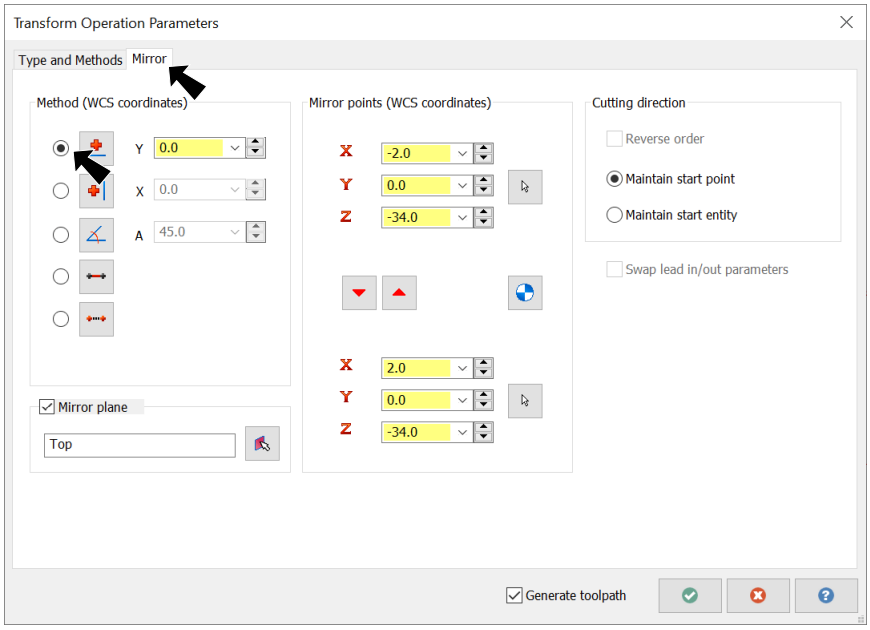


Fig. 28

F. Verify Right Cut.

Step 1. In Toolpaths Manager, click the **Transform/Mirror** toolpath, **Fig. 29**.

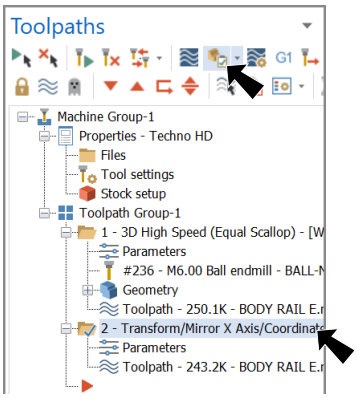


Fig. 29

Step 2. Click **Verify**  in Toolpaths Manager.

Step 3. Click **Play**  (**R**) in playback bar.

Step 4. Click **Close**  to close Mastercam Simulation.

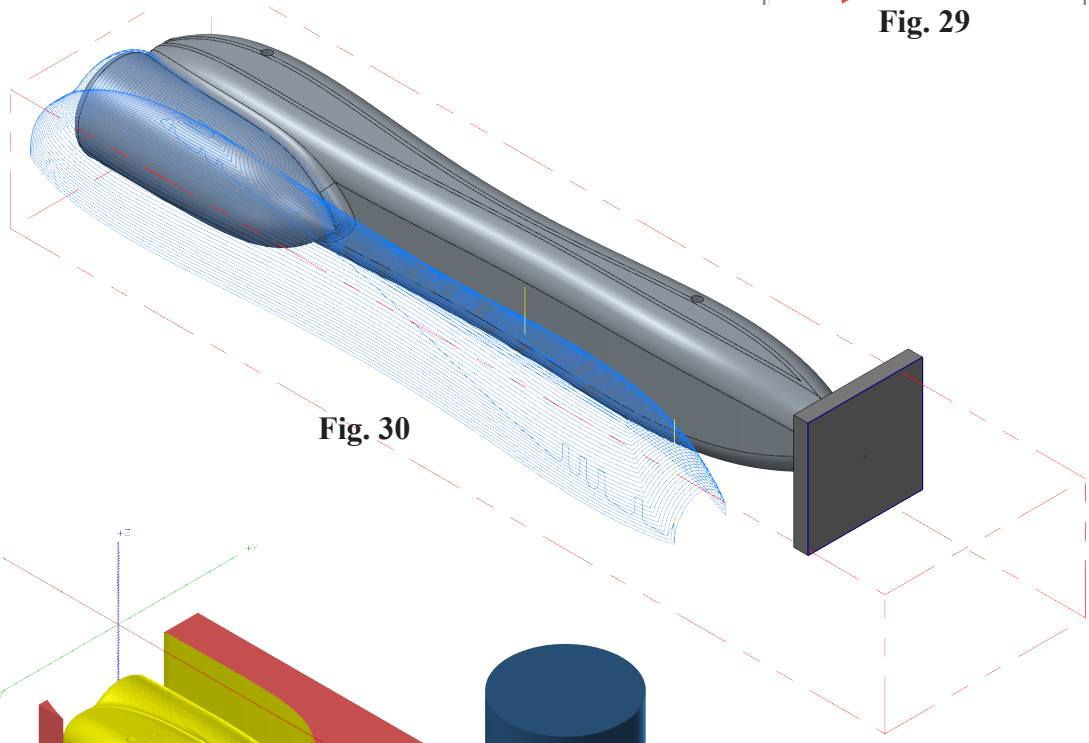


Fig. 30

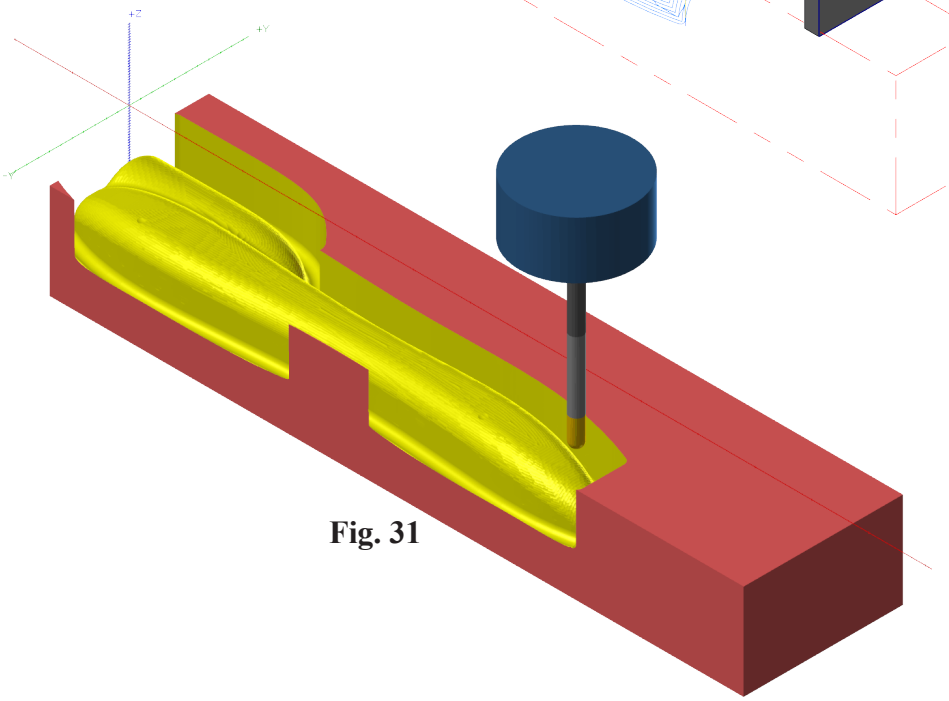


Fig. 31