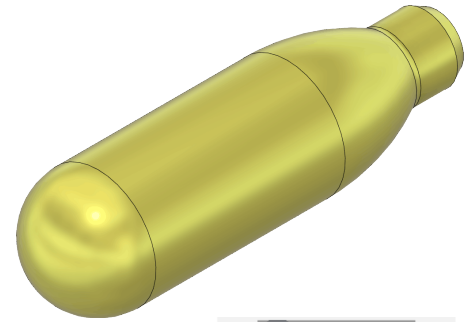




Rail Car Form Cartridge



A. New Metric Document.

Step 1. Confirm new document and **units** are mm, Fig. 1.

B. Sweep Path Sketch.

Step 1. On the Solid tab **SOLID** click **Create Sketch**  in the Sketch area of toolbar and click **Right plane**  in canvas.

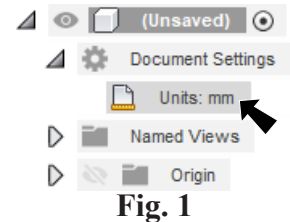


Fig. 1

Step 2. Click **Line**  (L) on the toolbar.

Step 3. Sketch **3 lines** starting at Origin , Fig. 2.

Step 4. Click Create Menu > Arc > **Center Point Arc** .

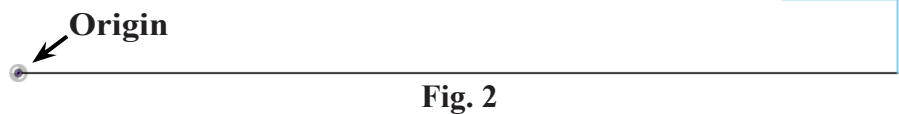


Fig. 2

Step 5. Click the bottom horizontal line close to the Origin to place the center of the arc. Click the Origin to start the first arc endpoint, then move cursor around clockwise to swing arc roughly 90 degrees. Click to place the second endpoint, Fig. 3.

Step 6. Click **Line**  (L) on the toolbar.

Step 7. Starting from the endpoint of the arc, sketch a horizontal line across the sketch, Fig. 4, then **click and drag** at the endpoint of the line, a tangent arc to endpoint of short horizontal line, Fig. 5.

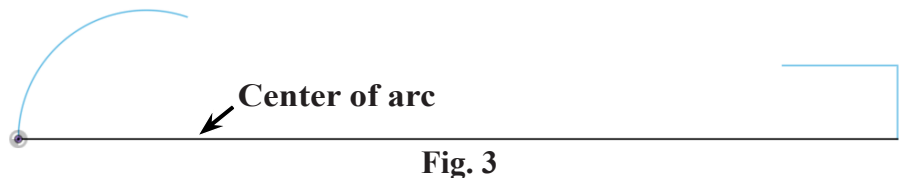


Fig. 3

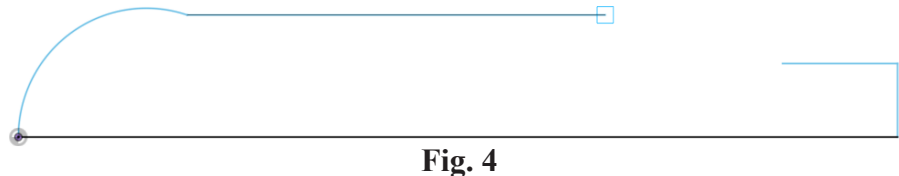


Fig. 4

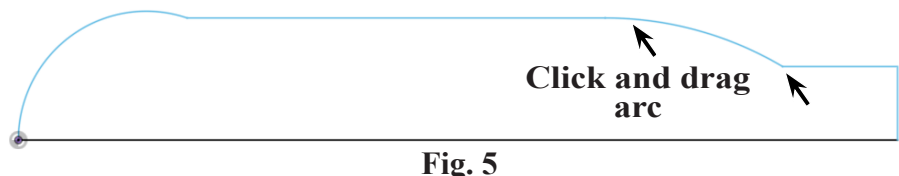


Fig. 5

Step 8. Click **Tangent**  in the Constraints area of toolbar and click **center point arc** and **horizontal line**, Fig. 6.

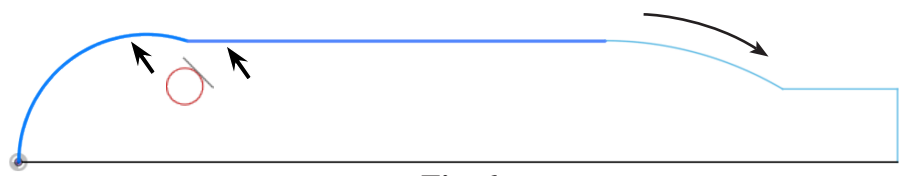
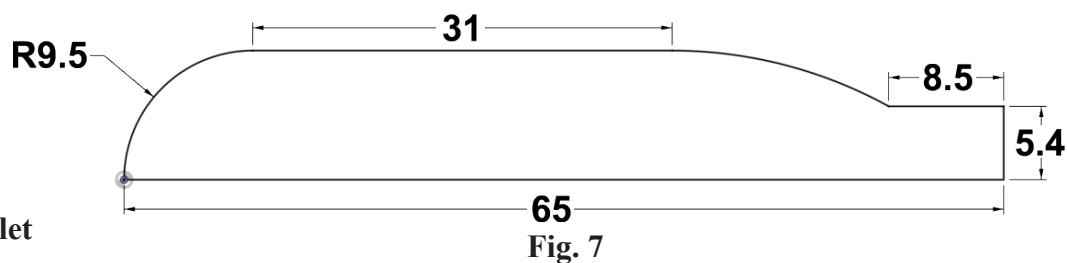


Fig. 6

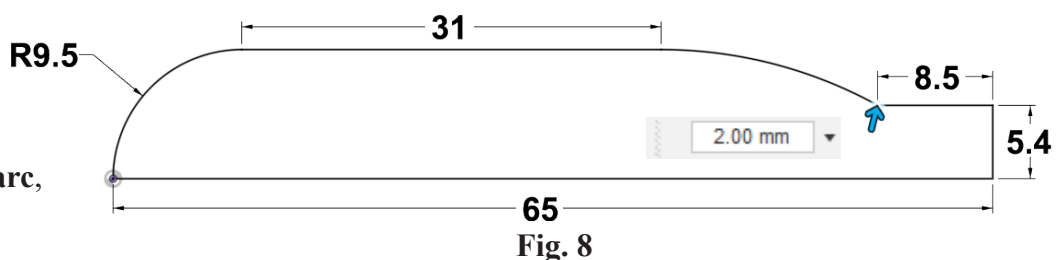
Step 9. Click **Dimension**  (D) on the toolbar.

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



Step 11. Click **Fillet**  in the Modify area of toolbar.

Step 12. Click **intersection point of line and arc**, **Fig. 8**
Key-in 2
Press ENTER to complete the command.



Step 13. On the Solid tab **SOLID** click **Revolve** .

Step 14. In the Revolve panel set, **Fig. 9**
Axis click **bottom horizontal line**, **Fig. 10**
click OK.

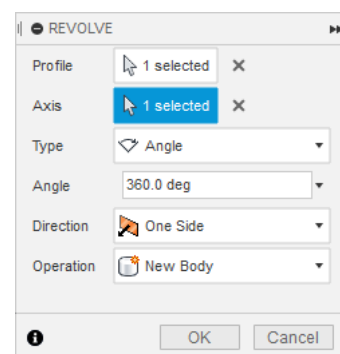


Fig. 9

C. Save as "CARTRIDGE".

Step 1. Click File Menu > Save.

Step 2. In the Save dialog box:
Key-in **CARTRIDGE** for filename
click Save.

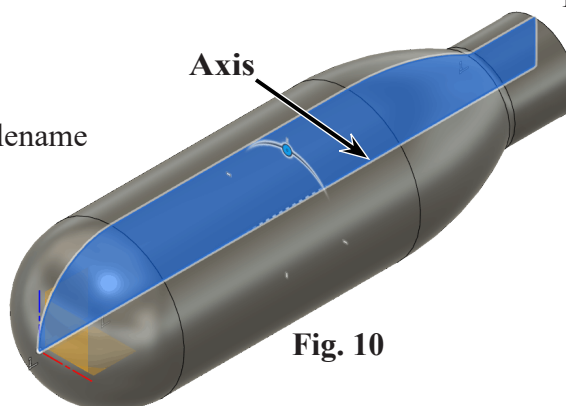


Fig. 10

D. Chamfer.

Step 1. On the Solid tab **SOLID** click Modify Menu > Chamfer .

Step 2. In the Chamfer panel set, **Fig. 11**
 Edges click **rear edge**, **Fig. 12**
 Chamfer Type **Two distances** 
 Distance1 **1**
 Distance2 **2**
 click OK.

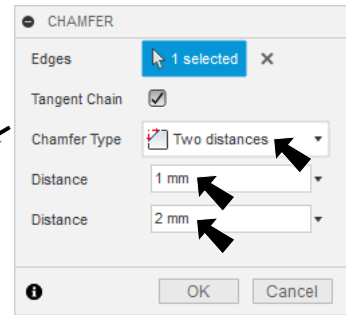


Fig. 11

E. Shell.

Step 1. Switch Visible Style to **Wireframe (Ctrl-7)**. To switch to Wireframe, click the Display Settings  pull-down in the Navigation Bar at the bottom of the canvas and select **Visual Style > Wireframe**, **Fig. 13**.

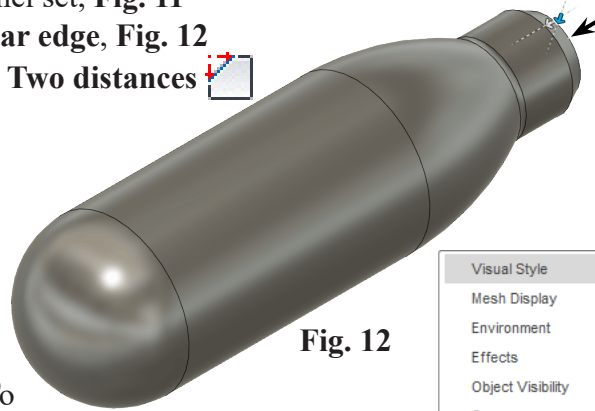


Fig. 12

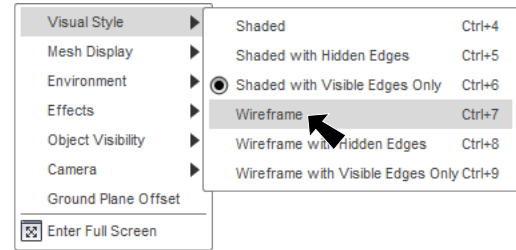


Fig. 13

Step 2. On the Solid tab **SOLID** click Shell .

Step 3. In the Shell panel set:
 Faces/Body **drag a selection across body**, **Fig. 15**
 Inside Thickness **1.25**
 Direction **Inside**
 click OK.

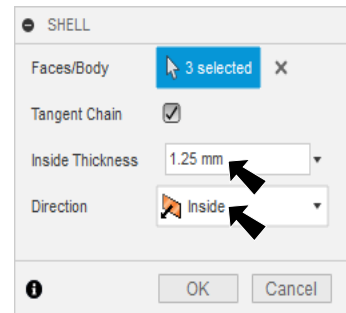


Fig. 14

Step 4. Switch Visible Style to **Shaded with visible Edges Only (Ctrl-6)**. To switch, click the Display Settings  pull-down in the Navigation Bar at the bottom of the canvas and select **Visual Style > Shaded with visible Edges Only**, **Fig. 17**.

Step 5. Save. **Ctrl-S** and press **ENTER**.

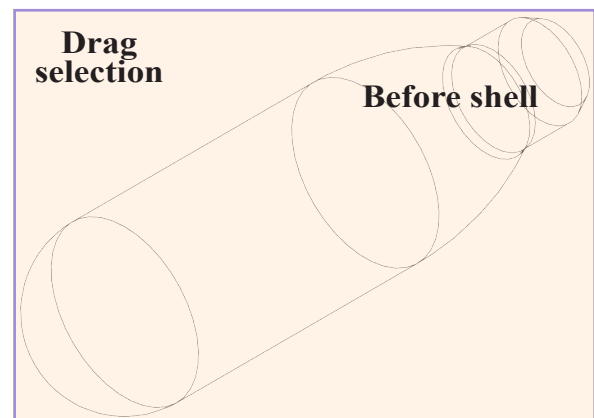


Fig. 15

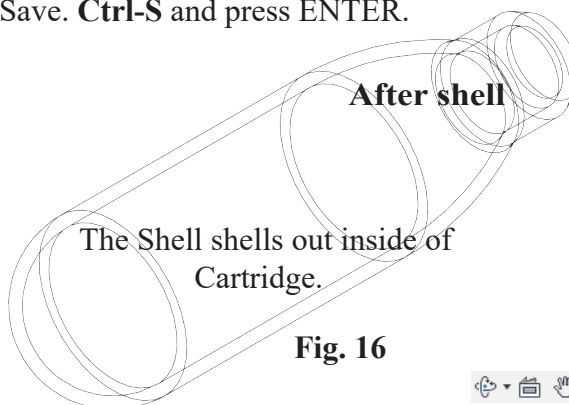


Fig. 16

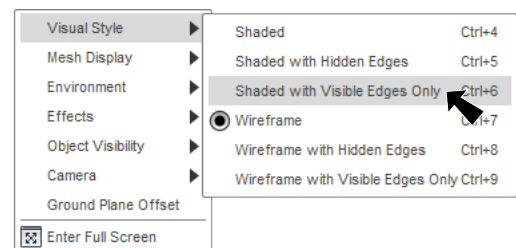


Fig. 17

F. Material Stainless Steel.

Step 1. On the Solid tab **SOLID** click Modify Menu > Physical Material.

Step 2. In the Physical Material Panel:
under Library, **Fig. 18**.
expand **Metal**
scroll down to
Steel AISI 1522 304 HR
and drag onto the body.
Close panel.

G. Appearance.

Step 1. Display the Appearance  panel, use A key.

Step 2. In the Appearance Panel:
under In This Design, **Fig. 19**.
double click the Steel appearance.

Step 3. In the Material Editor:
set **RGB values**, **Fig. 20**.
R 255
G 255
B 128
click **Done**.

Step 4. In the Appearance Panel:
click **Close**.

Step 5. Save. Use **Ctrl-S**
and press ENTER.

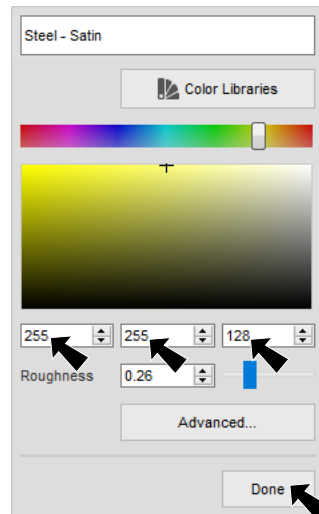


Fig. 20

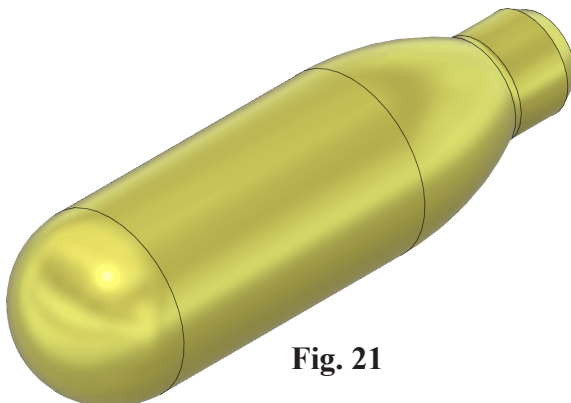


Fig. 21

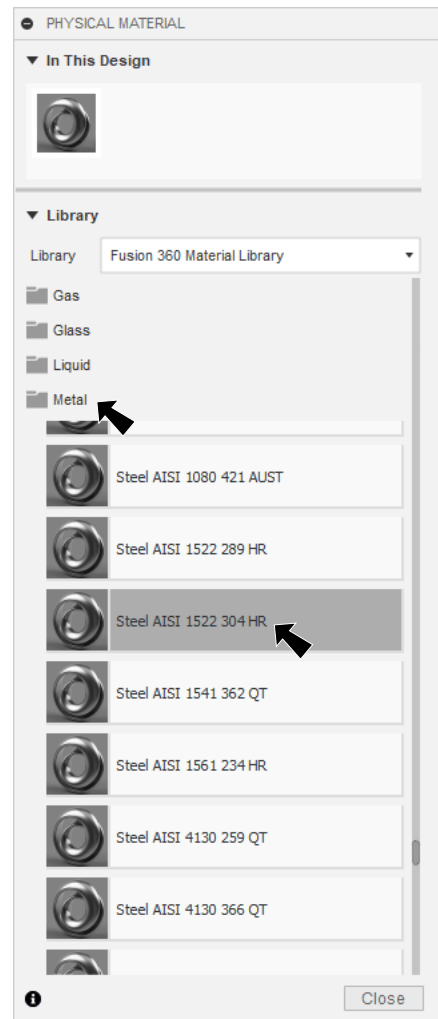


Fig. 18

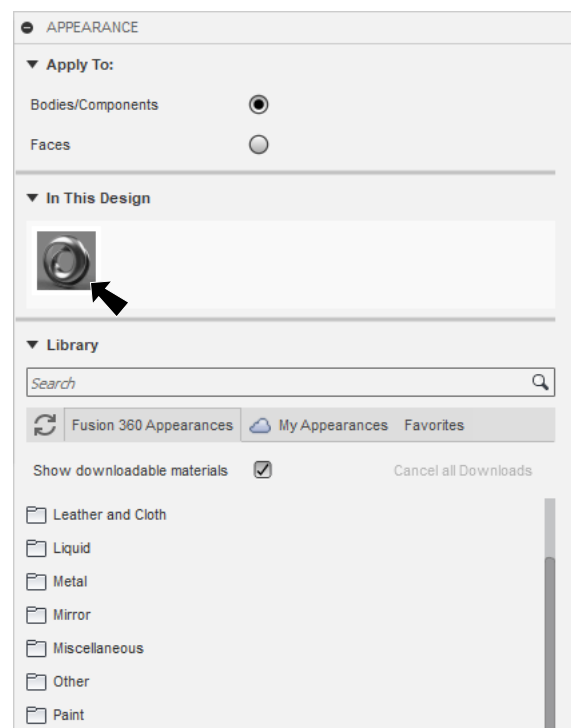


Fig. 19

H. Open Body Rail Form File, Insert Cartridge and Add Joint.

Step 1. Open your **BODY RAIL FORM** file.

Step 2. Open Data Panel .

Step 3. Drag **Cartridge** from Data Panel onto the canvas, **Fig. 22**.

Step 4. On the Solid tab **SOLID** click **Joint**  (J) in the Assembly area of toolbar.

Step 5. Click **cylindrical front edge of the Cartridge for Joint Origin**  and **cylindrical front edge of cartridge hole in Body for Joint Origin** , **Fig. 23**.

Step 6. Click **Right** on View Cube .

Step 7. Switch to **Wireframe** use **Ctrl-7**.

Step 8. Click **Horizontal Manipulator** , **Fig. 24** and drag **-10 mm**, **Fig. 25**.

Step 9. In the Joint panel set **Rigid**  click OK.

Step 10. Switch to **Shaded with visible Edges Only**, use **Ctrl-6**.

Step 11. Save. **Ctrl-S** and press **ENTER**.



Fig. 22

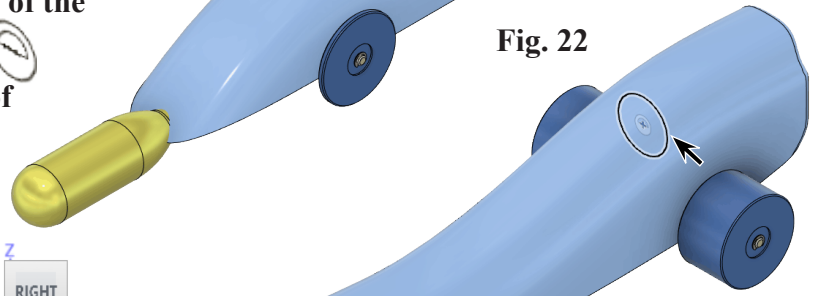


Fig. 23

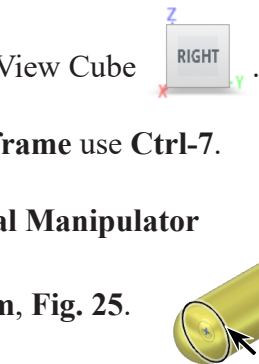


Fig. 24

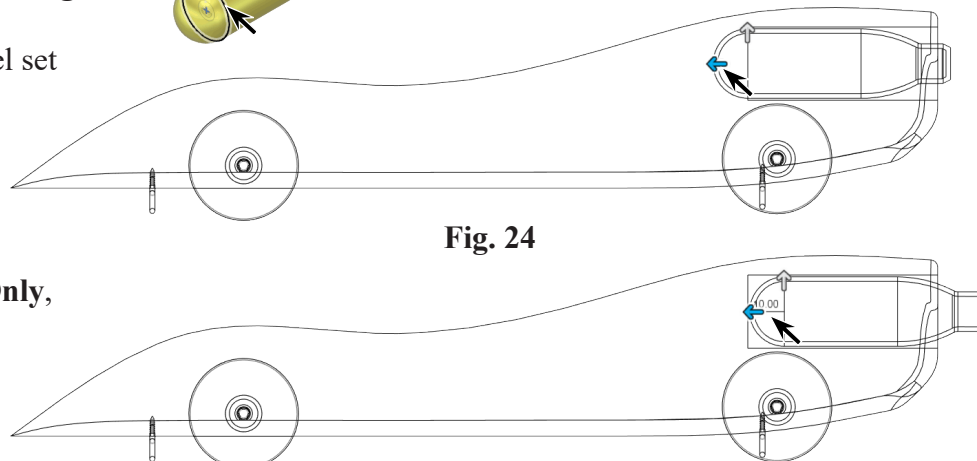


Fig. 25

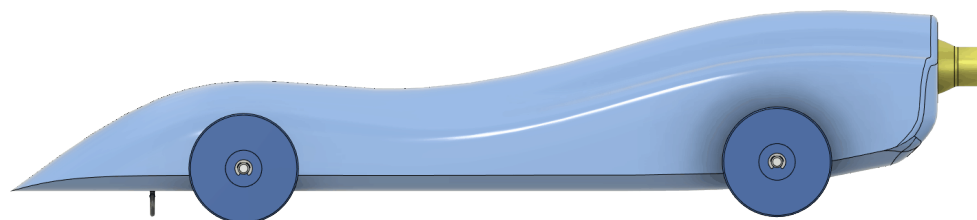


Fig. 26