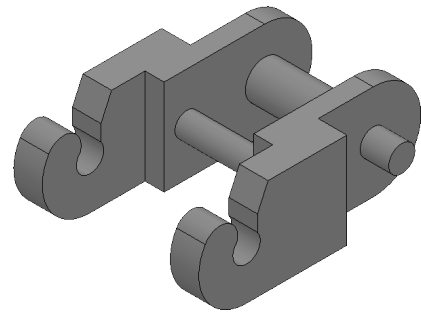


E's Small Car Chain Link



A. Create Plane1.

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

Step 2. Click **Right Plane** in the Feature Manager to display Plane in graphics area, **Fig. 1**.

Step 3. In graphics area **Ctrl drag Right plane** to right hand side of the vehicle (passenger's side) and release, **Fig. 2**.

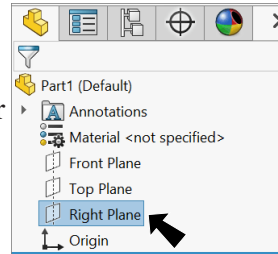


Fig. 1

Step 4. In the Plane Property Manager set: under First Reference, **Fig. 3**

Distance **3.875**
and press ENTER.

The new plane should be right hand side of vehicle (passenger's side) of Right plane, **Fig. 2**.

Click OK .

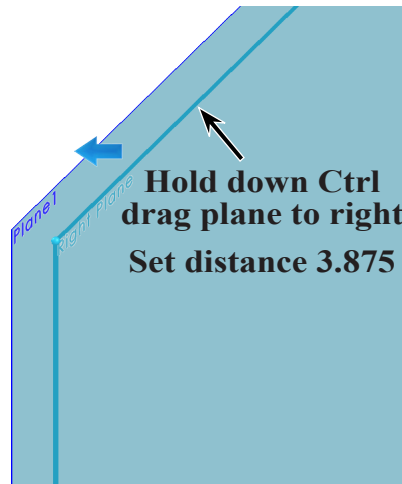


Fig. 2

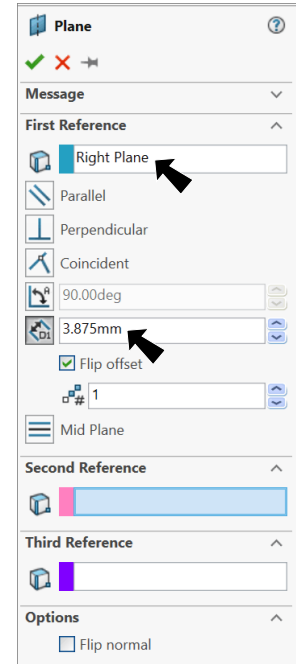


Fig. 3

B. Save as "CHAIN LINK".

Step 1. Click File Menu > Save As.

Step 2. Key-in **CHAIN LINK** for the filename and press ENTER.

C. Extrude1 Sketch1 Body.

Step 1. **Hide Plane1** . To hide, click **Plane1** in the graphics area and **Hide** on the context toolbar, **Fig. 4**.

Step 2. Click **Plane1** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 5**.

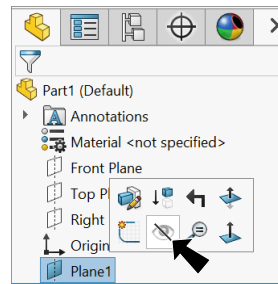


Fig. 4

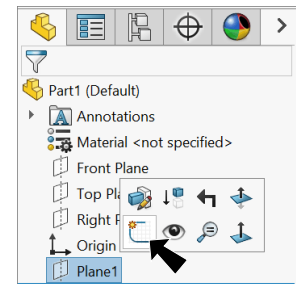




Fig. 5

Step 3. Click **Centerpoint Straight Slot**  (S) in the **Straight Slot flyout**  on the Sketch toolbar.

Step 4. Sketch a **horizontal Centerpoint**

Straight Slot at Origin , Fig. 6. To sketch horizontal slot, click centerpoint of slot at Origin. Move cursor to the right. Use the horizontal relation . Click for ending point of length. Move cursor down for width and click.

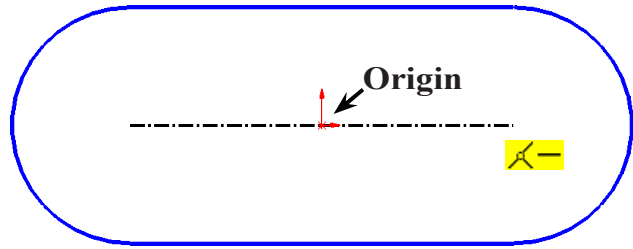


Fig. 6

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



Step 6. Add dimensions, Fig. 7. To wake up midpoint of radii, hover cursor over circular entity.

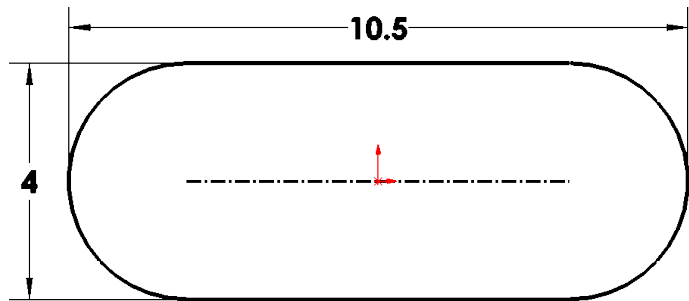





Fig. 7

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

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

Step 9. Click **Extruded Boss/Base**  on the Features toolbar.

Step 10. In the Boss-Extrude Property Manager set:

under Direction 1, Fig. 8
 End Condition **Blind**
 Depth  2
 click OK .

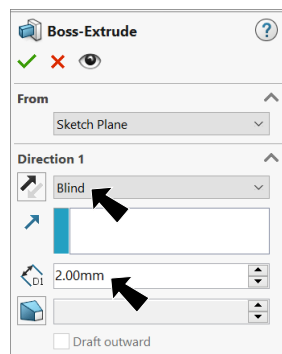


Fig. 8

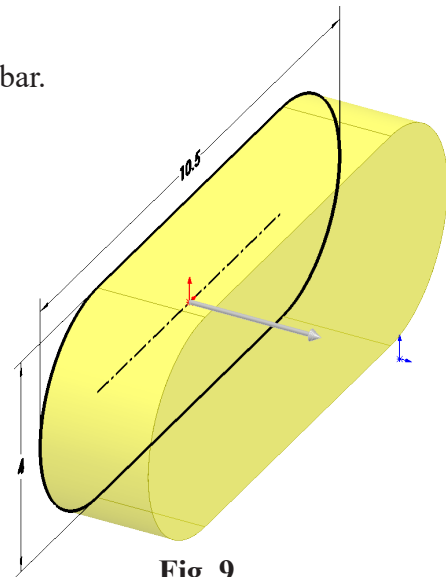


Fig. 9

D. Cut Extrude1 Sketch2.

Step 1. Click **Top Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 10**.

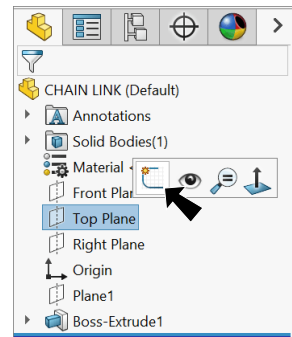





Fig. 10

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 **two rectangles** starting from corner endpoints, **Fig. 11**.

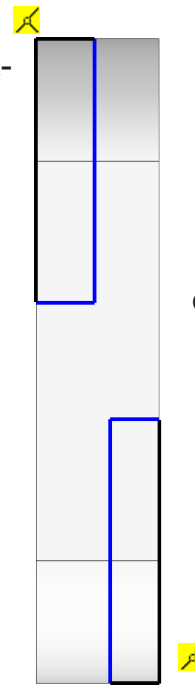



Fig. 11

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

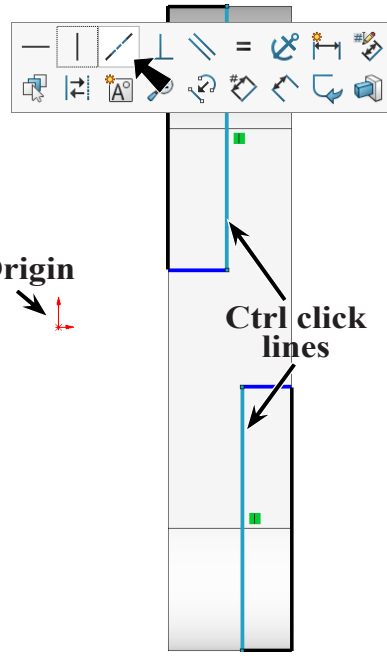



Fig. 12

Step 6. **Ctrl click both vertical lines in center** to select both. Release Ctrl key and click **Make Collinear**  on the context toolbar, **Fig. 12**.

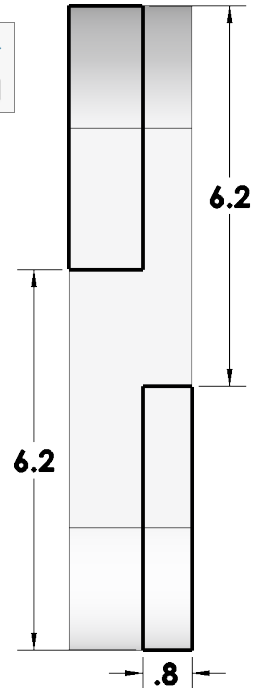



Fig. 13

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

Step 8. Add dimensions, **Fig. 13**.

Step 9. Click **Isometric**  on the Standard Views toolbar. (**Ctrl-7**)

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

Step 11. Click **Extruded Cut**  on the Features toolbar.

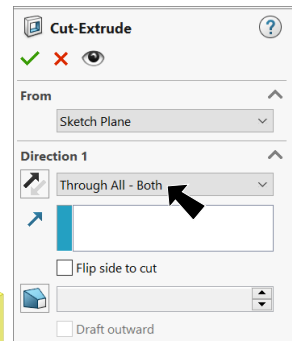



Fig. 14

Step 12. In the Cut-Extrude Property Manager:
 under Direction 1, **Fig. 14**
 End Condition
Through All - Both
 click OK .

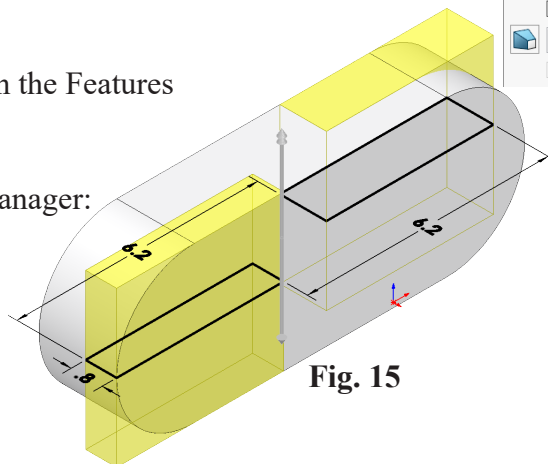




Fig. 15

E. Extrude2 Sketch3 Pins.

Step 1. Click **Right Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 16**.

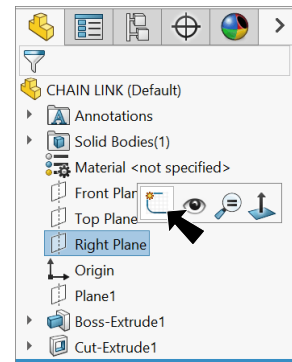




Fig. 16

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

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

Step 4. Sketch **circle at Origin**  and **circle concentric with right circular edge**, **Fig. 17**. To wake up centerpoint of edge, hover cursor over circular edge.

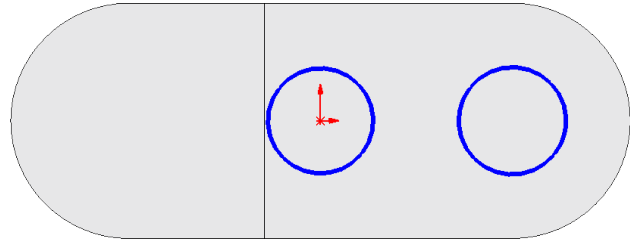




Fig. 17

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

Step 6. Dimension diameters, **Fig. 18**.

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

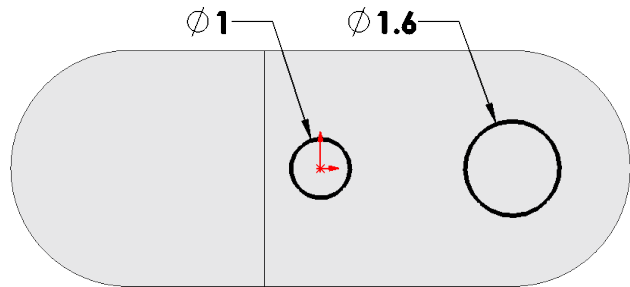



Fig. 18

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

Step 9. Click **Extruded Boss/Base**  on the Features toolbar.

Step 10. In the Boss-Extrude Property Manager set:
under Direction 1, **Fig. 19**

Reverse Direction 
End Condition Up To Next

click OK .

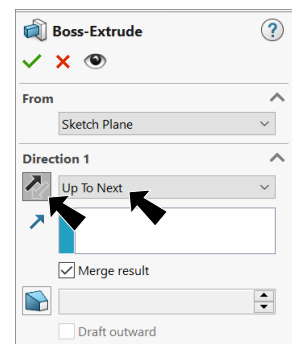


Fig. 19

Step 11. Save  (**Ctrl-S**).

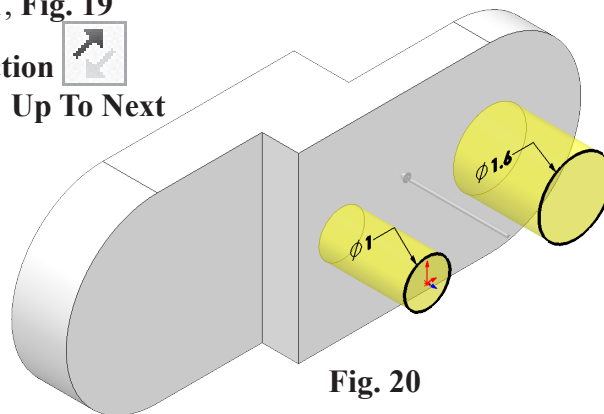


Fig. 20

F. Extrude3 Sketch4.

Step 1. Rotate view to back side, **Ctrl-Shift** click the **Y axis** of the **Reference Triad** (bottom left corner of graphics area).

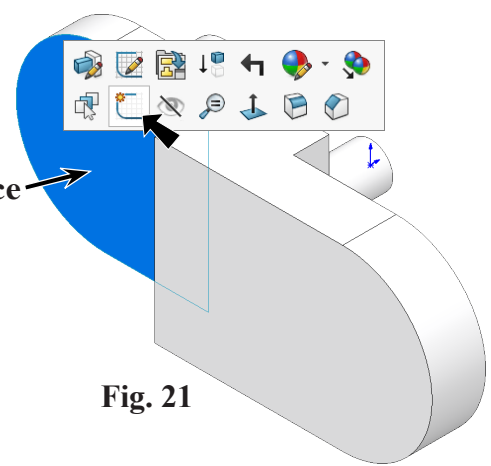
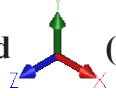


Fig. 21

Step 2. Click the **rear face of left side** and click **Sketch** on the context toolbar, **Fig. 21**.

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

Step 4. Sketch circle concentric with circular edge, **Fig. 22**. To wake up centerpoint, hover cursor over circular edge.

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

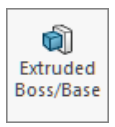


Step 6. Dimension **diameter 1.1**, **Fig. 22**.

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. 23**

Start Condition **Surface/Face/Plane** in Select a Surface/Face/Plane box click **outside face**, **Fig. 24**

click **OK** .

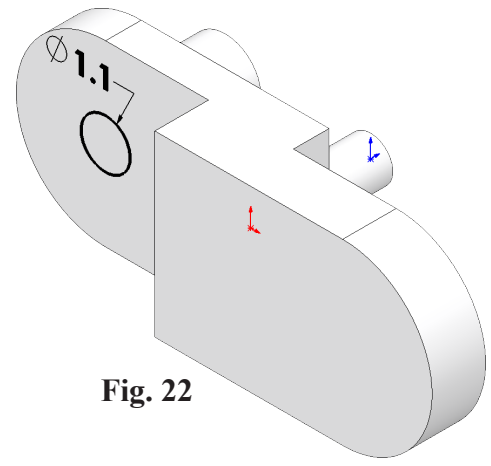


Fig. 22

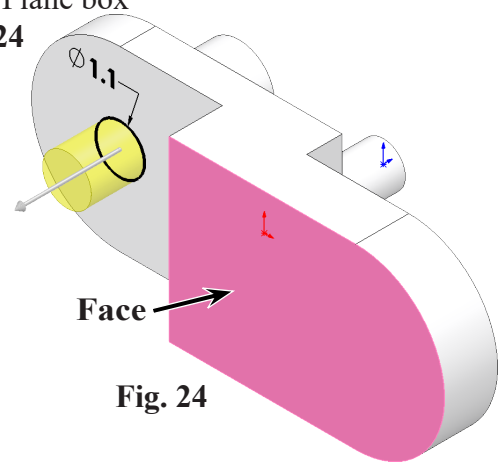


Fig. 24

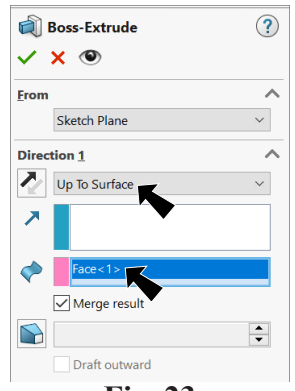




Fig. 23

G. Cut Extrude2 Sketch5.

Step 1. Click **Right**  on the Standard Views toolbar. (Ctrl-4)

Step 2. Click the **side face of left side** and click **Sketch**  on the context toolbar, Fig. 25.

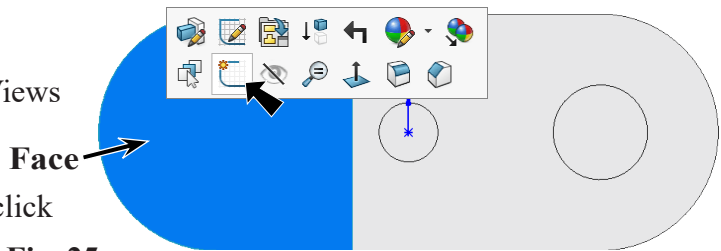



Fig. 25

Step 3. **Unselect face** and click **Convert Entities**  on the Sketch toolbar.

Step 4. In the Convert Entities Property Manager: under Entities to Convert, Fig. 26 click **left circular edge and top edge**, Fig. 27 click OK .

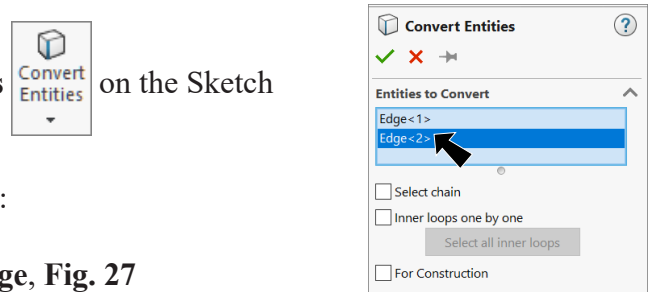


Fig. 26

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

Step 6. Sketch circle concentric with circular edge of left side, Fig. 28. To wake up center-point, hover cursor over circular edge.

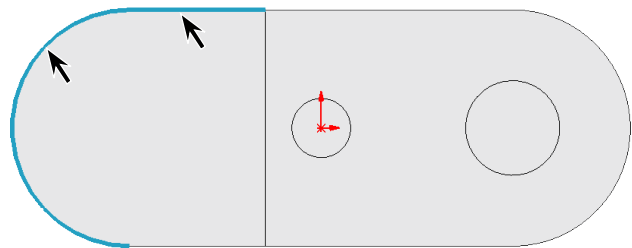


Fig. 27

Step 7. Click **Line**  (L) on the Sketch toolbar.

Step 8. Sketch **vertical line up from circle and chained line angled to right up to converted line**, Fig. 29. To sketch nontangent line, click circle and move cursor up very slightly.

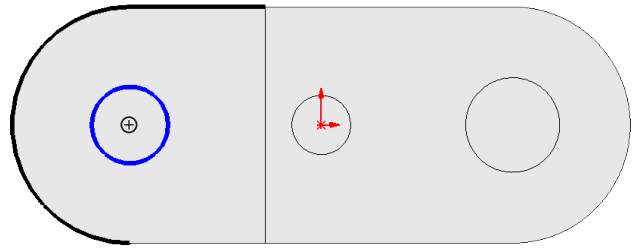


Fig. 28

Step 8. Click **3 Point Arc**  (S) in the Arc flyout  on the Sketch toolbar.

Step 9. Sketch **arc with start endpoint at converted circular edge and endpoint at circle and radius up**, Fig. 30.

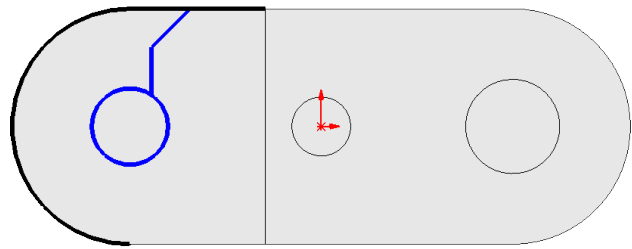



Fig. 29

Step 10. **Unselect Arc tool**. To unselect, right click graphics area and click **Select**  from menu.

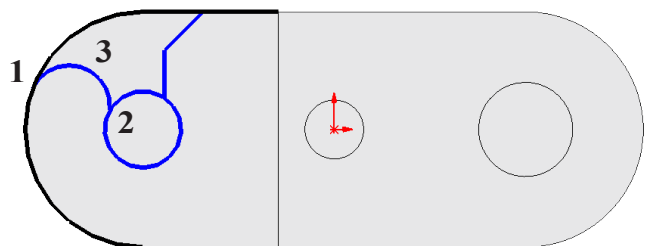



Fig. 30

Step 11. **Ctrl click converted circular edge and arc to select both.** Release Ctrl key and click **Make Tangent**  on the context toolbar, **Fig. 31.**

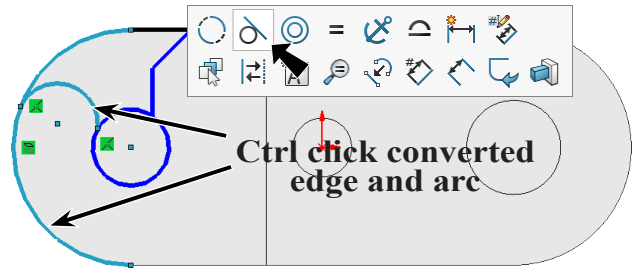



Fig. 31

Step 12. **Ctrl click centerpoint of circle and angled line to select both.** Release Ctrl key and click **Make Coincident**  on the context toolbar, **Fig. 32.**

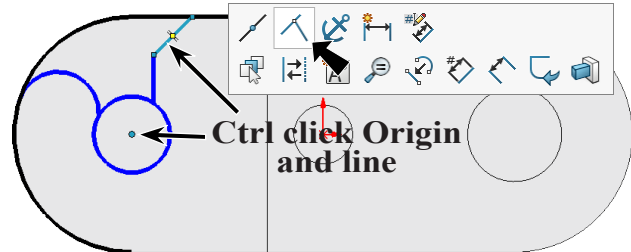



Fig. 32

Step 13. Click **Smart Dimension**  (S) on the Sketch toolbar.

Step 14. Add dimensions, **Fig. 33.**

Step 15. Click **Isometric**  on the Standard Views toolbar. (Ctrl-7)

Step 16. Click **Features**  on the Command Manager toolbar.

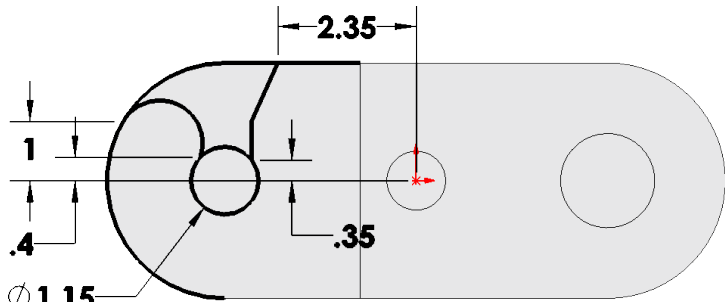



Fig. 33

Step 17. Click **Extruded Cut**  on the Features toolbar.

Step 18. In the Cut-Extrude Property Manager set:
 under Direction 1, **Fig. 34**
 End Condition **Through All**
 under Selected Contours
 click the **two contours**, **Fig. 35**
 click OK .

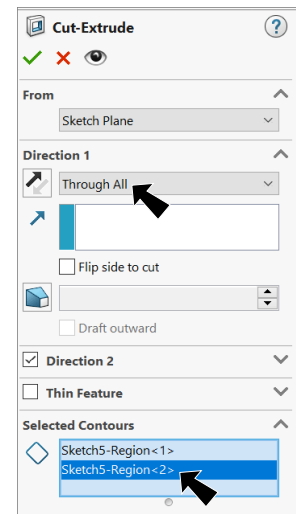


Fig. 34

Step 19. Save  (Ctrl-S).

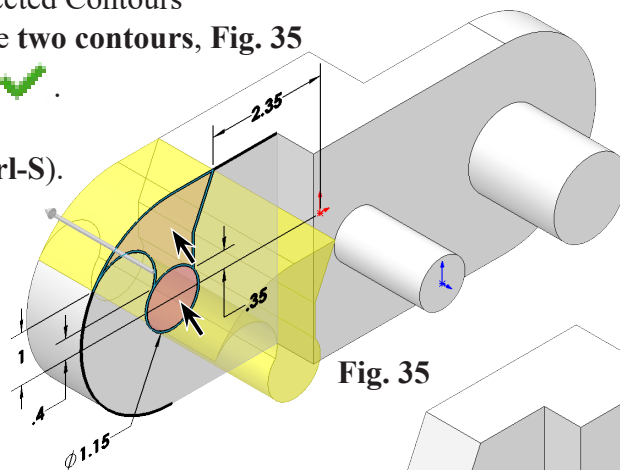


Fig. 35

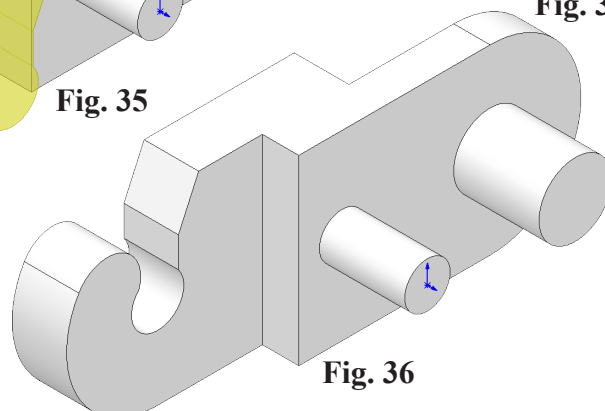


Fig. 36

H. Mirror Body.

Step 1. Expand Solid Bodies folder in the Feature Manager. **Ctrl click Cut-Extrude2** body and **Right Plane** to select Body and Plane, **Fig. 37**.

Step 2. Click **Mirror** on the Features toolbar.

Step 3. In the Mirror Property Manager click OK .

Step 4. Save  (Ctrl-S).

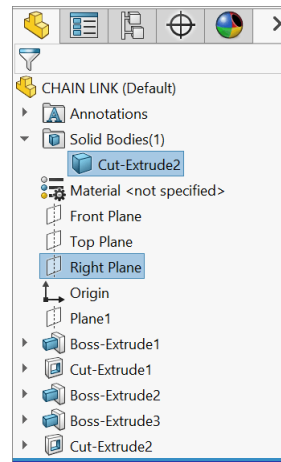


Fig. 37

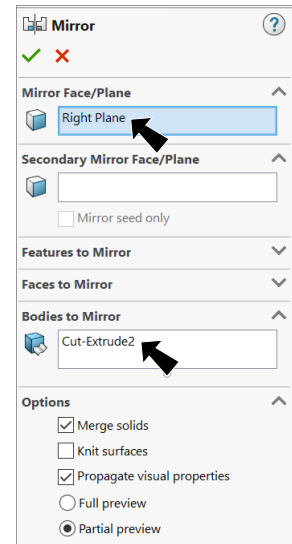


Fig. 38

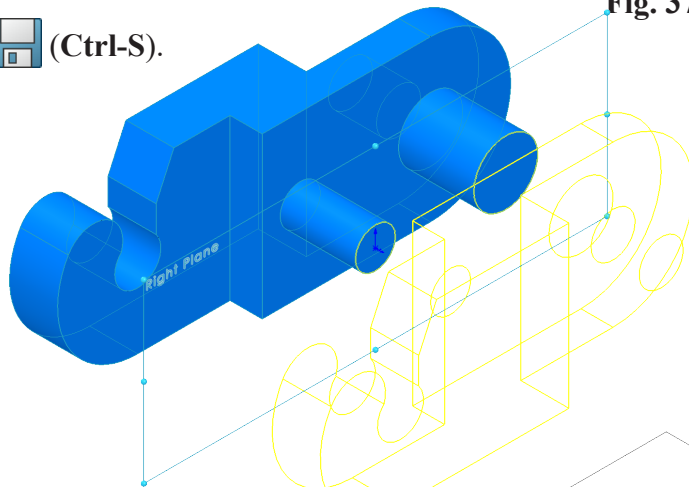


Fig. 39

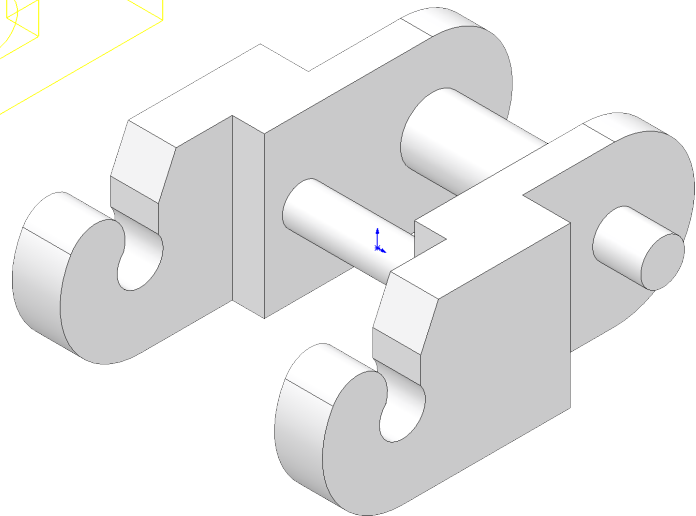


Fig. 40

I. Appearance: Gray Plastic.

Step 1. Click the **Chain Link** to select part, click **Appearances Callout** on the context toolbar and click **Chain Link..**, Fig. 41.

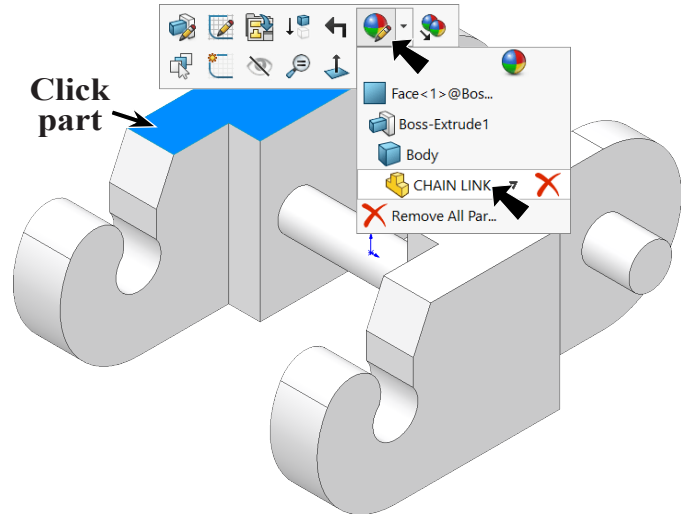


Fig. 41

Step 2. In the Appearances Task pane, expand **Plastic**, click **Medium Gloss** and in the lower pane select **light grey medium gloss plastic**, Fig. 42.

Step 3. In the Appearances Property Manager:

under Color, Fig. 43

set RGB values:

R 127

G 127

B 127

click OK.

Step 4. Save (Ctrl-S).

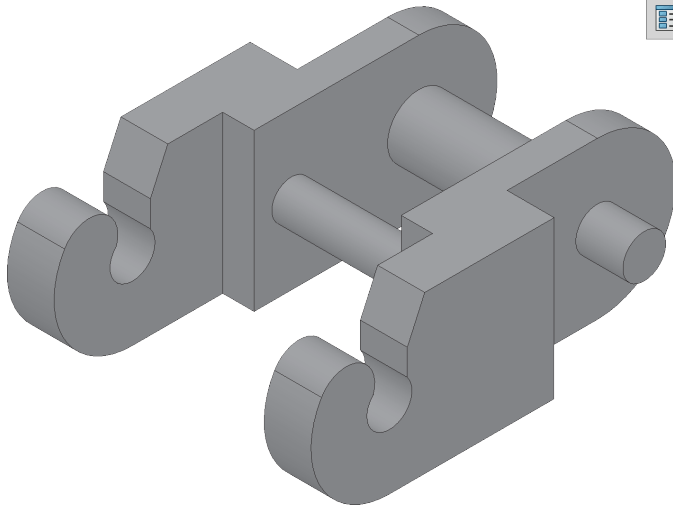


Fig. 44

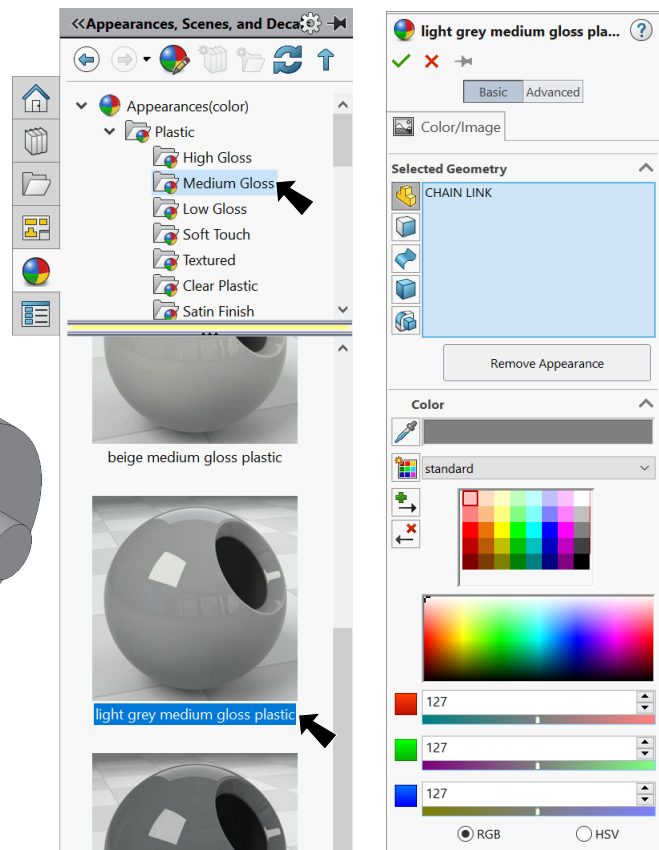


Fig. 42

Fig. 43