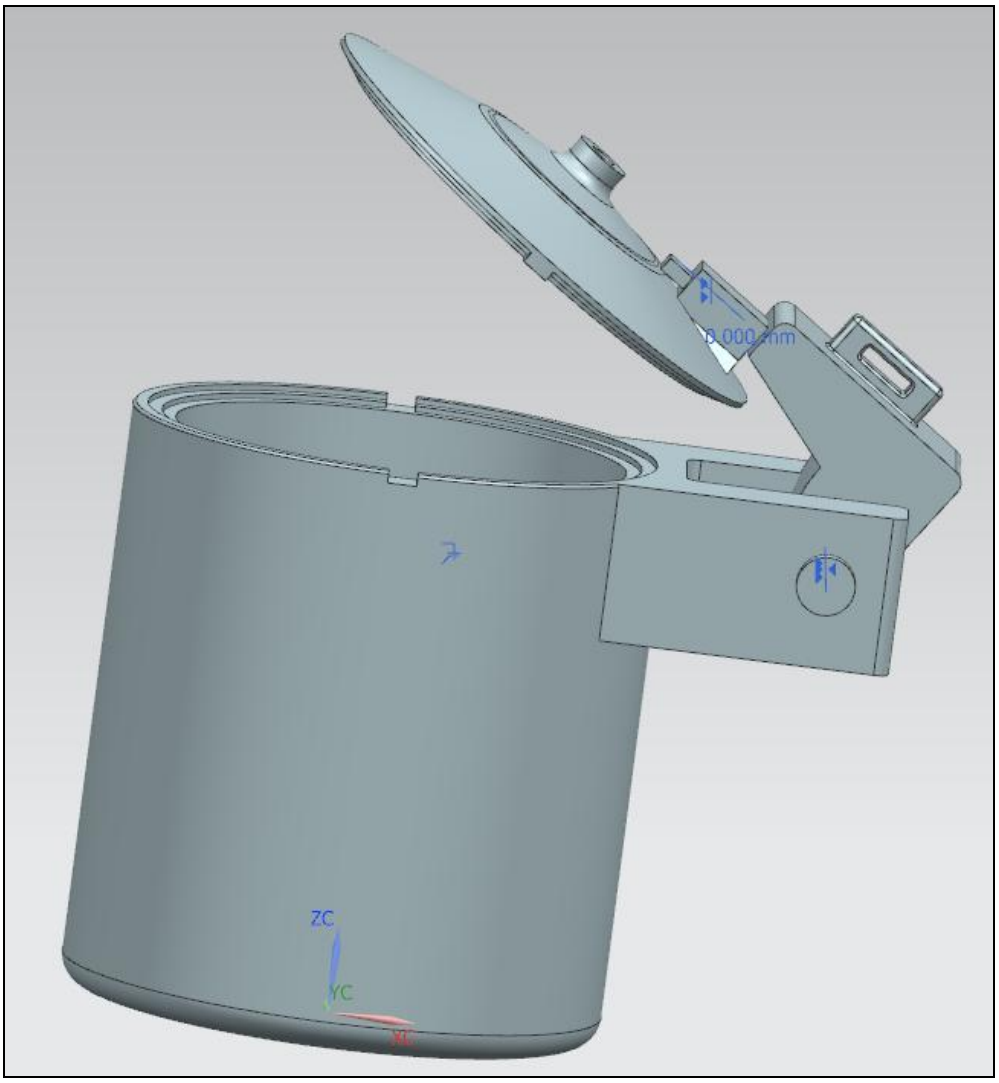
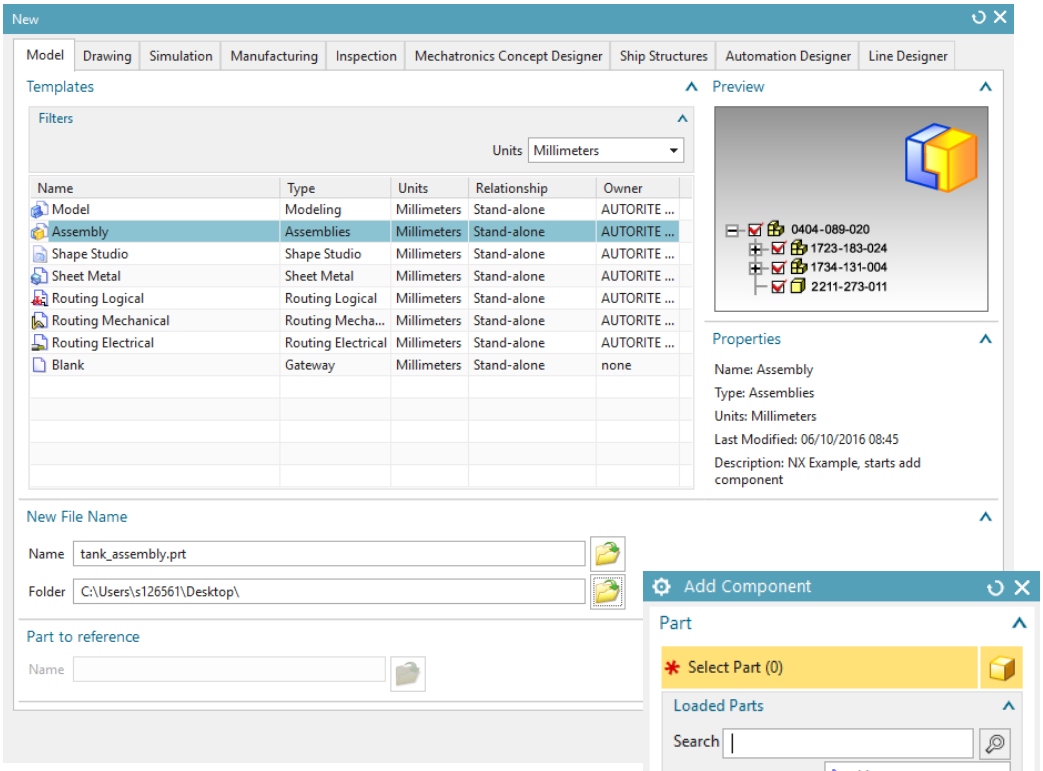
Using Siemens NX 11 Software

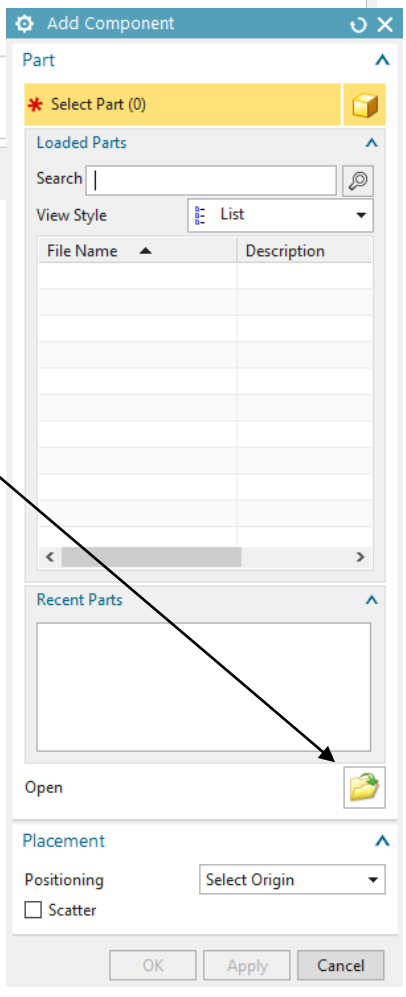
Assembly example - Tank



1 – Introduction.

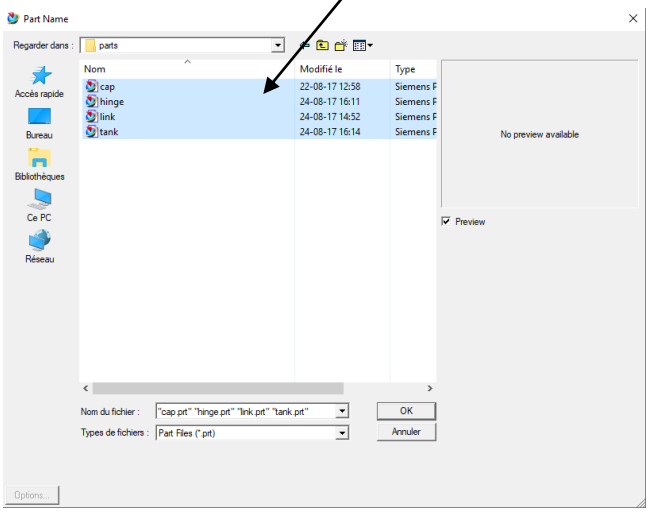
- **Copy**/Paste the folder of C:\Commun\NX\tank into your local folder.
- Click *New*. In the *New* dialog box, select the *Assembly* model and name your file *tank_assembly.prt*.
- Click *OK* to validate.



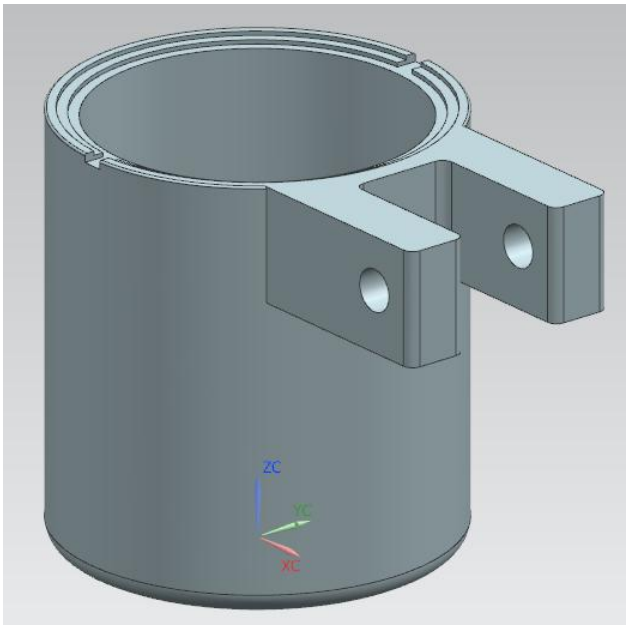


2 – Adding a part.

- When the *Add Component* dialog box opens, click on the *Open* button (located in the right lower part of the dialog box) and select the files from the folder you just copied.



- The selected files will appear in the file list of the A*dd Component* dialog box. In this list, select the file *tank.prt* and click *OK*.
- Then, the *Point* dialog box will ask you where to add the new part. Keep the default parameters and click *OK* again.
- The *tank.prt* part should now appear in the visualization window.

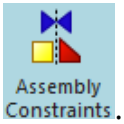


- In the *Assembly Navigator* you can see that a new element *tank* has been added. You can activate/deactivate this element by clicking on its corresponding check box.
- By selecting it and clicking delete, you can also delete the element if necessary.
- Eventually, it is possible to hide or show a given element by right-clicking on it and select *Hide* or *Show* in the menu.

3 – Setting a constraint.

We will here set the tank in an absolute fixed position in space.

- On the toolbar, click on the tab *Assemblies* and then the button *Assembly Constraints*



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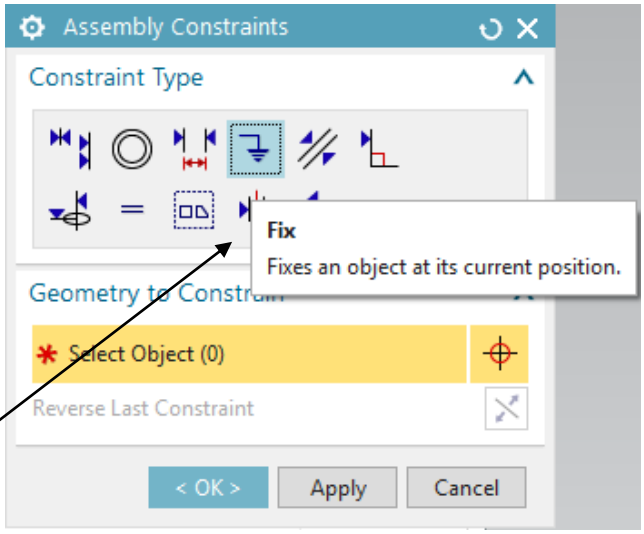
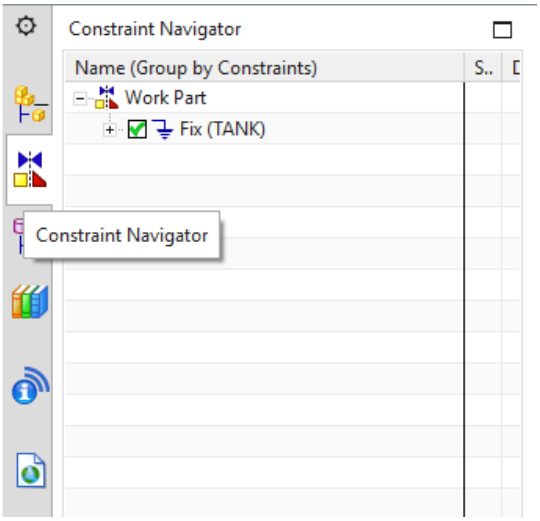
- In the *Assembly Constraints* dialog box, select the option *Fix* in the *Constraint Type* field and click on the *tank* part to apply this constraint to the object.
- You can see in the *Constraint Navigator* that a new constraint has been added. You can activate/deactivate this constraint by clicking on its corresponding checkbox.
- If necessary, it is also possible to delete a constraint by selecting it and clicking *delete*.





4 – Adding and moving a part.

- In the *Assemblies* toolbar, click on the *Add* button 

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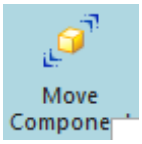
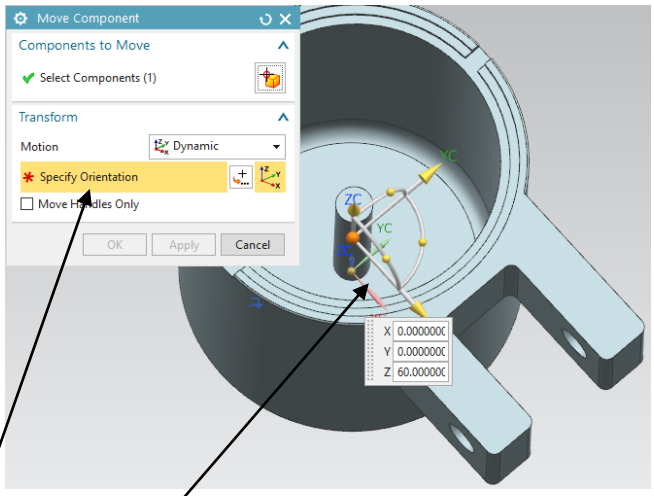
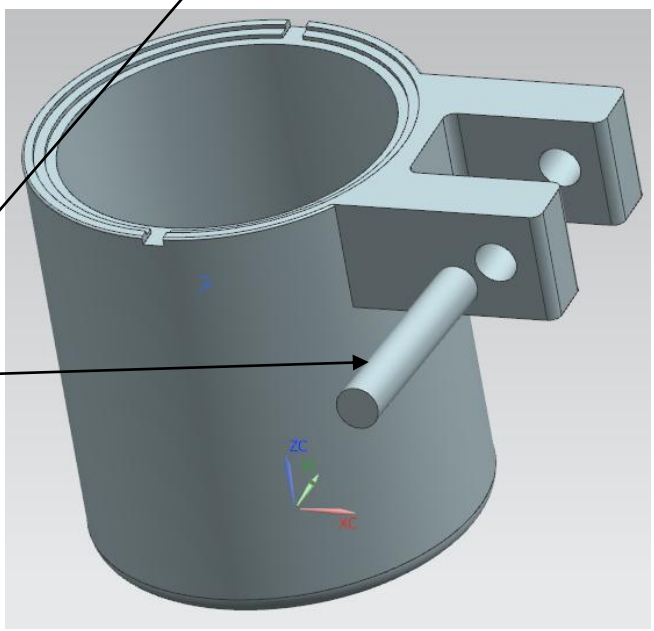
- In the *Add Component* dialog box, select the *link.prt* part and click *OK* to add it to the assembly.
- Click the *Move Component* button 

and select the link.
- In the *Move Component* dialog box, select the *Dynamic* option in the *Transform* field.
- Then, click on *Specify orientation*. This option will make appear a reference frame on the selected part.
- Move manually the link by clicking left (and then drag) on the arrows or the angles of the reference frame.
- Try to move the link in a similar position as shown in the figure.
- Click *OK* to validate the new position.





5 – Setting another constraint.

- Click on the *Assembly Constraints* button 

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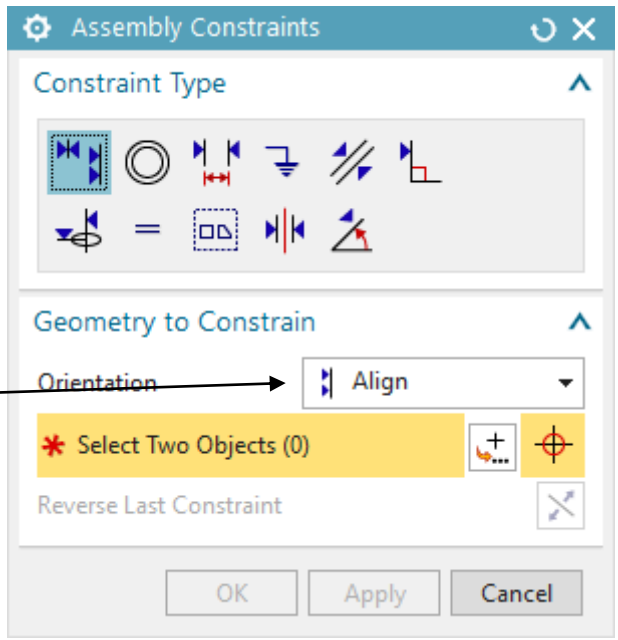
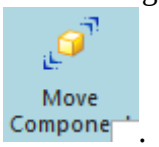
- In the *Assembly Constraints* dialog box, select the *Touch/Align* constraint in the *Constraint Type* field with the *Orientation* option set to *Align*.



- Select the centre line of the link and the center line of one of the two traversing holes of the tank.
- Click *OK* to validate.
- Finally, move manually the link inside the holes using the *Move Component* button 

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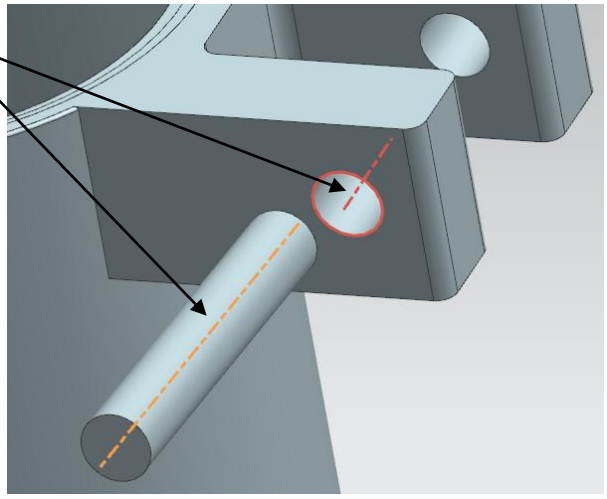
- The *Align* constraint will guarantee that the previously selected two axes will remain aligned during the manipulation.

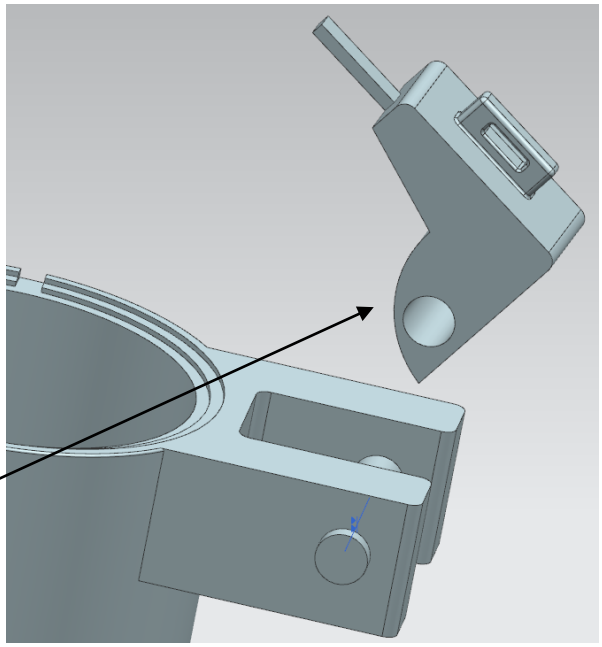


6 – Adding and constraining the hinge.

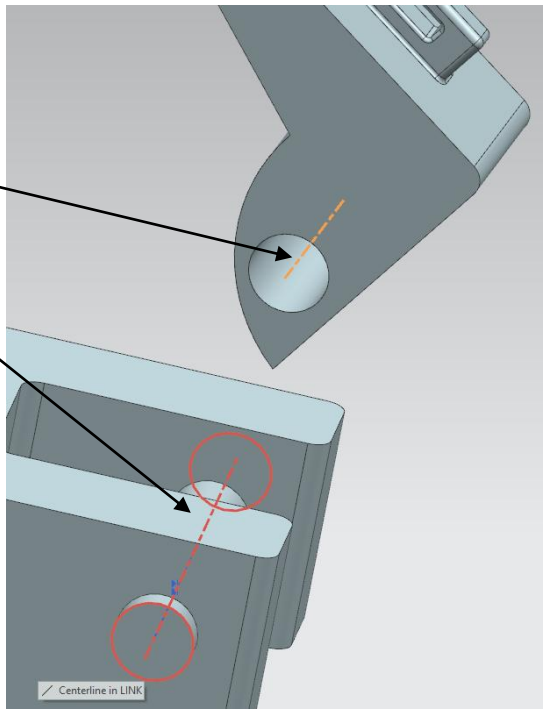
- Add the *hinge.prt* file by clicking the *Add* button 

, and then selecting the *hinge.prt* file in the *Add Component* dialog box' list.
- Using the *Move Component* button 

, position the hinge approximately as shown in the figure.



- Add a *Touch/Align* constraint  with the *Orientation* option set to *Infer Center/Axis*. Apply this constraint between the axis of the traversing circular holes of the hinge and the axis of the link.

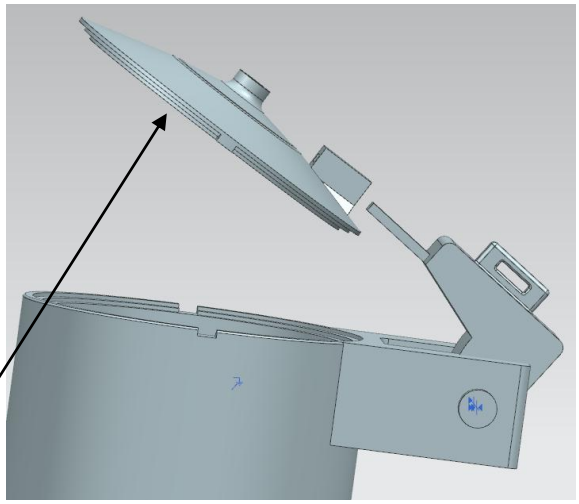


7 – Adding and constraining the cap.

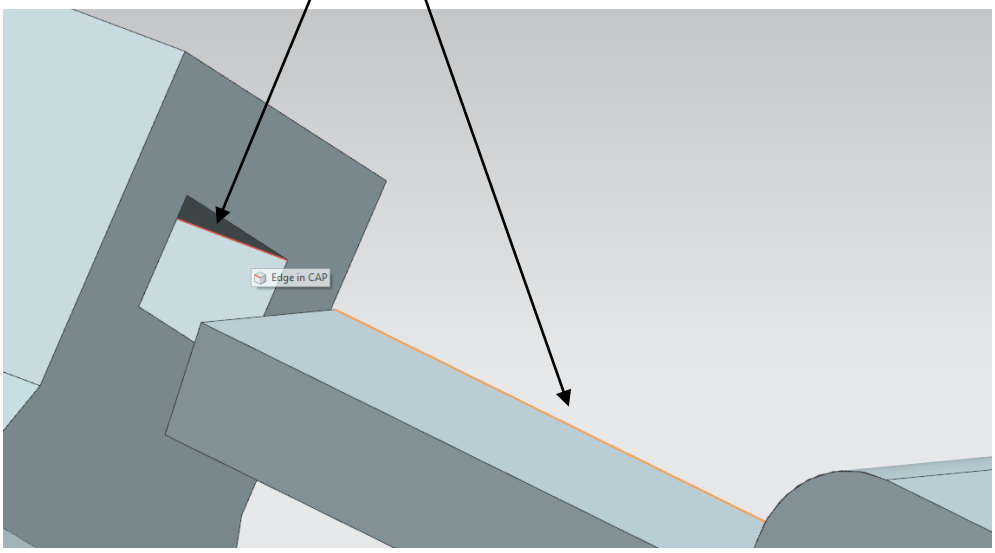
- Add the *cap.prt* file by clicking the *Add* button 

, and then selecting the *cap.prt* file in the *Add Component* dialog box' list.
- Using the *Move Component* button 

, position the cap approximately as shown in the figure.

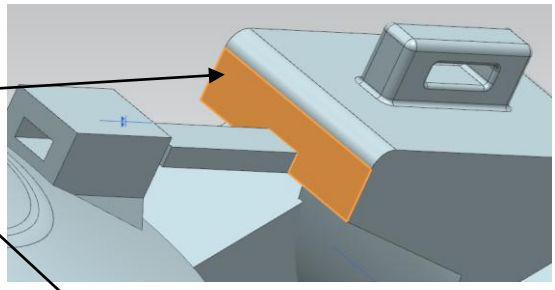


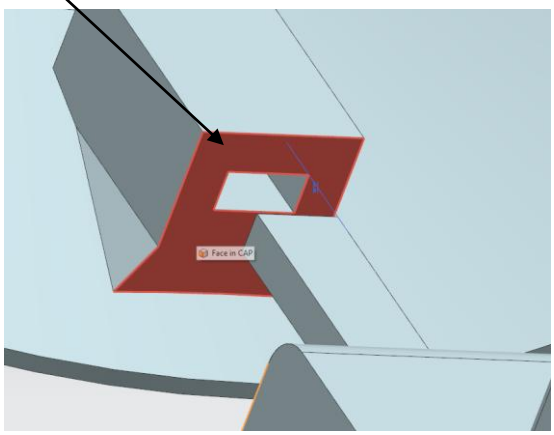
- Add a *Touch/Align* constraint  with the *Orientation* option set to *Align*. **First**, select an edge of the rectangular nose of the hinge. **Second**, select the corresponding edge of the traversing rectangular holes of the cap.



- Finally, add a distance constraint  of **0 mm** between the face holding the nose of the hinge and the front face encompassing the traversing rectangular hole of the cap.

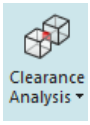
- The assembly is complete. You should obtain something similar as the figure shown at the beginning of this tutorial.





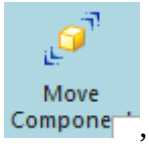
7 – Interference analysis.

The aim of an *Interference/Clearance* analysis, is two determine whether two parts touch and/or intersect together.

- Click on the *Clearance Analysis* button  and select *New Set*  .
- In the *Clearance Analysis* dialog box, select the cap and the tank as objects to analyze.
- Click *OK* to validate the set.

- The *Clearance Browser* window will open. In the *Interference* sub-tree click on the check box in order the visualize interferences.

With an open cap, is there any interference ?

Now, using the *Move Component* button  , close the tank with the cap and redo an interference analysis. Is there any interference?

Do you think that the current design of the cap and the tank is good for the current open mechanism? Why (not)?