
Exploded Views

Exploded views in engineering drawings are typically used to communicate information on what are the components in an assembly, how they are assembled, what's their part number and correlate them to the information provided in the BOM, preparation of spare parts manual etc. In this task you will learn how to use ThinkDesign's Explode Assembly command introduced in ver9.0. We take the example of a Hydraulic pump assembly for this purpose. As you go through the task you'll use different parameters available to explode the assembly, edit them, sketch/edit path lines, create Visual bookmarks to generate exploded views and exploded view player. Let's begin.

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1. Step1: The first Explosion

In this step, you will get the feel of how the new selection list for **Explode Assembly** command operates. The components involved in the assembly and their movements can be segregated into Groups and Steps as per user convenience and requirements. They help understand a particular set of components are assembled and also aid in editing/modifying the exploded views.

Open Assy_pump.e3 from the task installation folder. Let's hide component 'Support ' from the assembly and concentrate on the remaining components. The point to note here is that Components can be hidden also when you are within the **Explode Assembly** command. Suppose some of the components are in 'Light representation' mode or are 'Unloaded' from the assembly, ThinkDesign gives a message that such components will be excluded from the exploded assembly. Ensure the 'Leaf component' filter is Set. Right click on 'Support ' and select **Hide Entities** to hide the component.

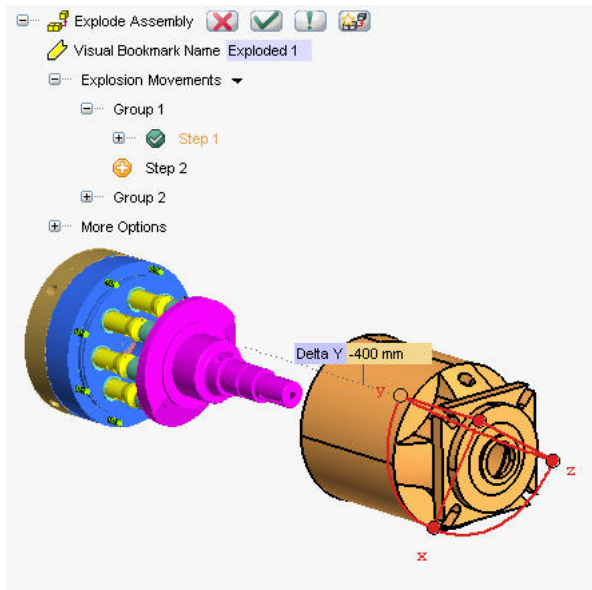
- Start **Explode Assembly** command.


ThinkDesign prompts you to select the entities for the explosion.

- Under  Step1 select components HOUSING and RING.

The movement Handle comes up.

- Drag the Handle along Y axis. Key in value -400mm in the Delta Y minialog to give the first movement.

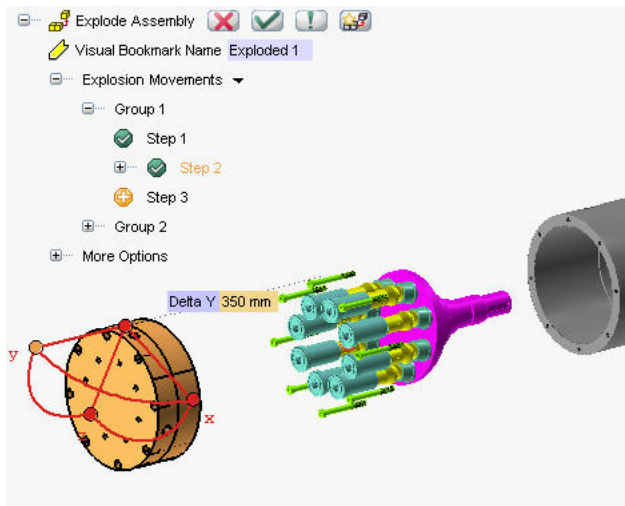


- Click  Step 2 in the selection list.

The movement Handle comes up.

- Drag along Y-axis. Key in value 350 mm in the Delta Y minialog.
- Then Select component Back_plate to move it by the specified distance.
- Then select Component Plate.

It also moves in the same direction of the previously selected component in the same Step. Take note of this behavior.



You can also deselect components with the Step still active.

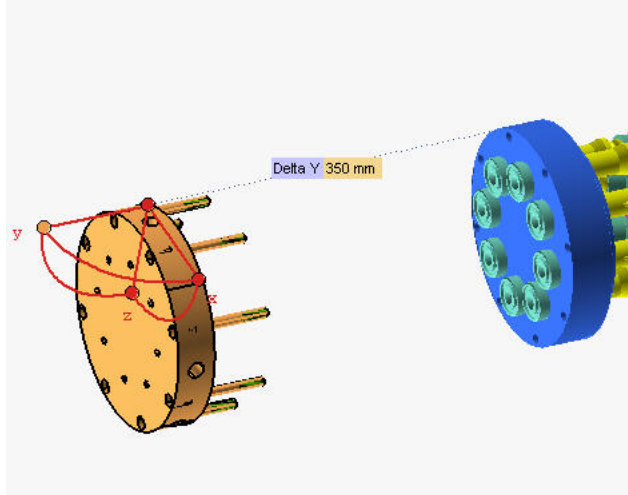
- Hold **Ctrl** key and select Plate to remove it from Step2.

You can see that it moves back to its original position.

- Instead select all M8 screws.

You can make this selection from the graphics window or from the History tree also.

See that all the screws now move in the direction of Back Plate.

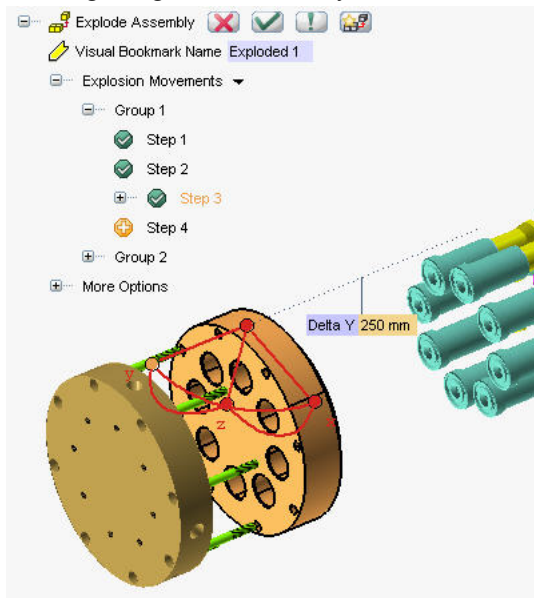


2. Step2: Work with Steps and Explode

Editing, modifying and reworking with steps are very easy in the **Explode Assembly** command. You can change the way components are organized in steps and create individual bookmarks from them. Also one component can be a part of many steps.

Continue from the first Step.

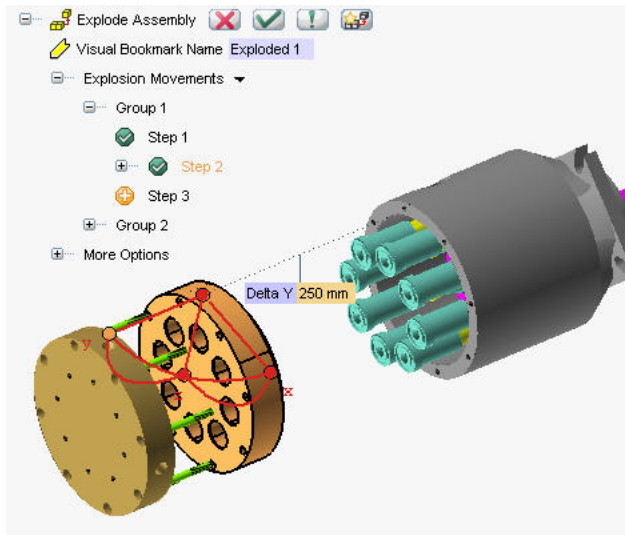
- Click on Step3 in the selection list and select Plate.
- Drag along Y direction. Key in value 250 in the Delta Y minialog.



Suppose you are not happy with the way your steps are organized, you can change them.

- Right click on Step1 and select Delete.

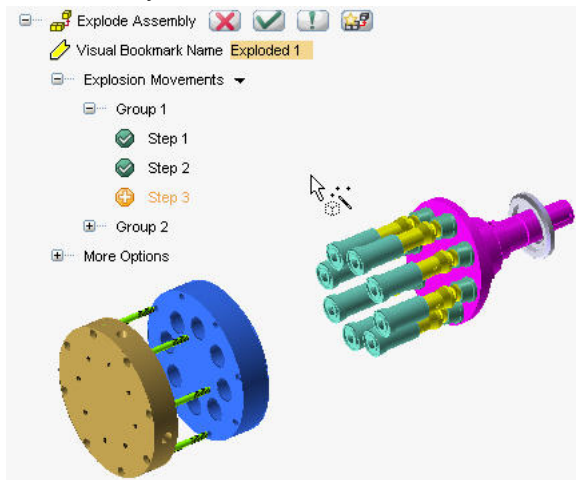
The movements of entities in that step i.e Housing and Ring gets deleted.



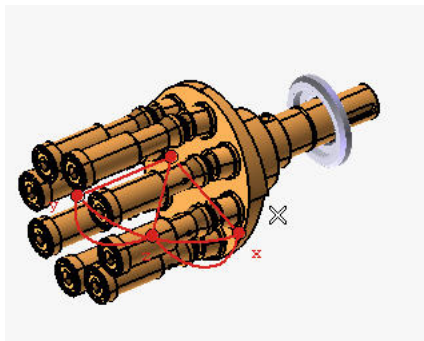
Continuing...

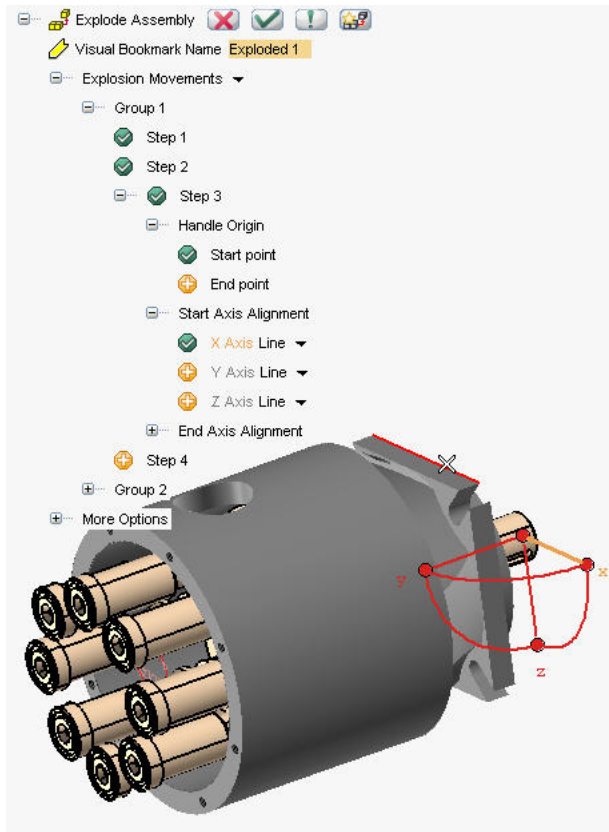
You can hide entities when you are within the **Explode Assembly** command.

- Click Step3 in the Selection list.
- Click **Hide Entities** command and select Housing to hide it.
- Hit **[Esc]** key to come out of hide command and continue with Explode assembly command.



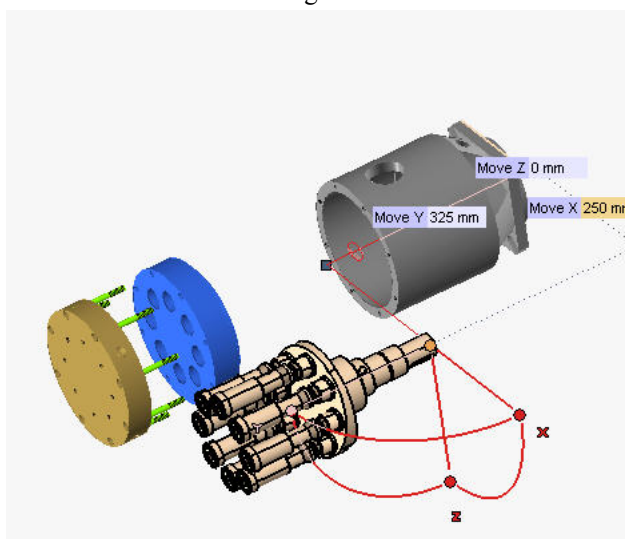
- Use window selection to select all the remaining components for Step3 and deselect Ring using **[Ctrl]** key.





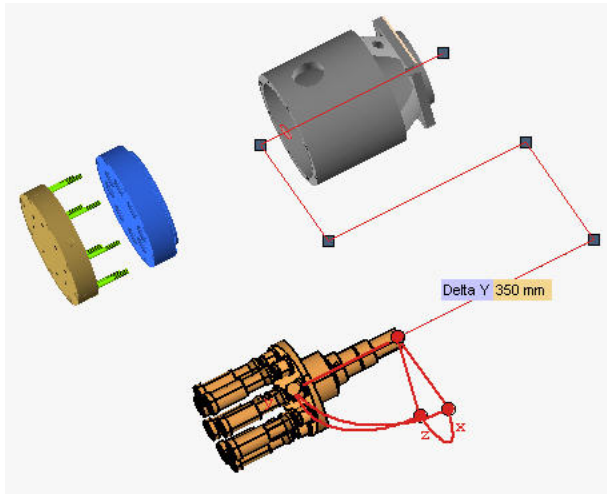
Let's now key in the input values for the movements and also capture the path of the movements.

- Expand More Options in the Selection list.
- Set Sketch Path lines to Follow movements.
- Click on End point (Under Step 3 in selection list). The movement axes with minidialog shows up.
- Input Move Y minidialog value 325 mm.
- Then Move X minidialog value as 250 mm.

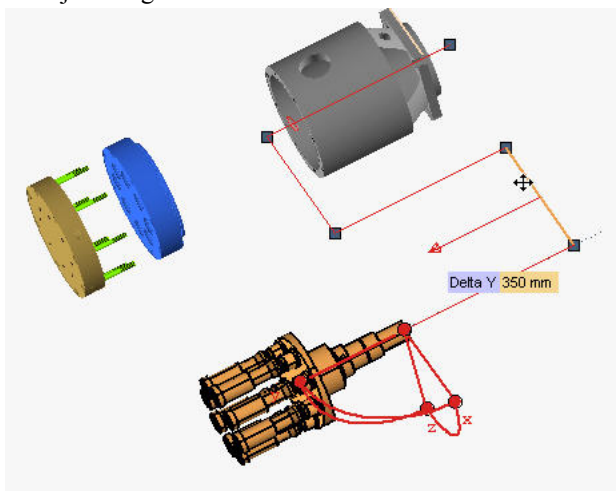


- Again Move Y input of -25.


- Another Move X input of 500 mm.
- And finally another Y axis input of 350 mm.



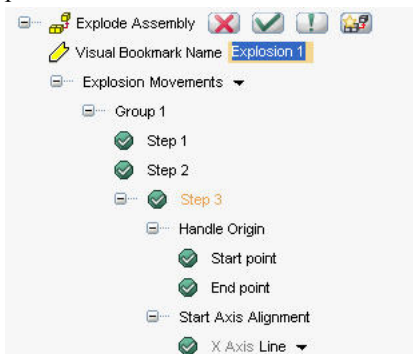
You can see that the path lines are seen showing the trace of the movement. If you want to adjust these path lines just drag them.



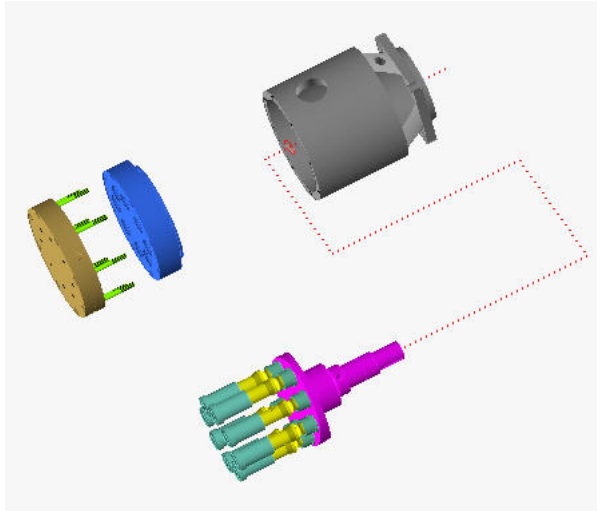
The Red arrow shows the direction of the drag. Double clicking it changes the direction of drag.

- Input the name of the  Visual Bookmark that has captured the exploded view as Explosion1 and hit OK button to create it.

Notice that as the bookmark is created all the component movements are reset and they come back to unexploded state.



- To view the exploded view, right click on the bookmark and select View Exploded Assembly.



You can see the bookmark with the path lines also clearly visible. This is a View-only visual bookmark and cannot be edited when active.

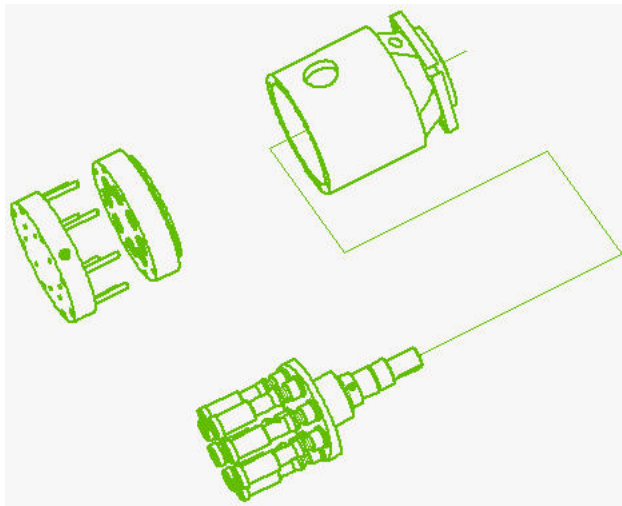
3. Step3: Creating a 2D exploded view

You have generated a Visual bookmark of the exploded assembly. Let's now see how you can use this bookmark and create a 2D drawing view, which is the ultimate requirement in any design process.

- Open a **New Drawing** file.
- Click **Insert** \rightarrow **Drawing View** \rightarrow **Exploded**
- Browse to select the assembly file.

The Edit explosion window shows up where you can set the parameters for the view.


- Check Visual bookmark orientation button under View orientation.
- Select Explosion1 under Visual Bookmark pull down menu and keep the other settings default.
- Click in the graphics window to place the view as seen.



You can see that the path lines created are also visible, clearly conveying information on the path movement of the selected set of components.

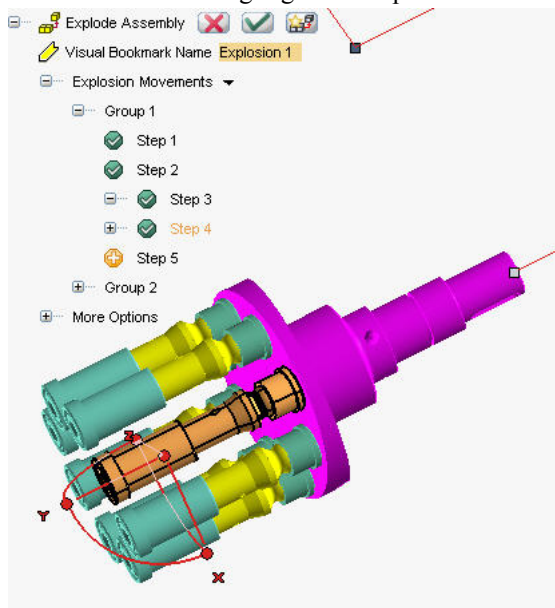
4. Step4: Editing the Exploded assembly

You can make changes to the **Exploded View** that is created by modifying the Visual bookmark. You can add additional steps, change the groups to which components belong, change view orientations etc. Let's see how we can do this.

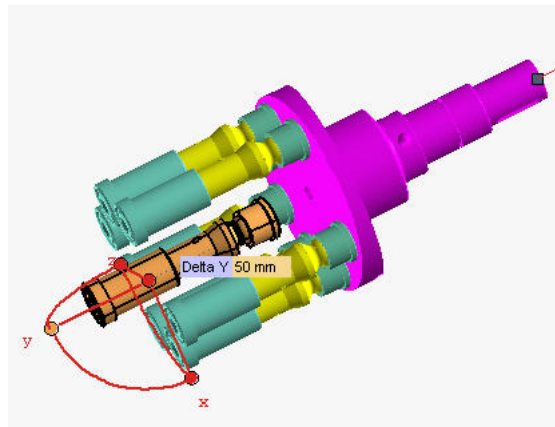
- Go back to the Assy_Pump model file and click  Visual Bookmarks tab.
- Right click Bookmark Explosion1 and select Modify.
- The selection list opens up showing all the steps and path lines used to explode the assembly.

We will now insert a New Step.

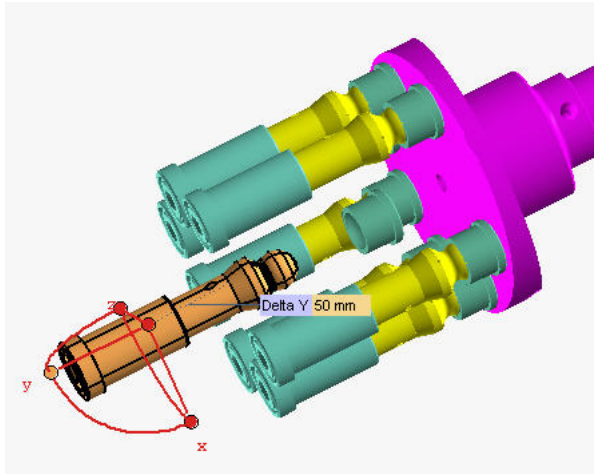
- Click Step4 in the selection list.
- Select the three highlighted components as shown.



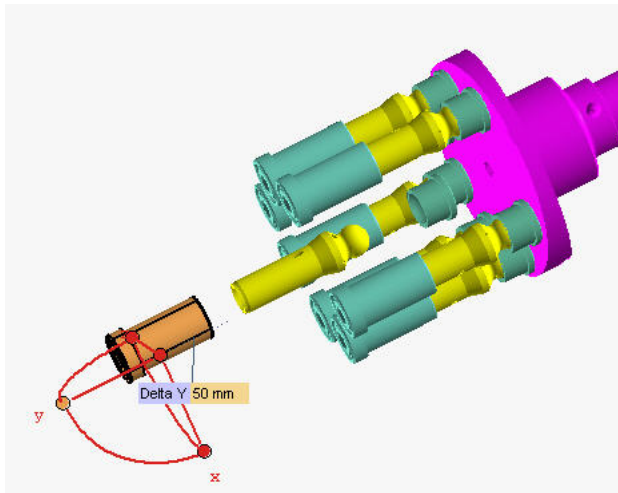
- Click on Y bar of the handle to open the bring up the minidialog and input value 50 mm.



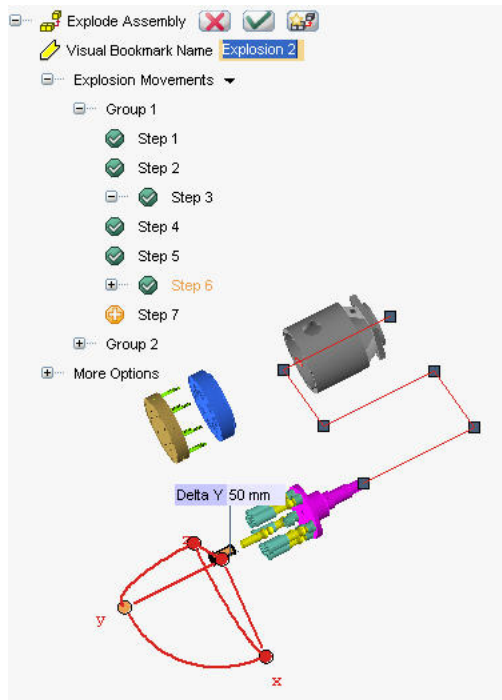
- Now insert another new step by selection Step5 in the selection list.
- Click the first two components as shown and give a Y axis displacement of 50 mm as before.



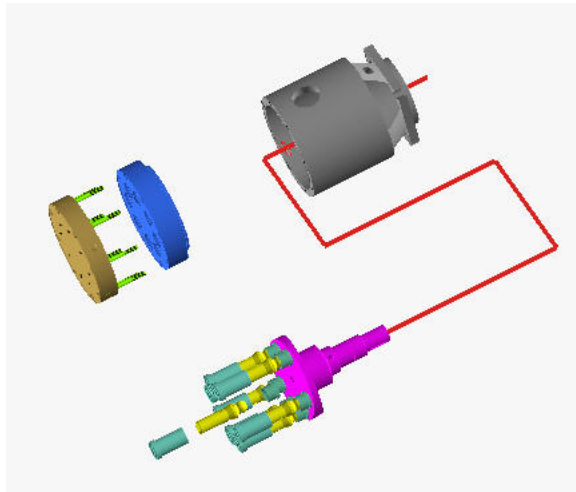
- Now insert another new step by selecting Step6 in the selection list.
- Click the first component only as shown and give a Y axis displacement of 50 mm.



- Give the new Visual bookmark name as Explosion 2 and click OK.



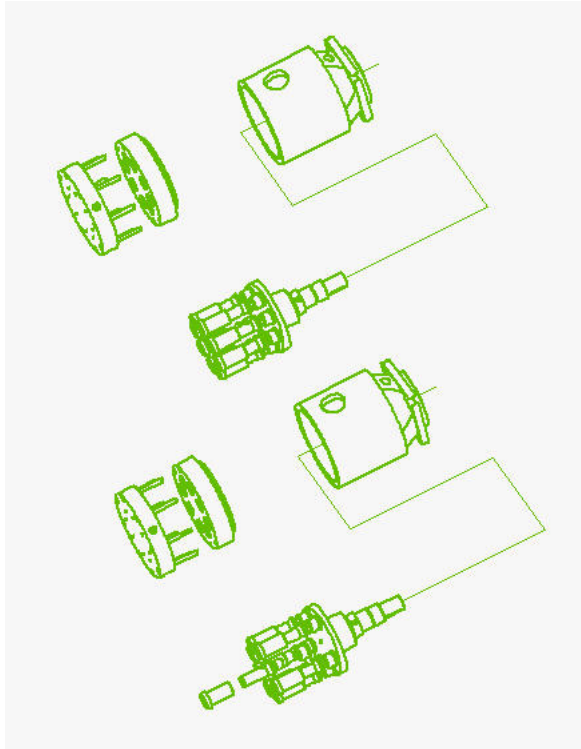
- Right Click Explosion2 Visual Bookmark and select View Exploded assembly to view it.



You can see the new movements captured.

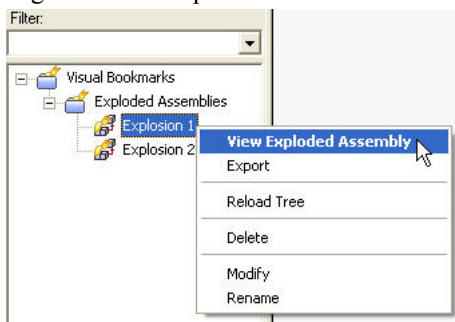
Now go back to open the drawing created.

- Insert a New **Exploded View** based on Visual bookmark Explosion2 as explained previously.

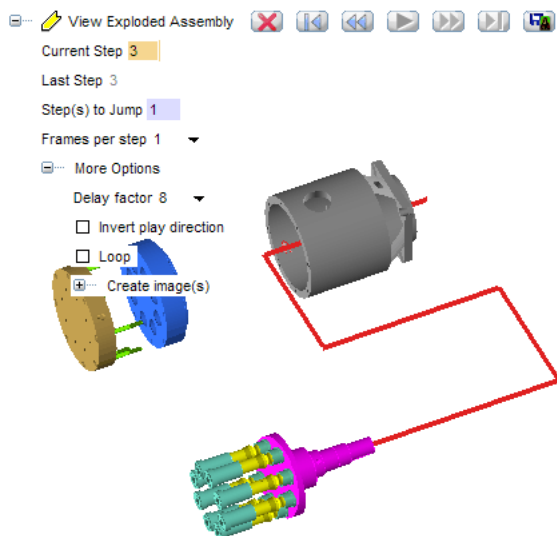


5. Step5: Exploded-View player

Right click on Explosion 1 and select View Exploded Assembly.



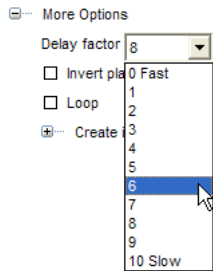
You can see exploded view player as shown below.



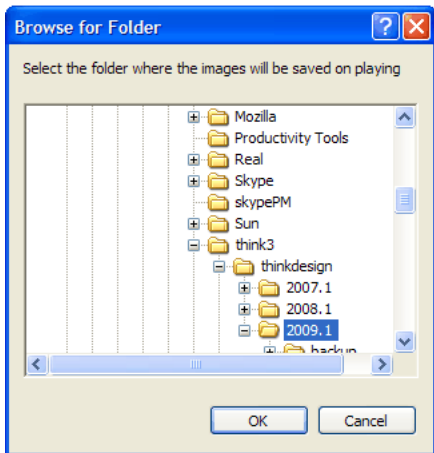
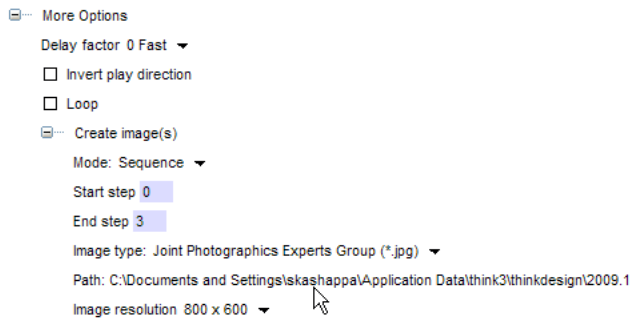
Click on the button Go to Start.



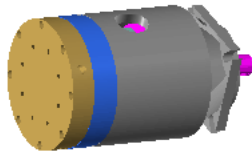
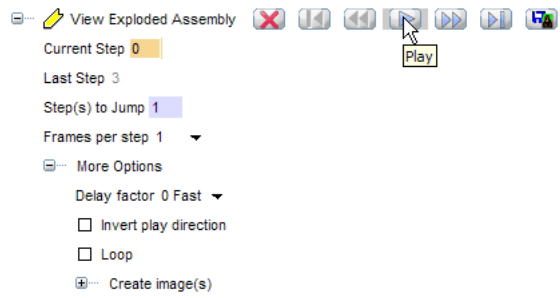
- Click More Options for Delay factor.
- To view the exploded assembly continuously check Loop.



Same time, you can create images too. For each step an image with the extension ".jpg" is created. Click on the default folder and a browser is opened to change the location for the folder.



Hit Play to view the exploded assembly.



This brings us to the end of this task.