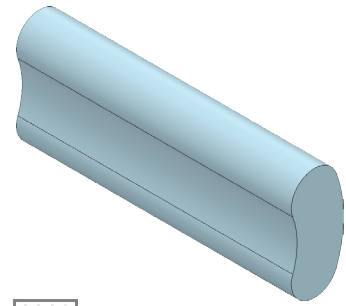# Wind Up Car
Cross Member

A. Extrude.

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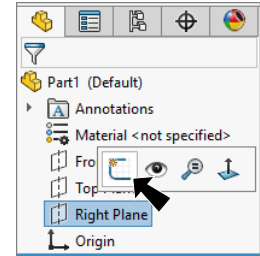
Step 3.   Click **Centerline** in the **Line flyout** on the Sketch toolbar.

Step 4.   Sketch centerline from Origin out to left, **Fig. 2**.

Step 4.   Click **Centerpoint Arc Slot** (S) in the **Straight Slot flyout** on the Sketch toolbar.
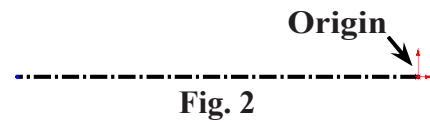
Step 5.   Sketch a centerpoint arc slot centered at the left endpoint of centerline and to the right, **Fig. 3**. To sketch slot, click left endpoint of centerline to specify centerpoint of the arc. Move cursor down and to left of Origin to specify the radius of the arc and click. Move cursor up to specify the length of the slot and then click. Then, move cursor to create width of the slot and click.
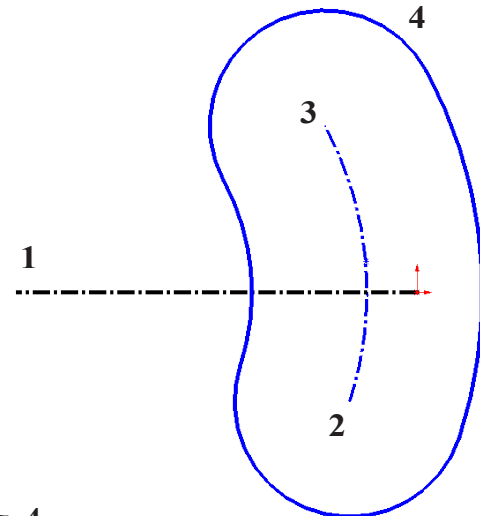
Step 6.   Click **Centerline** in the **Line flyout** on the Sketch toolbar.

Step 7.   Sketch centerline between slot centerarc endpoints, **Fig. 4**.

Step 8.   **Right click graphics area and click Select** from menu to unselect Centerline tool.
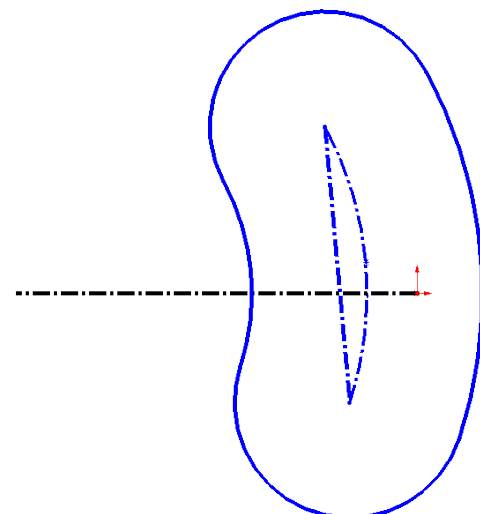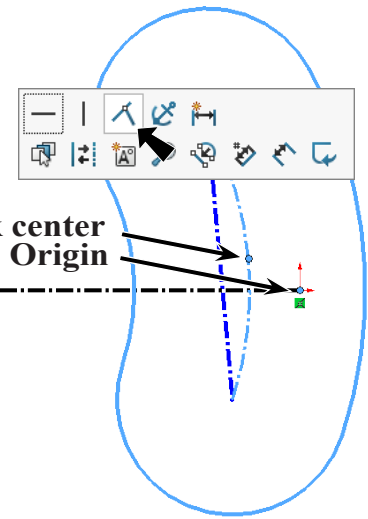

Fig. 1

Fig. 2

Fig. 3

Fig. 4

3/3/21

Step 9. **Ctrl click centerpoint of slot centerarc** and **Origin** ⌐ to select both. Release Ctrl key and click **Make Coincident** on the context toolbar, **Fig. 5**.

Step 10. Click centerline at slot centerar endpoints and click **Make Vertical** | on the context toolbar, **Fig. 6**.

Ctrl click center point and Origin

Step 11. Click **Smart Dimension** (**S**) on the Sketch toolbar.
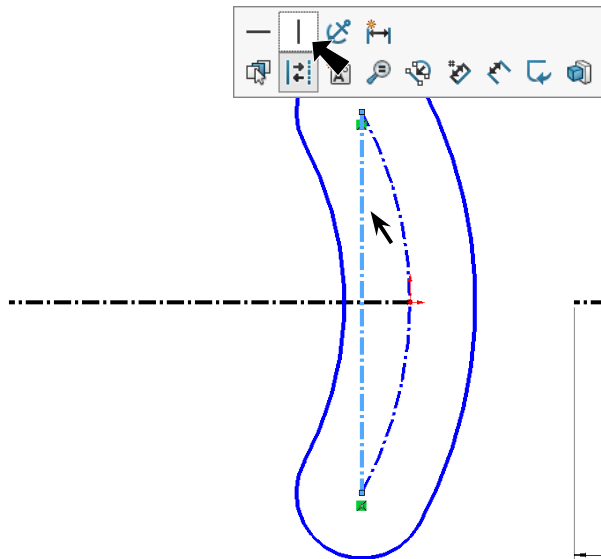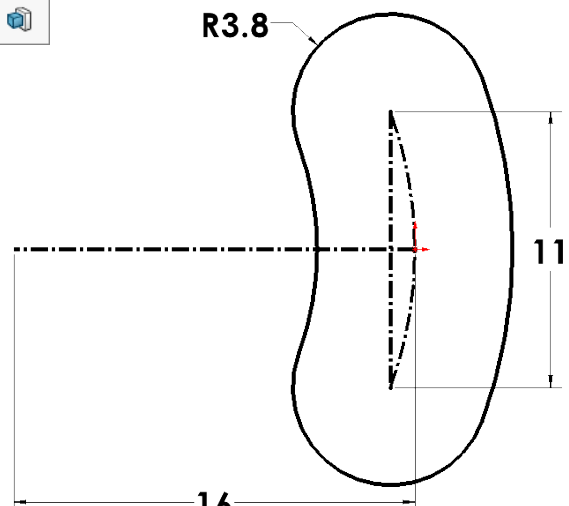
Step 12. Add dimensions, **Fig. 7**.

Fig. 5

R3.8

11

16

Fig. 6

Fig. 7

Step 13. Click **Features** Features on the Command Manager toolbar.

Step 14. Click **Extruded Boss/Base** Extruded Boss/Base on the Features toolbar.

Step 15. In the Property Manager set:
  under Direction 1, **Fig. 8**
  End Condition **Mid Plane**

  Depth 46

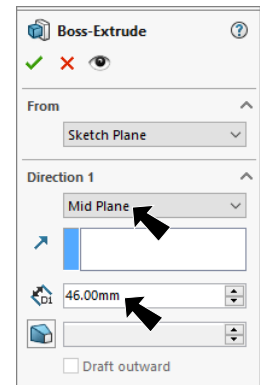 click OK ✔ .

Boss-Extrude

From
  Sketch Plane

Direction 1
  Mid Plane

  46.00mm

  ☐ Draft outward

Fig. 8

B. Save as "CROSS MEMBER".

Step 1. Click File Menu > Save As.

Step 2. Key-in **CROSS MEMBER** for the file-name and press ENTER.
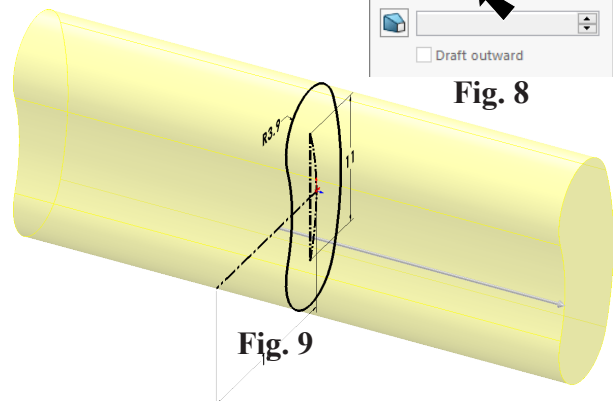
R3.9

Fig. 9

C. Mate References.

Step 1. Click **Right Plane** ⬚ in the Feature Manager to select Plane, **Fig. 10**.
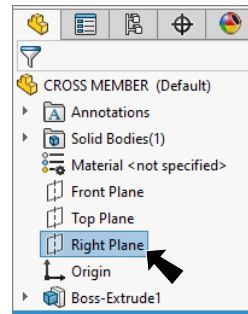
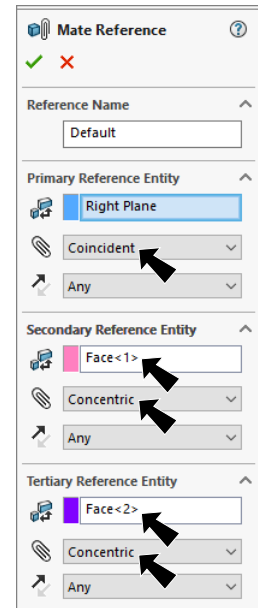**Step 2.** Click **Reference Geometry** 🗐 on the Features toolbar and **Mate Reference** from the menu.

Step 3. In the Mate Reference Manager:

      under **Primary** Reference Entity ▮, **Fig. 11**

        Right plane was preselected

        Mate Reference Type 🖇 **Coincident**

      under **Secondary** Reference Entity ▮

        click in Entity box 🗐
        and click **top curved face**, **Fig. 12**

        Mate Reference Type 🖇 **Concentric**

      under **Tertiary** Reference Entity ▮

        click in Entity box 🗐
        and click **bottom curved face**

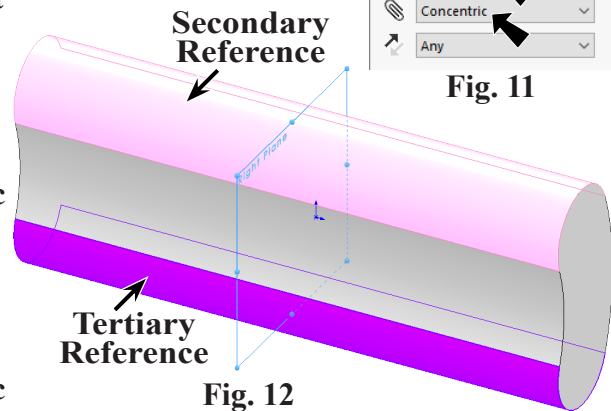   Mate Reference Type 🖇 **Concentric**

      click OK ✔ .

Step 4. Save 💾 (**Ctrl-S**).

Fig. 10

Fig. 11

Secondary Reference

Tertiary Reference

Fig. 12

D. Appearance.

Step 1.   Click part, click **Appearance Callout**
on the context toolbar and click **CROSS M...** , **Fig. 13**.

Step 2.   In the Appearances Task pane, expand
Plastic, click **High Gloss** and in the lower
pane select **white high gloss plastic**, **Fig. 14**.

Step 3.   In the Appearances Property Manager set:
under Color, **Fig. 15**
set **RGB values**
R 173
G 205
B 217
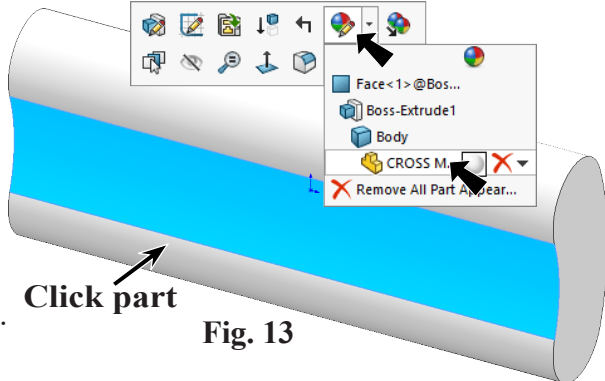click OK ✔ .

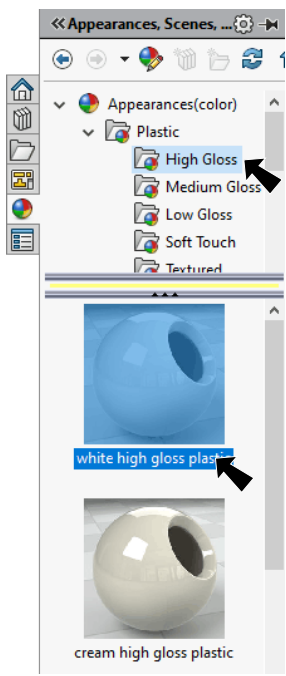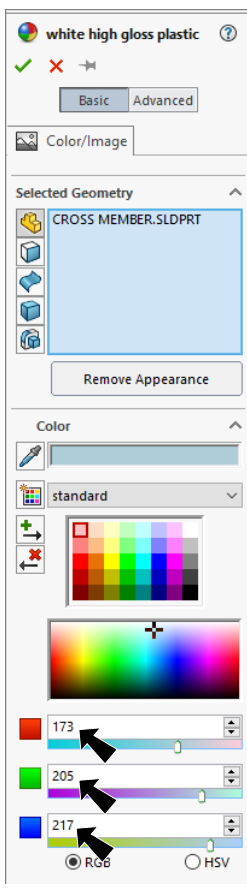Step 4.   Save (**Ctrl-S**).

Click part

Fig. 13

Fig. 16

Fig. 14

Fig. 15