Aalto University
School of Engineering

EXERCISE 3.3 – ASSEMBLY DRAWING

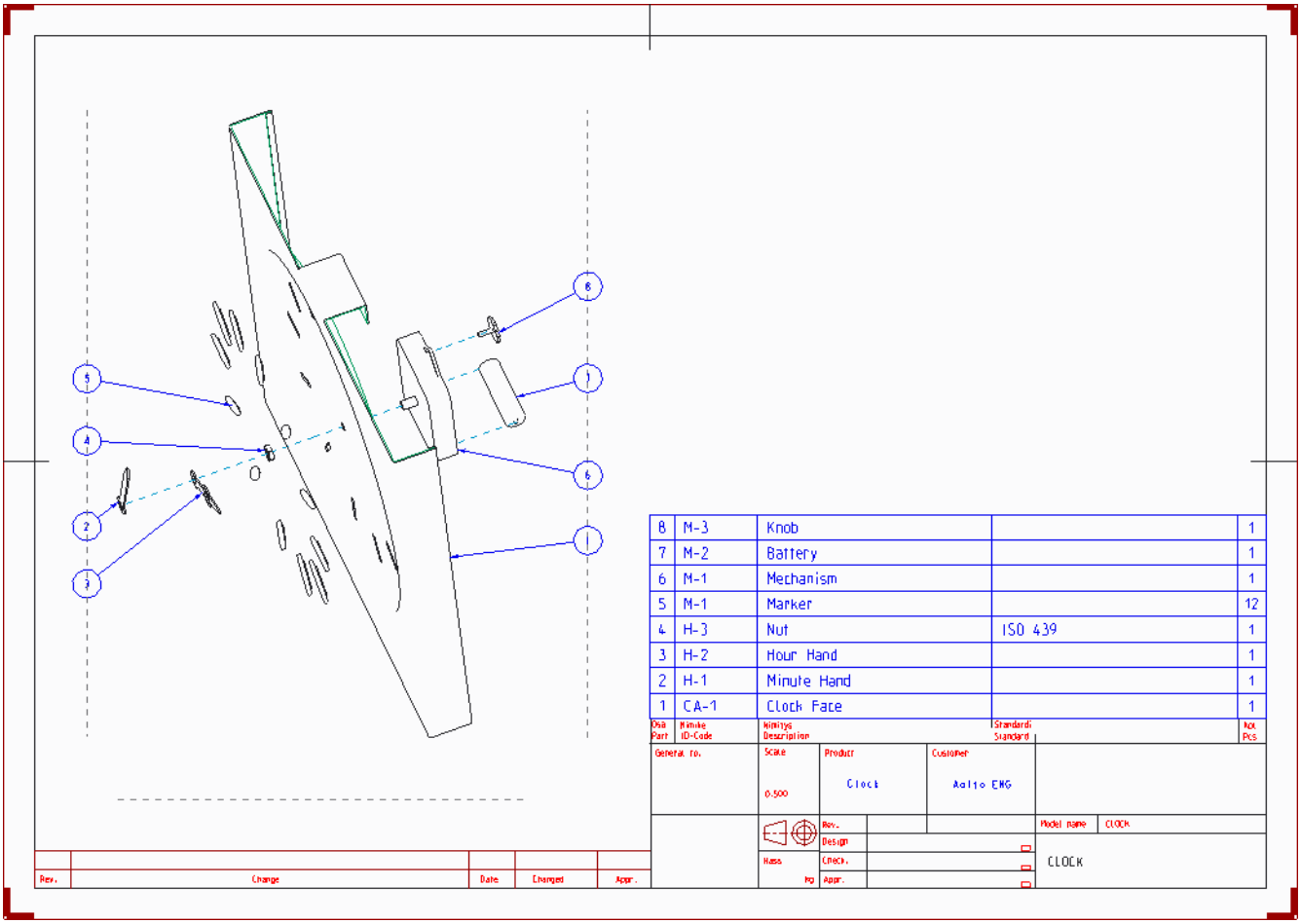

Figure 1: An assembly drawing with BOM and BOM Balloons.

Learning Targets

In this exercise you will learn:

- ✓ to use drawing templates
- ✓ to create explode state
- ✓ to create custom orient views
- ✓ to create BOM parameters
- ✓ to create BOM balloons.

An assembly created in Exercise 2.2 is utilized as a demo model in this document. Creo version is 3.0.

Creo assembly drawing file (.drw) is essentially a set of instructions on how to create a 2D drawing from an existing 3D assembly model. The drawing file is always dependent of the assembly file, and does not by itself carry any information about the assembly geometry. Thus, drawing files automatically update to reflect changes in the assembly files, but naturally cannot be distributed separated from them.

Creating Explode View

1) Open the assembly model (in this case clock.asm)

2) Select V**iew Manager** ( ) from *Model Display* group.

3) Select **Explode** tab.

4) Click **New** to create a new exploded state (there is already one called Default Explode, but mostly its unusable). Give a name.

5) Click **Properties>>** and select **Edit Position** ( ).

6) Select **Options** tab. There are three useful tools (Figure 2). *Copy Position* copies other part's location, *Motion increment* allows more precise movement (for ex. 50) and *Move with Children* option moves dependent parts (for ex. when moving mechanism, also battery and knob moves).

Figure 2: Tools in *Options* tab.

7) Jus select parts and move them to locations that creates a clean explode view (for ex. like Figure 3). Hint: to move all patterned parts, select first part (from the model tree) with option *Move with Children* on.

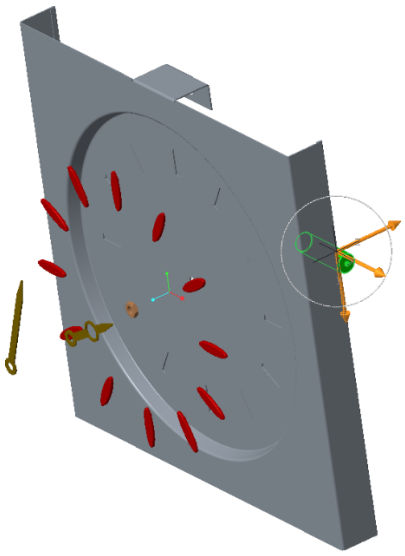

Figure 3: An example explode, battery selected for moving.

8) To add offset lines, select  . Select first reference, then second one and click **Apply** to create an offset line between references, for ex. like in Figure 4. **Close** to close the tool.

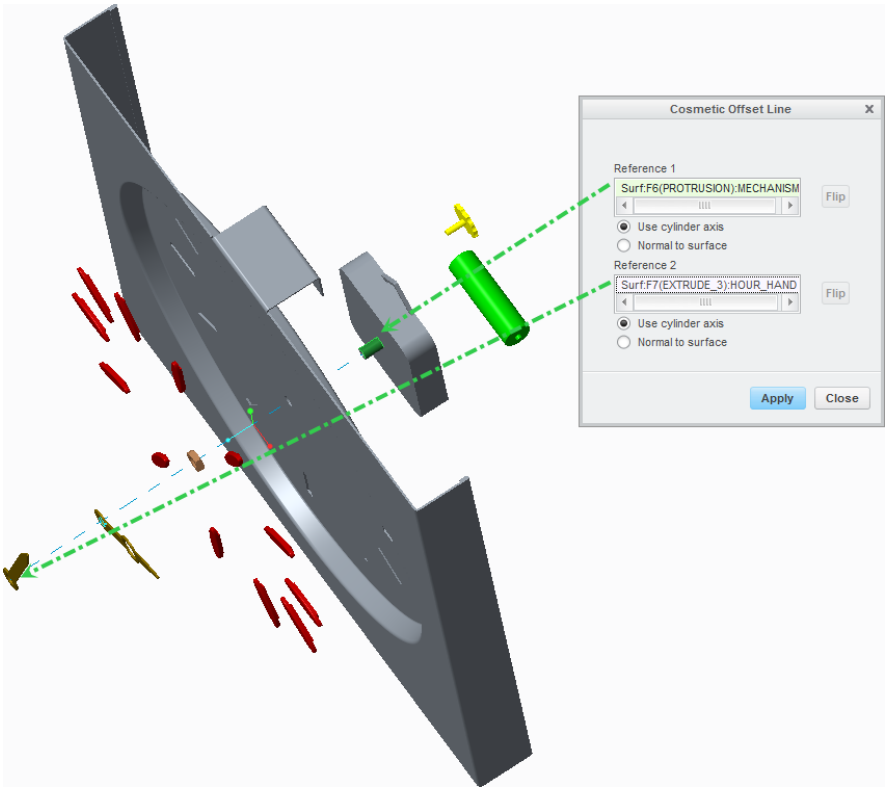

Figure 4: Offset line created using cylindrical surfaces (green arrows).

9) Close Explode Tool by selecting  . Select **<<List**. Click **RMB** over previously created explode (*Bum* in this case) and select **Save** (Figure 5). Click **OK** to the next window. Remember always to save your view, otherwise it will be lost!

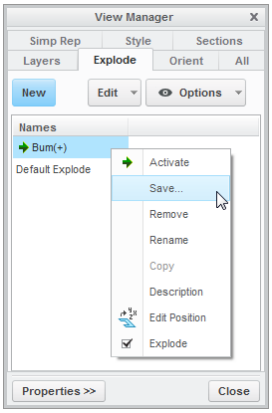

Figure 5: Saving Explode view.

Creating View Orientation

1) In **View Manager** (), select **Orient** tab. Rotate your model in desired orientation, click **New** and give a name for the new view (Figure 6). Now you can use it as any other view (Back, Bottom etc.).

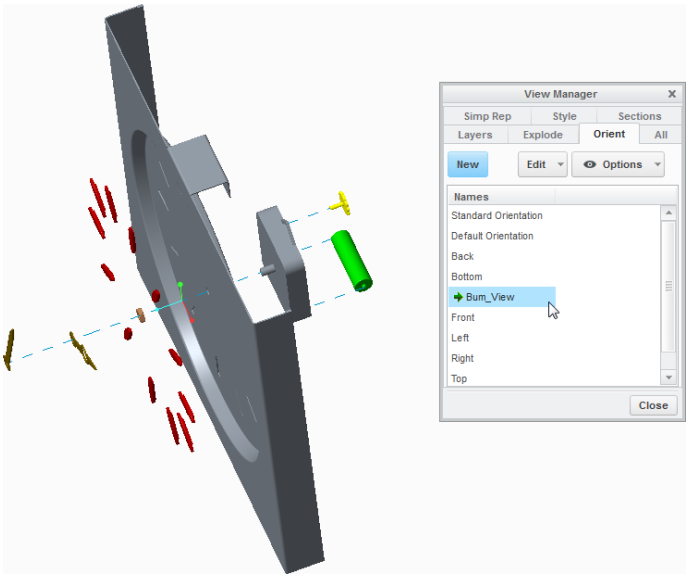

Figure 6: New Orient created (bum_view).

Explode On/Off

Use **Exploded View** ( ) option from *Model Display* to toggle explode on/off. Other option is to use View Manager, Explode tab and double-clicking explode name.

Naming Parts for BOM

Bill of Material (BOM) is a list holding information about parts in the assembly.

When using A3_Aalto drawing template, the BOM list will be created based on the DESCRIPTION (for part's name) parameter (default parameter in part template). Additional two parameters (in parts!) are needed:

1. ID_CODE (custom id code for part, if needed)
2. STANDARD (if part is standard parts, what standard is used, for exp. DIN439 for nut).

Adding BOM Parameters

Traditional way:

1) Select a part in the assembly, hold **RMB** and select **Parameters** (Figure 7)

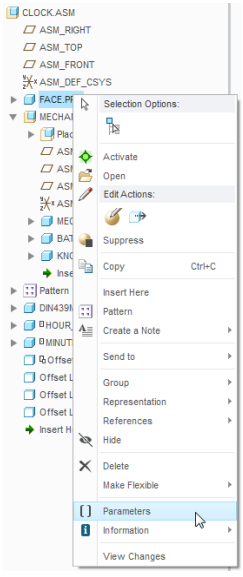

Figure 7: Selecting Parameters for FACE.PRT.

2) Create needed parameters (Type String) and give values (Figure 8).

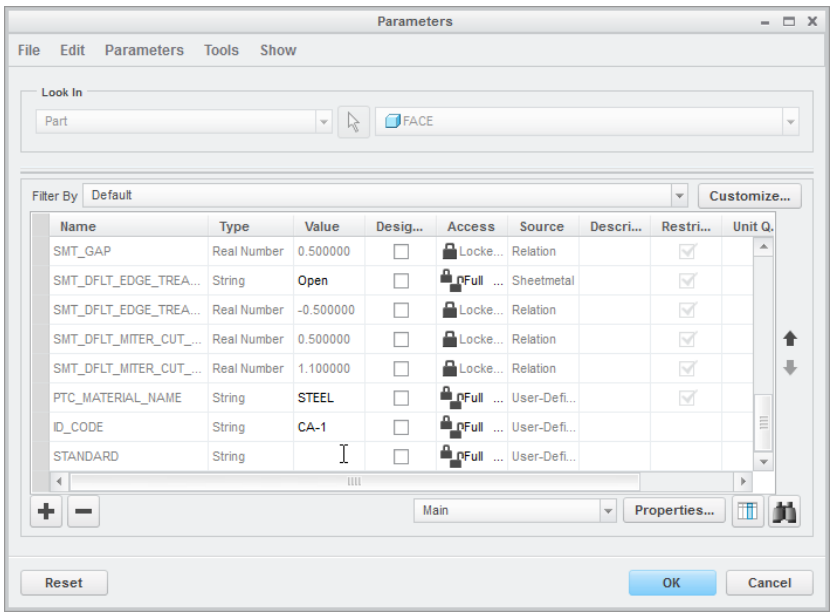

Figure 8: Created parameters (id_code and standard) and values.

3) Repeat to all other parts in assembly.

Using Model Tree

1) Select Model Tree **Settings** ( ) and then **Tree Columns** (Figure 9).

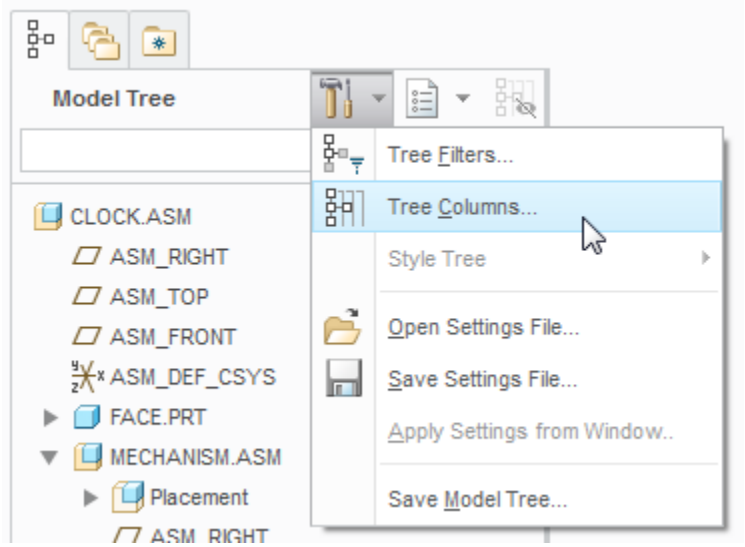

Figure 9: Selecting *Tree Columns*.

2) Change *Type* from drop-down menu to *Model Params*. Write parameter name to *Name* field and press ENTER or select >> (Figure 10).

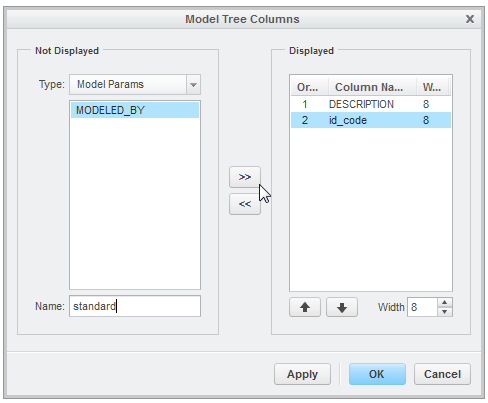

Figure 10: Adding new column named TKK_DESC.

3) When needed parameters are added to the list, click **OK**. You may need to resize *Model Tree* (make id wider).

4) Select empty field and program will create a new parameter (Figure 11). Change parameter type and give new value.

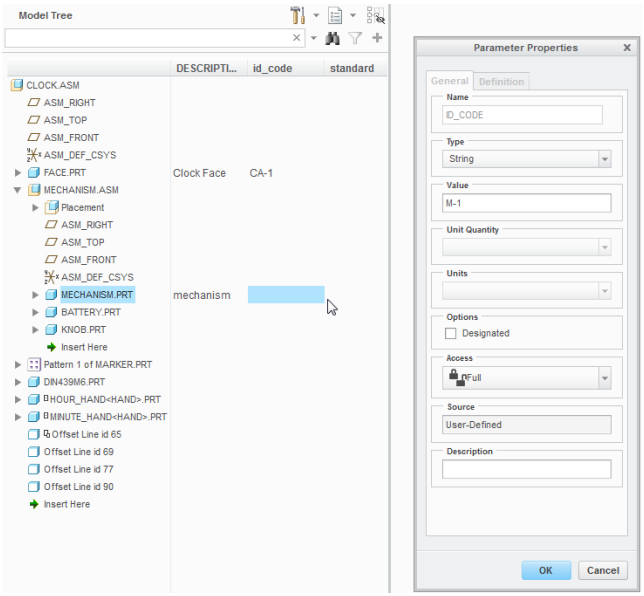

Figure 11: Clicked highlighted field (Mechansims.prt, id_code) and new parameter created (type needed to change).

5) Repeat to all other parts in assembly.

Family Table Parts

If there are several family table parts in the assembly, a bit different approach is needed.

1) Open family table generic part (i.e. part that has family table).

2) Create needed parameters to generic part (id_code and standard, type string).

3) Open **Family Table** ( ) and select **Add Column** ( ).

4) Select *Add Item* type as **Parameter** and add desired parameters to table (Figure 12). When ready, **Close** and **OK**.

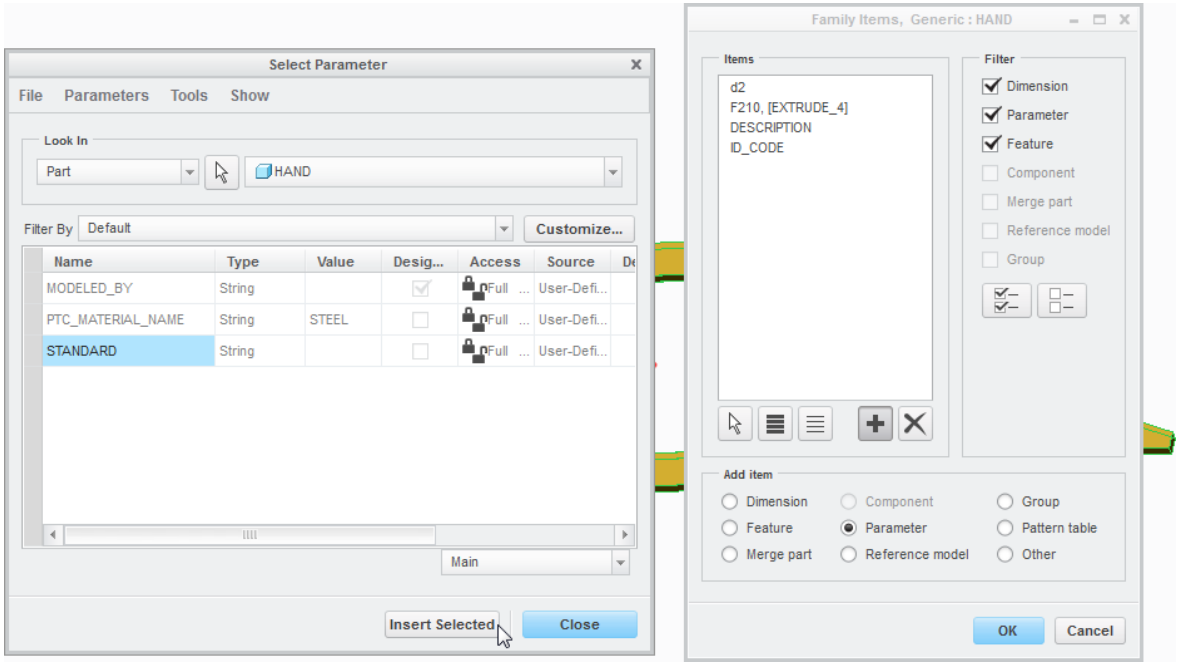

Figure 12: TKK_DESC and ID_CODE added, adding STANDARD.

5) Add new values for family table instances (Figure 13) and accept family table.

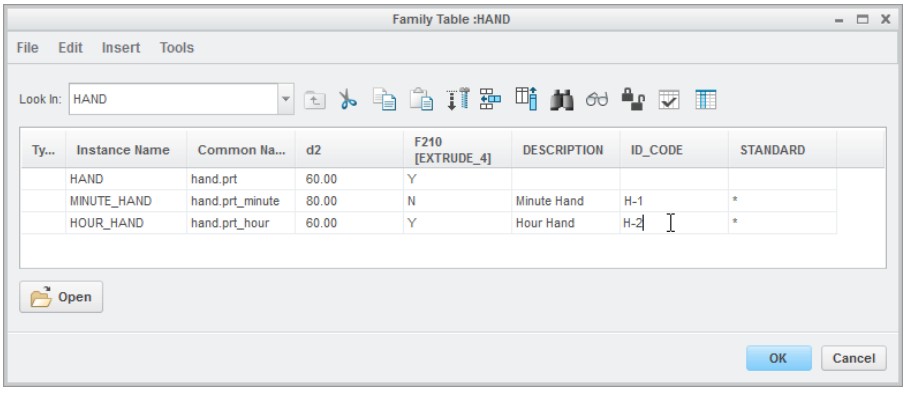

Figure 13: Updated family table.

6) Now family table parts have different values in assembly (regeneration is needed, **CTRL+G**).

Assembly Drawing View

1) Create a new drawing (*Empty with format*, A3_Aalto as *Format*).

2) If BOM parameters are created, you can see them in the list.

3) Insert **General View** ( ) using created model view (Choose *No Combined States*). Select **View States** tab and check *Explode components in view* and select desired explode (Figure 14). From **View Type** tab, select previously created view from the list.

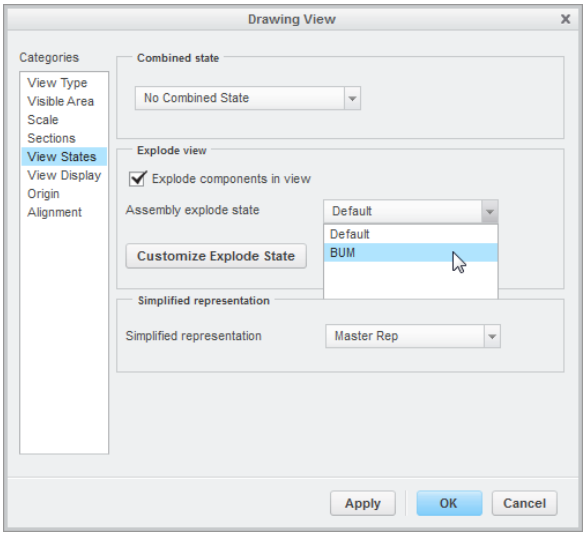

Figure 14: Selecting desired explode (created previously).

4) Adjust Scale if needed (from the left bottom corner).

BOM Table Options

1) All parts may not visible in BOM. Select **Table** tab and **Repeat Region** ( ).

2) Select **Attributes**, point BOM list and select **Recursive** (Flat means that subassembly parts are hidden). Click **Done/Return**. Click **Done**. BOM list is updated.

BOM Balloons

1) Select **Create Balloons** (⊣⑤) from *Balloons* group (in Table tab). Select **All** as sub-option.

2) Select all balloons and select **Cleanup Balloons** (, from *Balloons* group).

3) Select option *Create corresponding snap lines* and click **OK**.

4) Adjust location of balloons and arrows. To change where the arrow points, select arrow, hold RMB and select **Edit Attachment**. Then select a new point to where to point (Figure 15). **MMB** to close the attachment tool.

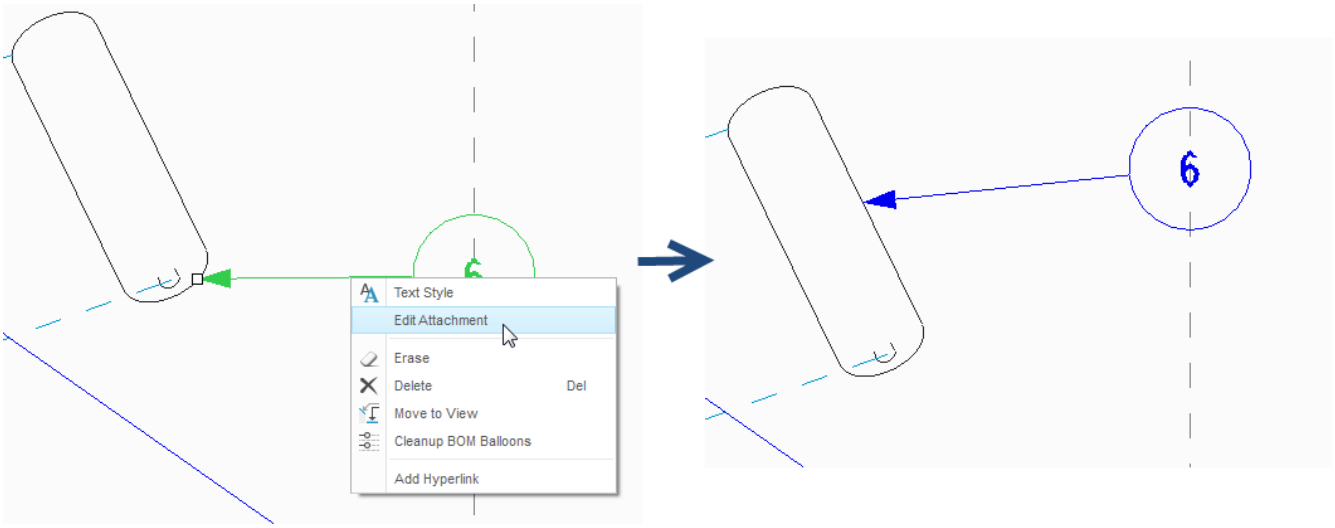

Figure 15: Changing to where the arrow points.