

Solar Train Straight Rail

A. Extrude1 Sketch1.

Step 1. Click **New**  on the Standard toolbar, click **Part Metric**  and OK.

Step 2. Click **Front Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 1**.

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

Step 4. Sketch 7 lines with the last line vertical down to the Origin , right click vertical line at Origin and click **Construction Geometry**  on the context toolbar, **Fig. 2**.

Step 5. Drag a selection to select **all geometry**, **Fig. 3**.

Step 6. Click **Mirror Entities**  **Mirror Entities** on the Sketch toolbar.

Step 7. Click **Smart Dimension**  (S) on the Sketch toolbar.

Step 8. Add dimensions, **Fig. 4**.

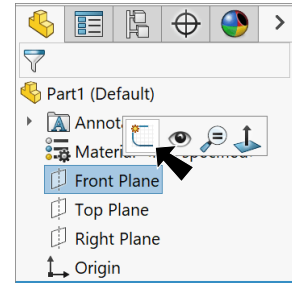


Fig. 1

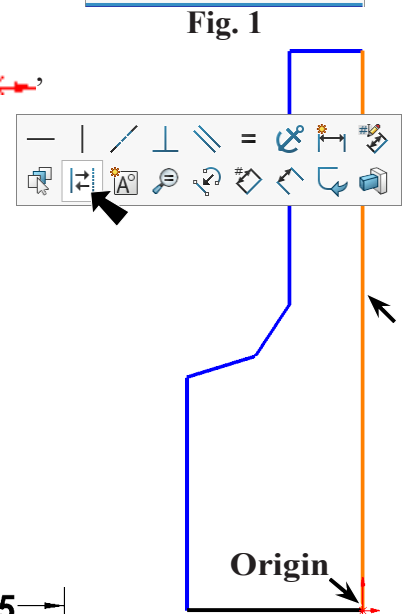


Fig. 2

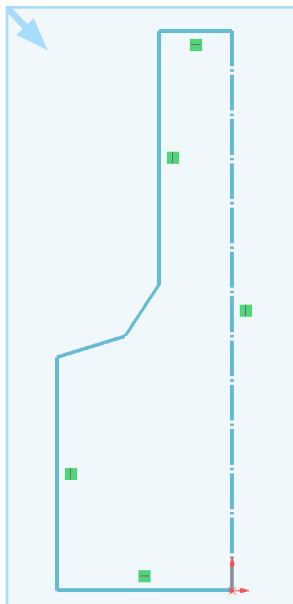


Fig. 3

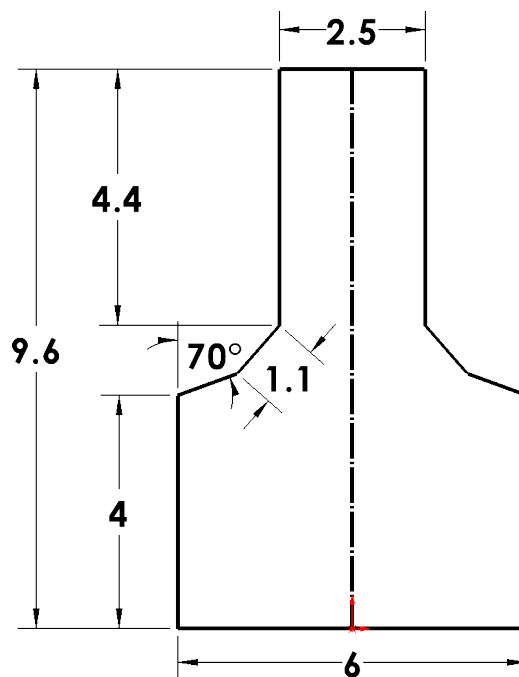
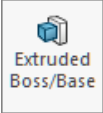


Fig. 4

Step 9. Click **Features**  on the Command Manager toolbar.

Step 10. Click **Extruded Boss/Base**  on the Features toolbar.

Step 11. In the Boss-Extrude Property Manager set:
under Direction 1, **Fig. 5**
End Condition **Mid Plane**
Depth  **135**
click OK .

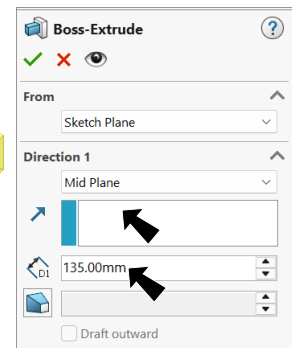


Fig. 5

B. Save as "STRAIGHT RAIL".

Step 1. Click File Menu > Save As.

Step 2. Key-in **STRAIGHT RAIL** for the filename and press ENTER.

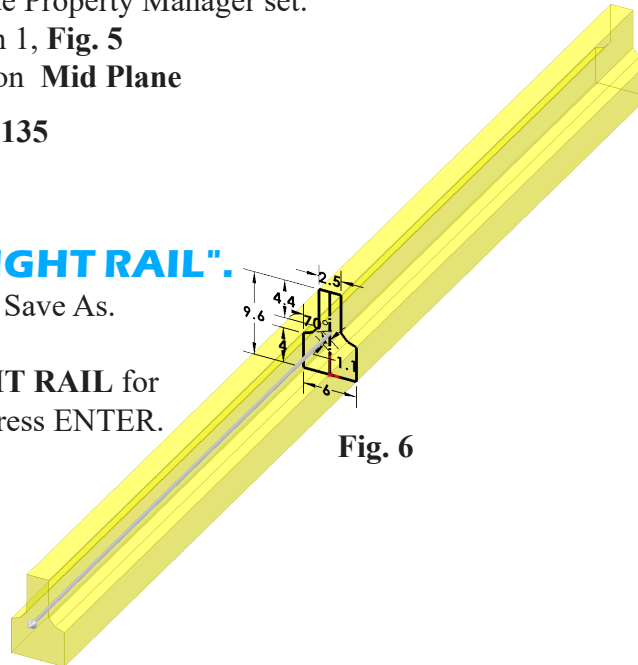


Fig. 6

C. Extruded Cut1 Sketch2.

Step 1. Click the **top face** and click **Sketch**  on the context toolbar, **Fig. 7**.

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

Step 3. Zoom in on front, **Fig. 8**.

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

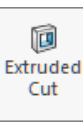
Step 5. Sketch **corner rectangle coincident with bottom right corner**, **Fig. 9**.

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

Step 7. Add dimensions, **Fig. 10**.

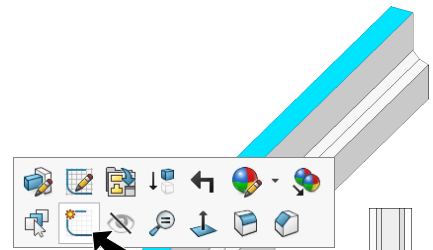
Step 8. Click **Isometric**  on the Standard Views toolbar. (Ctrl-7)

Step 9. Click **Features**  on the Command Manager toolbar.

Step 10. Click **Extruded Cut**  on the Features toolbar.

Step 11. In the Cut-Extrude Property Manager set:
under Direction 1, **Fig. 11**
End Condition **Blind**
Depth  **6.65**
click OK .

Step 12. Save  (Ctrl-S).



Face

Fig. 7

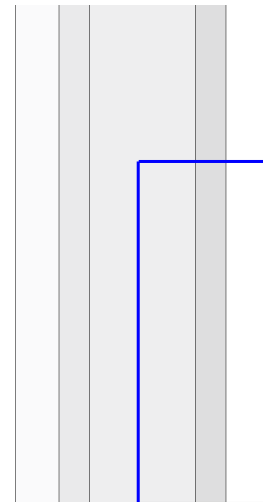


Fig. 9

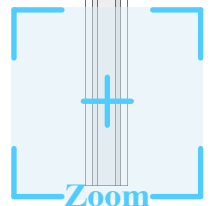


Fig. 8



Fig. 10

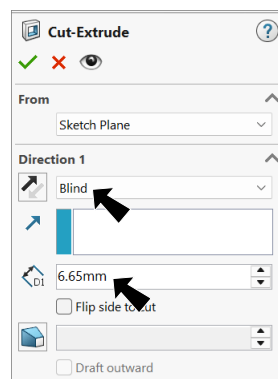


Fig. 11

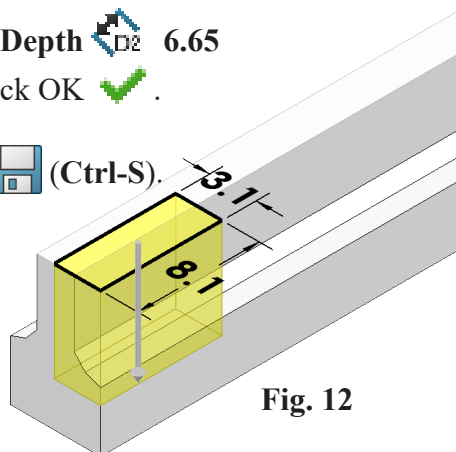


Fig. 12

D. Extruded Cut2 Sketch3.

Step 1. Click the **front face** and click **Sketch**  on the context toolbar, **Fig. 13**.

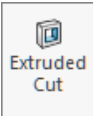
Step 2. Click **Corner Rectangle**  in the **Rectangle flyout**  on the Sketch toolbar.

Step 3. Sketch **corner rectangle coincident**  with **bottom left corner**, **Fig. 14**.

Step 4. Click **Smart Dimension**  (S) on the Sketch toolbar.

Step 5. Add dimensions, **Fig. 15**.

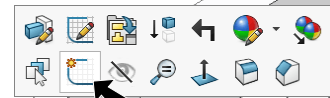
Step 6. Click **Features**  on the Command Manager toolbar.

Step 7. Click **Extruded Cut**  on the Features toolbar.

Step 8. In the Cut-Extrude Property Manager set:
under **Direction 1**, **Fig. 16**
End Condition **Blind**

Depth  **D2** **4**
click **OK** .

Step 9. Save  (**Ctrl-S**).



Face

Fig. 13



Fig. 14

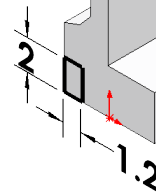


Fig. 15

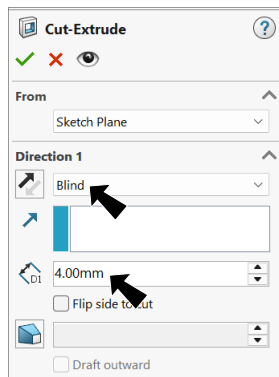


Fig. 16

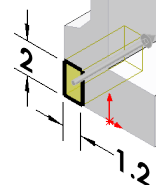
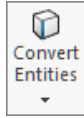


Fig. 17

E. Extrude2 Sketch4 Support 1.

Step 1. Click the **front face** and click **Sketch**  on the context toolbar, **Fig. 18**.

Step 2. With the face still selected, click **Convert Entities**



on the Sketch toolbar, **Fig. 19**.

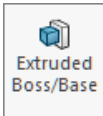
Step 3. Click **Line**  (L) on the Sketch toolbar.

Step 4. Sketch line, **Fig. 20**.

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

Step 6. Add **2** dimension, **Fig. 21**.

Step 7. Click **Features**  on the Command Manager toolbar.

Step 8. Click **Extruded Boss/Base**  on the Features toolbar.

Step 9. In the Boss-Extrude Property Manager set:

under Direction 1, **Fig. 22**

End Condition **Blind**

Depth  **8**

Reverse Direction 

under Selected Contours

click the **contour**, **Fig. 23**

click **OK** .

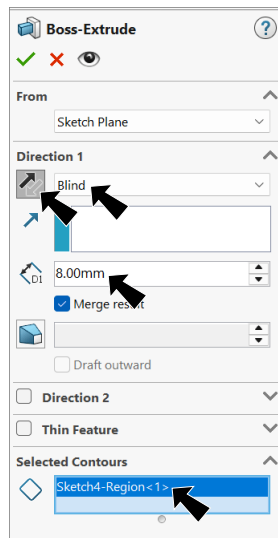


Fig. 22

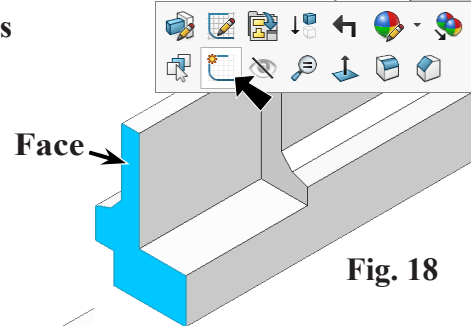


Fig. 18

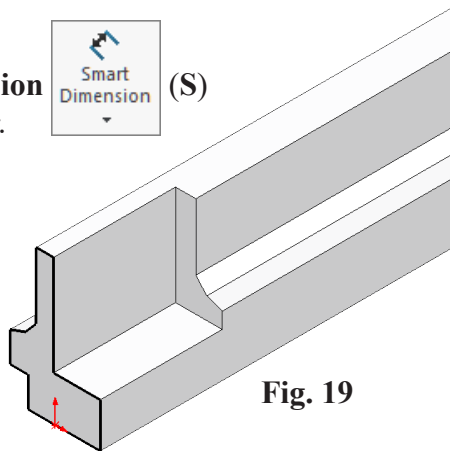


Fig. 19

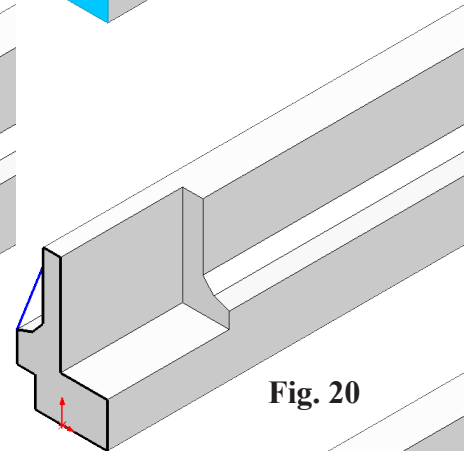


Fig. 20

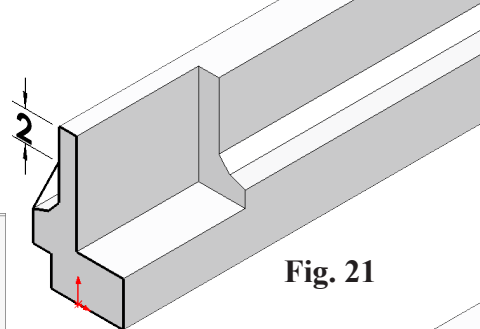


Fig. 21

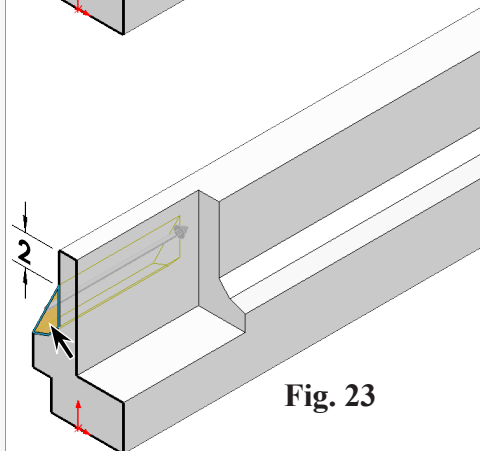


Fig. 23

F. Extruded Cut3 Sketch5.

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. Zoom in on rear, **Fig. 25**.

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

Step 5. Sketch **corner rectangle coincident**  with rear left corner, **Fig. 26**.

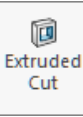
Step 6. Click **Smart Dimension** (S)  on the Sketch toolbar.

Step 7. Add dimensions, **Fig. 27**.

Step 8. Rotate view to back side, click

Isometric  on the Standard Views toolbar (**Ctrl-7**), then **Shift click the Y**  **axis of the Reference Triad**  **twice, Fig. 29.**

Step 9. Click **Features**  on the Command Manager toolbar.

Step 10. Click **Extruded Cut**  on the Features toolbar.

Step 11. In the Cut-Extrude Property Manager set:
under Direction 1, **Fig. 28**
End Condition **Through All**
click OK .

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

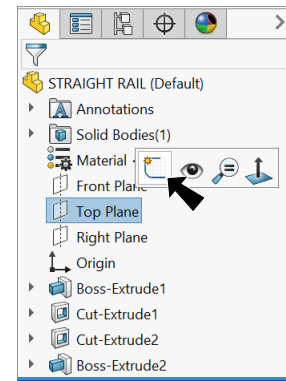


Fig. 24

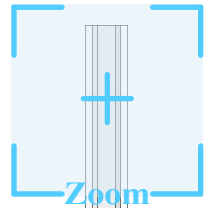


Fig. 25

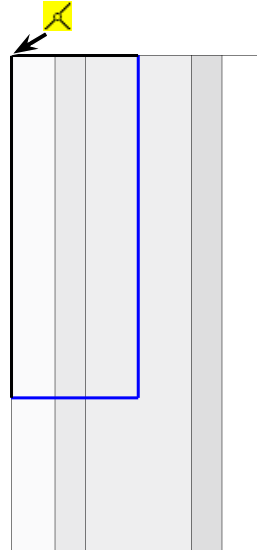


Fig. 26

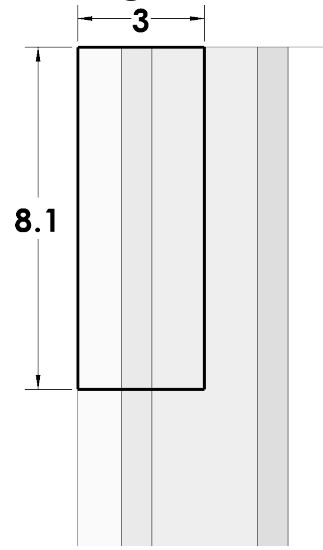


Fig. 27

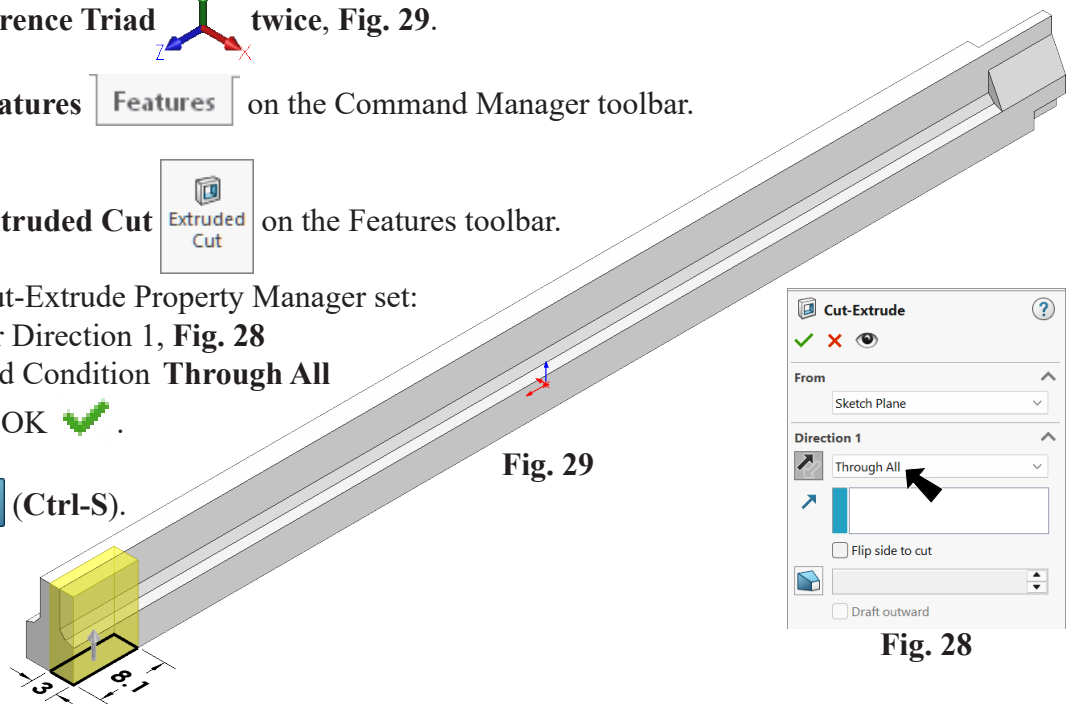


Fig. 29

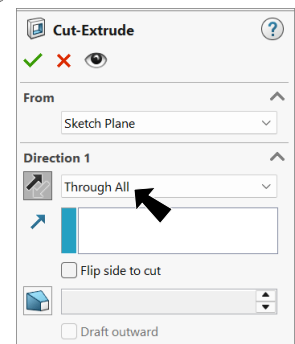


Fig. 28

G. Extruded Cut4 Sketch6.

Step 1. Click **Top Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 30**.

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

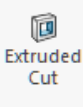
Step 3. Zoom in on rear, **Fig. 31**.

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

Step 5. Sketch **corner rectangle coincident**  from cut left corner to top right corner, **Fig. 32**.

Step 6. Use **Previous View**  on the Standard Views toolbar. (**Ctrl-Shift-Z**) to return to previous zoomed in view.

Step 7. Click **Features**  on the Command Manager toolbar.

Step 8. Click **Extruded Cut**  on the Features toolbar.

Step 9. In the Cut-Extrude Property Manager set:
under Direction 1, **Fig. 33**
End Condition **Blind**

Depth  **3.2**
click OK .

Step 10. Save  (**Ctrl-S**).

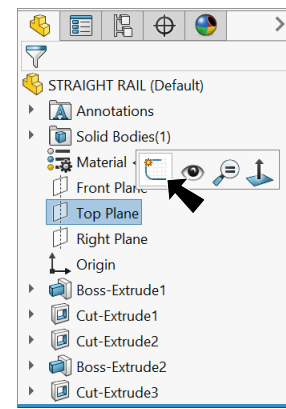


Fig. 30

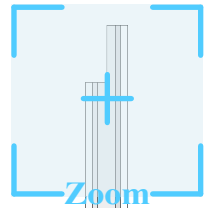


Fig. 31

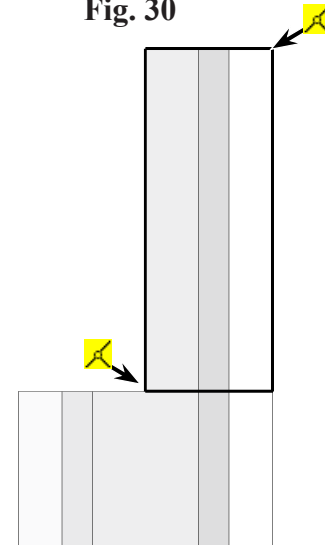


Fig. 32

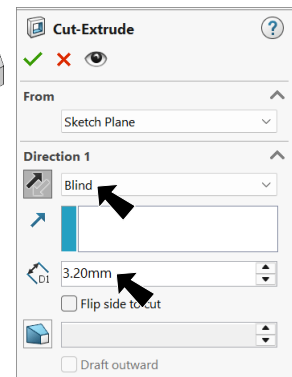


Fig. 33

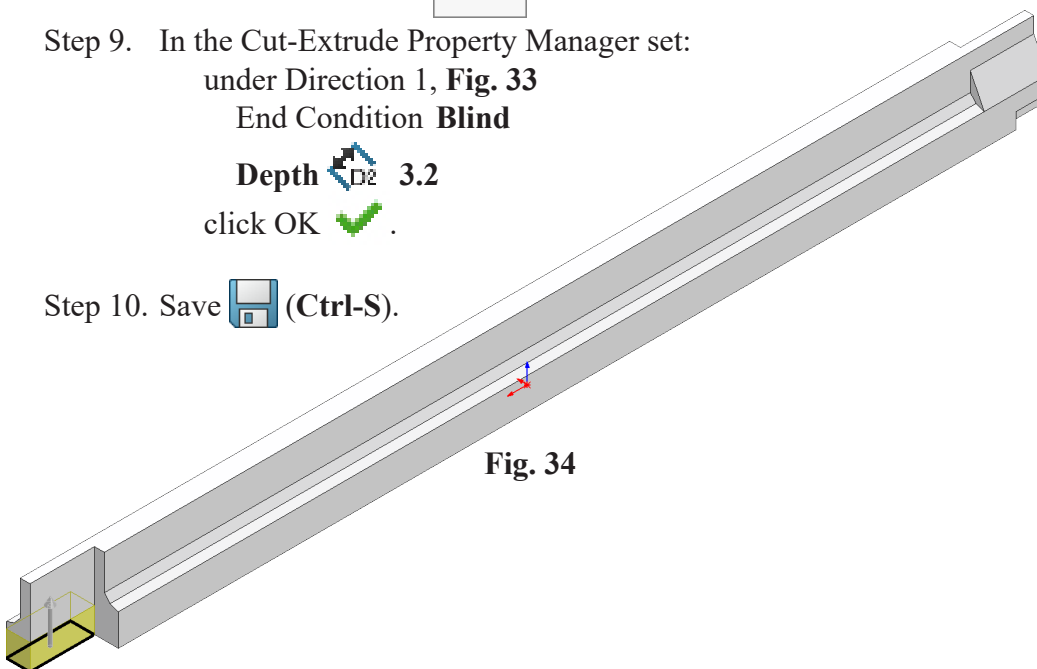
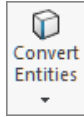


Fig. 34

H. Extrude3 Sketch7 Support 2.

Step 1. Click the **rear face** and click **Sketch**  on the context toolbar, **Fig. 35**.

Step 2. With the face still selected, click **Convert Entities**



on the Sketch toolbar, **Fig. 36**.

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

Step 4. Sketch line, **Fig. 37**.

Step 5. Click **Smart Dimension**



on the Sketch toolbar.

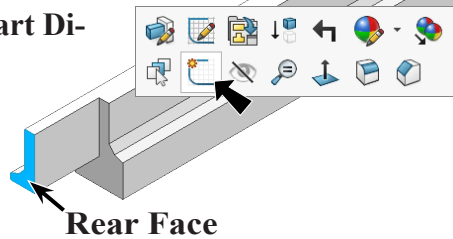


Fig. 35

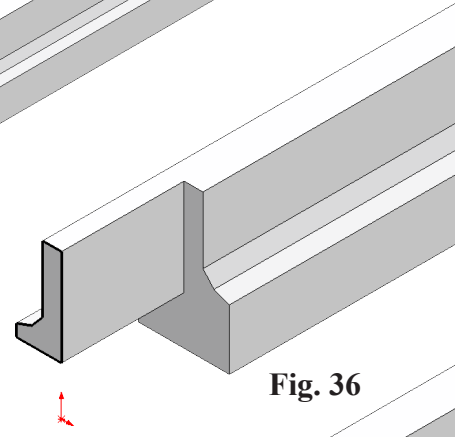
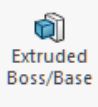


Fig. 36

Step 6. Add **2** dimension, **Fig. 38**.

Step 7. Click **Features**  on the Command Manager toolbar.

Step 8. Click **Extruded Boss/Base**  on the Features toolbar.

Step 9. In the Boss-Extrude Property Manager set:

under Direction 1, **Fig. 39**

End Condition **Blind**

Depth  **8**

Reverse Direction 

under Selected Contours

click **contour**, **Fig. 40**

click **OK** .

Step 10. Save  (Ctrl-S).

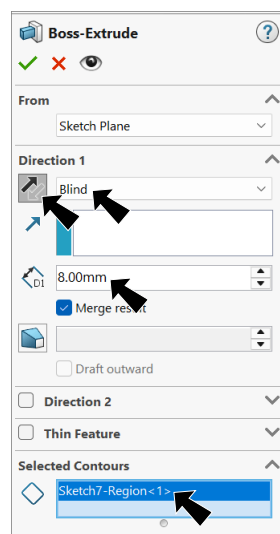


Fig. 39

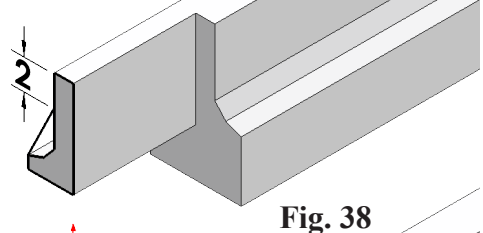


Fig. 38

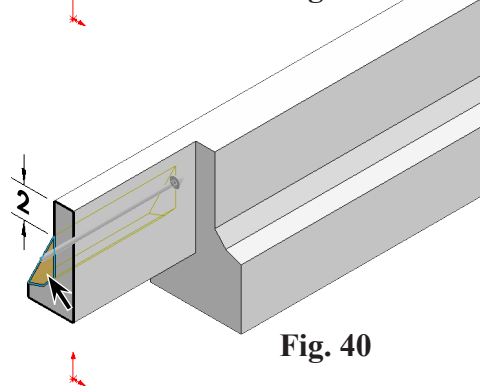


Fig. 40

I. Fillets.

Step 1. Click **Isometric**  on the Standard Views toolbar. (Ctrl-7)

Step 2. Click **Fillet**  on the Features toolbar.

Step 3. In the Fillet Property Manager set:
select **FilletXpert**, Fig. 41

Radius  .3

click top side edges and end edges (4), Fig. 42

click OK .

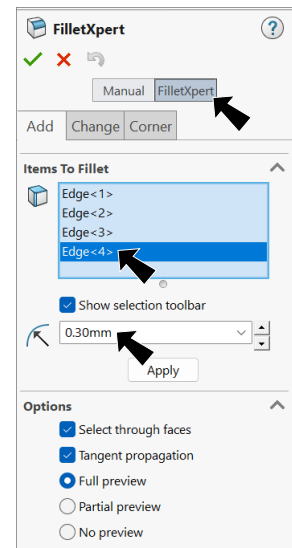


Fig. 41

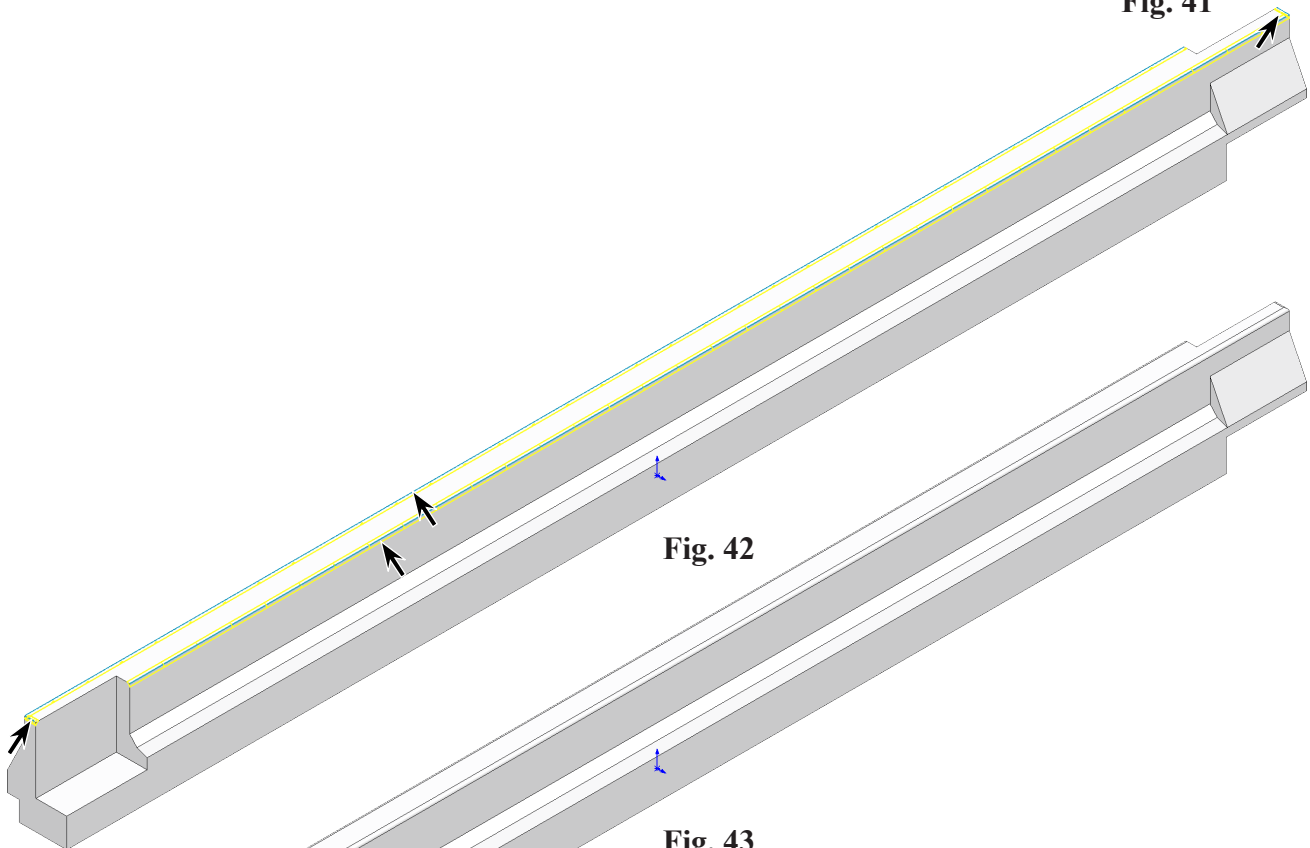


Fig. 42

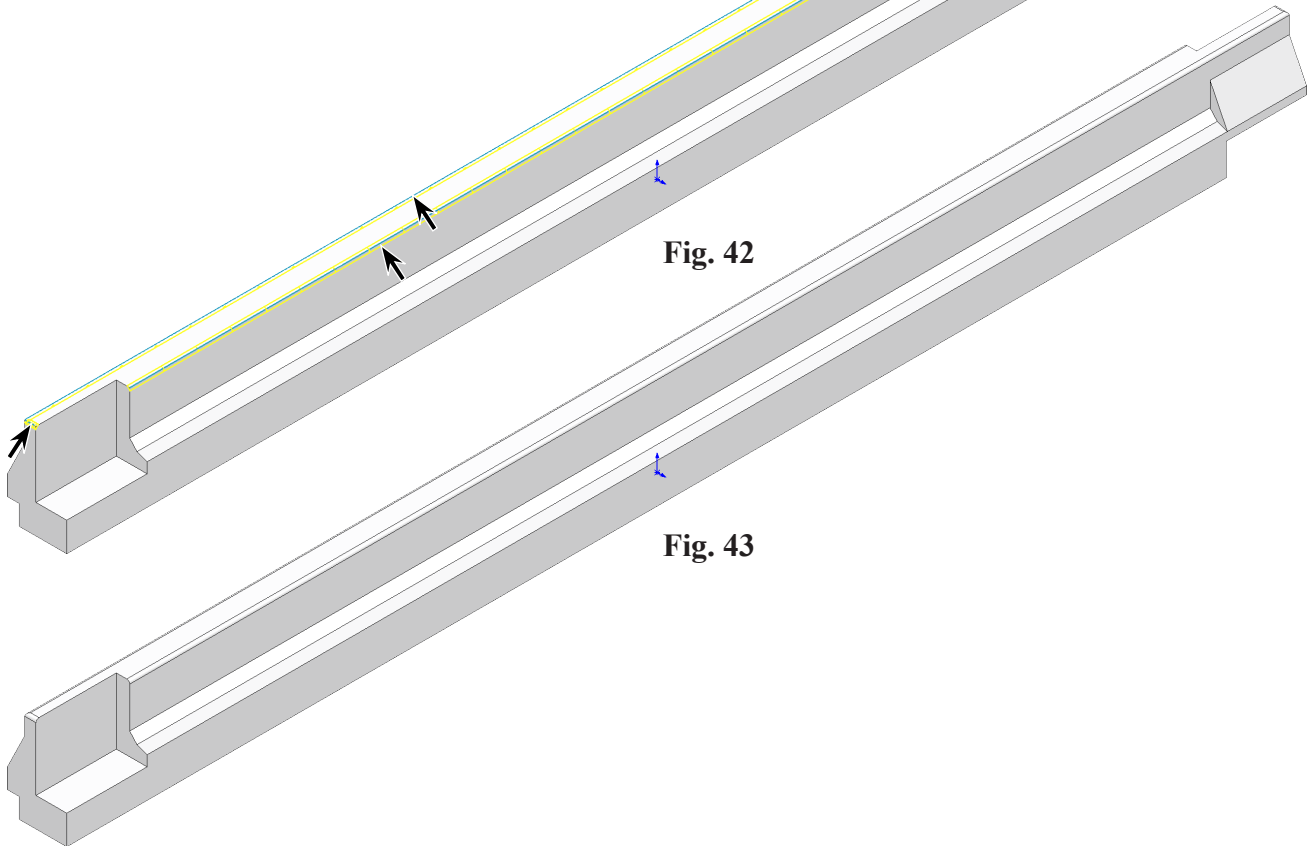


Fig. 43

J. Appearance: Matte Iron.

Step 1. Click part, click **Appearance Callout**  on the context toolbar and click **STRAIGHT RAIL** , Fig. 44.

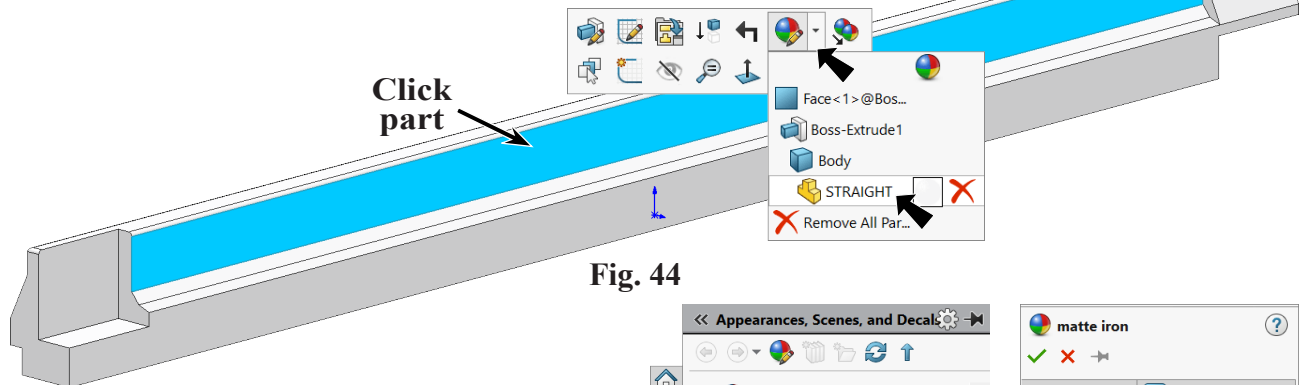


Fig. 44

Step 2. In the Appearances Task pane, expand **Metal**, click **Iron** and in the lower pane select **matte iron**, Fig. 45.

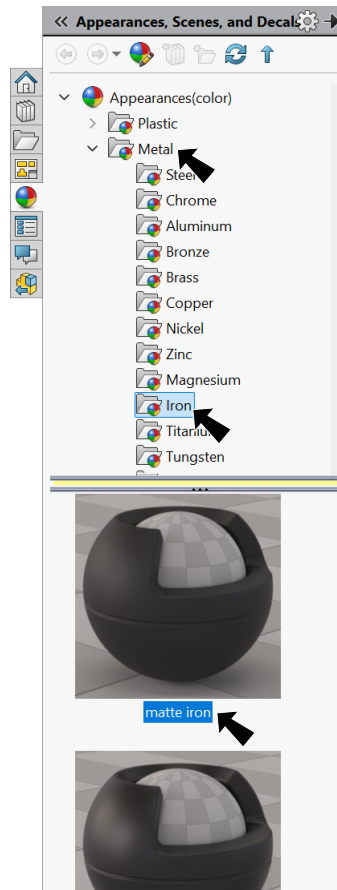


Fig. 45

Step 3. Over in Appearances Property Manager, under Color, Fig. 46
set RGB values
R 105
G 105
B 105
click OK .

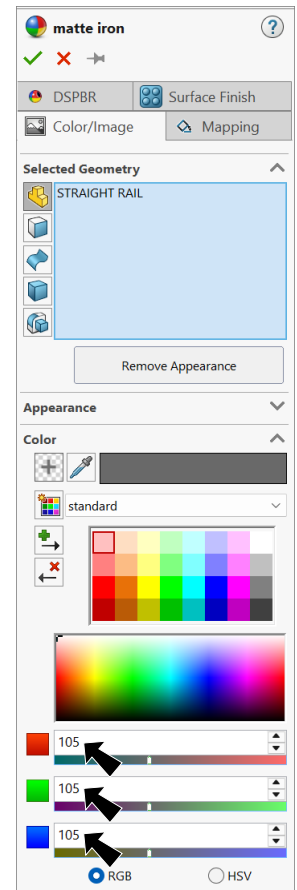


Fig. 46

Step 4. Save  (Ctrl-S).

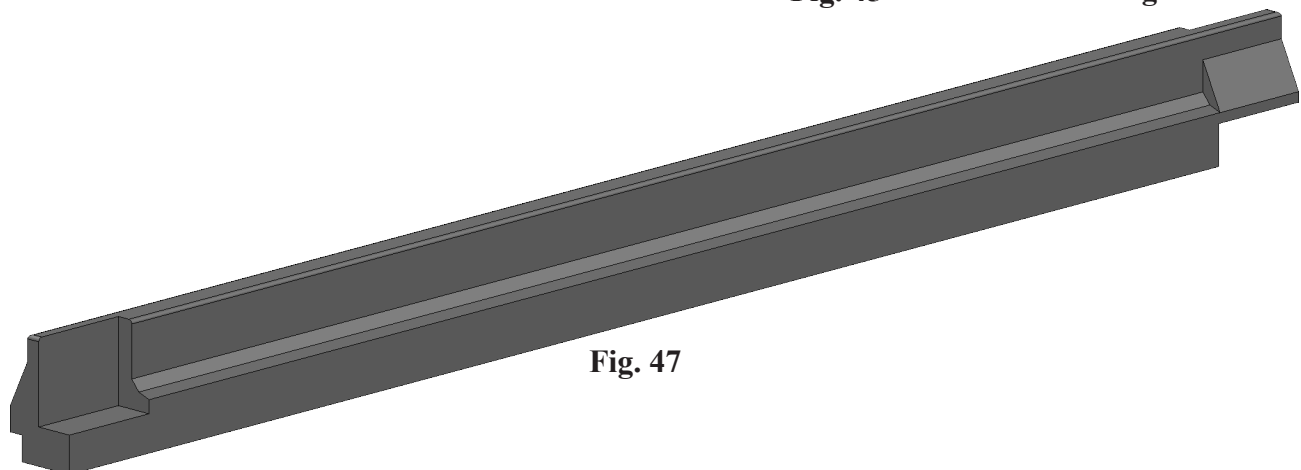


Fig. 47