Departamento de Computação

PROJETO E MANUFATURA ASSISTIDOS POR COMPUTADOR 27260 A

AULA 05– LAB08
FEATURE OPERATIONS

Departamento de Computação
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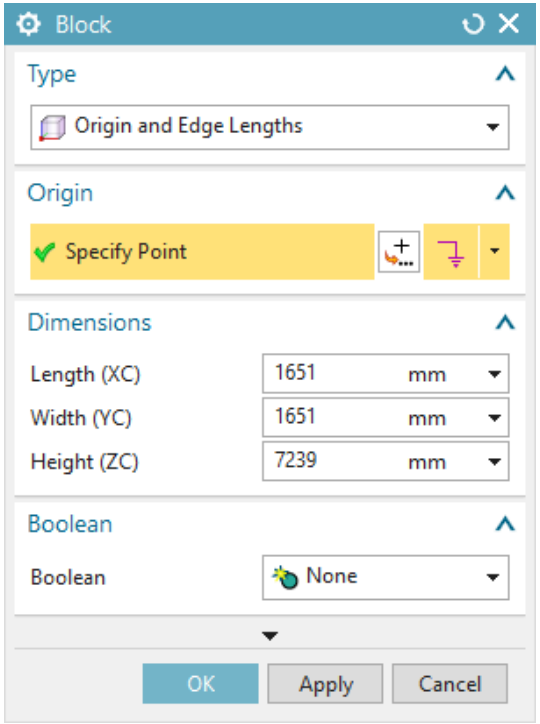
Aula 04

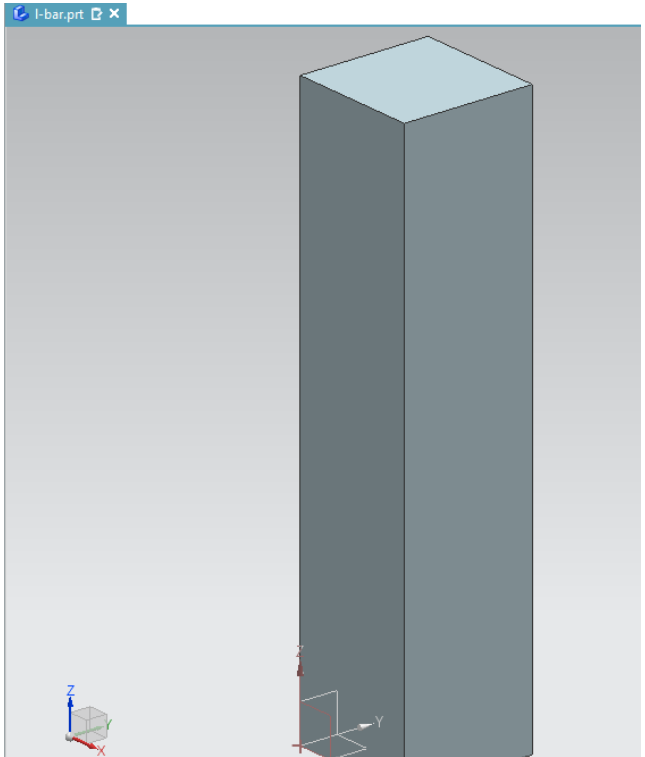
Here, we will make use of some Primitives and Feature Operations such as Edge Blend, Chamfer, and Subtract. It should be noted that the same model can be more easily created by 2D Sketching and Extruding, but Primitives are used here to familiarize the users with these features.

5.1 L-Bar

1. Create a new file and save it as **Arborpress_L-bar**
2. Choose **Insert** →**Design Feature** →**Block**
3. Create a **Block** with the following dimensions:

Length = **1651 mm**
Width = **1651 mm**
Height = **7239 mm**





5.1 L-Bar

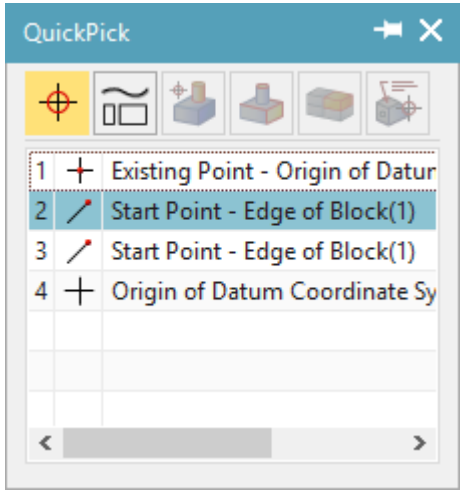
Create the block at the **Origin**

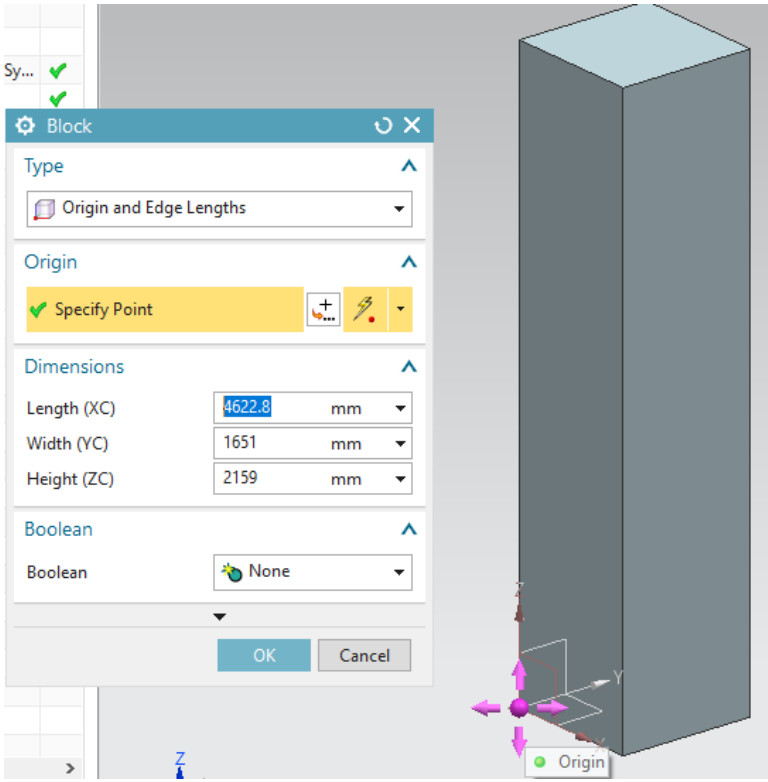
4. Create a second block also placed at the origin with the following dimensions:

Length = **4622.8 mm**

Width = **1651 mm**

Height = **2159 mm**



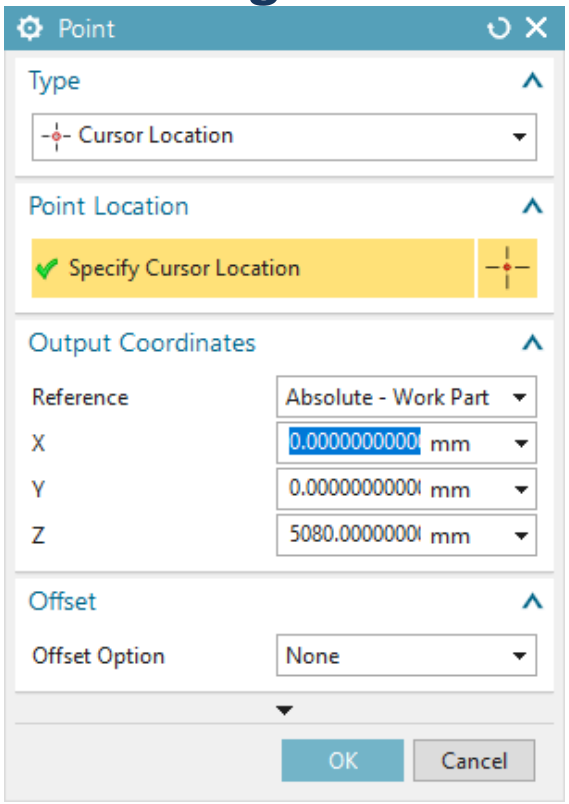


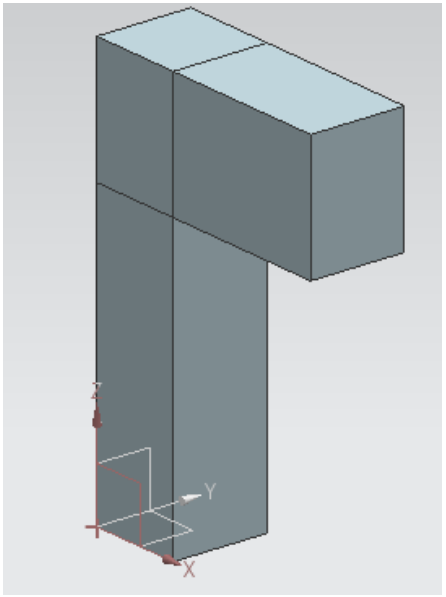
5.1 L-Bar

We have to move the second block to the top of the first block:

5. In Specify Point , click **Point Dialog**
6. In Output Coordinates:

   Z: 5080 mm
7. Click **OK**

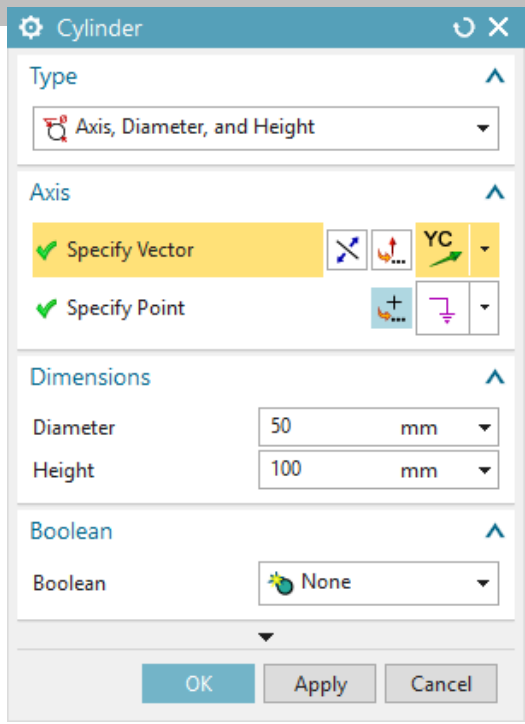


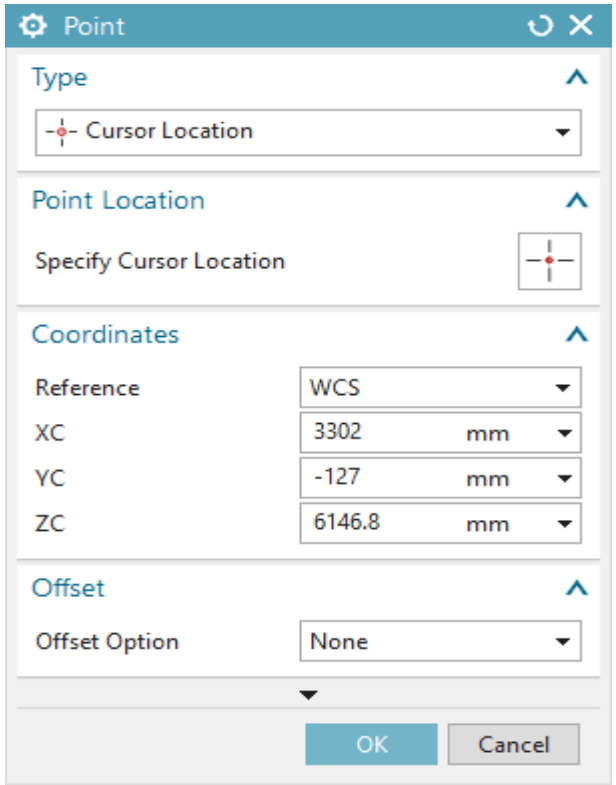


5.1 L-Bar

Now we will create a *Hole*.

8. Choose **Insert →Design Feature →Cylinder**
9. On the **Specify Vector**, select the **YC Axis** icon





10. In the **Specify Point**, enter the following values:

XC = 3302
YC = -127
ZC = 6146.8

5.1 L-Bar

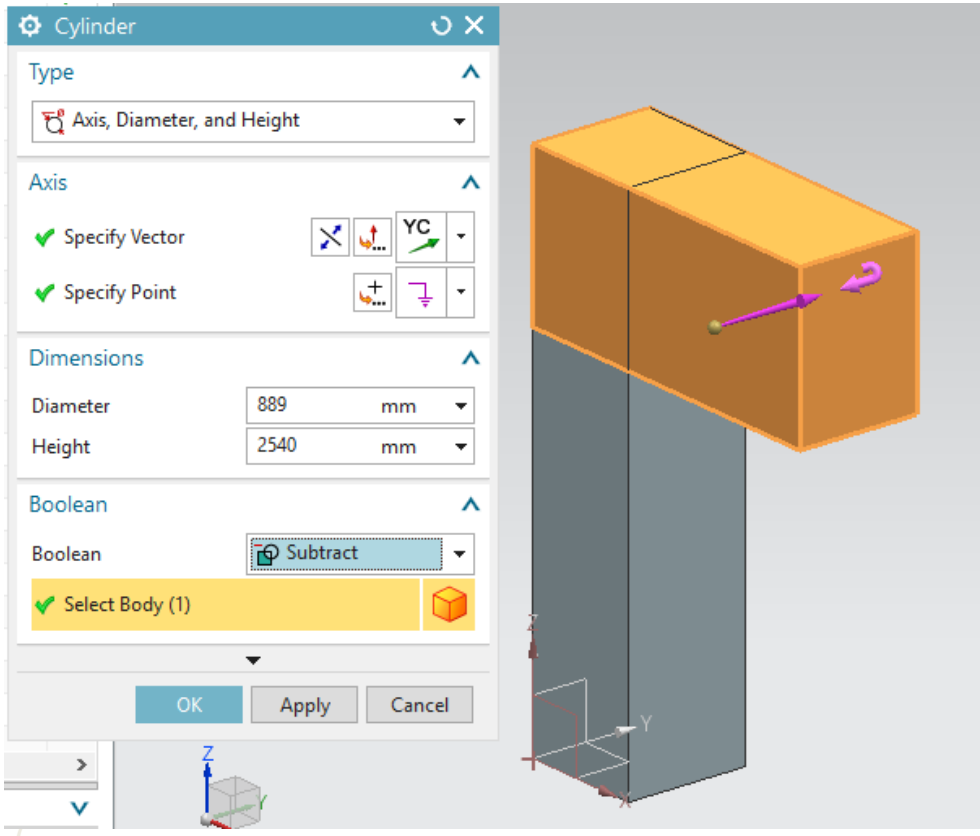
11. The cylinder should have the following dimensions:

Diameter = **889 mm**

Height = **2540 mm**

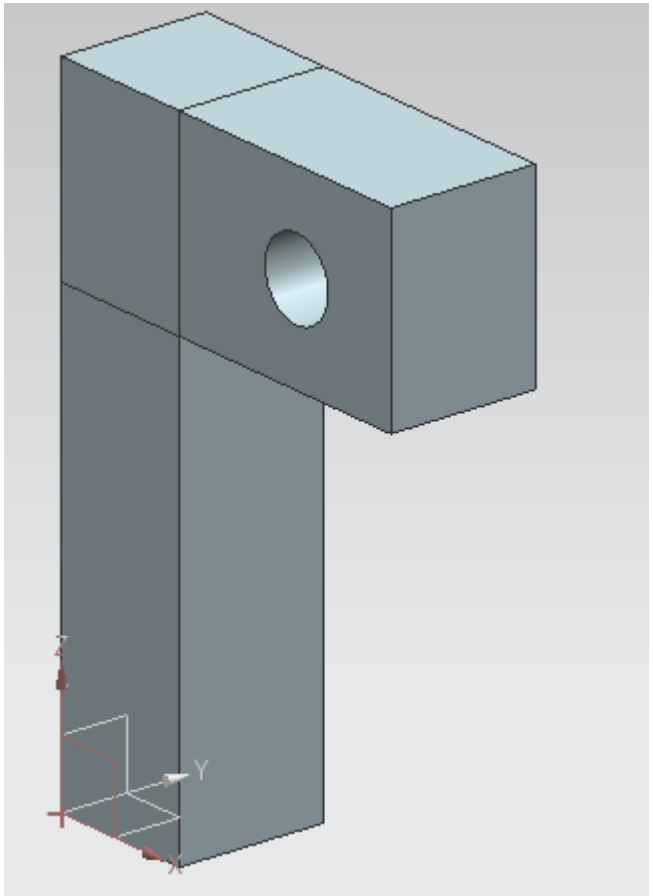
12. Under the **Boolean** drop-down window, choose **Subtract**

13. Select the horizontal block at the top



5.1 L-Bar

The hole should look like the one in the figure.



5.1 L-Bar

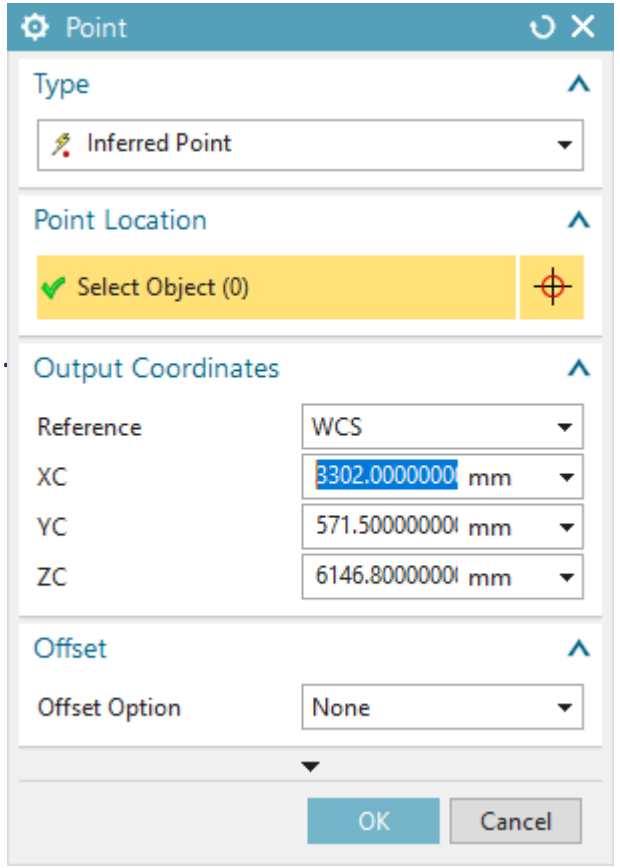
Now we will create another cylinder and subtract it from the upper block.

14. The cylinder should be pointing in the positive *Y-direction* set at the following poin

XC = 3302

YC = 571,5

ZC = 6146,8



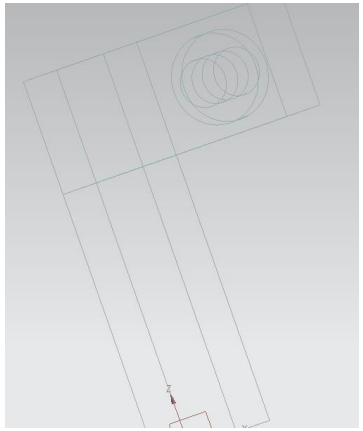
5.1 L-Bar

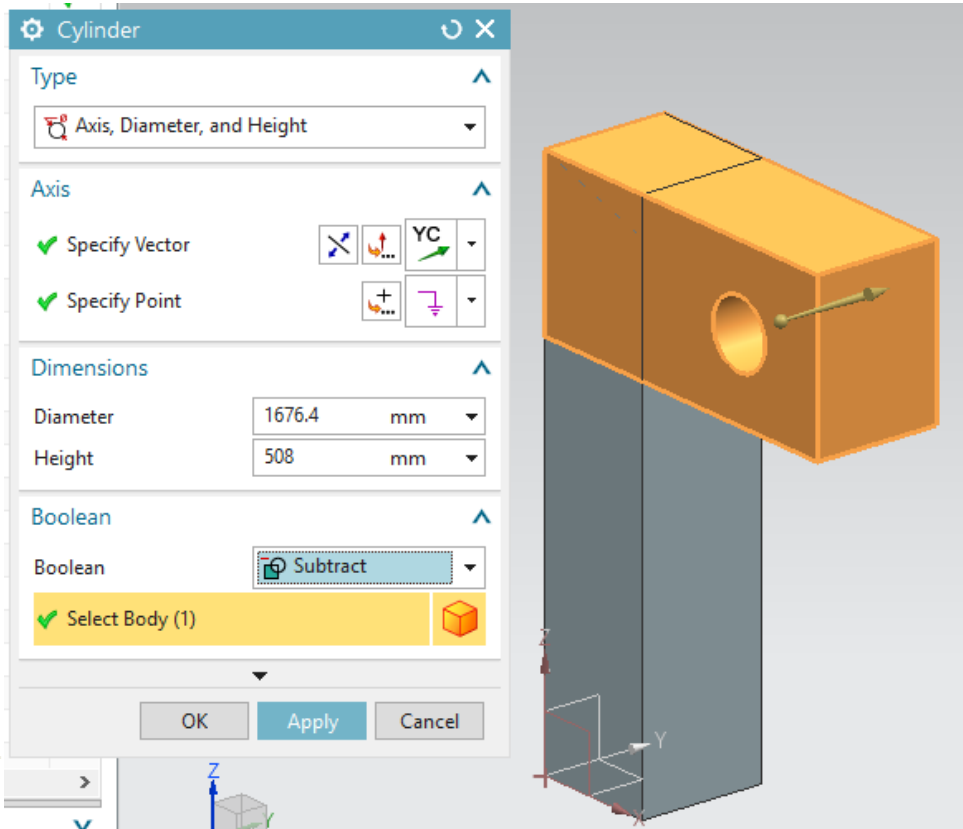
and should have the following dimensions:

Diameter = 1676,4 mm;

Height = 508 mm

15. **Subtract** this cylinder from the same block as before using the **Boolean** drop-down Menu.





Departamento de Computação

5.1 L-Bar

Now we will create a block.

16. Choose **Insert →Design Feature →Block**
17. Create a block with the following dimensions:

Length = **635 mm**

Width = **508 mm**

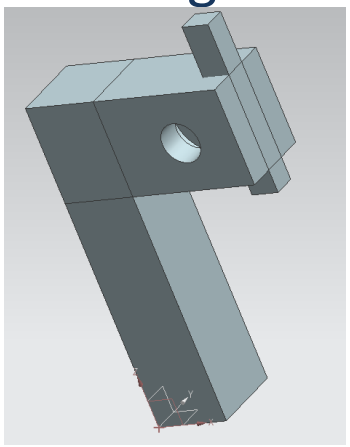
Height = **3810 mm**

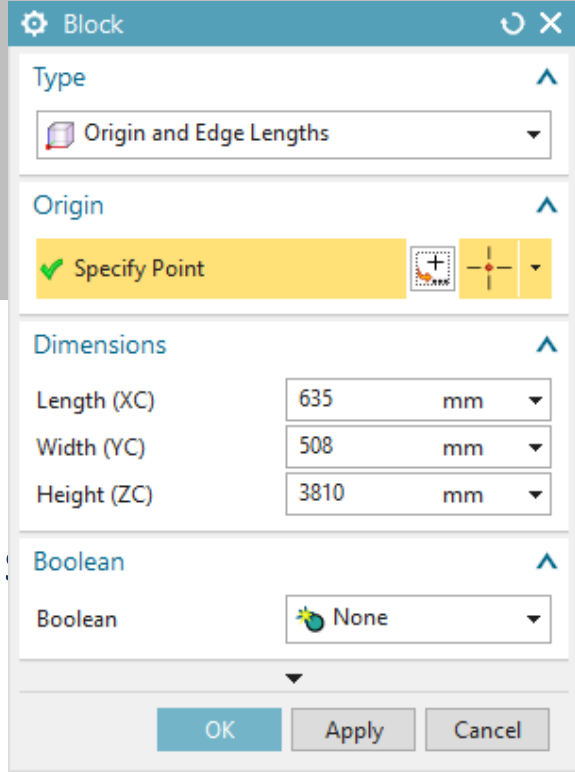
18. Click on the **Point Dialog** icon in the **Origin** box and enter the following values:

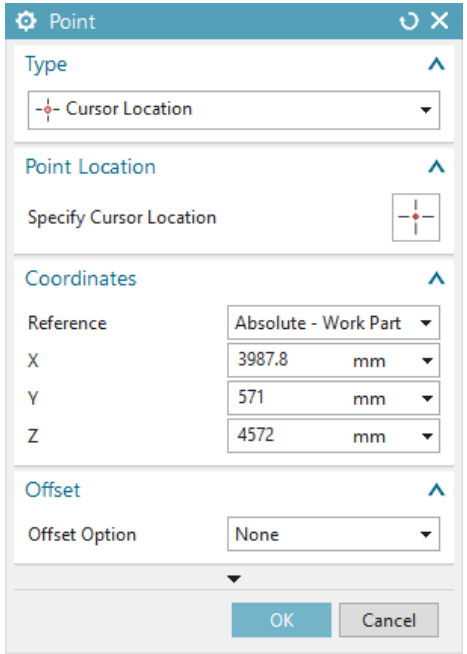
X= **3987.8**

Y = **571.**

Z = **4572**



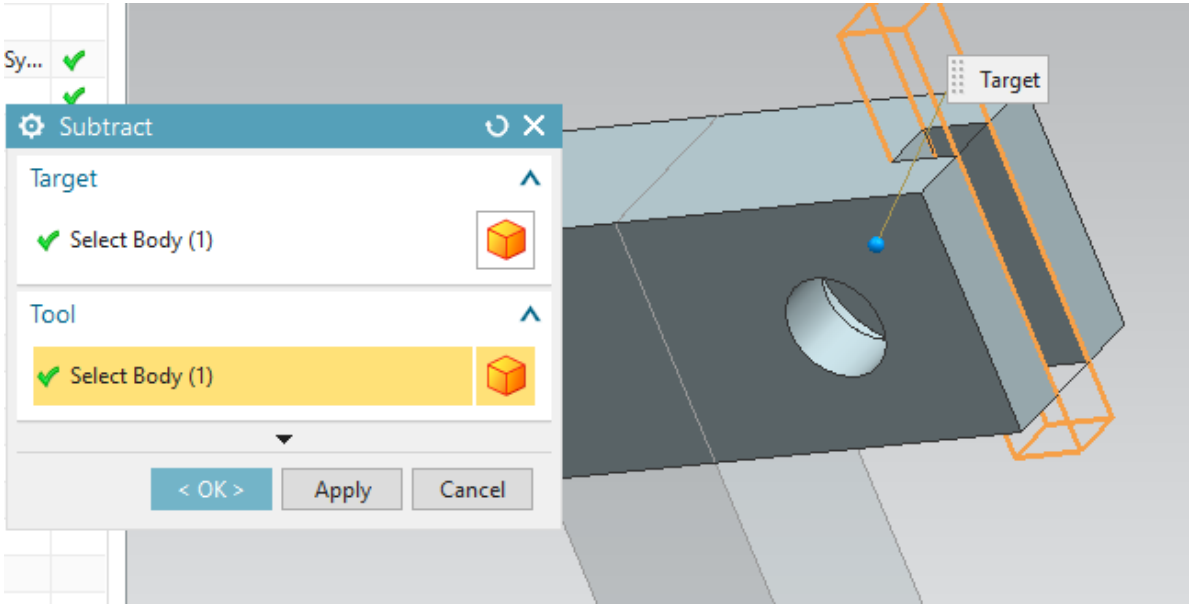




5.1 L-Bar

Now we will subtract this block from the block with the hole.

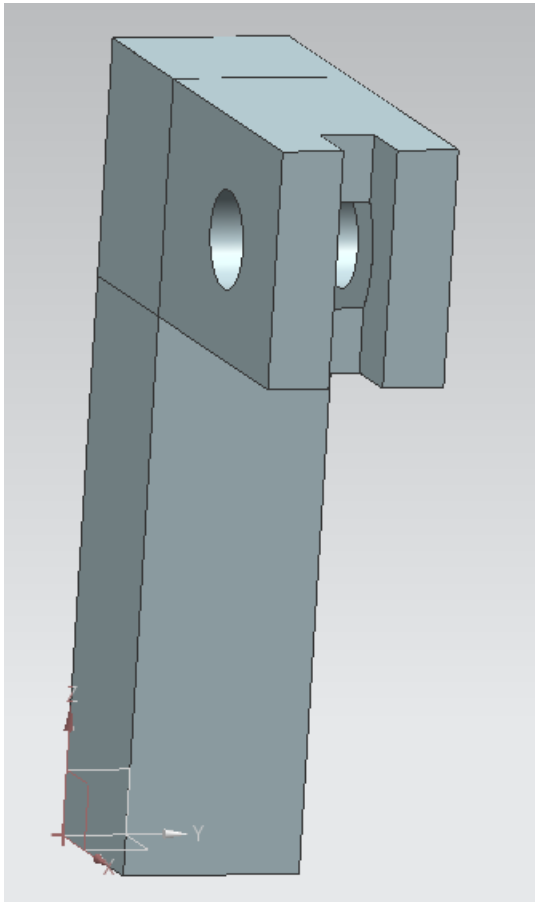
19. Choose **Insert** →**Combine** →**Subtract**
20. Click on the block with the two holes as the **Target**
21. Select the newly created block as **Tool**
22. Click **OK**



5.1 L-Bar

The model will be seen as shown. Now we will use the *Blend* function in the *Feature Operations*. We must first unite the two blocks.

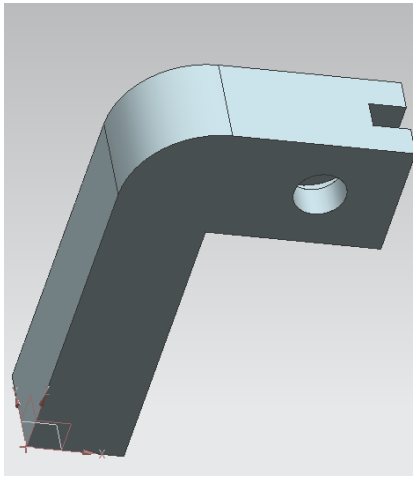
23. Choose **Insert** →**Combine** →**Unite**
24. Click on the two blocks and click **OK**

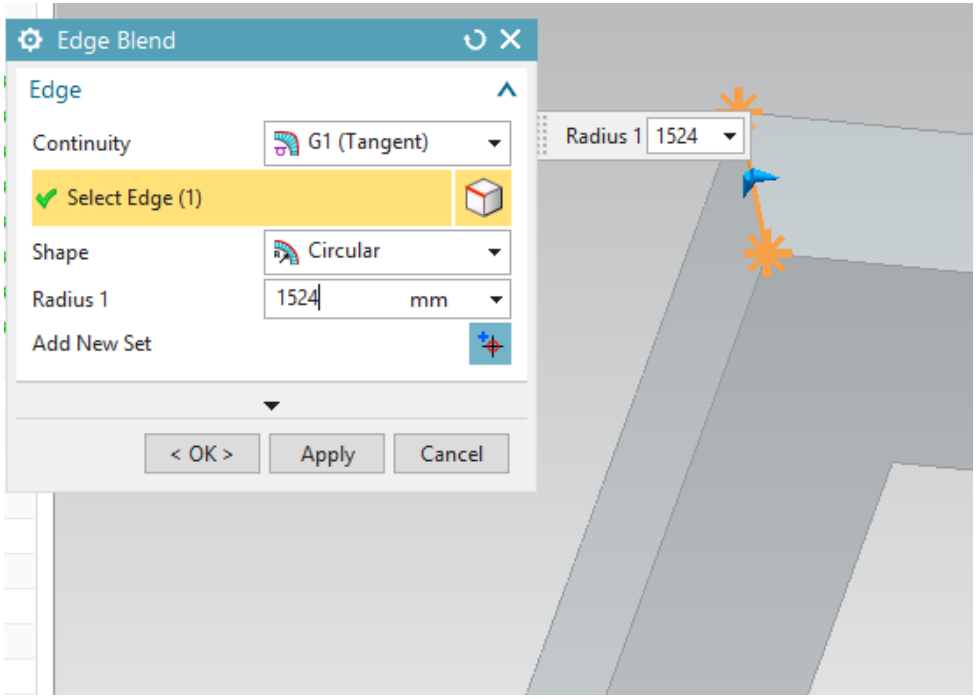


5.1 L-Bar

The two blocks are now combined into one solid model.

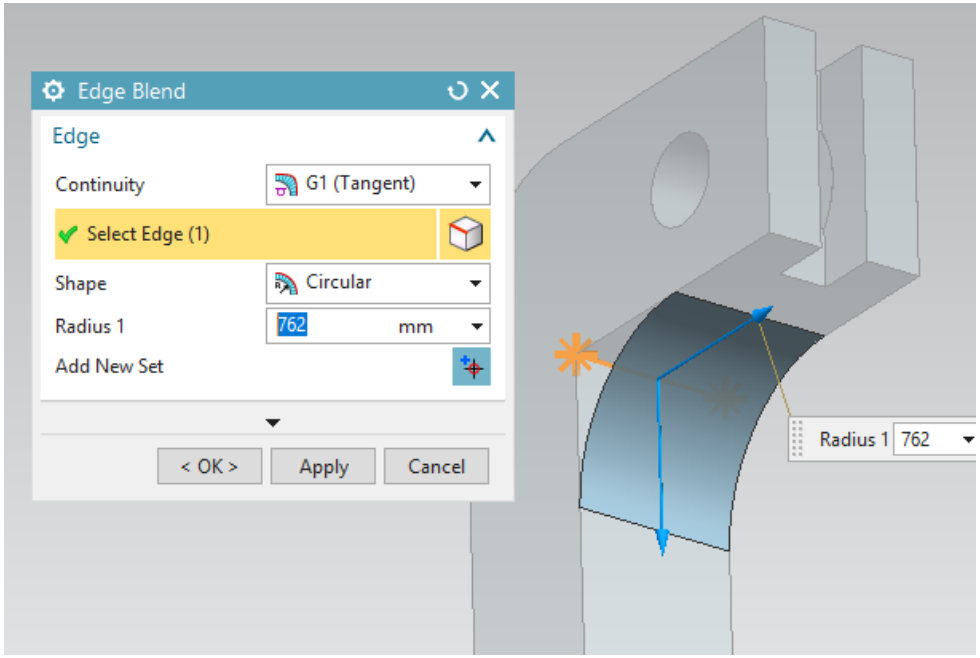
25. Choose **Insert** →**Detail Feature** →**Edge Blend**
26. Change the **Radius** to **1524**
27. Select the edge at the interface of the two blocks
28. Click **OK**





5.1 L-Bar

29. Repeat the same procedure to Blend the inner edge of the blocks. This time, the Radius should be changed to **762**.



5.1 L-Bar

We will now make four holes in the model. You can create these holes by using the *Hole* option.

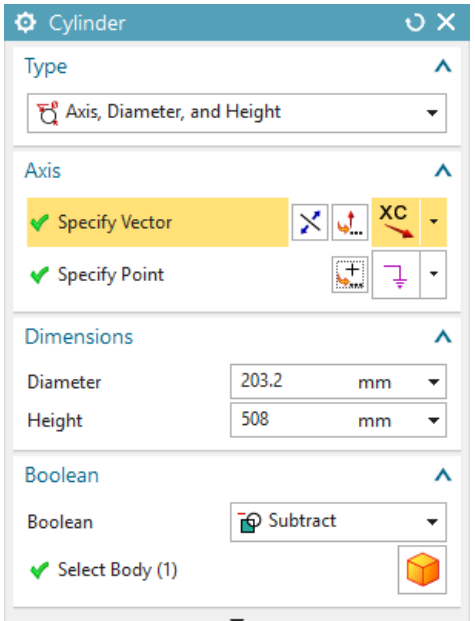
However, to practice using *Feature Operations*, we will subtract cylinders from the block.

30. Insert four cylinders individually. They should be pointing in the **positive XC**-direction

and have the following dimensions.

Diameter = **203,2 mm**

Height = **508 mm**



5.1 L-Bar

Construct them in the **XC**-direction at the following point coordinates:

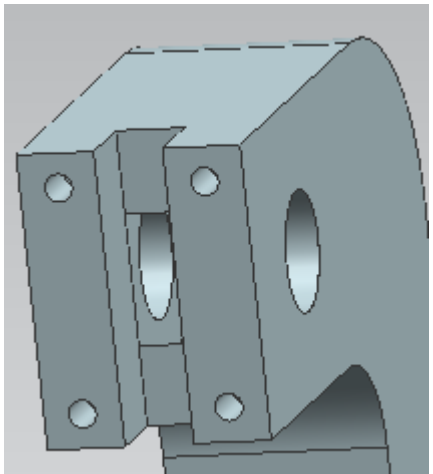
Cylinder #1: X = **4114.8**; Y = **285.75**; Z = **5334**

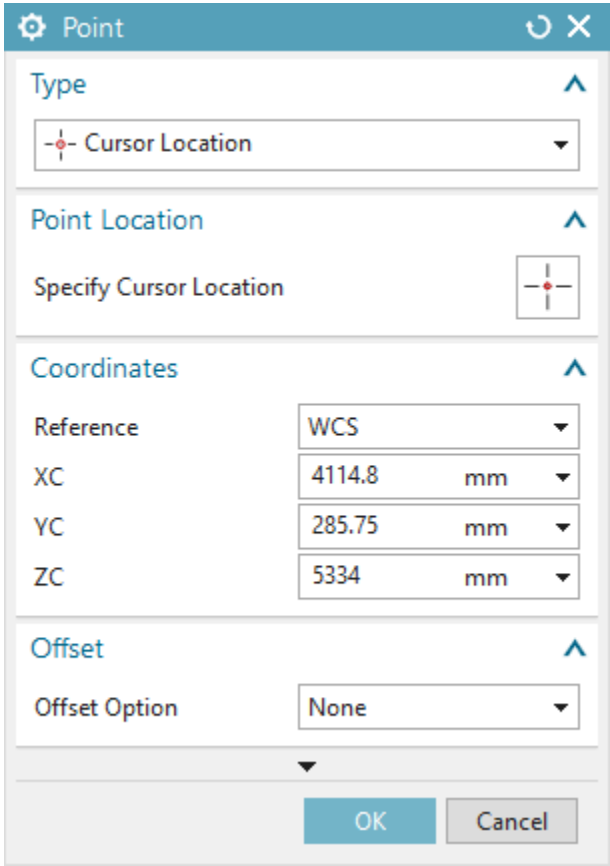
Cylinder #2: X = **4114.8**; Y = **285.75**; Z = **6985**

Cylinder #3: X = **4114.8**; Y = **1365.25**; Z = **5334**

Cylinder #4: X = **4114.8**; Y = **1365.25**; Z = **6985**

31. **Subtract** these cylinders from the block in the **Boolean** dialog box





5.1 L-Bar

The last operation on this model is to create a block and subtract it from the top block.

32. Create a **Block** with the following dimensions:

Length = **1524 mm**

Width = **508 mm**

Height = **1676.4 mm**

5.1 L-Bar

33. Enter the following values in the **Point Dialog** as the **Origin** of the **Block**

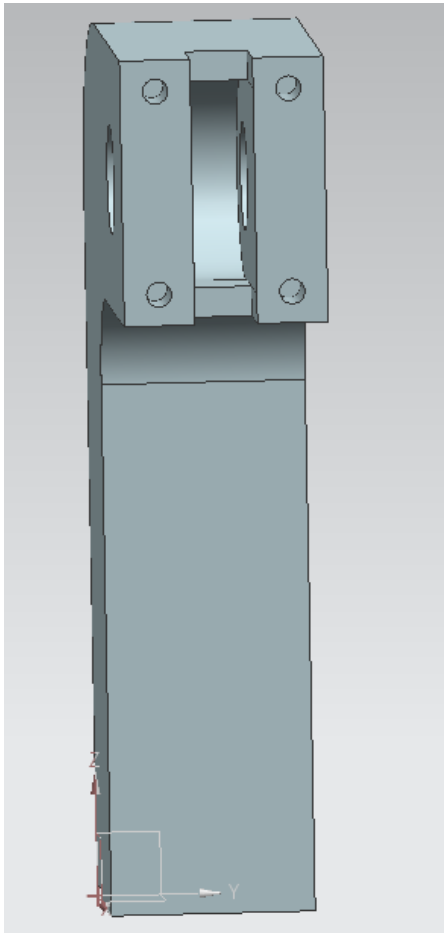
XC = **3302**

YC = **571.5**

ZC = **5321.3**

34. After creating the block, **subtract** this block from the block at the top.

The final figure will look like this.



35. Save and **close** the file.