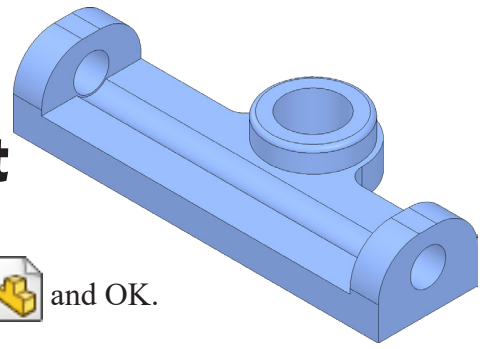


Solar Train Bogie Bracket



A. Extrude1.

Step 1. Click **New**  on the Standard toolbar, click **Part Metric**  and OK.

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

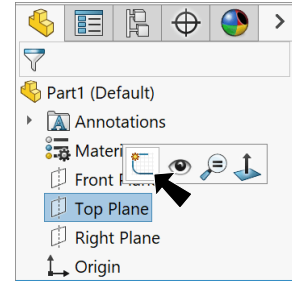


Fig. 1

Step 3. Click **Center Rectangle**  in the **Rectangle** flyout  on the Sketch toolbar.

Step 4. Sketch a **centerpoint rectangle at Origin**

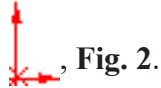


Fig. 2

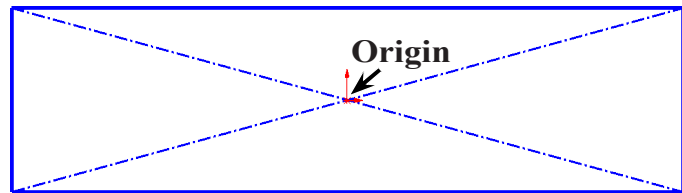


Fig. 2

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

Step 6. Sketch **two concentric circles** above Origin , **Fig. 3**.

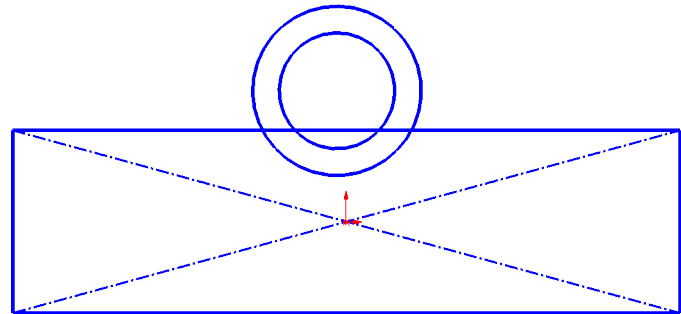


Fig. 3

Step 7. **Unselect Circle tool**. To unselect, right click graphics area and click **Select**  from menu.

Step 8. **Ctrl click centerpoint of circle and**

Origin  to select both. Release Ctrl key and click **Make Vertical**



on the context toolbar, **Fig. 4**.

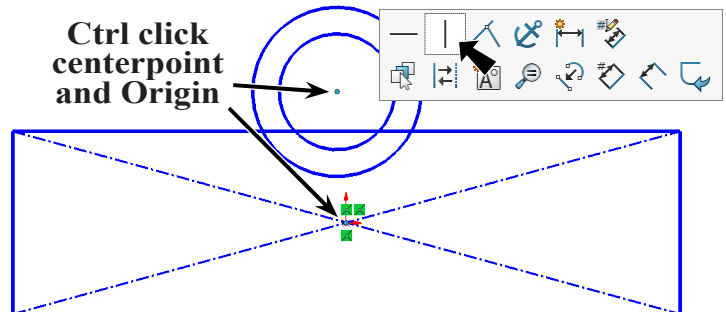


Fig. 4

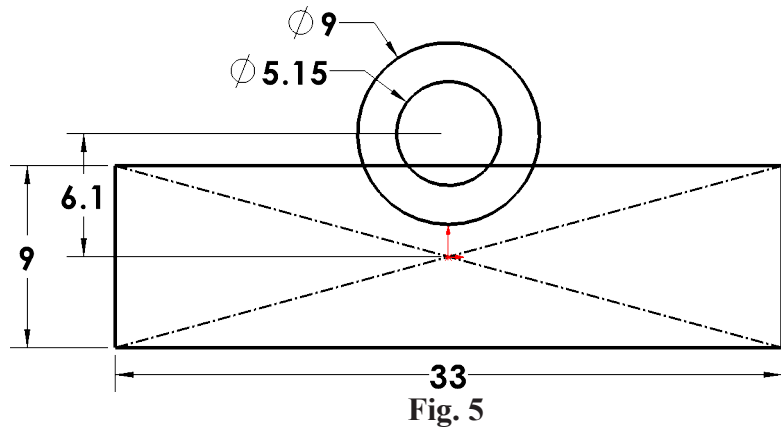
Step 9. Click **Smart Dimension**



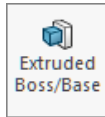
(S) on the Sketch toolbar.

Step 10. Add dimensions, **Fig. 5**.

Step 11. Click **Features** on the Command Manager toolbar.



Step 12. Click **Extruded Boss/Base** on the Features toolbar.



Step 13. In the Boss-Extrude Property Manager set:

under Direction 1, **Fig. 6**

End Condition **Blind**

Depth 2.55

under Selected Contours

click the **three contours**, **Fig. 7**

click OK .

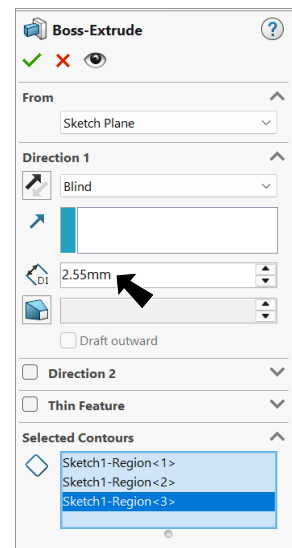


Fig. 6

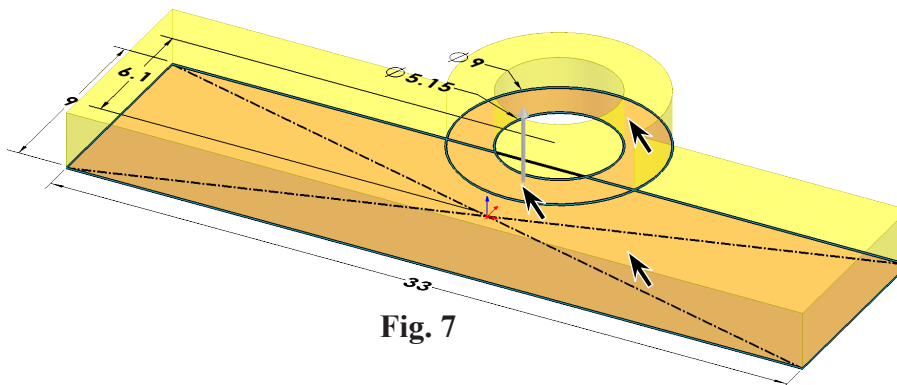


Fig. 7

B. Save as "BOGIE BRACKET".

Step 1. Click File Menu > Save As.

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

C. Extrude2 Legs.

Step 1. Click **Top Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 8**.

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

Step 3. Click **Corner Rectangle**  in the **Rectangle flyout**  on the Sketch toolbar.

Step 4. Sketch corner rectangle at **both ends of Extrude**, **Fig. 9**.

Step 5. **Unselect Rectangle tool**. To unselect, right click graphics area and click **Select**  from menu.

Step 6. **Ctrl click a horizontal line of rectangles** to select both. Release Ctrl key and click **Make Equal**  on the context toolbar, **Fig. 10**.

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

Step 8. Dimension **length 2.55**, **Fig. 11**.

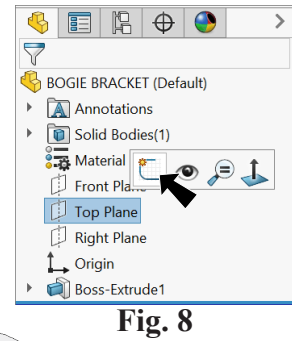


Fig. 8

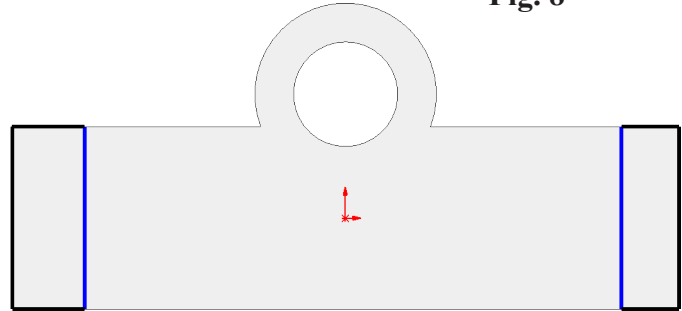


Fig. 9

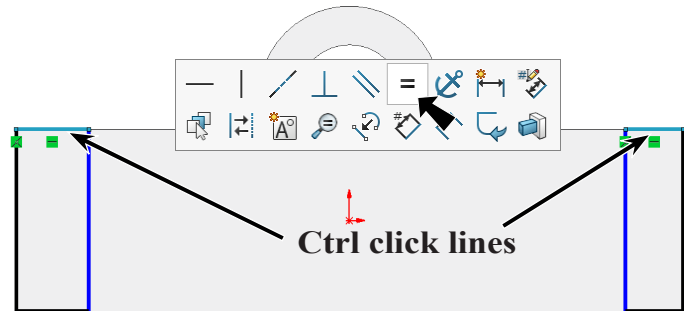


Fig. 10

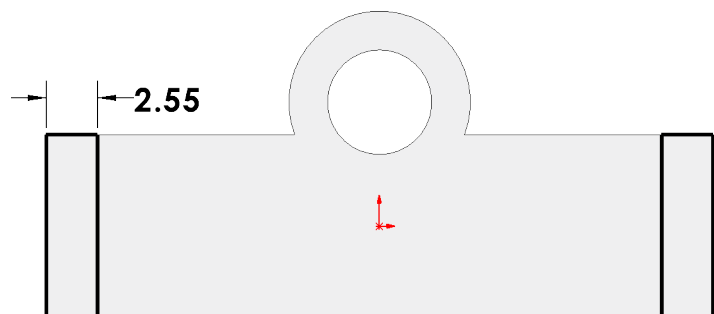
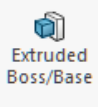


Fig. 11

Step 9. Click **Isometric**  on the Standard Views toolbar. (**Ctrl-I**)

Step 10. Click **Features**  on the Command Manager toolbar.

Step 11. Click **Extruded Boss/Base**  on the Features toolbar.

Step 12. In the Boss-Extrude Property Manager set:
under Direction 1, **Fig. 12**

End Condition **Blind**

Depth  6.7

click OK .

Step 13. Save  (**Ctrl-S**).

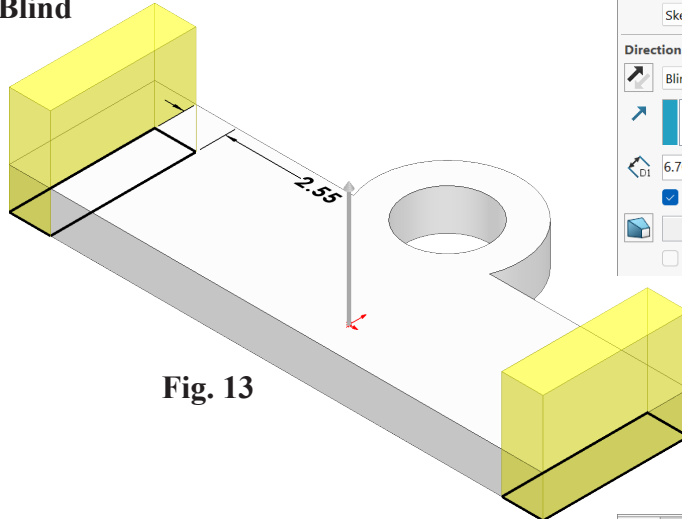


Fig. 13

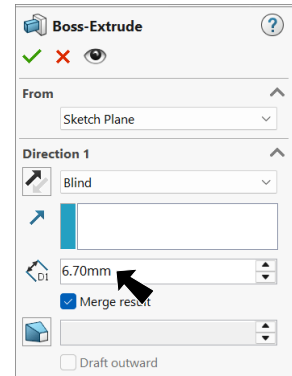


Fig. 12

D. Cut-Extrude1 Sketch3 Axle Hole.

Step 1. Click **Right Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 14**.

Step 2. Click **Circle**  (S) on the Sketch toolbar.

Step 3. Sketch circle above Origin , **Fig. 15**.

Step 4. **Unselect Circle tool**. To unselect, right click graphics area and click **Select**  from menu.

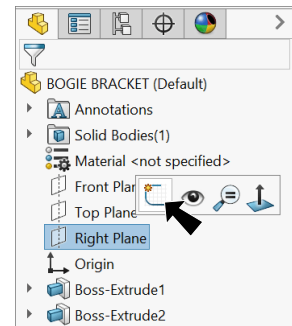


Fig. 14

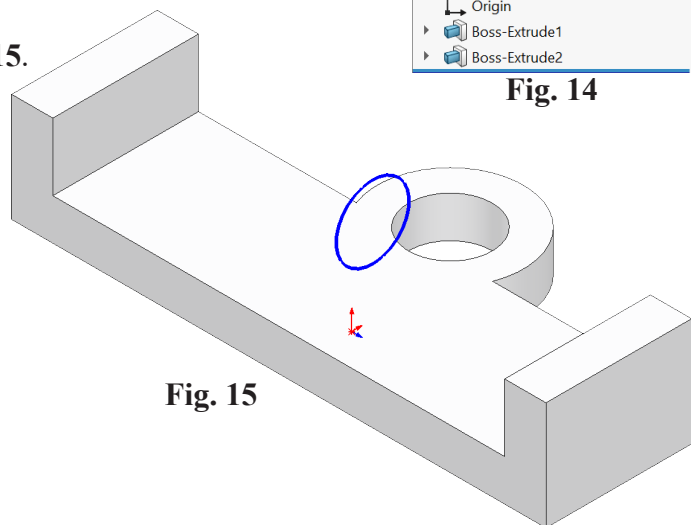


Fig. 15

Step 5. **Ctrl click centerpoint of circle and Origin**

to select both. Release Ctrl key and click **Make Vertical** on the context toolbar, Fig. 16.

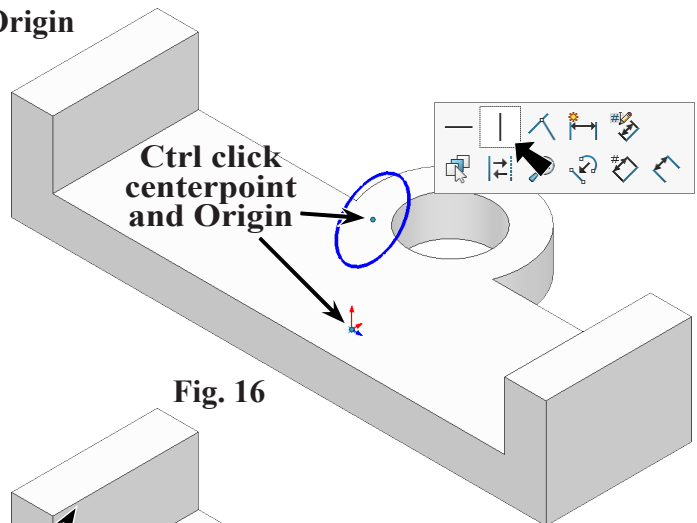


Fig. 16

Step 6. Click **Smart Dimension** on the Sketch toolbar.

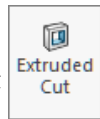


Step 7. Dimension **diameter 3.2** 3 from top edge, Fig. 17.

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



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



Edge

$\phi 3.2$

3

Fig. 17

Step 10. In the Cut-Extrude Property Manager set:
under Direction 1, Fig. 18
End Condition **Through All - Both**
click OK.

Step 11. Save (Ctrl-S).

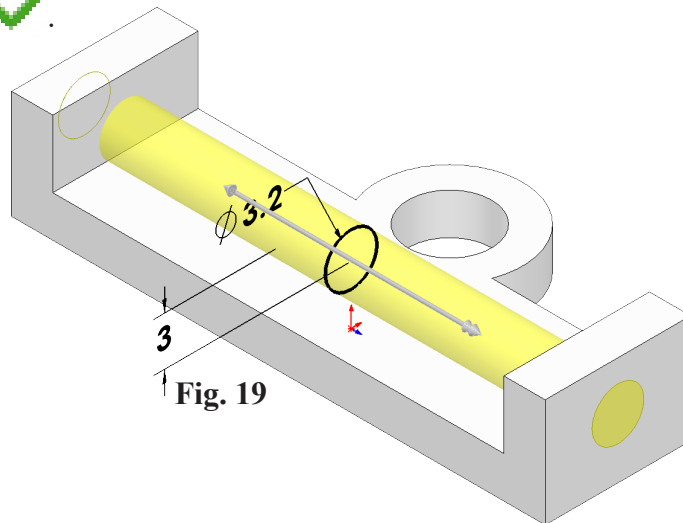


Fig. 19

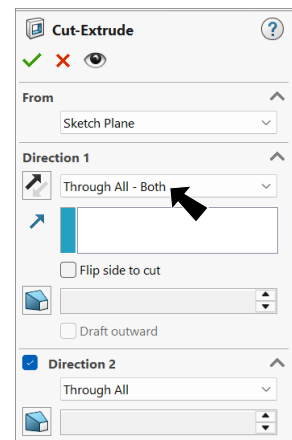


Fig. 18

E. Cut-Extrude2 Sketch4 Axle Clearance.

Step 1. Click **Right Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 20**.

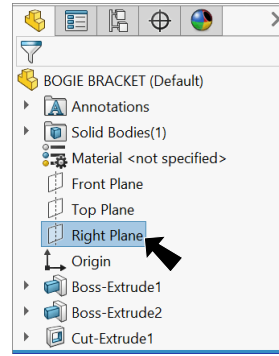


Fig. 20

Step 2. Select **Sketch3** . To select, expand **Cut-Extrude1**  in the Feature Manager and click **Sketch3**  to select, **Fig. 21**.

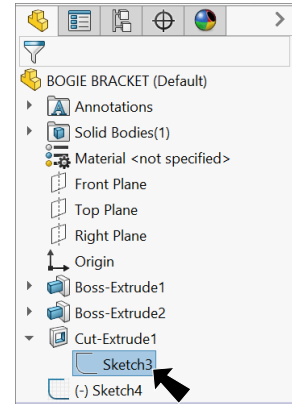
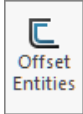


Fig. 21

Step 3. Click **Offset Entities**  on the Sketch toolbar.

Step 4. In the Offset Entities Property Manager set:
under Parameters, **Fig. 22**

Distance  **.15** (clearance for Axle)
uncheck **Reverse**
click OK .

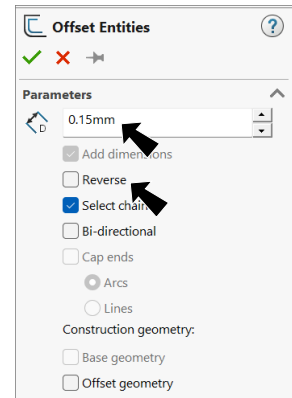


Fig. 22

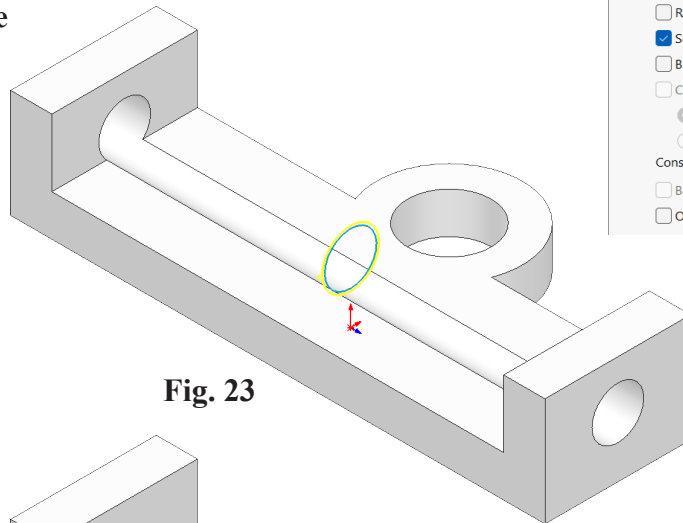


Fig. 23

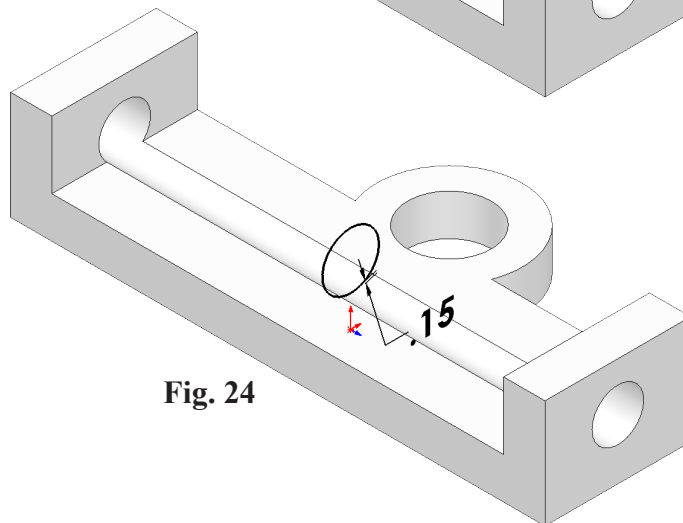
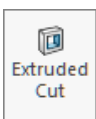


Fig. 24

Step 5. Click **Features**  on the Command Manager toolbar.

Step 6. Click **Extruded Cut**  on the Features toolbar.

Step 7. In Cut-Extrude Property Manager set:
under Direction 1, **Fig. 25**
End Condition **Up To Surface**
click **inside face of leg**, **Fig. 26**
under Direction 2
End Condition **Up To Surface**
click **inside face of other leg** (to select face, rotate view or
right click a face and use Select Other)
click OK .

Step 8. Save  (Ctrl-S).

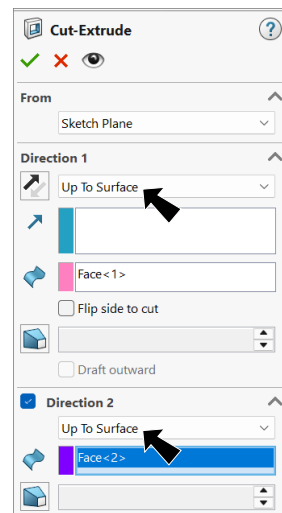


Fig. 25

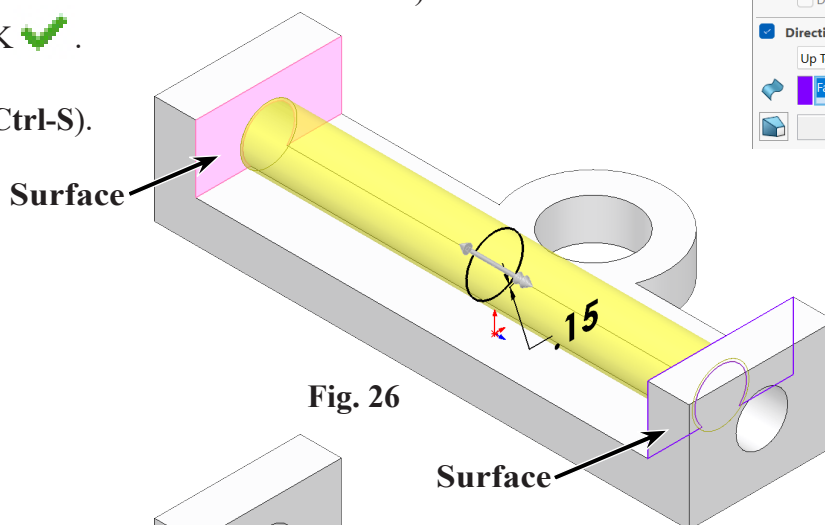


Fig. 26

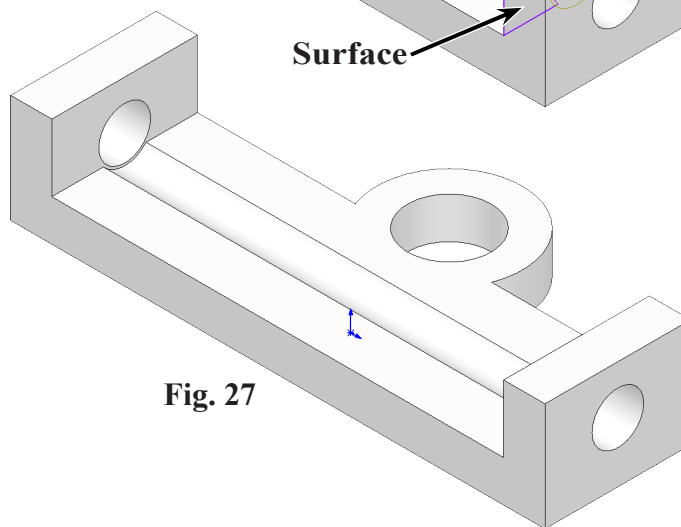


Fig. 27

F. Extrude3 Spacer for Pin.

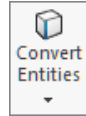
Step 1. Click the **top face** and click **Sketch**



on the context toolbar, **Fig. 28**.

Step 2. Unselect the face.

Step 3. Click **Convert Entities** on the Sketch toolbar.



Step 4. In the Convert Entities Property Manager:
under Entities to Convert, **Fig. 29**
click **edge of Pin hole**, **Fig. 30**
click OK ✓.

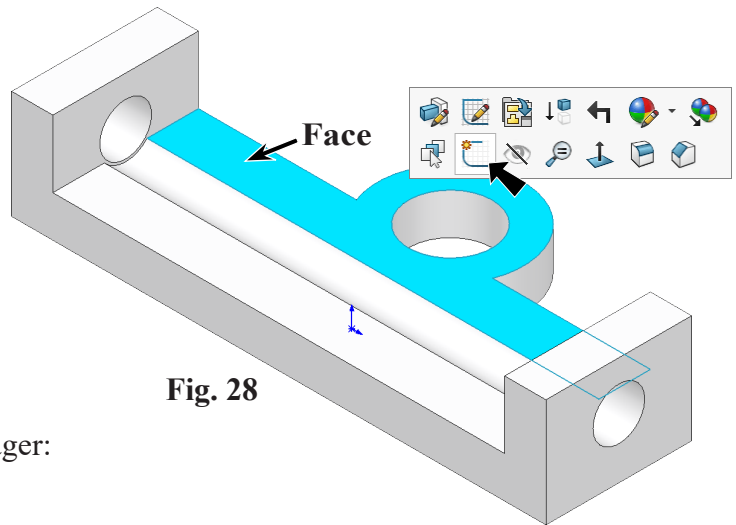


Fig. 28

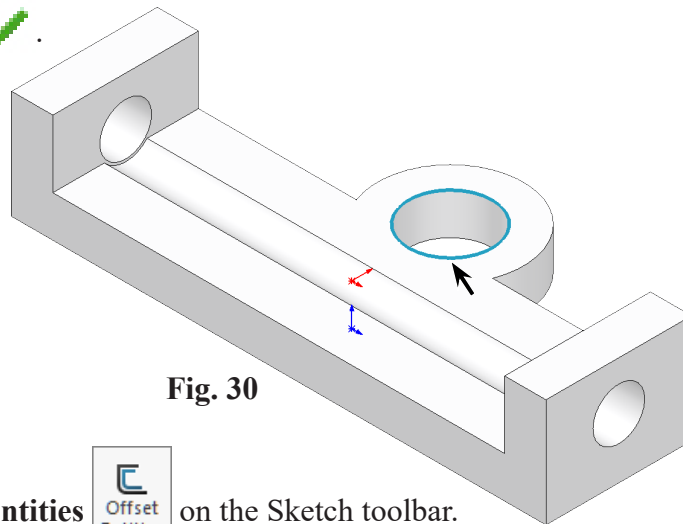


Fig. 30

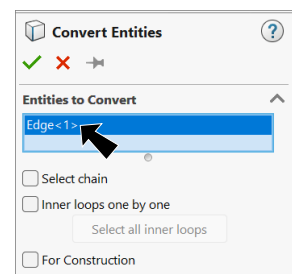
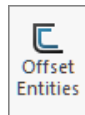


Fig. 29

Step 5. Click **Offset Entities** on the Sketch toolbar.



Step 6. In the Offset Entities Property Manager set:
under Parameters, **Fig. 31**

Distance **1.5**

click **converted edge**, **Fig. 32**

click OK ✓.

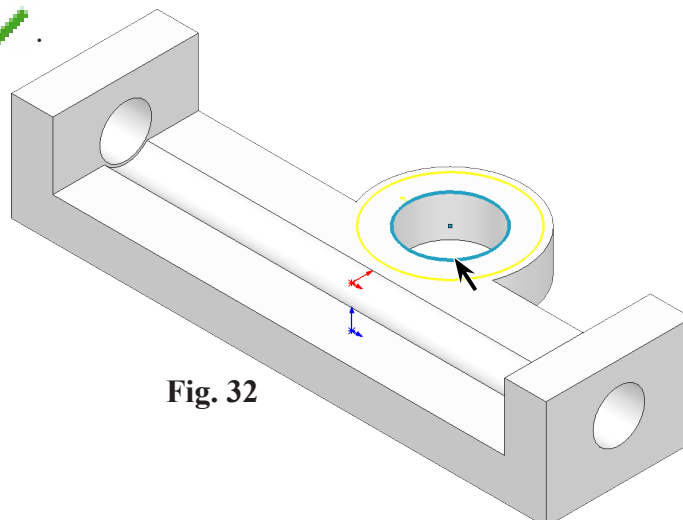


Fig. 32

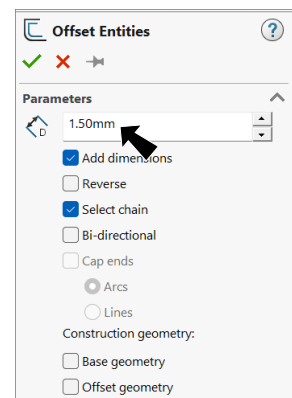
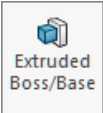


Fig. 31

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

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

Step 9. In the Boss-Extrude Property Manager set:
under Direction 1, **Fig. 33**
End Condition **Blind**

Depth  **2.4**
click OK .

Step 10. Save 
(**Ctrl-S**).

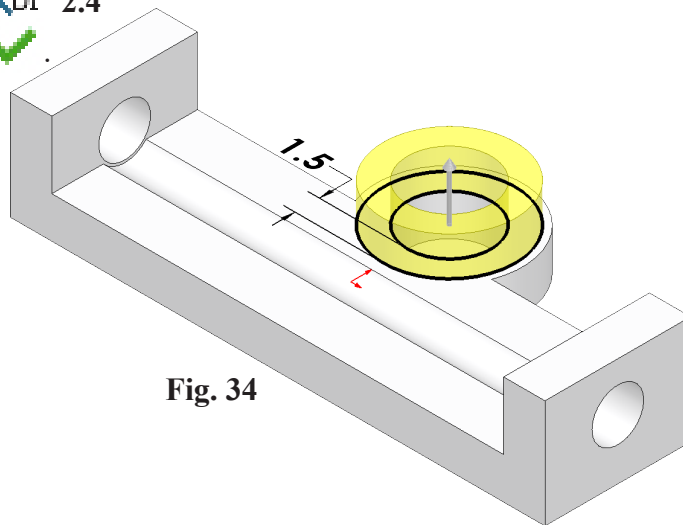


Fig. 34

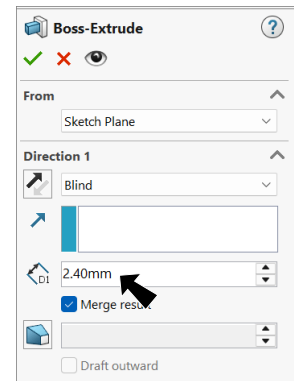


Fig. 33

G. Fillets 1-3.

Step 1. Click **Fillet**  on the Features toolbar.

Step 2. In the Fillet Property Manager set:
select **FilletXpert**, Fig. 35

① **Radius**  3.7

click top edges of both legs (4), Fig. 36
click Apply

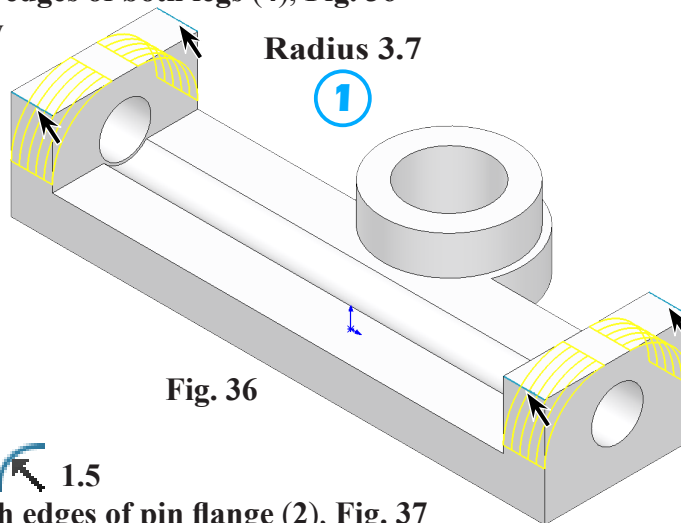


Fig. 36

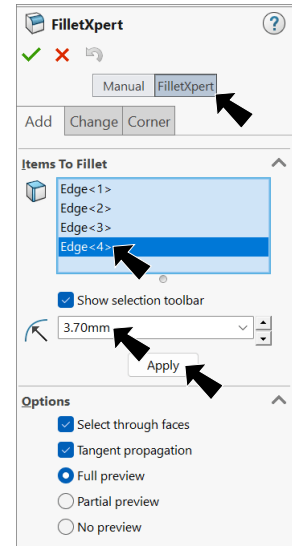


Fig. 35

② **Radius**  1.5

click both edges of pin flange (2), Fig. 37
click Apply

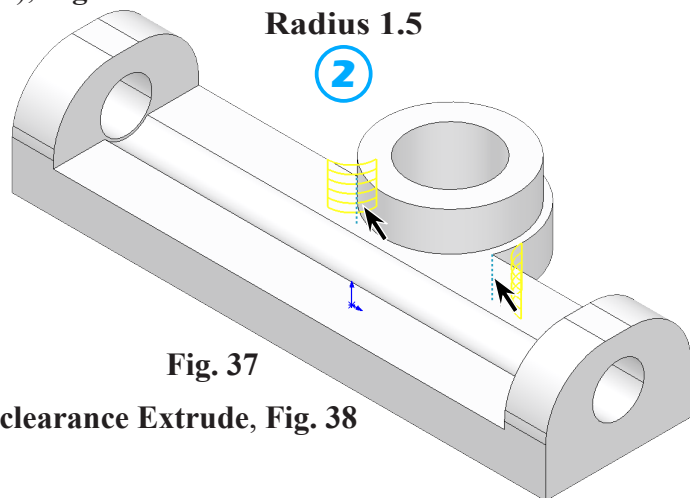


Fig. 37

③ **Radius**  .4

click circular edge of Pin hole clearance Extrude, Fig. 38
click OK .

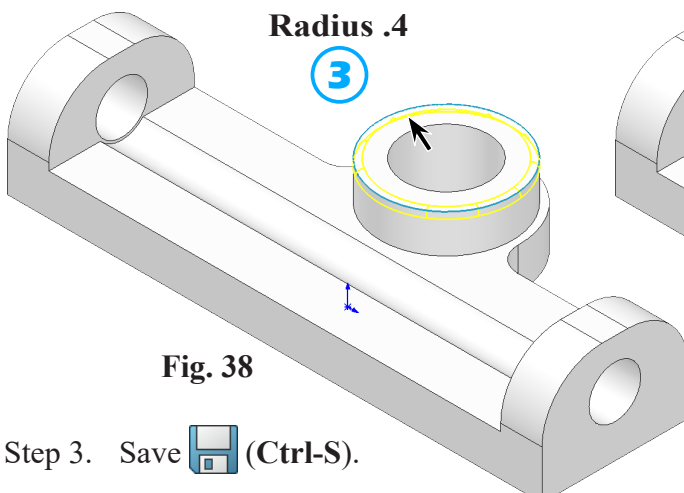


Fig. 38

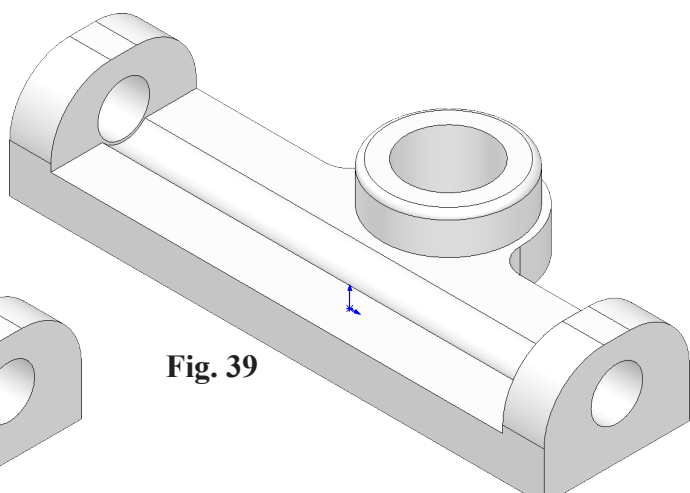


Fig. 39

Step 3. Save  (Ctrl-S).

H. Appearance: Blue Plastic.

Step 1. Click part, click **Appearance Call-**

out  on the context toolbar and click **BOGIE BRACKET** , **Fig. 40.**

Click part →

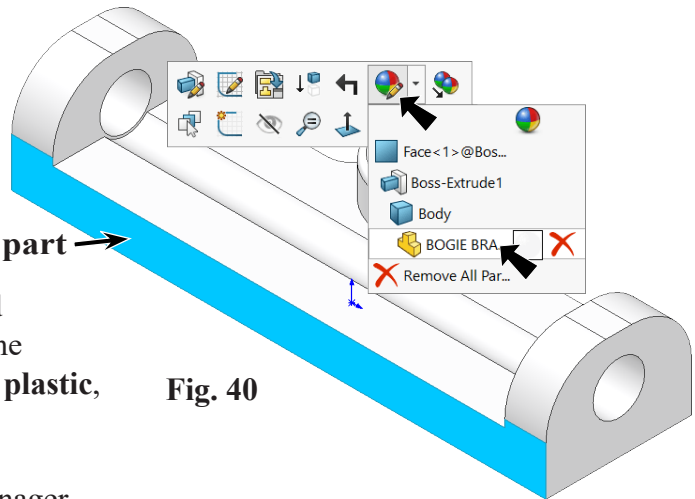


Fig. 40

Step 2. In the Appearances Task pane, expand **Plastic**, click **Medium Gloss** and in the lower pane select **blue medium gloss plastic**, **Fig. 41.**

Step 3. Over in the Appearances Property Manager, under **Color**, **Fig. 42**

set **RGB values**

R 150

G 185

B 255

and OK .

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

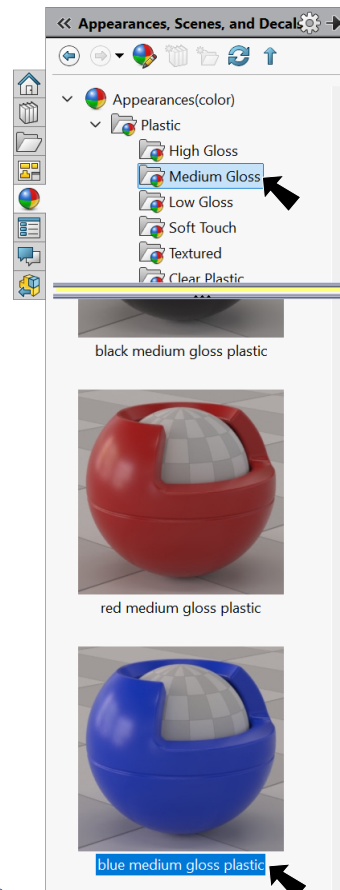


Fig. 41

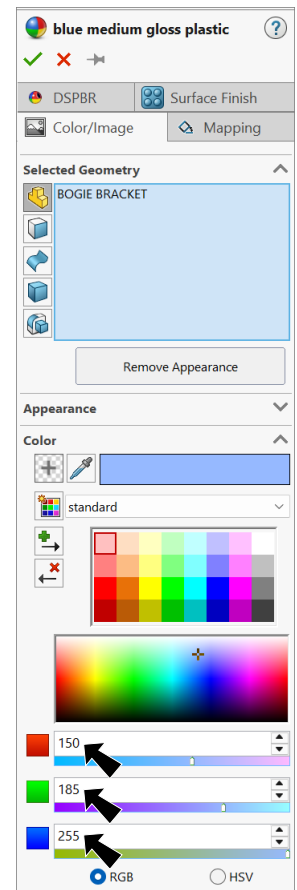


Fig. 42

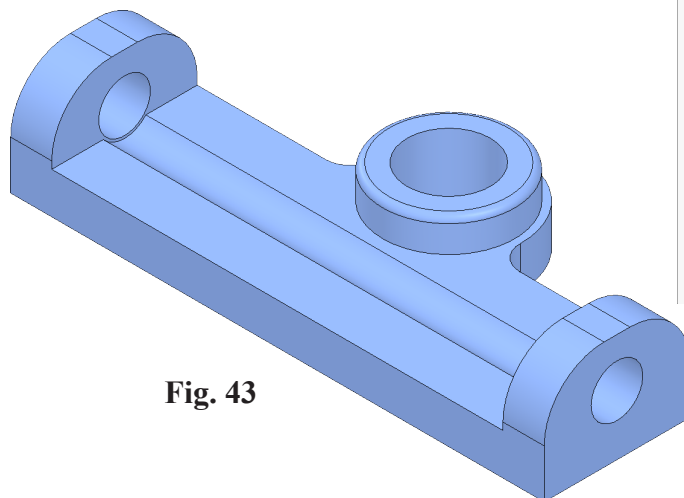


Fig. 43