



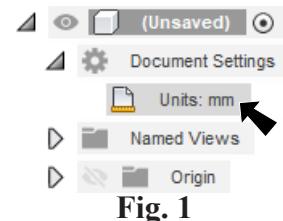
Chapter 11

CO2 Rail Car Form E Clip



A. New Metric Document.

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



B. Sketch Circles.

Step 1. On the Solid tab **SOLID** click Create Sketch in the Sketch area of toolbar and click **Right plane** in canvas, Fig. 2.



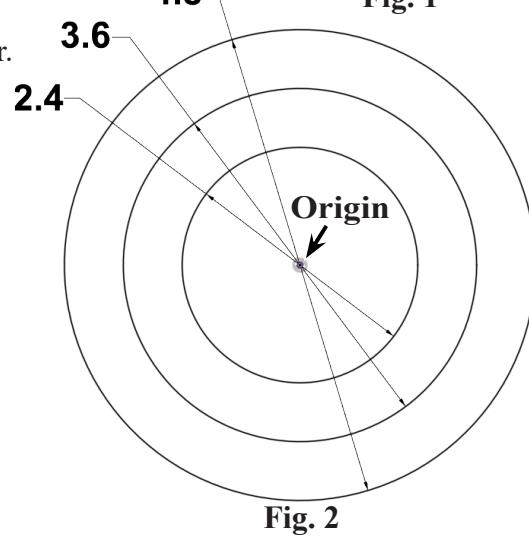
Step 2. Click **Center Diameter Circle** (C) in toolbar.

Step 3. Sketch **three circles** at the Origin , Fig. 18.

Step 4. Click **Dimension** (D) on the toolbar.

Step 5. Dimension diameters, Fig. 2.

Step 6. Click **Fit** (F6) on the Navigation Bar.



C. Add Lines.

Step 1. Click **Line** (L) on the toolbar.

Step 2. Starting from the Origin sketch **two radii** out to the middle circle, keep **one horizontal** (1) and the other **at angle** (2). Sketch a vertical radii to outer circle (3). Sketch a line at angle from endpoint of radii to outer circle (4), Fig. 3.

Step 3. Click **Dimension** (D) on the toolbar.

Step 4. Dimension angles 70° and 8° , Fig. 4.

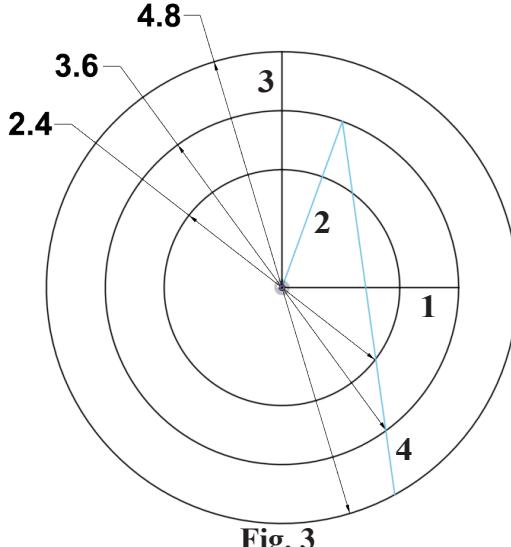


Fig. 3

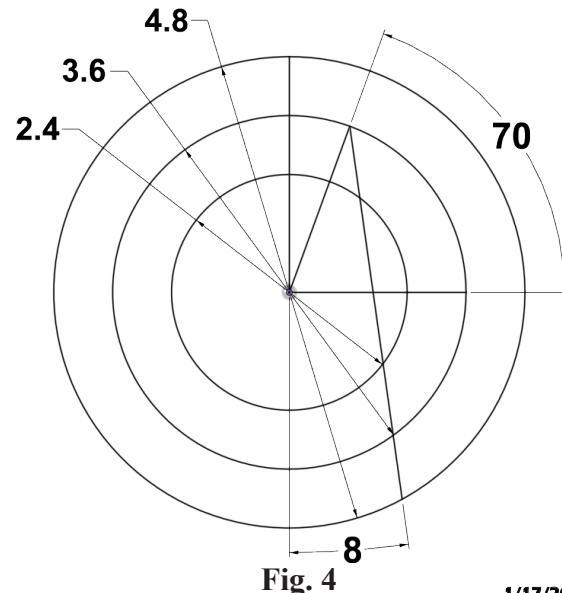


Fig. 4

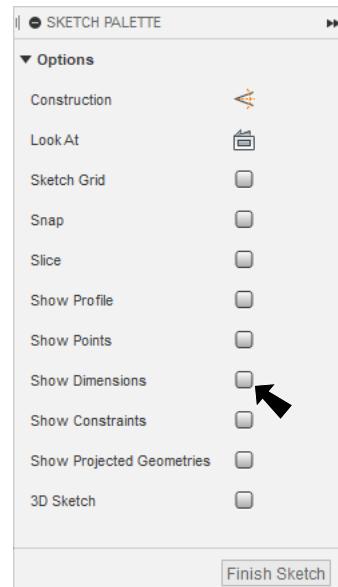
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D. Save as "E CLIP".

Step 1. Click File Menu > Save.

Step 2. In the Save dialog box:

Key-in **E CLIP** for filename
click Save.



E. Trim.

Step 1. **Hide dimensions** in the Sketch Palette, Fig. 5.

Step 2. On the Sketch tab **SKETCH** click **Trim** (T) in the Modify area of toolbar.

Step 3. Trim:

Circles left of centerline 1, 2, 3 (click to trim), Fig. 6

two arcs segments 4 and 5

results shown in Fig. 7.

Fig. 5

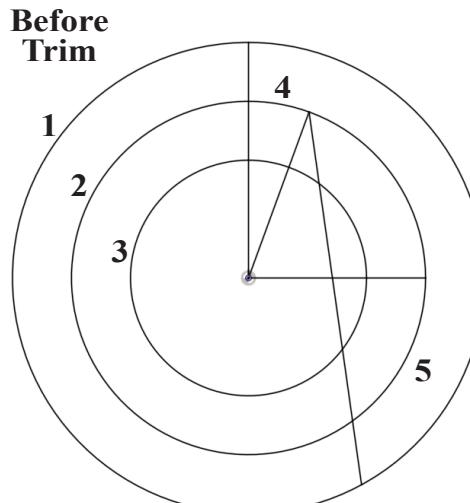


Fig. 6

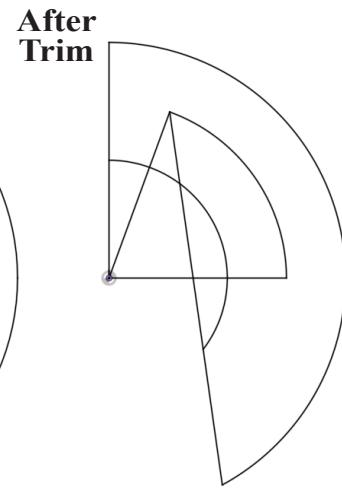


Fig. 7

F. Sketch Fillets.

Step 1. On the Sketch tab **SKETCH** click **Fillet** in the Modify area of toolbar.

Step 2. Click line and arc at **top of middle arc segment**, Fig. 8

Key-in .3

Click intersection point at **bottom of middle arc segment**, Fig. 9

Key-in .3

Click intersection point at **bottom of outside arc**, Fig. 10

Key-in .35

Press ENTER to complete the command

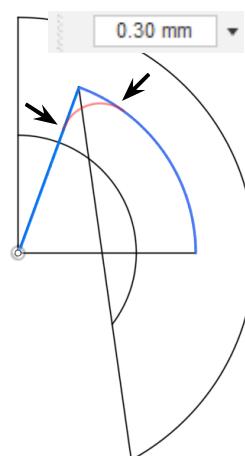


Fig. 8

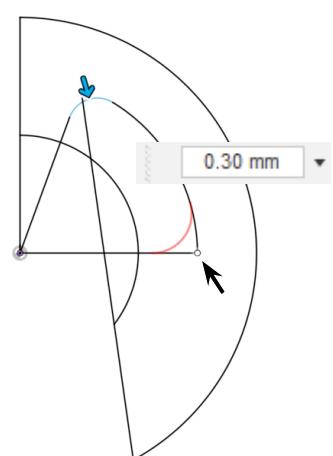


Fig. 9



Fig. 10

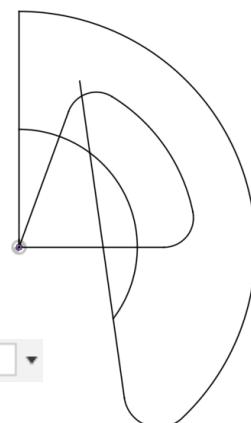


Fig. 11

G. Mirror.

Step 1. Click **Mirror**  on the toolbar.

Step 2. In the Mirror panel set, Fig. 12

Objects click **all geometry except vertical centerline**, Fig. 13
confirm **9 selected**

Mirror Line click **Mirror Line Select button**
click **centerline**, Fig. 14
click OK.

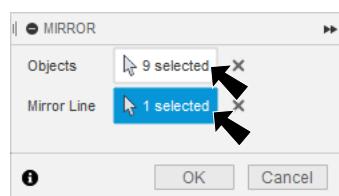


Fig. 12

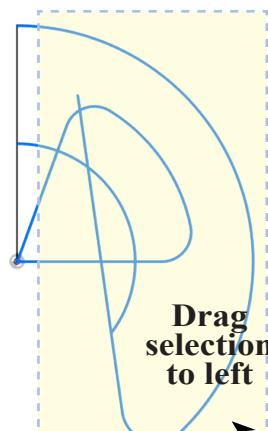


Fig. 13

Tip: Drag a selection window from bottom right up crossing all but centerline

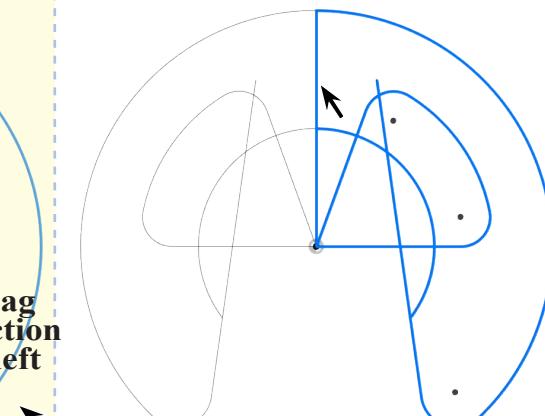


Fig. 14

H. Extrude.

Step 1. Show Profile in the Sketch Palette, Fig. 15.

Step 2. Click Home  (Isometric) on View Cube



Step 3. On the Solid tab **SOLID** click Extrude  (E).

Step 4. In the Extrude panel set, Fig. 16

Select 2 profiles, Fig. 17

Start **Profile Plane**

Direction **Symmetric** 

Measurement **Whole Length** 

Distance **.25**

click OK.

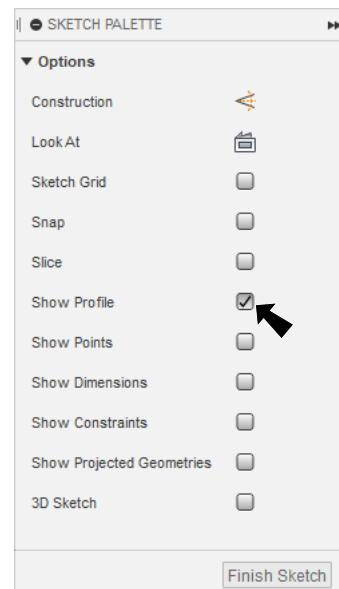


Fig. 15

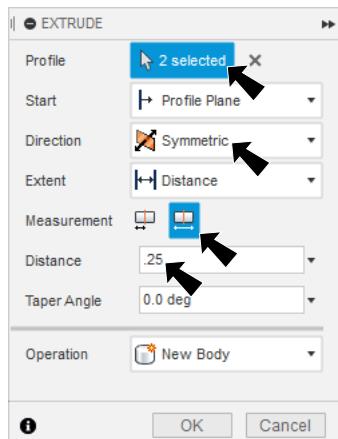


Fig. 16

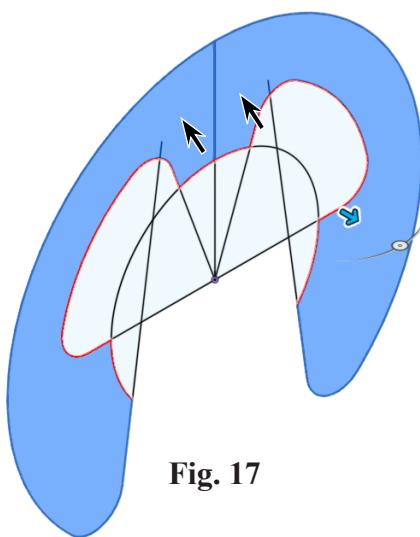


Fig. 17

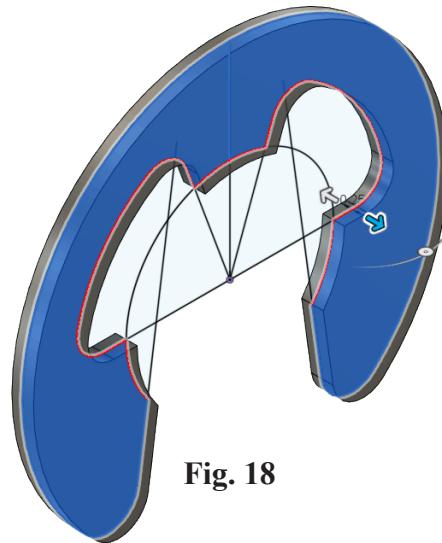


Fig. 18

I. 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. 19**.

expand Metal

scroll down to Stainless Steel 316L and drag onto the body.

Close panel.

Step 3. Save. Ctrl-S and press ENTER.

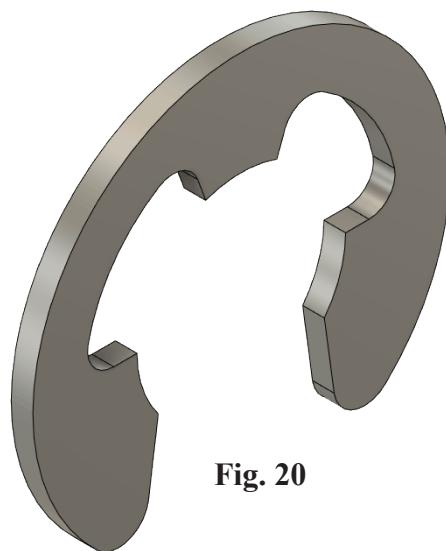


Fig. 20

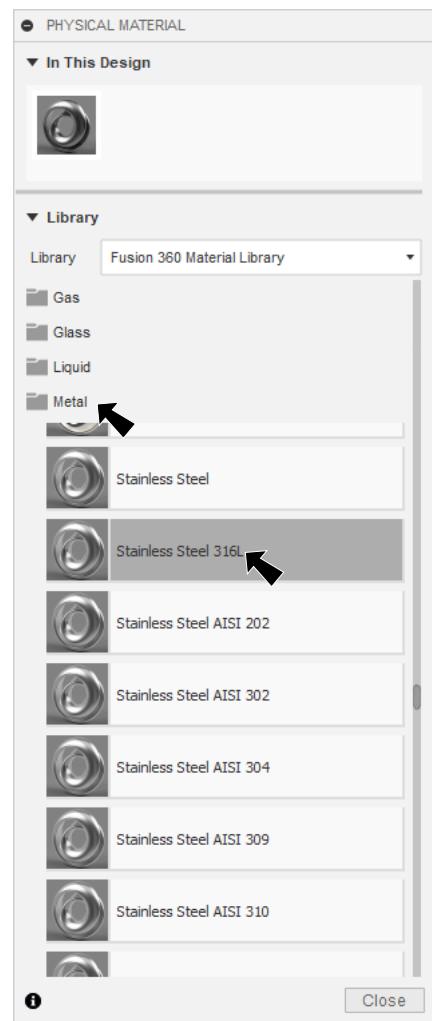


Fig. 19