



**3DXpert™ for SOLIDWORKS®**

# **Adjust model for 3D Printing**

Direct modeling tools

13,0600,1489,1616(SP6)



**3D SYSTEMS®**

Sometimes, the model needs to be prepared or adapted for printing. Adding material, change of a draft angles are an example. In this exercise, we will learn the **Direct Modeling tools** to make some shape changes to the 3DP component.

This tools are named **Direct Modeling** since they can be applied for geometry changes to a model, regardless of the model's feature history.

This family of commands is Solid based, so that the result is a solid object as well:





**Resize Round** –the user can change the radius value of rounds (fillets).

**Remove & Extend** –the user pick face/s to remove and the system looks for extensions.

**Direct Modeling** – the user can apply several types of changes like: change draft angle, offset, move linear, move radial and replace.

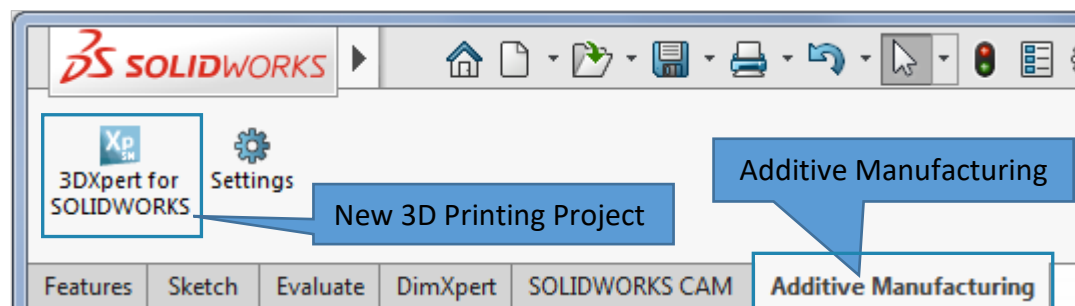
To use this command we need to follow few steps (guided):

- Load **Direct modeling tools Start.SLDPRT** to SOLIDWORKS
- Launch **3DXpert for SOLIDWORKS**.
- Use **Direct Modeling tools**.

 Notice/ Remember		Left mouse button name is " <b>pick</b> "
		Middle mouse button name is " <b>Exit</b> "
		Right mouse button name is " <b>Click</b> "

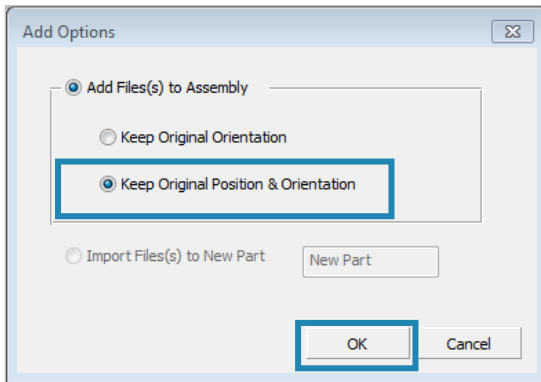
1. Load **Direct modeling tools Start.SLDPRT** to SOLIDWORKS from the folder that it was downloaded to.

2. From the Additive Manufacturing tab **pick 3XPert for SOLIDWORKS** command.



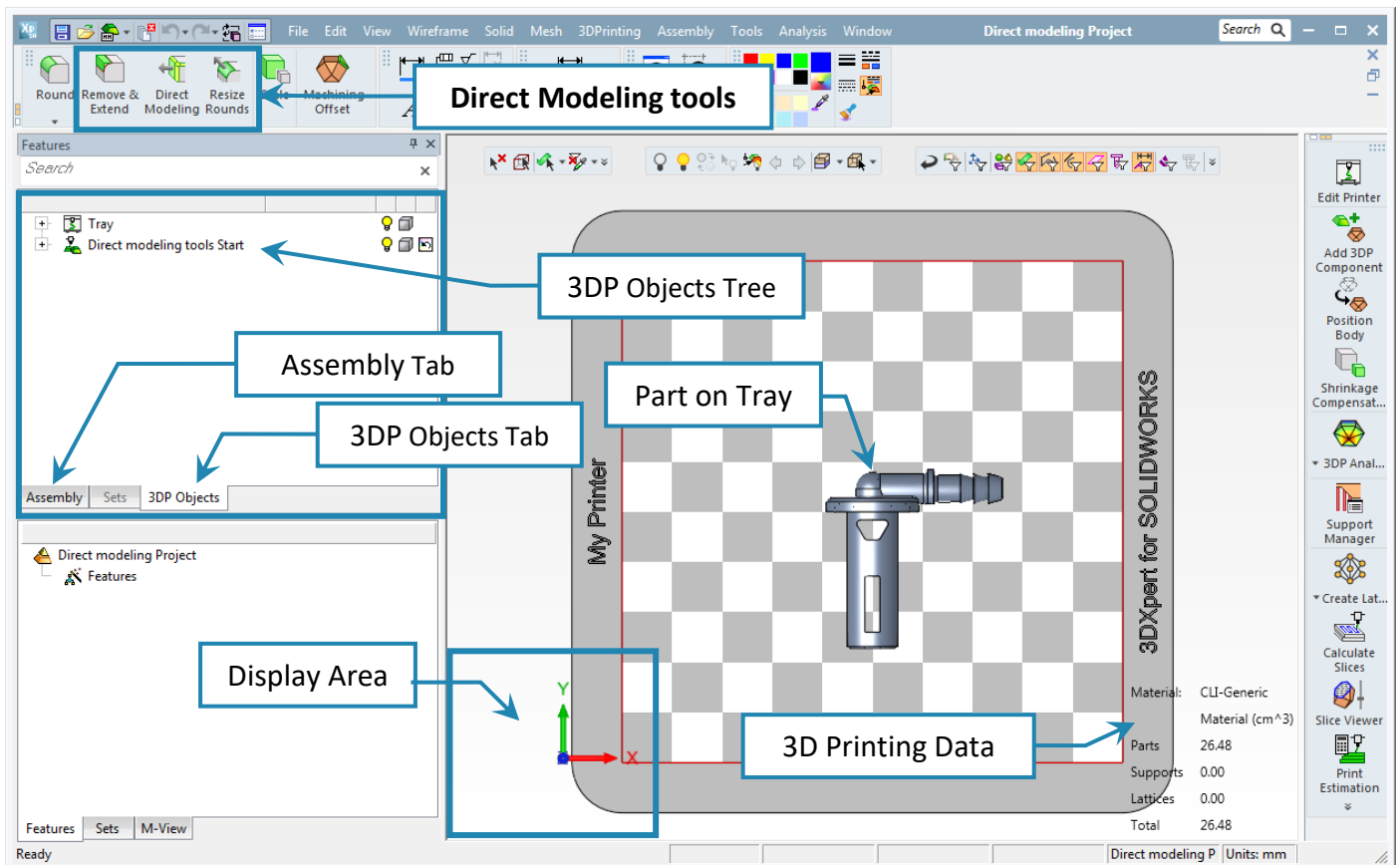
This command will launch **3DXpert for SOLIDWORKS**.

3. After the **3Dxpert for SOLIDWORKS** is invoked, new window will open:




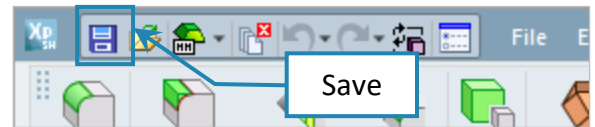
**Pick Keep Original Position & Orientation and OK:**

After the file is open the screen will look like this:

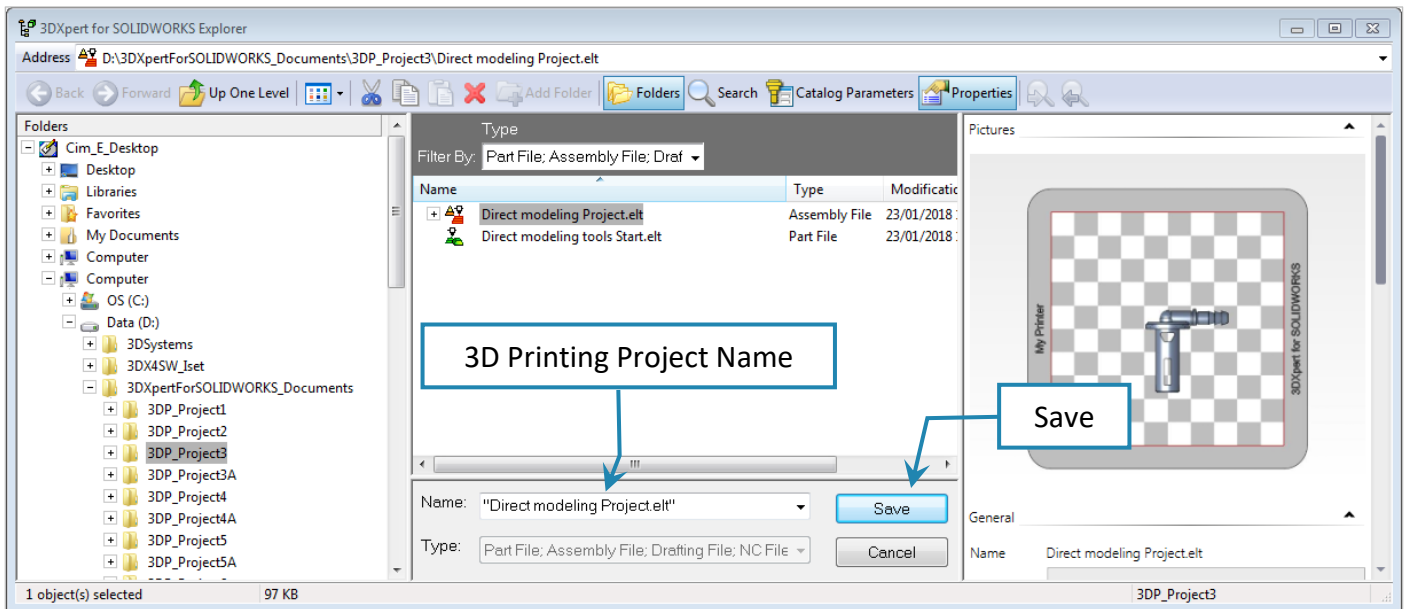


Notice that Direct Modeling tools are in the Main Toolbar at the top screen.

4. Save the project, pick the Save  command on top left corner.

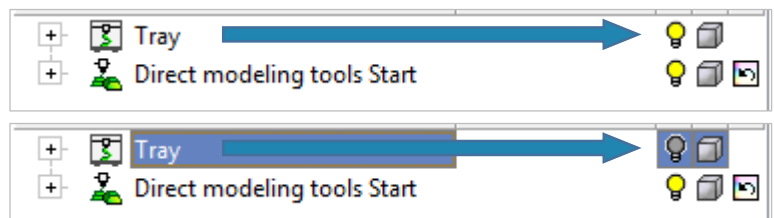


This command will open the **3DXpert for SOLIDWORKS Explorer**. Save the file to the same folder with the downloaded files.



NOTE: For this exercise, the exact position is not important.

5. Hide the Tray, from the 3DP Objects Tree **pick** the bulb of the Tray,

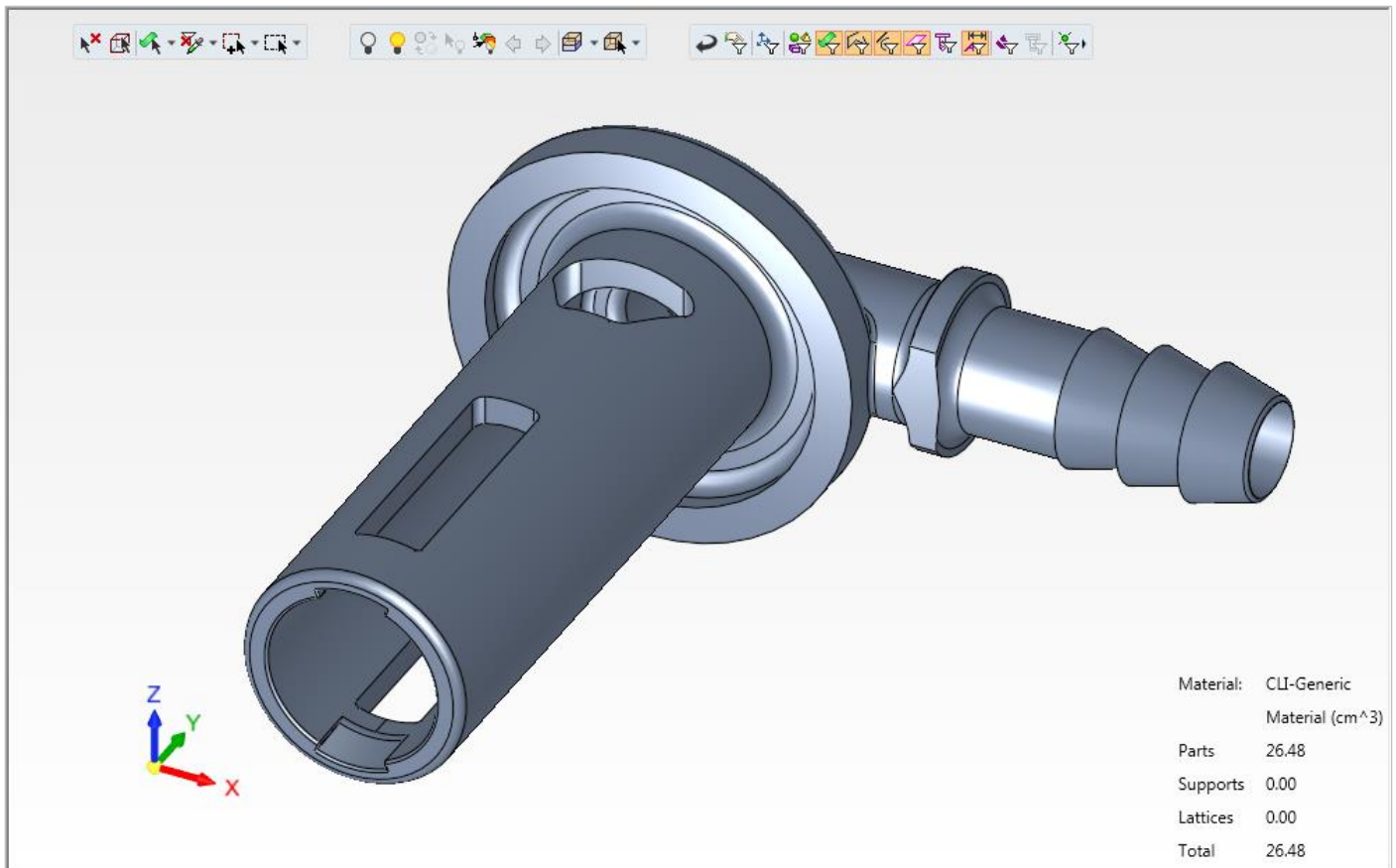


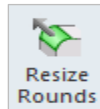
The bulb will turn grey and the Tray "disappears" from display.  
At any time **pick** again to Show.

**Click** the white ball in the Display Area to get an ISO view on the part.




After hiding the tray the, **3DP component** will look like this from ISO view:

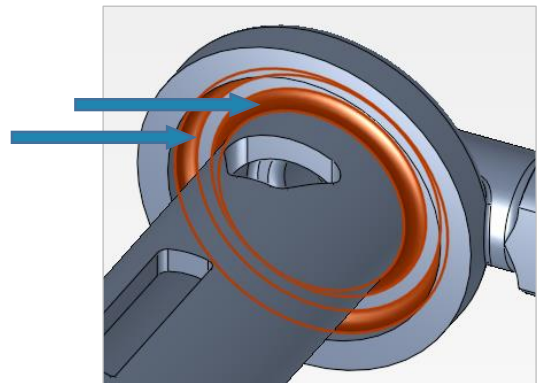




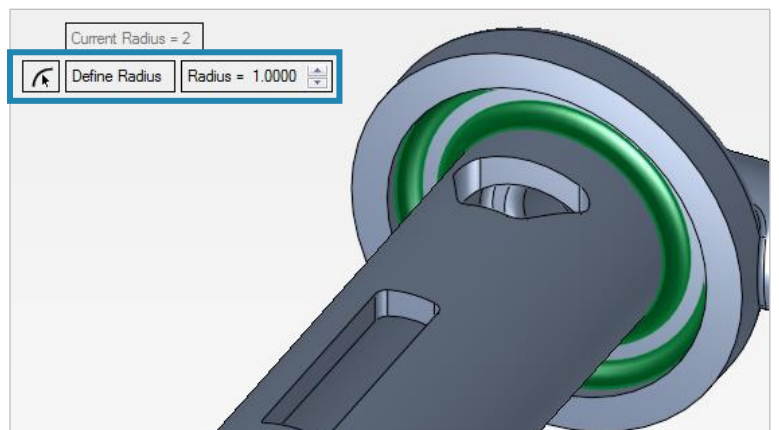
6. **Pick the Resize Round** command from the Main Toolbar.

	 <b>Resize Round</b> 1) <b>Pick</b> rounds 2) Set parameters  To move from step 1) to 2) press <b>Exit</b>	
		<b>"Preview"</b> the result without executing
		To approve and finish use the <b>"OK"</b>
		To approve and continue use the <b>"Apply"</b> .
		<b>"Cancel"</b> – exit the comand without keep changes

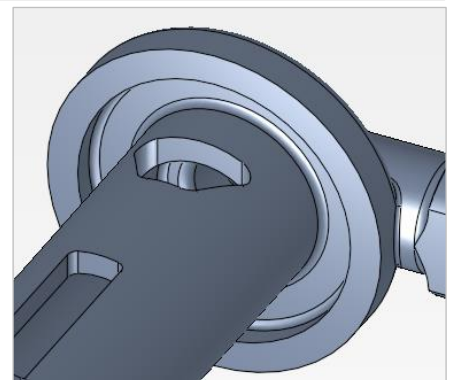
**Pick** 2 rounds as shown,  
Press **Exit** to next step.



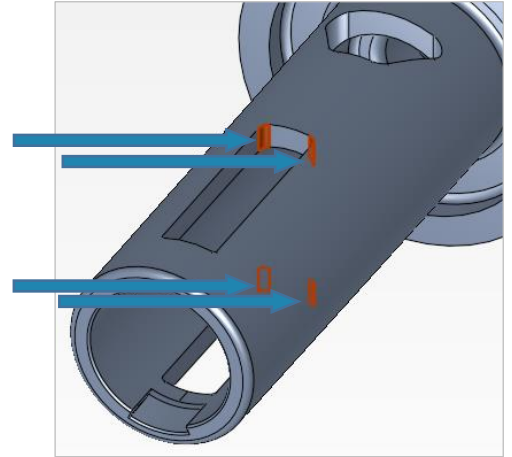
Set parameters as shown and **Apply** .




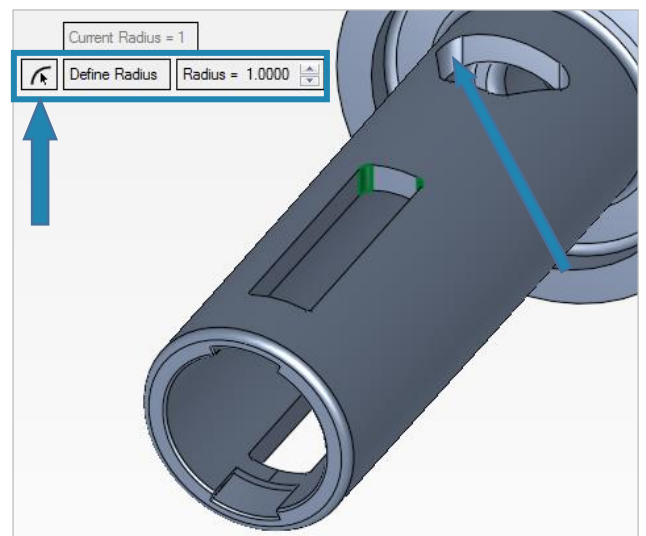
As a result the rounds became smaller, now  
set to R=1




7. **Pick** 4 rounds as shown,  
Press **Exit** to next step.



**Pick Define Radius**  command, and **pick** the radius shown in the picture as reference.

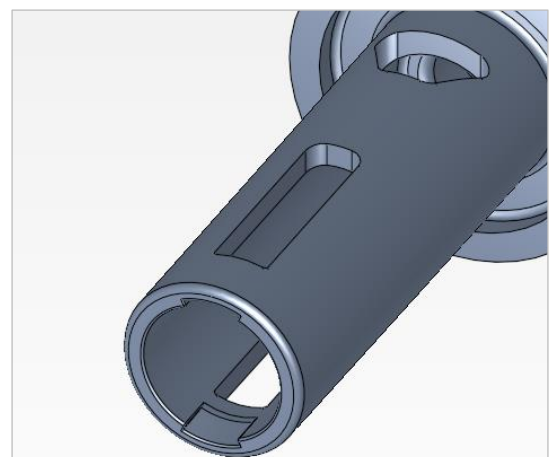


*Please notice:*

 Define a radius value for the selected faces, by using the button to **pick** a reference round and acquiring its radius as the value.

The value of the reference radius is set in.

**Pick Preview**  and then **OK** .



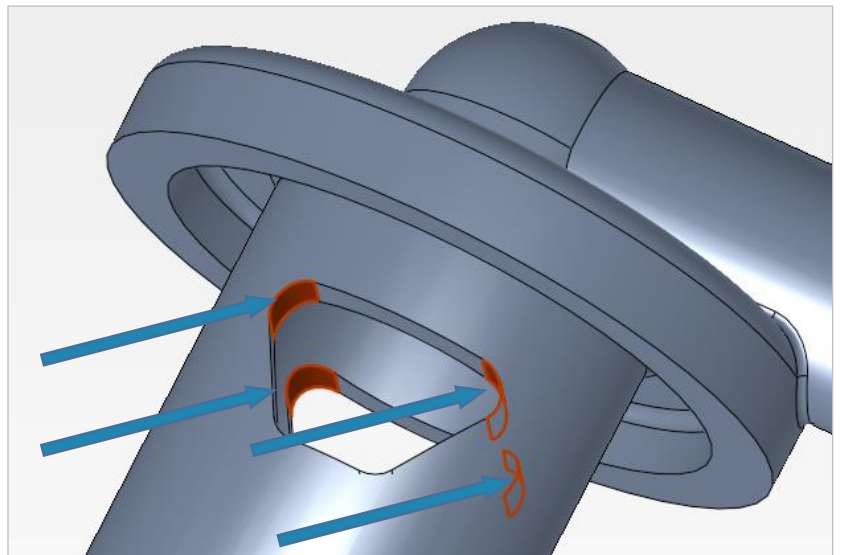


8. **Pick the Remove & Extend** command from the Main Toolbar.

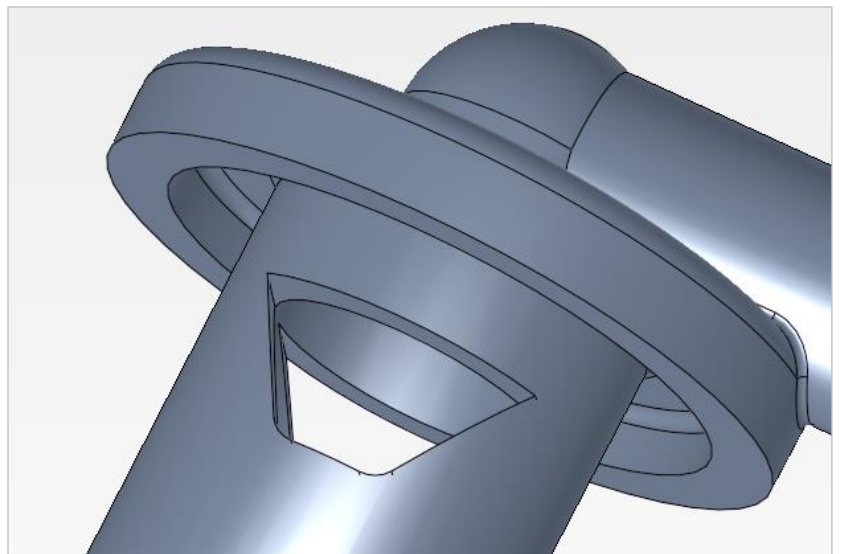


	<b>Remove &amp; Extend</b>
	1) <b>Pick</b> face(s) to be removed.
	<b>"Preview"</b> the result without executing
	To approve and finish use the <b>"OK"</b>
	To approve and continue use the <b>"Apply"</b> .
	<b>"Cancel"</b> – exit the comand without keep changes

9. **Pick** 4 rounds as shown,

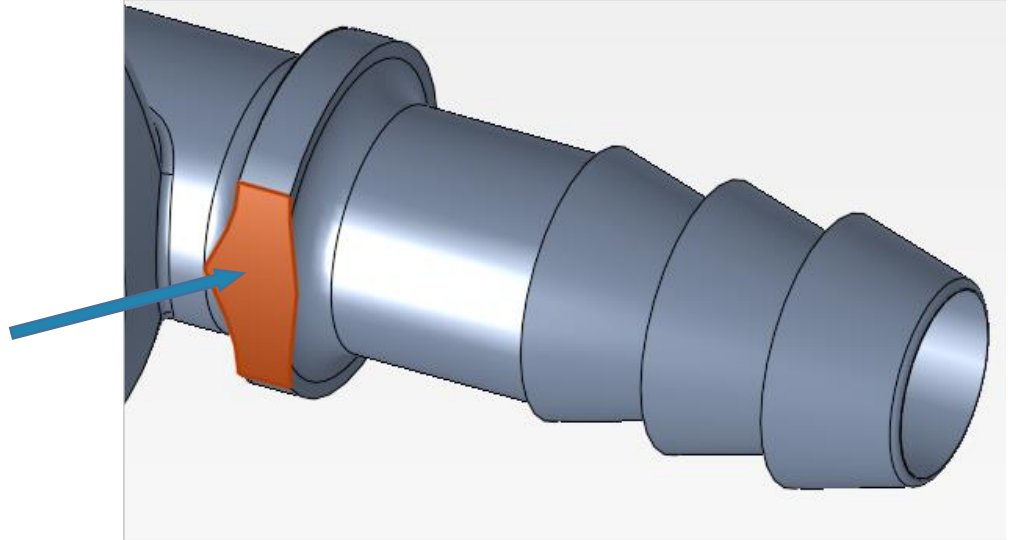


**Pick Preview** and then **Apply** .

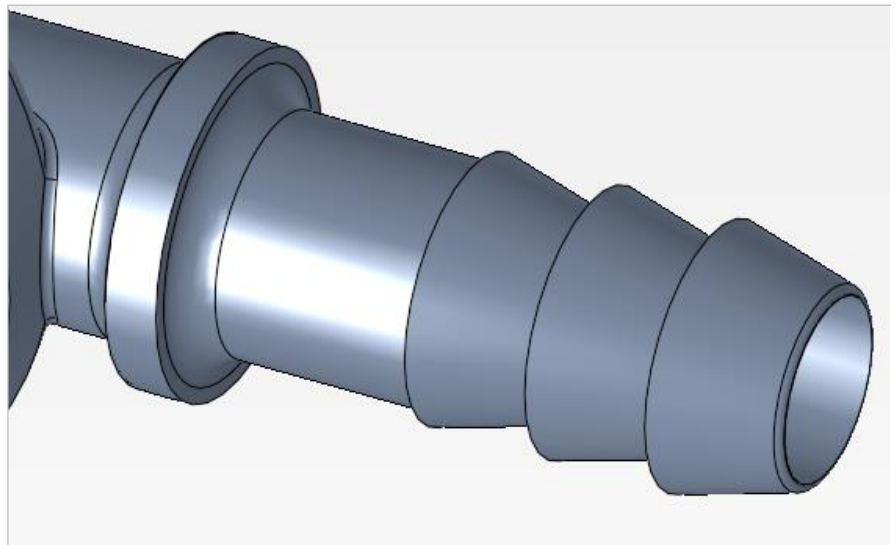


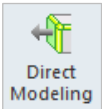


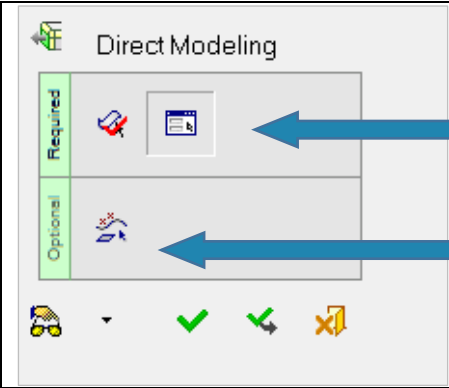

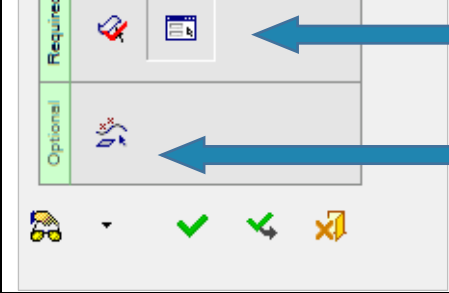






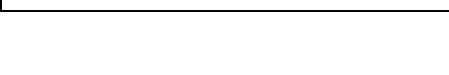

10. **Pick** the face as shown,



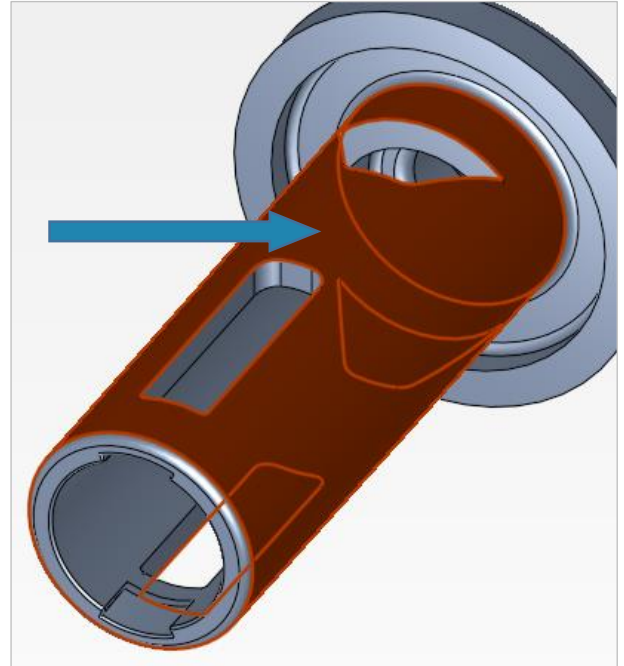
**Pick Preview**  and then **OK** .



11. **Pick** the Direct Modeling  command from the Main Toolbar.

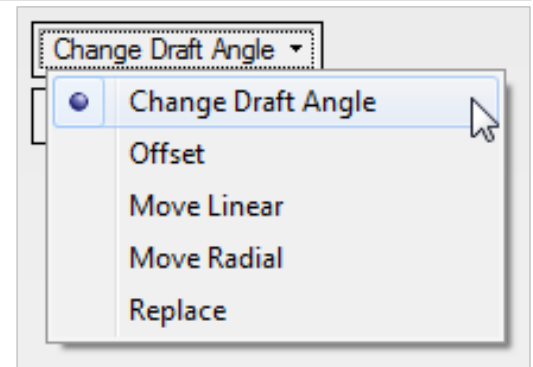
	 <b>Direct Modeling</b>
	<ol style="list-style-type: none"> <li>1) <b>Pick</b> face(s).</li> <li>2) Select options and set parameters</li> </ol> <p>To move from step 1) to 2) press <b>Exit</b></p> <p>Option: <b>Pick/unpick</b> round faces</p>
	 <b>"Preview"</b> the result without executing
	 To approve and finish use the <b>"OK"</b>
	 To approve and continue use the <b>"Apply"</b> .
	 <b>"Cancel"</b> – exit the comand without keep changes

12. **Pick** the face as shown,  
Press **Exit** to next step.



In the second step we have 5 major options:

- Change Draft Angle
- Offset
- Move Linear
- Move Radial
- Replace.

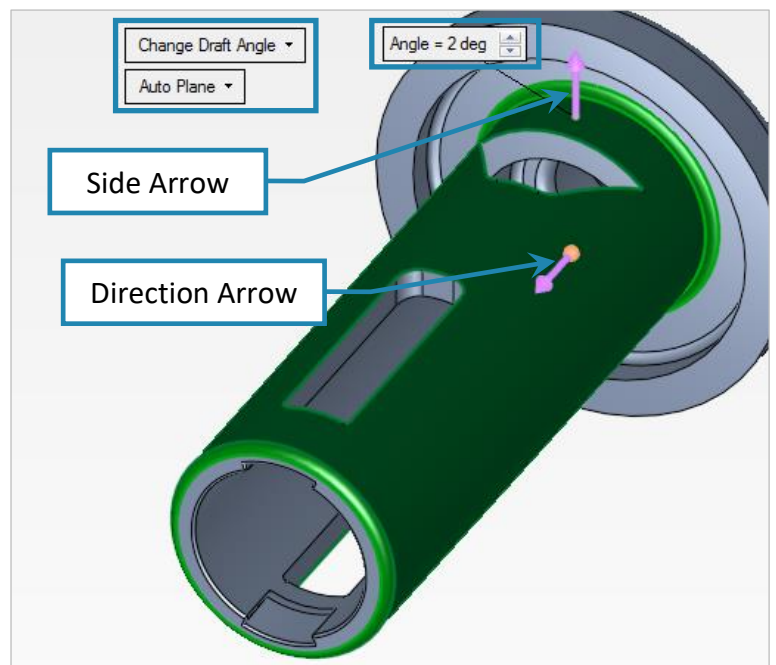


**Pick Change Draft Angle** option, and set parameters as shown:

The **Side Arrow**: determine the taper direction - outside or inside.

The **Direction Arrow** defines in this case the direction of normal to the plane, which is the plane according to which the angle will change. If needed, **pick** the **Direction Menu** by clicking on the ball in the base of the arrow.

**Auto Plane** (can be changed to **Auto contour** or **Natural Plane**) is the reference plane, automatically selected based on the direction of the direction arrow.



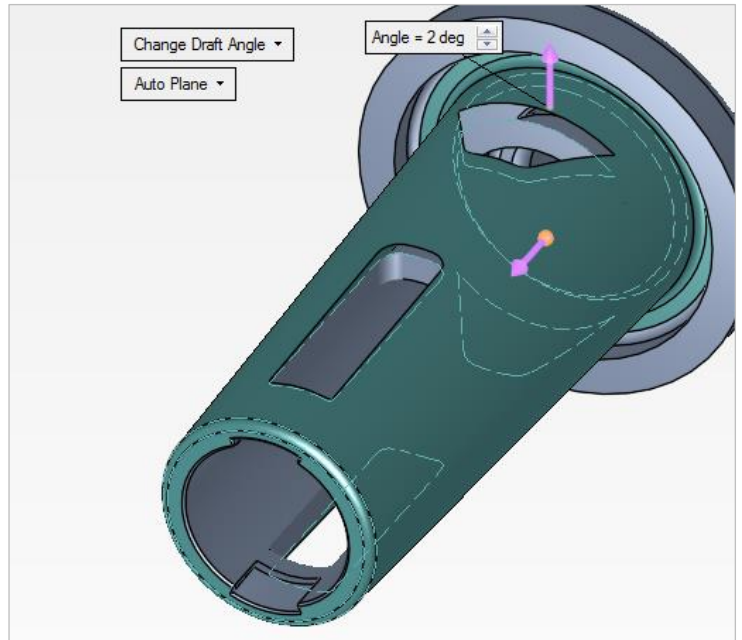


**Pick Preview**

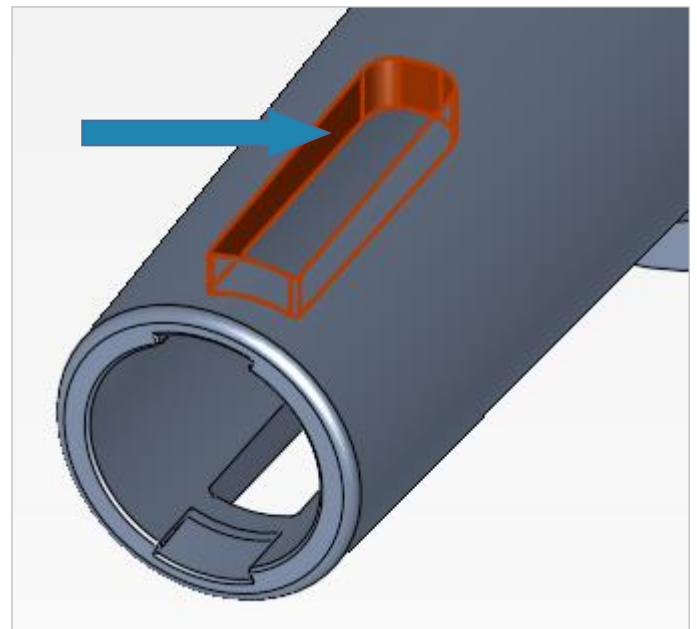
It is possible to see the result to be obtained, and in the dashed line to see the previous shape.



**Pick Apply**

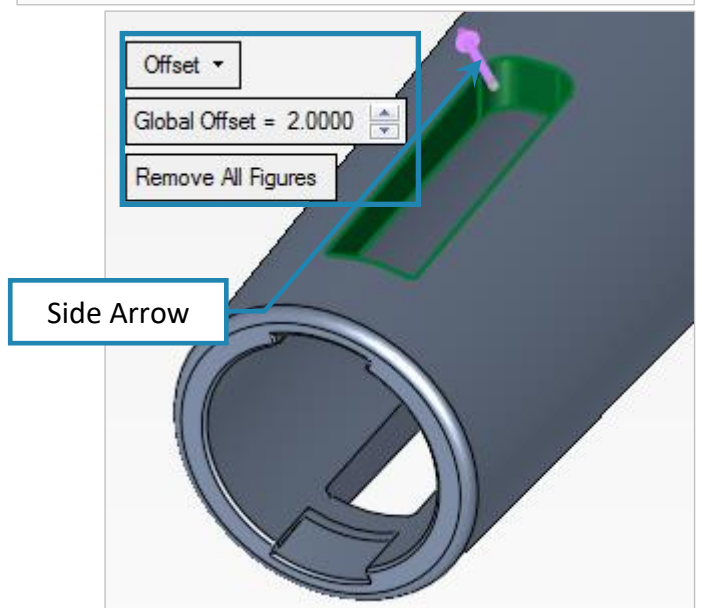


13. **Pick all** the faces as shown,  
Press **Exit** to next step.



**Pick Offset** option, and set parameters as shown:

The **Side Arrow**: determine the offset side, outside or inside.  
In this case we want it outside.

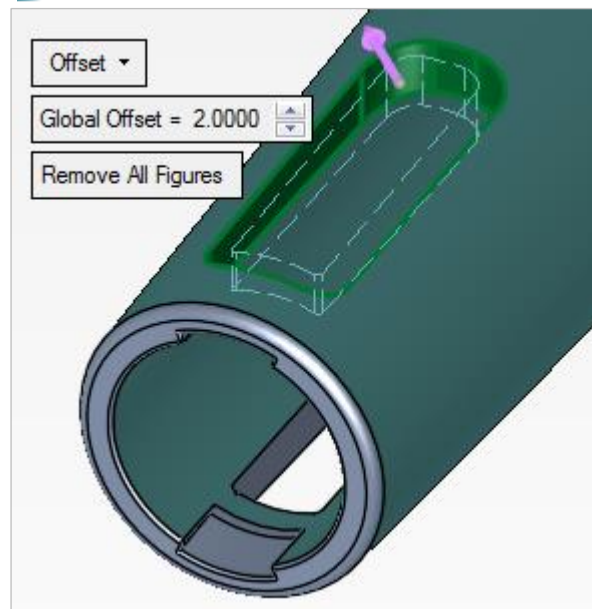


**Pick Preview**

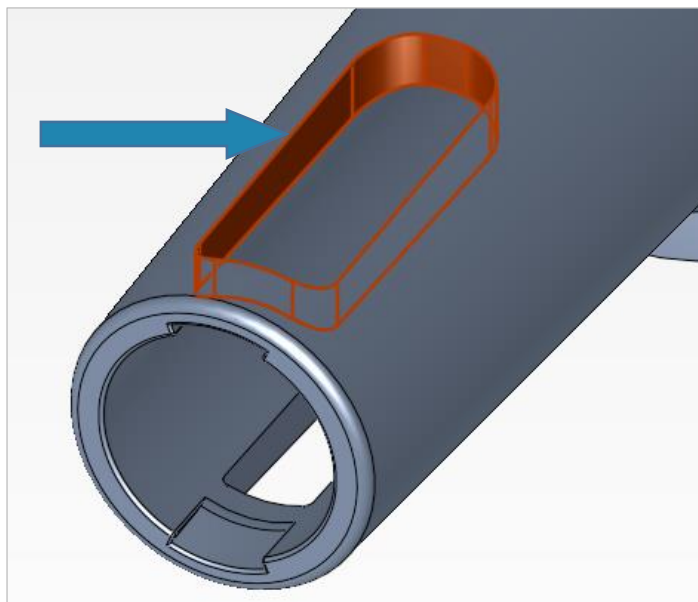


It is possible to see the result to be obtained, and in the dashed line to see the previous shape.

**Pick Apply**



14. **Pick all** the faces as shown,  
Press **Exit** to next step.

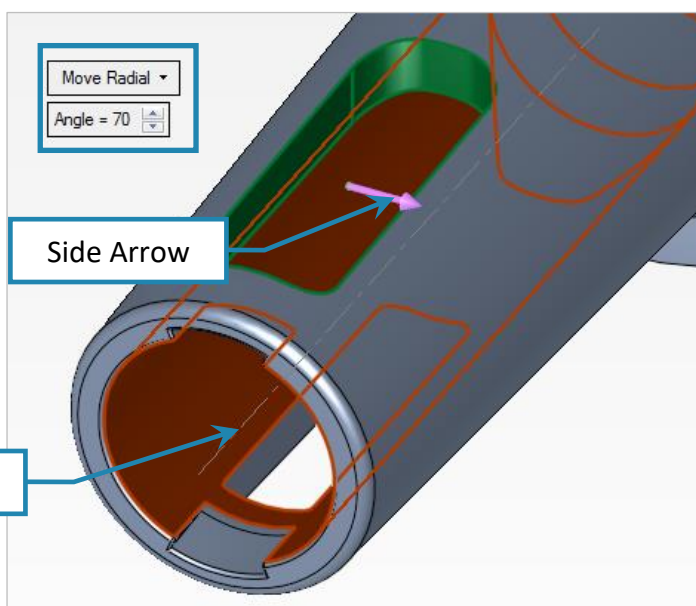


**Pick Move Radial** option, and set parameters as shown:

In addition, **pick** the central **cylinder as the axis** of the radial movement.

The **Side Arrow**: determine the side of the rotation, left or right.

Cylinder as Axis

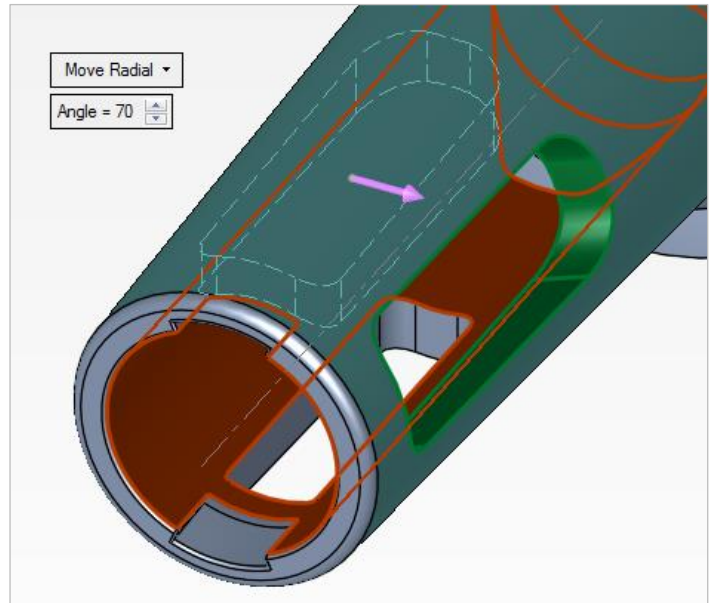




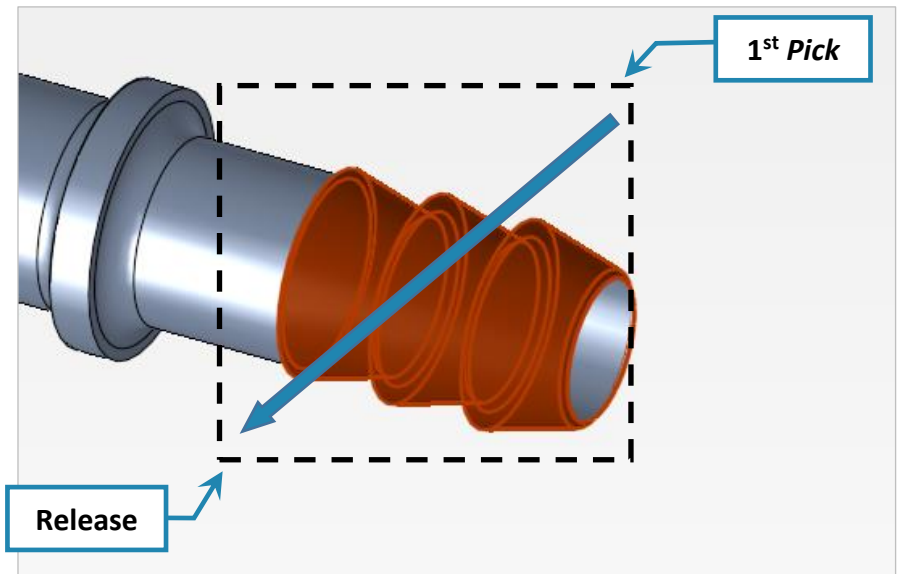
**Pick Preview**  ,

It is possible to see the result to be obtained, and in the dashed line to see the previous shape.

**Pick Apply**  .

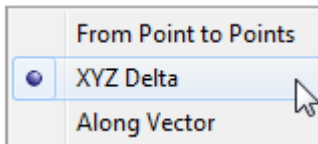


15. **Pick all** the faces as shown By Box,  
1<sup>st</sup> **pick** top right and drag to bottom left, then release.  
Notice that while selecting, the box is dashed.  
Press **Exit** to next step.



**Pick Move Linear** option, and set parameters as shown:

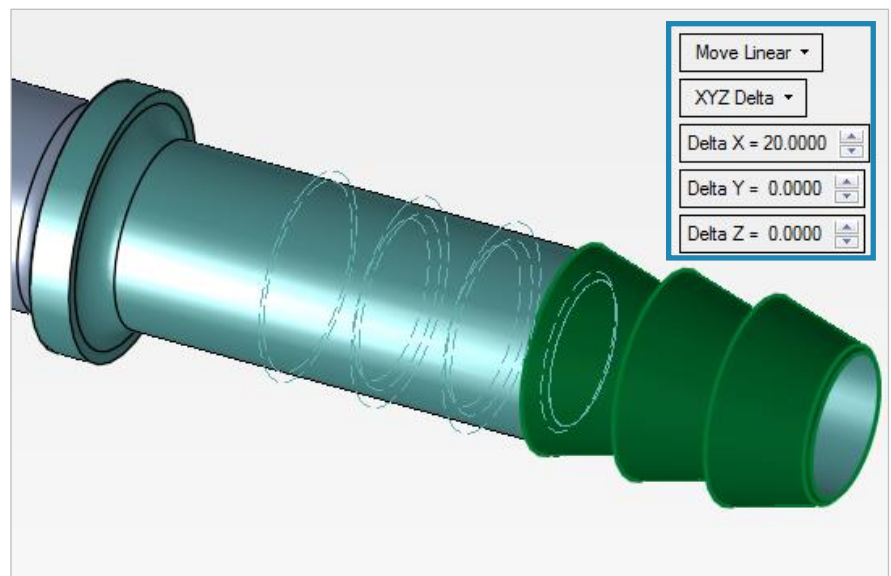
In **Move Linear** there are 3 options:



**Pick Preview**  ,

It is possible to see the result to be obtained, and in the dashed line to see the previous shape.

**Pick OK**  .

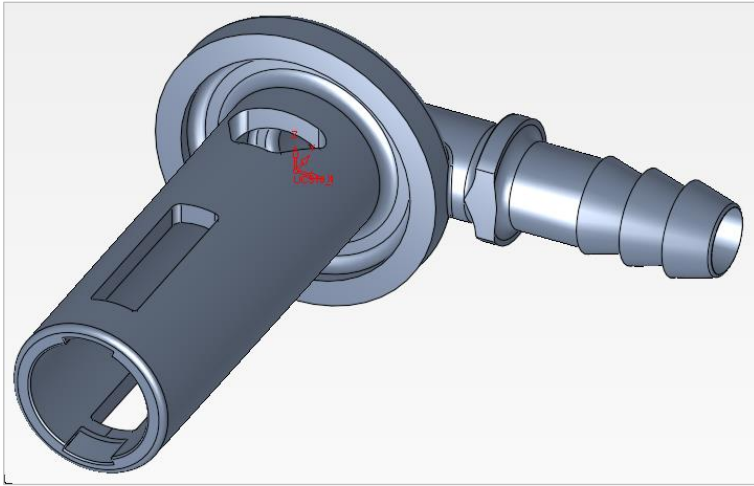




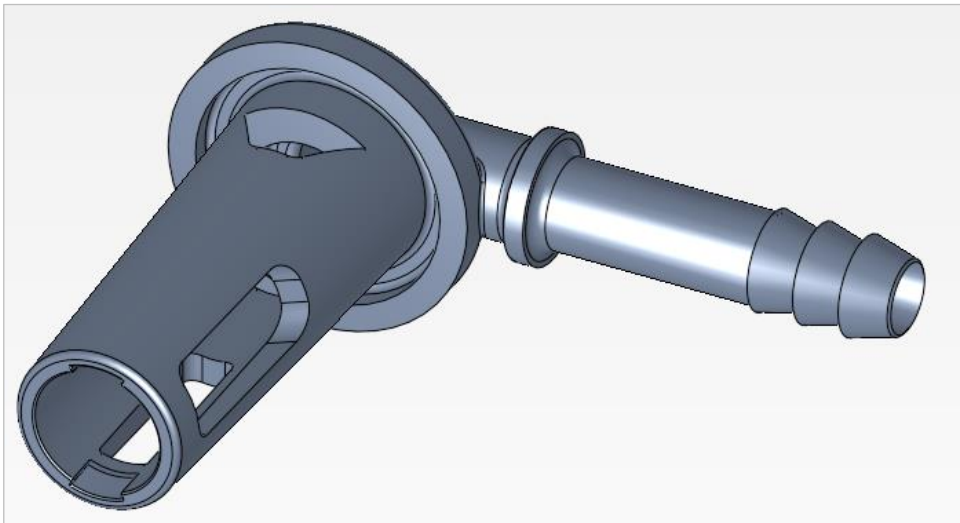
*Please notice:*

**The option *Replace* in *Direct Modeling* requires the creation of face. This functionality is not included in the Standard package.**

Part at Start



Part at the End



End of Exercise.