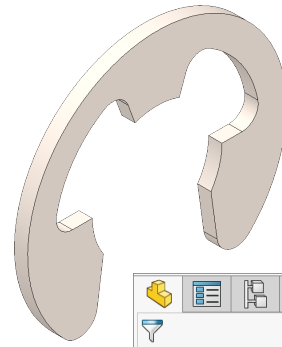





# CO2 Rail Car E E-Clip



## A. Sketch Circles.

- 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**.
- Step 3. Click **Circle**  (S) on the Sketch toolbar.

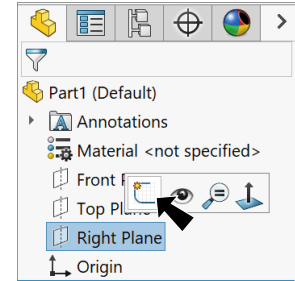



Fig. 1

- Step 4. Sketch **three circles** coincident at Origin , **Fig. 2**.

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

- Step 6. Dimension diameters, **Fig. 2**.

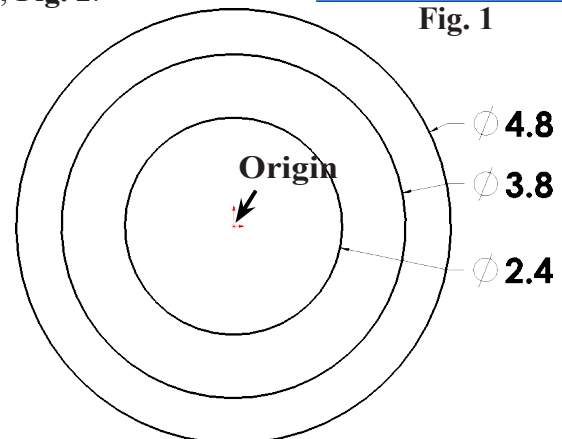



Fig. 2

## B. Add Lines.

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

- Step 2. Starting from the Origin  sketch **two radii** out to the middle circle, keep **one horizontal** and the other **at angle**. Sketch a vertical radii to outer circle. Sketch a line at angle from endpoint of radii to outer circle, **Fig. 3**. To terminate chain, double click back on the line you have just sketched.

- Step 3. Click **Smart Dimension**  (S) on the Sketch toolbar.

- Step 4. Dimension angles **70°** and **8°**, **Fig. 3**.

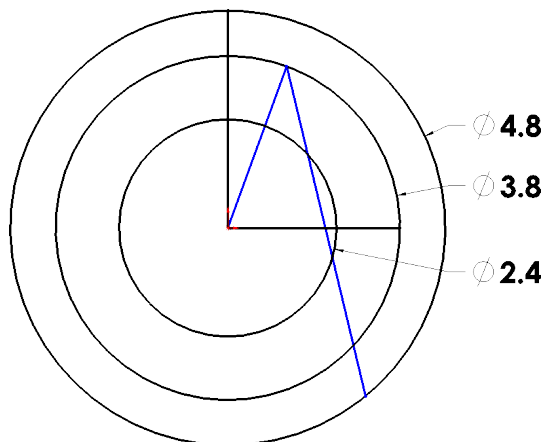


Fig. 3

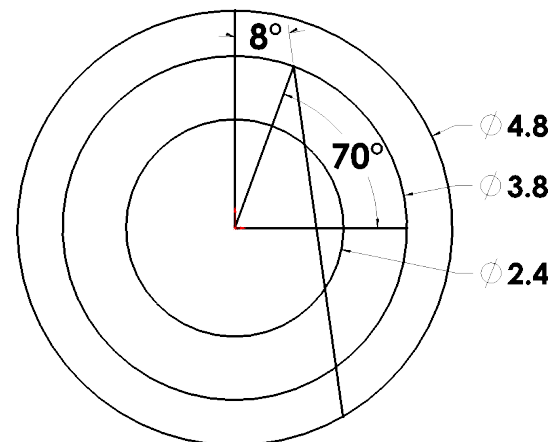


Fig. 4

### C. Save as "E CLIP".


Step 1. Click File Menu > Save As.

Step 2. Key-in E CLIP for the filename and press ENTER.

### D. Trim 1.

Step 1. Click **Trim Entities**  (S) on the Sketch toolbar.

Step 2. In the Trim Property Manger:

select **Trim to closest** , Fig. 5  
click arcs to trim, Fig. 6  
results shown in Fig. 7.

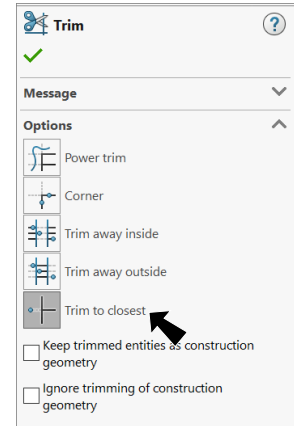


Fig. 5

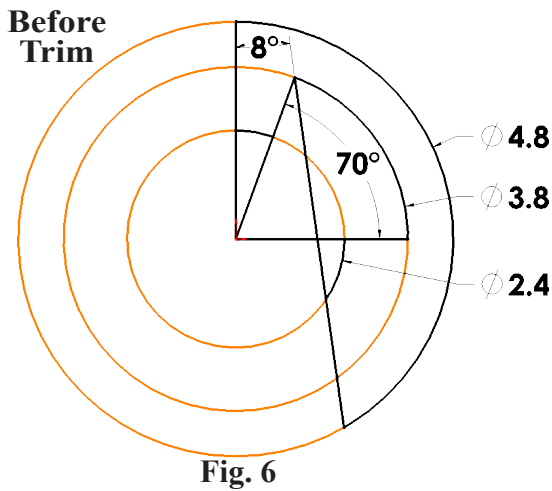


Fig. 6

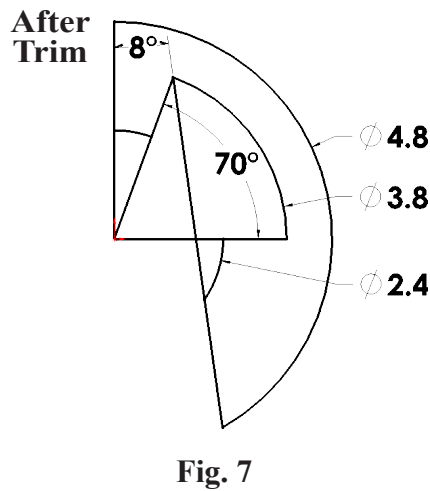


Fig. 7

### E. Trim 2 Keep Construction Geometry.

Step 1. In the Trim Property Manger:

check **Keep trimmed entities as construction geometry**, Fig. 8  
click lines to convert to construction lines, Fig. 9  
results shown in Fig. 10.

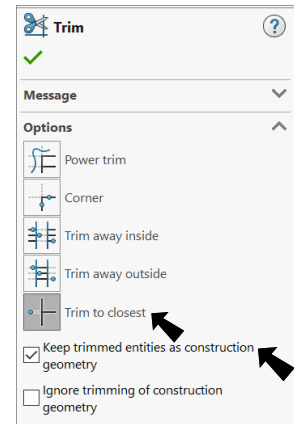


Fig. 8

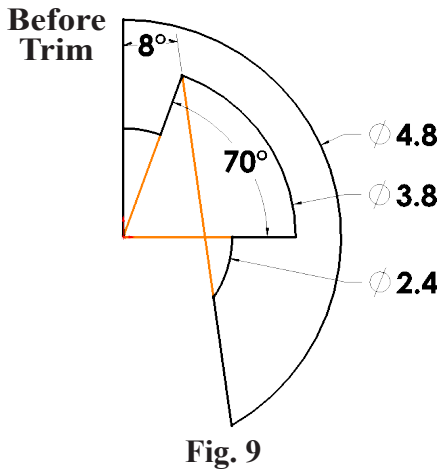


Fig. 9

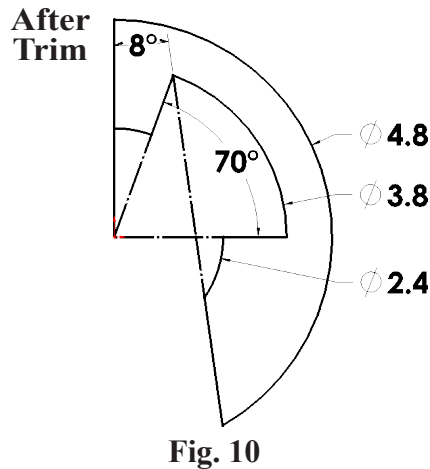






Fig. 10

## F. Sketch Fillets.

Step 1. Click **Sketch Fillet**  on the Sketch toolbar.

Step 2. In the Sketch Fillet Property Manager set: under Fillet Parameters, **Fig. 11**

**Radius**  **.3**  
 click **top two corners**, **Fig. 12**  
 click OK 

**Radius**  **.35**, **Fig. 13**  
 click **bottom corner**, **Fig. 14**  
 click OK  twice.

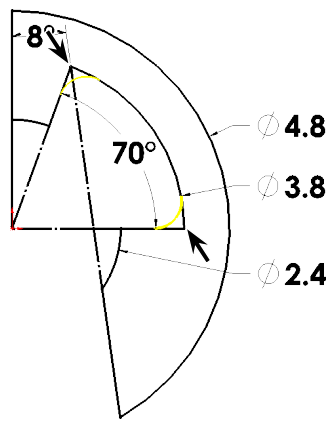


Fig. 12

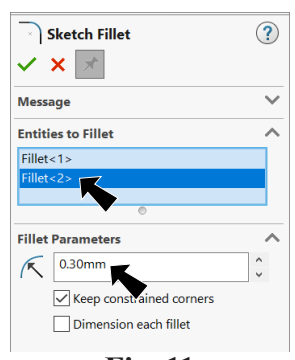


Fig. 11

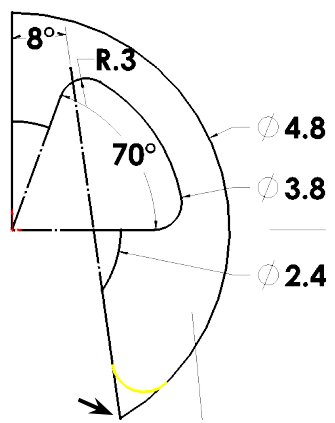


Fig. 14

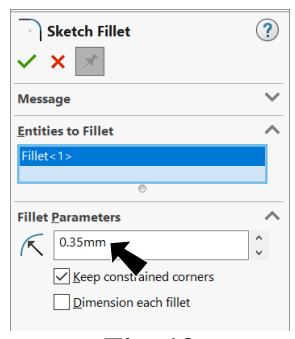



Fig. 13

## G. Vertical Centerline.

Step 1. Click **vertical radii** and click **Construction Geometry**  on the context toolbar, **Fig. 15**.

Step 2. Save  (Ctrl-S).

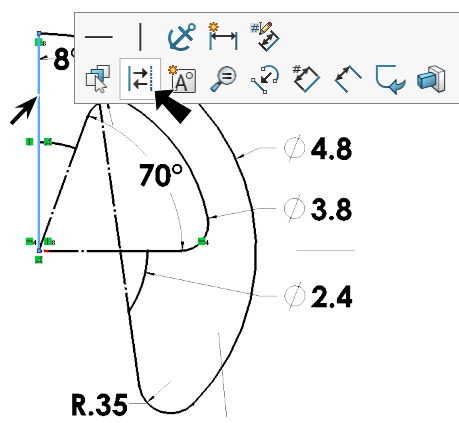


Fig. 15

## H. Mirror.

Step 1. Right click an arc of the sketch and click **Select Chain** from the menu, Fig. 16.

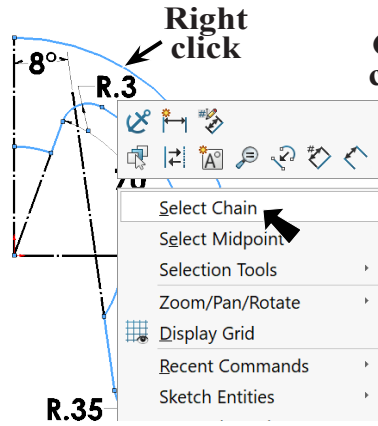


Fig. 16

Step 2. Ctrl click vertical centerlines to add to selection, Fig. 17.

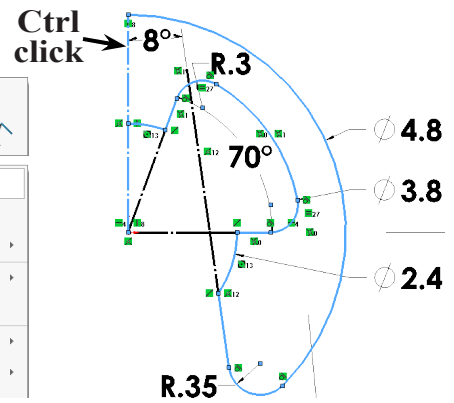



Fig. 17

Step 3. Click **Mirror Entities**  **Mirror Entities** on the Sketch toolbar, Fig. 18.

Step 3. Save  (Ctrl-S).

## J. Extrude.

Step 1. Click **Features**  on the Command Manager toolbar.

Step 2. Click **Extruded Boss/Base**  on the Features toolbar.

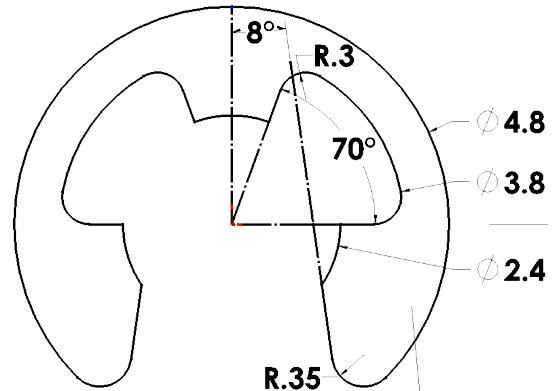


Fig. 18

Step 3. In the Boss- Extrude Property Manager set:  
under Direction 1, Fig. 19

End Condition **Mid Plane**

Depth  **.25**

click OK .

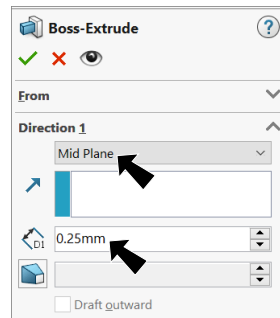


Fig. 19

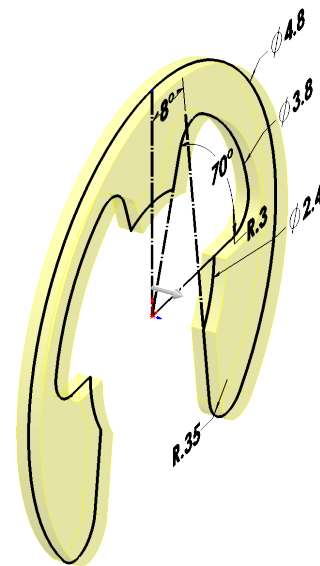
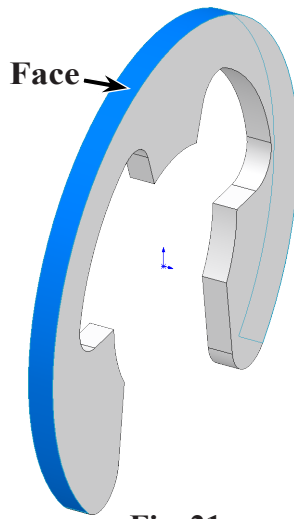
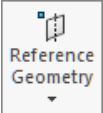


Fig. 20

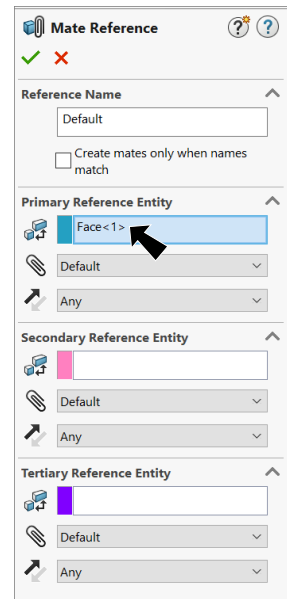
## K. Mate Reference.

Step 1. Click a cylindrical face to select it, Fig. 21.



Step 2. Click **Reference Geometry**  on the Features toolbar and **Mate Reference** from the menu.

Step 3. In the Mate Reference Property Manager click OK  , Fig. 22.



## L. Material Stainless Steel.

Step 1. Right click **Material**  in the Feature Manager and click **Edit Material**.

Step 2. Expand **Steel** in the material tree and select **AISI 316 Stainless Steel Sheet**. Click **Apply** and **Close**.

Step 3. Save  (Ctrl-S).

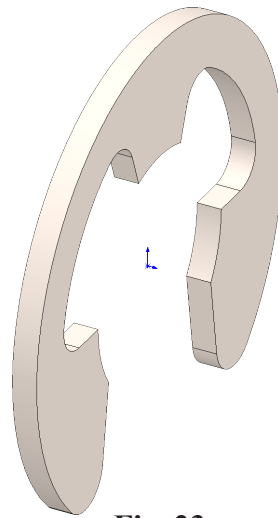


Fig. 22

Fig. 23