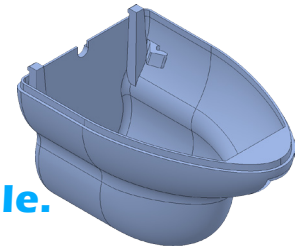
HAWT

Bottom Nacelle



A. Open Turbine Assembly and Edit Bottom Nacelle.

Step 1. Open your **Wind Turbine Assembly** file.

Step 2. Click **Bottom Nacelle** part in the Feature Manager and click **Edit Part** on the context toolbar, **Fig. 1**.

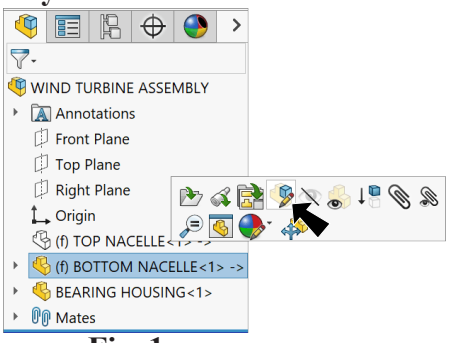


Fig. 1

Step 3. Expand **Bottom Nacelle** part in the Feature Manager. Click **Right Plane** and click **Sketch** on the context toolbar, **Fig. 2**.

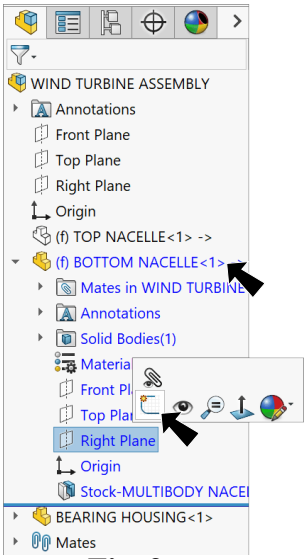


Fig. 2

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

Step 5. Click **Wireframe** on the View toolbar.

Step 6. Click **Offset Entities** on the Sketch toolbar.

Step 7. In the Offset Entities Property Manager set:
under Parameters, **Fig. 3**

Distance .2 (clearance of Bearing Housing)
click **angled rear edge of Bearing Housing** part, **Fig. 4**
uncheck **Reverse**
uncheck **Bi-directional**
Yellow offset should be to right (rear)

click OK .

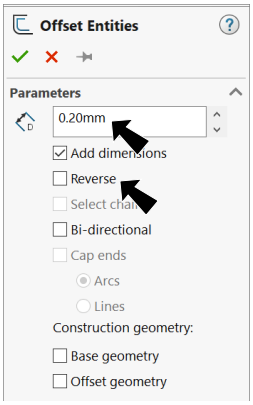


Fig. 3

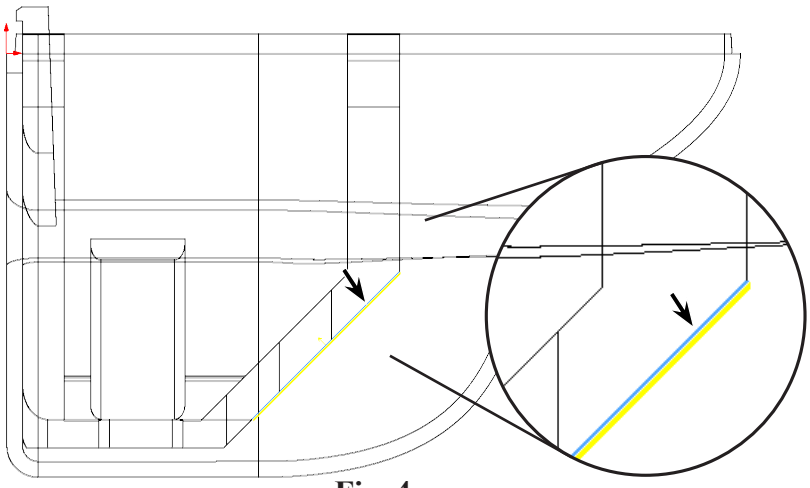


Fig. 4

Step 8. Click **Line**  **(L)** on the Sketch toolbar.

Step 9. Sketch **3 lines**, **Fig. 5**. **Horizontal line on top edge out past body, horizontal line on bottom edge out past body and line connecting right endpoints.**

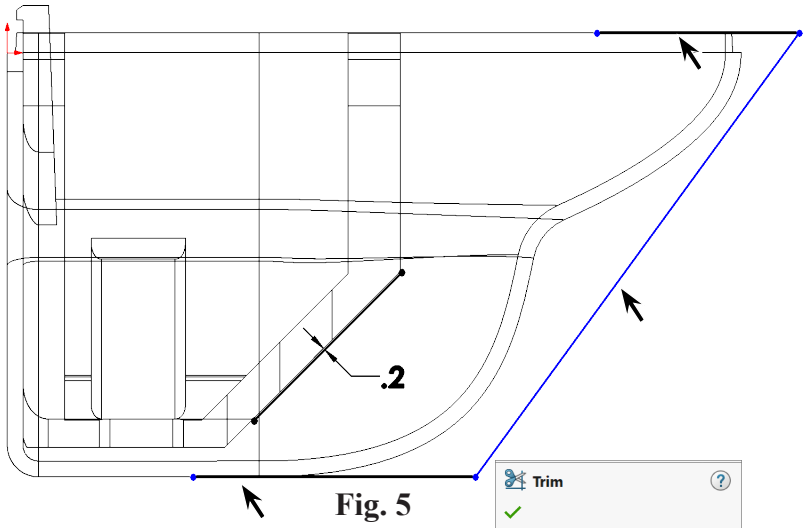


Fig. 5

Step 10. Click **Trim Entities** 

(S) on the Sketch toolbar.

Step 11. In the Trim Property Manger:

select **Corner**  , **Fig. 6**
Trim corner, **Fig. 7**. Click segments to trim. Result in **Fig. 8**.
Trim other corner, **Fig. 9**. Result in **Fig. 10**.
Click OK  when done.

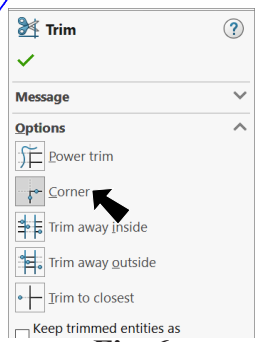


Fig. 6

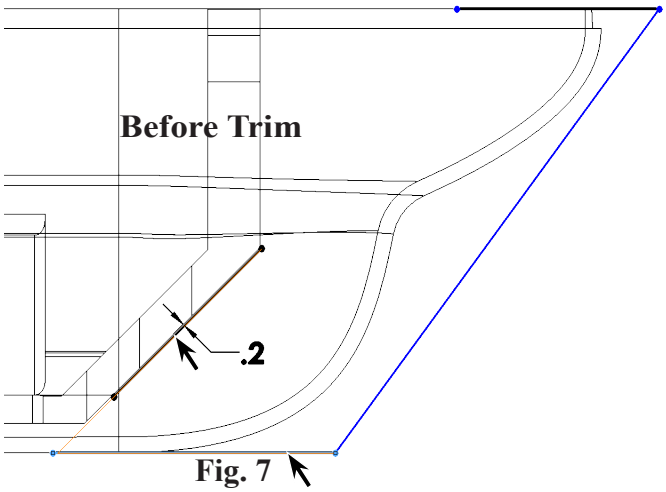


Fig. 7

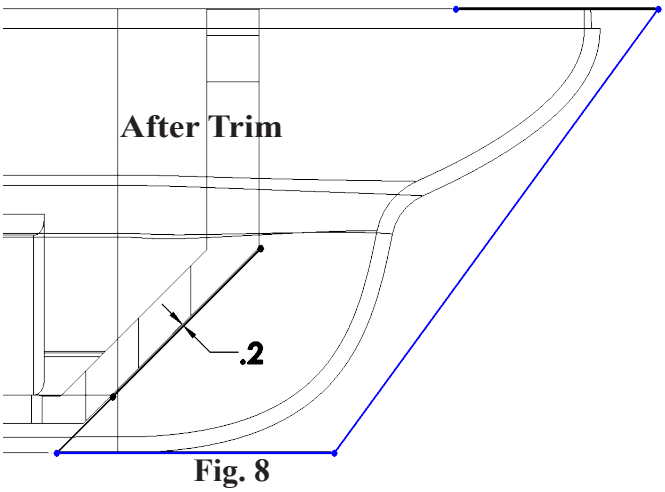


Fig. 8

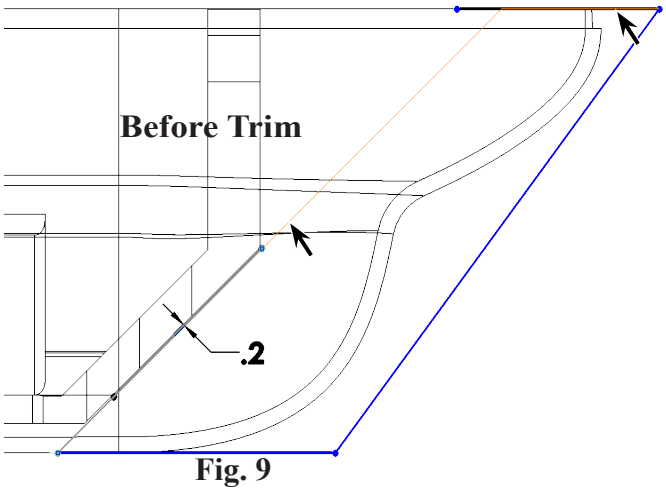


Fig. 9

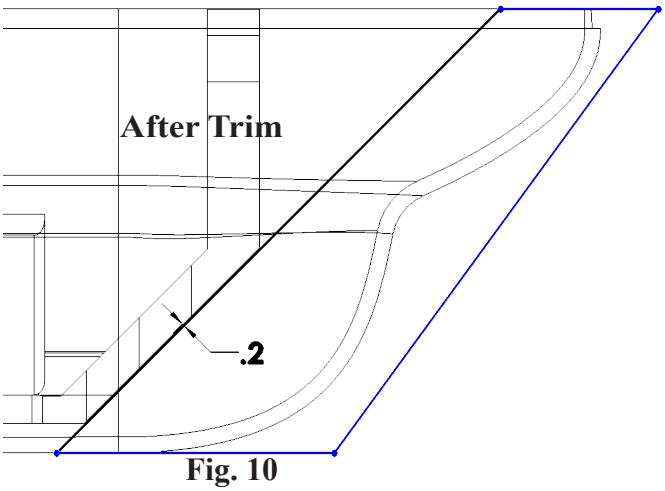


Fig. 10

Step 12. Click **Isometric** on the Standard Views toolbar. (**Ctrl-7**)

Step 13. Click **Shaded With Edges** on the View toolbar.

Step 14. Click **Features** Features on the Command Manager toolbar.

Step 15. Click **Extruded Boss/Base** Extruded Boss/Base on the Features toolbar.

Step 16. In the Boss-Extrude Property Manager set:
under Direction 1, **Fig. 11**
End Condition **Up to Body**
in the Solid/Surface box
click **Nacelle body**, **Fig. 12**
under Direction 2
End Condition **Up to Body**
in the Solid/Surface box
click **Nacelle body again**
click OK .

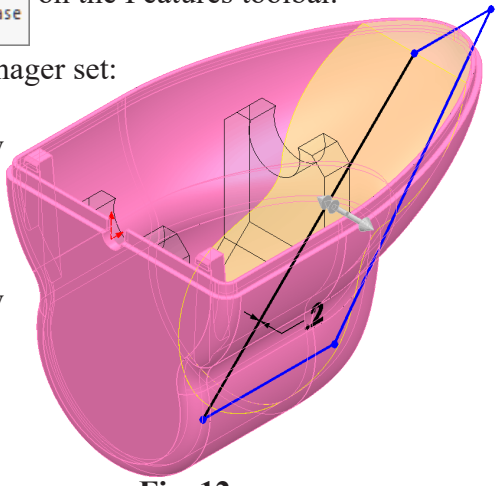


Fig. 12

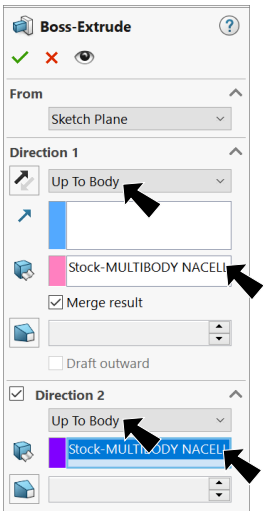


Fig. 11

Step 17. Click **Edit Component** Edit Component on the Features toolbar to **exit**.

Step 18. Save All (**Alt-F L**). File Menu > Save All.

B. Open Part.

Step 1. Click **Bottom Nacelle** part in the graphics area and click **Open Part** on the context toolbar, **Fig. 13**.

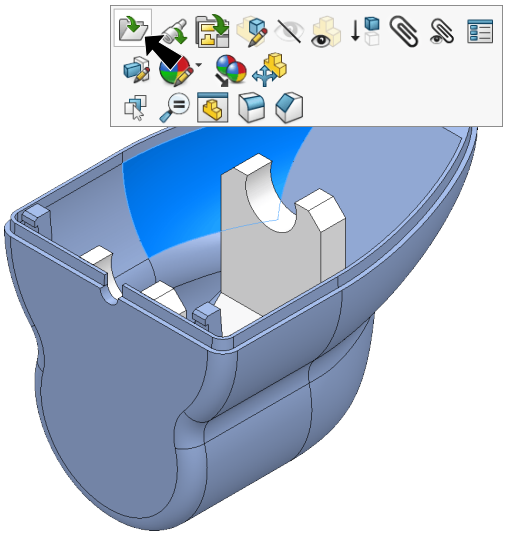


Fig. 13

C. Extrude Thin Sketch2 Bearing Housing Base.

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

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

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

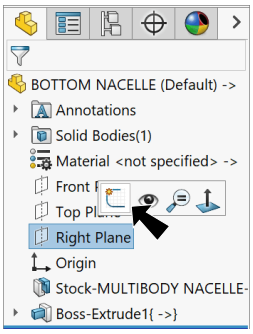


Fig. 14

Step 4. Click **Line** **(L)** on the Sketch toolbar.

Step 5. Sketch **horizontal line across just inside bottom**, **Fig. 15**.

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

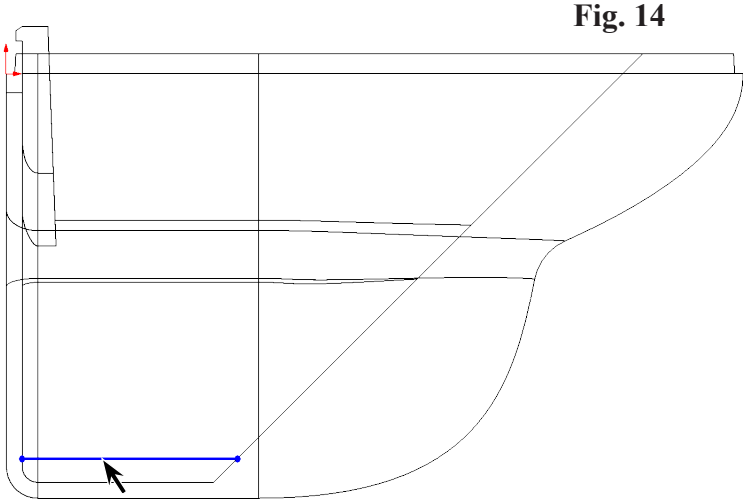


Fig. 15

Step 7. Dimension line **37.8** to **Origin** , **Fig. 16**.

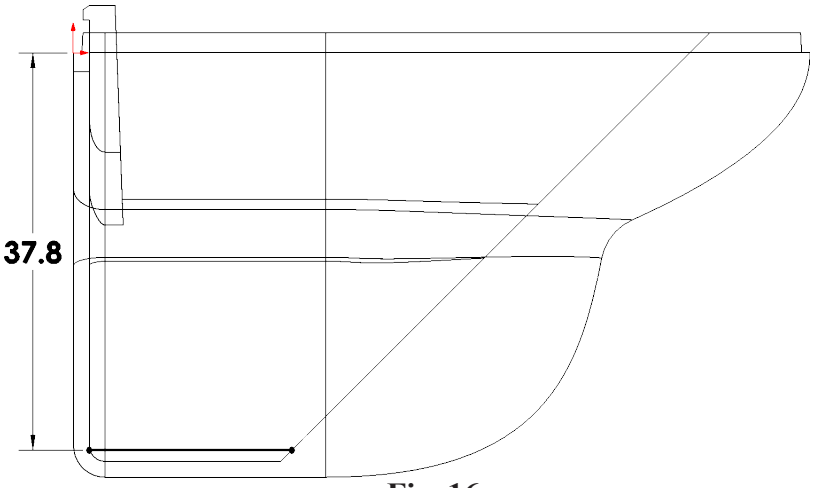


Fig. 16

Step 8. Click **Shaded With Edges** on the View toolbar.

Step 9. Rotate view to **view inside bottom of Nacelle**. Click **Isometric** on the Standard Views toolbar. (**Ctrl-7**) and **Down Arrow key** **3 times**, **Fig. 17**.

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

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

Step 12. In the Boss-Extrude Property Manager set:
under Direction 1, **Fig. 18**
End Condition **Up to Body**
in the Solid/Surface box
click **body**, **Fig. 19**
under Direction 2
End Condition **Up to Body**
in the Solid/Surface box
click **body**, **Fig. 6**
under Thin Feature
Thickness T1 **2**
click OK .

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

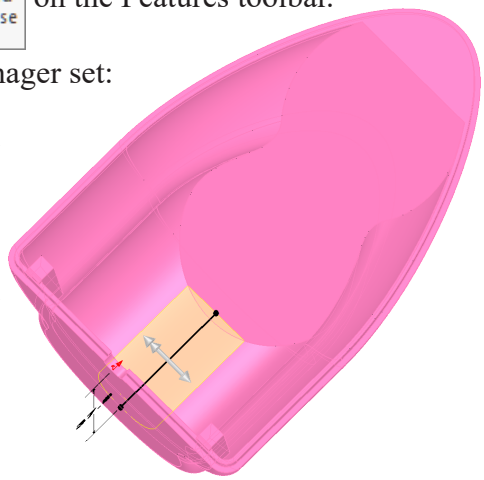


Fig. 18

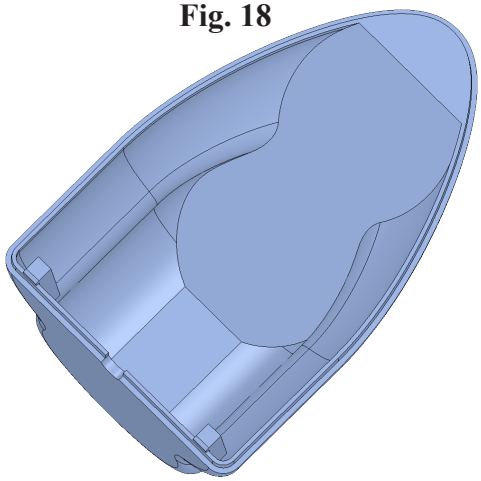


Fig. 19

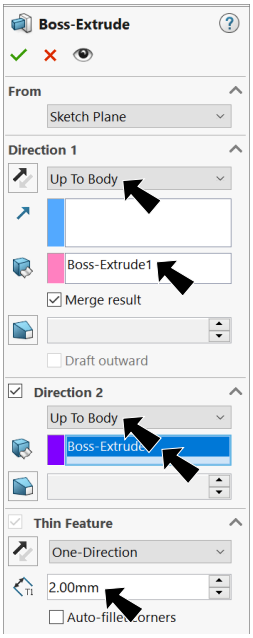


Fig. 17

D. Cut Extrude1 Sketch3 Yawl Post Hole.

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

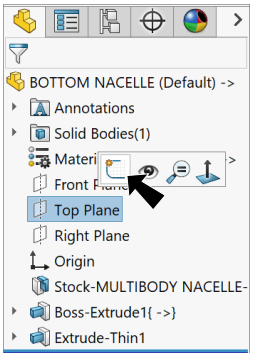


Fig. 20

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

Step 3. Click **Polygon** on the Sketch toolbar.

Step 4. In Polygon Property Manager set:
under Parameter, **Fig. 21**
Number of Sides **4**

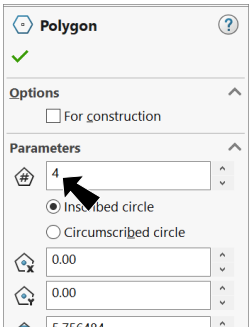


Fig. 21

Step 5. Sketch polygon, **Fig. 22**

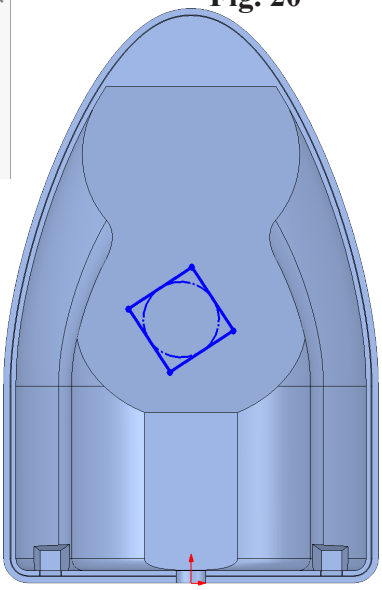


Fig. 22

Step 6. **Unselect Polygon tool**. To unselect, **right click graphics area and click Select** from menu.

Step 7. **Ctrl click centerpoint of polygon** and **Origin** to select both. Release Ctrl key and click **Make Vertical** on the context toolbar, **Fig. 23**.

Step 8. **Ctrl click two opposite vertices of polygon** and click **Make Vertical** on the context toolbar, **Fig. 24**.

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

Tip: You could flip over to Assembly file and see this polygon aligns with polygon cut in the Bearing Housing.

Step 10. Dimension **10 across two opposite vertices** and **26 to Origin** , **Fig. 25**.

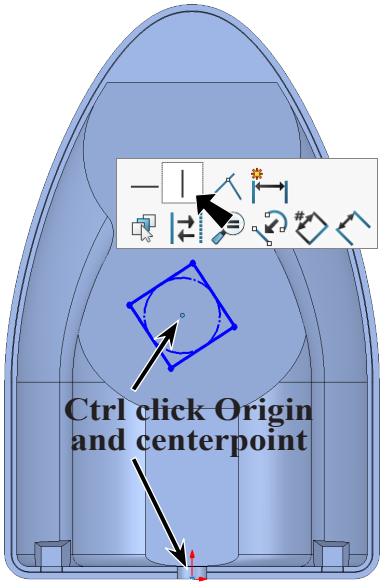


Fig. 23

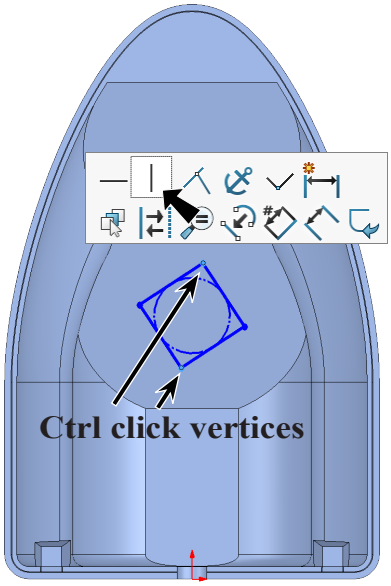


Fig. 24

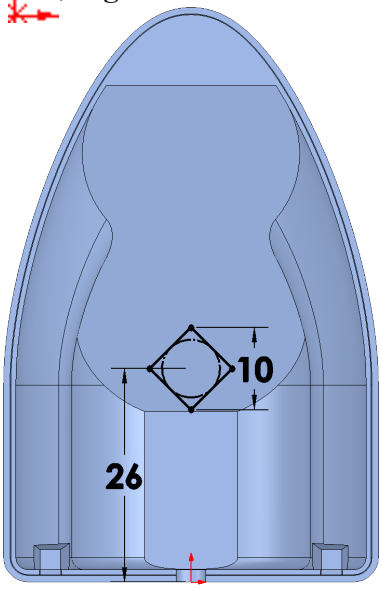


Fig. 25

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

Step 12 .Click **Features** Features on the Command Manager toolbar.

Step 13. Click **Extruded Cut** Extruded Cut on the Features toolbar.

Step 14. In the Cut-Extrude Property Manager set:
under Direction 1, **Fig. 26**
End Condition **Through All**
click OK .

Step 15. Save (**Ctrl-S**).

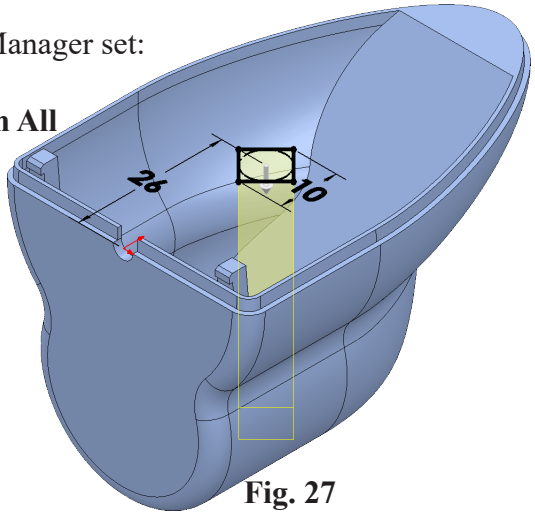


Fig. 27

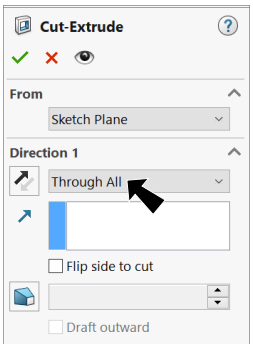


Fig. 26

E. Cut Extrude2 Sketch4 Vane Boom Hole.

Step 1. Click **Front Plane** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 28**.

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

Step 3. Click **Polygon** on the Sketch toolbar.

Step 4. Confirm **Number of Sides** **4**.

Step 5. Sketch polygon, **Fig. 29**.

Step 6. **Unselect Polygon tool**. To unselect, **right click graphics area and click Select** from menu.

Step 7. **Ctrl click centerpoint of polygon** and **Origin** to select both. Release Ctrl key and click **Make Vertical** on the context toolbar, **Fig. 30**.

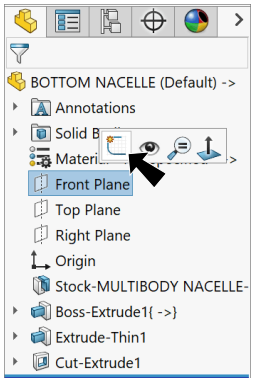


Fig. 28

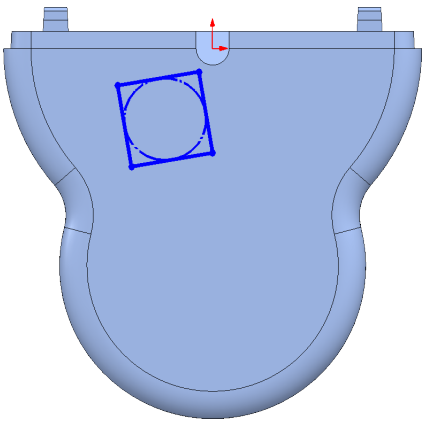


Fig. 29

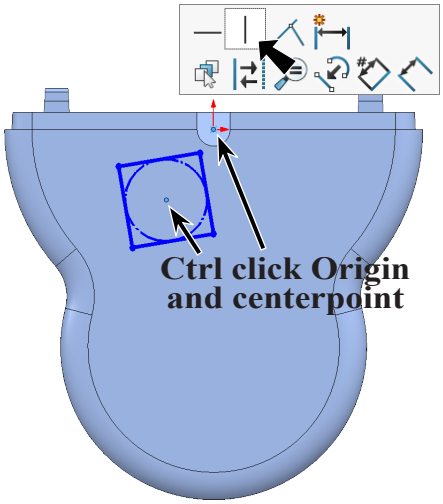
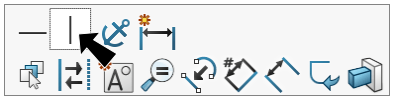


Fig. 30

Step 8. Click a **polygon segment** and click **Make Vertical** on the context toolbar, **Fig. 31**.



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

Step 10. Dimension a **segment 8** and **centerpoint 6.5 to Origin** , **Fig. 32**.

Step 11. Click **Right** on the Standard Views toolbar. (**Ctrl-4**)

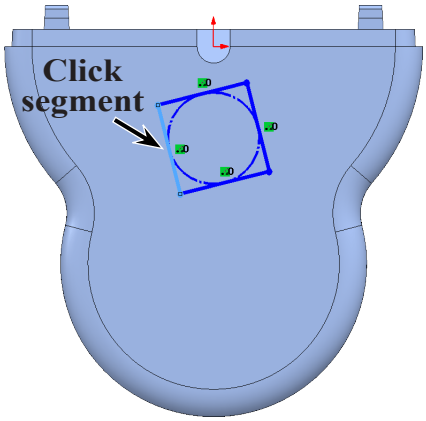


Fig. 31

Step 12 .Click **Features** on the Command Manager toolbar.

Step 13. Click **Extruded Cut** on the Features toolbar.

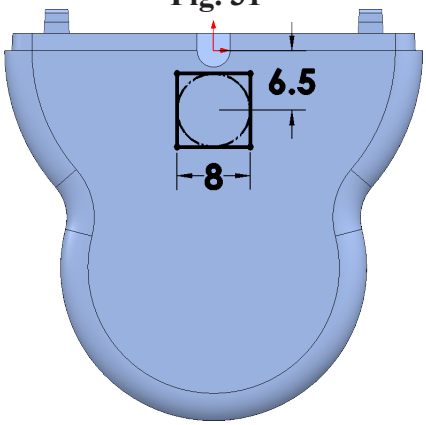


Fig. 32

Step 14. In the Cut-Extrude Property Manager set:

under From, **Fig. 33**

End Condition **Offset**

Offset 56.5

Reverse Direction

under Direction 1

End Condition

Through All

click OK .

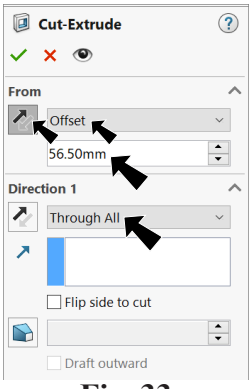


Fig. 33

Step 15. Save (**Ctrl-S**).

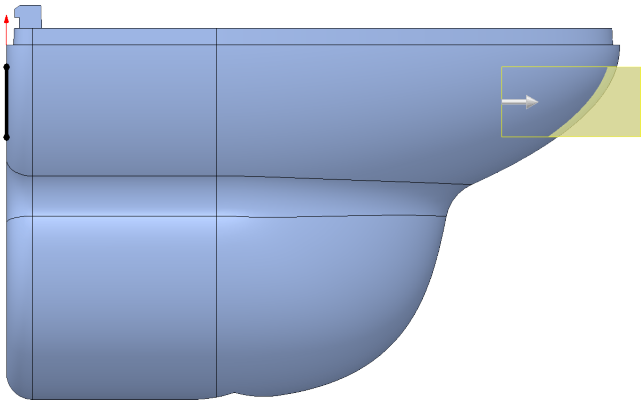


Fig. 34

F. Create Plane1.

Step 1. Click **Top Plane** in the Feature Manager to display Plane is graphics area, **Fig. 35**.

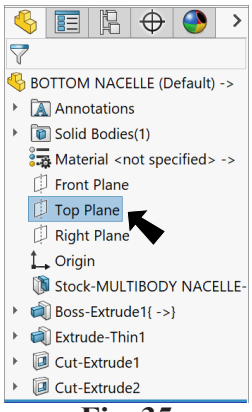


Fig. 35

Step 2. In graphics area **Ctrl drag Top plane down** and release, **Fig. 36**.

Step 3. In the Plane Property Manager set:
under First Reference, **Fig. 37**
Distance 6
and press **ENTER**.
The new plane should be below Top Plane, **Fig. 36**.
Click OK .

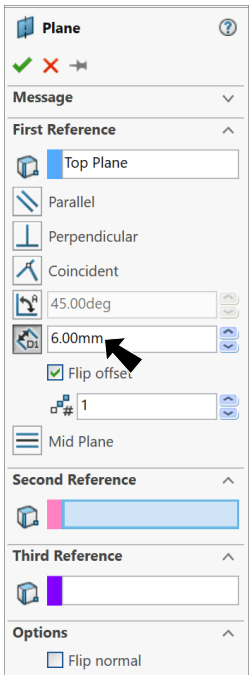


Fig. 37

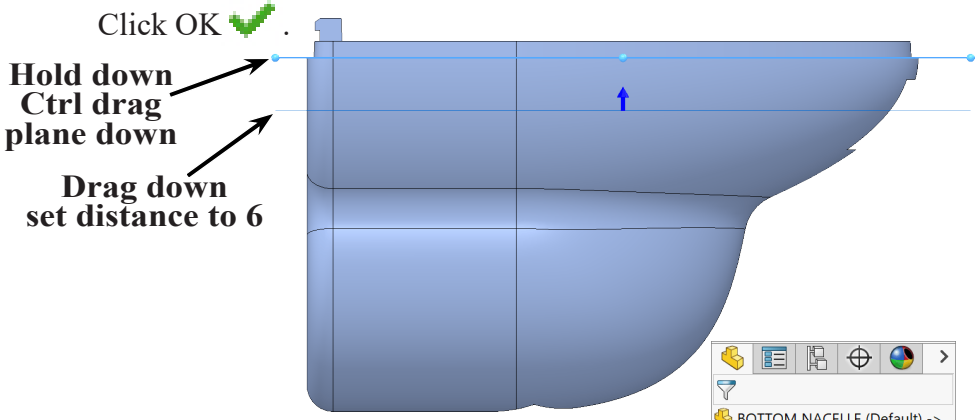


Fig. 36

G. Sweep Sketch5 Wire Run.

Step 1. **Hide Plane1** . To hide, click **Plane1** in the Feature Manager and **Hide** on the context toolbar, **Fig. 38**.

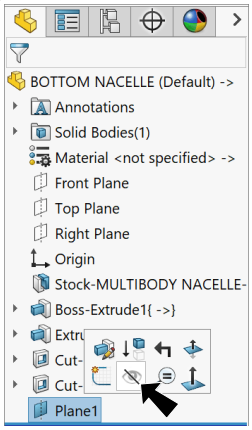


Fig. 38

Step 2. Click **Plane1** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 39**.

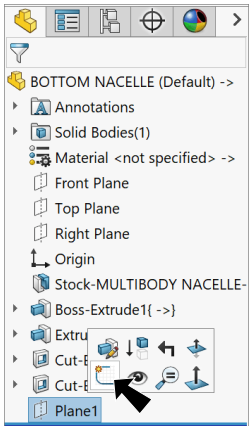


Fig. 39

Step 3. Click **Normal To** on the Standard Views toolbar. **(Ctrl-8)**

Step 4. Click **Intersection Curve** Intersection Curve in the **Convert Entities flyout** Convert Entities on the Sketch toolbar.

Step 5. In the Intersection Curve Property Manager:
under Select Entities, **Fig. 40**
click **inside face bottom left corner of Bottom Nacelle**, **Fig. 41**
click OK **twice**.

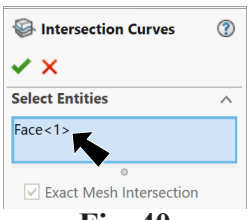


Fig. 40

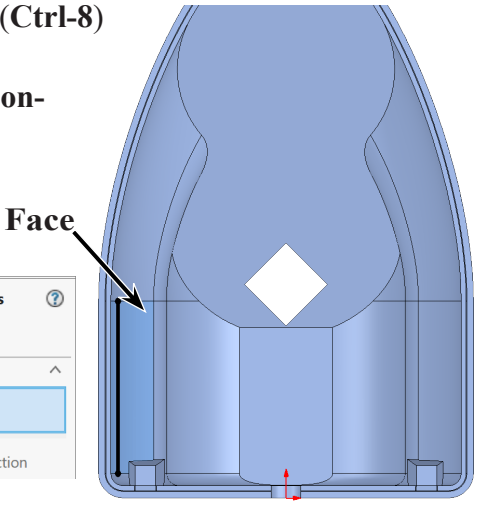


Fig. 41

Step 6. Click **Line**  **(L)** on the Sketch toolbar.

Step 7. Sketch 5 lines, **Fig. 42**.

Step 8. **Unselect Line tool**. To unselect, **right click graphics area and click Select** from menu.

Step 9. **Ctrl click a set of angled lines** to select both. Release Ctrl key and click **Make Parallel**  on the context toolbar, **Fig. 43**.

Make other set of angled of lines parallel, Fig. 44.

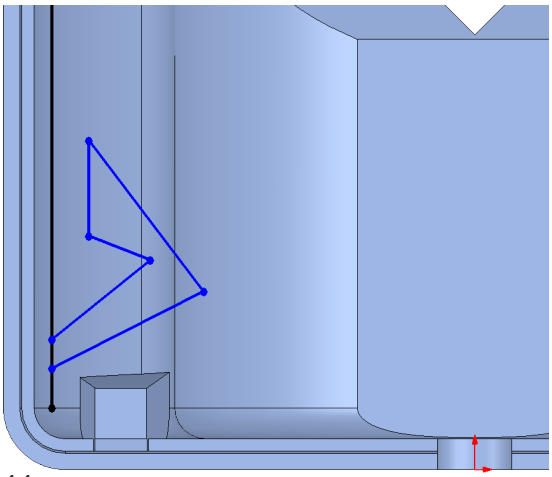


Fig. 42

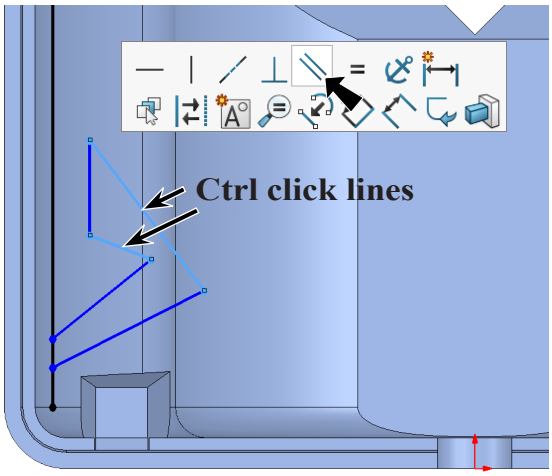


Fig. 43

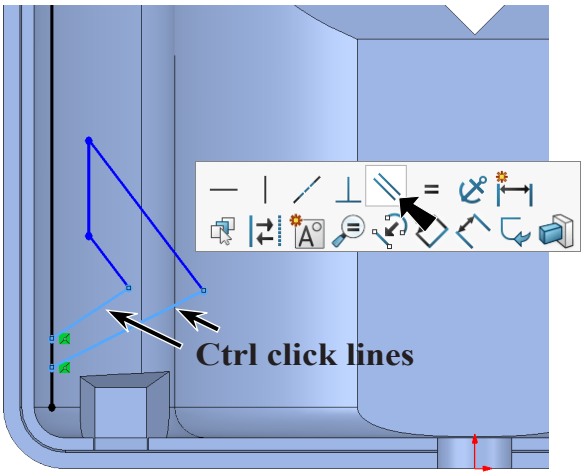


Fig. 44

Step 10. Click **Trim Entities** 

(S) on the Sketch toolbar.

Step 11. In the Trim Property Manger:

select **Corner**  , **Fig. 45**
Trim corner, **Fig. 46**. Result in **Fig. 47**.
Trim other corner, **Fig. 48**. Result in **Fig. 49**.
Click OK when done.

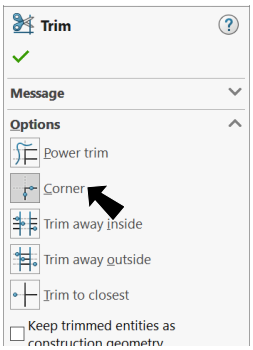


Fig. 45

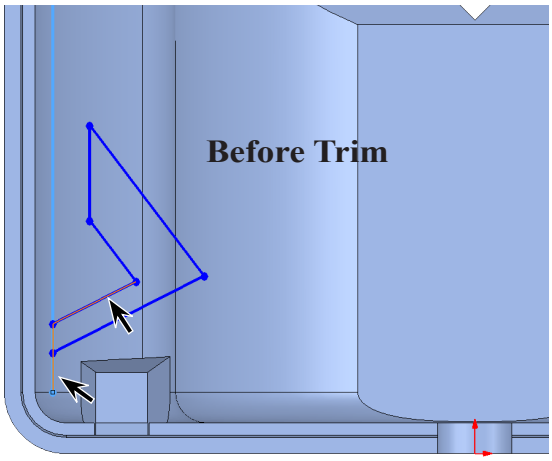


Fig. 46

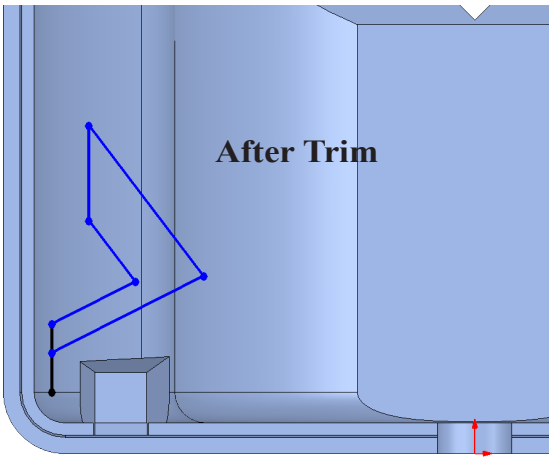


Fig. 47 **Fig. 45**

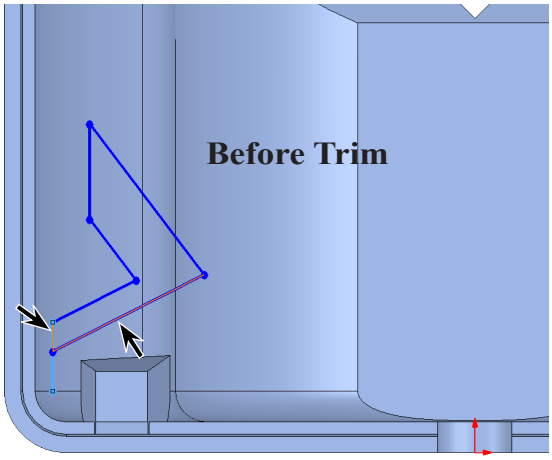


Fig. 48

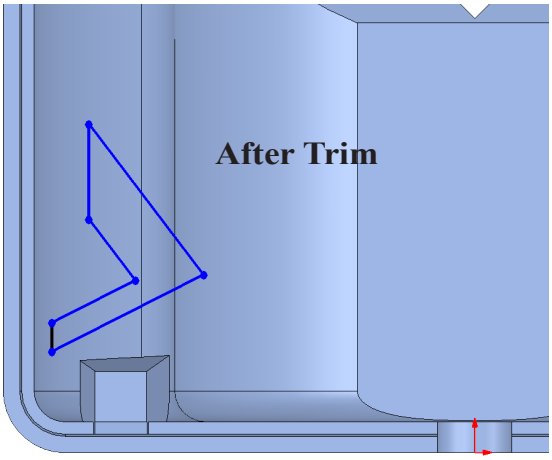


Fig. 49

Step 12. Click **Smart Dimension** 

(S) on the Sketch toolbar.

Step 13. Add dimensions, **Fig. 50**.

Step 14. Click **Exit Sketch** 

on the Sketch toolbar.

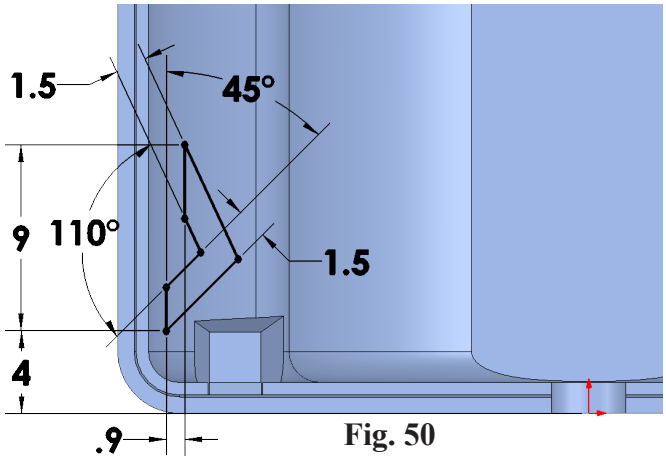
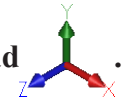


Fig. 50

H. Create Plane 2.

Step 1. Rotate Isometric view to view inside front of part, **Fig. 51**. To rotate view, click **Isometric**  on the Standard Views toolbar (**Ctrl-7**), then in bottom left corner of graphics area **Shift click the Y axis of the Reference Triad**  .

Step 2. Click **Front Plane** in the Feature Manager to display Plane is graphics area, **Fig. 52**.

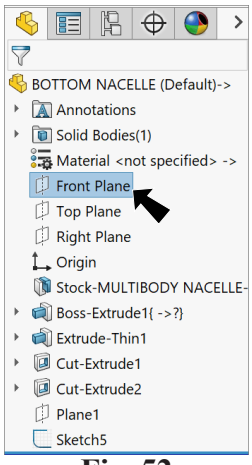


Fig. 52

Step 3. In graphics area **Ctrl drag Top plane to rear** and release, **Fig. 51**.

Step 4. In the Plane Property Manager:
under First Reference, **Fig. 53**
Front Plane was preselected
click **Parallel** 
under Second Reference
click **forward most vertex of Sketch5**, **Fig. 51**
click OK  .

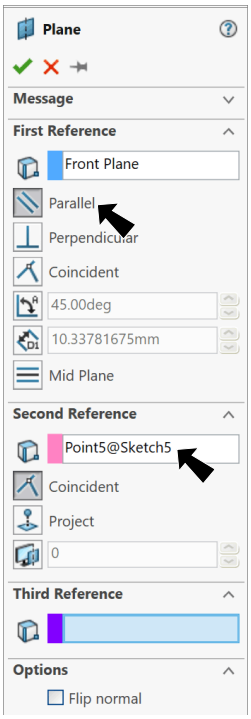


Fig. 53

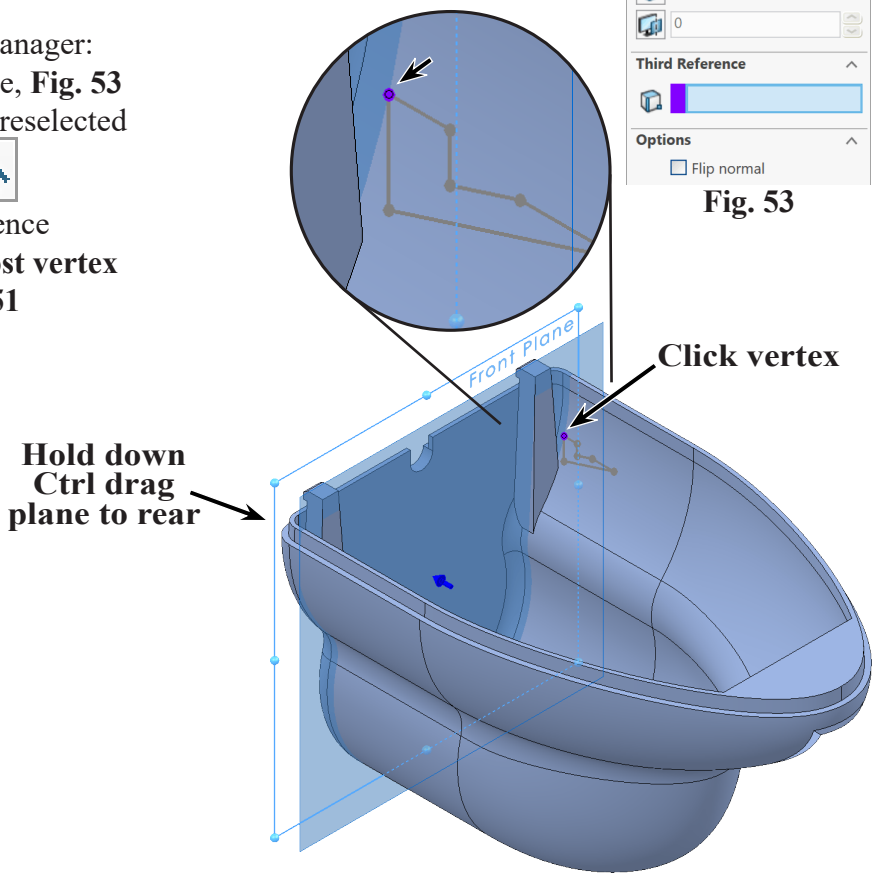


Fig. 51

I. Sweep Sketch6 Wire Run.

Step 1. **Hide Plane2**. To hide, click **Plane1** in the Feature Manager and **Hide** on the context toolbar, **Fig. 54**.

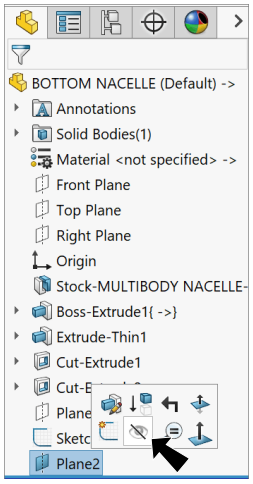


Fig. 54

Step 2. Click **Plane2** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 55**.

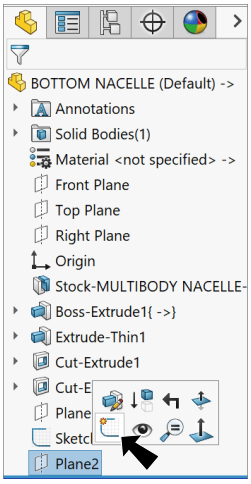


Fig. 55

Step 3. Click **Intersection Curve** in the **Convert Entities flyout** on the Sketch toolbar.

Step 4. In the Intersection Curve Property Manager:
under Select Entities, **Fig. 56**
click **inside face of Nacelle at Sketch5**, **Fig. 57**
click OK **twice**.

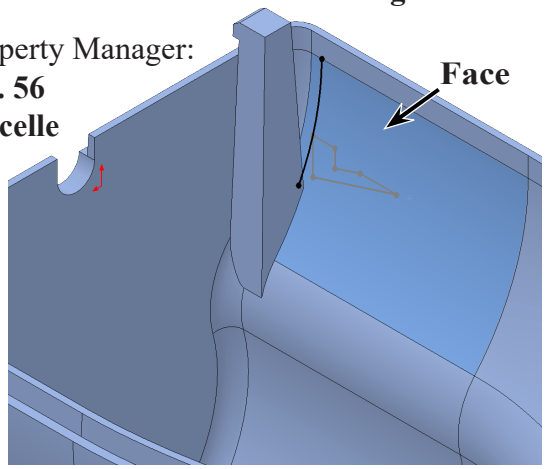


Fig. 57

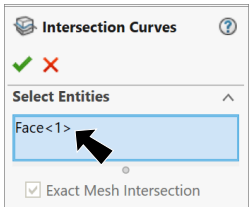


Fig. 56

J. Sweep.

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

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

Step 3. In the Swept Boss/Base Property Manager:
under Profile and Path, **Fig. 58**
Profile click **Sketch5**, **Fig. 59**
Path click **Sketch6**
click **Direction 2**
click OK .

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

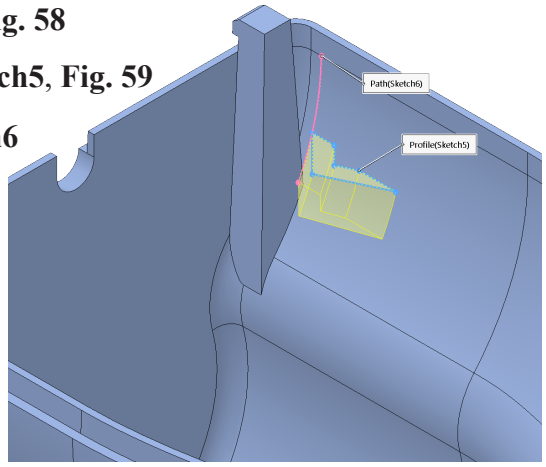


Fig. 59

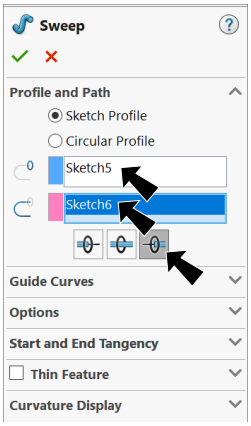


Fig. 58

K. Fillet Edges.

Step 1. Click **Fillet** 

on the Features toolbar.

Step 2. In the Fillet Property Manager set:
select **FilletXpert**, **Fig. 60**
Radius **2**
click the **forward edge of wire run at face of Nacelle**, **Fig. 61**
click **Apply**

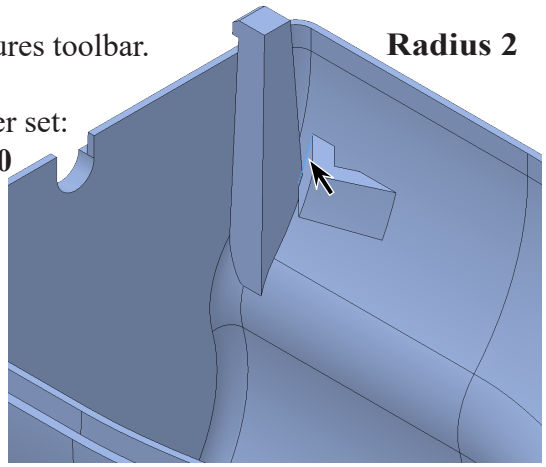


Fig. 61

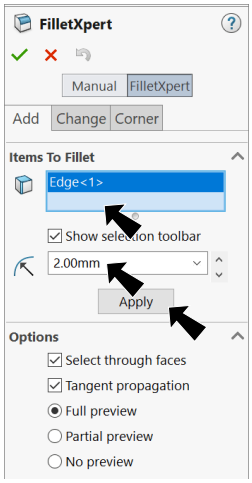


Fig. 60

Radius **.5**, **Fig. 62**
click the **edges (4) of wire run**, **Fig. 63**
click OK .

Step 3. Save (**Ctrl-S**).

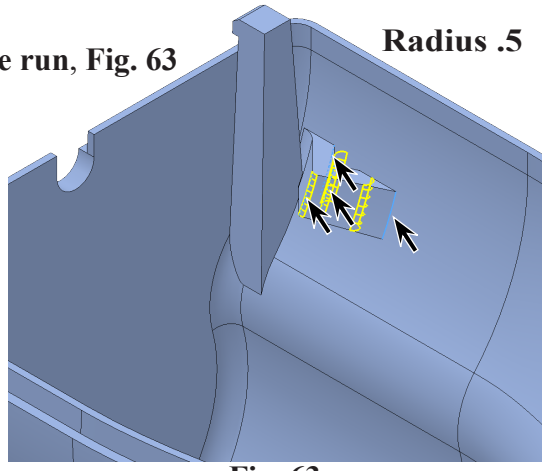


Fig. 63

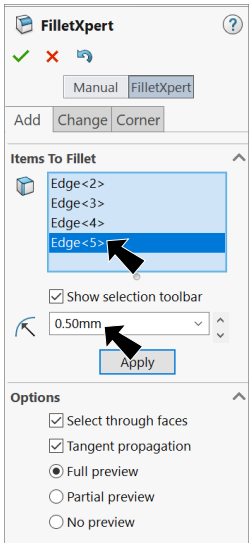


Fig. 62

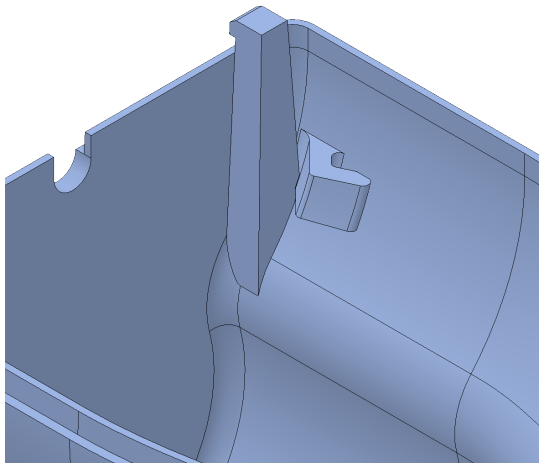


Fig. 64