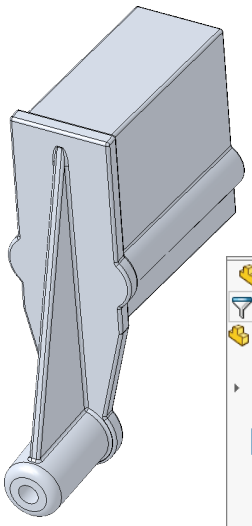
Chapter 6

Delta Dart Socket



A. Sketch for Plane.

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

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

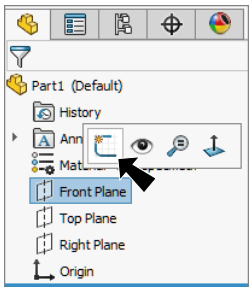


Fig. 1

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

Step 4. Starting at the Origin sketch horizontal line to the right, **Fig. 2**.

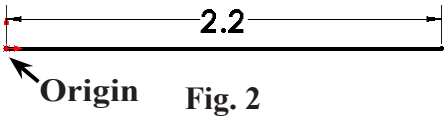


Fig. 2

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

Step 6. Dimension line **2.2**, **Fig. 2**.

Step 7. Click **Exit Sketch** on the Sketch toolbar.

B. Create Plane.

Step 1. Click **Trimetric** on the Standard Views toolbar.

Step 2. Click **Front Plane** in the Feature Manager, **Fig. 3**.

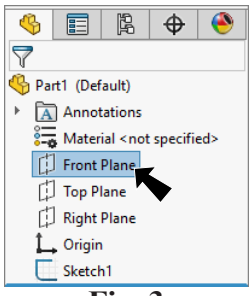


Fig. 3

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

Step 4. In the Plane Property Manager set:

under First Reference, **Fig. 4**

Front Plane should be selected

At angle **7**

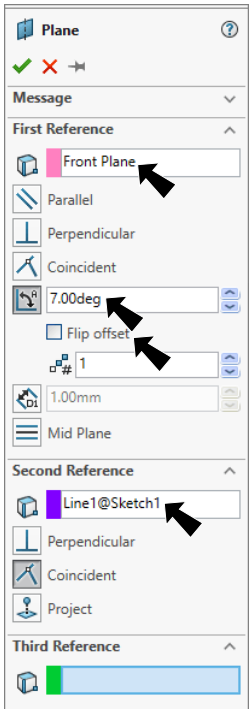


Fig. 4

under Second Reference

click Secondary Reference box

click **line** in sketch, **Fig. 5**

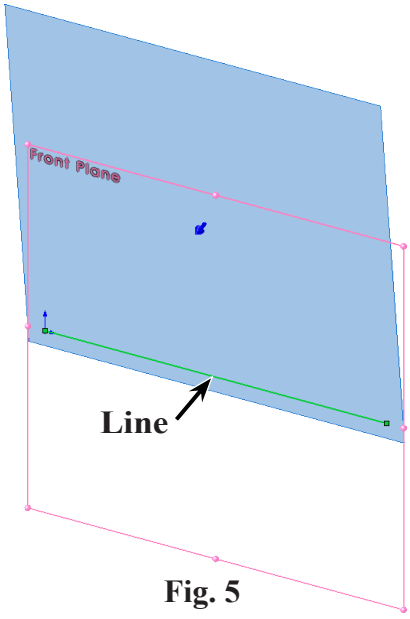


Fig. 5

uncheck **Flip**, the top of plane should be forward, **Fig. 5**, if wrong direction check Flip

click OK .

© Cudacountry.net Tech Ed

http://www.cudacountry.net email:cudacountry@hotmail.com

C. Save as "SOCKET".

Step 1. Click File Menu > Save As.

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

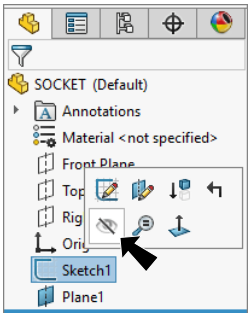


Fig. 6

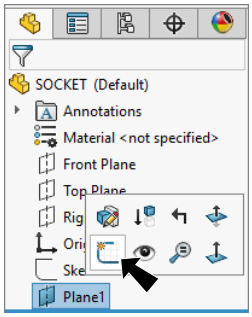


Fig. 7

D. Sketch Socket Base.

Step 1. **Hide Sketch1**. To hide, click **Sketch1** in the Feature Manager and click **Hide** on the context toolbar, **Fig. 6**.

Step 2. Hide **Plane1**. Click View Menu > Show/Hide > Planes.

Step 3. Click **Plane1** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 7**.

Step 4. Click **Normal To** on the Standard Views toolbar. (**Ctrl-8**)

Step 5. Click **Corner Rectangle** in the **Rectangle flyout** on the Sketch toolbar.

Step 6. Sketch a rectangle with the **Origin** in top right corner**, Fig. 8**.

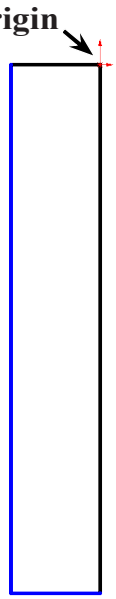


Fig. 8

Step 7. **Right click graphics area and click Select** from menu to unselect Rectangle tool.

Step 8. Ctrl click **right vertical line** of rectangle and click **Construction Geometry** on the context toolbar, **Fig. 9**.

Step 9. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 10. Double distance dimension between vertical line and centerline **3**, **Fig. 10**. To double distance dimension, click the vertical line and then the centerline, move the cursor to right side of the centerline and click. Key-in 3 and press ENTER.

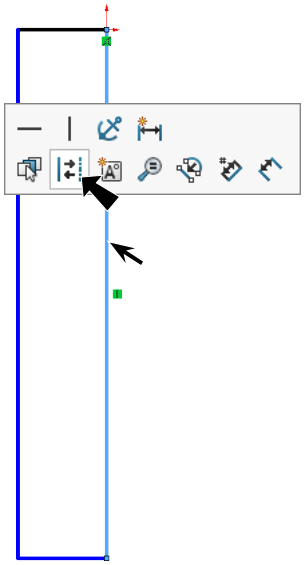


Fig. 9

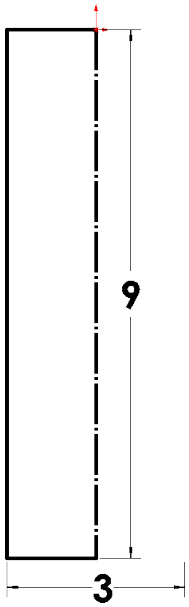


Fig. 10

Step 11. Click **Circle** (**S**) on the Sketch toolbar.

Step 12. Sketch **circle** on left vertical line, **Fig. 11**.

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

Step 14. Dimension circle **1.2 diameter** and **2 from bottom**, **Fig. 12**.

Step 15. Click **Trim Entities** (**S**) on the Sketch toolbar.

Step 16. In the Trim Property Manger:

select **Trim to closest** , **Fig. 13**

Trim away line inside circle and right side of circle, **Fig. 14**.
Click line and arc you want to trim away. Results shown in **Fig. 15**.

Click OK when done.

Step 17. **Drag selection around sketch** to select all entities, **Fig. 16**.

Step 16. Click **Mirror Entities** on the Sketch toolbar, **Fig. 17**.

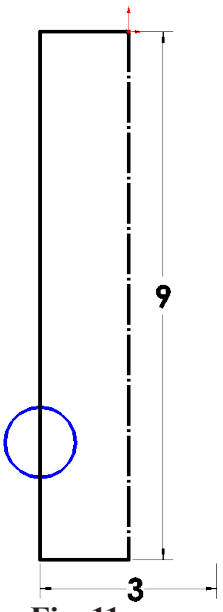


Fig. 11

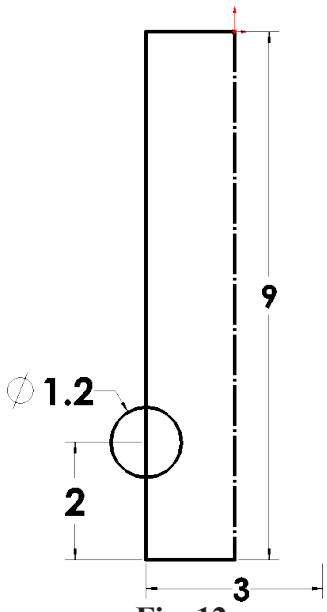


Fig. 12

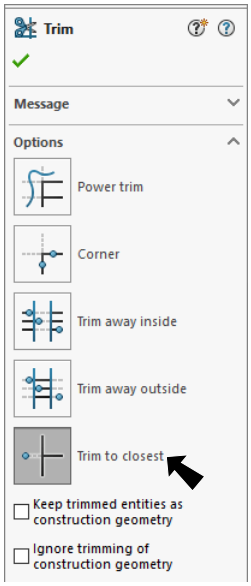


Fig. 13

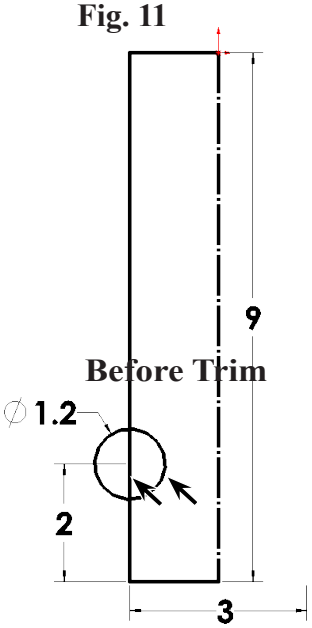


Fig. 14

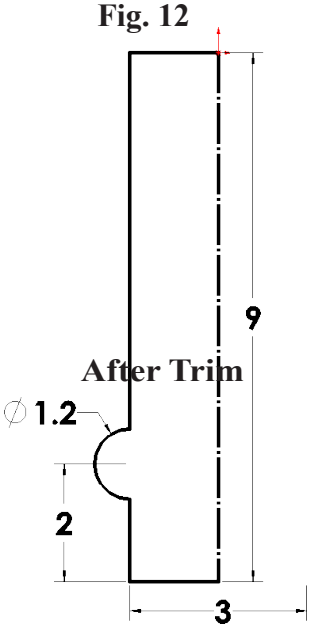


Fig. 15

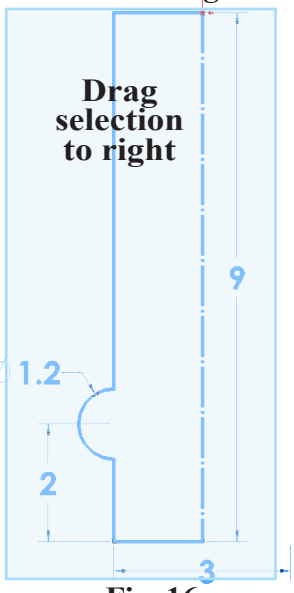


Fig. 16

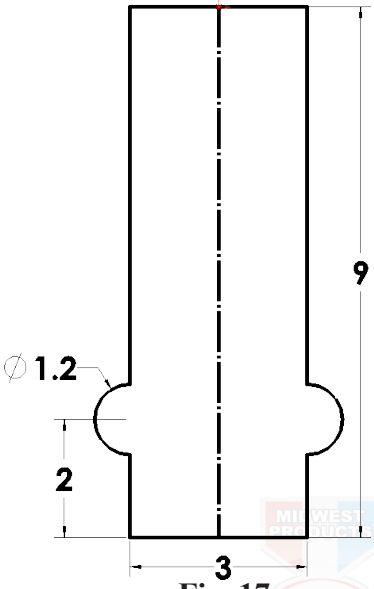


Fig. 17

Step 17. Click **Offset Entities**

on the Sketch toolbar.

Step 20. In the Offset Entities Property Manager set:
under Parameters, **Fig. 18**

Distance .72
uncheck **Reverse**
check **Select chain**
uncheck **Bi-directional**
click **sketch**, **Fig. 19**
The yellow offset should be outside original sketch.
If it is not, check Reverse.
click OK .

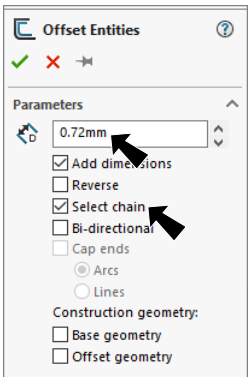


Fig. 18

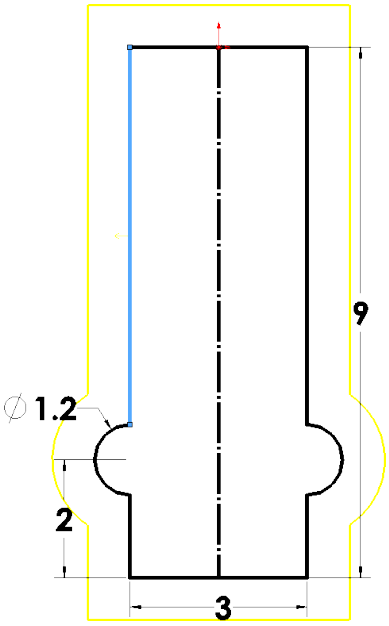
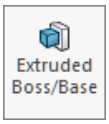


Fig. 19

E. Extrude Socket.

Step 1. Click **Features**

on the Command Manager toolbar.

Step 2. Click **Extruded Boss/Base** 

on the Features toolbar.

Step 3. In the Property Manager set:
under Direction 1, **Fig. 20**

click **Reverse direction**
Direction arrow should point to rear, **Fig. 21**

click in the **Direction of Extrusion** box

expand the flyout Feature Manager design tree (click) in the top left corner of the graphics area and click **Front Plane** , **Fig. 21**.

Depth 10.85
click OK .

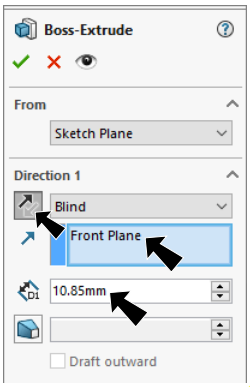


Fig. 20

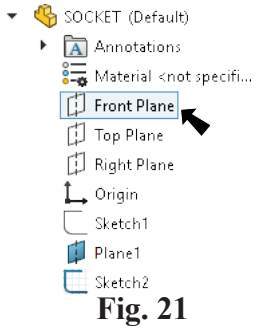


Fig. 21

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

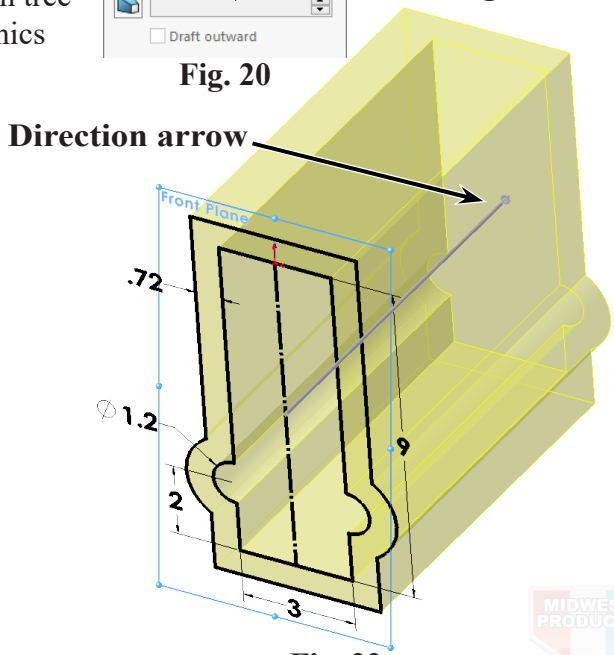


Fig. 22

F. Boss.

Step 1. Click the **front face** of the part and click **Sketch** on the context toolbar, **Fig. 23**.

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

Step 3. Click off of face to unselect face.

Step 4. Click **Offset Entities** on the Sketch toolbar.

Step 5. In the Offset Entities Property Manager set:
under Parameters, **Fig. 24**

Distance **.3**
uncheck **Reverse**
uncheck **Select chain**
uncheck **Bi-directional**
click **all outside edges of front face except bottom edge**, **Fig. 25**
The yellow offset should be outside original sketch.
If it is not, check Reverse.

click OK .

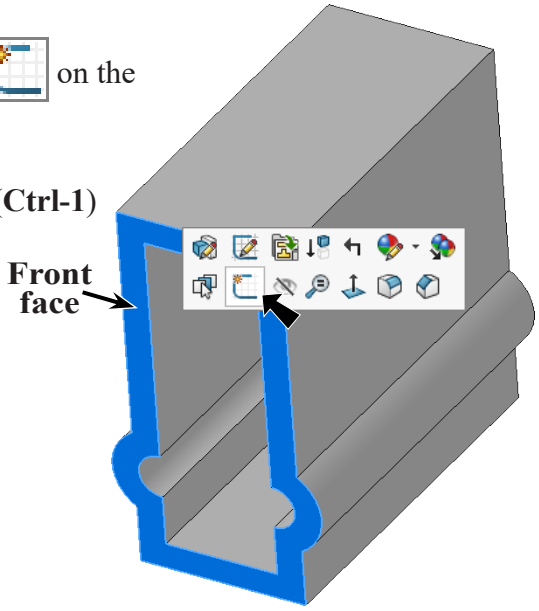


Fig. 23

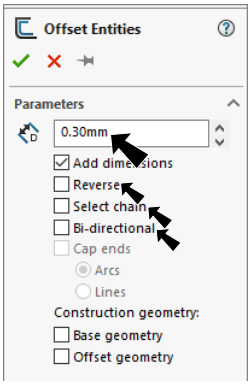


Fig. 24

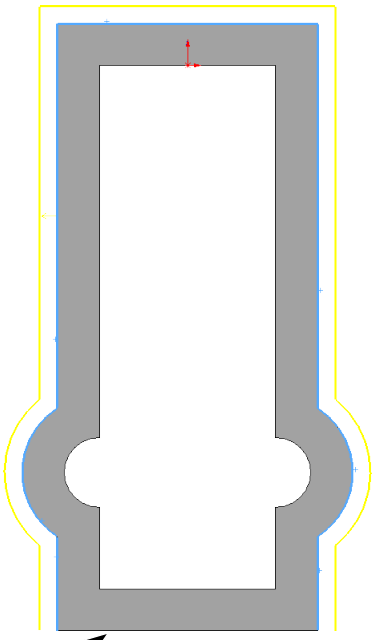


Fig. 25

Select all edges except bottom edge

Step 6. Click **Centerline** in the **Line flyout** on the Sketch toolbar.

Step 7. Sketch **vertical centerline down from the Origin** **to beyond the bottom edge of part**, **Fig. 26**.

Step 8. Click **Smart Dimension**

(**S**) on the Sketch toolbar.

Step 9. Dimension centerline **16**, **Fig. 27**.

Step 10. Click **Circle** (**S**) on the Sketch toolbar.

Step 11. Sketch **circle** at bottom endpoint of centerline, **Fig. 28**.

Step 12. Click **Line** (**L**) on the Sketch toolbar.

Step 13. Sketch a line from bottom endpoint of offset line to circle, **Fig. 29**.

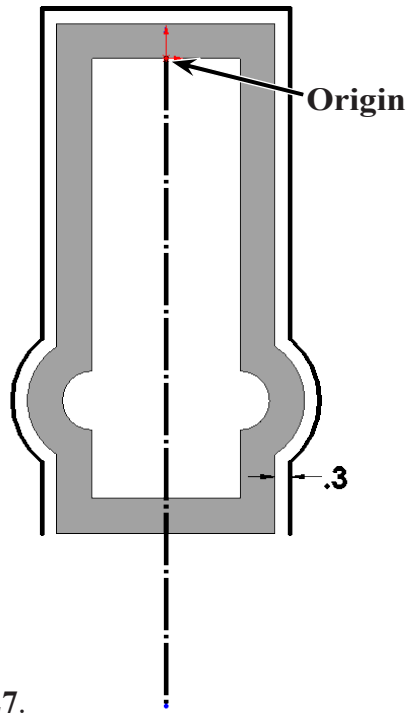


Fig. 26

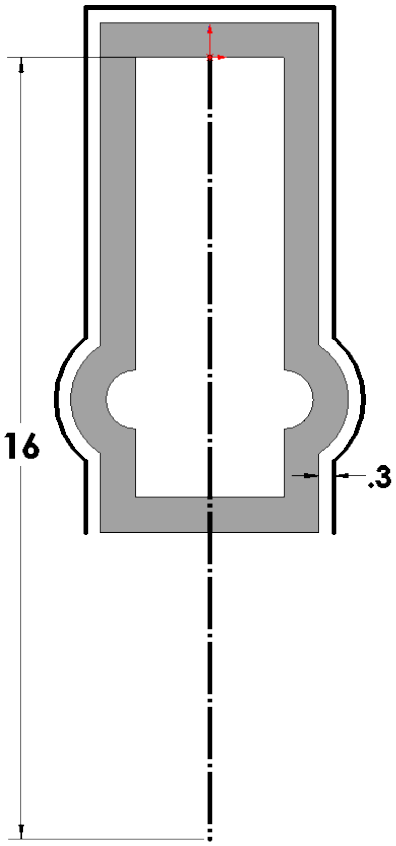


Fig. 27

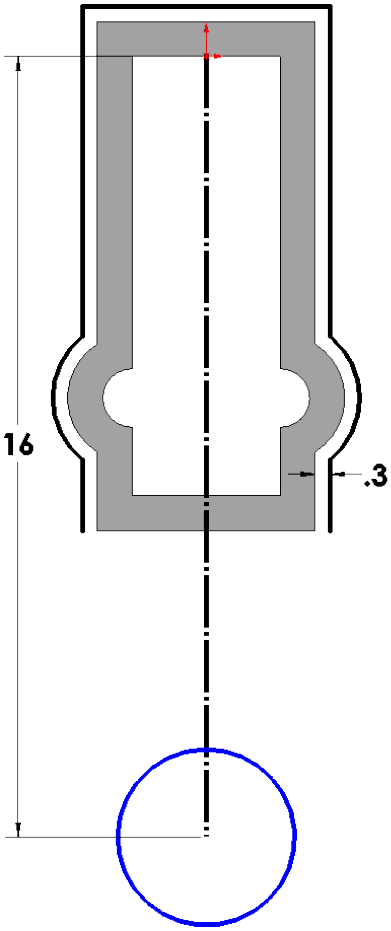


Fig. 28

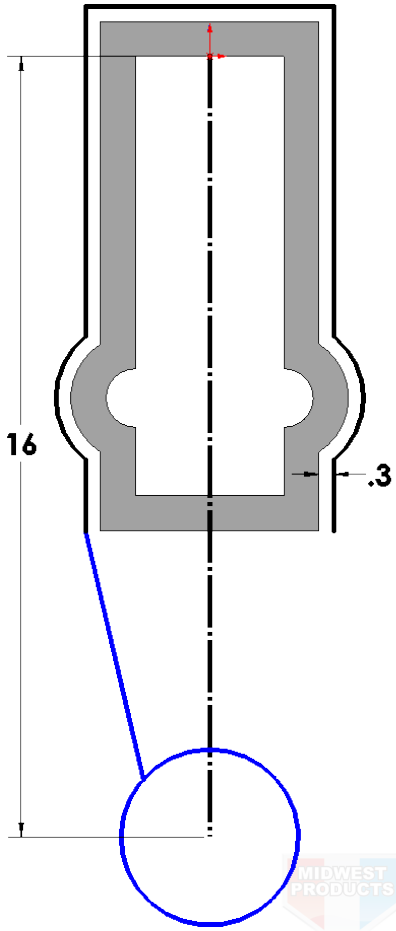


Fig. 29

Step 14. Click **Smart Dimension**

(S) on the Sketch toolbar.

Step 15. Dimension circle **diameter 3.6** and **angle 167**, **Fig. 30**.

Step 16. **Right click sketching and click Select** from menu to unselect Smart Dimension.

Step 17. **Ctrl click centerline and angled line** to select both, **Fig. 31**.

Step 18. Click **Mirror Entities**

on the Sketch toolbar, **Fig. 32**.

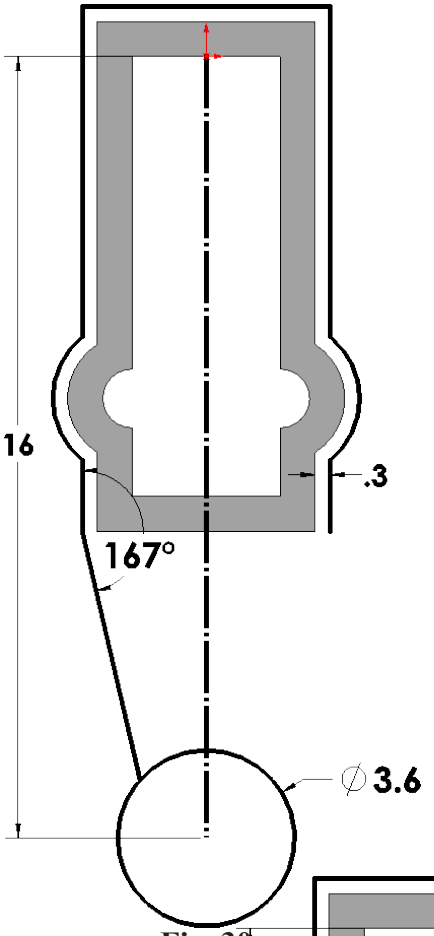


Fig. 30

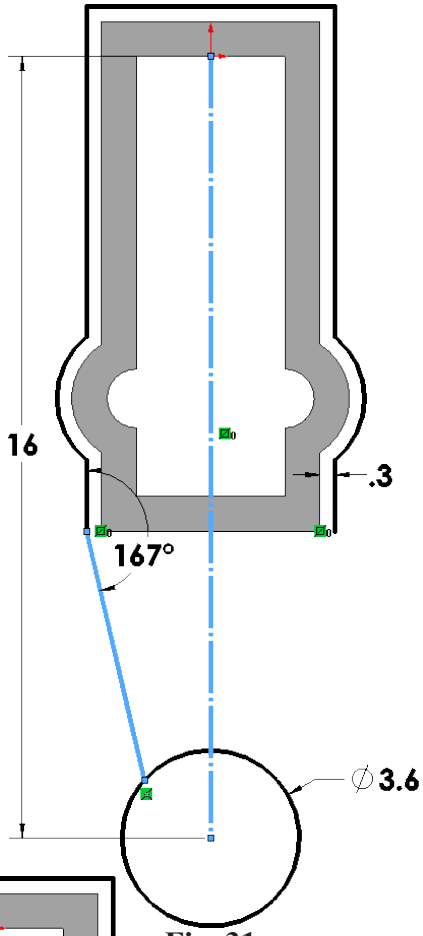


Fig. 31

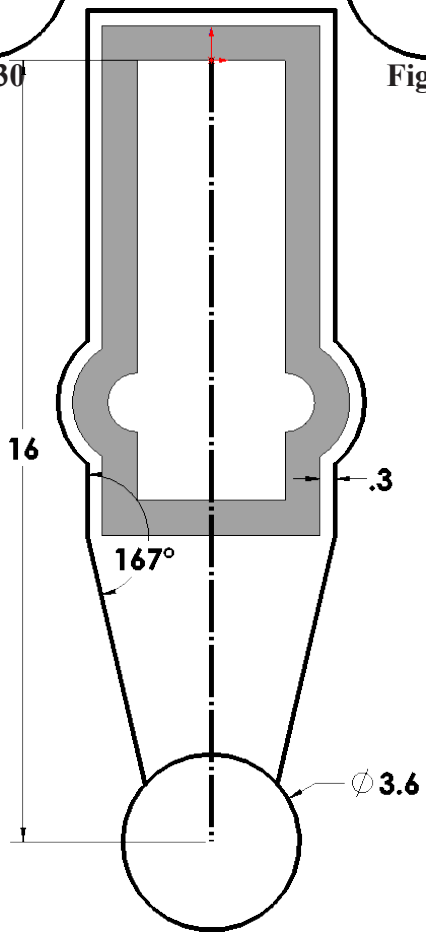


Fig. 32

G. Extrude Boss.

Step 1. Click **Features** Features on the Command Manager toolbar.

Step 2. Click **Extruded Boss/Base** Extruded Boss/Base on the Features toolbar.

Step 3. In the Extrude Property Manager set:
under Direction 1, **Fig. 33**
Depth D1 **.8**
under Selected Contours
click the **5 regions in sketch**, **Fig. 34**
click OK ✔.

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

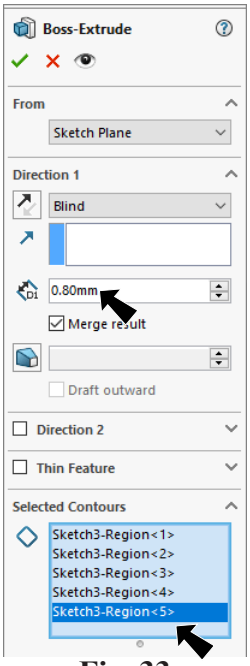


Fig. 33

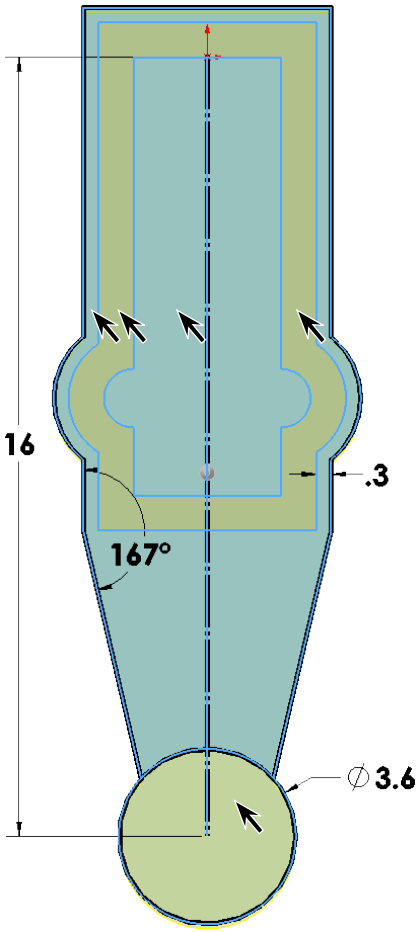


Fig. 34

H. Hub.

Step 1. Click **Trimetric** on the Standard Views toolbar.

Step 2. Click the **front face** of the boss and click **Sketch** on the context toolbar, **Fig. 35**.

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

Step 4. Sketch **circle** at center of arc edge, **Fig. 36**. To find arc centerpoint, hover cursor over edge of arc and center will displayed.

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

Step 6. Dimension circle **diameter 3**, **Fig. 36**.

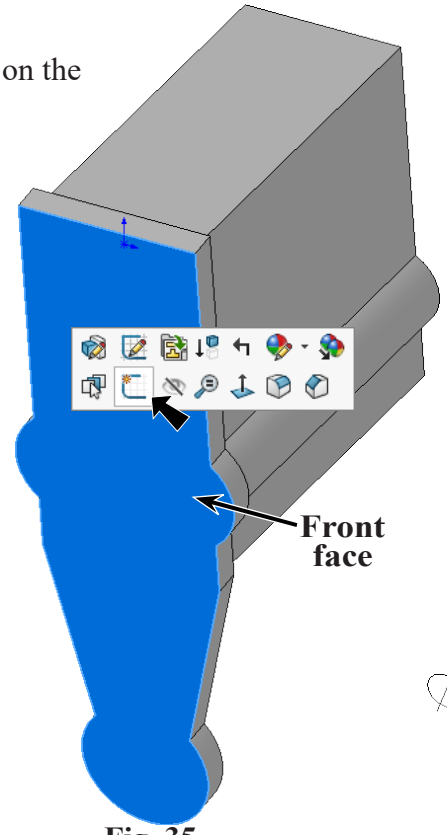


Fig. 35

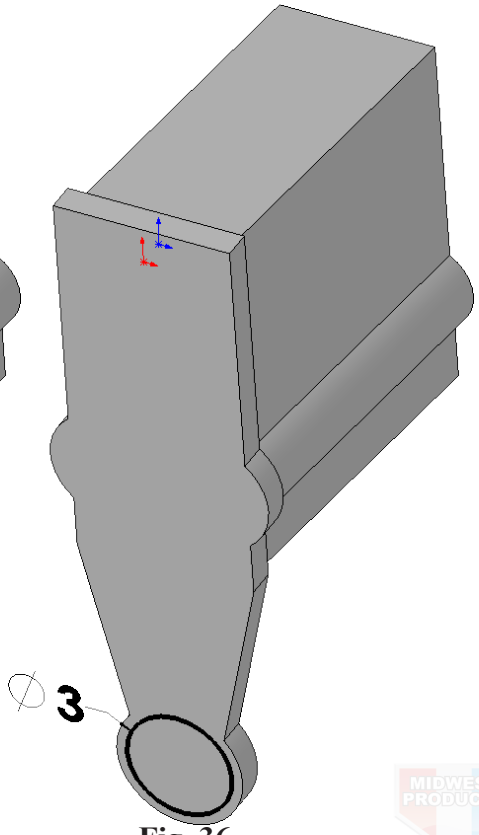


Fig. 36

I. Extrude Hub.

Step 1. Click **Features** Features on the Command Manager toolbar.

Step 2. Click **Extruded Boss/Base** Extruded Boss/Base on the Features toolbar.

Step 3. In the Extrude Property Manager set:
under Direction 1, **Fig. 37**
Depth D1 **5**
click **Draft On**
1 degrees (inward), **Fig. 38**
click OK ✔.

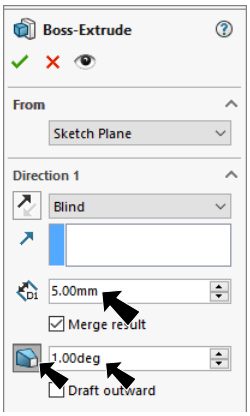


Fig. 37

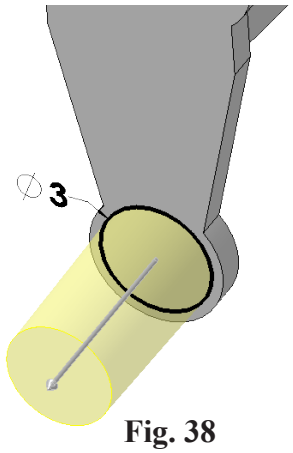


Fig. 38

J. Cut Hole.

Step 1. Click the **front face** of the hub and click **Sketch** on the context toolbar, **Fig. 39**.

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

Step 3. Sketch **circle** at center of circle, **Fig. 40**. To find center, hover cursor over cylindrical edge of hub.

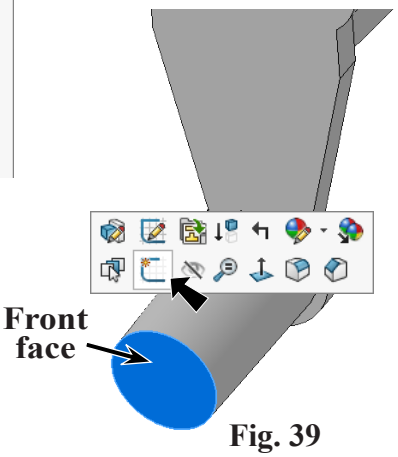


Fig. 39

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

Step 5. Dimension circle **diameter 1**, **Fig. 40**.

Step 6. Click **Features** Features on the Command Manager toolbar.

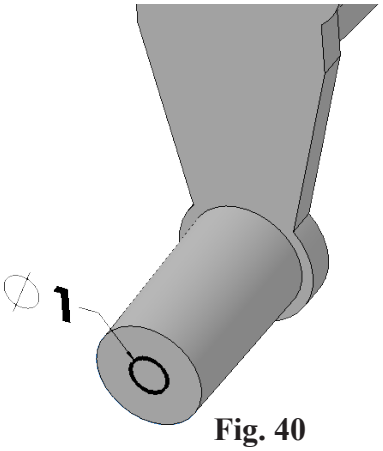


Fig. 40

Step 7. Click **Extruded Cut** Extruded Cut on the Features toolbar.

Step 8. In the Cut-Extrude Property Manager set:
End Condition **Through All**, **Fig. 41**
click OK ✔.

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

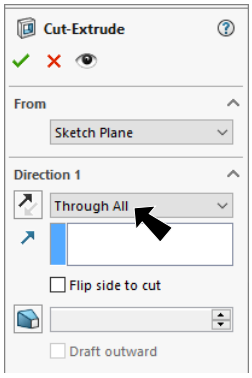


Fig. 41

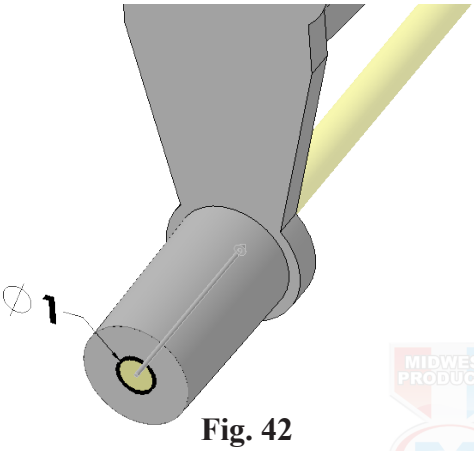


Fig. 42

K. Rib 1.

Step 1. Click **Right Plane** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 43**.

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

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

Step 4. Sketch **line from front edge boss to top edge of hub**, **Fig. 44**.

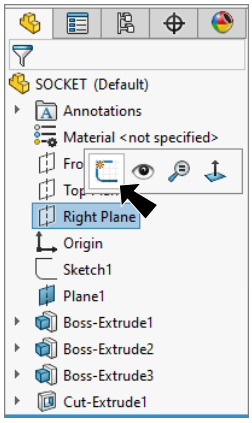


Fig. 43

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

Step 6. Dimension **.9** down from top and **.7** from front edge, **Fig. 45**.

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

Step 8. Click **Rib** on the Features toolbar.

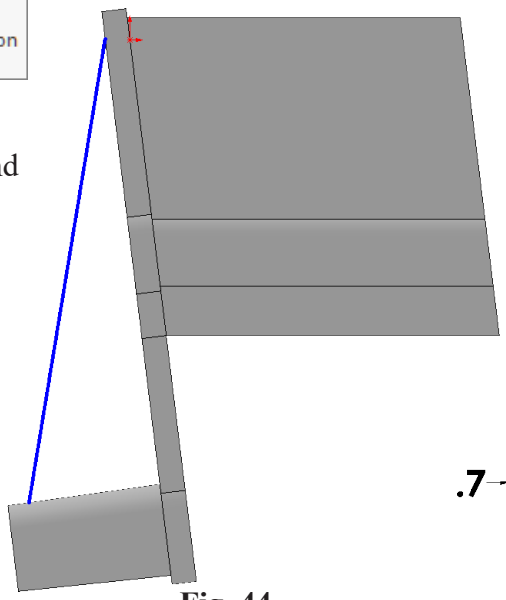


Fig. 44

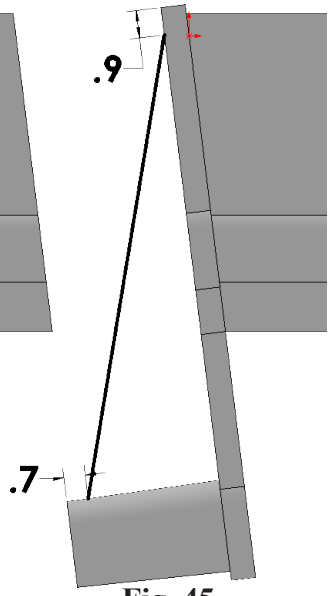


Fig. 45

Step 9. In the Rib Property Manager:
under Parameters, **Fig. 46**

Both sides

Rib thickness **.5**
check **Flip material side**

click **Draft On**
2 degrees

check **Draft outward**

click OK .

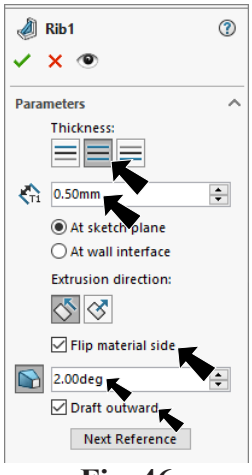


Fig. 46

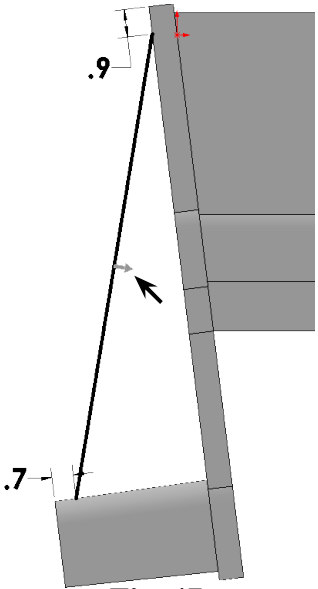


Fig. 47

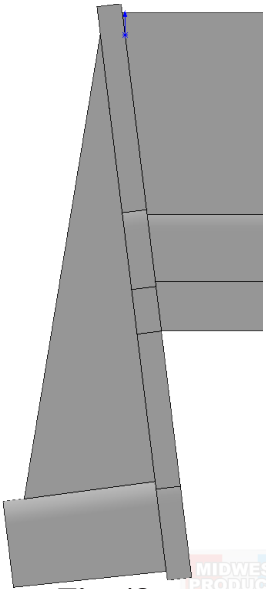


Fig. 48

L. Rib 2.

Step 1. Click **Right Plane** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 49**.

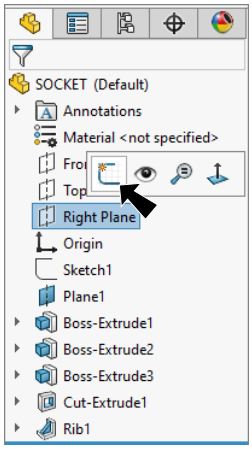


Fig. 49

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

Step 3. Sketch line behind hub to socket, **Fig. 50**.

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

Step 5. Dimension **3.5** and **5.5**, **Fig. 50**.

Step 6. Click **Features** on the Command Manager toolbar.

Step 7. Click **Rib** on the Features toolbar.

Step 8. In the Rib Property Manager set:
under Parameters, **Fig. 51**
Both sides
Rib thickness .5
uncheck **Flip material side**
click **Draft On**
2 degrees
check **Draft outward**
click OK .

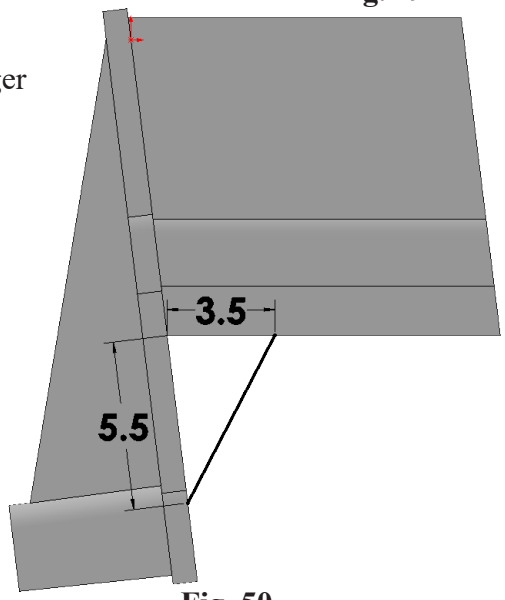


Fig. 50

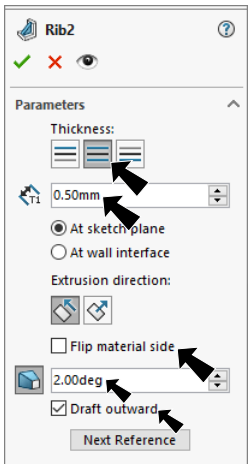


Fig. 51

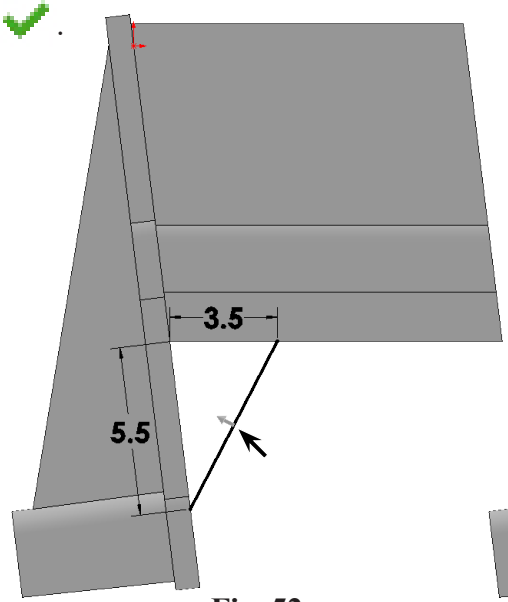


Fig. 52

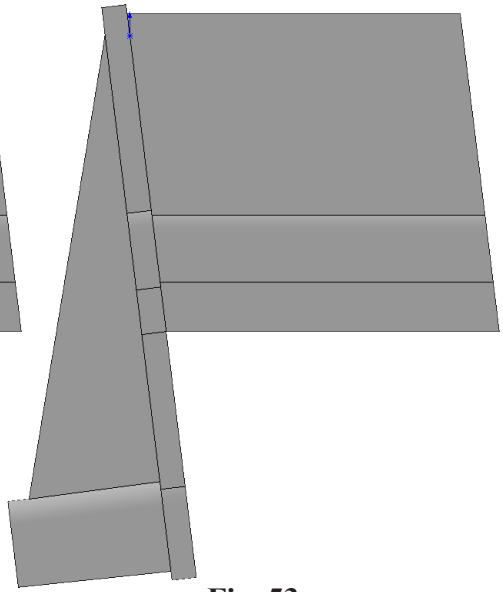


Fig. 53

M. Fillet Edges.

Step 1. Click **Trimetric** on the Standard Views toolbar.

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

Step 3. In the Fillet Property Manager set:

select **FilletXpert**, **Fig. 54**

Radius **.14**

click **edge of boss** feature, **Fig. 55**

click **Internal to feature** **29 edges** on the Fillet pop-up
click **Apply**, **Fig. 54**

click **edge of base** feature, **Fig. 56**

click **Connected** **32 edges** on the Fillet pop-up toolbar
click **Apply**

click **edge of Rib1** feature, **Fig. 57**

click **Connected** **8 edges** on the Fillet pop-up toolbar
click **Apply**.

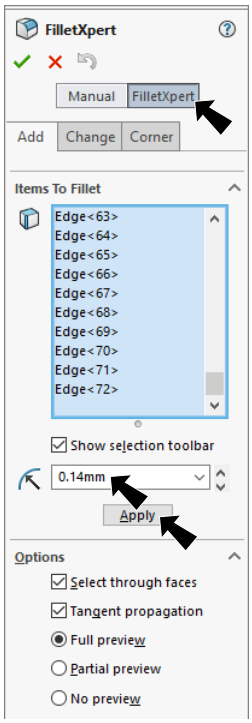


Fig. 54

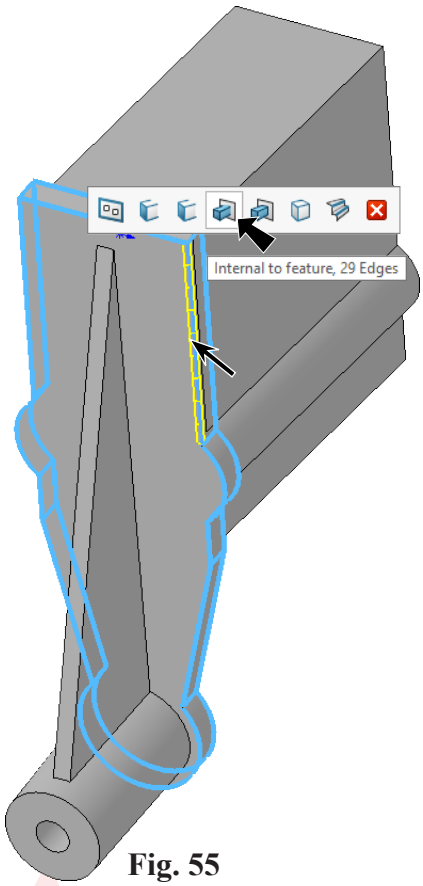


Fig. 55

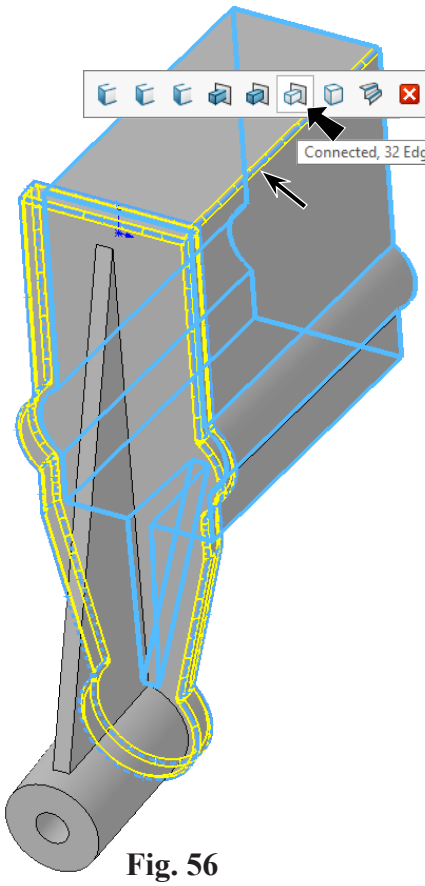


Fig. 56

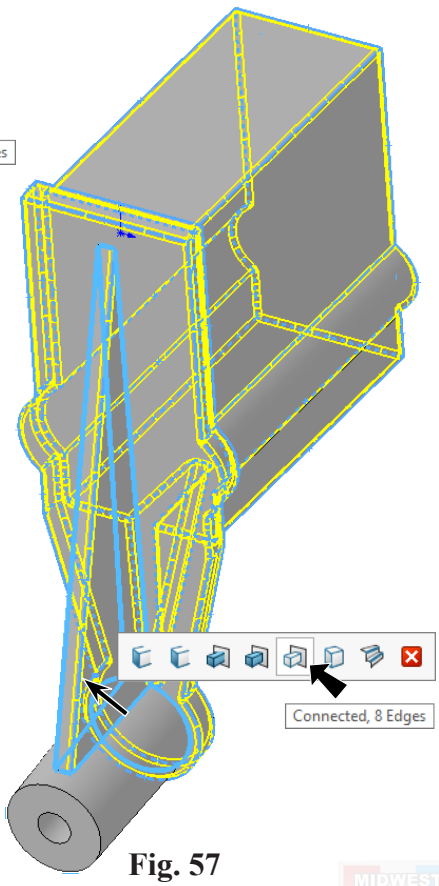


Fig. 57

Step 4. In the Fillet Property Manager set:

Radius .5
click **front edge of hub**, **Fig. 60**
click OK .

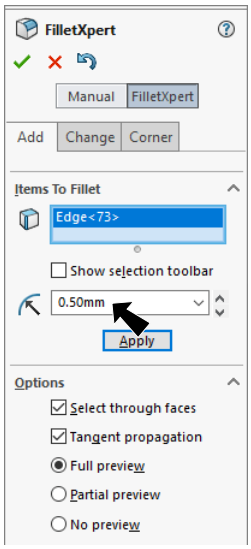


Fig. 58

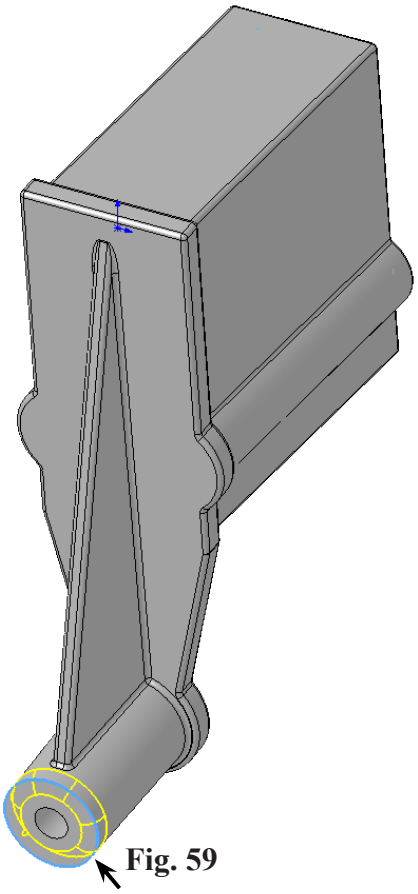


Fig. 59

N. Material POM Acetal Copolymer.

Step 1. **Right click Material** in the Feature Manager and click **Edit Material**, **Fig. 60**.

Step 2. Expand **Plastics** in the material tree and select **POM Acetal Copolymer**, **Fig. 61**. Click **Apply** and **Close**.

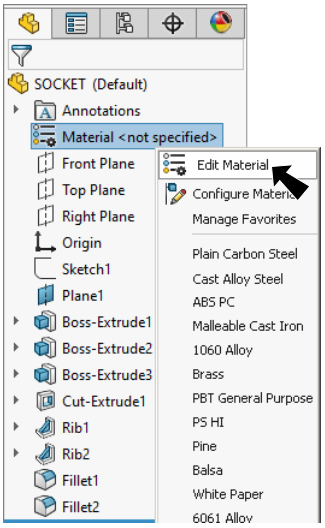


Fig. 60

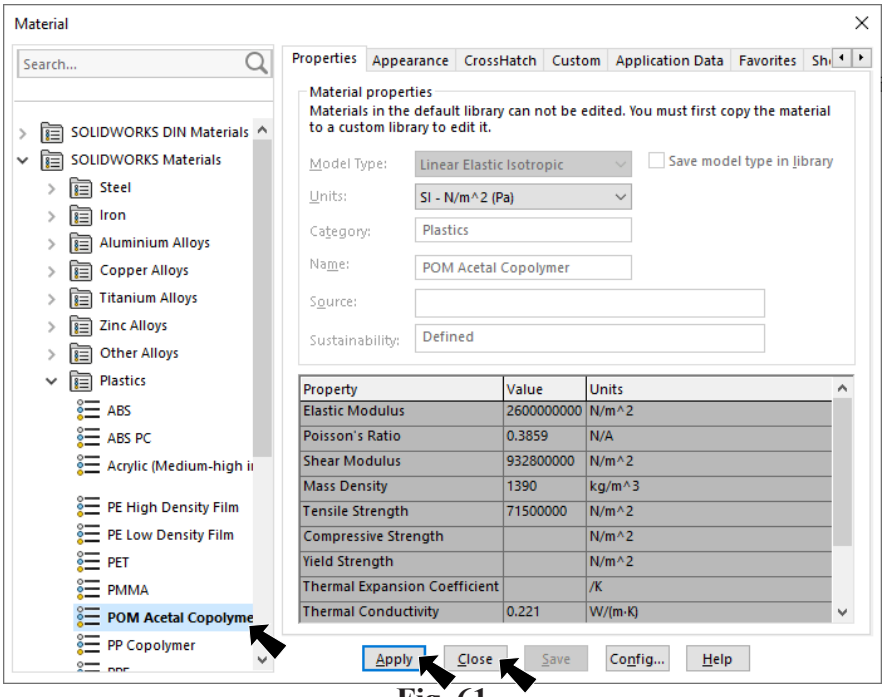


Fig. 61

O. Appearance Light Blue.

Step 1. Click the part, click **Appearance Callout** on the context toolbar and click **SOCKET**, **Fig. 62**.

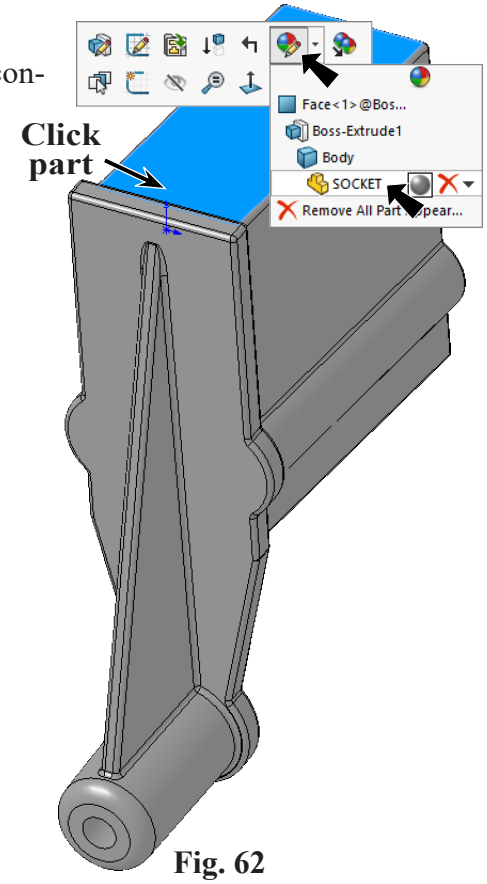


Fig. 62

Step 2. In the Appearances Property Manager:

under Color, **Fig. 63**

set **RGB values**

R 234

G 242

B 255

click OK .

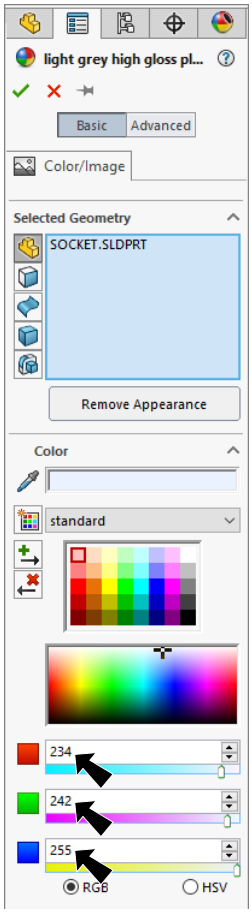


Fig. 63

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

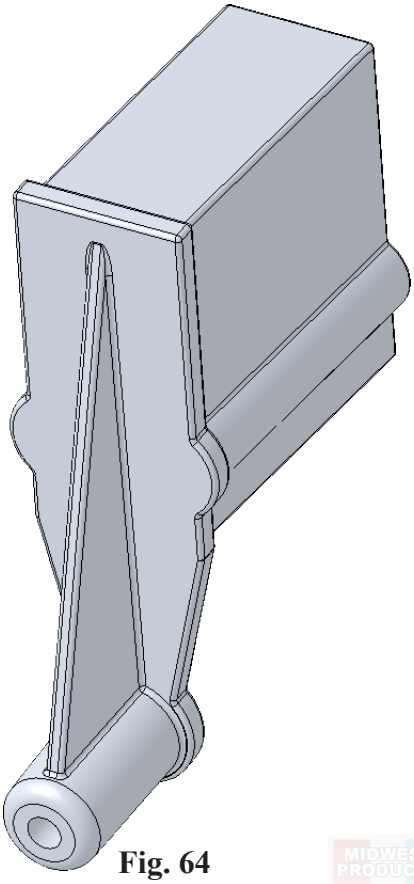


Fig. 64