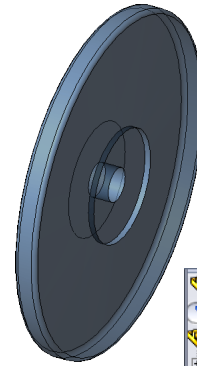




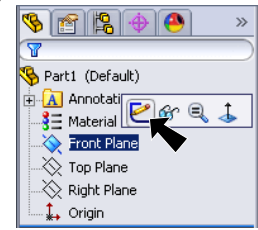
# CO2 Rail Car E Front Wheel





## 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**  from the Content toolbar, **Fig. 1**.



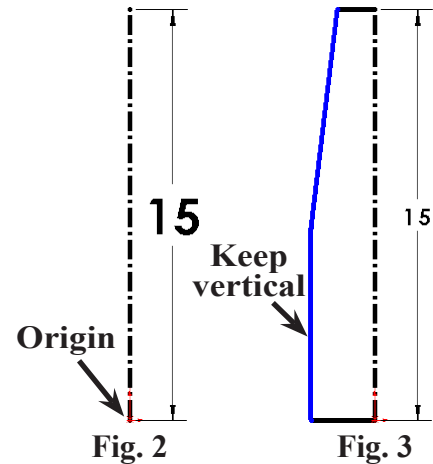
**Fig. 1**

Step 3. Click **Centerline**  (S) 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 the centerline **15**, **Fig. 2**.



**Fig. 2**

**Fig. 3**

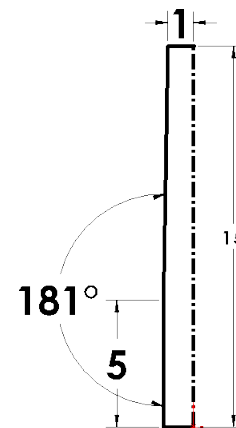
Step 7. Click Zoom to Fit  (F) on the View toolbar.

Step 8. Click **Line**  (L) on the Sketch toolbar.

Step 9. Draw the **four lines** as shown in **Fig. 3**.

Step 10. Click **Smart Dimension**  (S) on the Sketch toolbar.

Step 11. Add dimensions as shown in **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 (lines and dimensions), **Fig. 5**. To drag selection, click above and to left of sketch and drag down and to right to drag around all.

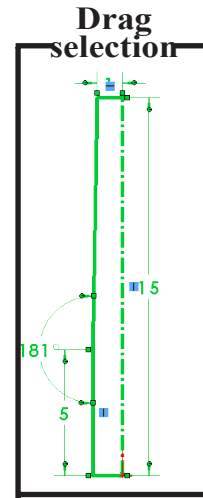


Fig. 5

Step 2. Click **Mirror Entities**  on the Sketch toolbar, **Fig. 6**.

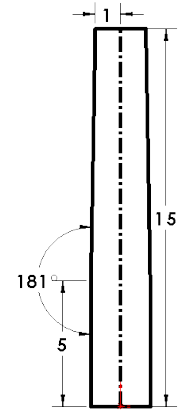
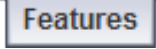


Fig. 6

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:

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

click OK .

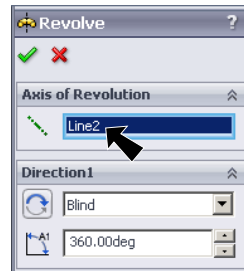


Fig. 7

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

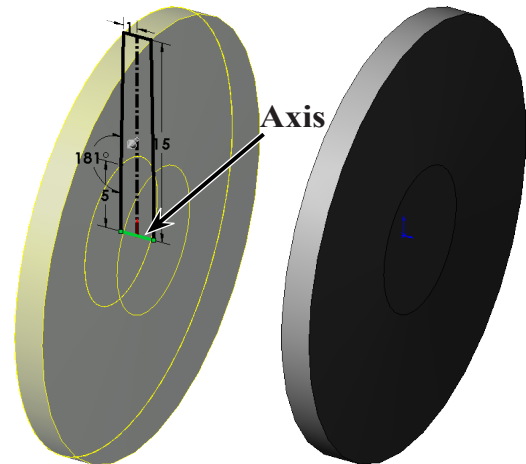



Fig. 8

Fig. 9

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

## D. Axle Hole Wizard.

Step 1. Click the **vertical side face of wheel**, Fig. 10.

Step 2. Click **Hole Wizard**  on the Features toolbar.

Step 3. In the Property Manager on the Type tab set:

under Hole Type

click **Counterbore** , Fig. 11

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.

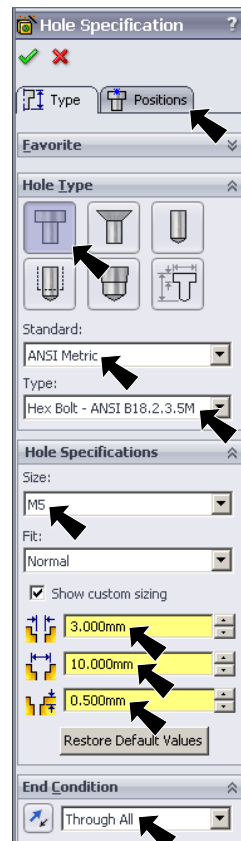


Fig. 11

Click the **Origin** , Fig. 12. If you miss

the Origin, Fig. 13, click **Point**  on the Sketch toolbar to **turn off** Point tool, then drag Point to Origin, Fig. 13.

Click OK  in the Point Property Manager.

Click OK  in the Hole Wizard Property Manager.

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

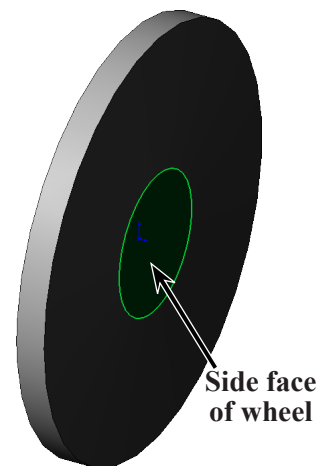


Fig. 10

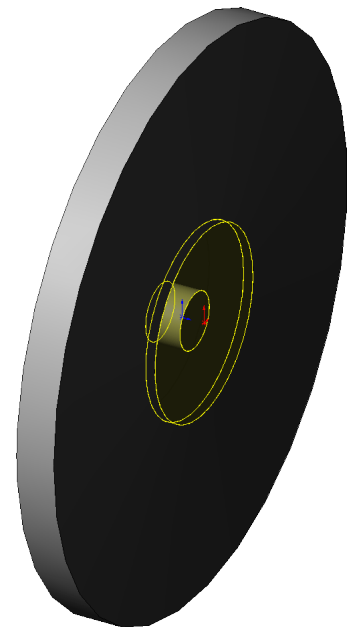


Fig. 12

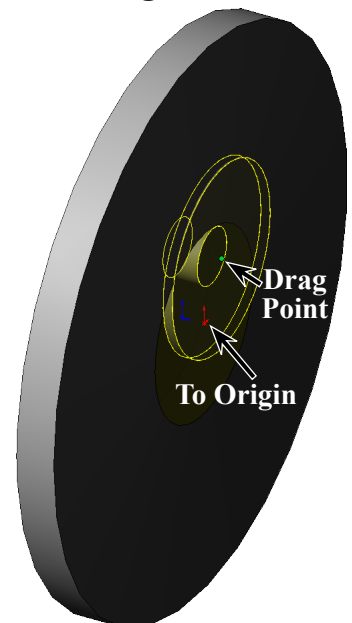


Fig. 13

## E. Fillet Face.

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

Step 2. In the Fillet Property Manager set:

select **FilletXpert**, Fig. 14.

**Radius**  .4

select **Full preview**

click the **outside cylindrical face** of wheel, Fig. 15.

click OK , Fig. 16.

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

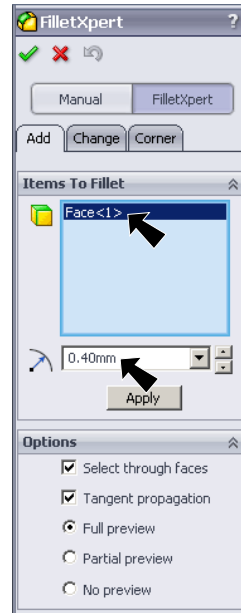


Fig. 14

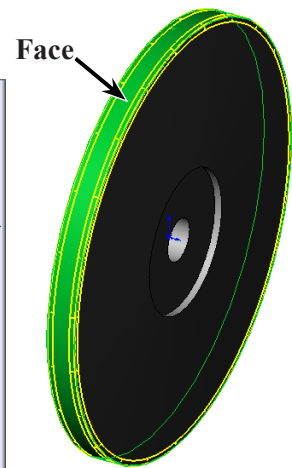


Fig. 15

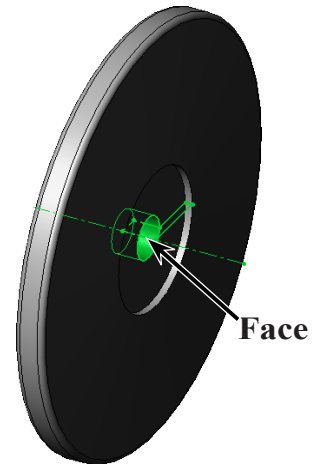



Fig. 16

## F. Mate Reference.

Step 1. Click the **inside cylindrical face of axle hole** to select it, Fig. 16.

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. 17.

## G. Material POM Acetal Copolymer.

Step 1. **Right click Material**  in the Feature Manager and click **Edit Material**, Fig. 18.

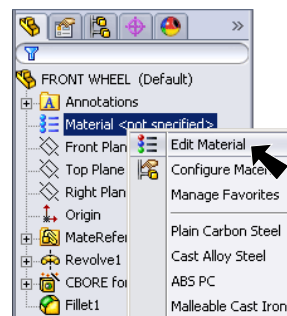


Fig. 18

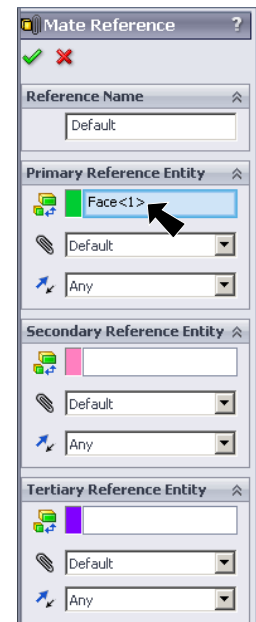


Fig. 17

Step 2. **Expand Plastics** in the material tree and select **POM Acetal Copolymer**, Fig. 19. Click **Apply** and **Close**.

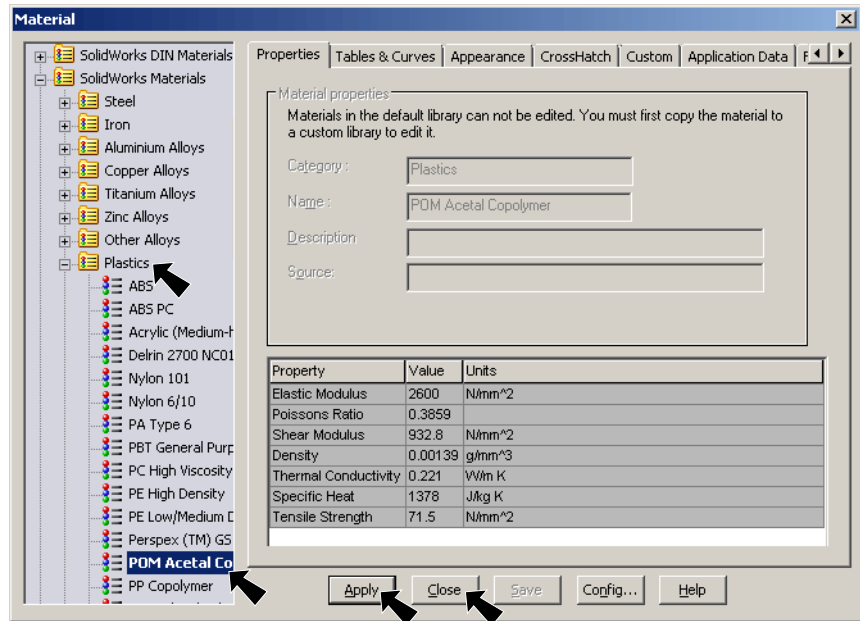


Fig. 19

## H. Appearance.

Step 1. Click the wheel to select the part, click **Appearances Call-out** on the Content menu and click **FRONT W...**, Fig. 20.

Step 2. In the Appearances Task pane, expand **Plastic**, click **Clear Plastic** and in the lower pane select **polypropylene plastic**, Fig. 21.

Step 3. In the Appearances Property Manager, Fig. 22 under **Color** set **RGB values:**  
**R 135**  
**G 192**  
**B 255**  
 click **OK**

in the Property Manager.

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

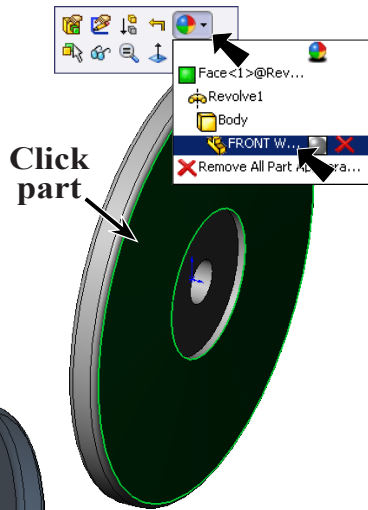
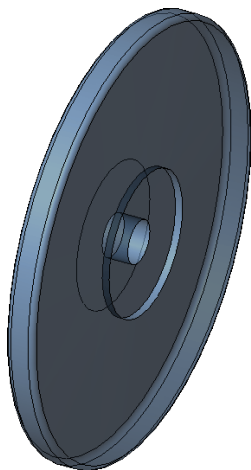


Fig. 20

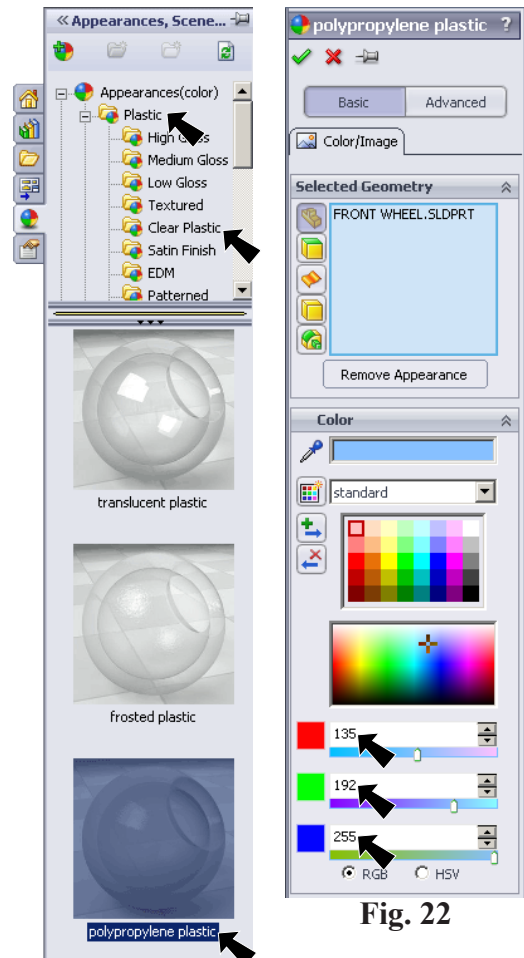


Fig. 21

Fig. 22