

TUTORIAL 7

Core/Cavity Mold

Learning Objectives

After completing this tutorial, you will be able to:

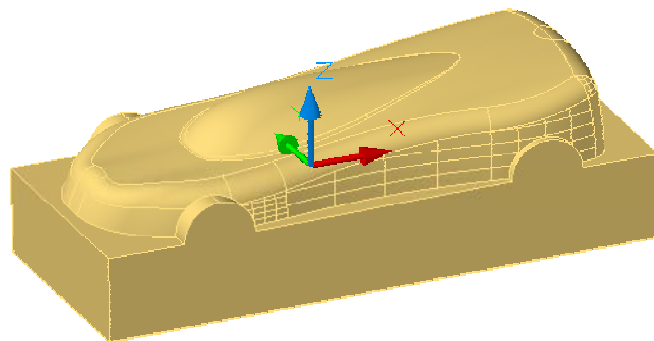
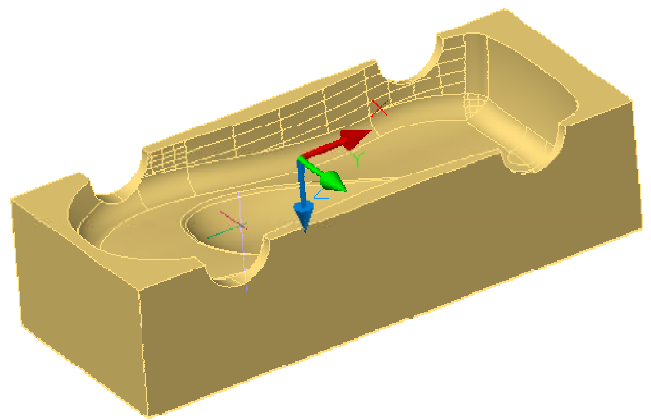
- Use the new 3D Modeling tools in AutoCAD 2007 for freeform sculpting.

Required Competencies

Before starting this tutorial, you should have been able to:

- Use AutoCAD at an intermediate to advanced level
- Stretch solid faces

The new 3D modeling tools in AutoCAD 2007 allow you to model complex shapes that previously were not possible to model in AutoCAD. This tutorial assumes that the user is completely familiar with creating precise 2D sketches of arcs, lines, polylines, and splines in any location as well as the 3D tools from previous releases.



Core/Cavity Mold

1. Open the file named Toolbody.dwg. Union the two cylinders to the car body.

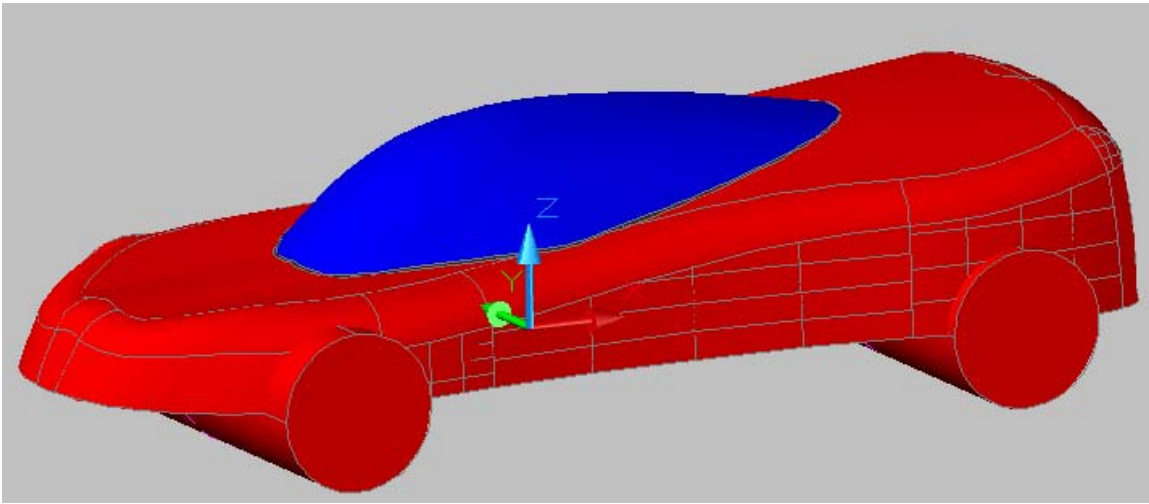


Figure 1

2. Make new layers named Core and Cavity. Make the Core layer the active layer. Select the Box command and create a box from the center of one end of one of the cylinders to the diagonal center of another cylinder end. Make the height 75mm going away from the car body.

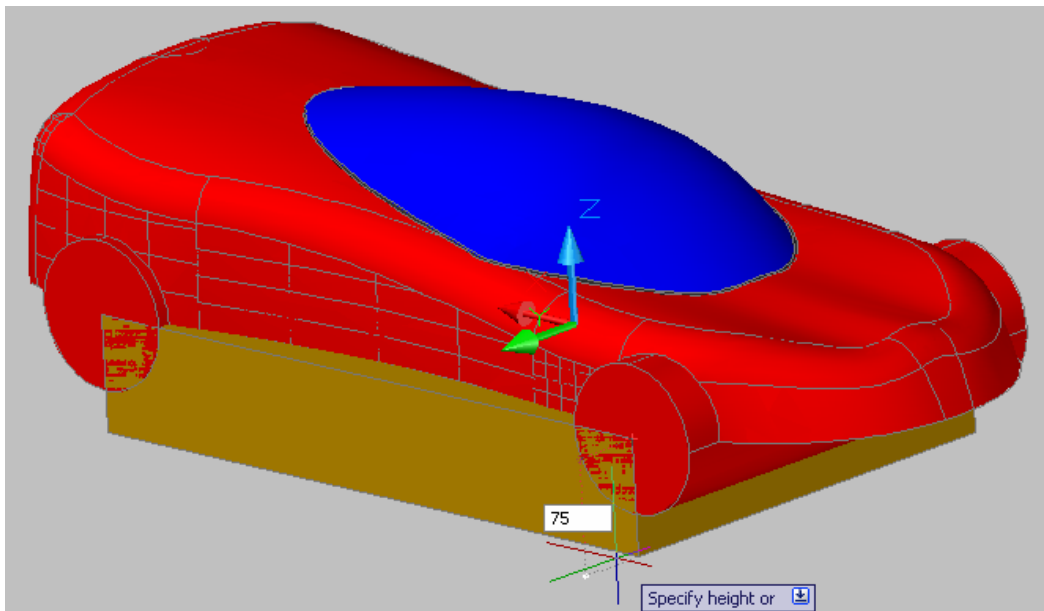


Figure 2

3. Holding the Ctrl key select the end of the box and then select the handle in the middle of the face. Stretch the face tracking straight back a distance of 100mm.

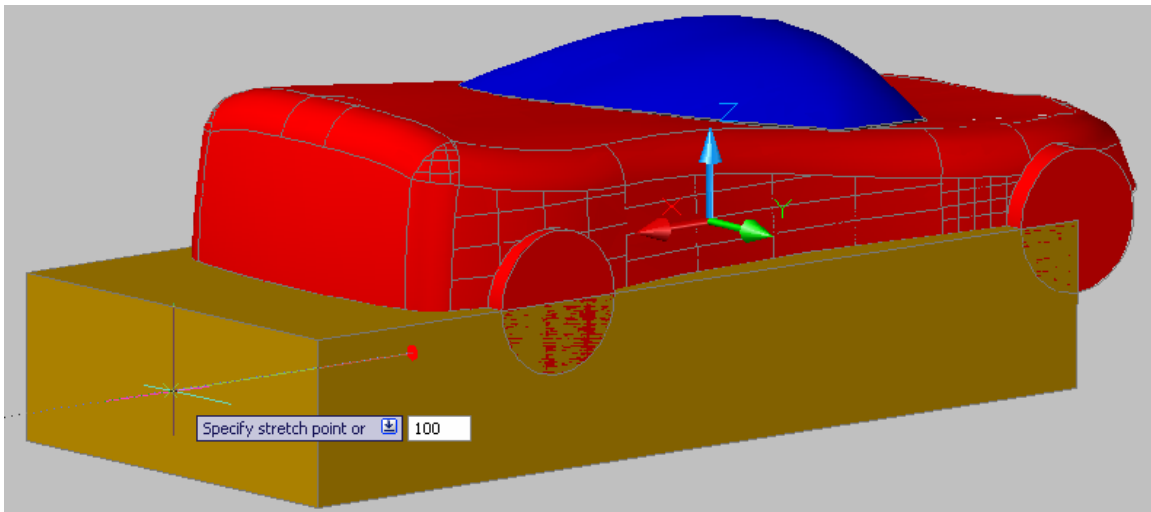


Figure 3

4. Turn the parts around and repeat the same procedure on the other end.

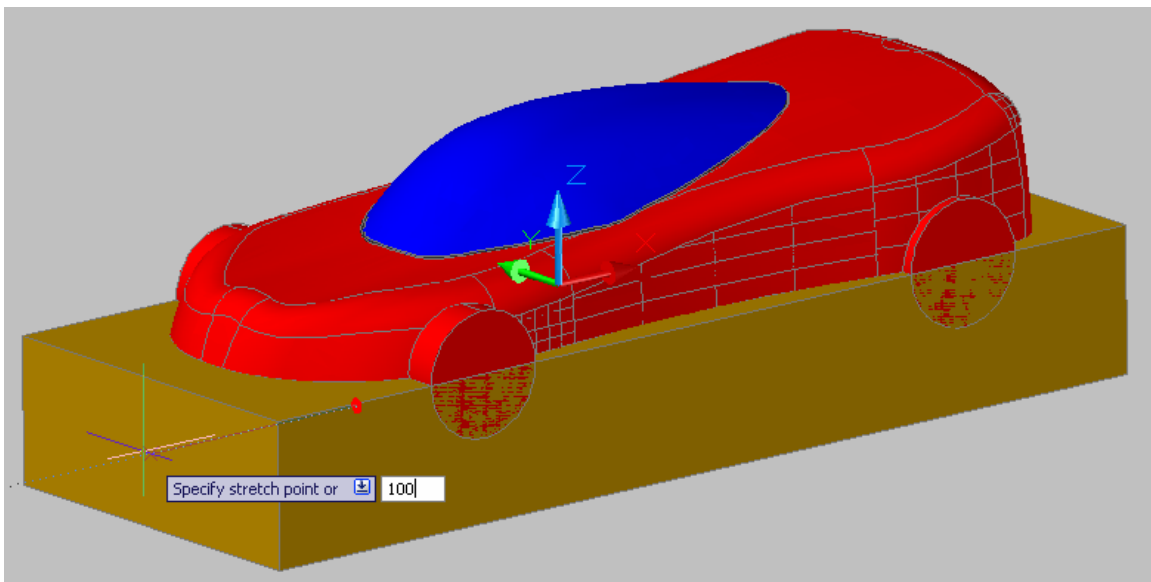


Figure 4

5. Union the base to the body.

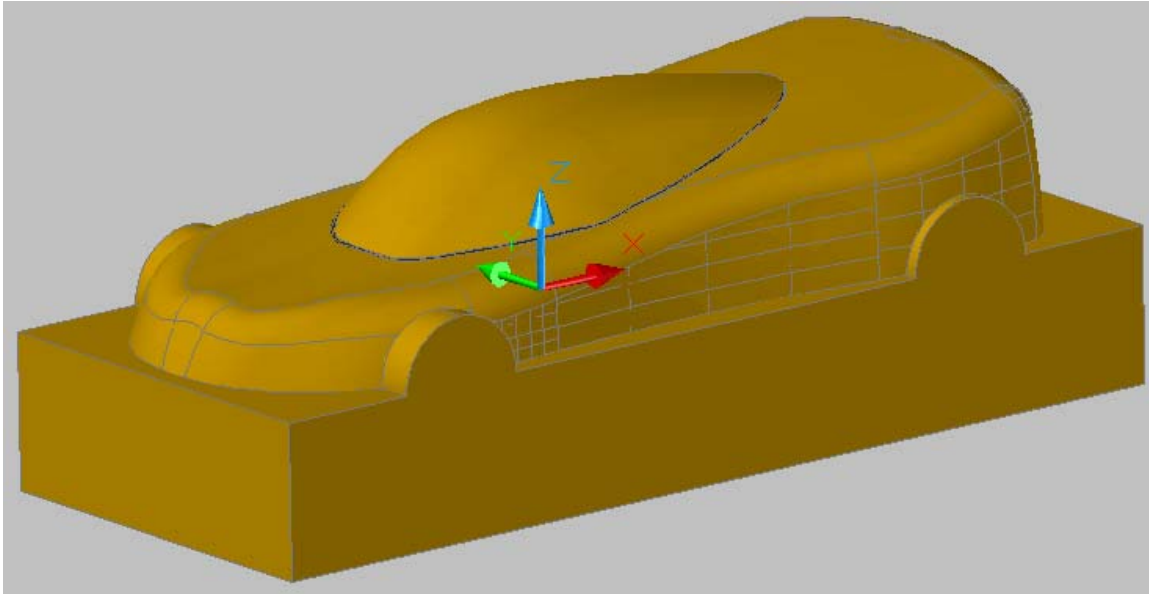


Figure 5

6. Make the Cavity layer the active layer. Create a Box from corner to diagonal corner of the base and a height of 125mm.

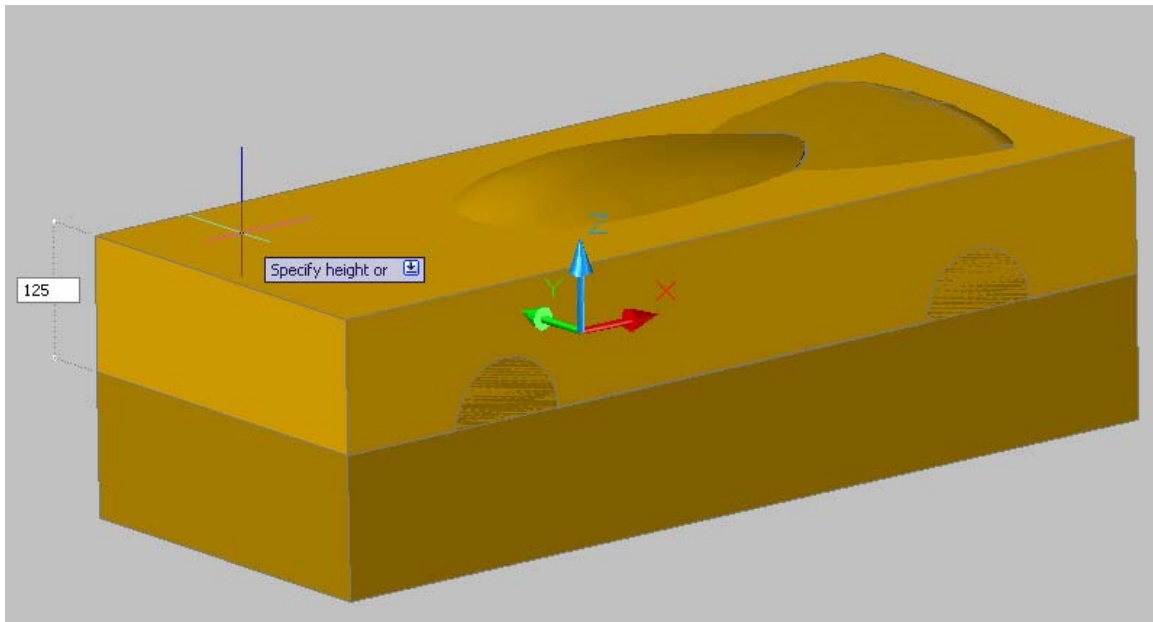


Figure 6A

7. Read this step carefully before continuing. Turn the assembly over. **Copy** the Core side in the same location so that there are two core bodies. Then Subtract one of the cores from the Cavity side. Turn off the visibility of the Core layer and the Cavity should look like Figure 7.

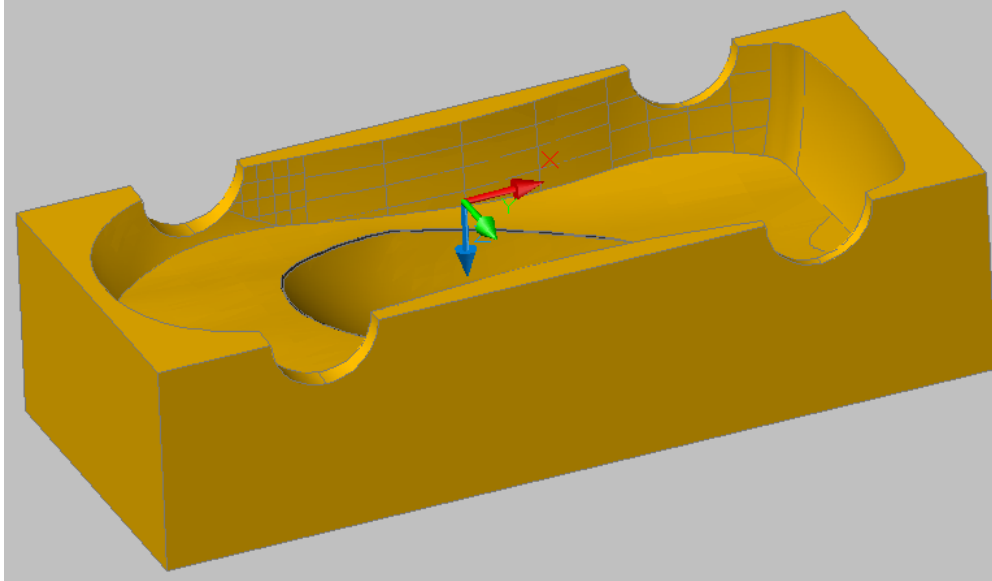


Figure 7

8. Turn off the Cavity layer and turn the Core layer back on and make it the active layer.

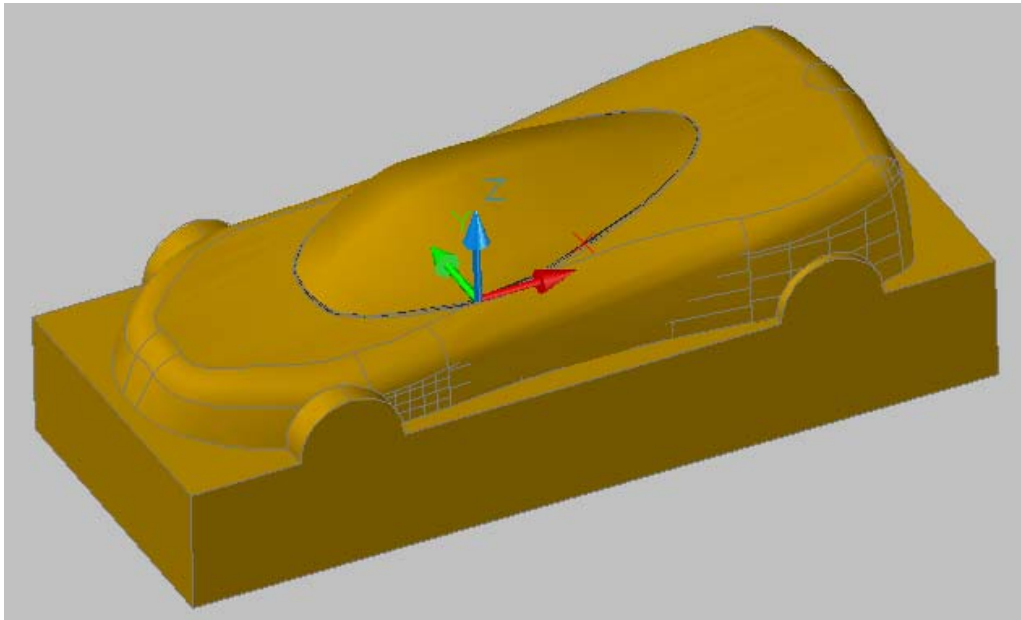


Figure 8

9. Minimize the Toolbody file and open the Tutorial 6 Toy Car file. Turn on the Mounting Posts layer.

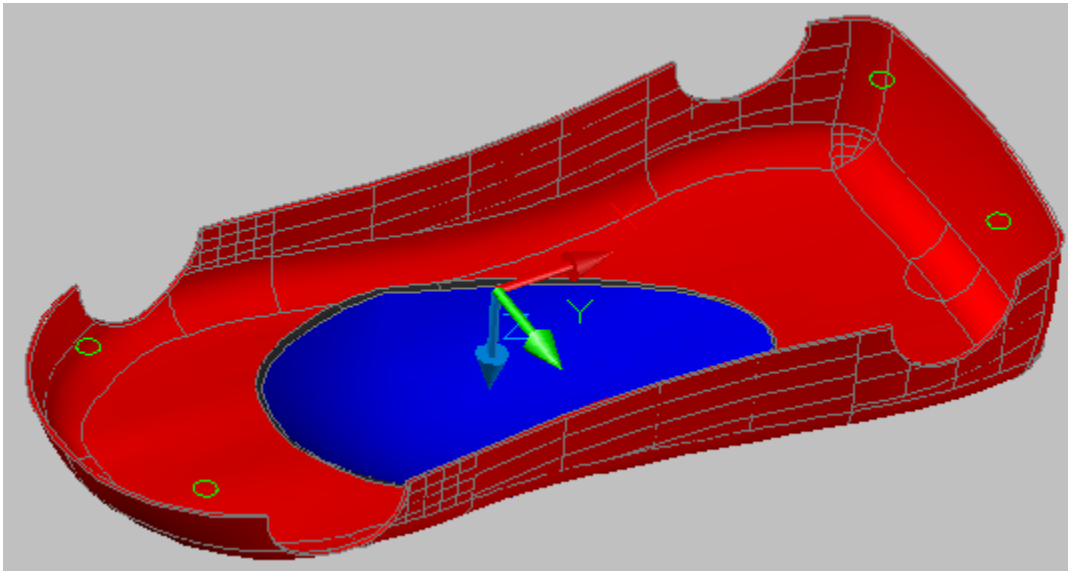


Figure 9

10. Extrude the four sketch wires with a taper of -3° and a distance of 100mm.

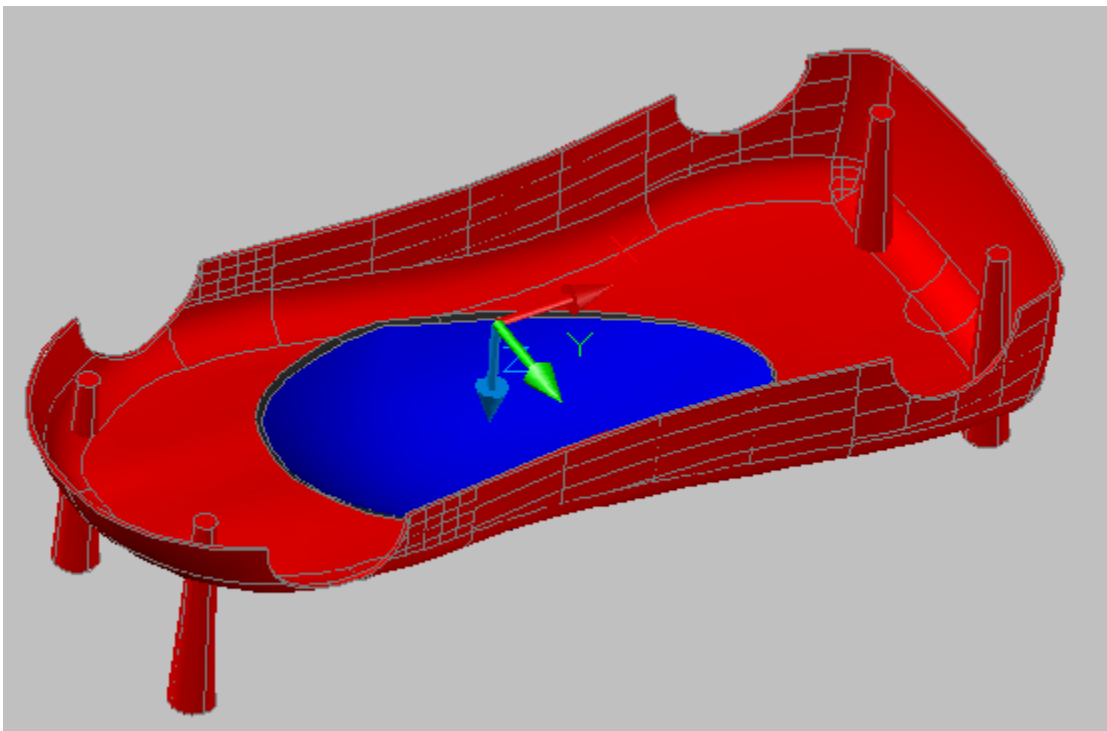


Figure 10

11. Read this step carefully. Make a Copy of the car body in the same location.
Subtract the car body from the four posts in one operation.

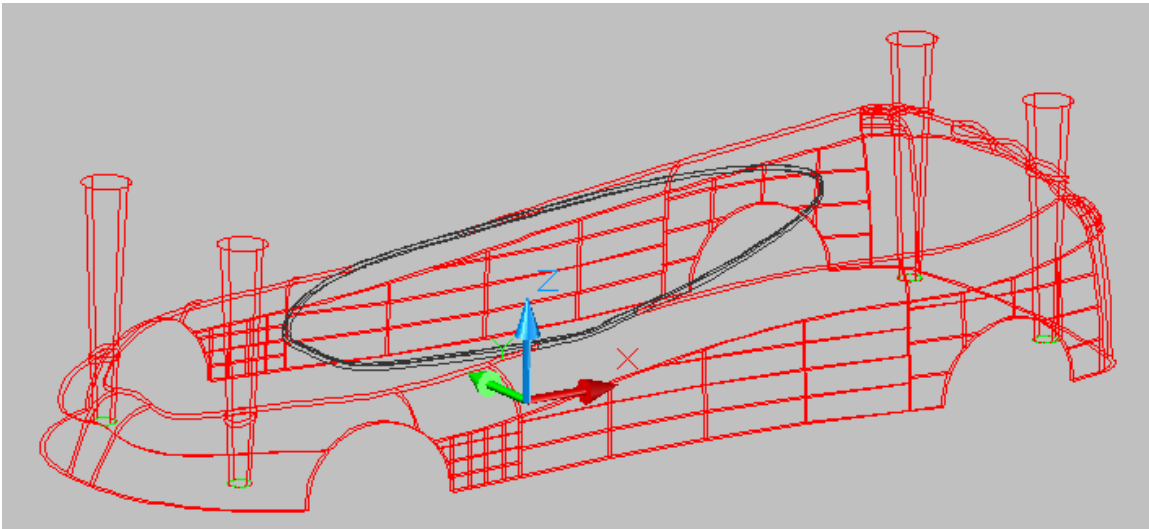


Figure 11

12. Separate the upper portion of the posts from the lower portion.

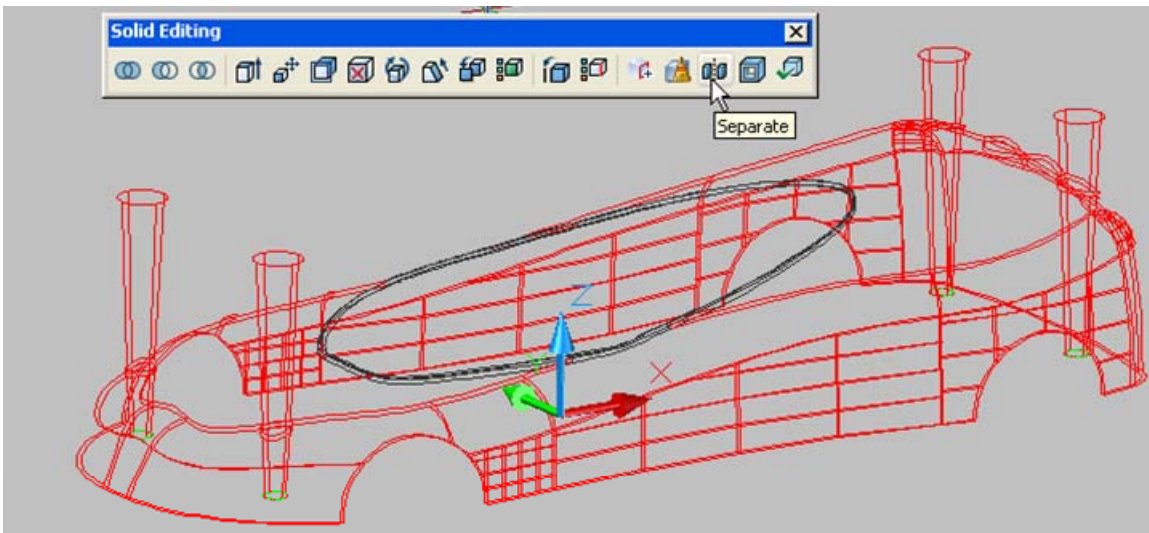


Figure 12

13. Delete the upper portion of the posts and then Union the lower posts to the body. Copy the Car Body to the clipboard with basepoint (0,0,0). Save and close the file.

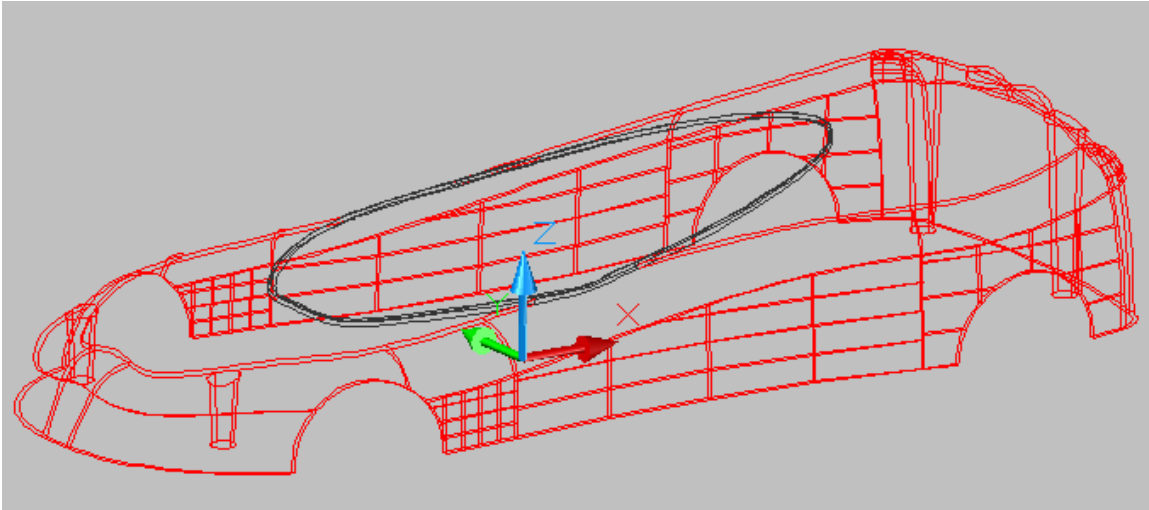


Figure 13

14. Paste the car body into the Toolbody in the (0,0,0) location. Save the file, if it is going to crash the next operation is a likely time.

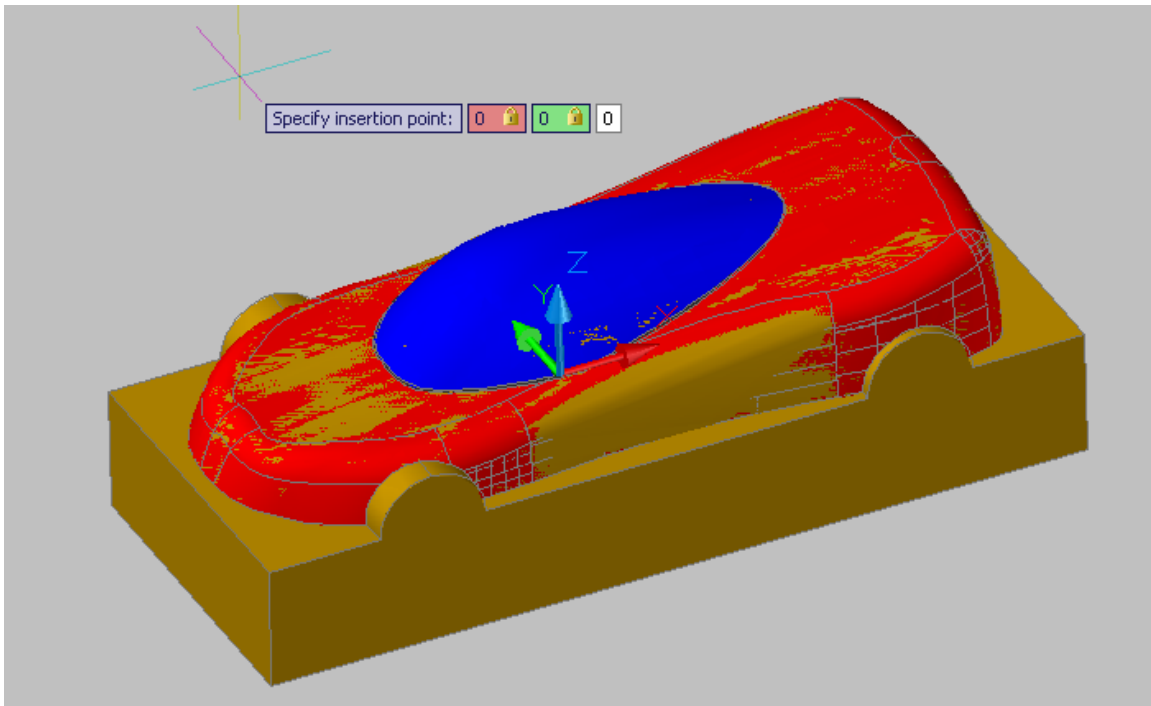


Figure 14

15. Subtract the car body from the core. The subtract operation may take several minutes – and unfortunately on my machine it did not result in the proper geometry with the car body including the mounting posts subtracted from the core.

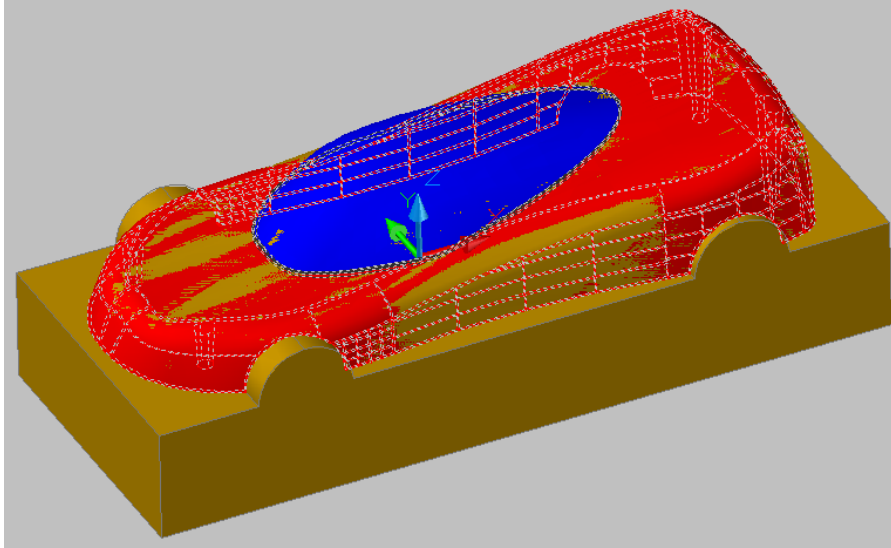


Figure 15

16. Examine the results carefully. We have removed the material from the core that would be filled with plastic between the two halves of the mold. *(Tip: You should have noticed I changed some face colors as we went along – don't let the changes of colors confuse you.)*

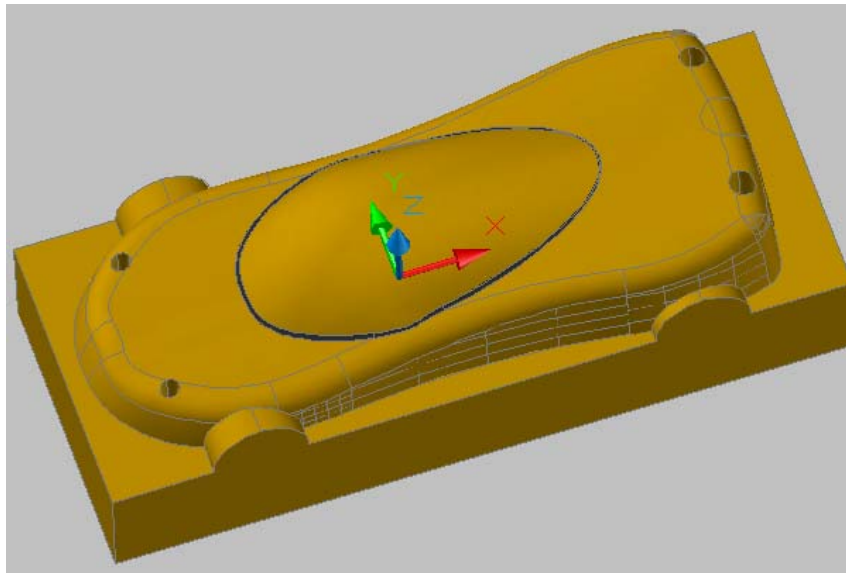


Figure 15

Of course there is much more to mold design than what we have done here. We did not consider shrinkage or other parts of the tool.
