

Solar Train Curved Rail R40

A. Open Straight Track Assembly.

Step 1. Open your Straight Track Assembly file, Fig. 1.

Step 2. **Hide all Tie components, Fig. 2.** To hide, move cursor over the component in graphics area and press **Tab** key.

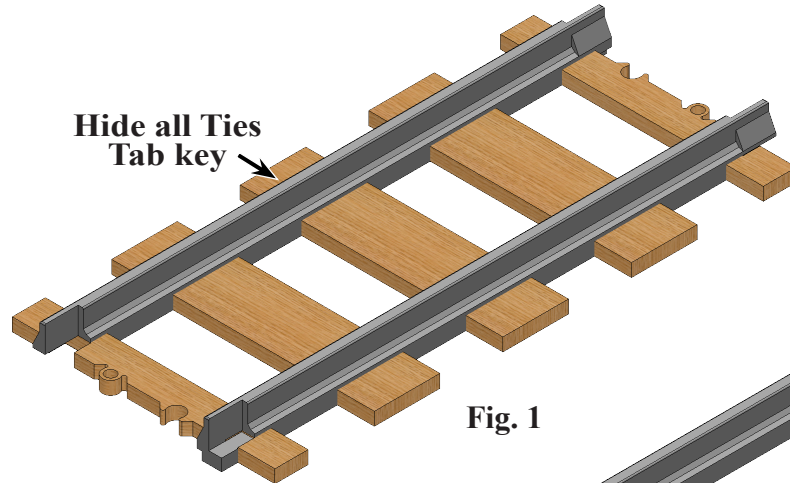


Fig. 1



Fig. 2

Step 3. Click File Menu > Save As.

Step 4. In the Save As dialog box, Fig. 3.
key-in **CURVED RAIL R40** for filename
Save as type: select **SOLIDWORKS Part**
under Geometry to save
select **Include specified components**
click Save.

Step 5. Close ASSEMBLY file and **don't save**.

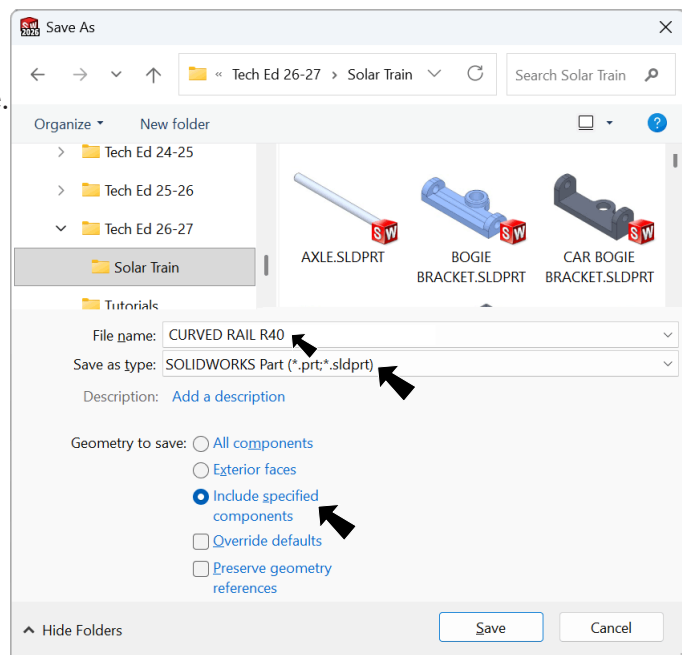


Fig. 3

B. Split Curved Rail part.

Step 1. Open your **Curved Rail R40** part file.

Step 2. Click **Top Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 4**.

Step 3. Click **Normal To**  on the Standard Views toolbar. (**Ctrl-8**)

Step 4. Click **Corner Rectangle**  in the **Rectangle flyout**  on the Sketch toolbar.

Step 5. Sketch **corner rectangle coincident with front vertex of Rail**, **Fig. 5**.

Step 6. Click **Smart Dimension**  (**S**) on the Sketch toolbar.

Step 7. Add **8.2** dimension, **Fig. 6**.

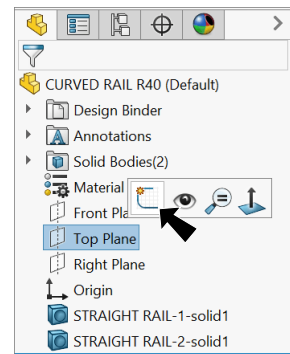


Fig. 4

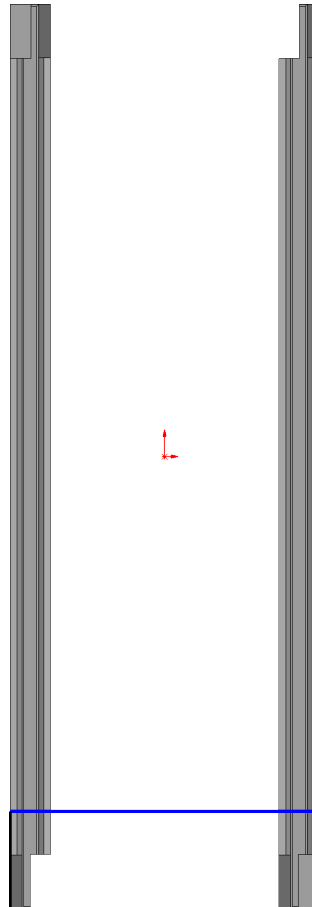


Fig. 5

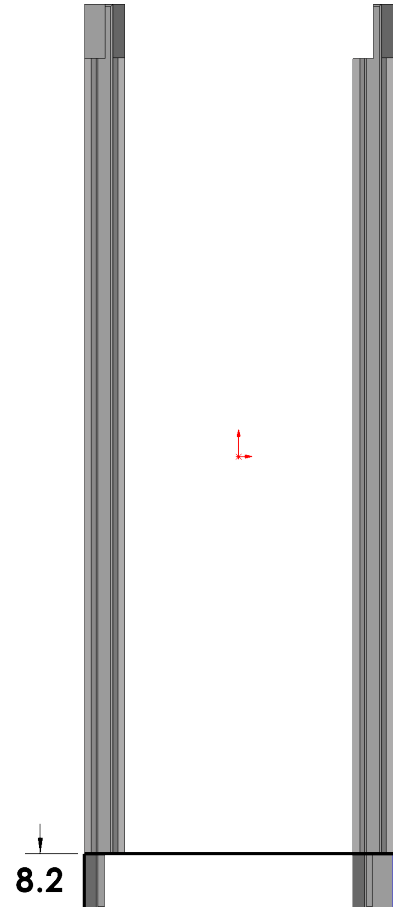
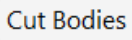


Fig. 6

Step 8. Click Insert Menu > Features > Split.

Step 9. In the Split Property Manager:
under Trim Tools, **Fig. 7**

Sketch1 was preselected

click **Cut Bodies**  button

under Resulting Bodies

in the graphics area click the **top end of rails**, **Fig. 8**

check **Consume cut bodies**

click OK .

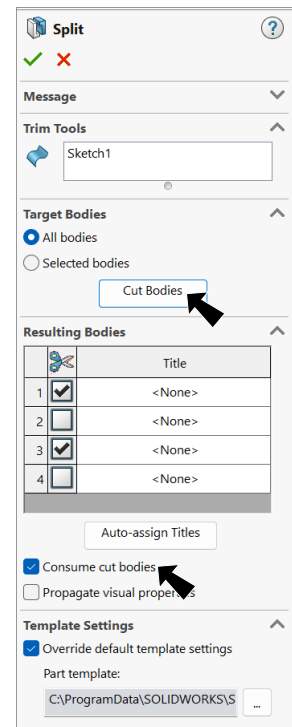


Fig. 7

Step 10. **Hide Sketch1** . To hide,
click **Sketch1**  in the graphics
area and **Hide**  on the
context toolbar, **Fig. 9**.

Step 11. You can switch to **Isometric**



views and confirm thin
body left after split.

Step 12. Save  (**Ctrl-S**).

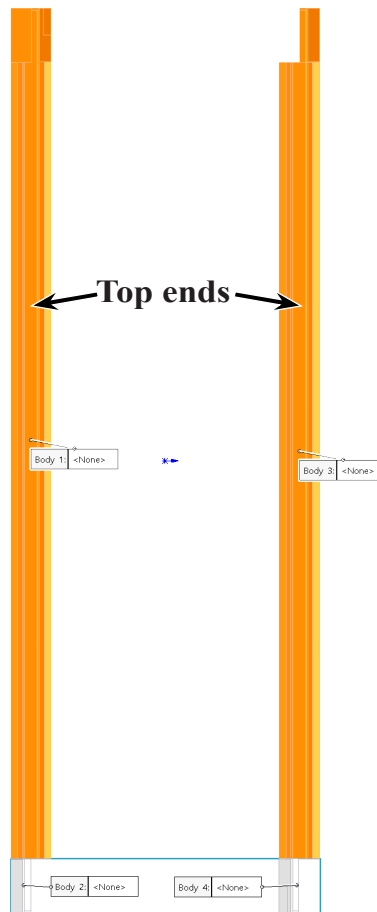


Fig. 8

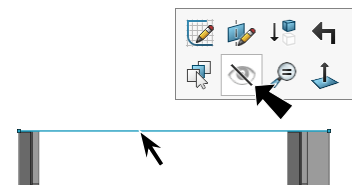


Fig. 9

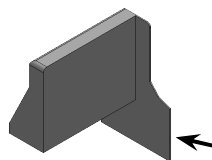
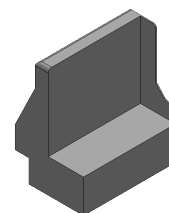


Fig. 10



C. Sketch2 for Axis1.

Step 1. Click **Top Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 11**.

Step 2. Click **Normal To**  on the Standard Views toolbar. (**Ctrl-8**)

Step 3. Click **Line**  (**L**) on the Sketch toolbar.

Step 4. Starting from Origin  sketch right triangle, **Fig. 12**.

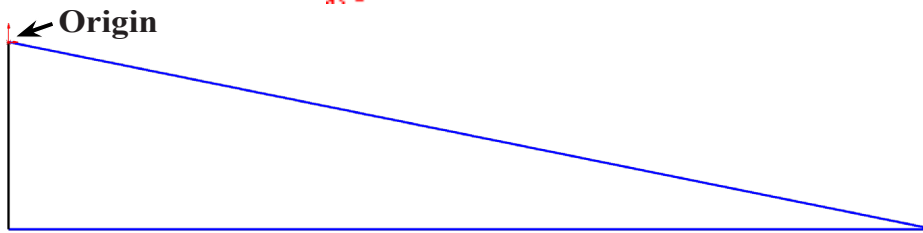


Fig. 12

Step 5. Click **Smart Dimension**  (**S**) on the Sketch toolbar.

Step 6. Add dimensions, **Fig. 13**.

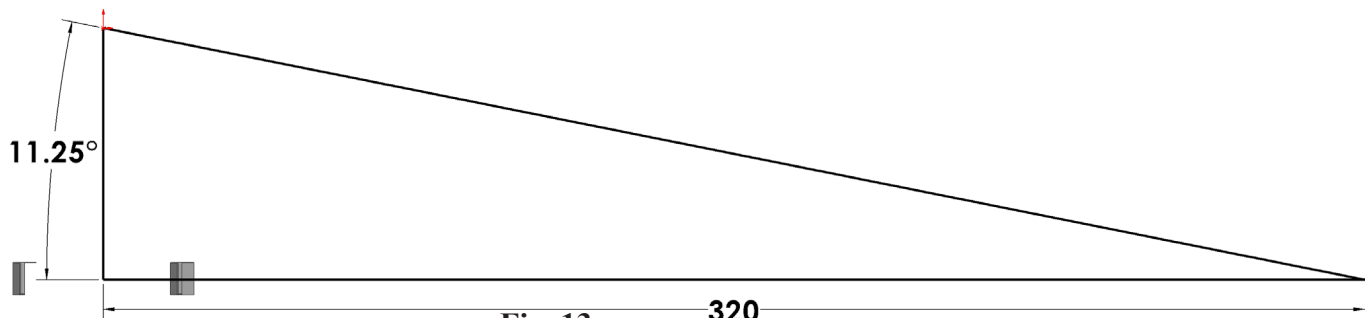


Fig. 13

Step 7. Click **Exit Sketch**  on the Sketch toolbar.

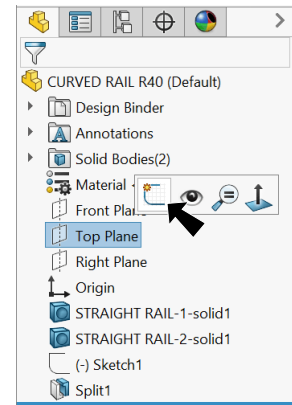


Fig. 11

D. Create Axis1.

Step 1. Click **Trimetric**  on the Standard Views toolbar.

Step 2. **Ctrl click Top Plane**  in the Feature Manager, **Fig. 14** and **point of intersection of long lines** in the graphics area to select both, **Fig. 15**.

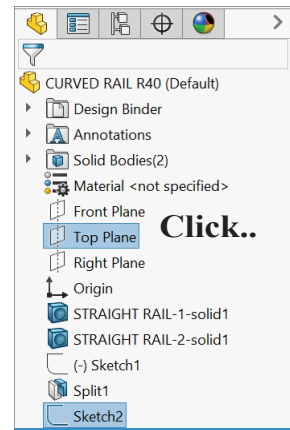


Fig. 14

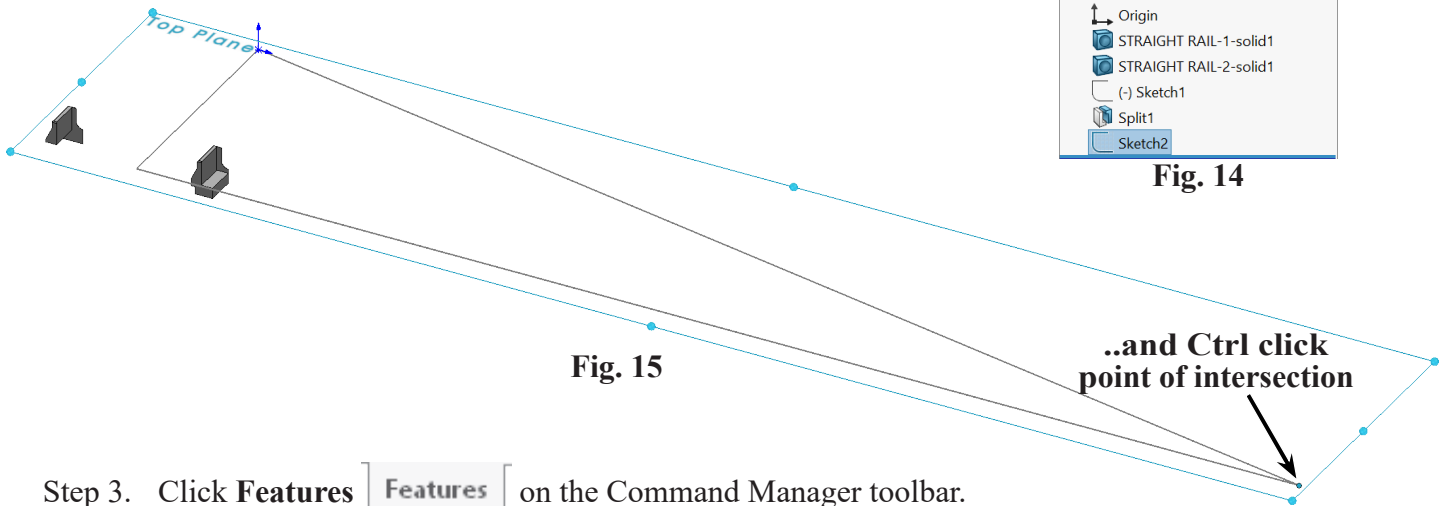
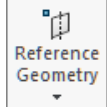


Fig. 15

Step 3. Click **Features**  on the Command Manager toolbar.

Step 4. Click **Reference Geometry**  on the Features toolbar and **Axis**  from the menu.

Step 5. In the Axis Property Manager:
under Selections, **Fig. 16**
Plane and point were preselected
click OK .

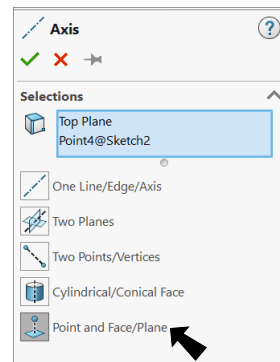


Fig. 16

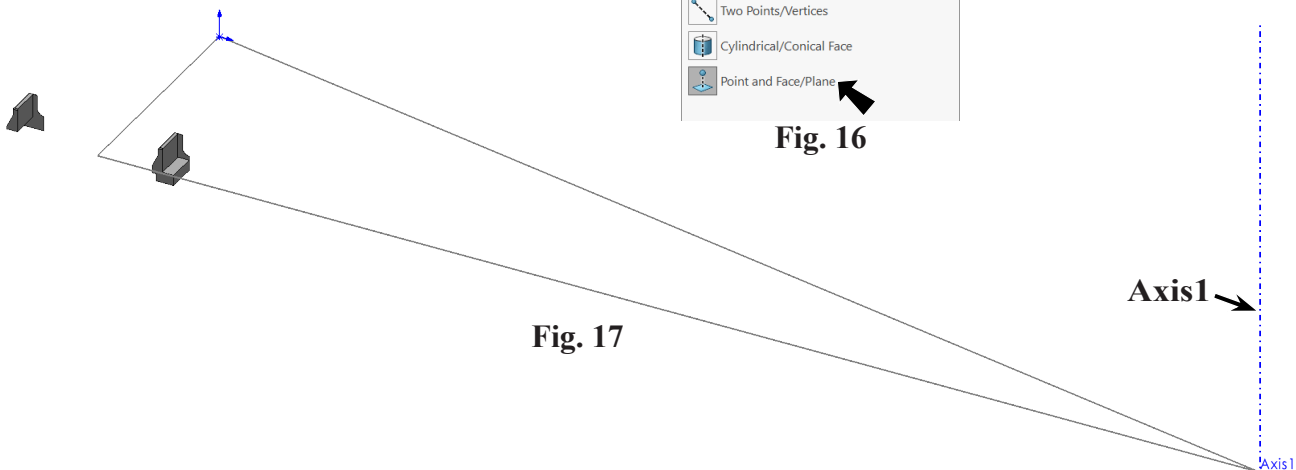


Fig. 17

E. Move Copy Body 1.

Step 1. Click Insert Menu > Features > Move/Copy.

Step 2. In the Move/Copy Body Property Manager set:

under Bodies to Move/Copy, **Fig. 18**

click **both Rail bodies** , **Fig. 19**

check **Copy**

under Rotate

click in the Rotation Reference  box

click the **point of intersection between bodies**

you might have to zoom in to avoid the triad 

Y Rotation Angle  **180°**

click OK .

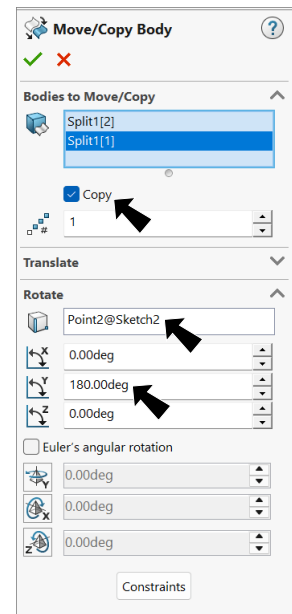
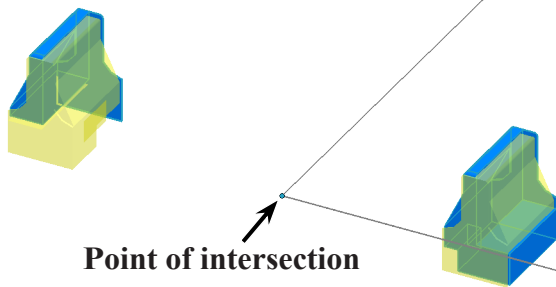


Fig. 18



Point of intersection

Fig. 19

Step 3. **Hide Sketch2** . To hide, click **Sketch2**  in the graphics area and **Hide**  on the context toolbar, **Fig. 20**.

Step 4. Save  (Ctrl-S).

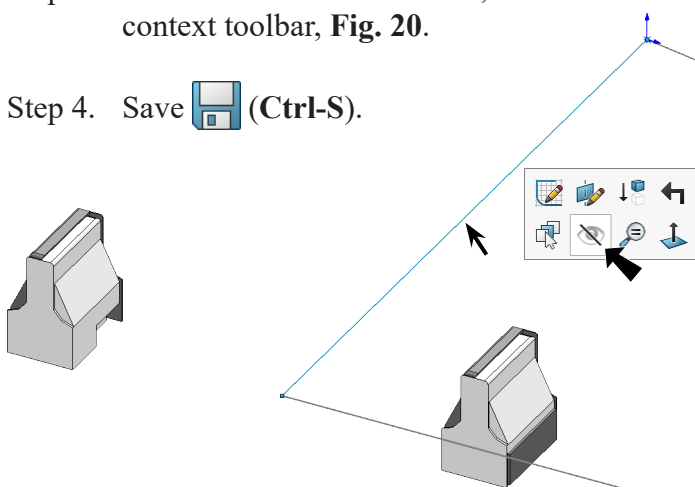


Fig. 20

F. Move Copy Body2.

Step 1. Click Insert Menu > Features > Move/Copy.

Step 2. In the Move/Copy Body Property Manager set:

under Bodies to Move/Copy, **Fig. 21**

click **both copied Rail bodies** , **Fig. 22**

uncheck **Copy**

under Rotate

click in the Rotation Reference   box

click **Axis1** 

Delta X 22.5° (337.5°)

click **Angle**  to reverse

click OK .

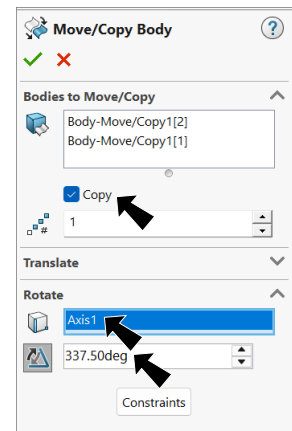


Fig. 21

Step 3. Save  (Ctrl-S)

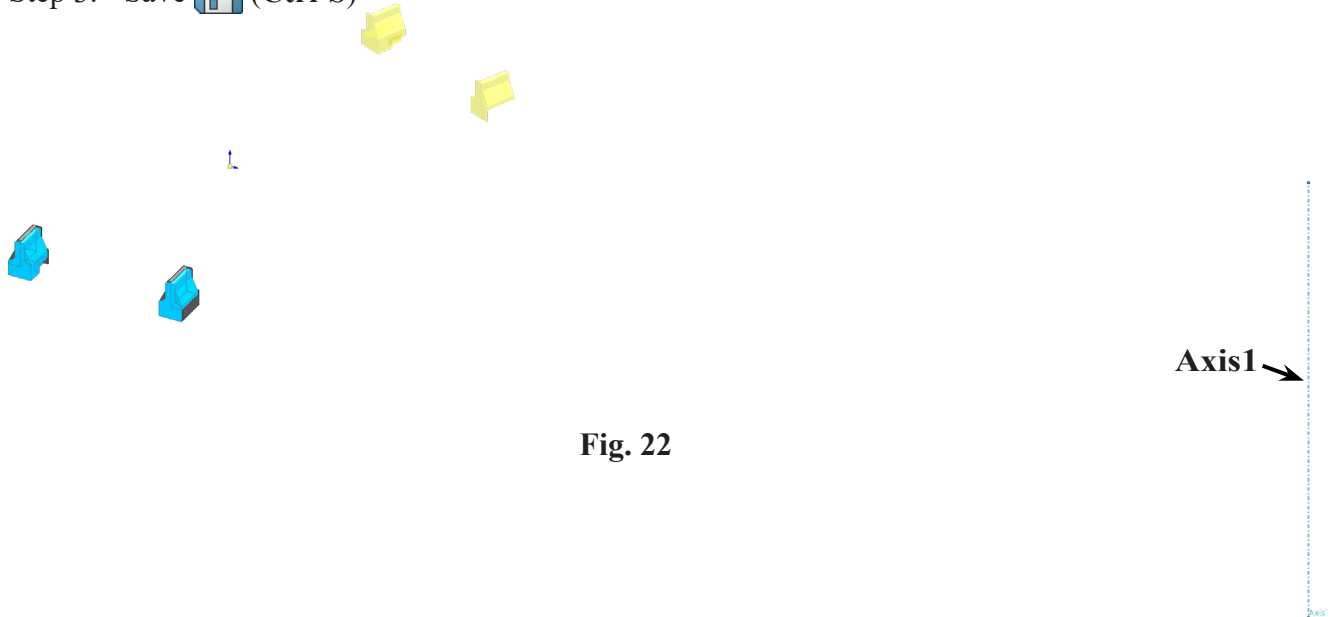


Fig. 22

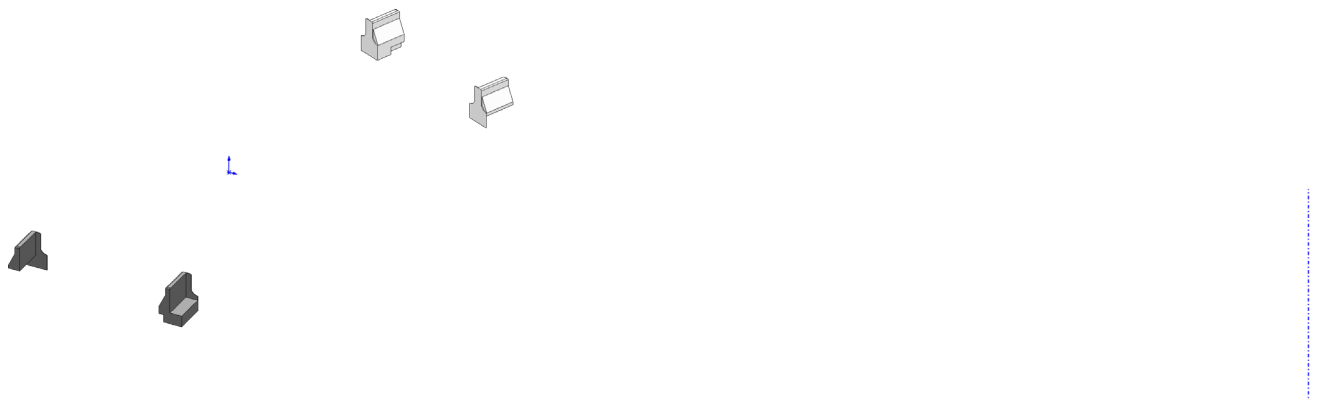


Fig. 23

G. Sketch3 for Axis2.

Step 1. Click **Top Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 24**.

Step 2. Click **Normal To**  on the Standard Views toolbar. (**Ctrl-8**)

Step 3. Click **Line**  (**L**) on the Sketch toolbar.

Step 4. **Sketch horizontal line from vertex of inside of Split body and a line at angle back to left, Fig. 25.**

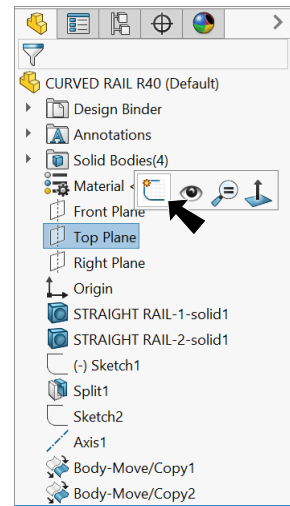
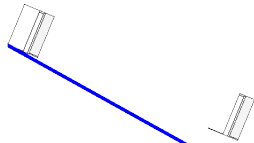


Fig. 24

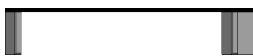


Fig. 25

Step 5. **Unselect Line tool.** To unselect, right click graphics area and click **Select**  from menu.

Step 6. Zoom in copied bodies, **Fig. 26**.

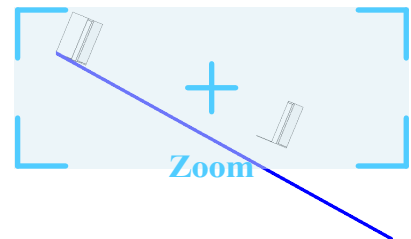
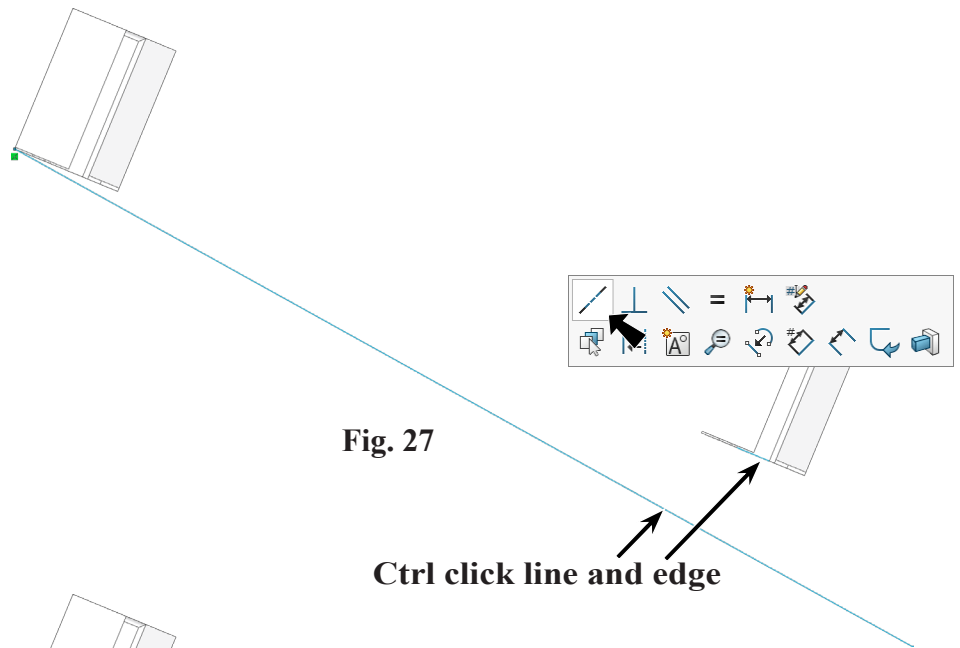
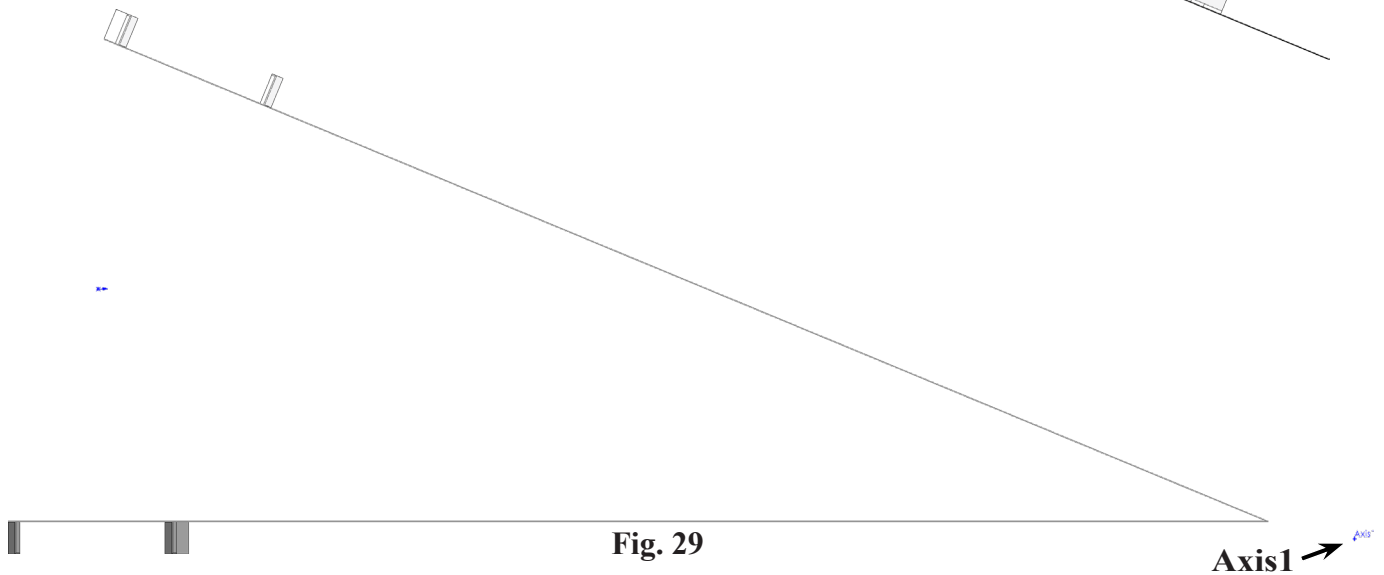
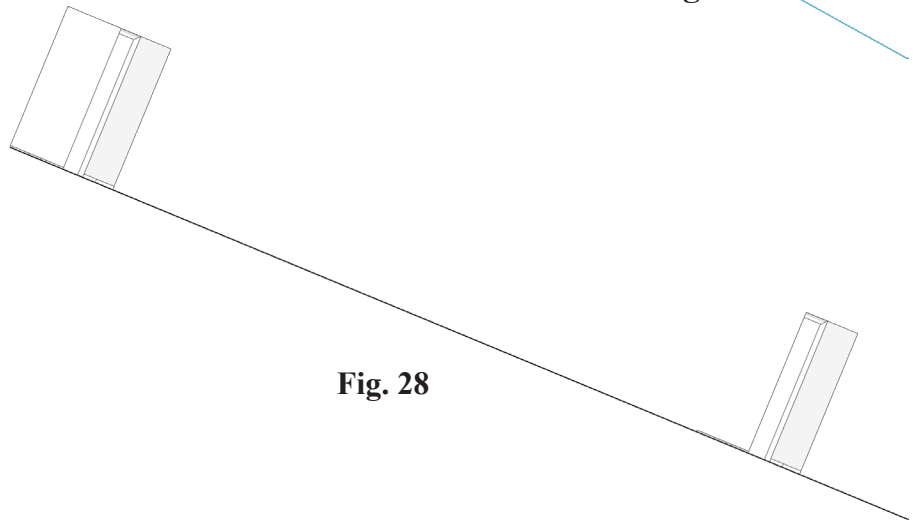


Fig. 26

Step 7. **Ctrl click the line and an inside edge of rotate bodies to select both.** Release Ctrl key and click **Make Collinear**  on the context toolbar, **Fig. 27.**



Step 8. Click **Exit Sketch**  on the Sketch toolbar.



H. Create Axis2.

Step 1. Click **Trimetric**  on the Standard Views toolbar.

Step 2. **Ctrl click Top Plane**  in the Feature Manager, **Fig. 30** and **point of intersection of long lines** in graphics area to select both, **Fig. 31**.

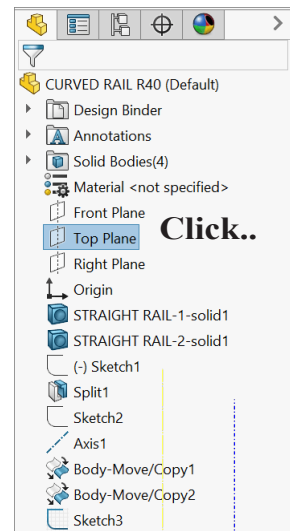


Fig. 30

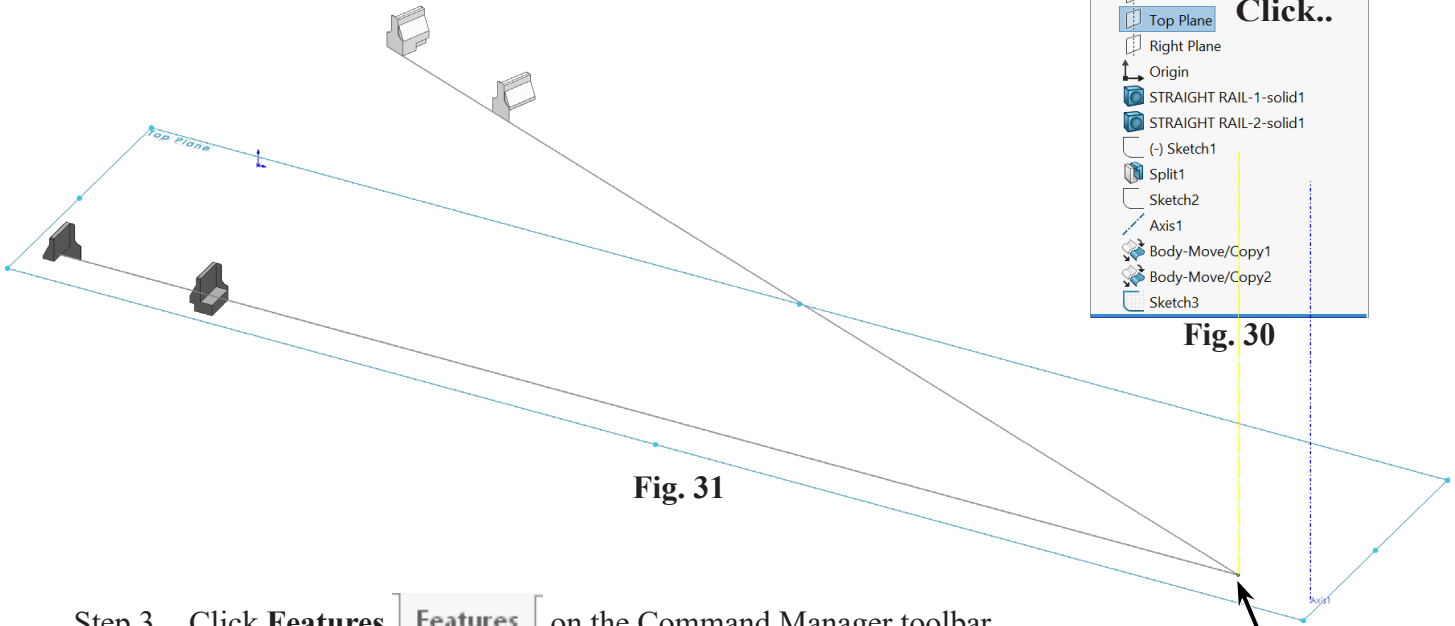
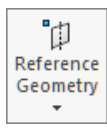
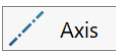


Fig. 31

Step 3. Click **Features**  on the Command Manager toolbar.

Step 4. Click **Reference Geometry**  on the Features toolbar and **Axis**  from the menu.

Step 5. In the Axis Property Manager:
under Selections, **Fig. 32**
Plane and point were preselected
click OK .

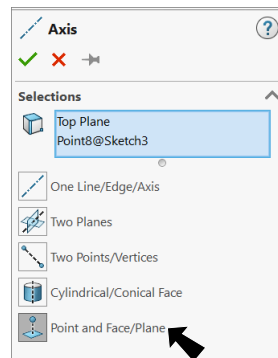


Fig. 32

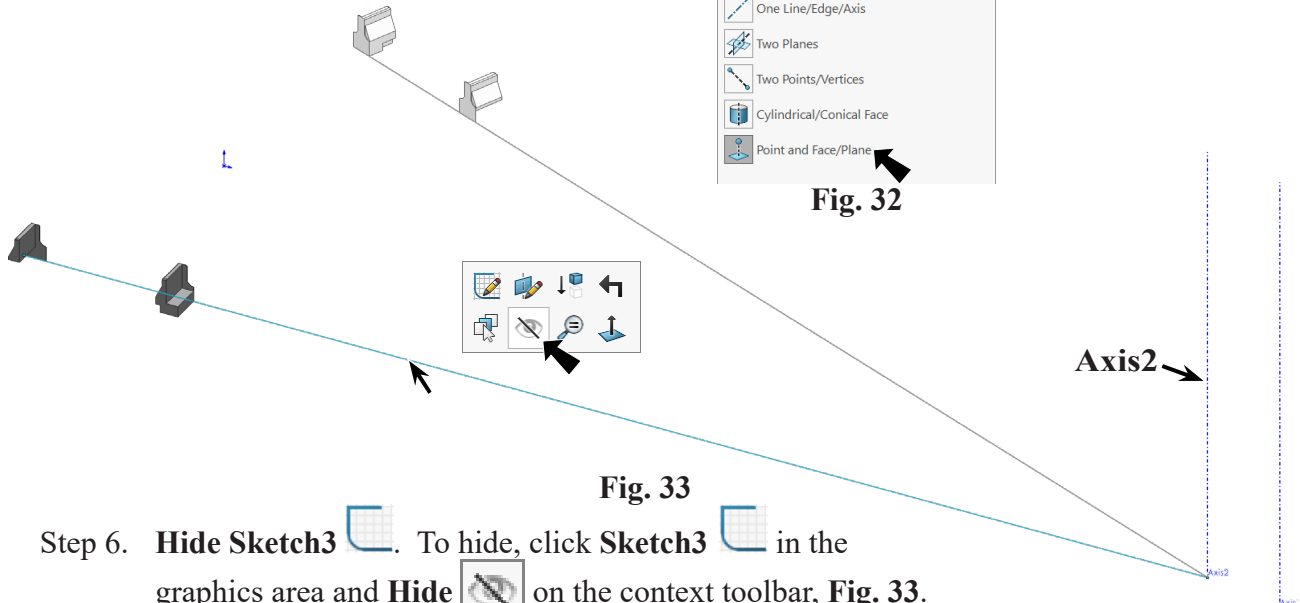
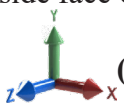


Fig. 33

Step 6. **Hide Sketch3** . To hide, click **Sketch3**  in the graphics area and **Hide**  on the context toolbar, **Fig. 33**.

I. Revolve.

Step 1. Rotate view to inside face of Split1, **Fig. 34**. To rotate view, **Shift click the Y axis**  of the **Reference Triad**  (bottom left corner of graphics area).

Step 2. Click the **inside face of one of the Split bodies** and click **Sketch**  on the context toolbar, **Fig. 34**.

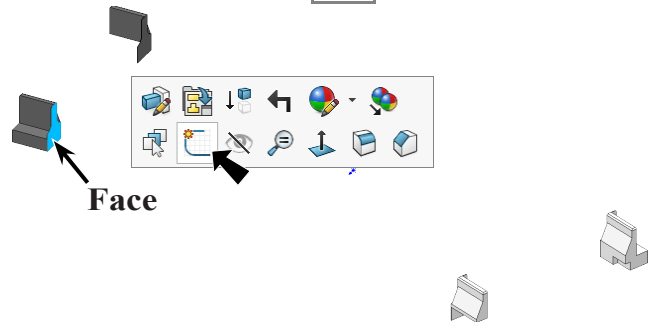
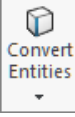


Fig. 34

Step 3. Unselect face.

Step 4. Click **Convert Entities**  on the Sketch toolbar.

Step 5. In the Convert Entities Property Manager:
under Entities to Convert, **Fig. 35**
click **both inside faces**, **Fig. 36**
click OK .

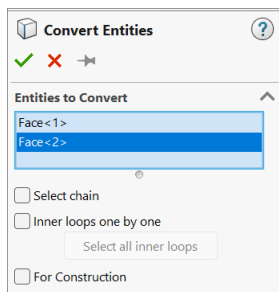


Fig. 35

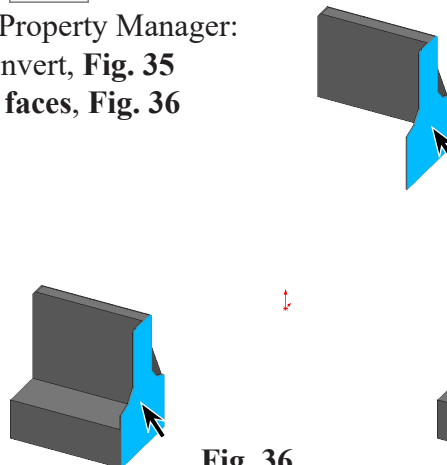


Fig. 36

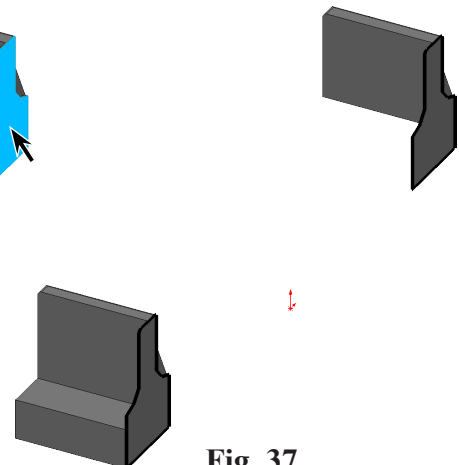
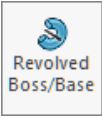


Fig. 37

Step 6. Click **Features**  on the Command Manager toolbar.

Step 7. Click **Revolved Boss/Base**  on the Features toolbar.

Step 8. In the Revolve Property Manger set:

under Axis of Revolution 
click **Axis2**, Fig. 38

Reverse Direction 

Angle  22.5

click OK .

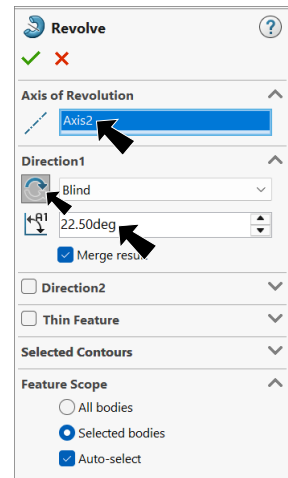


Fig. 38

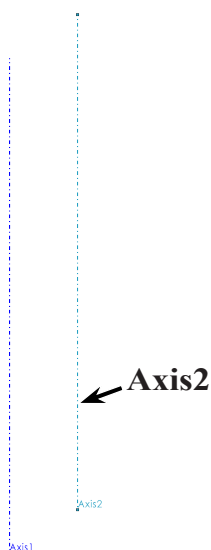
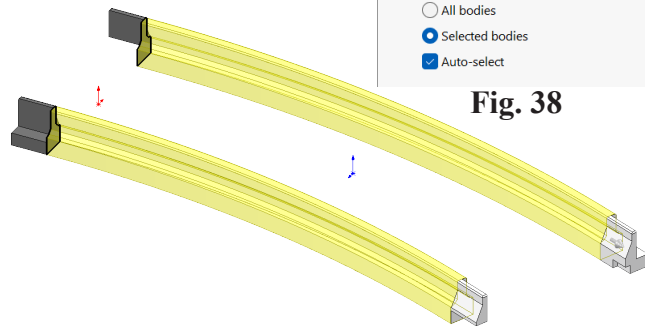


Fig. 39

Step 9. **Hide Axes** . To hide, click View Menu > Hide/Show > Axes.

Step 10. Save  (Ctrl-S)

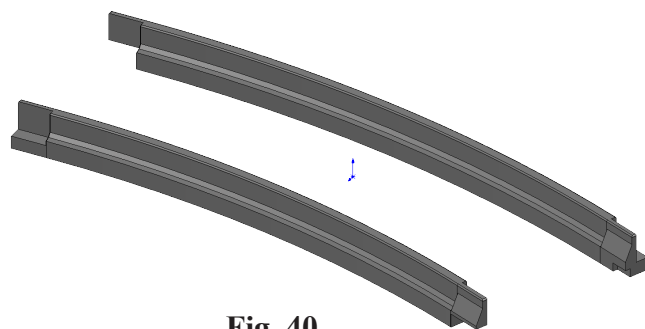


Fig. 40