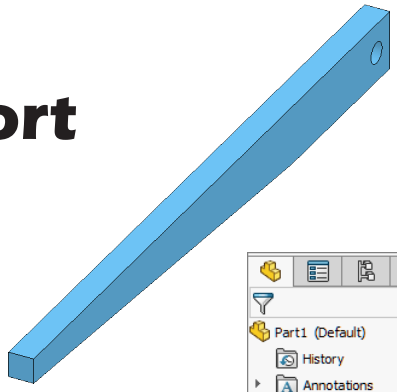
Chapter 15

Solar Car

Cross Support



A. Sketch.

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

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

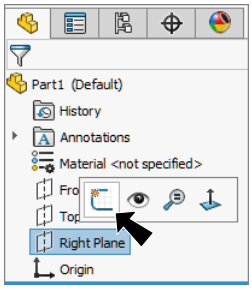


Fig. 1

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

Step 4. Sketch lines starting from the Origin , **Fig. 2**.

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

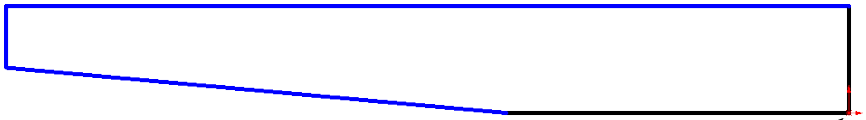


Fig. 2

Step 6. Sketch circle for hole, **Fig. 4**.

Step 7. Click **Smart Dimension** **(S)** on the Sketch toolbar.

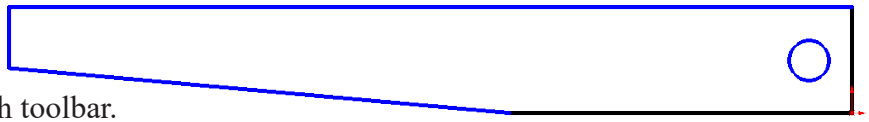


Fig. 3

Step 8. Add dimensions, **Fig. 4**.

Step 9. Click **Features** on the Command Manager toolbar.

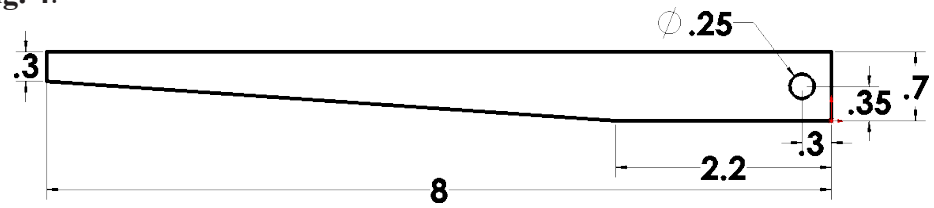


Fig. 4

Step 10. Click **Extruded Boss/Base** on the Features toolbar.

Step 11. In the Boss-Extrude Property Manager set:

under Direction 1, **Fig. 5**

End Condition **Mid Plane**

Depth **.3**

click OK .

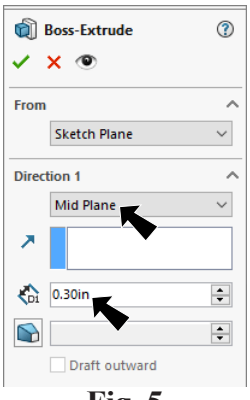


Fig. 5

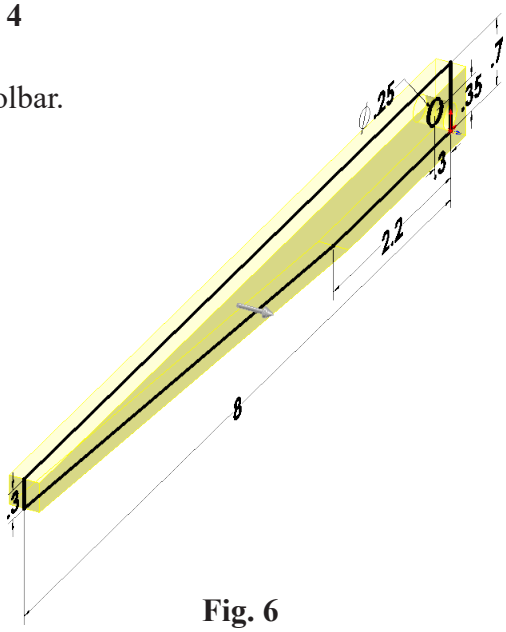


Fig. 6

B. Save as "CROSS SUPPORT".

Step 1. Click File Menu > Save As.

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

C. Material PS HI (Polystyrene).

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

Step 2. Expand **Plastics** (click ▸) in the material tree and select **PS HI**. Click **Apply** and **Close**.

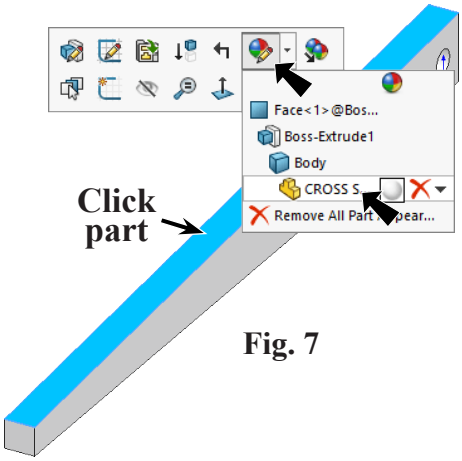


Fig. 7

D. Appearance Color.

Step 1. Click the part, click **Appearance Callout** on the context toolbar and click **CROSS SUPPORT**, **Fig. 7**.

Step 2. In the Appearances Task pane, expand **Plastic**, click **Soft Touch** and in the lower pane select **blue soft touch plastic**, **Fig. 8**.

Step 3. In the Appearances Property Manager:
under Color, **Fig. 9**
set **RGB values**
R 111
G 202
B 255
click OK.

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

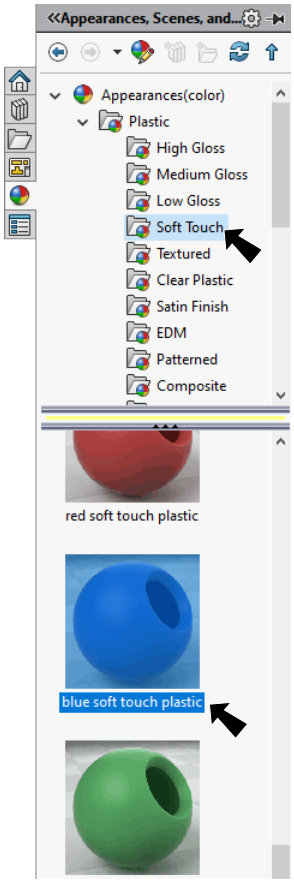


Fig. 8

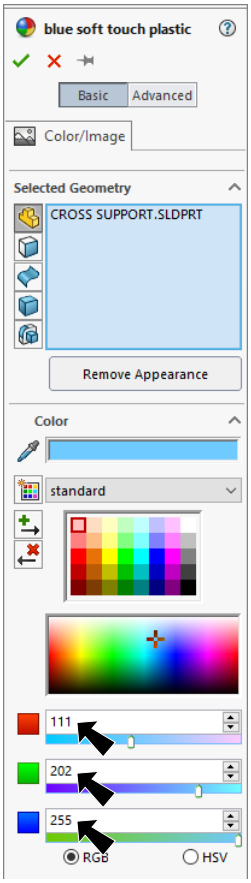


Fig. 9

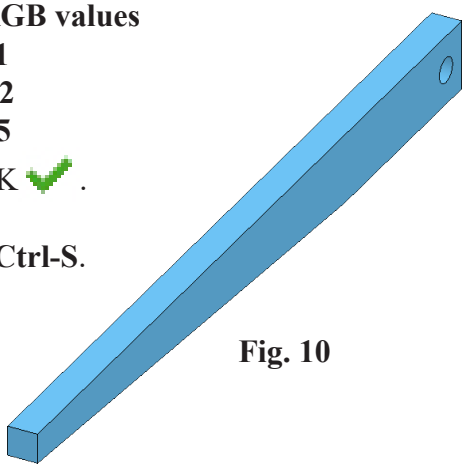


Fig. 10

E. Insert Front Axle and Cross Support into Assembly.

Step 1. Open your **SOLAR CAR ASSEMBLY** file.

Step 2. Click **Isometric** on the View toolbar. (**Ctrl-7**)

Step 3. Click **Insert Components** on the Assembly toolbar.

Step 4. Select your **Front Axle** file and click Open from the Open dialog box.

Step 7. Click **Keep Visible** in the Property Manager.

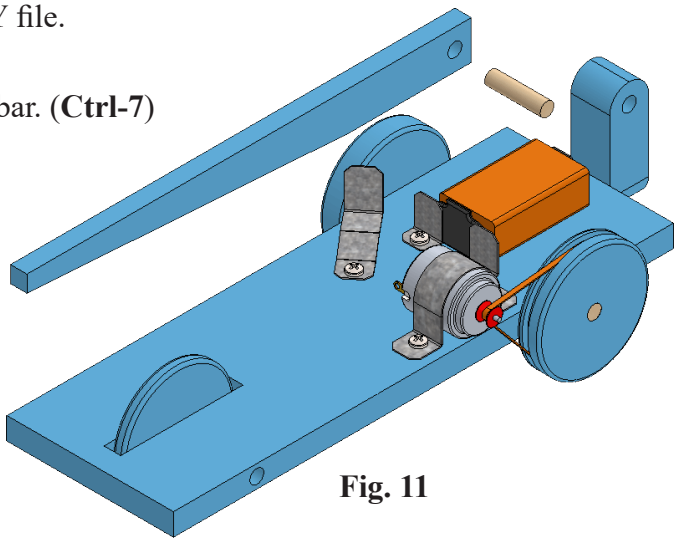


Fig. 11

Step 6. Place Front Axle as positioned in **Fig. 11**.

Step 8. Click **Browse** in the Property Manager and insert **Cross Support**, **Fig. 11**.

Step 9. Click OK in the Property Manager when done.

F. Mate: Axle and Arm and Cross Support.

Step 1. Click **Mate** on the Assembly toolbar.

Step 2. Click **end face of the Axle** and **side face of Arm**, **Fig. 12**.

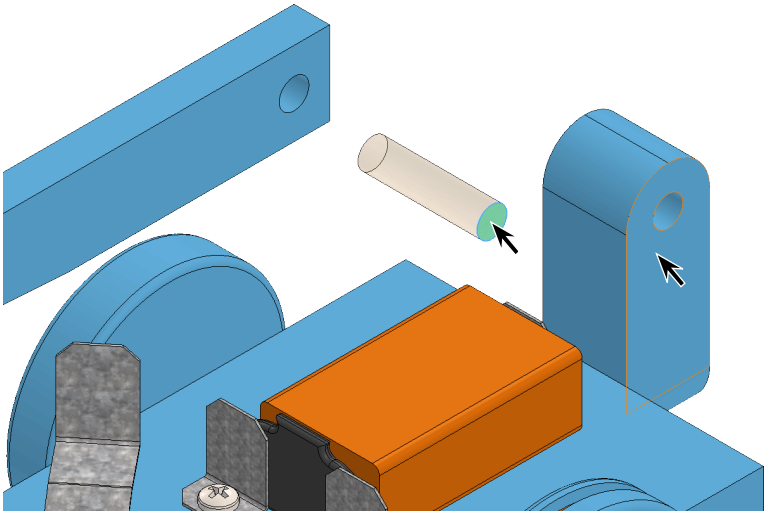


Fig. 12

Step 3. Click Add/Finish Mate in Mate pop-up toolbar to add a **Coincident** mate.

Step 4. Click **cylindrical face of hole in Arm** and **cylindrical face of Axle**, **Fig. 13**.

Step 5. Click Add/Finish Mate in Mate pop-up toolbar to add a **Concentric** mate.

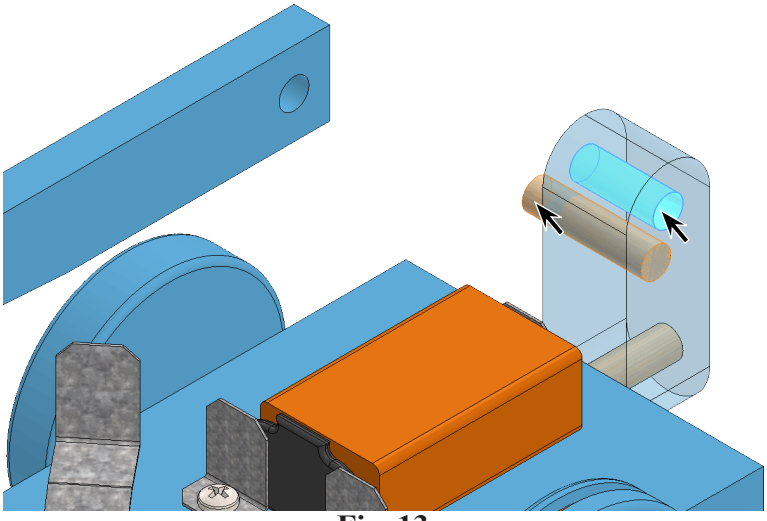


Fig. 13

Step 6. **Hide the cylindrical face of the Axle**. Press **Alt key to hide**., **Fig. 14**.

Step 7. Click **end face of Axle**, then **hide face of Cross Support** and click **right face**, **Fig. 15**.

Step 8. Click Add/Finish Mate  to add a **Coincident** mate.

Step 9. Grab the Cross Support and move away from Axle, then click **cylindrical face of Axle** and **cylindrical face of hole in Cross Support**, **Fig. 16**.

Step 10. Click Add/Finish Mate  in Mate pop-up toolbar to add a **Concentric** mate.

Step 11. Click OK  in the Property Manager.

Step 12. Save. Use **Ctrl-S**.

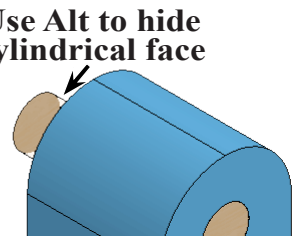


Fig. 14

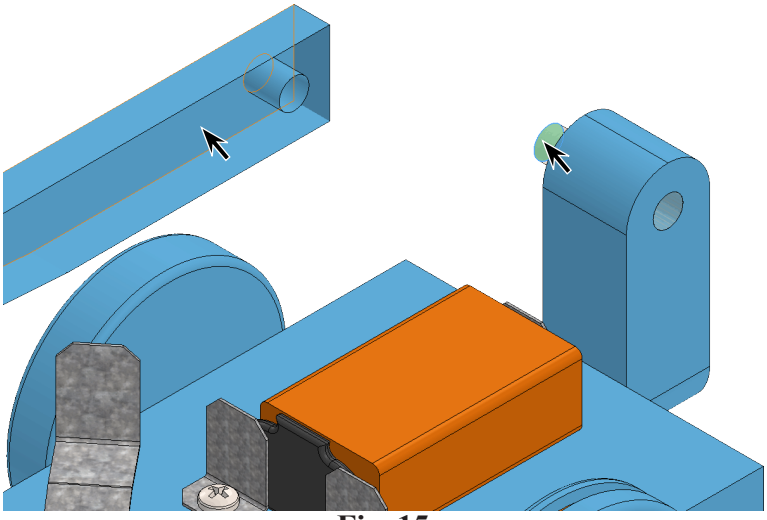


Fig. 15

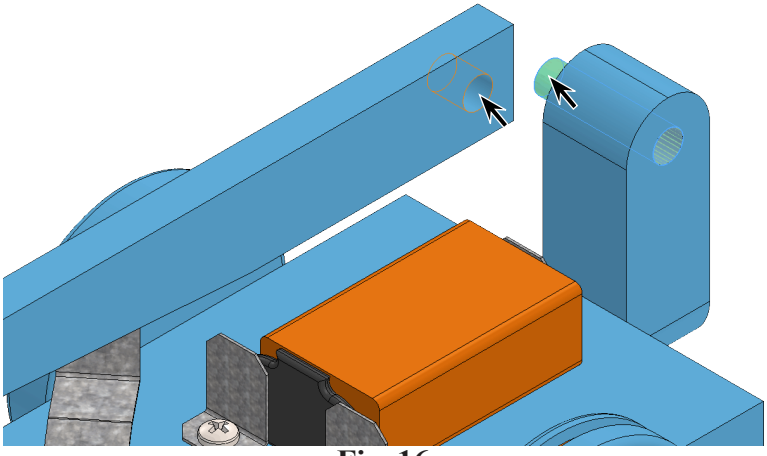


Fig. 16

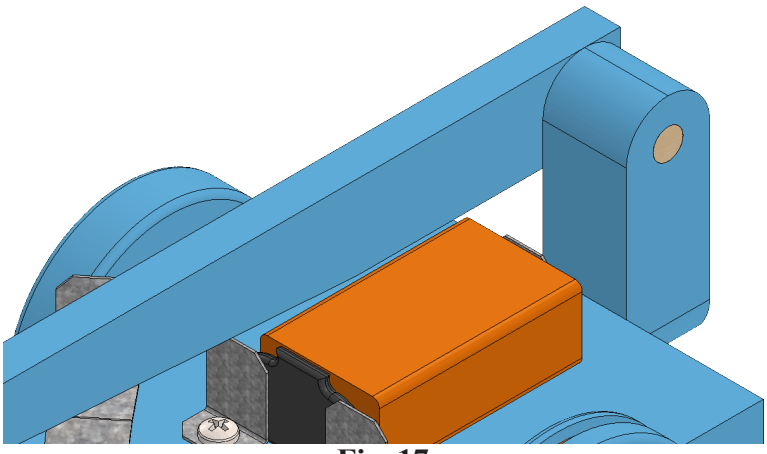


Fig. 17