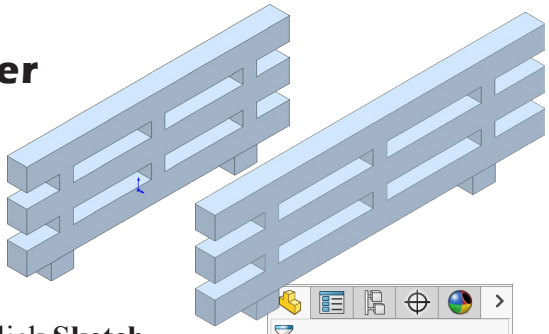
Chapter 18

Bike and Trailer

Rails



A. Extrude1.

Step 1. Click File Menu > New, click **Part Metric** and OK.

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

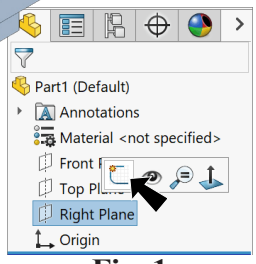


Fig. 1

Step 3. Click **Corner Rectangle** in the **Rectangle flyout** on the Sketch toolbar.

Step 4. Sketch a rectangle **above** Origin , **Fig. 2**.

Fig. 2

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

Step 6. **Ctrl click bottom line of rectangle** and the **Origin**. Release Ctrl key and click **Make Midpoint** on the context toolbar, **Fig. 3**.

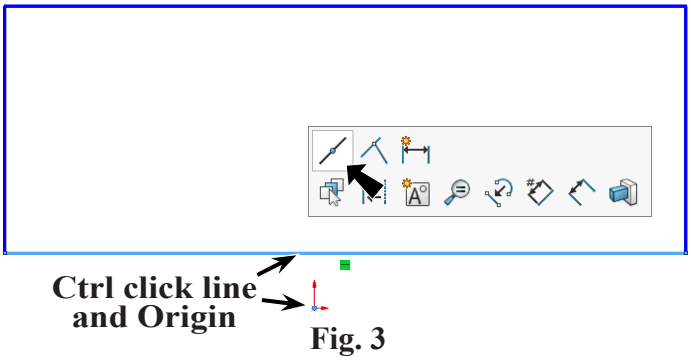


Fig. 3

Step 7. Click **Line** **(L)** on the Sketch toolbar.

Step 8. Sketch **4 horizontal lines across rectangle**. Double click to terminate the chain of lines, **Fig. 4**.

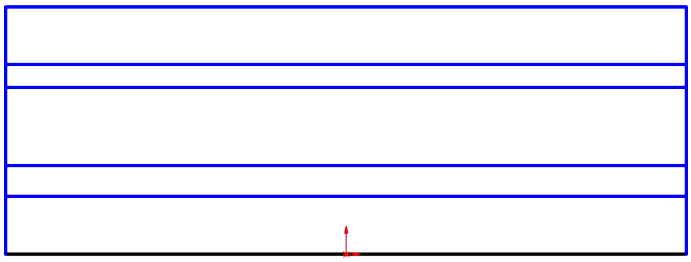


Fig. 4

Step 9. Sketch **4 vertical lines from second line from top line to bottom line**, **Fig. 5**.

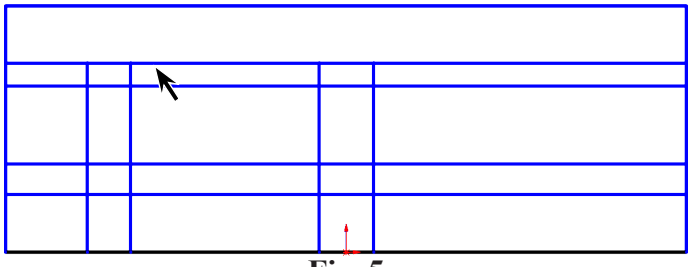


Fig. 5

1/2/23

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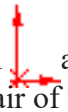
Step 10. Click **Centerline** in the **Line flyout** on the Sketch toolbar.

Step 11. Sketch **two vertical centerlines**.

One up from Origin  and another up between other pair of vertical lines, **Fig. 6**.

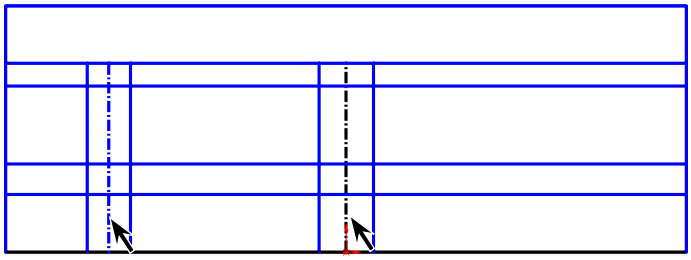


Fig. 6

Step 12. **Unselect Centerline tool**. To unselect, **right click graphics area and click Select** from menu.

Step 13. **Drag a selection to left across a pair of vertical lines**. Click **Make Symmetric** on the context toolbar, **Fig. 7**.

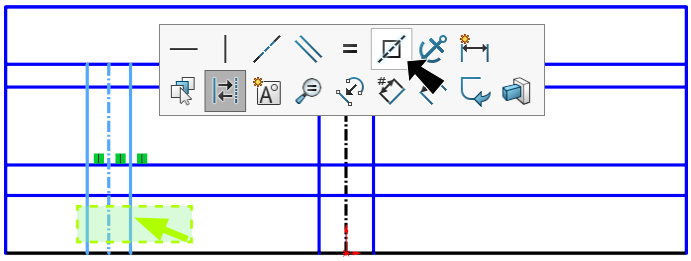


Fig. 7

Step 14. **Drag a selection other set of vertical lines at Origin** . Click **Make Symmetric** on the context toolbar, **Fig. 8**.

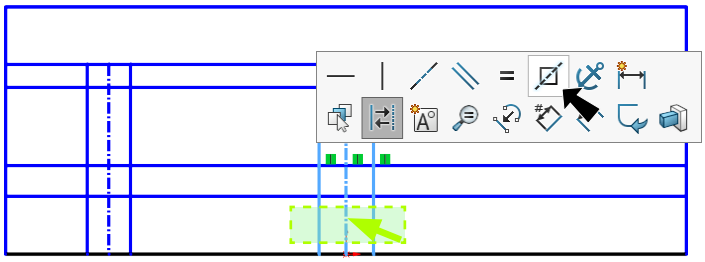


Fig. 8

Step 15. Click **Smart Dimension** **(S)** on the Sketch toolbar.

Step 16. Add dimensions, **Fig. 9**.

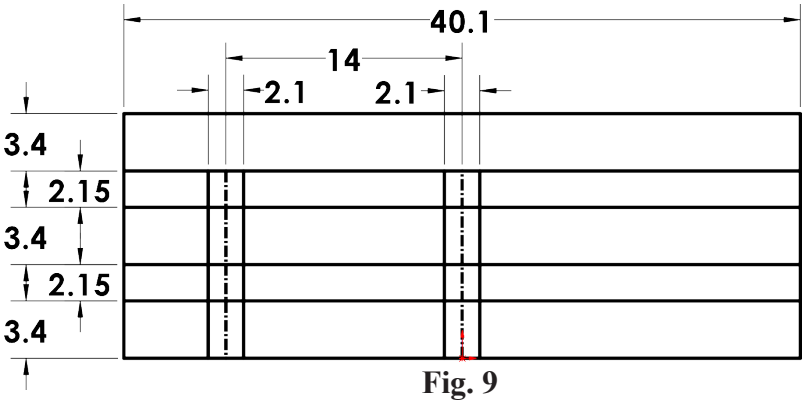


Fig. 9

Step 17. Click **Line** **(L)** on the Sketch toolbar.

Step 18. Sketch **3 lines off of left vertical post**, **Fig. 10**.

Step 19. **Unselect Line tool**. To unselect, **right click graphics area and click Select** from menu.

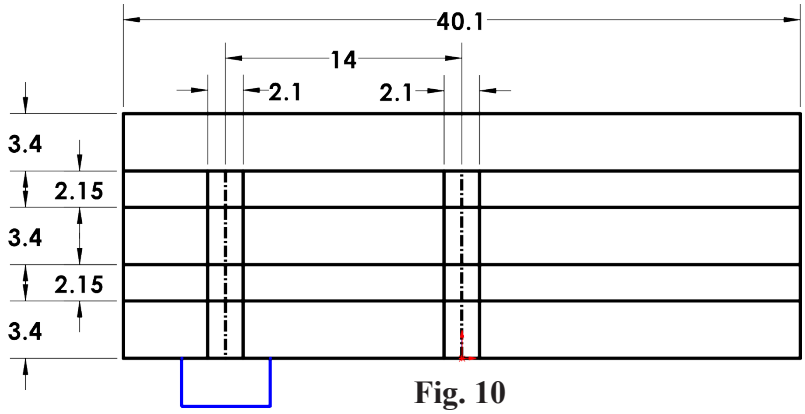


Fig. 10

Step 20. **Ctrl click both vertical lines and centerline** to select both. Release Ctrl key and click **Make Symmetric** on the context toolbar, **Fig. 11**.

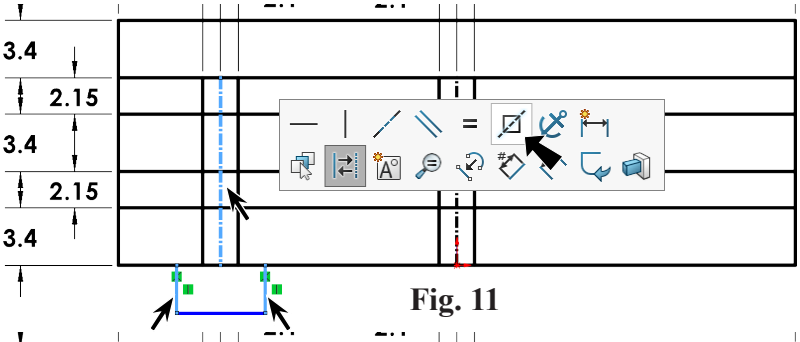


Fig. 11

Step 21. Click **Smart Dimension**

(S) on the Sketch toolbar.

Step 22. Add dimensions, **Fig. 12**.

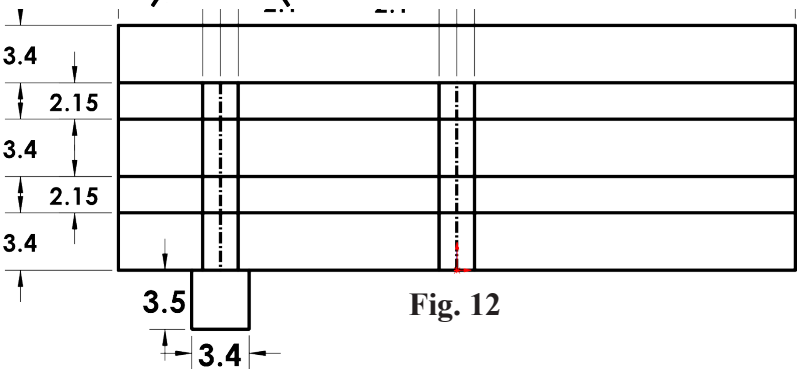


Fig. 12

Step 23. **Unselect Smart Dimension**. To unselect, **right click graphics area and click Select** from menu.

Step 24. Drag a **selection to right to select the left stake geometry**, **Fig. 13**

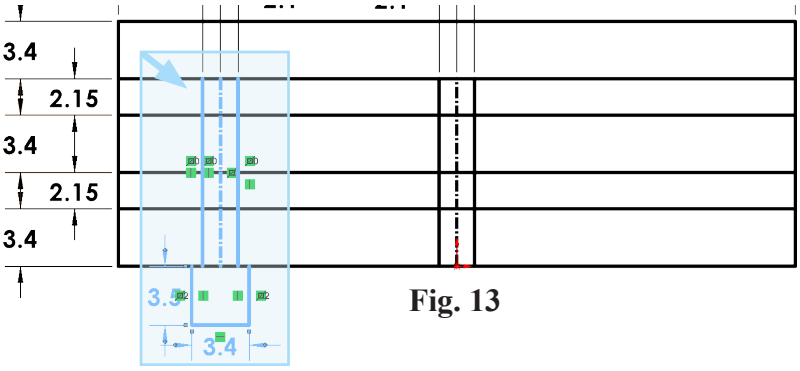


Fig. 13

Step 25. Then, **Ctrl click it's centerline to unselect**. Then, **Ctrl click centerline at Origin** to select, **Fig. 14**.

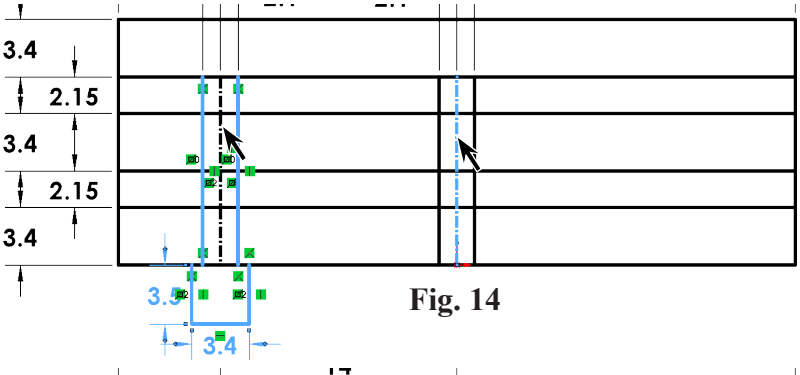
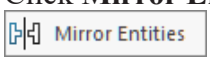


Fig. 14

Step 26. Click **Mirror Entities** 

on the Sketch toolbar, **Fig. 15**.

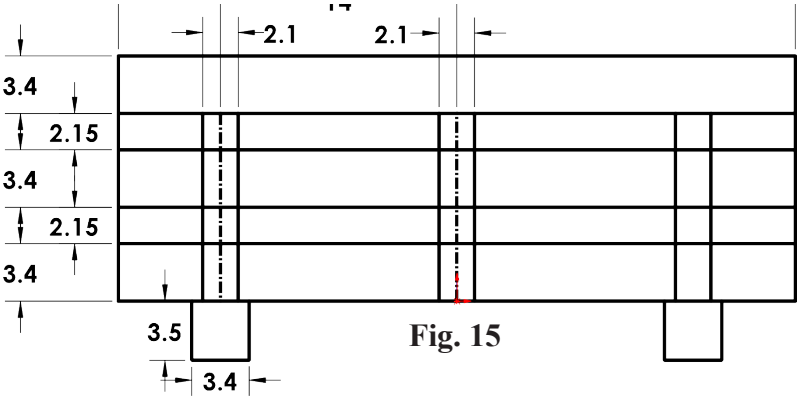


Fig. 15

Step 27. Click **Features** Features on the Command Manager toolbar.

Step 28. Click **Extruded Boss/Base** Extruded Boss/Base on the Features toolbar.

Step 29. In the Boss-Extrude Property Manager set:

under Direction 1, **Fig. 16**

End Condition **Blind**

Depth D1 **3**

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

under Selected Contours

click the **contours (21), Fig. 17**

Rotate view to **view bottom**. Use **Up Arrow key** **once** and **Right Arrow key** **once.**

click OK .

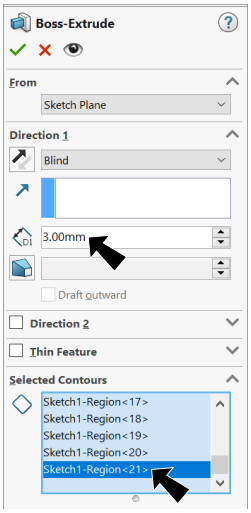


Fig. 16

B. Save as "REAR RAIL".

Step 1. Click File Menu > Save As.

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

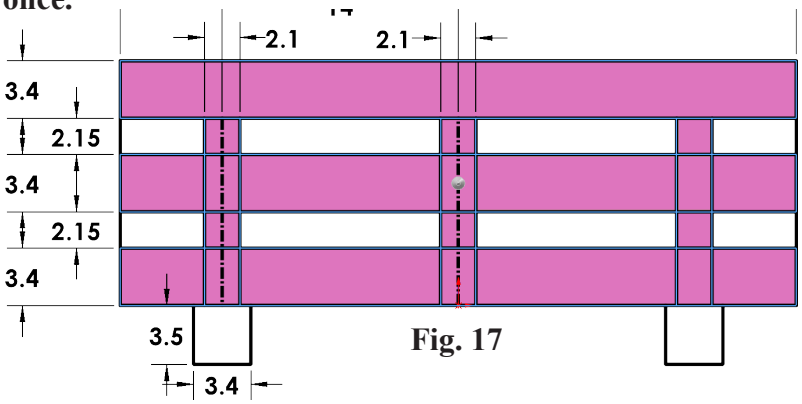


Fig. 17

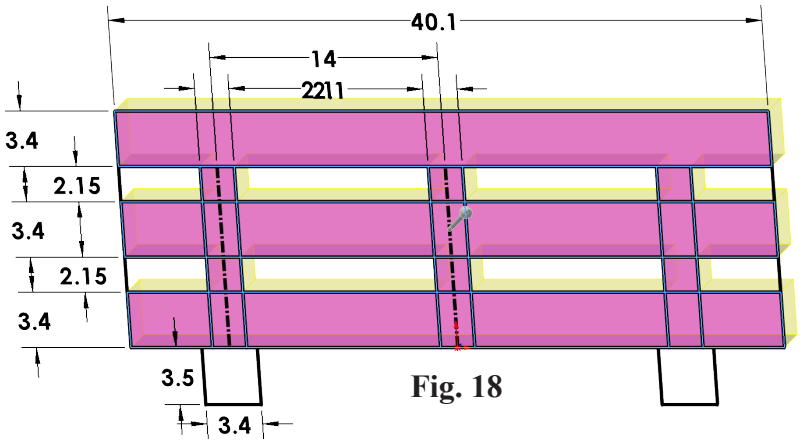


Fig. 18

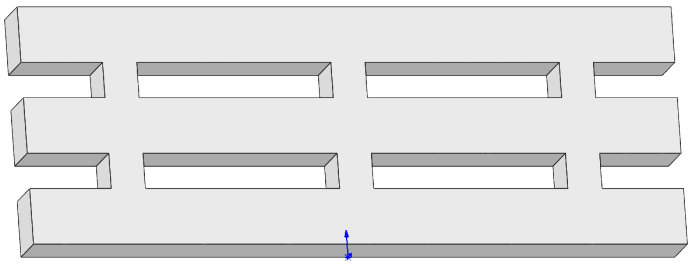


Fig. 19

C. Extrude2.

Step 1. Expand **Boss-Extrude1** in the Feature Manager and click rail sketch, **Sketch1** to select sketch, **Fig. 20**.

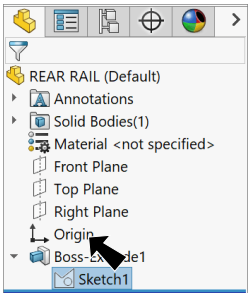
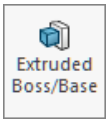


Fig. 20

Step 2. Click **Extruded Boss/Base** 

on the Features toolbar.

Step 3. In the Boss-Extrude Property Manager set:
under Direction 1, **Fig. 21**
End Condition **Blind**
Depth D1 **2.4**
under Selected Contours
click the **2 contours**, **Fig. 22**
click OK ✔ .

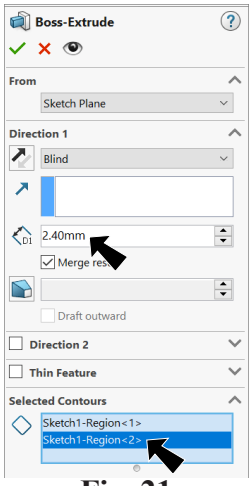


Fig. 21

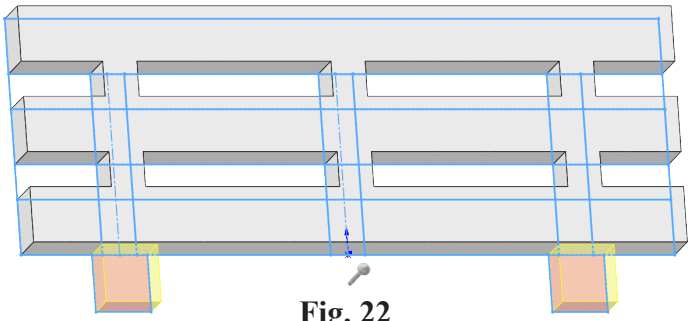


Fig. 22

D. Chamfers.

Step 1. Click **Chamfer**

on the Features toolbar.

Step 2. In the Chamfer Property Manager set:
under Chamfer Type, **Fig. 23**
select **Angle Distance**
under Chamfer Parameters
Distance D **.5**
Angle A **45°**
under Items To Chamfer
click **bottom face of both stakes**, **Fig. 24**
click OK ✔ .

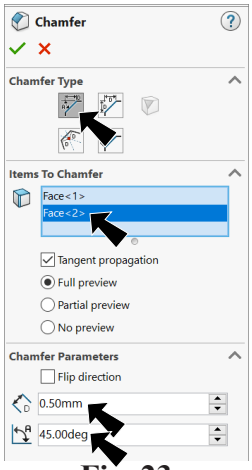


Fig. 23

Step 3. Save **(Ctrl-S)**.

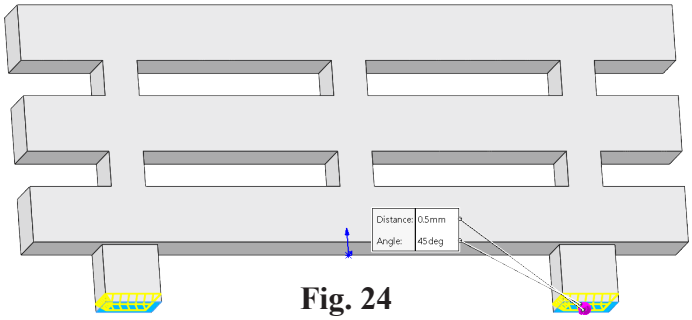


Fig. 24

L. Appearance: Blue Paint.

Step 1. Click the part to select part, click **Appearances Callout** on the context toolbar and click **REAR RAIL**, **Fig. 45**.

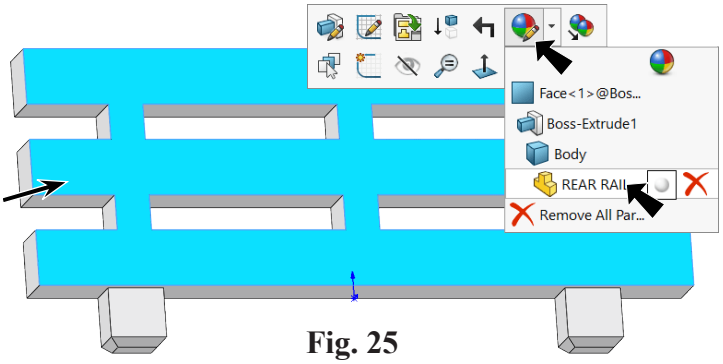


Fig. 25

Step 2. In the Appearances Task pane, expand **Painted**, click **Car** and in the lower pane select **gloss blue**, **Fig. 46**.

Step 3. In the Appearances Property Manager set:
under Color, **Fig. 47**
set **RGB values**
R 207
G 229
B 255
click OK .

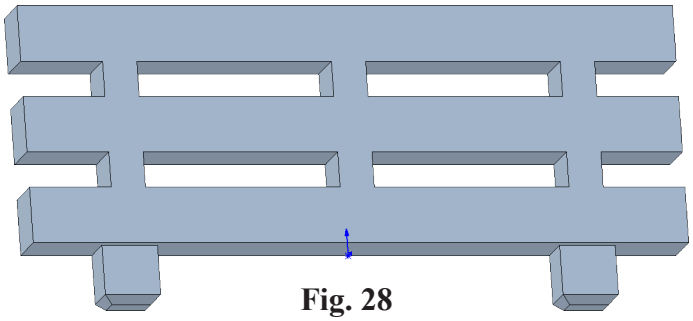


Fig. 28

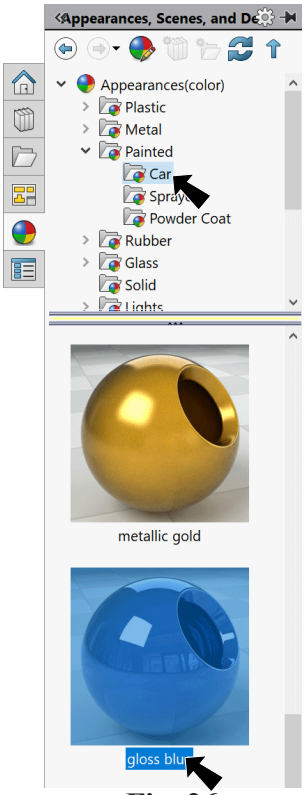


Fig. 26

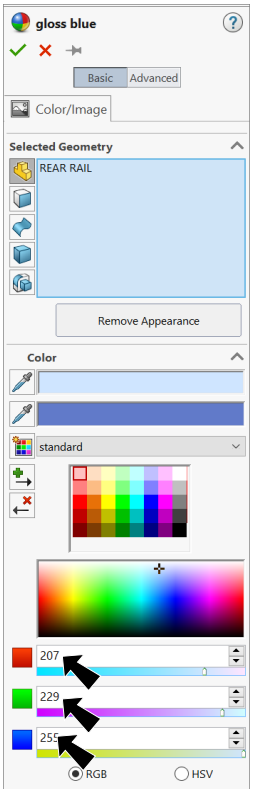


Fig. 27

F. Save As "SIDE RAIL".

Step 1. Save. Use **Ctrl-S** to save REAR RAIL.

Step 2. Click File Menu > Save As.

Step 3. Key-in **SIDE RAIL** for the filename and press ENTER.
You now have two Rail files, REAR and SIDE. Next, we lengthen SIDE RAIL.

G. Change Length.

Step 1. Click **Boss-Extrude1** in the Feature Manager and **Edit Sketch** in the content toolbar, **Fig. 29**.

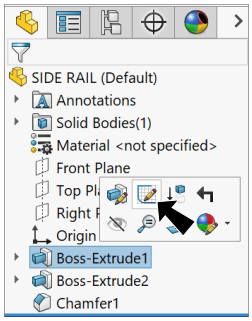


Fig. 29

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

Step 3. Change width dimension 40.1 to **50.1** and 14 to **16.4**, **Fig. 30**.

Step 4. Click **Exit Sketch** on the Sketch toolbar.

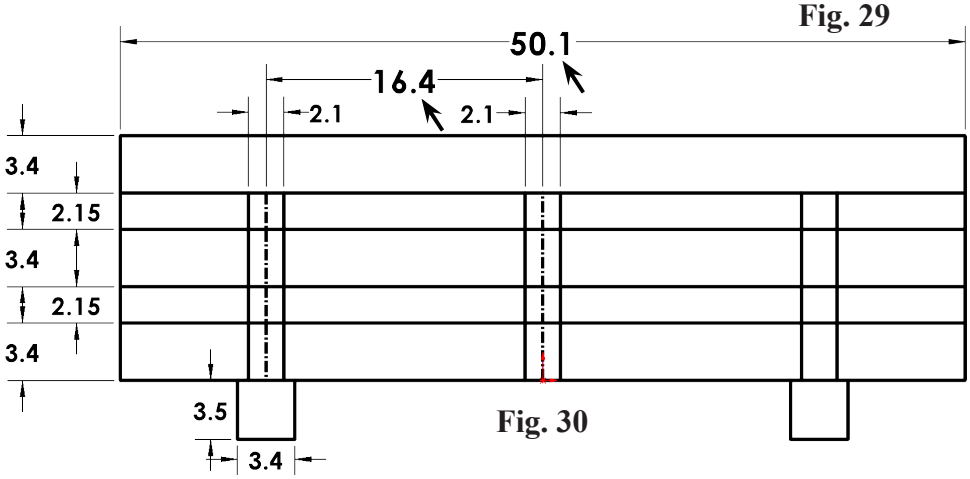


Fig. 30

Step 5. Save (**Ctrl-S**).

You should have 2 Rails:
REAR
SIDE

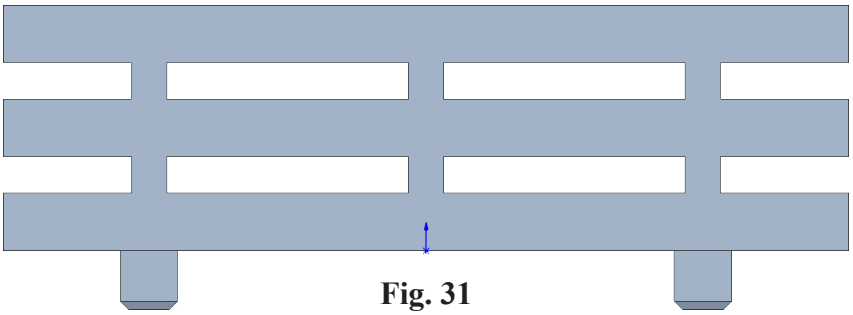


Fig. 31

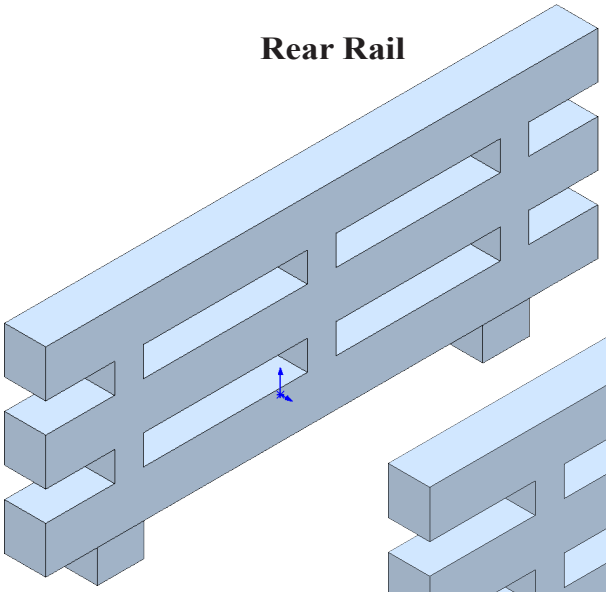


Fig. 32

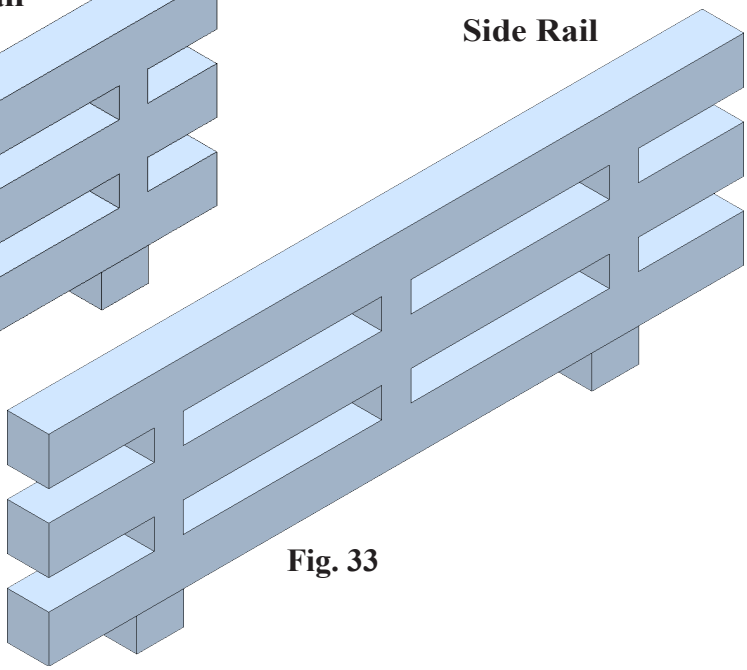


Fig. 33