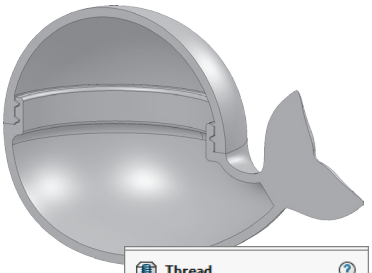
Whale

Threads Feature



A. Thread Feature.

Step 1. If necessary, open your **WHALE** part file.

Step 2. Click **Thread**

in the **Hole Wizard flyout**

on the Features toolbar.

Step 3. In the Thread Property Manager set:

under Thread Location , **Fig. 1**
click **circular edge of Extrude**, **Fig. 2**
check **Offset**
Offset Distance 2
Reverse Direction

under End Condition
select **Up To Selection**
click **top face of Base Loft1**, **Fig. 2**

under Specification
Type **Metric Die**
Size **M18x2.0**
click **Override Pitch** **3.5**
Thread method **Cut thread**

under Thread Options
select **Right-hand thread**
check **Trim with start face**
check **Trim with end face**

click OK .

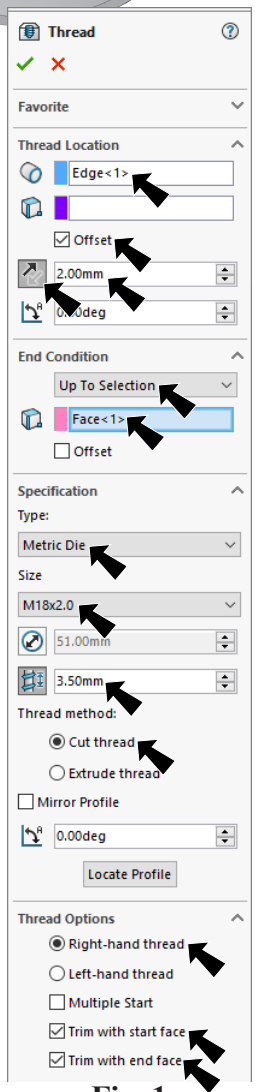


Fig. 1

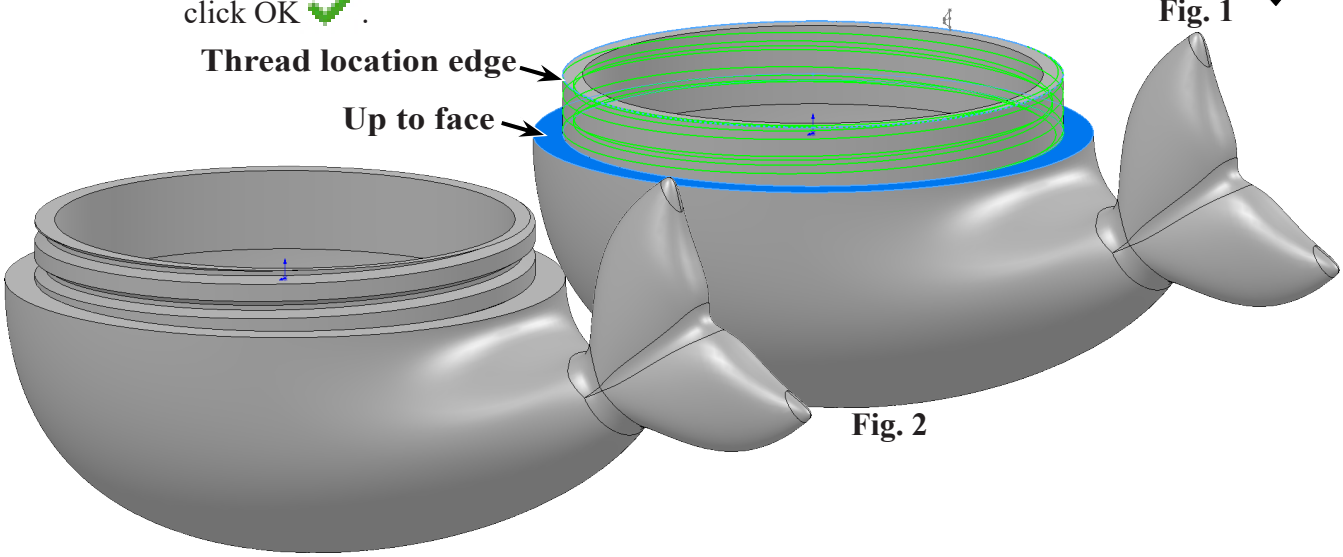


Fig. 2

Fig. 3

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B. Section View.

Step 1. Click **Section View** in View toolbar. Or View > Display > Section View.

Step 2. In the Section View Property Manager:
under Section 1, **Fig. 4**
click **Right Plane**
click OK .

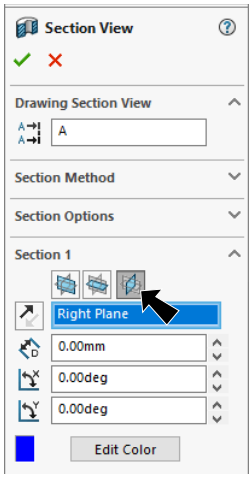

Fig. 4

C. Fillet Inside Extrude.

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

Step 2. In the Fillet Property Manager set:
select **FilletXpert**, **Fig. 5**
Radius .75
click **both inside cylindrical edges of Extrude**, **Fig. 6**
click **Apply**
Radius 2.15, **Fig. 7**
click **inside cylindrical edge under lip**, **Fig. 8**
click OK .

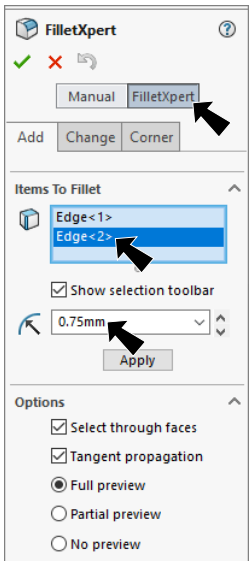

Fig. 5

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

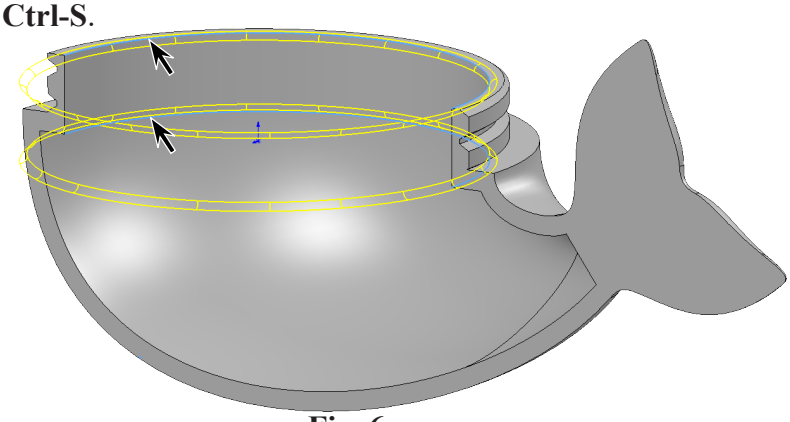
Fig. 6

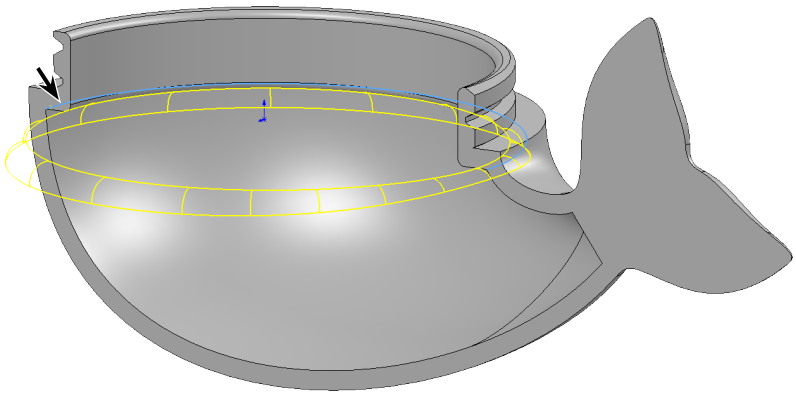
Fig. 8

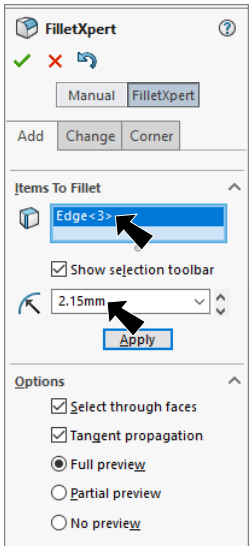

Fig. 7

D. Show Lid.

Step 1. **Show LID** body. To show, expand **Solid Bodies** folder in the Feature Manager. Click **LID** body and **Show** on the context toolbar, **Fig. 9**.

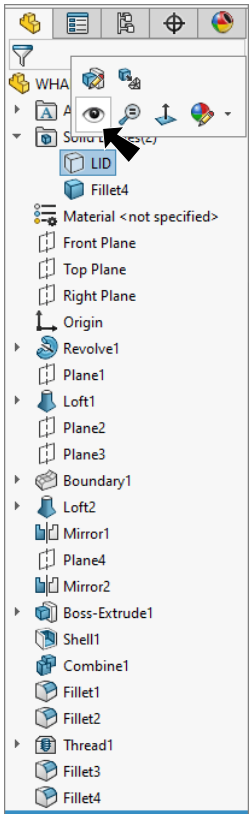

Fig. 9

E. Indent.

Step 1. Click Insert Menu > Features > Indent.

Step 2. In the Indent Property Manager:
under Selections, **Fig. 10**
Target body:
click **LID**, **Fig. 11**
Tool body region:
click **BASE**
check **Cut**
under Parameters
Clearance .22
click OK .

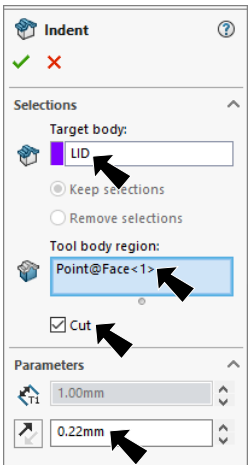

Fig. 10

Tip: Clearance may need to be adjusted depending on 3D printer.

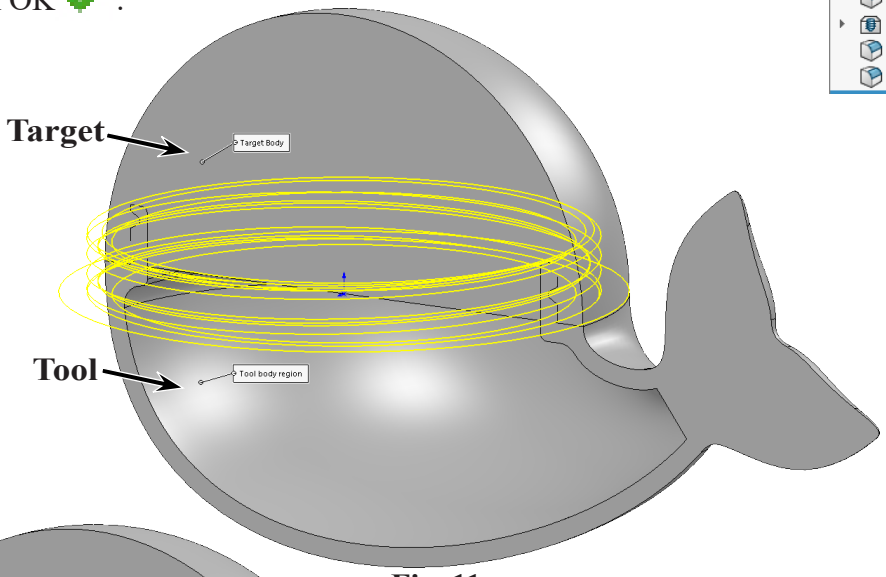

Fig. 11

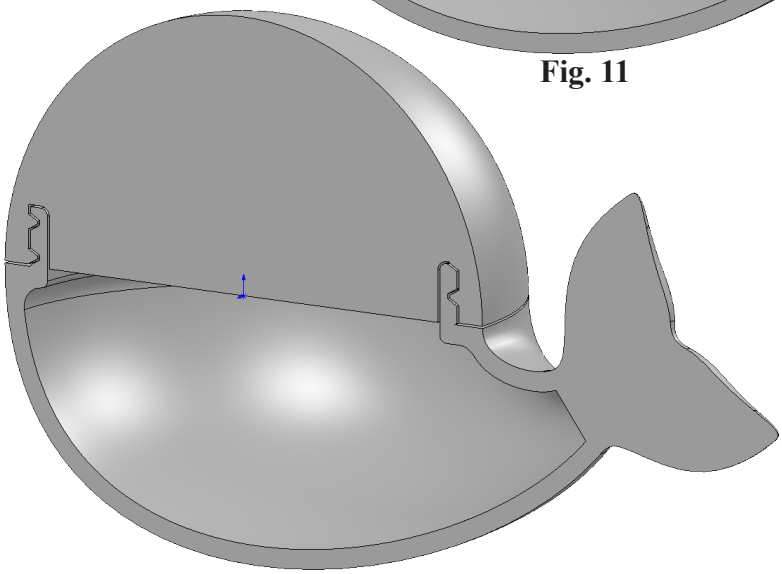

Fig. 12

F. Offset Surface.

Step 1. Zoom in on **treads in Lid**, **Fig. 13**.

Step 2. Note the Indent cut back the bottom face of Lid, **Fig. 14**. We'll repair with Offset and Replace surface.

Step 3. **Hide BASE** body. Move cursor over the Base body and press **Tab** key, **Fig. 14**.

Step 4. Click Insert Menu > Surface > Offset.

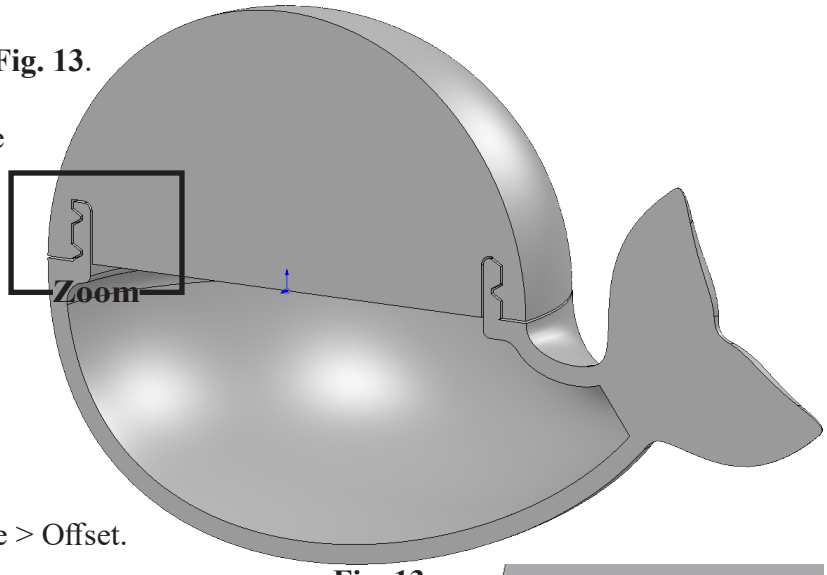

Fig. 13

Step 5. In the Offset Surface Property Manager:
under Offset Parameter, **Fig. 15**
click **bottom outside face of Lid**, **Fig. 16**
Offset distance .22

Tip: Offset distance is same as Indent Clearance which may need to be adjusted depending on 3D printer.

click OK .

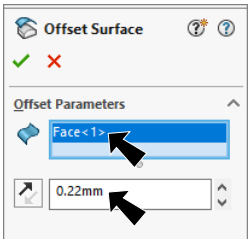

Fig. 15

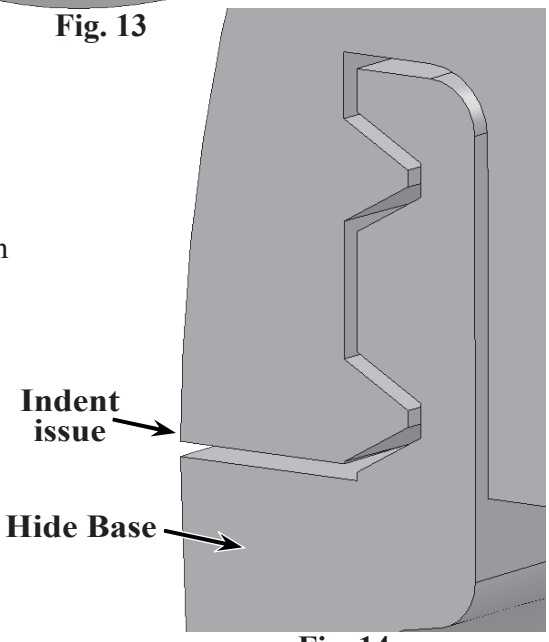

Fig. 14

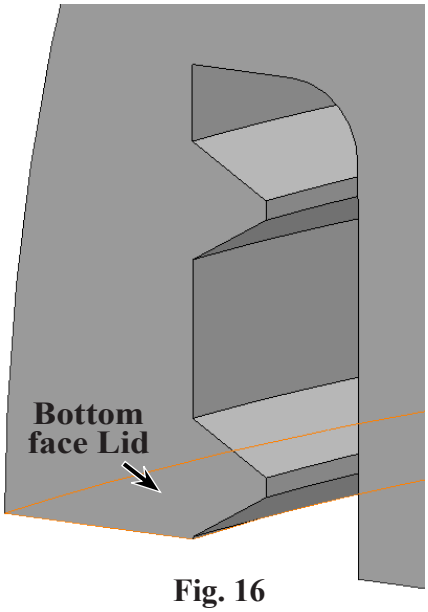

Fig. 16

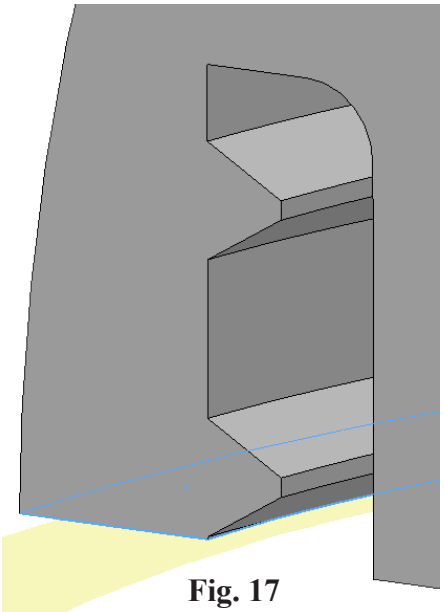

Fig. 17

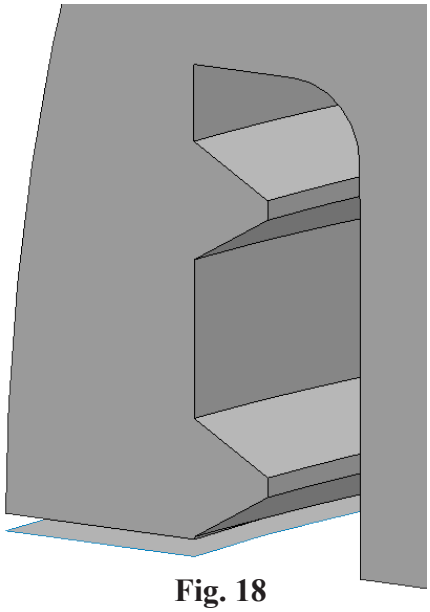

Fig. 18

G. Replace Face.

Step 1. Click Insert Menu > Face > Replace.

Step 2. In the Replace Face Property Manager:
under Replace Parameter, **Fig. 19**
click **bottom face of Lid Revolve**, **Fig. 20**
click in Replace Surface box
click **Offset Surface**, **Fig. 21**
click OK .

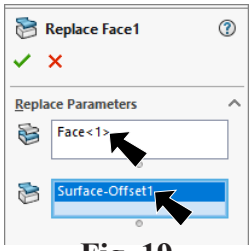

Fig. 19

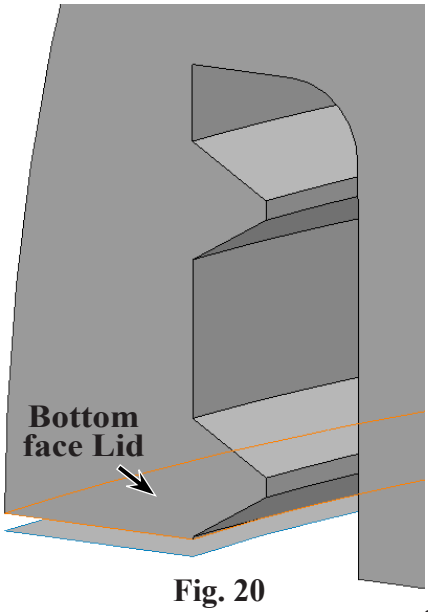

Fig. 20

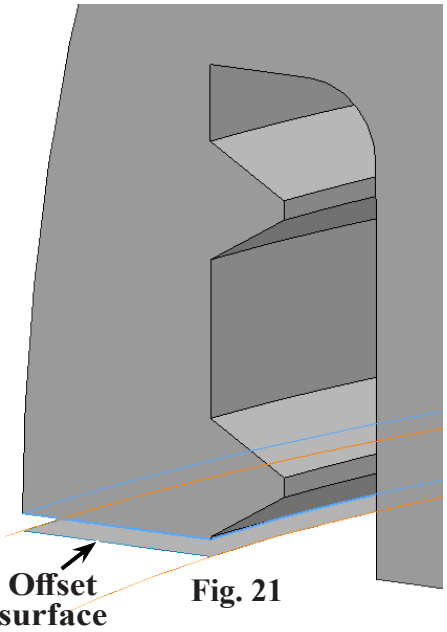

Fig. 21

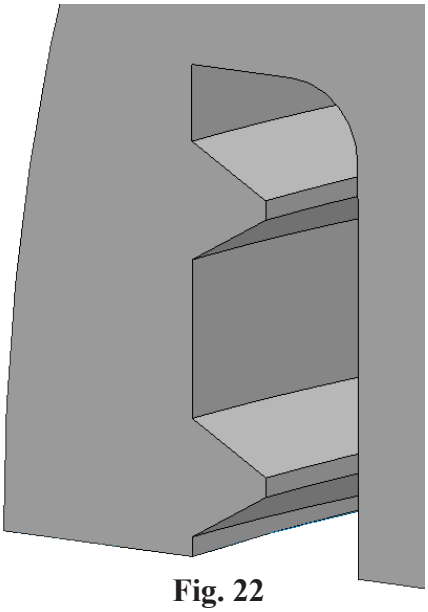
Fig. 22

H. Hide Offset Surface.

Step 1. Click **Surface-Offset1** in graphic area and click **Hide** on the context toolbar, **Fig. 23**.

Step 2. **Turn off Section View** in View toolbar. Or View > Display > Section View.

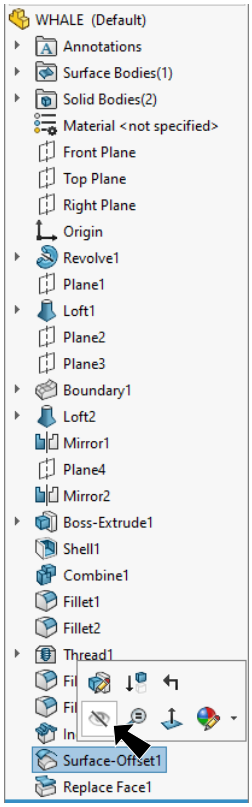

Fig. 23

I. Revolve Cut Lid.

Step 1. Click **Right Plane** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 24**.

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

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

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

Step 5. Sketch **vertical line up from Origin** **up to arc edge, Fig. 25**.

Step 6. Sketch **horizontal line coincident with vertical line and coincident with top silhouette edge cut threads, Fig. 26**.

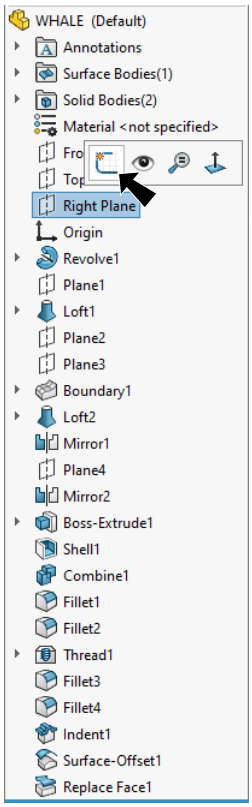

Fig. 24

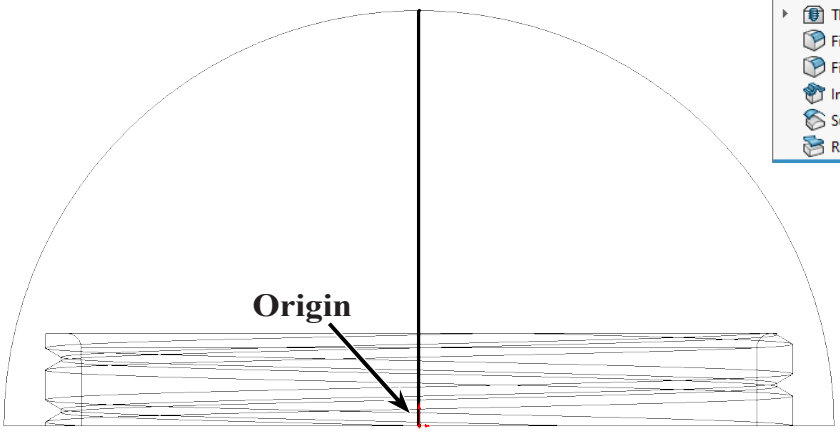

Fig. 25

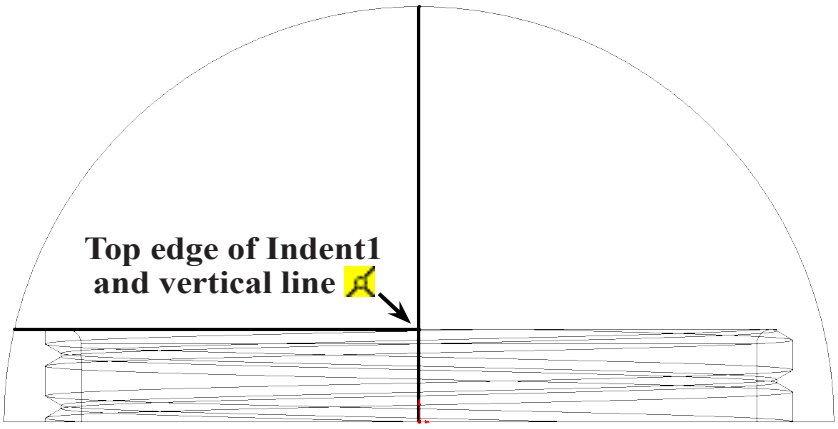

Fig. 26

Step 7. Click **Offset Entities**

on the Sketch toolbar.

Step 8. In the Offset Entities Property Manager set:
under Parameters, **Fig. 27**

Distance **2**
check **Reverse**
click **arc edge of Lid, Fig. 28**
The yellow offset should be inside the edge
If it is not, uncheck Reverse.
click OK ✔ .

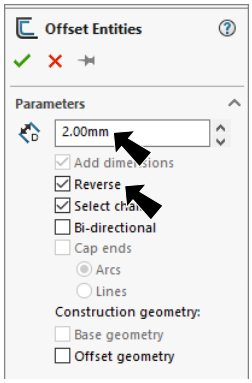

Fig. 27

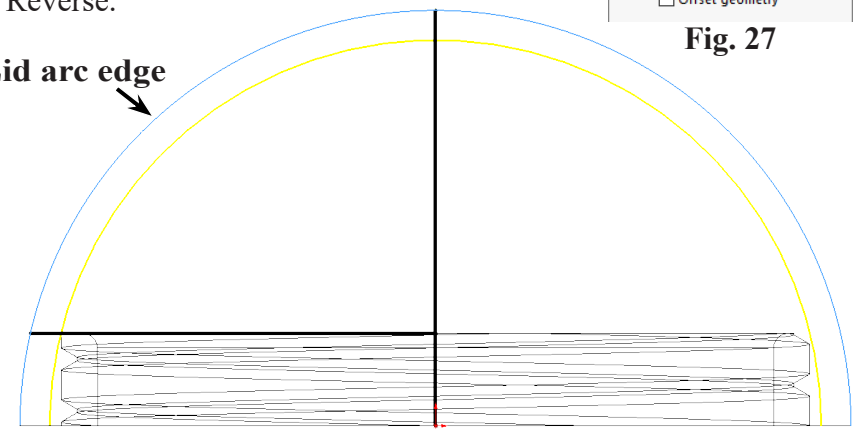

Fig. 28

Step 9. Click **Convert Entities**

on the Sketch toolbar.

Step 10. In the Convert Entities Property Manager:
under Entities to Convert, **Fig. 29**
click:
1) bottom edge
2) vertical silhouette edge
3) fillet silhouette edge
click OK ✔ .

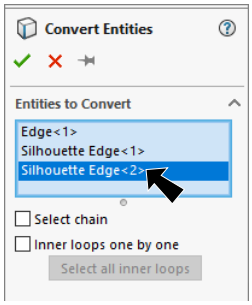

Fig. 29

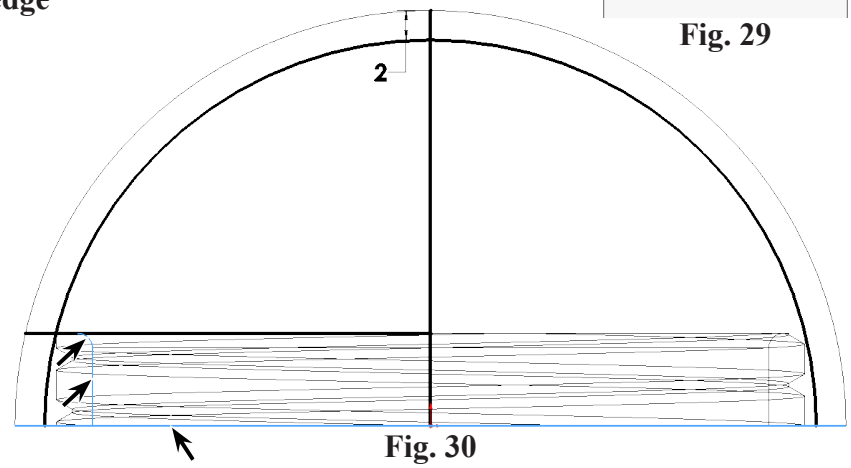

Fig. 30

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

Step 12. Click **Revolved Cut** Revolved Cut on the Features toolbar.

Step 13. In the Cut Revolve Property Manger set:

click in the Axis of Revolution box, **Fig. 31**
click **vertical line**, **Fig. 32**
uncheck **Thin Feature**
under Selected Contours
click in Selected contours box
click **both regions inside geometry**
click OK .

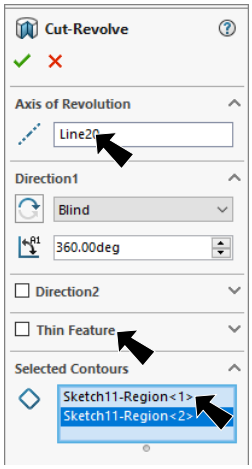

Fig. 31

Step 14. Click **Shaded With Edges** on the View toolbar.

Step 15. Click **Section View** in View toolbar. Or View > Display > Section View.

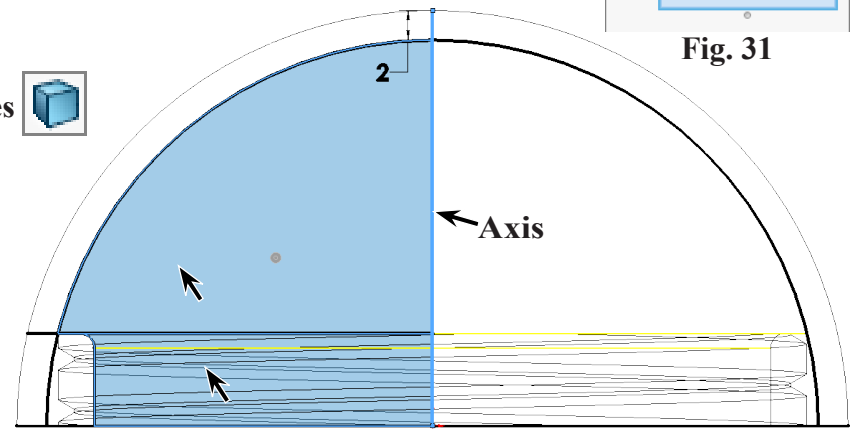

Fig. 32

Step 16. **Turn off Section View** in View toolbar. Or View > Display > Section View.

Tip: Toggle Hide/Show bodies by moving the cursor over the body in graphics area and press **Tab** key to hide or **Shift - Tab** to show.

Step 17. **Show BASE** body.

Step 18. Save. Use **Ctrl-S**.

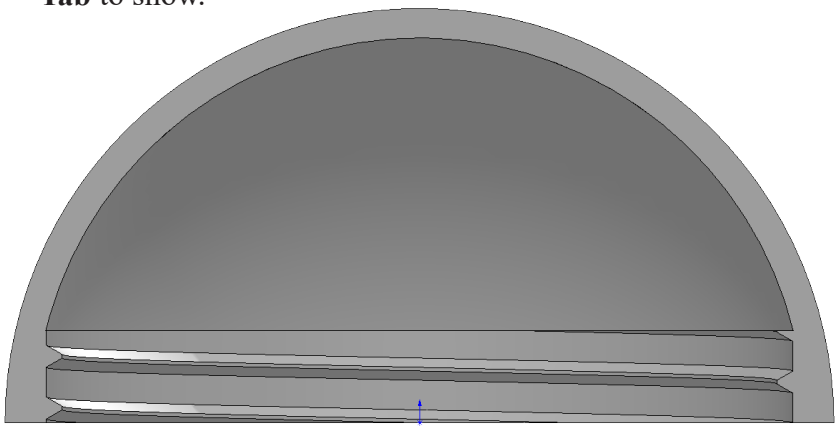

Fig. 32