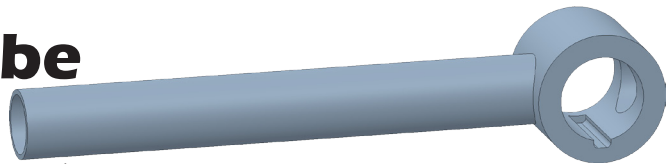




# Whomp Rocket Tube



## A. Extrude1 Sketch1.

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

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

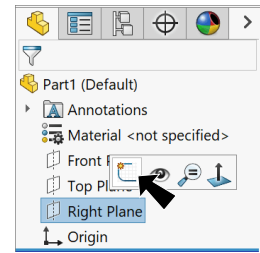


Fig. 1

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

Step 4. Sketch circle at **Origin** , **Fig. 2**.

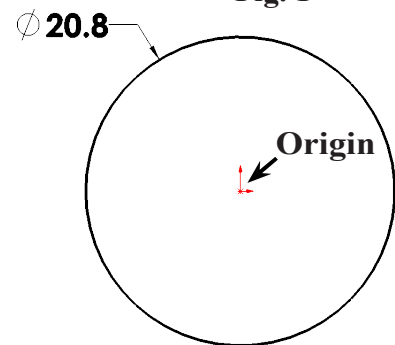

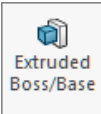




Fig. 2

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

Step 6. Dimension **diameter 20.8**, **Fig. 2**.

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. 3**  
 End Condition **Mid Plane**  
**Depth**  **17.9**  
 click OK .

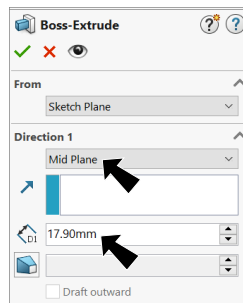


Fig. 3

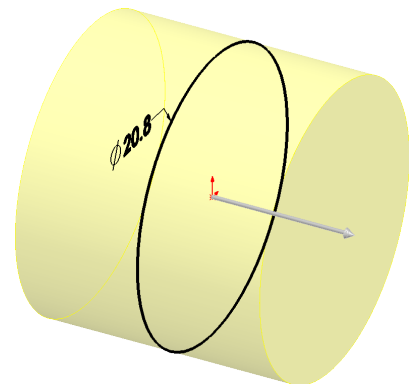


Fig. 4


## B. Save as "TUBE".

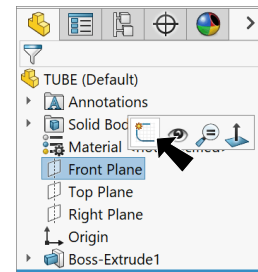
Step 1. Click File Menu > Save As.

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


**Tip:** Create a **Whomp Rocket** folder in your My Document folder to save your Whomp Rocket project files. At cudacountry we go a step further, and create a Tech Ed [school year] folder and in that folder we create the Whomp Rocket folder. Documents\Tech Ed 23-24\Whomp Rocket.

## C. Extrude2 Sketch2 Tube.

Step 1. Click **Front Plane**  in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 5**.



**Fig. 5**

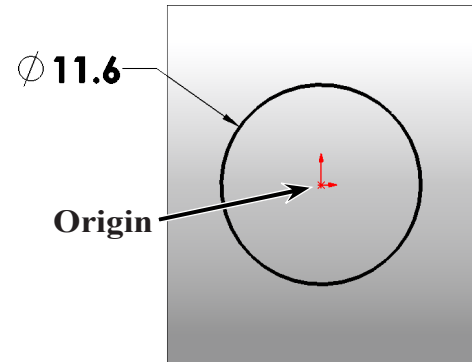
Step 2. Click **Normal To**  on the Standard Views toolbar. (**Ctrl-8**)

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

Step 4. Sketch circle at **Origin** , **Fig. 6**.

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


Step 6. Dimension **diameter 11.6**, **Fig. 6**.



**Fig. 6**

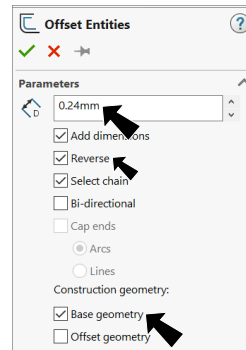
Step 7. Click **Offset Entities**  on the Sketch toolbar.

Step 8. In the Offset Entities Property Manager set:  
under Parameters, **Fig. 7**

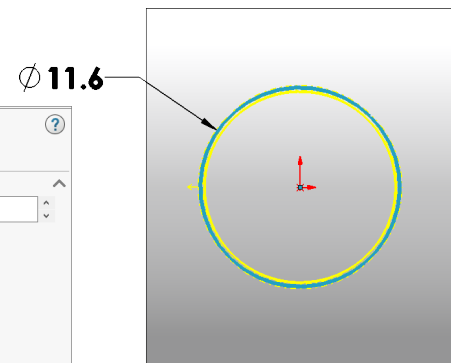
**Distance**  **.24**  
(clearance of Rocket ID)  
check **Reverse**  
uncheck **Bi-directional**  
under Construction geometry  
check **Base geometry**  
click circle, **Fig. 8**

**Yellow offset circle on inside -  
base geometry (construction) on outside.**

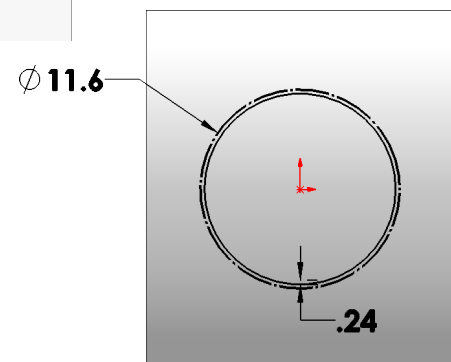
click OK .




**Fig. 7**



**Fig. 8**





**Fig. 9**

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

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

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

Step 12. In the Boss-Extrude Property Manager set:  
under Direction 1, **Fig. 10**  
End Condition **Blind**  
**Depth**  **93**  
click OK .

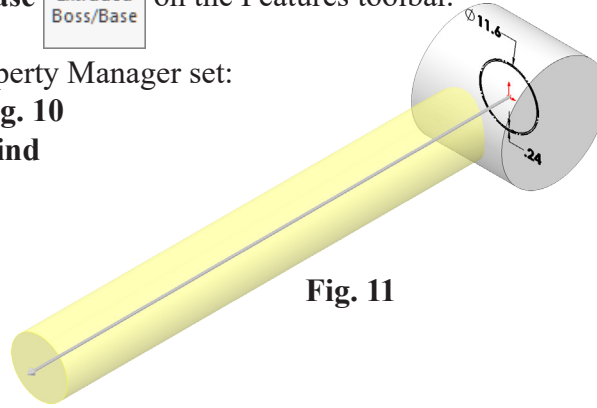


Fig. 11

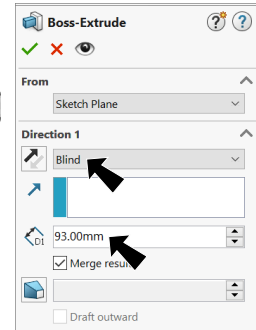




Fig. 10

Step 13. Save  (Ctrl-S).

## D. Extrude-Cut1 Sketch3 Cut Tube Air Hole.


Step 1. Click **Front Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 12**.

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


Step 3. Sketch circle at **Origin** , **Fig. 13**.

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

Step 5. Dimension **diameter 9.5**, **Fig. 13**.

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

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

Step 8. In the Cut-Extrude Property Manager set:  
under Direction 1, **Fig. 14**  
End Condition **Through All - Both**  
click OK .

Step 9. Save  (Ctrl-S).

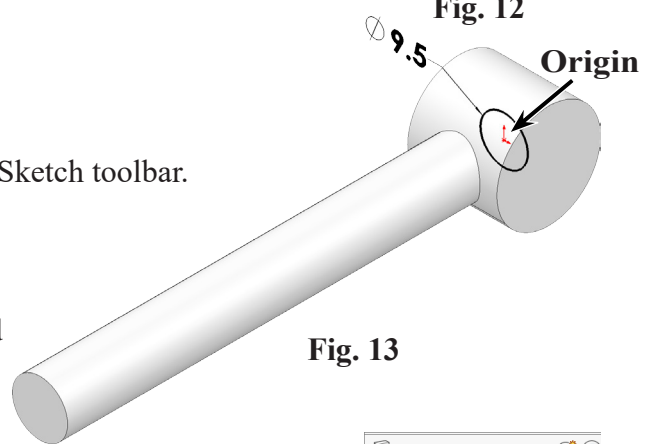


Fig. 13

Fig. 12

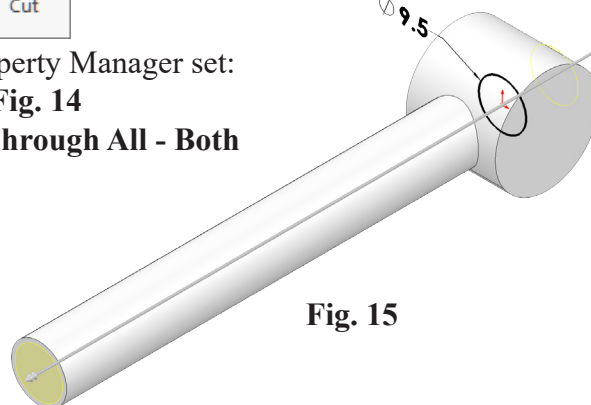
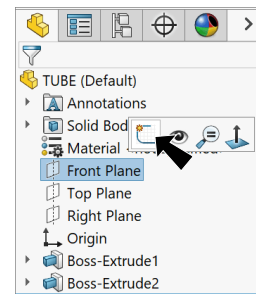


Fig. 15

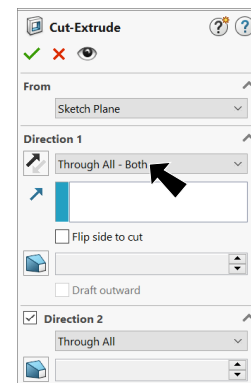


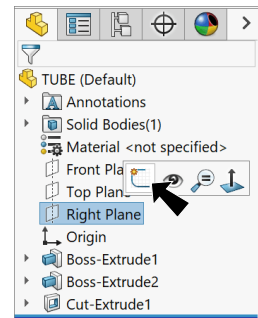


Fig. 14

## E. Extrude-Cut2 Sketch4 Cut Bolt Hole.

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



**Fig. 16**

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


Step 3. Sketch **circle at Origin** , **Fig. 17**.

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

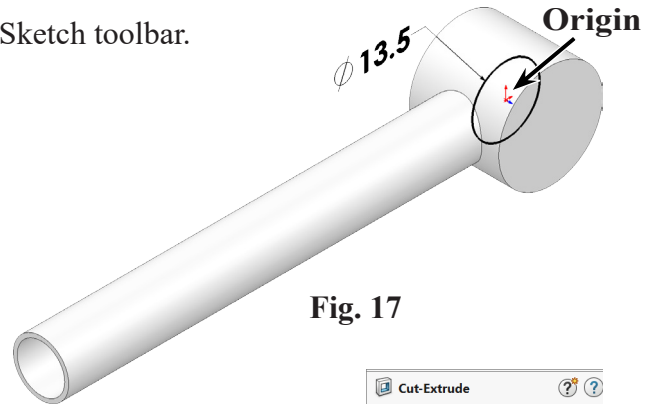
Step 5. Dimension **diameter 13.5**, **Fig. 17**.

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

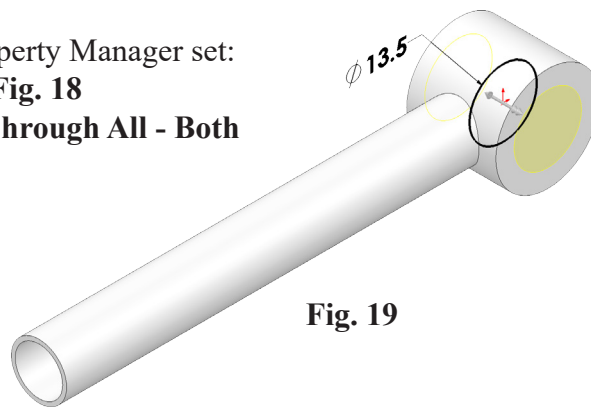
Step 7. Click **Extruded Cut**  on the Features toolbar.

Step 8. In the Cut-Extrude Property Manager set:  
under Direction 1, **Fig. 18**  
End Condition **Through All - Both**  
click OK .

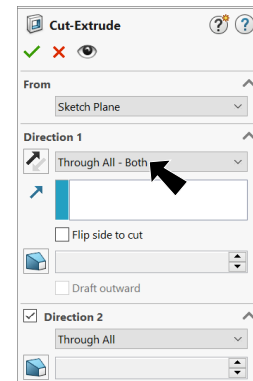
Step 9. Save  (Ctrl-S).



**Fig. 17**



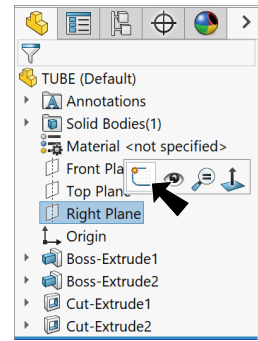
**Fig. 19**




**Fig. 18**


## F. Extrude-Cut3 Sketch5 Keyway.

Step 1. Click **Right 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 **Corner Rectangle**  in the **Rectangle flyout**  on the Sketch toolbar.

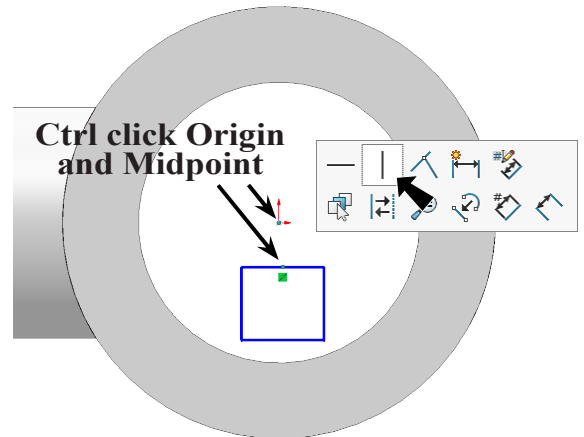
Step 4. Sketch **corner rectangle to below of Origin** , **Fig. 21**.



**Fig. 21**

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

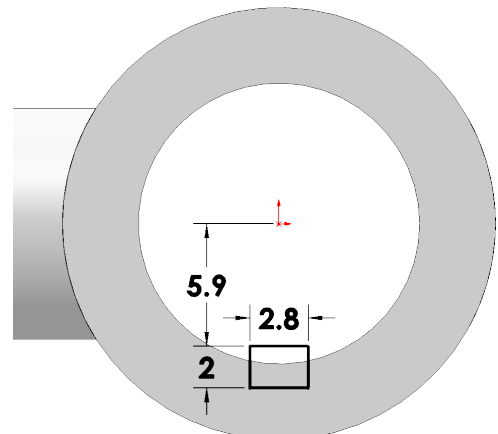
Step 6. **Ctrl click midpoint of top horizontal line and Origin**  to select both. Release Ctrl key and click **Make Vertical**  on the context toolbar, **Fig. 22**.



**Fig. 22**

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



Step 8. Add dimensions, **Fig. 23**.

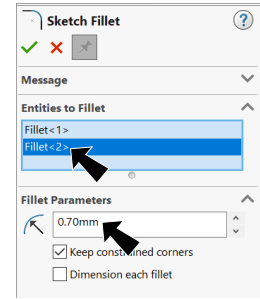
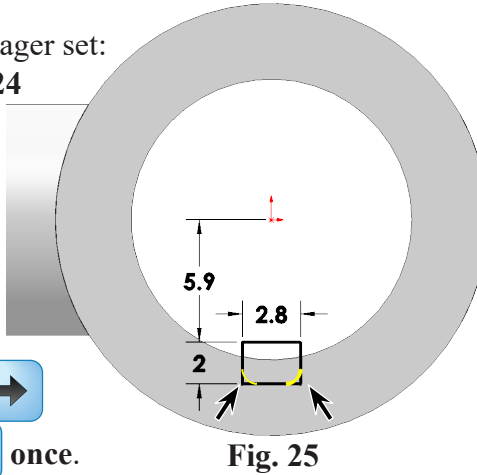


**Fig. 23**

Step 9. Click **Sketch Fillet**  on the Sketch toolbar.

Step 10. In the Sketch Fillet Property Manager set:  
under Fillet Parameters, **Fig. 24**

**Radius**  **.7**  
click **bottom corners**,  
**Fig. 25**  
click **OK**  **twice.**



**Fig. 24**



Step 11. Rotate view to view **keyway**,

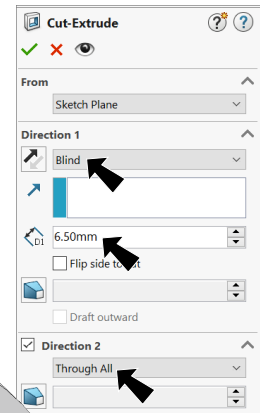
**Fig. 27.** Use **Right Arrow key**   
**once and Down Arrow key**  **once.**

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

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

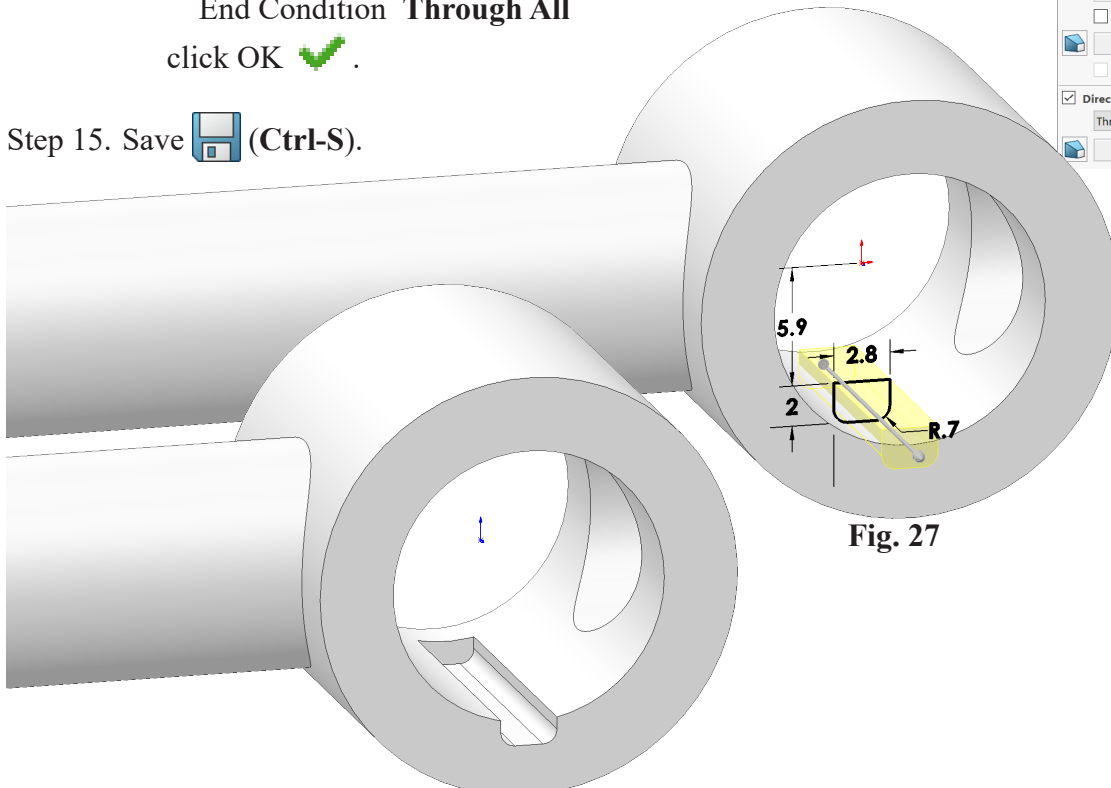
Step 14. In the Cut-Extrude Property Manager set:  
under Direction 1, **Fig. 26**

End Condition **Blind**  
**Depth**  **6.5**  
under Direction 2, **Fig. 12**  
End Condition **Through All**  
click **OK** .



**Fig. 26**

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



**Fig. 27**

**Fig. 28**

## G. Appearance: Light Blue.

Step 1. Click the part to select part, click **Appearances Callout**  on the context toolbar and click **TUBE** , Fig. 29.

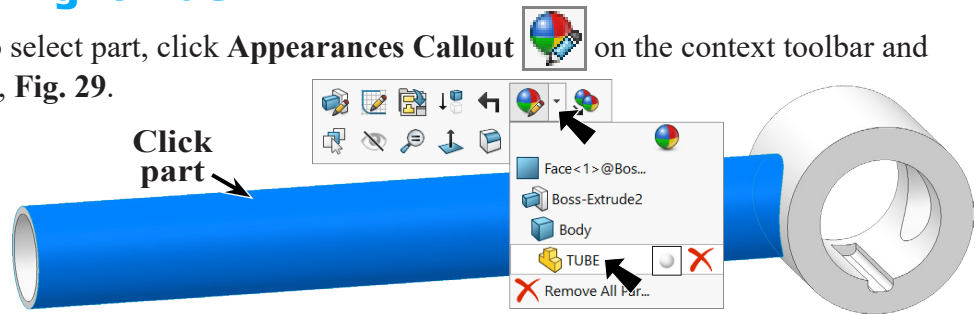


Fig. 29

Step 2. In the Appearances Property Manager set:  
under Color, Fig. 30  
set RGB values  
R 147  
G 168  
B 189  
click OK .

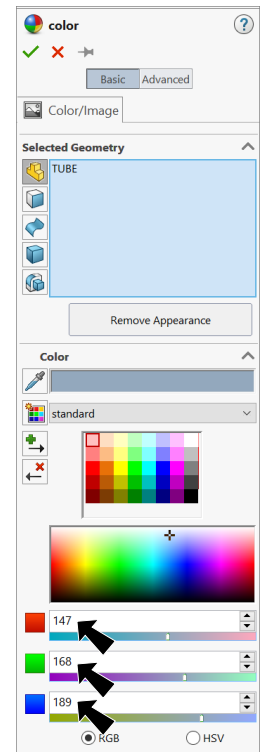


Fig. 30

Step 3. Save  (Ctrl-S).

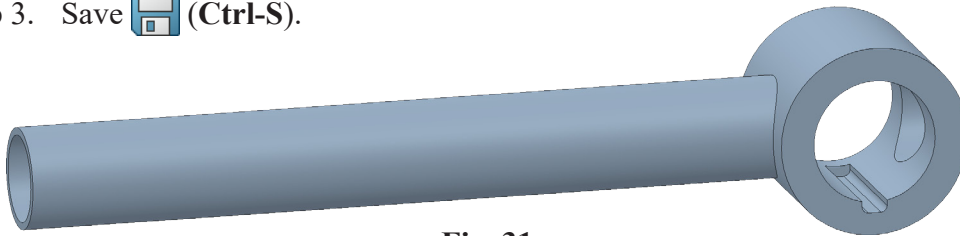


Fig. 31