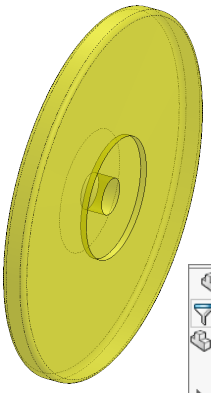
Chapter 3

CO2 Rail Car E
Front Wheel



A. Sketch.

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

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

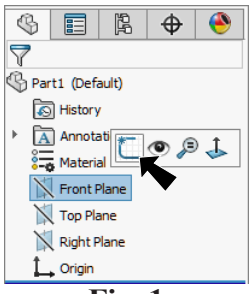


Fig. 1

Step 3. Click **Centerline** in the **Line flyout** on the Sketch toolbar.

Step 4. Draw a centerline up from the Origin, **Fig. 2**.

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

Step 6. Dimension centerline **15**, **Fig. 2**.

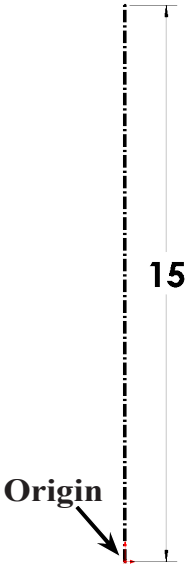


Fig. 2

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

Step 8. Draw **4 lines**, **Fig. 3**.

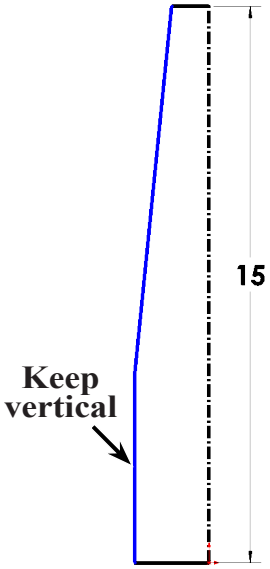


Fig. 3

Step 9. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 10. Add dimensions, **Fig. 4**. First, dimension the vertical line **5** and across the width **1**. Dimension the angle **181° degrees** between the vertical line and angled line. To Smart dimension the angle, click both lines, then move the cursor outside the angle and click. Key-in **181** for the dimension and press ENTER.

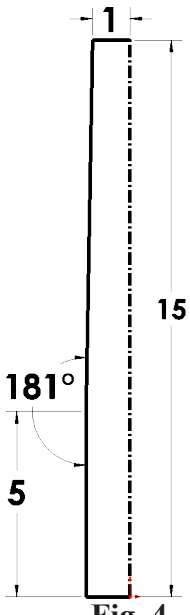


Fig. 4

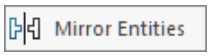
B. Save as "FRONT WHEEL".

Step 1. Click File Menu > Save As.

Step 2. Key-in **FRONT WHEEL** for the filename and press ENTER.

C. Mirror Sketch.

Step 1. **Drag selection around the sketch** to select all entities, **Fig. 5**. To drag selection, click above and to left of sketch and drag down and to right to select all.

Step 2. Click **Mirror Entities** 

on the Sketch toolbar, **Fig. 6**.

Step 3. Click **Features** 

on the Command Manager toolbar.

Step 4. Click **Revolved Boss/Base** 

on the Features toolbar.

Step 5. In the Revolve Property Manger set:

for Axis of Revolution 
click **bottom line of sketch**, **Fig. 8**

click OK  .

Step 6. Click Zoom to Fit  (**F**) on the View toolbar.

Step 7. Save. Use **Ctrl-S**.

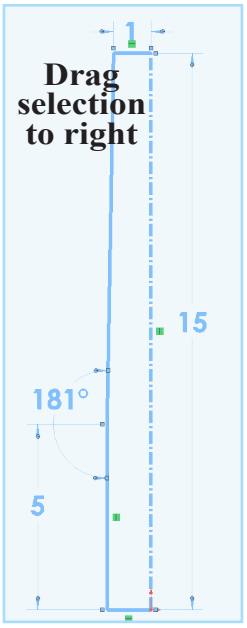


Fig. 5

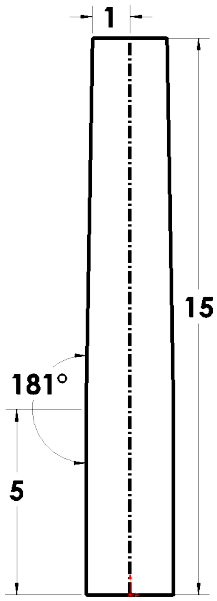


Fig. 6

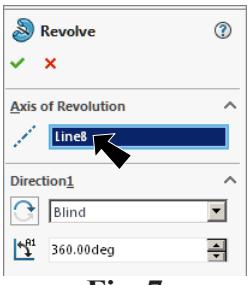


Fig. 7

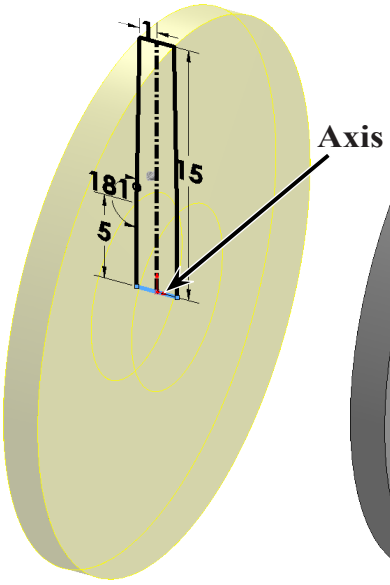


Fig. 8

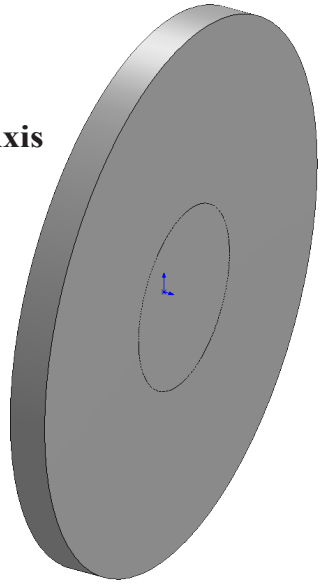


Fig. 9

D. Axle Hole Wizard.

Step 1. Click **Hole Wizard** 

on the Features toolbar.

Step 2. In the Hole Wizard Property Manager set:
under Hole Type, **Fig. 10**
click **Counterbore** 
under Standard:
select **ANSI Metric**
under Type:
Hex Bolt ANSI B18.2.3.5M
under Size:
select **M5**
check **Show custom sizing**
Through Hole Diameter  **3**
Counterbore Diameter  **10**
Counterbore Depth  **.5**
under End Condition
set **Through All**.

Click **Positions tab** 

at the top of the Property Manager.

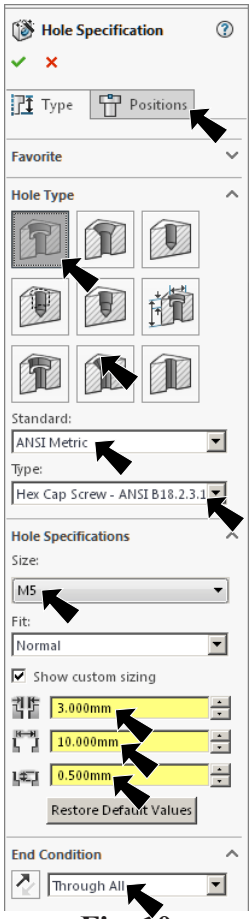


Fig. 10

Step 3. Click the **vertical side face of wheel** one time as face for holes, **Fig. 11**.

Step 4. Click the Origin  . Use the coincident relation icon  to locate the Origin, **Fig. 11**.

Step 5. Click OK  in the Hole Wizard Property Manager.

Step 6. Save. Use **Ctrl-S**.

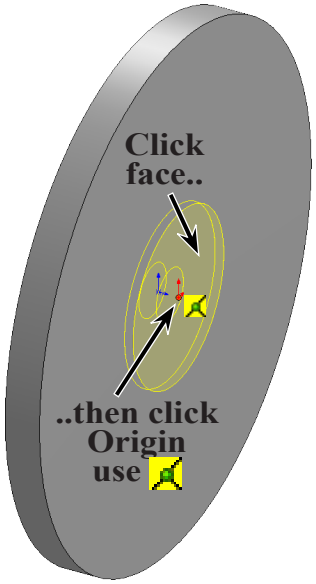


Fig. 11

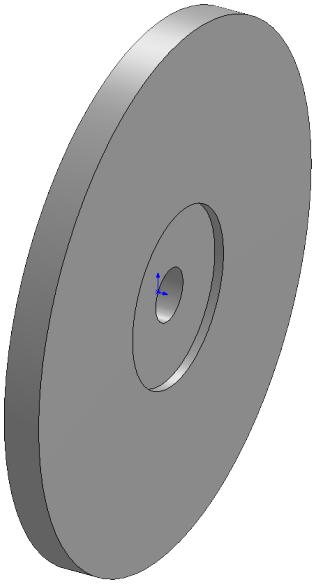


Fig. 12

E. Fillet Face.

Step 1. Click **Fillet** 

on the Features toolbar.

Step 2. In the Fillet Property Manager set:
select **FilletXpert**, **Fig. 16**
Radius .4
click **outside cylindrical face** of wheel, **Fig. 14**
click OK .

Step 3. Save. Use **Ctrl-S**.

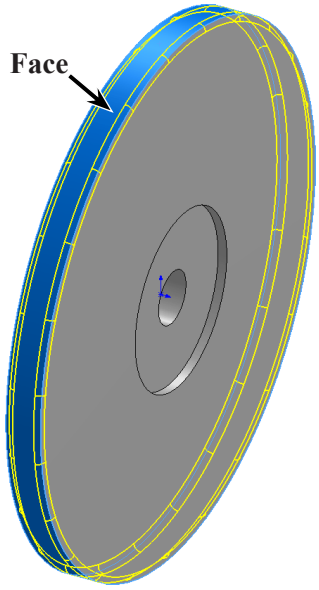


Fig. 14

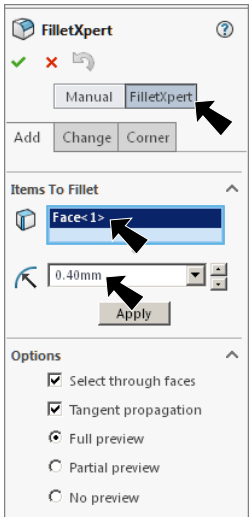
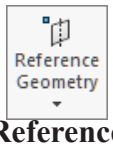


Fig. 13

F. Mate Reference.

Step 1. Click a **cylindrical face** to select it, **Fig. 15**.

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. 16**.

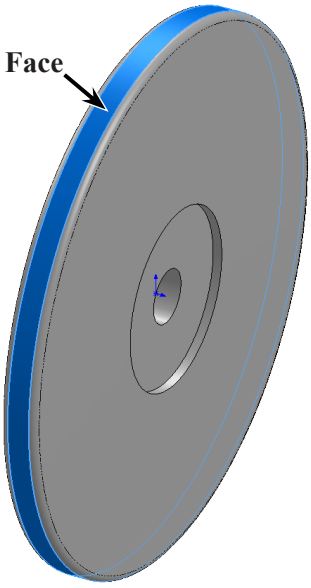


Fig. 15

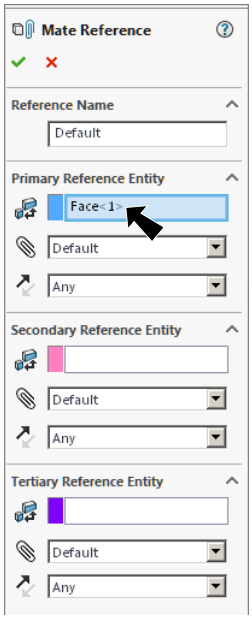


Fig. 16

G. Material POM Acetal Copolymer.

Step 1. **Right click Material**  in the Feature Manager and click **Edit Material**, **Fig. 17**.

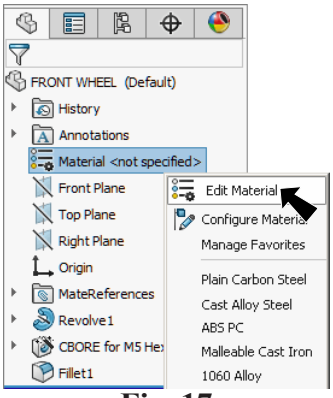


Fig. 17

Step 2. **Expand Plastics** in the material tree and select **POM Acetal Copolymer**, **Fig. 18**. Click **Apply** and **Close**.

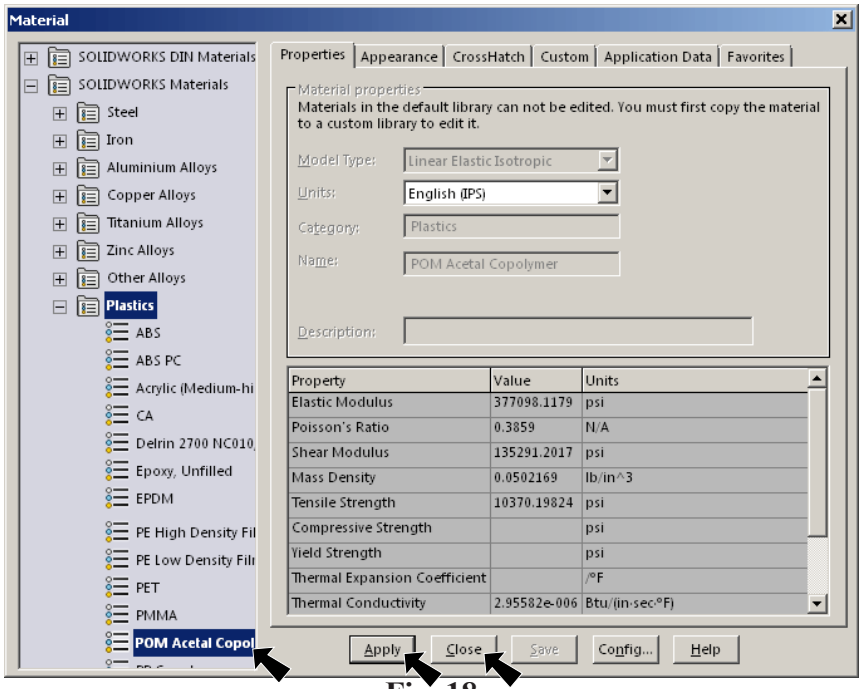


Fig. 18

H. Appearance.

Step 1. Click the Wheel to select the part, click **Appearances Callout** on the context toolbar and click **FRONT W...** , **Fig. 19**.

Step 2. In the Appearances Task pane, expand **Plastic**, click **Clear Plastic** and in the lower pane select **polypropylene plastic**, **Fig. 20**.

Step 3. In the Appearances Property Manager under Color, **Fig. 21** click the **3rd yellow swatch** click OK .

Step 4. Save. Use **Ctrl-S**.

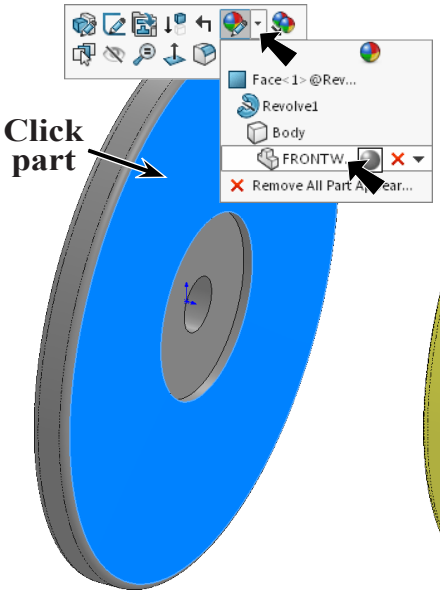


Fig. 19

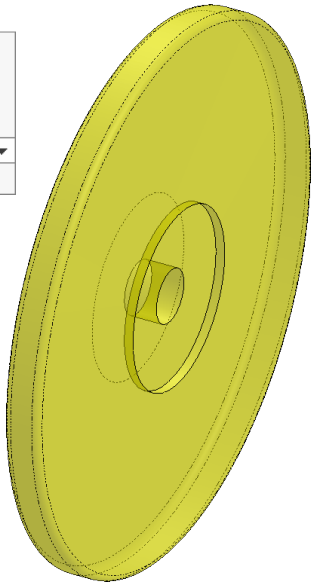


Fig. 22

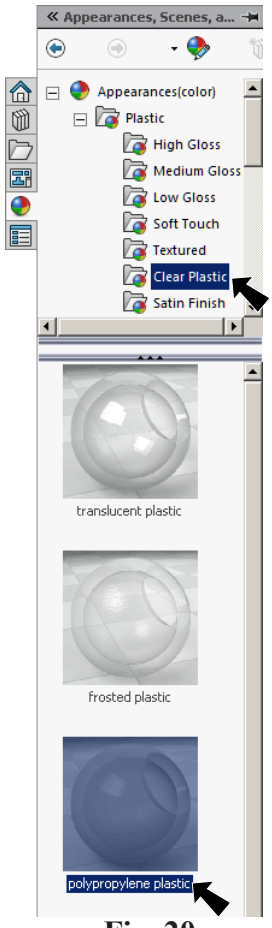


Fig. 20

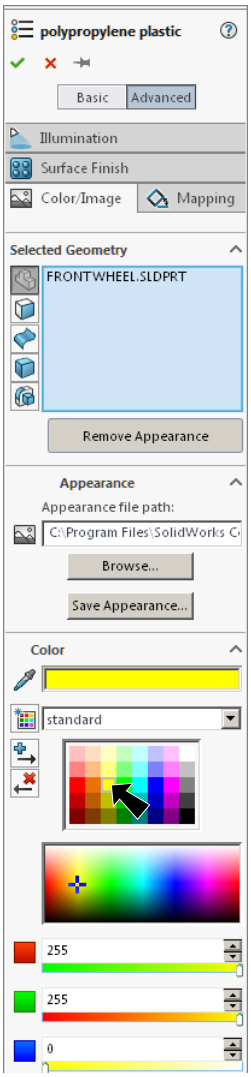


Fig. 21