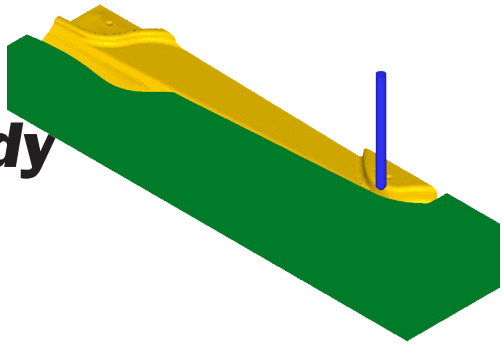
CO2 Rail Car

HST Toolpaths CO2 Rail Body



Cut Body (HST Scallop)

A. Machine Type and Stock Setup.

Step 1. If necessary, open your file from Chapter 20.

Step 2. If necessary, display Operations Manager. Use **Alt-O**.

Step 3. If Machine Group is **not** displayed in the Operations Manager, **Fig. 1**, click Machine Type Menu > Mill > Default.

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

Step 5. Click **Stock Setup** in the Toolpaths Manager, **Fig. 1**.

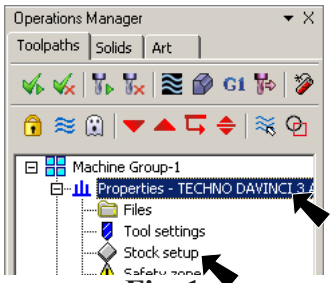


Fig. 1

Step 6. Click the **left front top corner of the stock** to move the origin, **Fig. 2**. After you click corner the arrow will point to corner.

Step 7. Click **All Entities** button in the Stock Setup, **Fig. 2**.

Step 8. Set Stock Origin coordinates:
X 0
Y -36
Z 21, **Fig. 2**.

Step 9. Click OK  in the Machine Group Properties, **Fig. 2**.

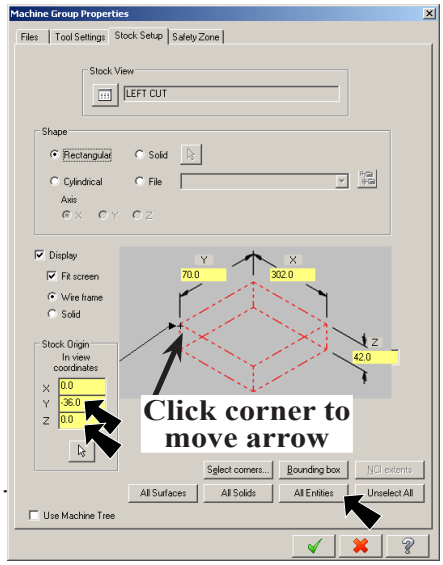


Fig. 2

B. Confirm WCS is LEFT CUT.

Step 1. In the bottom left corner of the display, confirm the Tool Plane (T/Cplane) is **LEFT CUT**, **Fig. 3**.

Step 2. The origin should be Left Cut. Use **F9** to show and hide axes.

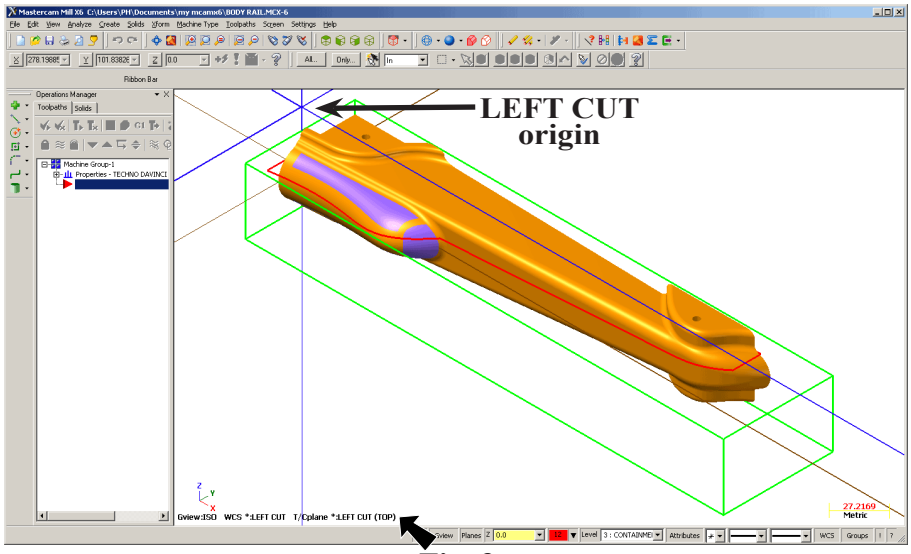


Fig. 3

C. Left Cut Finish Scallop Toolpath.

Step 1. Click Toolpaths Menu > Surface High Speed > **Scallop**.

Step 2. Click OK  in the NC name dialog, **Fig. 4**.

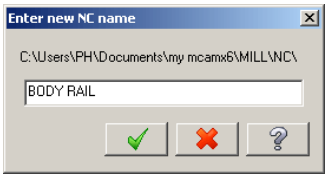


Fig. 4

Step 3. Click the **body solid** to select as Drive surfaces/ solid, **Fig. 5**. The solid will highlight when selected.

Step 4. **Press ENTER** to accept solid selection as drives surfaces.

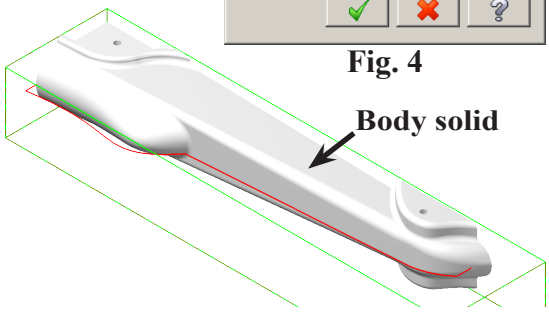


Fig. 5

Step 5. Click **Containment Select** button in the Toolpath/surface selection dialog box, **Fig. 6**.

Step 6. Click **Wireframe** button  in the Chaining dialog box, **Fig. 7**.

Step 7. Click **Chain** button  (**C**) in the Chaining dialog box, **Fig. 7**.

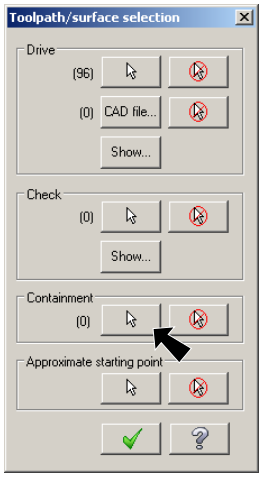


Fig. 6

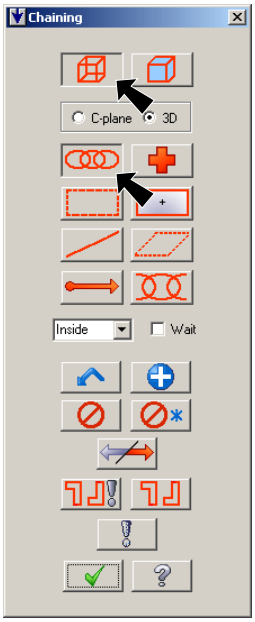


Fig. 7

Step 8. Click any **containment geometry**, **Fig. 8**. The containment geometry should chain all the way around the geometry. If all geometry doesn't chain, look for gaps, extra geometry or entities on top of entities. Any errors in the chain most likely occurred when trimming.

Step 9. Click OK  in Chain dialog box, **Fig. 7**.

Step 10. Click OK  in the Toolpath/surface selection dialog box, **Fig. 6**.

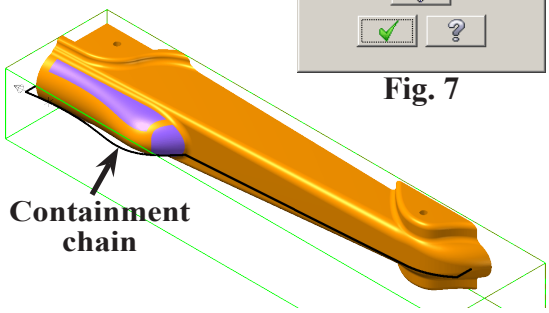


Fig. 8

Step 11. Select **Tool** from the tree control and:

click **Select library tool** button, **Fig. 9**.

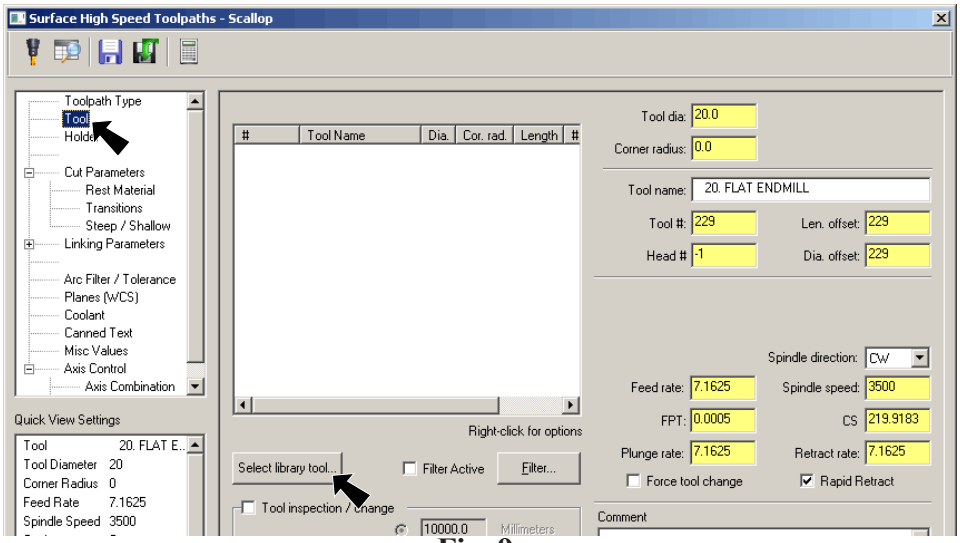


Fig. 9

Step 12. Click the **Filter** button, **Fig. 10**.

Step 13. Click **None button under Tool Types**, **Fig. 11**.

Step 14. Click **Endmill2 Sphere** button (second button top row), **Fig. 11** and click OK.

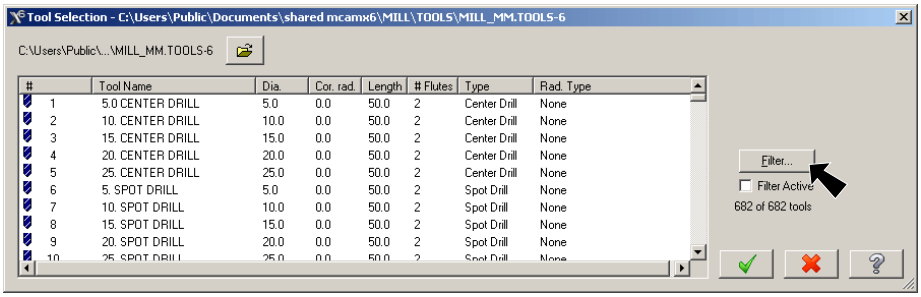


Fig. 10

Step 15. Click **240 Ball Endmill 6mm**, **Fig. 12** and click OK.

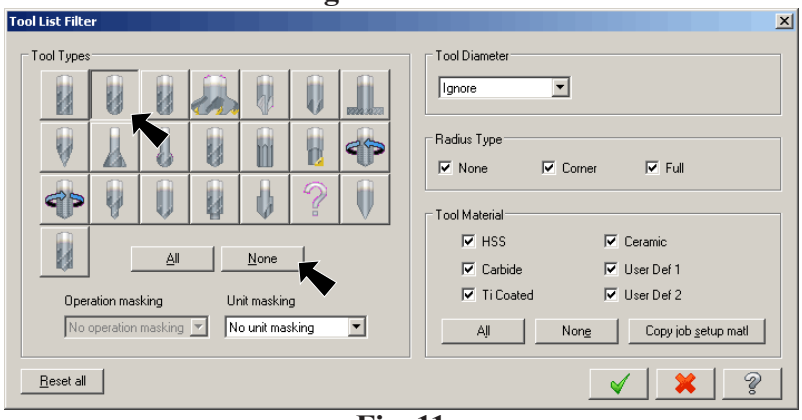


Fig. 11

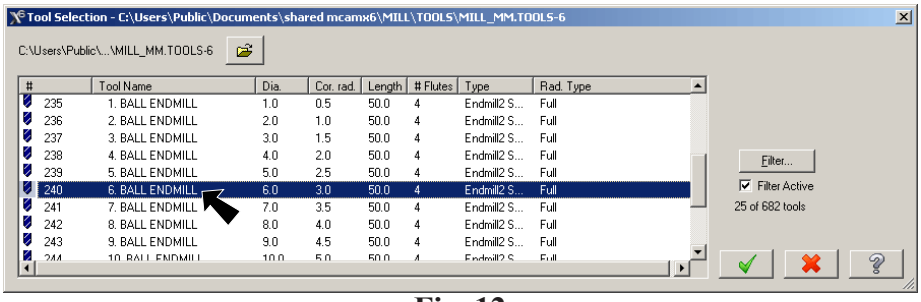


Fig. 12

Step 16. Back in **Tool** page set:

Tool # 1

Head # 1

Feed rate 300

Plunge rate 200
Fig. 13.

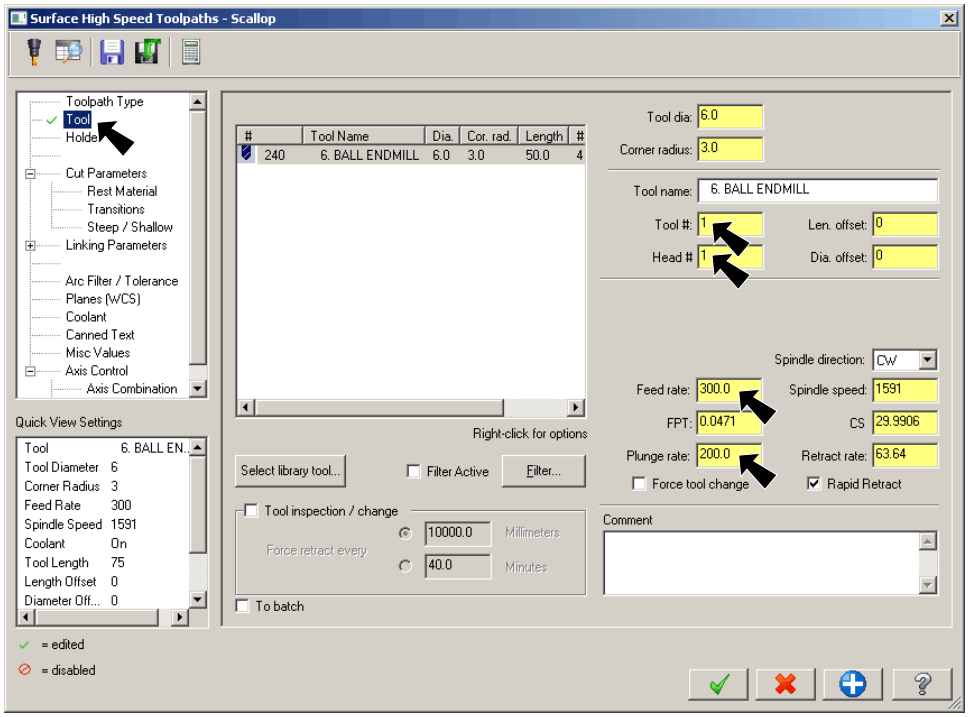


Fig. 13

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

Cutting method Zigzag

Stepover 1

Tool containment Compensate to: Center

Stock to leave on walls 0
Stock to leave on floors 0
Fig. 14.

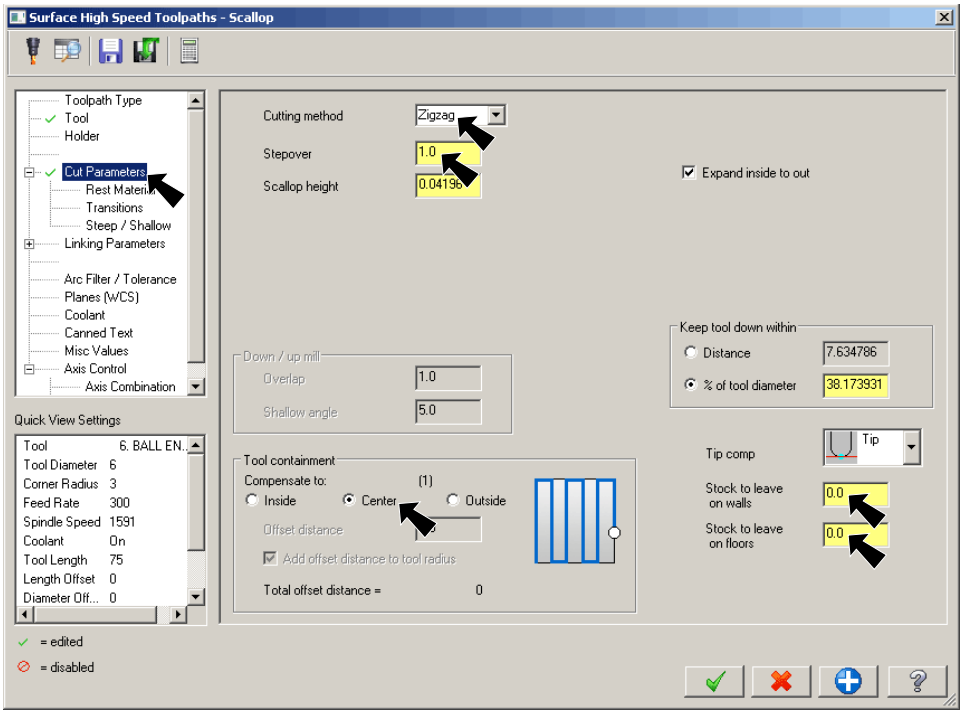


Fig. 14

Step 18. Select **Steep/ Shallow** from the tree control and set:

Check Use Z depths

Minimum depth 0

Maximum depth -37

Click **Apply**

Fig. 15.

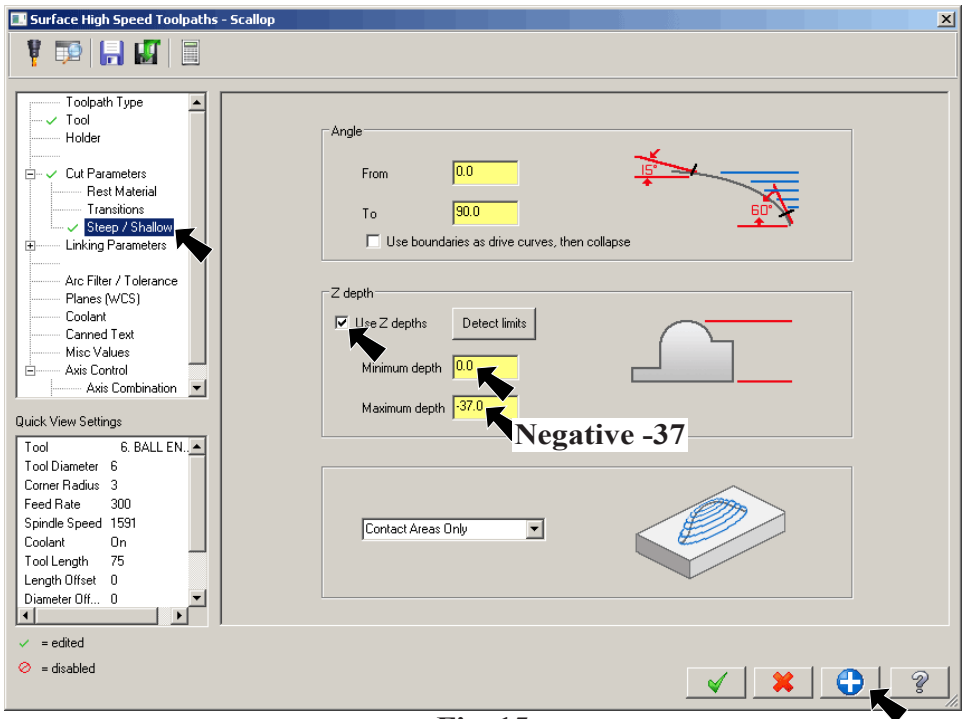


Fig. 15

Step 19. Select **Linking Parameters** from the tree control and set:

Clearance plane 0

Part clearance 0

Leads 0
Fig. 16.

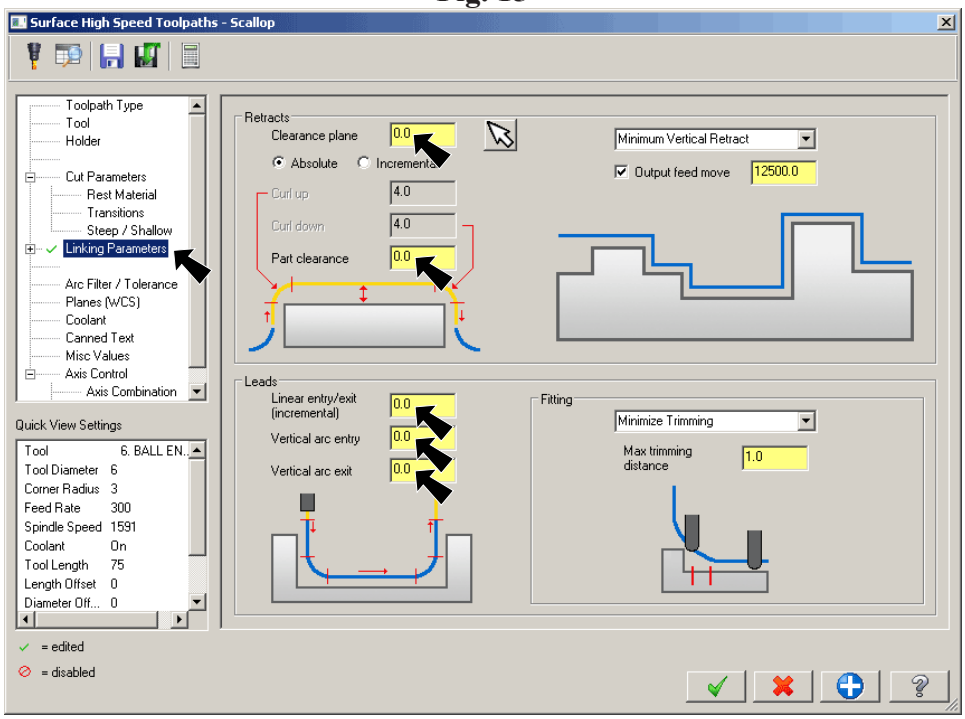


Fig. 16

Step 20. Select **Arc Filter/Tolerance** from the tree control and set:

Total tolerance .0625

click **Refine toolpath** button, **Fig. 17**.

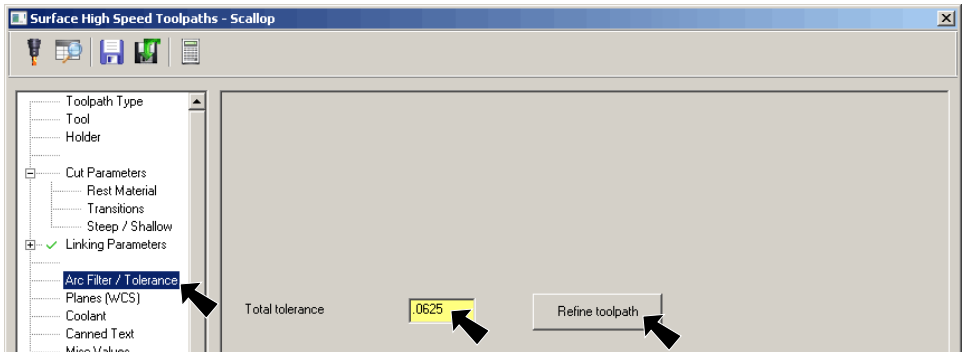


Fig. 17

Step 21. In the **Refine Toolpath** dialog box:

check **Line/Arc Filtering Setting**, **Fig. 18**

set **Minimum arc radius .0625**

uncheck **Create arcs in XY**

check **One way filtering**

move **NC program length slider to Short**.

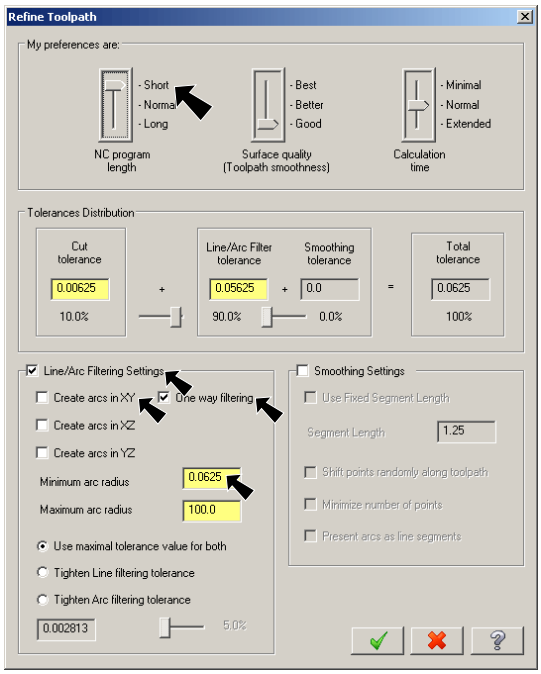


Fig. 18

Step 22. Click OK in Refine Toolpath dialog box.

Step 23. Click OK in Scallop dialog box.

Step 24. Allow Mastercam to calculate the toolpaths.

Step 25. Save . Use **Alt-F S**.

D. Verify Left Cut.

Step 1. In the Toolpaths Manager, click the **Scallop toolpath** to select toolpath, **Fig. 19**.

Step 2. Click **Verify** in the Toolpaths Manager, **Fig. 19**.

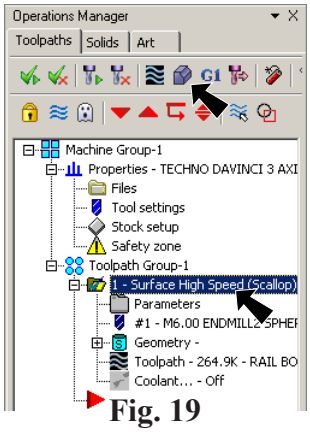


Fig. 19

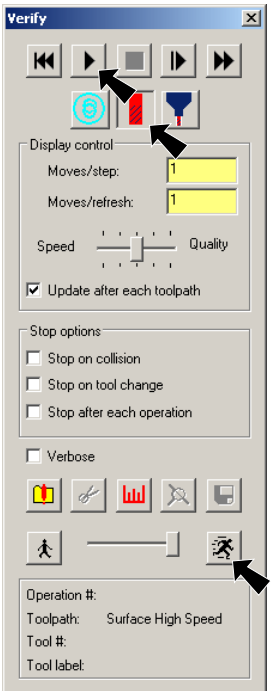


Fig. 20

Step 3. Click **Machine quickly** , **Fig. 20**.

Step 4. Turn on (button depressed) **Simulate tool** .

Step 5. Click the **Machine** in the Verify dialog box to start the machining, **Fig. 21**.

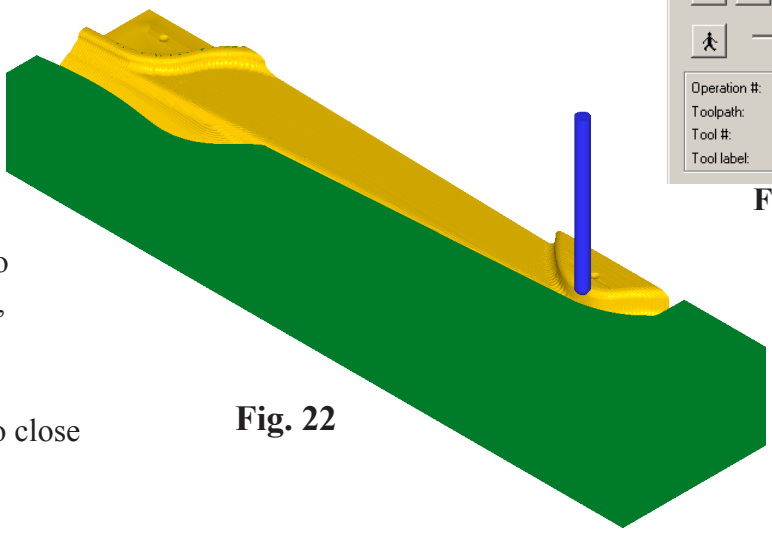


Fig. 22

Step 6. Click OK to close Verify dialog box.

E. Mirror LEFT CUT to RIGHT CUT Body Toolpaths.

Step 1. Click Toolpaths Menu > Transform.

Step 2. Under Type, select **Mirror**, **Fig. 22**.

Step 3. Under Source operations, select **Surface High Speed (Scallop)**, **Fig. 22**.

Step 4. Click the **Mirror tab** at the top of the dialog box, **Fig. 22**.

Step 5. Under Mirror, select **Mirror about X axis**  , **Fig. 23**.

Step 6. Click OK  in the Transform Operation Params dialog box.

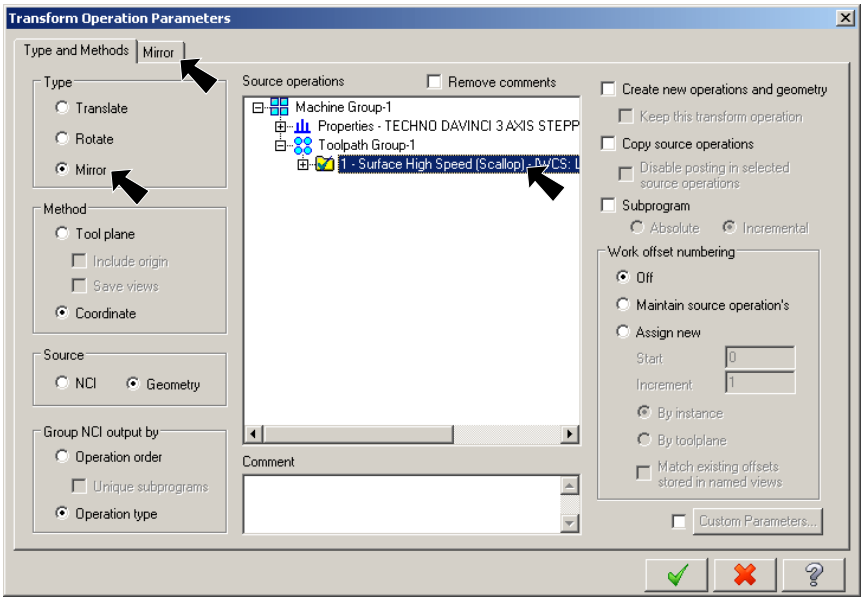


Fig. 22

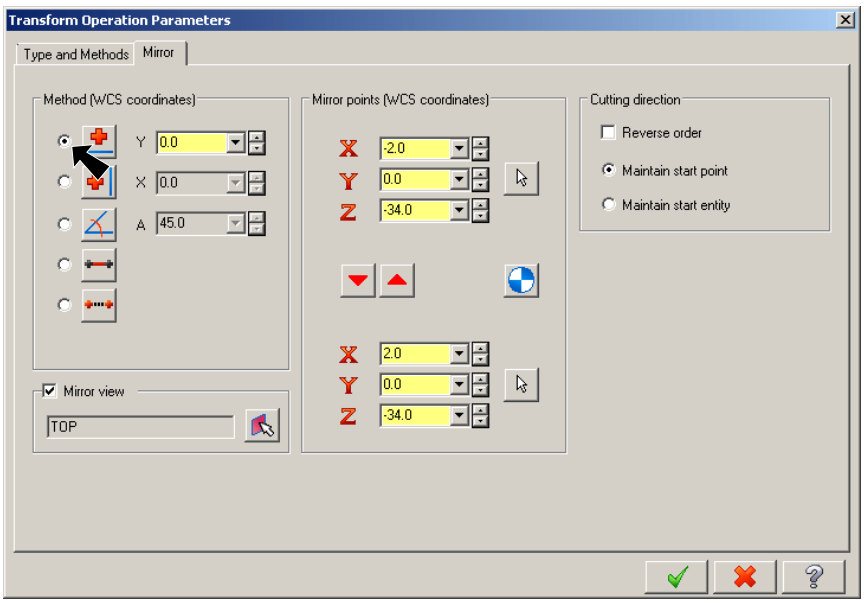


Fig. 23

F. Verify Right Cut.

Step 1. In the Toolpaths Manager, click the **mirrored Transform by Coordinate** toolpath, **Fig. 24**.

Step 2. Click **Verify**  in the Toolpaths Manager, **Fig. 24**.

Step 3. Click the **Machine**  in the Verify dialog box to start the machining, **Fig. 25**.

Step 4. Click OK  to close Verify dialog box.

Step 5. Save  . Use **Alt-F S**.

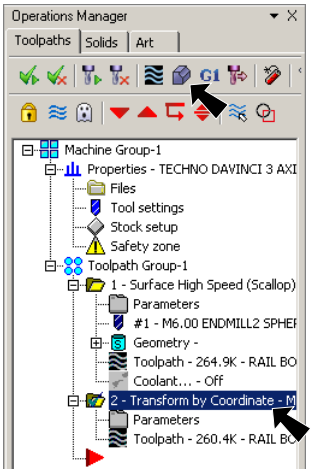


Fig. 24

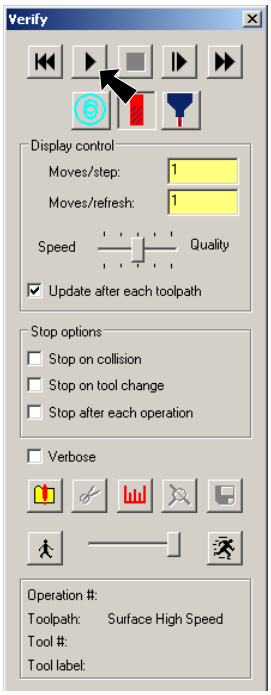


Fig. 25

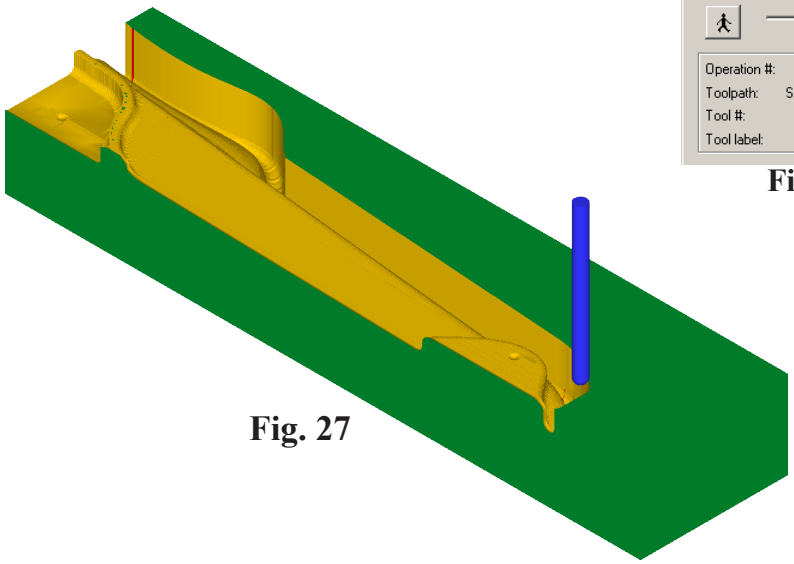


Fig. 27