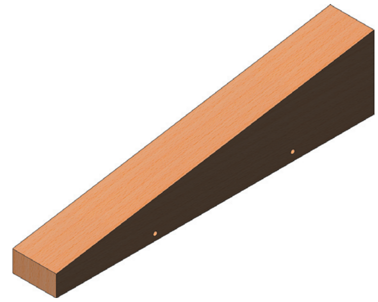
Chapter 1

CO2 Shell Car
Blank



A. New Metric Part.

Step 1. Click File Menu > New.

Step 2. Click **Part Metric** from the list and click OK, **Fig. 1**.

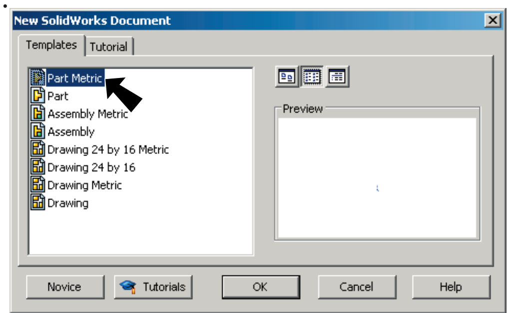


Fig. 1

B. Body.

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

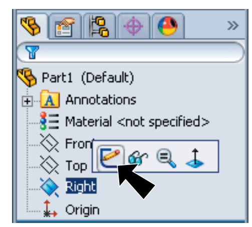


Fig. 2

Step 2. Click **Line**  (**L**) on the Sketch toolbar.

Step 3. Starting at the Origin  draw the sketch in **Fig. 3**. Use the inferencing line, the dotted line that appears when you draw the lines to keep the side lines vertical and the bottom line horizontal, **Fig. 3**. Do not add any extra lines. If you make a mistake, use Undo, **Ctrl-Z**.

Step 4. Click **Smart Dimension**  (**S**) on the Sketch toolbar.

Origin

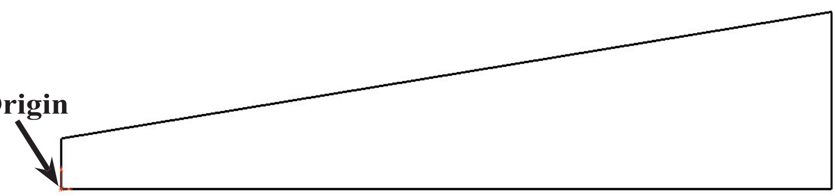


Fig. 3

Step 5. Add dimensions as shown in **Fig. 4**. To Smart dimension click the line then move the cursor out away from the line and click. Key-in the dimension and press ENTER. Arrange the dimensions as shown in **Fig. 4**.

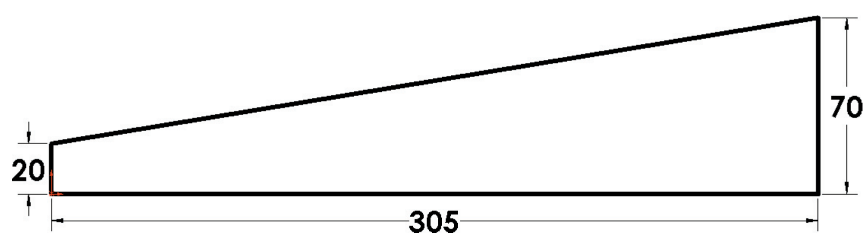


Fig. 4

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

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

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

Step 9. In the Property Manager, under **Direction 1** set:

End Condition to **Mid Plane**

Depth to **42**

and click OK, **Fig. 5 and Fig. 6**.

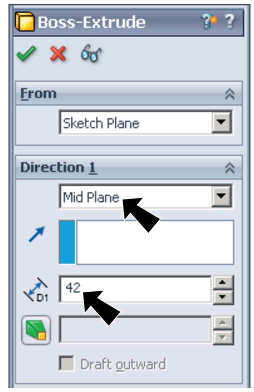


Fig. 5

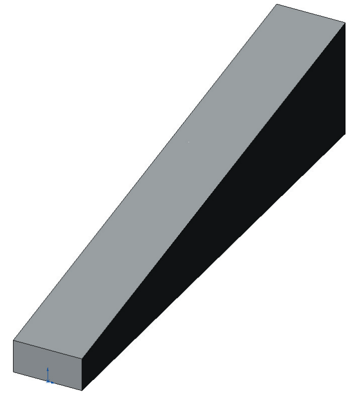


Fig. 6

C. Save as "BLANK".

Step 1. Click File Menu > Save As.

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

D. Cartridge Hole.

Step 1. Click **Back** on the Standard Views toolbar. (**Ctrl-2**)

Step 2. Click the **back face** of the body and click **Sketch** on the Content menu, **Fig. 7**.

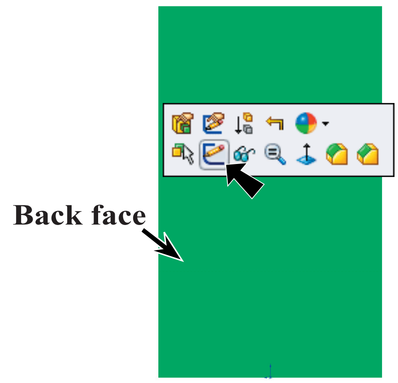


Fig. 7

Step 3. Click **Wireframe** on the View toolbar.

Step 4. Click **Circle** (**S**) on the Sketch toolbar.

Step 5. Draw a circle for the cartridge hole, **Fig. 8**. Use the vertical inferencing line, the dotted line that appears when you draw to keep the circle directly above the Origin, **Fig. 8**.

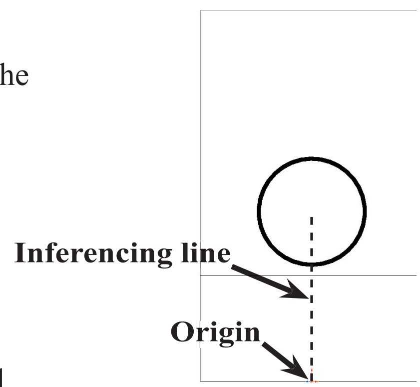


Fig. 8

Step 6. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 7. Add dimensions as shown in **Fig. 9**. To Smart dimension circle, click the circle then move the cursor out away from circle and click. Key-in **20** for diameter and press ENTER. To add other dimensions, click circle and edge of body, move cursor just off of body and click. Key in dimension and press ENTER. Arrange the dimensions as shown in **Fig. 9**.

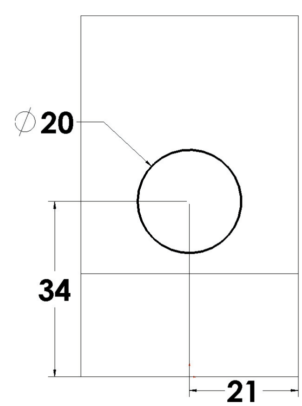


Fig. 9

Step 8. Click **Features** on the Command Manager toolbar.

Step 9. Click **Extruded Cut** on the Features toolbar.

Step 10. In the Property Manager, under **Direction 1** set:

Depth to **52**

and click OK, **Fig. 10** and **Fig. 11**.

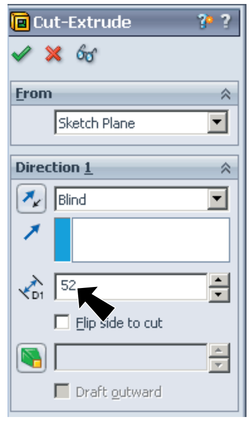


Fig. 10

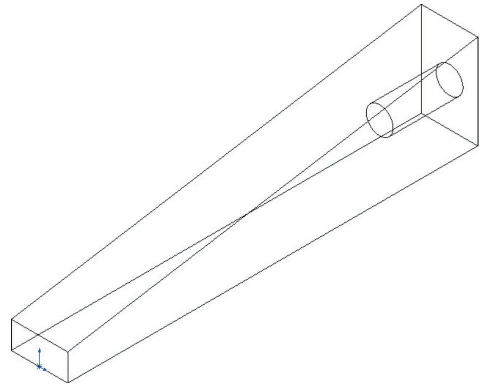


Fig. 11

Step 11. Click **Isometric** on the Standard Views toolbar. (**Ctrl-7**)

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

E. Axle Holes.

Step 1. Click **Right** (plane) in the Feature Manager and click **Sketch** from the Content toolbar, **Fig. 12**.

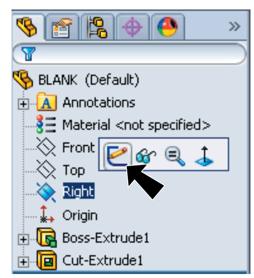


Fig. 12

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 for the axle holes, **Fig. 13**. Draw the back hole slightly above the front hole. **Do not** align circles, do not use the inferencing line, the dotted line that appears when you draw the second circle.

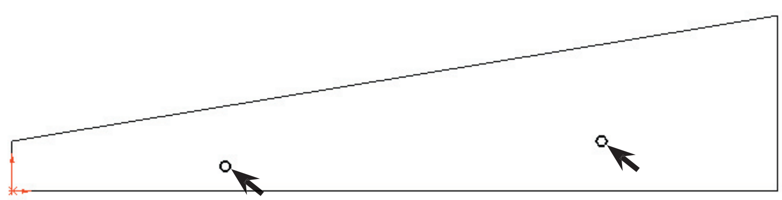


Fig. 13

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

Step 6. Add dimensions as shown in **Fig. 14**. To Smart dimension circle, click the circle then move the cursor out away from circle and click. Key-in **3.18** for diameter and press ENTER. To add other dimensions, click circle and edge of body, move cursor just off of body and click. Key in dimension and press ENTER. Arrange the dimensions as shown in **Fig. 14**.

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

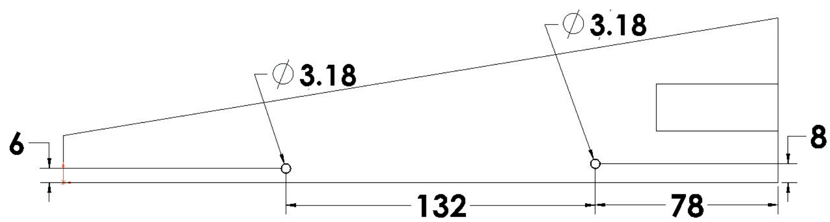


Fig. 14

Step 8. Click **Extruded Cut** [Extruded Cut] on the Features toolbar.

Step 9. Click **Isometric** on the Standard Views toolbar.

Step 10. In the Property Manager, under **Direction 1** set:

End Condition to **Mid Plane**

Depth to **42**

click OK, **Fig. 15** and **16**.

Step 11. Save. Use **Ctrl-S**.

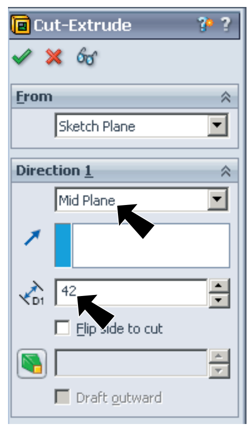


Fig. 15

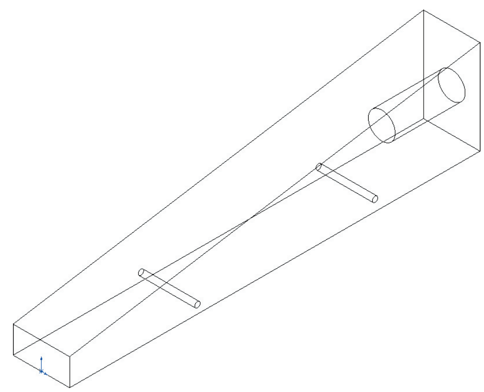


Fig. 16

F. Rename Features.

Step 1. Click **Shaded With Edges** on the View toolbar.

Step 2. **Rename Features** in the Feature Manager. To rename, slowly click twice over the Feature name and change name, **Fig. 17** and **Fig. 18**. **(F2)**

Change:

Boss-Extrude1	**to**	**Extrude1 BODY**
Cut-Extrude1	**to**	**Cut-Extrude1 CARTRIDGE HOLE**
Cut-Extrude2	**to**	**Cut-Extrude2 AXLE HOLES**

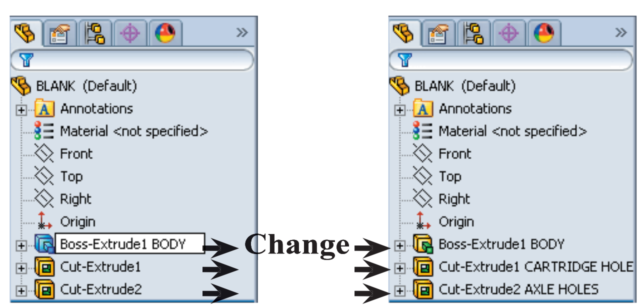


Fig. 17

Fig. 18

G. Mate References.

Fig. 19

Step 1. Click **Filter Faces** (**X**) on the **Selection Filter toolbar** at the bottom of the display, **Fig. 19**. If necessary, use **F5** key to display the toolbar.

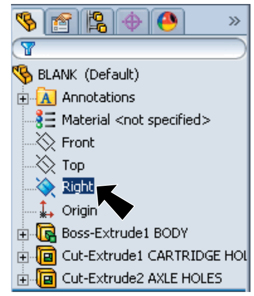


Fig. 20

Step 2. Click **Right** (plane) in the Feature Manager to select Plane, **Fig. 20**.

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

Step 4. In the Mate Reference Manager:

under **Primary** Reference Entity, **Fig. 21**

set **Mate Reference Type to Coincident**

under **Secondary** Reference Entity

click in Entity box and click **inside cylindrical face of front axle hole**, **Fig. 22**

click OK.

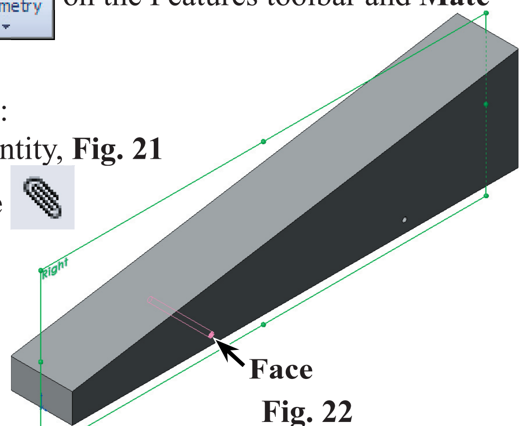


Fig. 22

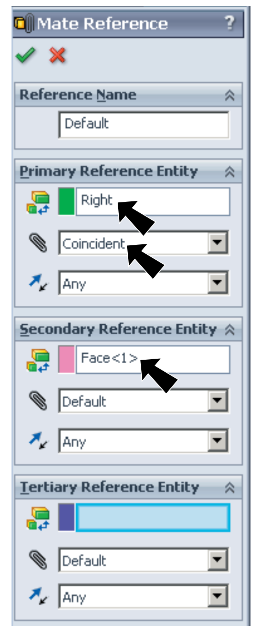


Fig. 21

Step 5. Click **Right** (plane) in the Feature Manager to select Plane, **Fig. 20**.

Step 6. Click **Reference Geometry** on the Features toolbar and **Mate Reference** from the menu.

Step 7. In the Mate Reference Manager:

under **Primary** Reference Entity, **Fig. 23**

set **Mate Reference Type to Coincident**

under **Secondary** Reference Entity

click in Entity box and click **inside cylindrical face of rear axle hole, Fig. 24**

click OK.

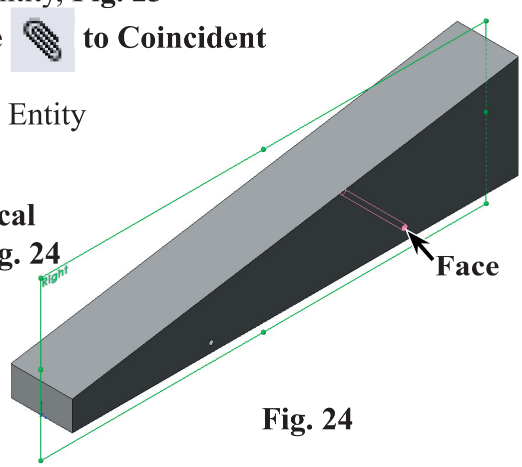


Fig. 24

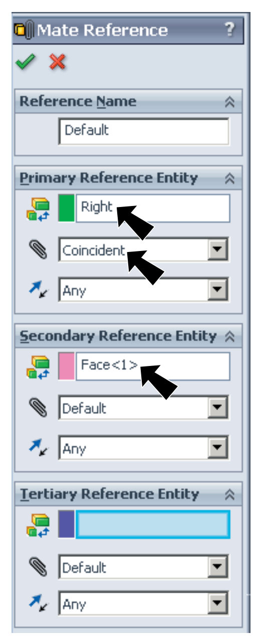


Fig. 23

Step 8. Turn off **Filter Faces** (**X**) on the **Selection Filter toolbar** at the bottom of the display, **Fig. 25**. Use **F6** key to turn off all filters.

Fig. 25

Step 9. Save. Use **Ctrl-S**.

H. Material Balsa.

Step 1. **Right click Material**  in the Feature Manager and click **Edit Material** , **Fig. 26**.

Step 2. **Expand Woods** (click the +) in the material tree and select **Balsa**, **Fig. 27**. Click **Apply** and **Close**, **Fig. 28**.

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

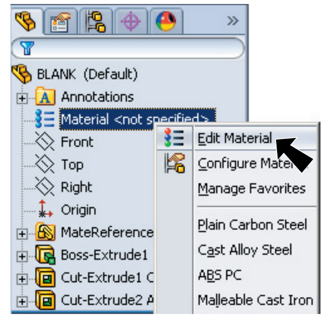


Fig. 26

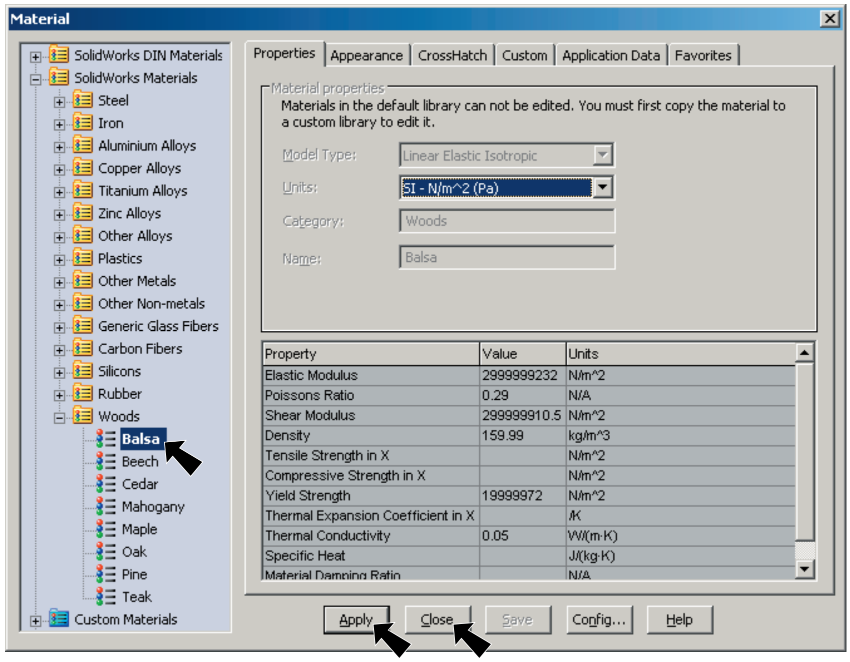


Fig. 27

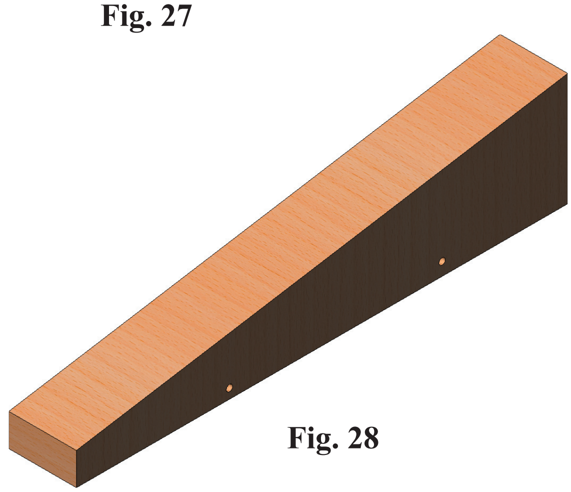


Fig. 28

I. Enable PhotoView 360.

Step 1. If necessary, turn on PhotoView 360: click Tools Menu > Add-Ins.

Step 2. In the dialog box scroll down to **PhotoView 360** and place a check in the check box under **Active Add-Ins** and **Start-Up**, **Fig. 29**. Click OK.

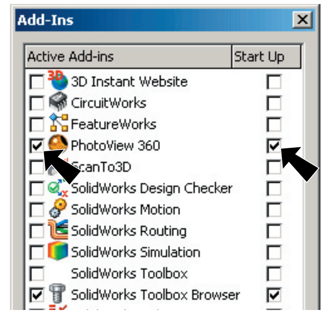
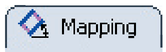


Fig. 29

J. Rotate Mapping.

Step 1. Click PhotoView 360 Menu > Edit Appearance.

Step 2. In the Property Manager:

click **Mapping tab** 

under Mapping controls,

click **Surface mapping** 
set **Rotation to 90**

click **Small mapping size** 
click OK , **Fig. 30**.

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

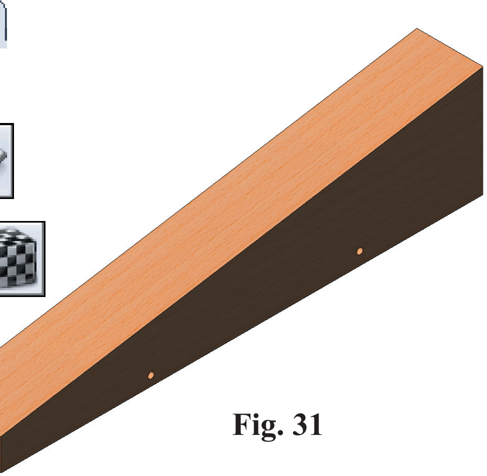


Fig. 31

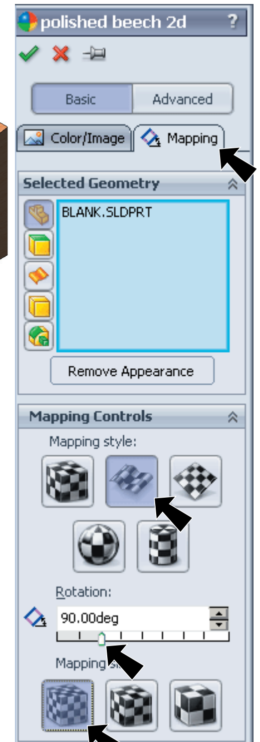


Fig. 30