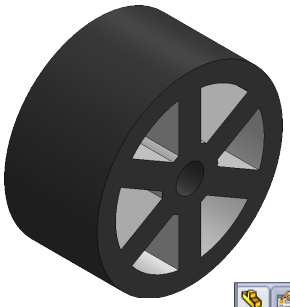
Chapter 4

Speedway Wheel



A. Wheel.

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

Step 2. Click **Right Plane** in the Feature Manager and click **Sketch** from the Content toolbar, **Fig. 1**.

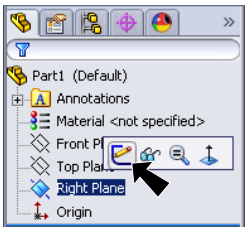


Fig. 1

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

Step 4. Draw **two circles** starting at the Origin , **Fig. 2**.

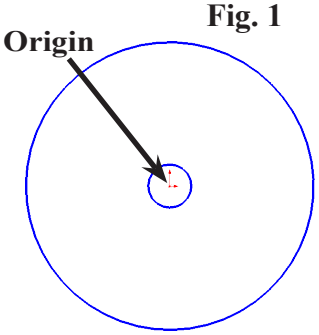


Fig. 2

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

Step 6. Dimension the circles as shown in **Fig. 3**.

Step 7. Click **Features** on the Command Manager toolbar.

Step 8. Click **Extruded Boss/Base** on the Features toolbar.

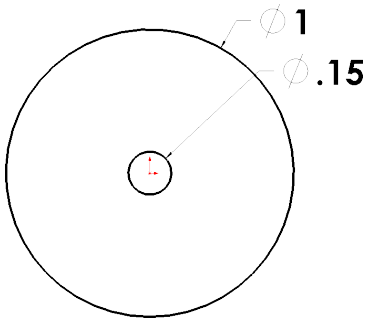


Fig. 3

Step 9. In the Property Manager set:

Depth to **.5**

click OK , **Fig. 4** and **Fig. 5**.

Step 10. Click Zoom to Fit (F) on the View toolbar.

B. Save as "WHEEL".

Step 1. Click File Menu > Save As.

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

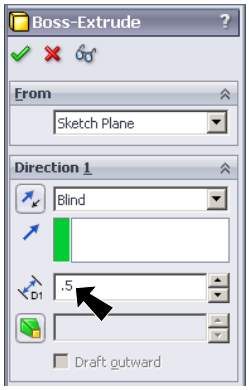


Fig. 4

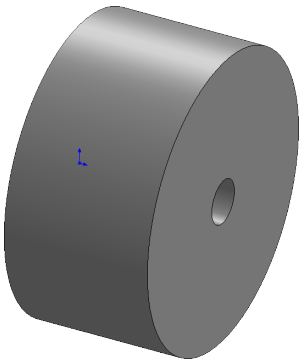


Fig. 5

C. Spoke Sketch.

Step 1. Click the **side face** and click **Sketch** on the Content menu, **Fig. 6**.

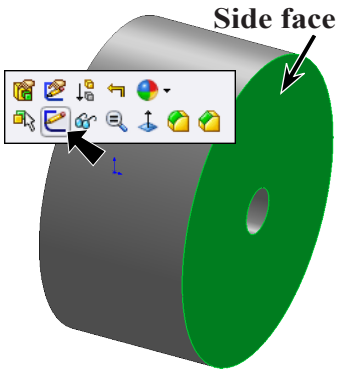


Fig. 6

Step 2. Click **Normal To** on the Standard Views toolbar. (**Ctrl-8**)

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

Step 4. Draw **two circles** starting at the Origin , **Fig. 7**.

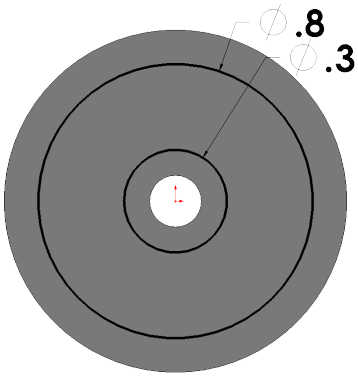


Fig. 7

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

Step 6. Dimension the circles as shown in **Fig. 7**.

Step 7. Click **Centerline** (**S**) in the **Line flyout** on the Sketch toolbar.

Step 8. Draw a centerline from the Origin **up to edge of Wheel**, **Fig. 8**. Keep centerline vertical.

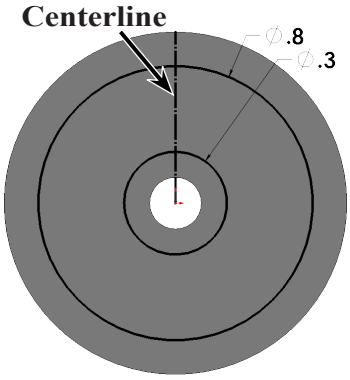


Fig. 8

Step 9. Click **Offset Entities** on the Sketch toolbar.

Step 10. In the Offset Entities Property Manager set:

Distance to .06 Fig. 9
check Bi-directional
click the centerline, **Fig. 10**

The yellow offset should on both side of centerline, **Fig. 10**.

Click OK when done.

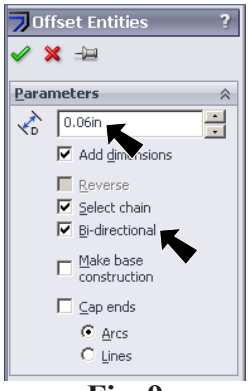


Fig. 9

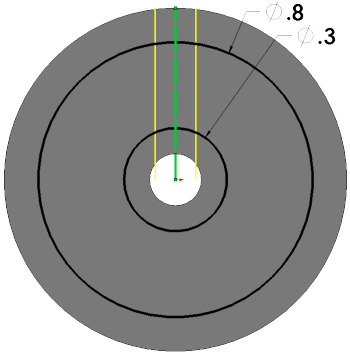


Fig. 10

D. Trim.

Step 1. Click **Trim Entities** 

(S) on the Sketch toolbar.

Step 2. In the Property Manger select **Trim to closest**  , **Fig. 11**.

Step 3. Trim away lines outside big circle and inside small circle, **Fig. 12**. Click line you want to trim away. Results shown in **Fig. 13**. Click OK  when done.

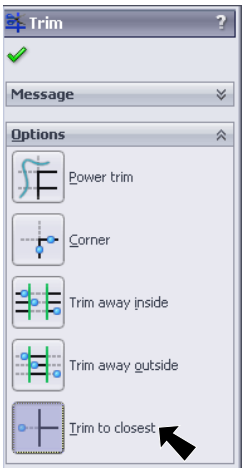


Fig. 11

Before Trim

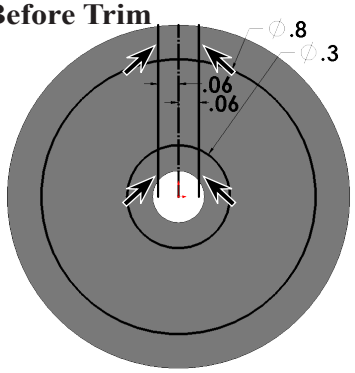


Fig. 12

After Trim

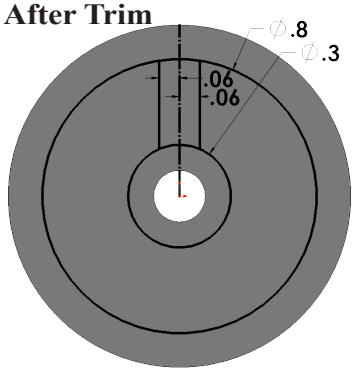


Fig. 13

E. Circular Sketch Pattern.

Step 1. Click **Circular Sketch Pattern** 

in the **Linear Sketch Pattern** flyout on the Sketch toolbar.

Step 2. In the Circular Sketch Pattern Property Manager set:

under Parameters,

check Equal spacing, **Fig. 14**

Number of Instances  to **6**

under Entities to Pattern

click both offset lines in sketch, **Fig. 15**

Pattern Axis 

the sketch **Origin (Point 1)** should be selected as default, **Fig. 14**

click OK  , **Fig. 16**.

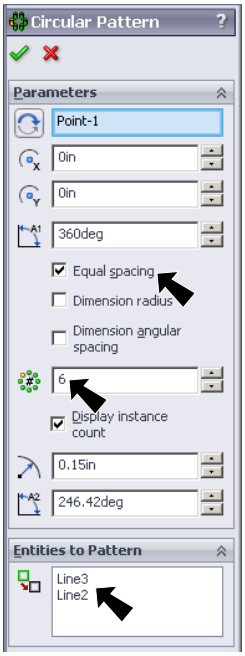


Fig. 14

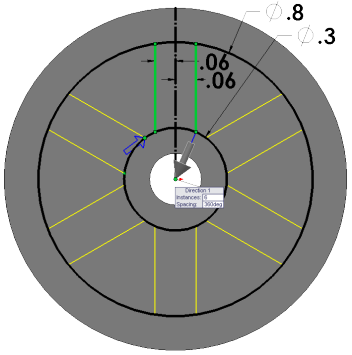


Fig. 15

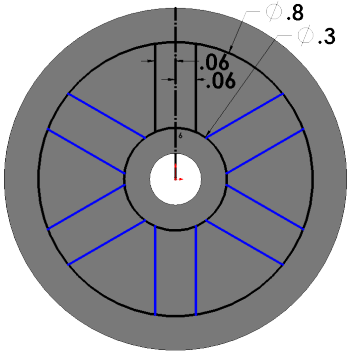


Fig. 16

F. Extruded Cut Spokes.

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

Step 2. Click **Extruded Cut** Extruded Cut on the Features toolbar.

Step 3. In the Cut-Extrude Property Manager set:
under Direction1, **Fig. 17**
End Condition to Through All

under Selected Contours
click each wedge shaped contour between spokes, **Fig. 18**

and click OK .

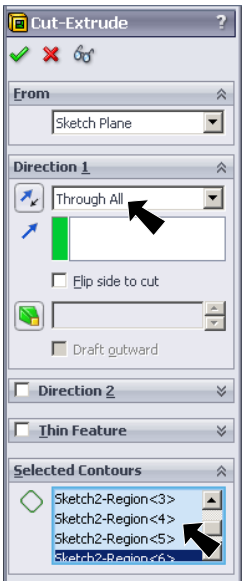


Fig. 17

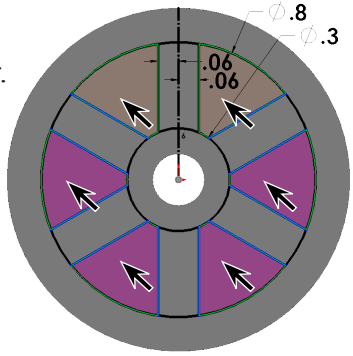


Fig. 18

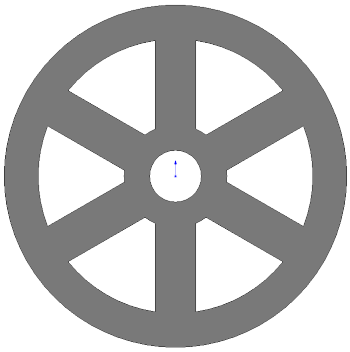


Fig. 19

G. Mate Reference.

Step 1. Click **Trimetric** on the Standard Views toolbar.

Step 2. Click the **inside cylindrical face of axle hole** to select it, **Fig. 20**.

Step 3. Click **Reference Geometry** Reference Geometry on the Features toolbar and **Mate Reference** from the menu.

Step 4. In the Mate Reference Property Manager click OK , **Fig. 21**.

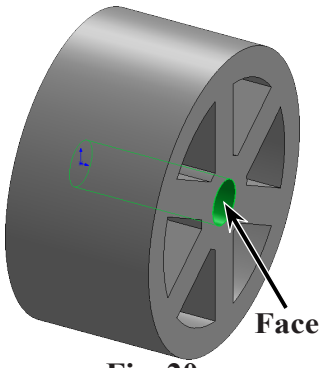


Fig. 20

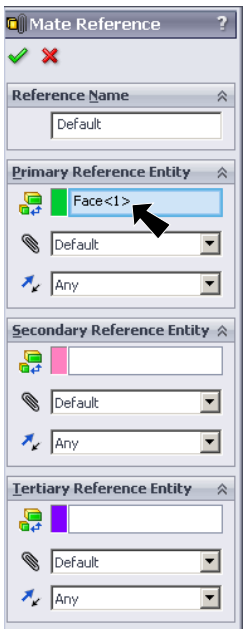


Fig. 21

H. Material POM Acetal Copolymer.

Step 1. **Right click Material** in the Feature Manager and click **Edit Material**, **Fig. 22**.

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

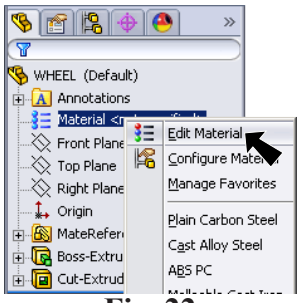


Fig. 22

I. Appearance.

Step 1. Click the part to select the part, click **Appearance Callout** on the Content menu and click **WHEEL**, **Fig. 23**.

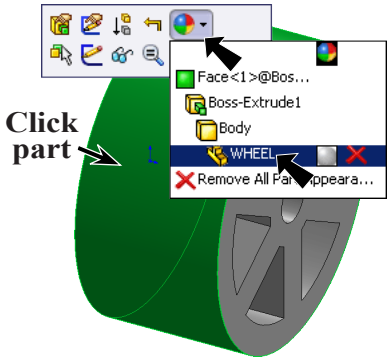


Fig. 23

Step 2. In the Appearances Property Manager, **Fig. 24**
under Color
set **RGB values** to:
R 75
G 75
B 75
click **Keep Visible** and OK, **Fig. 24**. The Push Pin on allows selection of another appearance.

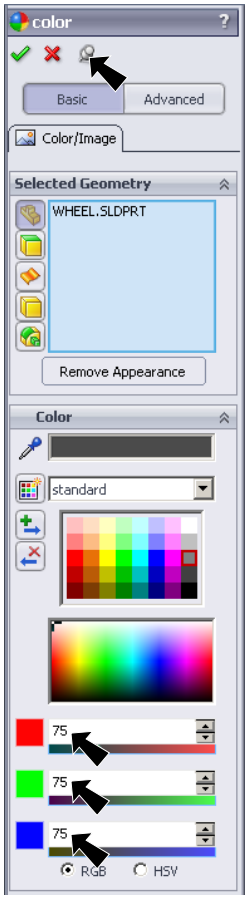


Fig. 24

Step 3. In the Appearances Property Manager,
under Selected Geometry
click **Select Features**, **Fig. 26**

click **one Extruded cut between spokes**, **Fig. 27**

under Color:
click the **white swatch**, **Fig. 26**.

click OK and
click Cancel.

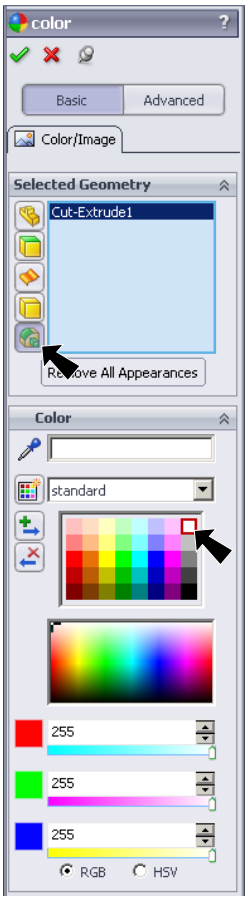


Fig. 26

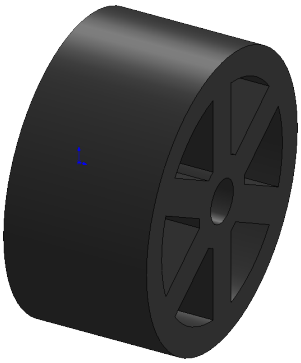


Fig. 25

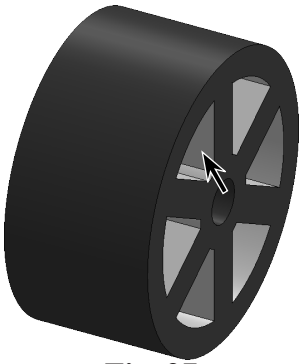


Fig. 27

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