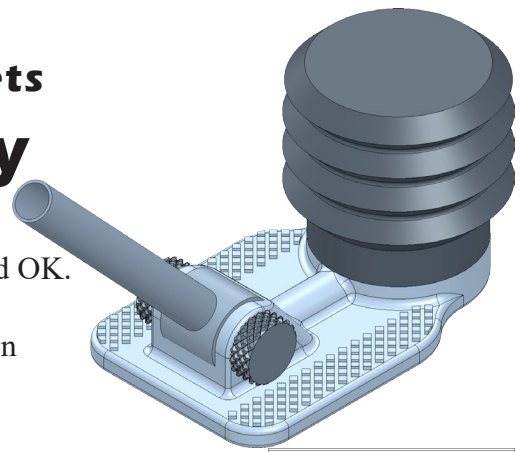


Whomp Rockets Assembly





A. Insert Base and Tube.

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

Step 2. Select your **BASE** file and click Open from the Open dialog box.

Step 3. In the Begin Assembly Property Manager set:

click **Keep Visible** , **Fig. 1**

Click OK  in the Property Manager. This will place Base origin at the assembly origin and fix the position so Base cannot move. This fixed component should have a **(f)** before its name in the Feature Manager >  (f) BASE<1>.

Step 4. Click **Browse** in the Property Manager, **Fig. 1**.

Step 5. Select your **TUBE** file and click Open.

Step 6. Click approximately where Tube is positioned in **Fig. 2**.

Step 7. Click **Cancel**  in the Property Manager when done.

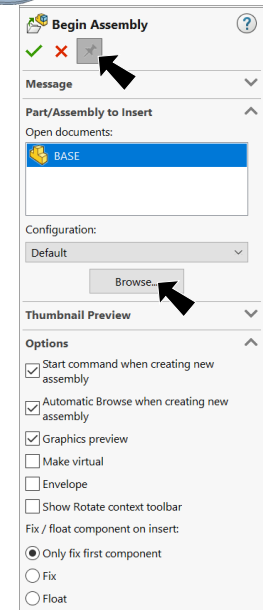


Fig. 1

B. Save as "WHOMP ASSEMBLY".

Step 1. Click File Menu > Save As.

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

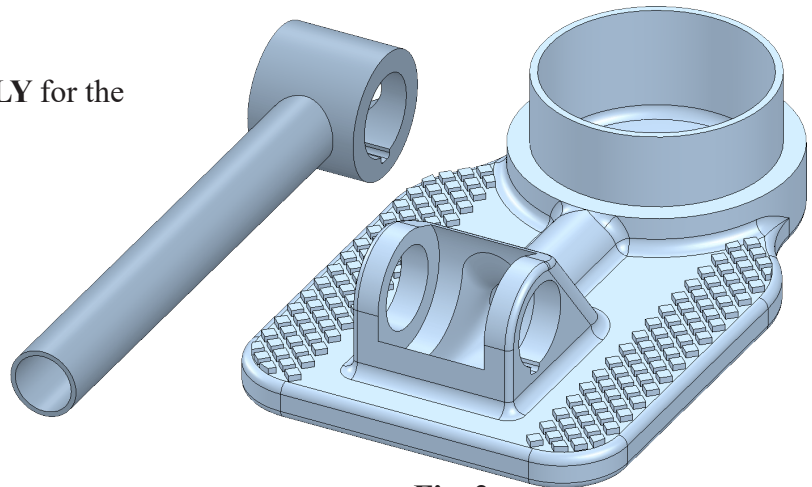



Fig. 2

C. Mate: Tube.

Step 1. Click **Right Plane**  in the Feature Manager and **Mate**  on the context toolbar, **Fig. 3**.

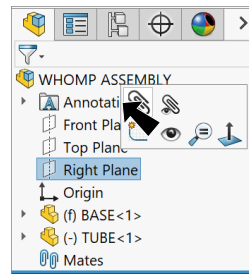



Fig. 3

Step 2. Expand the flyout Feature Manager design tree, expand **TUBE** and click **Right Plane** , **Fig. 4**.

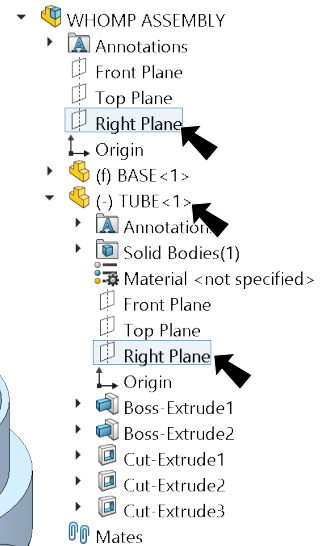


Fig. 4

Step 3. Click Add/Finish Mate  to add a **Coincident** mate.

**Right
to
Right Top**

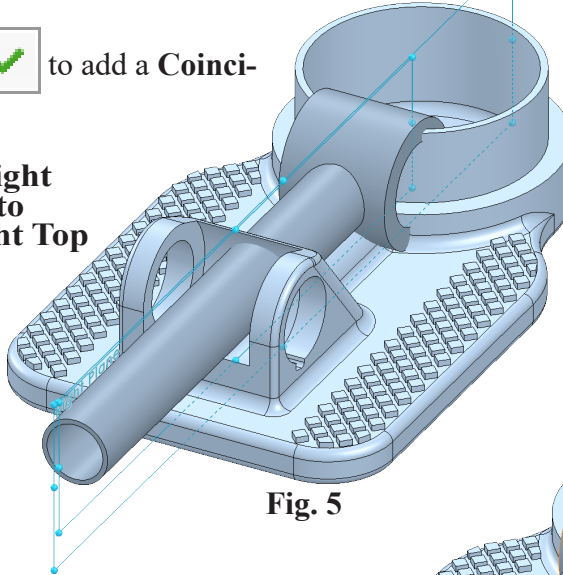


Fig. 5

Step 4. Click **cylindrical face of bolt hole in Base** and **cylindrical face of bolt hole in Tube**, **Fig. 6**.

Step 5. Click Add/Finish Mate  to add a **Concentric** mate.

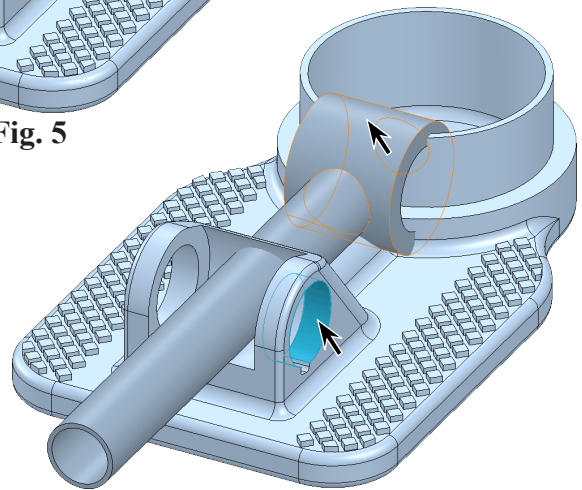


Fig. 6

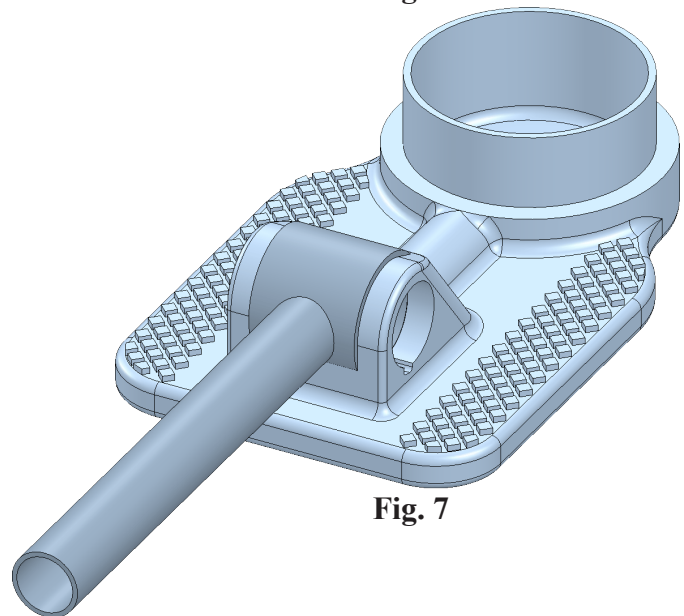


Fig. 7

Step 6. Click **Right**  on the Standard Views toolbar. (**Ctrl-4**)

Step 7. Expand the flyout Feature Manager design tree, click **Top Plane**  and expand **TUBE** and click **Top Plane** , **Fig. 8**.

Step 8. In the Mate Property Manager:
click **Advanced** tab , **Fig. 9**
under Mate Types

select **Angle** 

Angle 90 deg

Maximum Value  **90 deg**

Minimum Value  **10 deg**

click **OK** twice  .

Step 9. You can now rotate the Tube
thru the minimum and maximum
launch angle, **Fig. 11**.

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

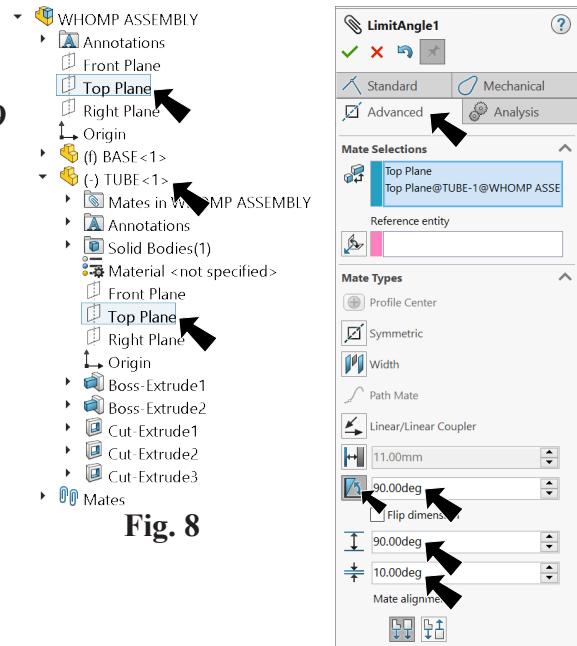


Fig. 8

Fig. 9

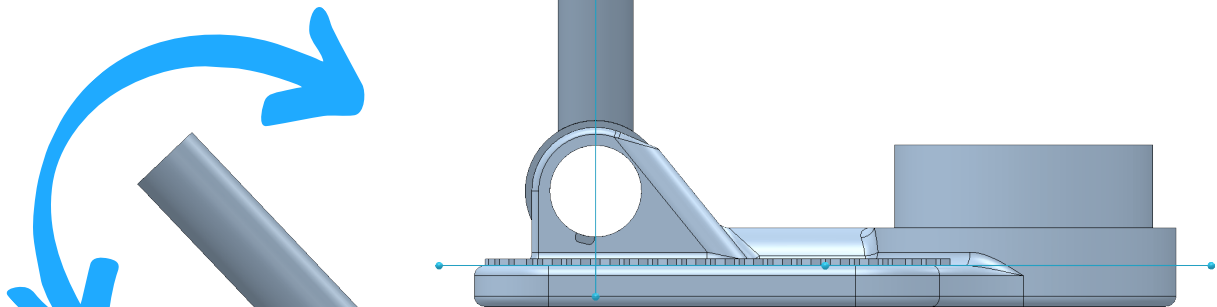


Fig. 10

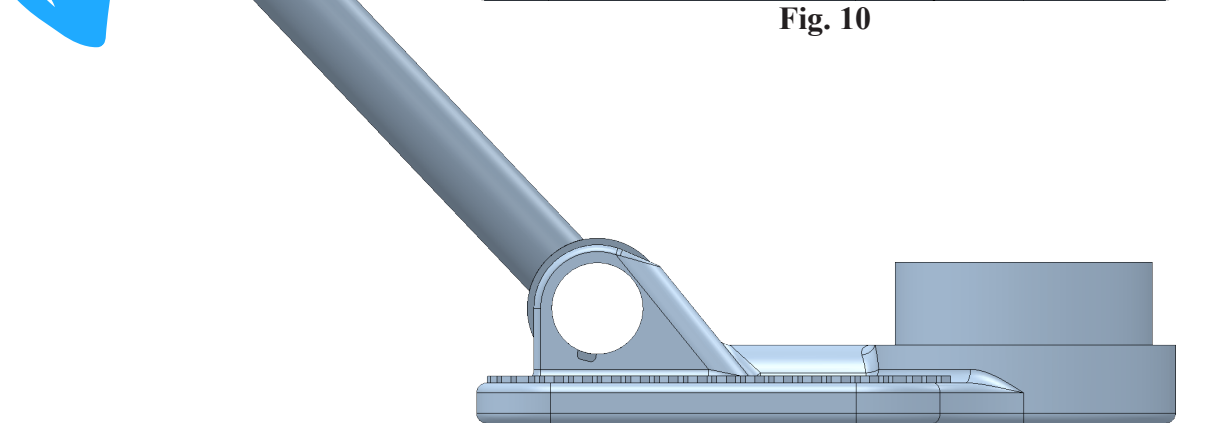







Fig. 11

D. Insert Bolt.

Step 1. Click **Isometric**  on the Standard Views toolbar. (**Ctrl-7**)

Step 2. **Hide Base**  part. To hide, move cursor over component in the graphics area and press **Tab** key to hide. Or click **Base** in the graphics area and **Hide Components**  on the context toolbar, **Fig. 12**.

Step 3. **Change Transparency of Tube**  part. To change, click the Tube in graphics area and click **Change Transparency**  on the context toolbar, **Fig. 13**.

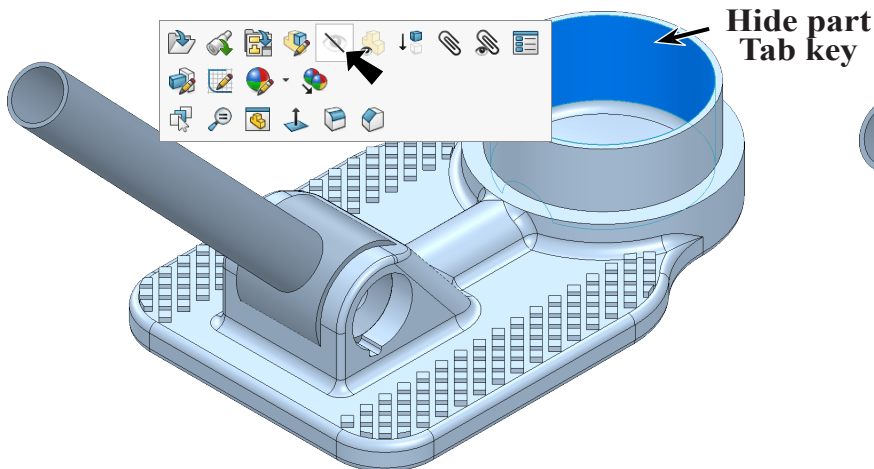


Fig. 12

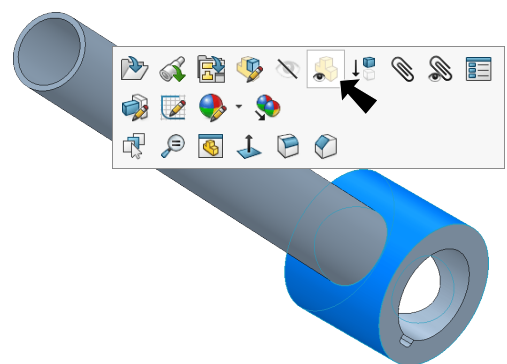



Fig. 13

Step 4. Rotate view to view key-way in Tube, **Fig. 14**. Use **Up Arrow** key  three times.

Step 5. Click **Insert Components**  on the Assembly toolbar.

Step 6. Click **BOLT** file and click Open from the Open dialog box.

Step 7. Click to place Bolt, **Fig. 14**.

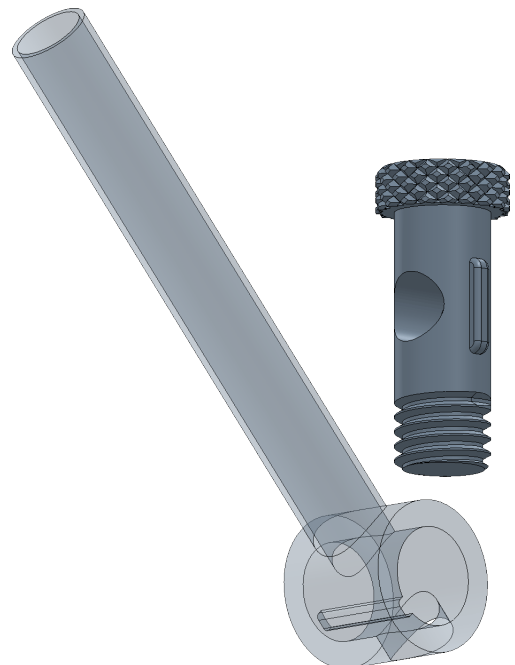
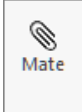


Fig. 14


E. Mate: Bolt.

Step 1. Click **Mate**  on the Assembly toolbar.

Step 2. Click **cylindrical face of bolt hole in Tube** and **cylindrical face of Bolt**, Fig. 15.

Step 3. The head of Bolt should be on port side of the assembly, Fig. 16. If positioned in opposite direction, click **Flip Mate Alignment**




in the Mate pop-up. Click **Add/Finish Mate**  to add **Concentric** mate, Fig. 17.

Step 4. Click **long cylindrical face of Tube** and **cylindrical face of hole in Tube**, Fig. 18.

Step 5. The key in Bolt should align with key-way in Tube, Fig. 19. If positioned in opposite direction, click

Flip Mate Alignment



in the Mate pop-up. Click **Add/Finish Mate**  to add **Concentric** mate, Fig. 20.

Step 6. Click **OK**  in the Property Manager.

Step 7. The Bolt will now rotate with the Tube.

Step 8. Save  (Ctrl-S).

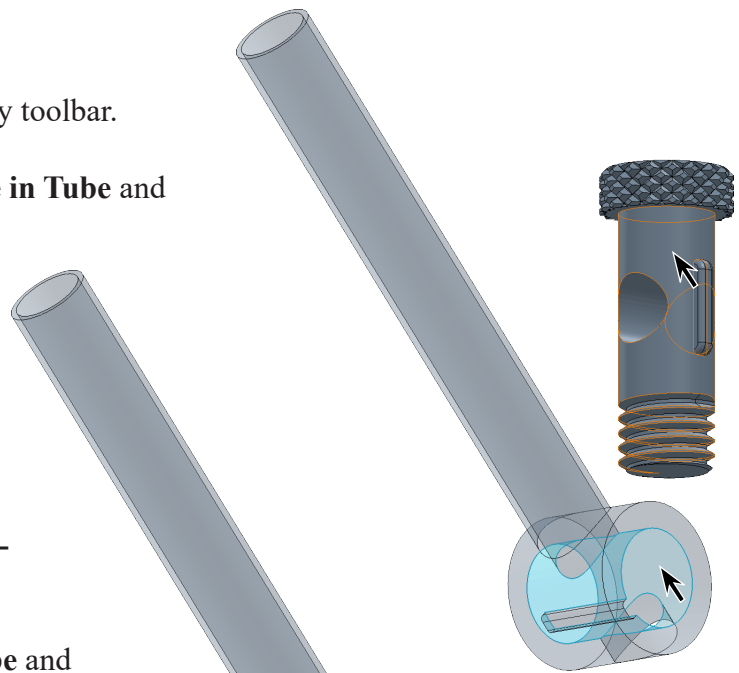


Fig. 15

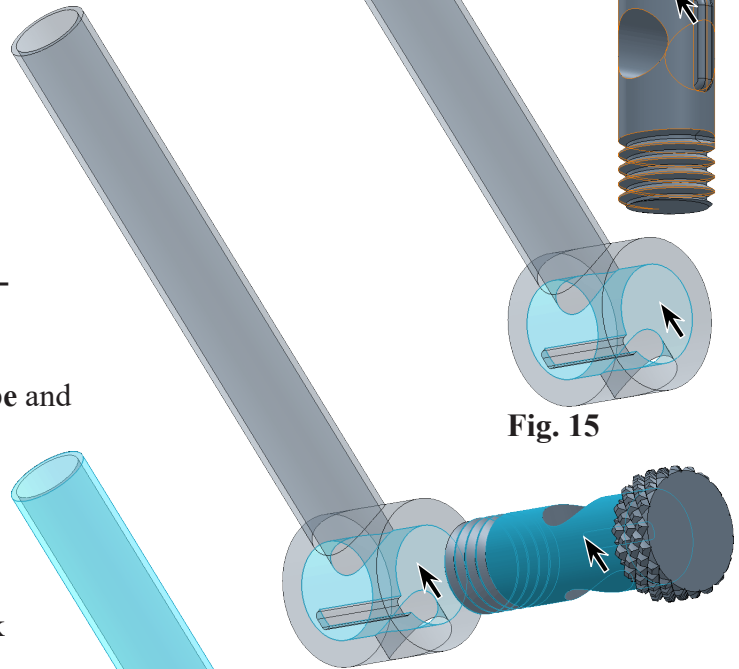


Fig. 16



Fig. 17

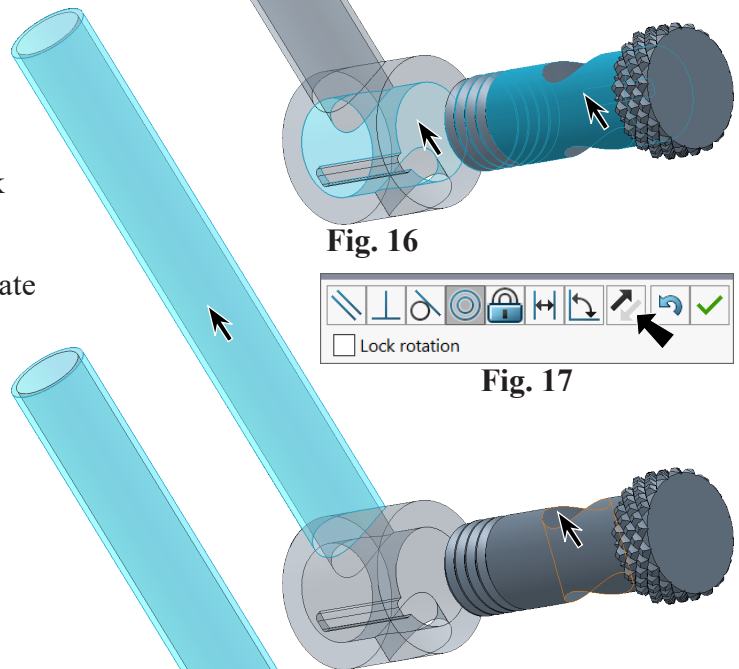


Fig. 18

Key and
keyway
align

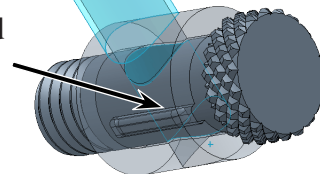



Fig. 19

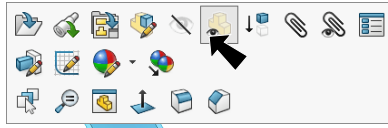


Fig. 20

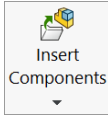
F. Insert Nut.

Step 1. Click **Isometric**  on the Standard Views toolbar. (**Ctrl-7**)

Step 2. Change **Tube** transparency **back**, Fig. 21.



Step 3. Click **Insert Components**



on the Assembly toolbar.

Step 4. Click **NUT** file and click Open from the Open dialog box.

Step 5. Click to place Nut, Fig. 22.

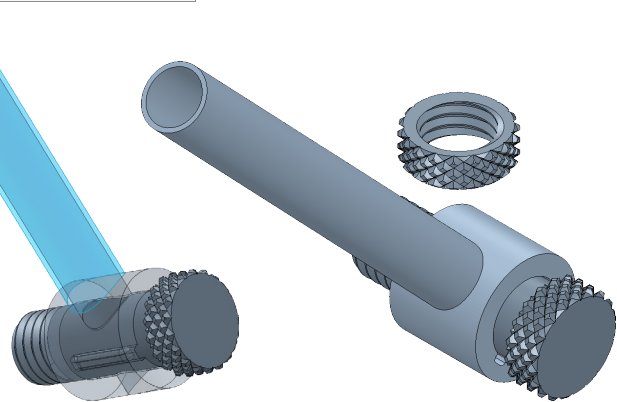




Fig. 21

Fig. 22


G. Mate: Nut.

Step 1. **Show Base**  part, Fig. 23. To show, move cursor over the component in graphics area and press **Shift - Tab**.

Step 2. Click **Mate**  on the Assembly toolbar.

Step 3. Click a **top cylindrical face of knurl on Nut**, **hide top cylindrical face of tube mount in Tube** plus **cylindrical face of bolt hole in Tube** and click **cylindrical face of Bolt** Fig. 24. To hide face, hover cursor over face and press **Alt** key.

Step 4. Check **Lock Rotation** and **Add/Finish**

Mate  in Mate pop-up toolbar to add a **Concentric** mate, Fig. 25.

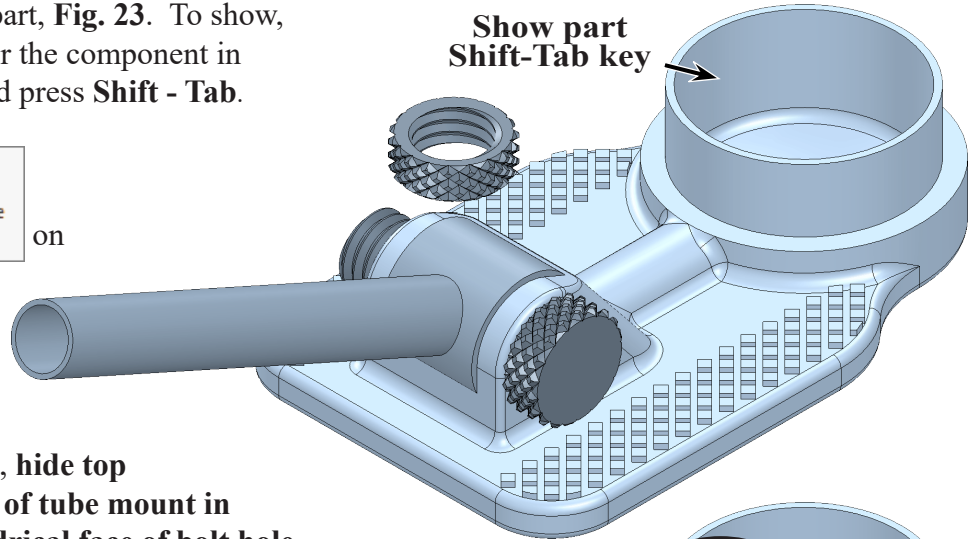


Fig. 23

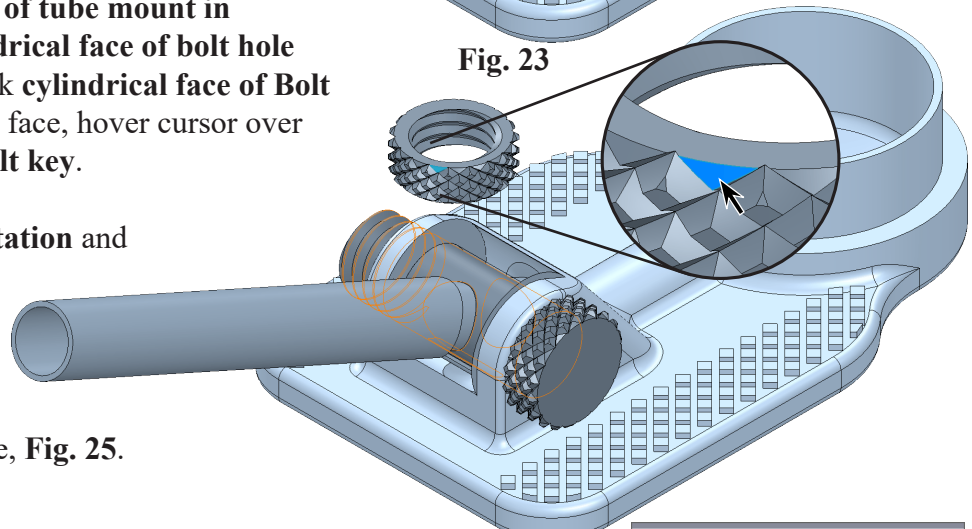



Fig. 24



Fig. 25

Step 5. Click **side face of the Nut**, **hide top face of tube mount in Base** and click **rear face of tube mount** **Fig. 26**. To hide face, hover cursor over face and press **Alt** key.

Step 6. Click **Add/Finish Mate**  to add a **Coincident** mate.

Step 7. Click **OK**  in the **Property Manager**.

Step 8. Save  (**Ctrl-S**).

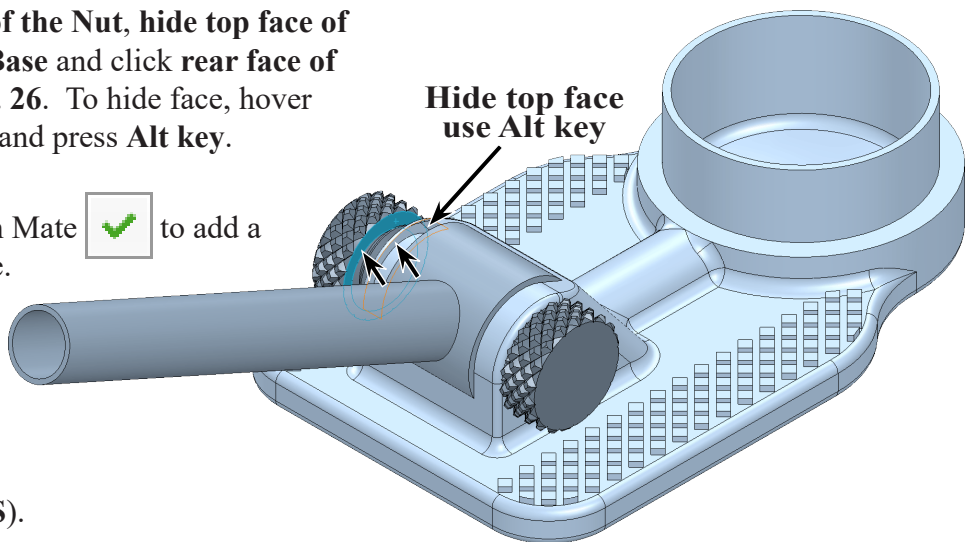


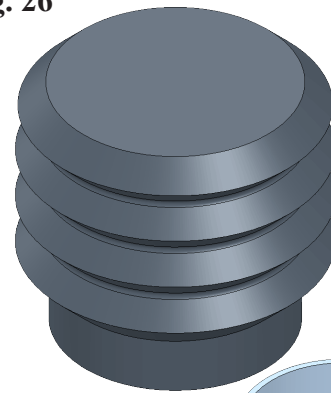
Fig. 26

H. Insert Plunger.

Step 2. Click **Insert Components**  on the **Assembly toolbar**.

Step 3. Click **PLUNGER** file and click **Open** from the **Open dialog box**.

Step 4. Click to place **Plunger**, **Fig. 27**.



Tip: If the **Angle Mate** ever gets flipped around, **Fig. 28**, click the **Limit Angle Mate**  in **Feature Manager** and

Edit Feature  on **content toolbar**, **Fig. 29**.

In the **LimitAngle** property manager check **Flip Dimension**, **Fig. 30**.

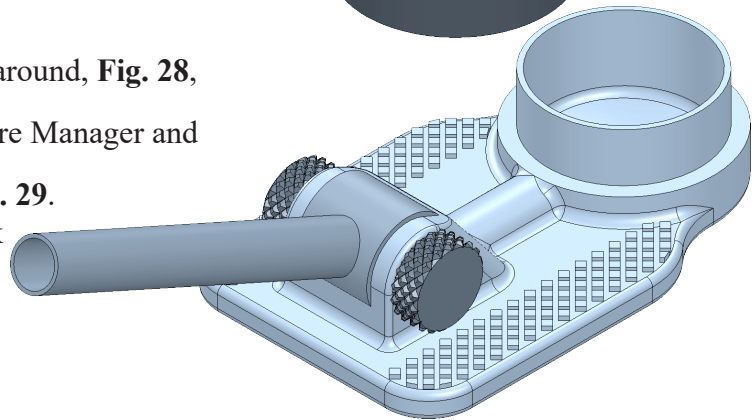


Fig. 27

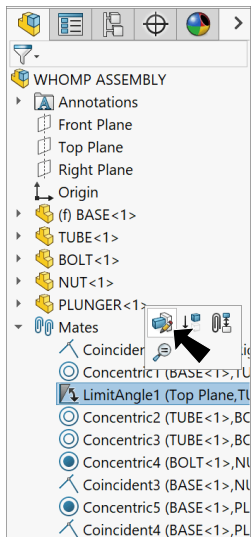


Fig. 29

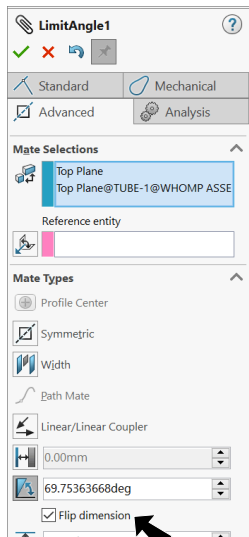


Fig. 30

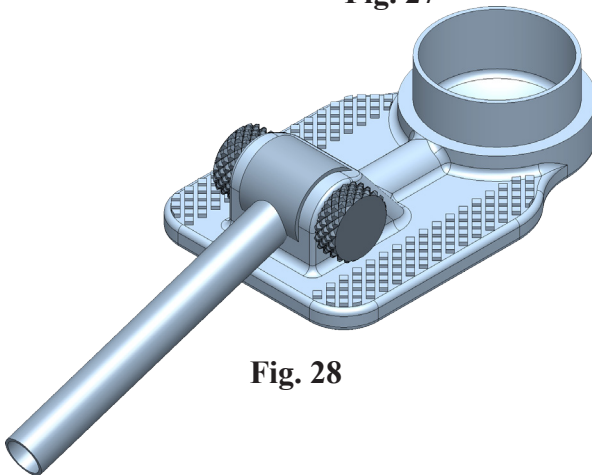




Fig. 28


I. Mate: Plunger.

Step 1. Click **Mate**  on the Assembly toolbar.

Step 2. Click **cylindrical face of Plunger** and **cylindrical face of tank** on Base, Fig. 31.

Step 3. Check **Lock Rotation** and Add/Finish Mate  in Mate pop-up toolbar to add a **Concentric** mate, Fig. 32.

Step 4. Click **top face of the Plunger mount** in Base, **hide cylindrical face of Plunger** and click **bottom face of Plunger** Fig. 33. To hide face, hover cursor over face and press **Alt** key.

Step 5. Click Add/Finish Mate  to add a **Coincident** mate.

Step 6. Click OK  in the Property Manager.

Step 7. Save  (Ctrl-S).

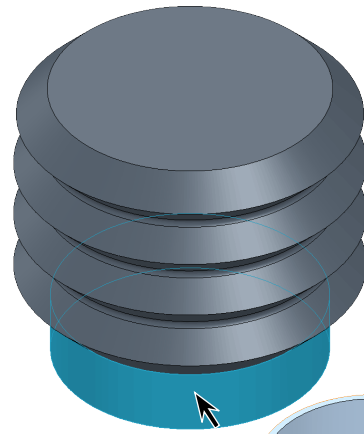


Fig. 31



Fig. 32

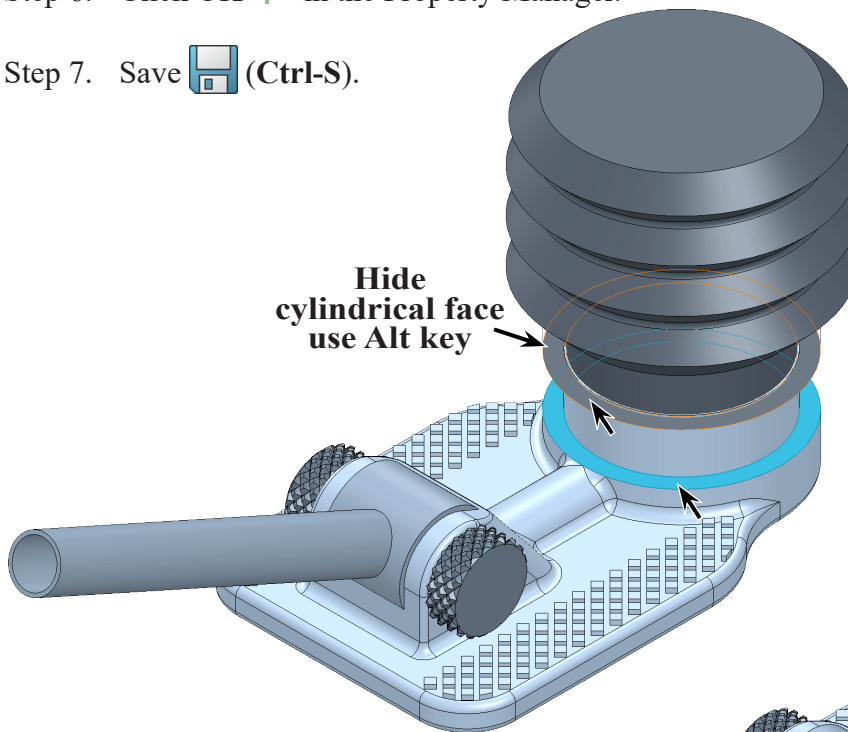


Fig. 33

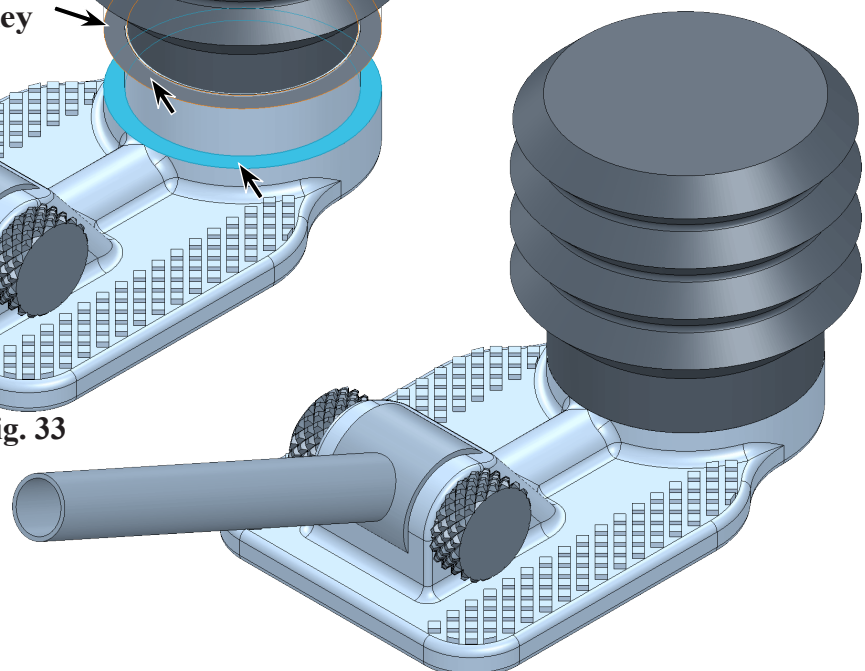


Fig. 34