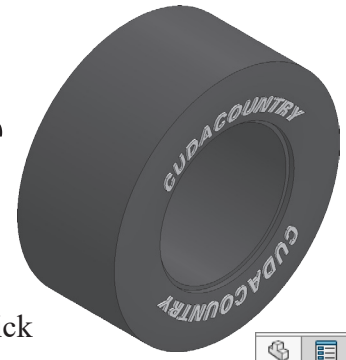
Chapter 7

CO2 Rail Car
Rear Tire



A. Sketch Lines.

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**.

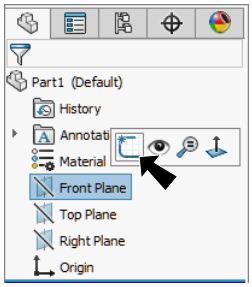


Fig. 1

Step 3. Click **Line** (**L**) on the Sketch toolbar.

Step 4. Starting at the Origin sketch lines, **Fig. 2**. Use the inferencing line, the dotted line that appears when you draw to keep lines vertical or horizontal.

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

Step 6. Add dimensions, **Fig. 3**.

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

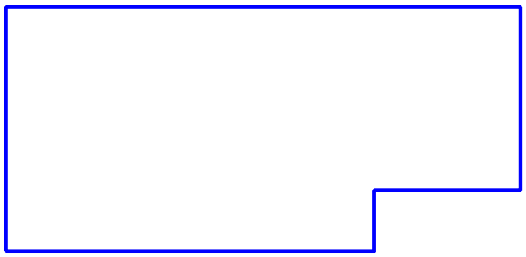


Fig. 2

B. Save as "REAR TIRE".

Step 1. Click File Menu > Save As.

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

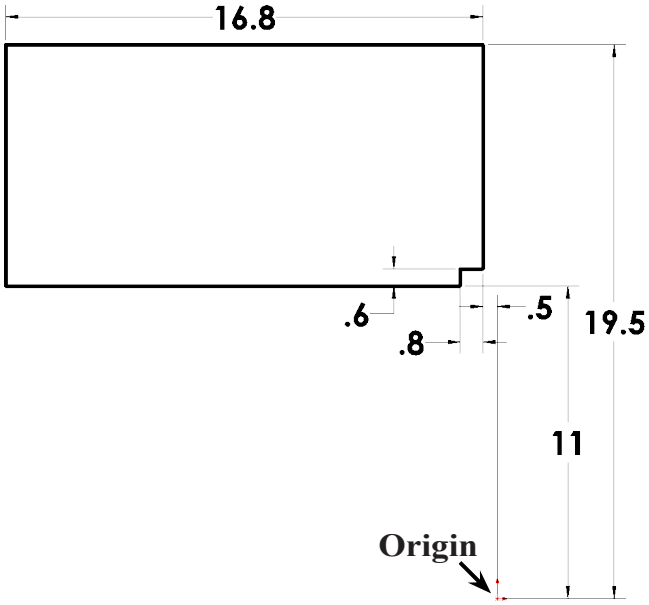


Fig. 3

C. 3 Point Arc.

Step 1. Click **3 Point Arc** (**S**) in the **Arc flyout** on the Sketch toolbar.

Step 2. Draw an arc between the Position 1, Position 2 and Position 3 in **Fig. 64**. To draw the arc, first click Position 1, then Position 2. Swing the arc out to Position 3 and click. Position 1 is the inside construction line endpoint.

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

Step 4. Add dimensions, **Fig. 5**.

Step 5. Save. Use **Ctrl-S**.

D. Centerline.

Step 1. Click **Centerline** (**S**) in the **Line flyout** on the Sketch toolbar.

Step 2. Sketch a horizontal centerline out from Origin, **Fig. 6**.

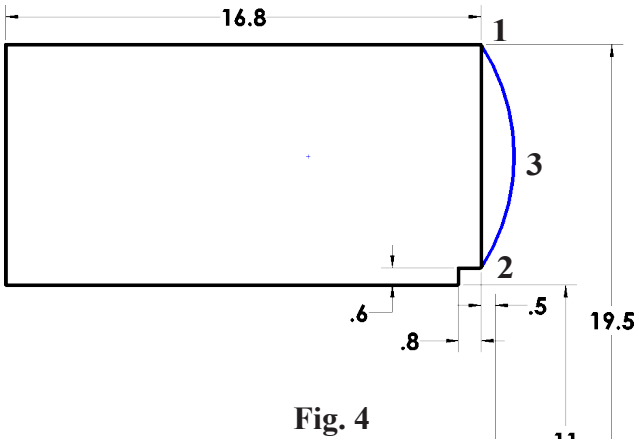


Fig. 4

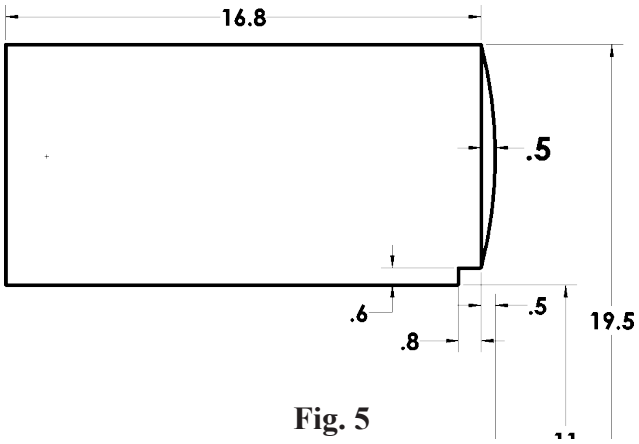


Fig. 5

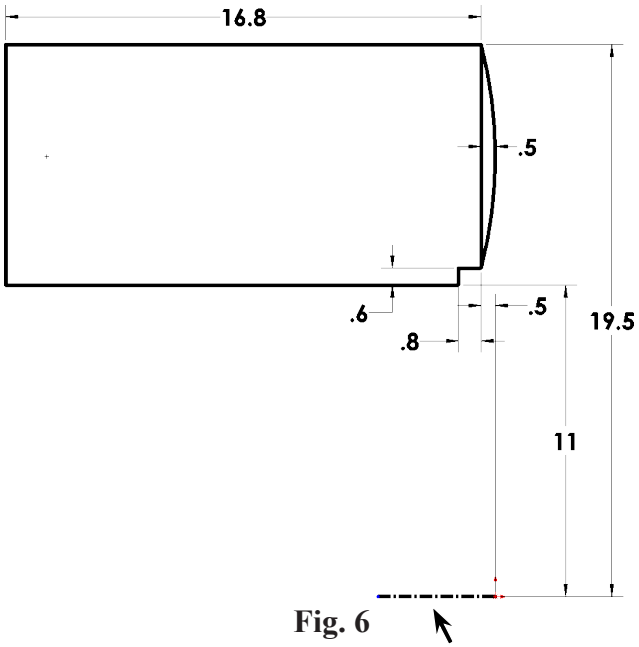


Fig. 6

E. Revolved Boss/Base.

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

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

Step 3. In the Revolve Property Manger set:
under Selected Contours, **Fig. 7**
click the **two contours**, **Fig. 8**
click OK ✔.

Step 4. Click Zoom to Fit (**F**) on the View toolbar.

Step 5. Save. Use **Ctrl-S**.

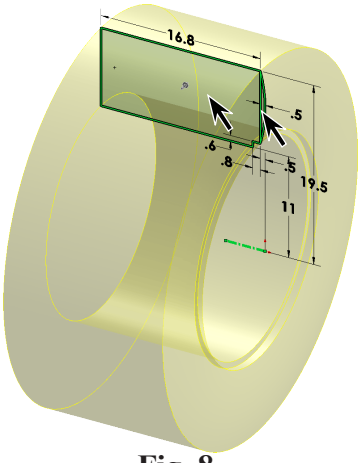


Fig. 8

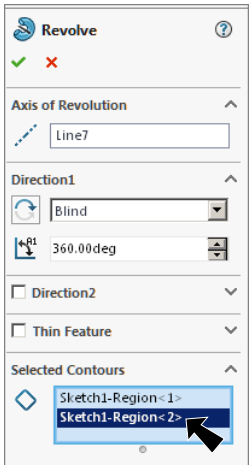


Fig. 7

F. Sketch Construction Circle.

Step 1. Click **Right Plane** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 9**.

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

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

Step 4. Draw a circle starting at the Origin, **right click circle** and click **Construction Geometry** on the context toolbar, **Fig. 10**.

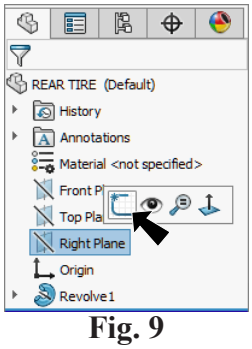


Fig. 9

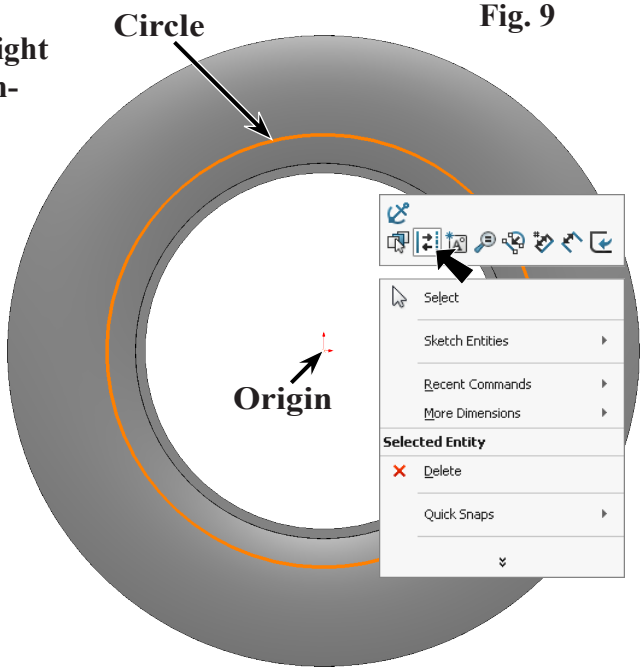


Fig. 10

Step 5. Click **Smart Dimension** 

(**S**) on the Sketch toolbar.

Step 6. Dimension **diameter 26**, **Fig. 11**.

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

G. Split Circle into Arcs.

Step 1. Click Tools Menu > Sketch Tools > Split Entities. (**Alt-T then T I**)

Step 2. In the Split Entities Property Manger:

Click **left quadrant point** ◆ **of circle** to split at that point, **Fig. 12**. The point should be directly to the left of the Origin.

Click **right quadrant point** ◆ **of circle** to split at that point, **Fig. 12**. The point should be directly to the right of the Origin.

The circle is now split into two arcs. Click Cancel ✕, **Fig. 13**.

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

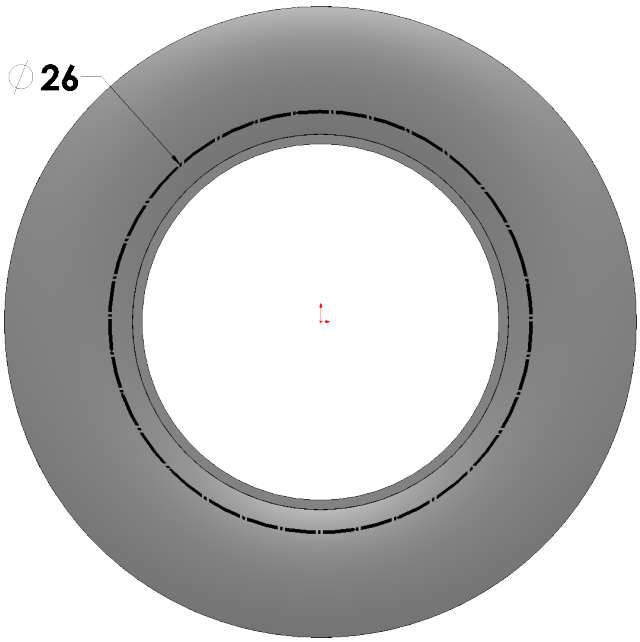


Fig. 11

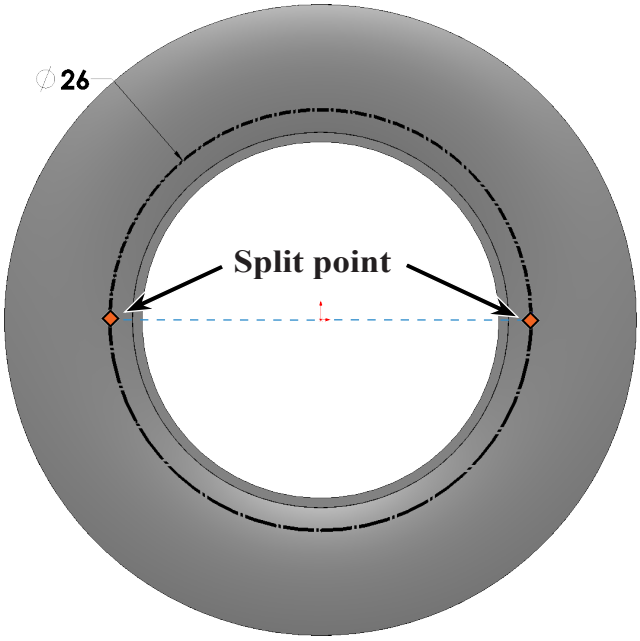


Fig. 12

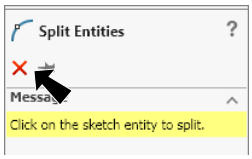


Fig. 13

H. Text on Top Arc.

Step 1. Click **Text Tool** on the Sketch toolbar.

Step 2. In the Sketch Text Property Manager set:
under Curves, **Fig. 14**
click the **top arc** in sketch, **Fig. 15**
under Text
click in the box and lock Caps Lock on keyboard key-in
CUDACOUNTRY
Center Align
Flip Vertical
Flip Horizontal

uncheck **Use document font** checkbox, **Fig. 14**
click **Font button**

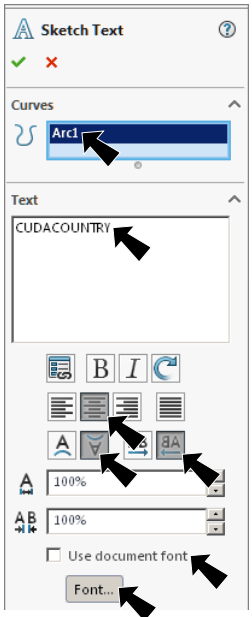


Fig. 14

Step 3. In the Choose Font dialog box select:
under Font, **Fig. 16**
Univers Black
under Font Style:
Oblique
under Height:
select **Points 8**

click OK button and
click OK .

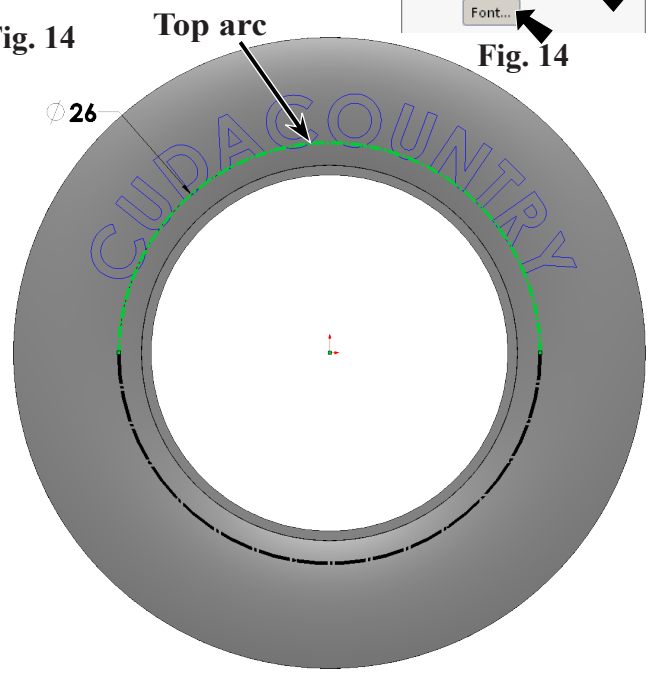


Fig. 15

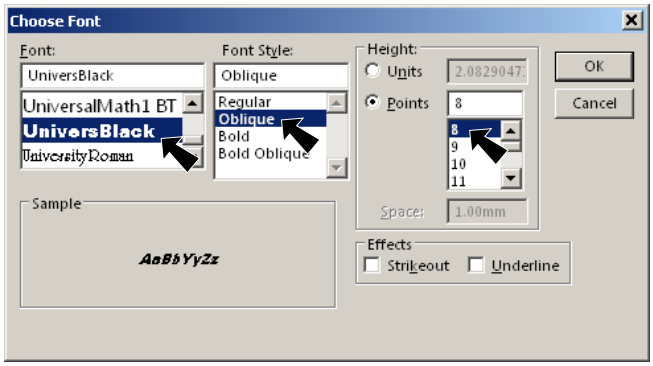


Fig. 16

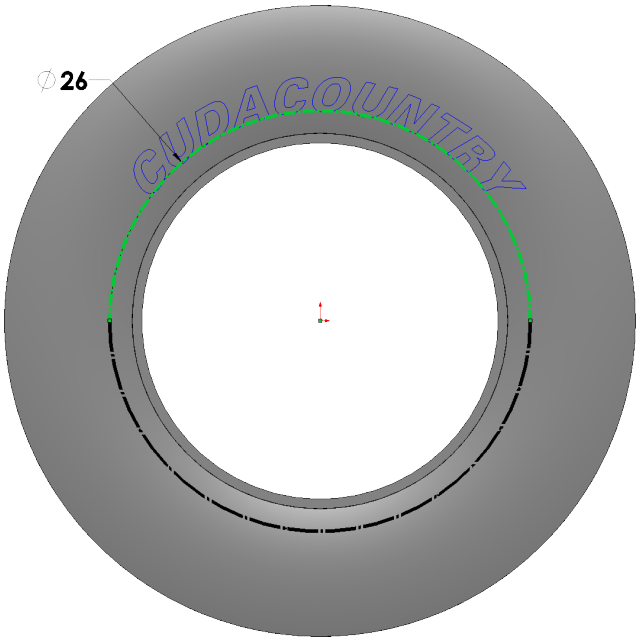


Fig. 17

I. Text on Bottom Arc.

Step 1. Click **Text Tool** on the Sketch toolbar.

Step 2. In the Sketch Text Property Manager set:
under Curves, **Fig. 18**
click the **bottom arc**, **Fig. 19**
under Text
click in the box and key-in **CUDACOUNTRY**

Center Align

Flip Vertical

Flip Horizontal

uncheck **Use document font** checkbox, **Fig. 18**
click **Font button**

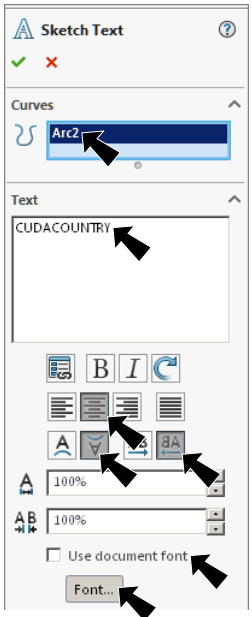


Fig. 18

Step 3. In the Choose Font dialog box select:
under Font, **Fig. 20**
Univers Black
under Font Style:
Oblique
under Height:
select **Points 8**

click OK button and
click OK .

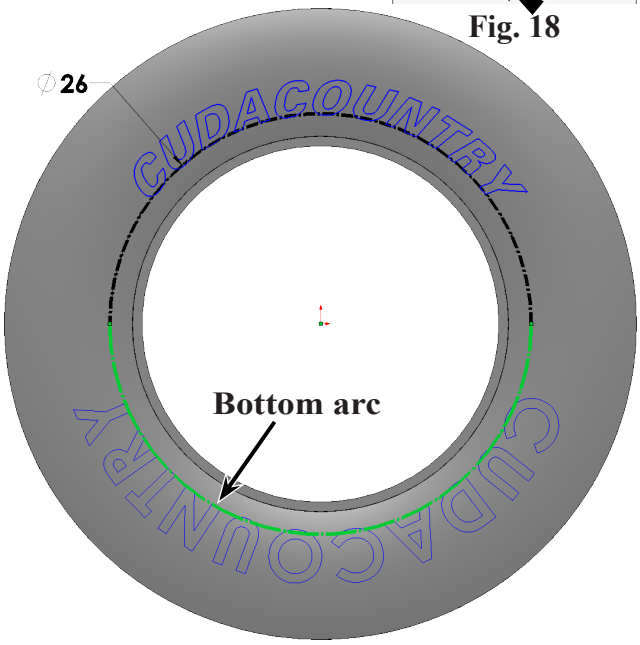


Fig. 19

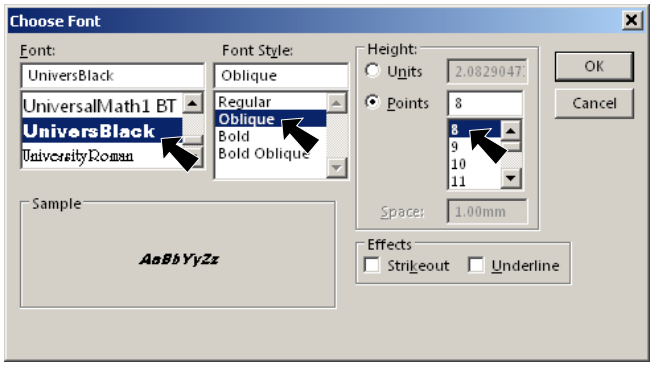


Fig. 20

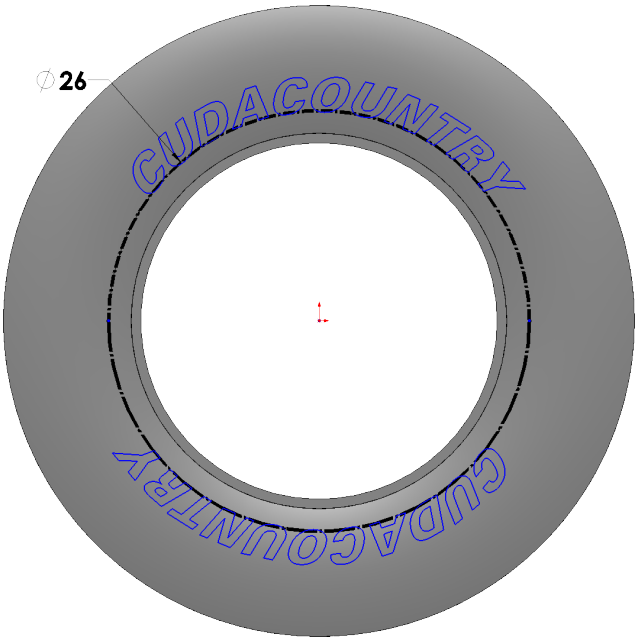


Fig. 21

J. Extrude Letters.

Step 1. Click **Front** on the Standard Views toolbar. (**Ctrl-1**)

Step 2. Zoom in around **top letters**, **Fig. 22**. To zoom, place the cursor over the letters and spin the wheel on mouse back. While spinning the wheel keep cursor on letters.

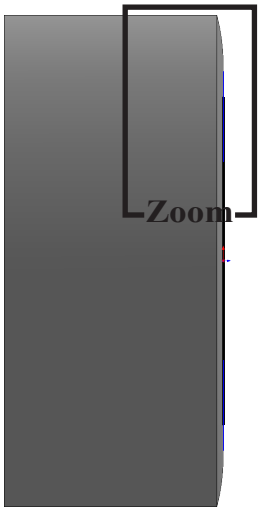


Fig. 22

Step 3. Click **Features** Features on the Command Manager toolbar.

Step 4. Click **Extruded Boss/Base** Extruded Boss/Base on the Features toolbar.

Step 5. In the Property Manager set:

under From, **Fig. 23**

Start Condition **Surface/Face/Plane**

for Face,

click **outside face of tire**, **Fig. 24**

under Direction 1

Depth .3

click OK .

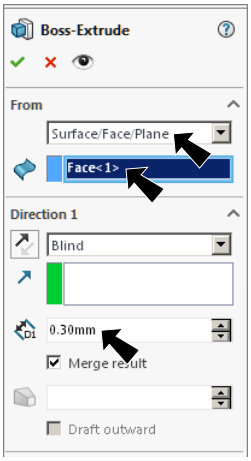


Fig. 23

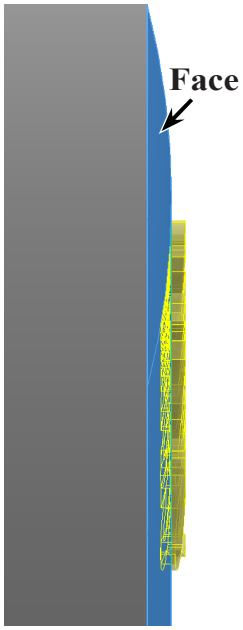


Fig. 24

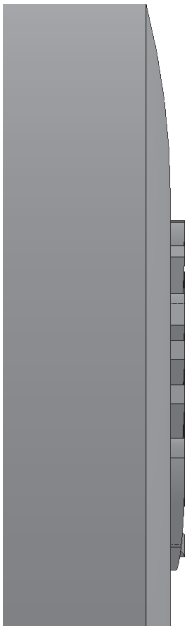


Fig. 25

K. Material Rubber.

Step 1. Click **Isometric** on the Standard Views toolbar. (**Ctrl-7**)

Step 2. **Right click Material** in the Feature Manager and click **Edit Material**, **Fig. 31**.

Step 3. **Expand Rubber** in the material tree and select **EPDM 60 Durometer**. Click **Apply** and **Close**.

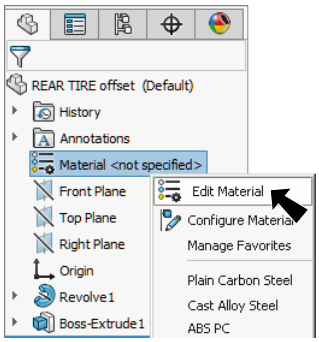


Fig. 27

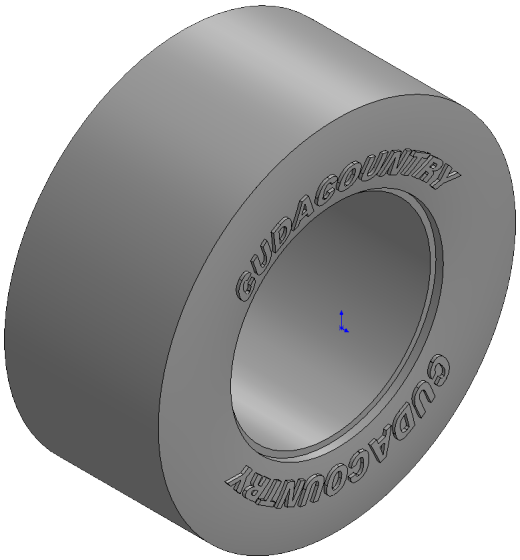


Fig. 26

L. Letters Appearance.

Step 1. Click an extruded letter to select the extrude feature, click **Appearance Callout** on the context toolbar and click **Boss-Extrude1**, **Fig. 28**.

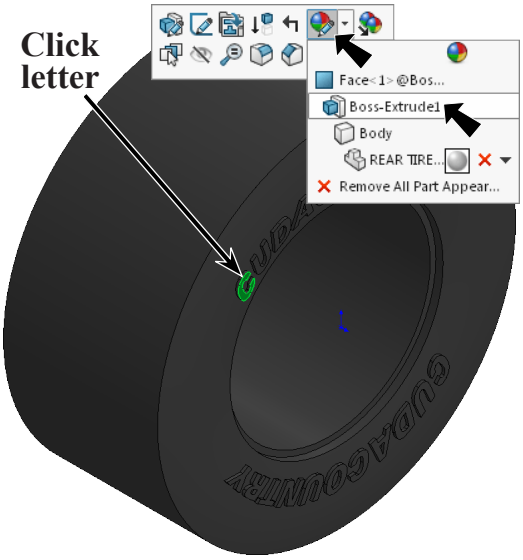


Fig. 28

Step 2. In the Color Property Manager,
under Color, **Fig. 29**
click **White** swatch
and OK .

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

Step 4. Use Chapter 5 Wheel Assembly to assemble Rear Rim Px and Rear Tire, **Fig. 31**.

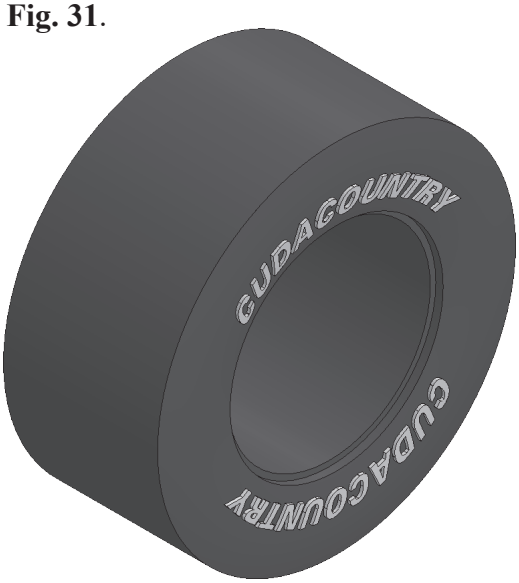


Fig. 30

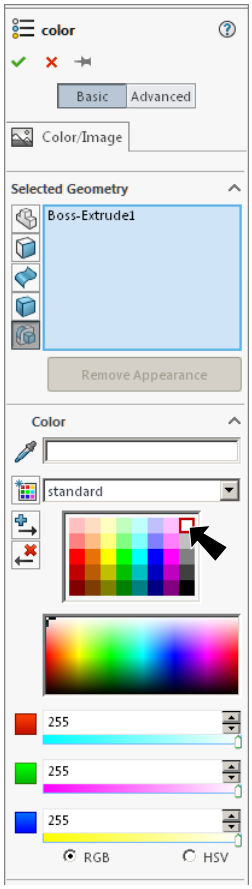


Fig. 29

Fig. 31