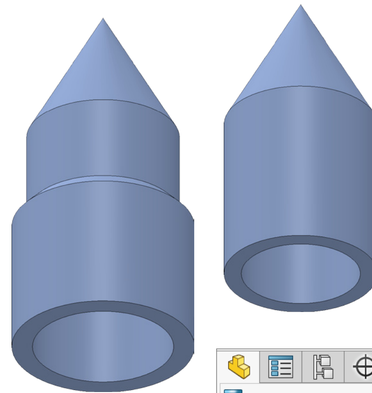
Chapter 16

HAWT
Couplers



A. Extrude1.

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

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

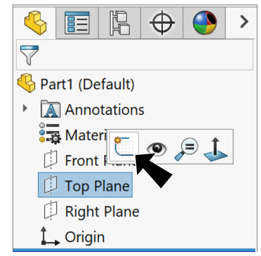


Fig. 1

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

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

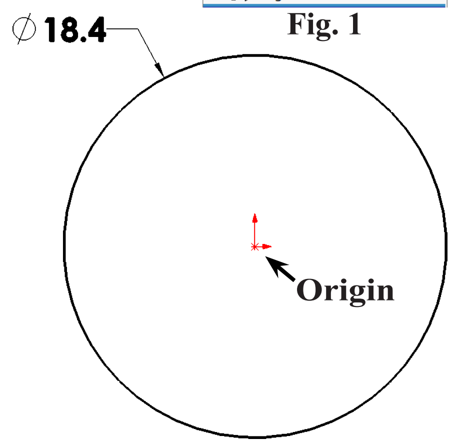


Fig. 2

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

Step 6. Dimension **diameter 18.4**, **Fig. 2**.

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

Step 8. In the Offset Entities Property Manager set:
under Parameters, **Fig. 3**

Distance **.3 (clearance of hole in Yaw Ring)**
check **Reverse**
uncheck **Bi-directional**
under Construction geometry
check **Base geometry**
click **circle**, **Fig. 4**
Yellow offset circle on inside
- base geometry
(construction) on outside

Click **Keep Visible** and OK .
on allows selection of another offset.

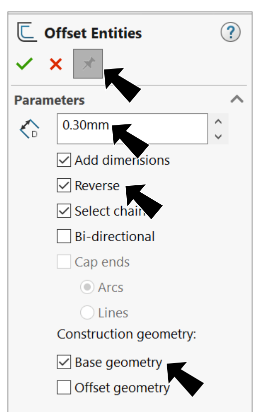


Fig. 3

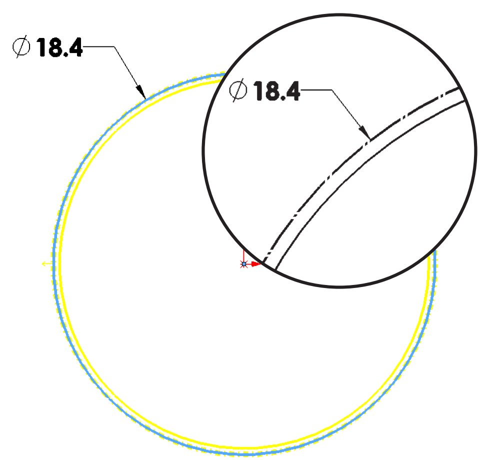


Fig. 4

Step 9. In the Offset Entities Property Manager set:

under Parameters, **Fig. 5**

Distance 2

check **Reverse**

under Construction geometry

uncheck **Base geometry**

click **offset circle**, **Fig. 6**

Yellow offset circle on inside

click OK **twice**.

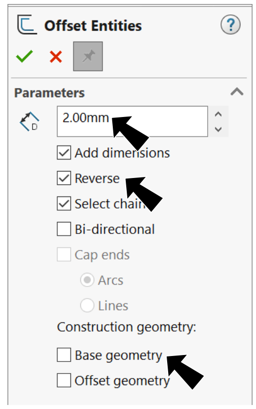


Fig. 5

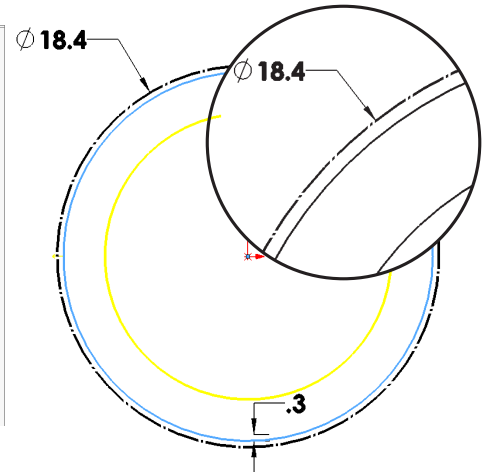


Fig. 6

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. 7**

End Condition **Blind**

Depth 20

Reverse Direction (down)

click OK .

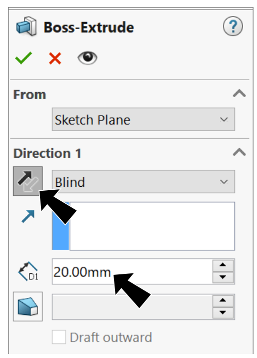


Fig. 7

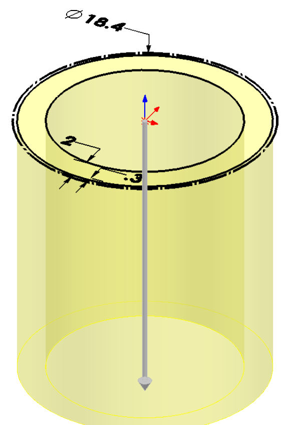


Fig. 8

B. Save as "COUPLER".

Step 1. Click File Menu > Save As.

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

C. Revolve1.

Step 1. Click **Right Plane** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 9**.

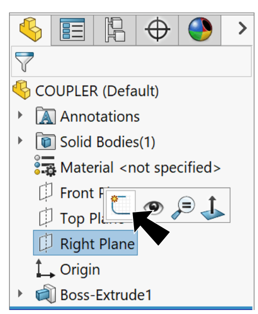


Fig. 9

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

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

Step 4. Sketch **3 lines**, **Fig. 10**. Sketch **horizontal line out to left** from Origin to edge of extrude, up at angle and back down with vertical line to Origin .

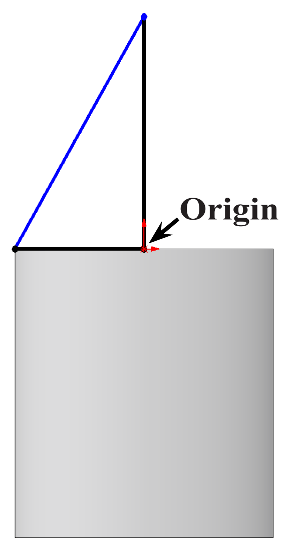


Fig. 10

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

Step 6. Dimension **angle 29º**, **Fig. 11**.

Step 7. Rotate view slightly to **view top face of extrude**, **Fig. 12**. Use **Down Arrow key** **a couple times**.

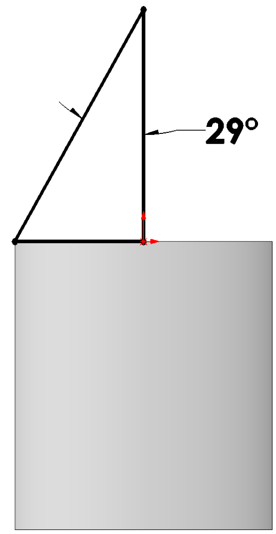


Fig. 11

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

Step 9. Sketch a **line from vertical line at angle**, **Fig. 13**.

Step 10. **Unselect Line tool**. To unselect, **right click graphics area and click Select** from menu.

Step 11. **Ctrl click bottom endpoint of angled line and inside cylindrical edge of extrude** to select both. **Release Ctrl key** and click **Make Pierce** on context toolbar, **Fig. 14**.

Step 12. **Ctrl click both angled lines** to select both. Release Ctrl key and click **Make Parallel** on the context toolbar, **Fig. 15**.

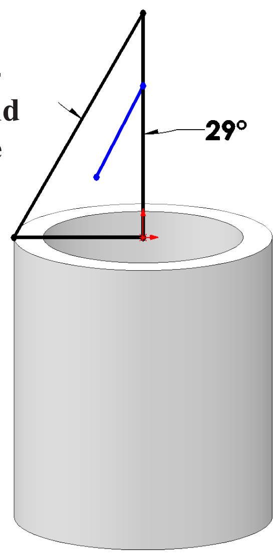


Fig. 12

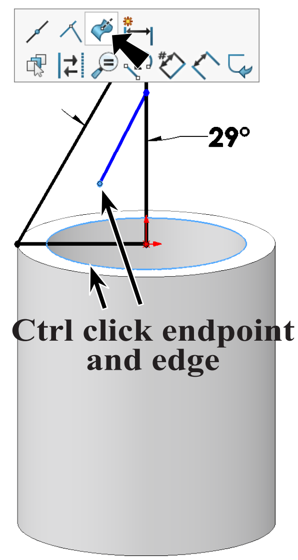


Fig. 13

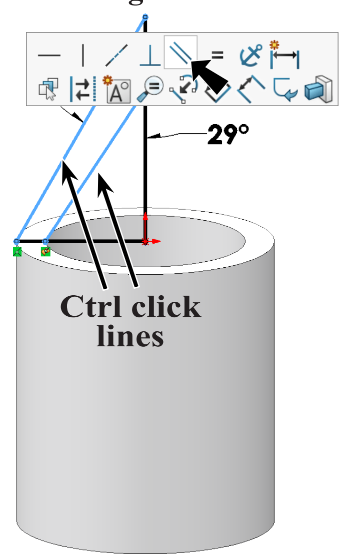


Fig. 14

Step 13. Click **Features** on the Command Manager toolbar.

Step 14. Click **Revolved Boss/Base** on the Features toolbar.

Step 15. In the Revolve Property Manger set:

under Axis of Revolution , **Fig. 15**
click on box
click **vertical line in sketch**, **Fig. 16**
uncheck Thin Feature
under Selected Contours
click the **contour**
click OK .

Step 16. Save (**Ctrl-S**).

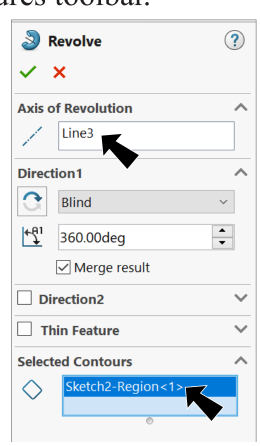


Fig. 15

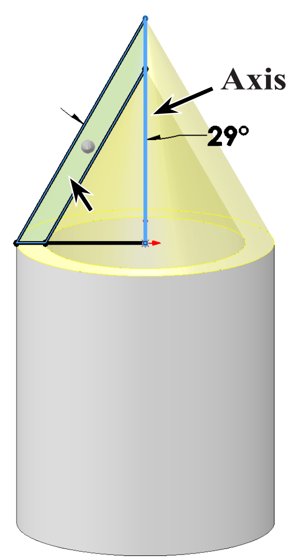


Fig. 16

D. Add Configurations Rebar and PVC Pipe.

Step 1. Click **Configurations Manger** tab in the Feature Manager to display the Configuration Manager, **Fig. 17**.

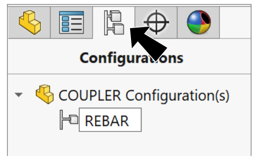


Fig. 17

Step 2. Rename **Default** configuration to **REBAR**, **Fig. 17**. To rename, slowly click the Default name and key-in the new name.

Step 3. **Right click COUPLER Configuration(s)** part name and click **Add Configuration**, **Fig. 18**.

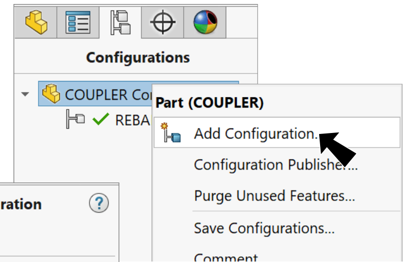


Fig. 18

Step 4. In the Add Configuration Manager set:

under Configuration Name **Fig. 19**

key-in **PCV**

click OK .

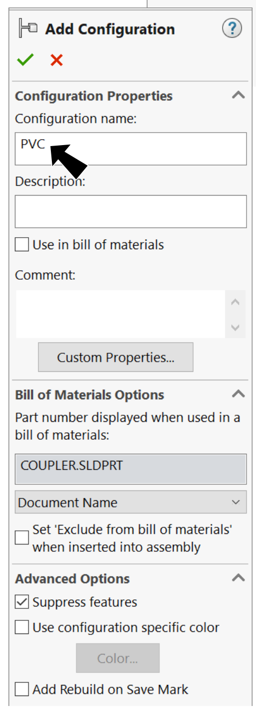


Fig. 19

Step 5. Click **Feature Manager Design Tree** tab at the top of the Configuration Manager to display Feature Manager, **Fig. 20**.

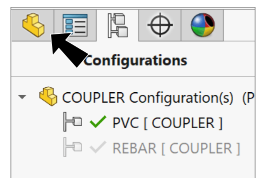


Fig. 20

Step 6. Save **(Ctrl-S)**.

E. Change Extrude Depth.

Step 1. Click **Boss-Extrude1** in the Feature Manager and click **Edit Feature** in the content toolbar, **Fig. 21**.

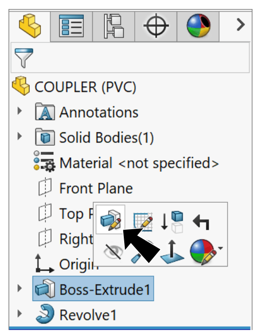


Fig. 21

Step 2. In the Property Manager set:

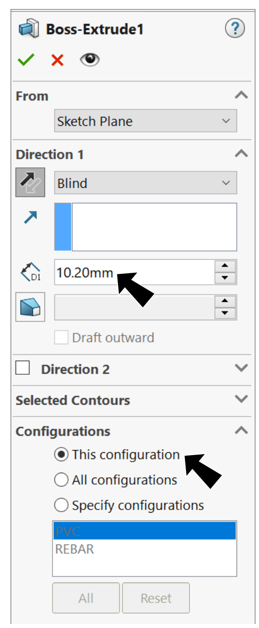
under Direction 1, **Fig. 22**

change **Depth** to **10.2**

under Configurations

select **This Configuration**

click OK .



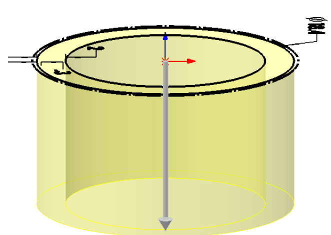


Fig. 23 **Fig. 22**

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

F. Revolve2.

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

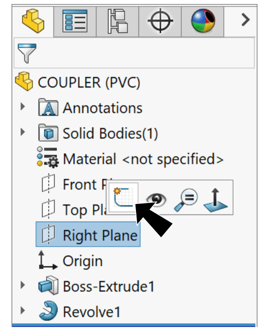


Fig. 24

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

Step 3. Click **Centerline** in the **Line flyout** on the Sketch toolbar.

Step 4. Sketch **vertical centerline** down from Origin, **Fig. 25**.

Step 5. Click **Line** (**L**) on the Sketch toolbar.

Step 6. Sketch **6 lines**. Start at bottom left vertex of extrude, **Fig. 26**.

Step 7. **Unselect Line tool**. To unselect, **right click graphics area and click Select** from menu.

Step 8. **Ctrl click centerpoint of circle** and **Origin** to select both. Release Ctrl key and click **Make Parallel** on the context toolbar, **Fig. 27**.

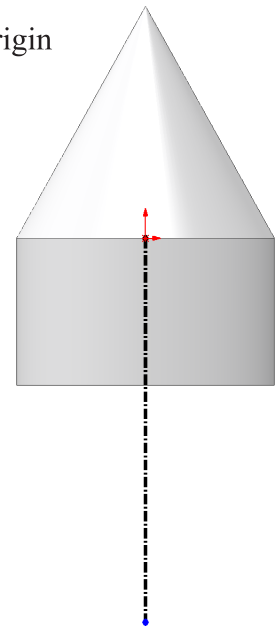


Fig. 25

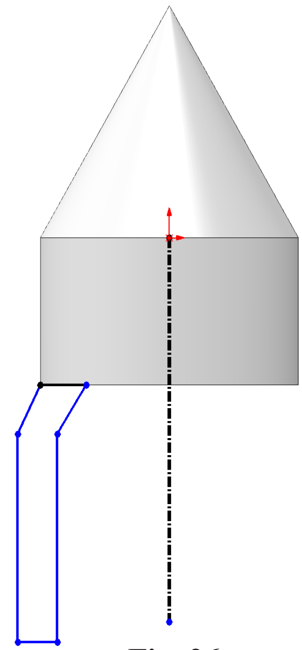
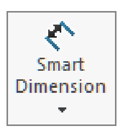


Fig. 26

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



Step 10. Add dimensions, **Fig. 28**. Next steps will fully define.

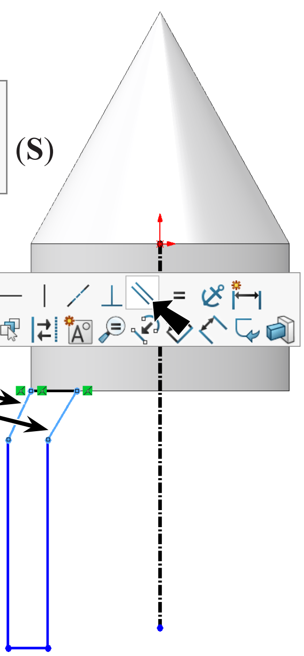


Fig. 27

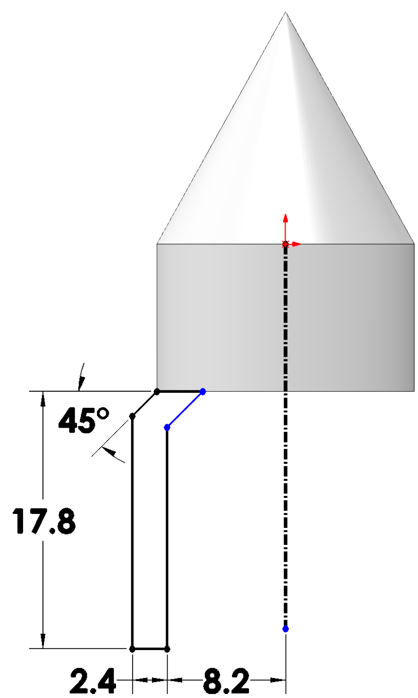


Fig. 28

Step 11. **Unselect Smart Dimension**. To unselect, **right click graphics area and click Select** from menu.

Step 12. Rotate view slightly to **view bottom face of extrude**, **Fig. 29**. Use **Up Arrow key** **a couple times**.

Step 13. **Ctrl click top endpoint of under defined angled line and inside cylindrical edge of extrude** to select both. **Release Ctrl key** and click **Make Pierce** on context toolbar, **Fig. 29**.

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

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

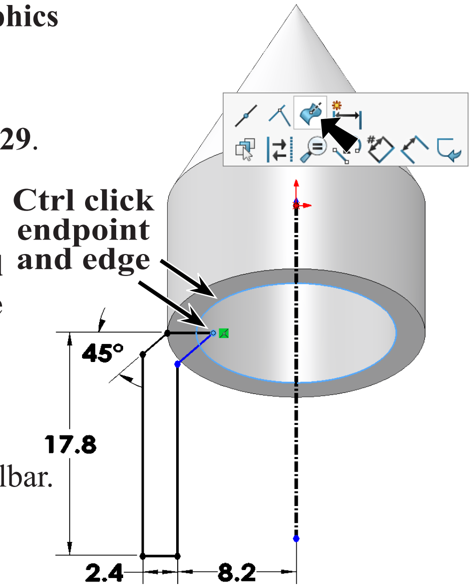


Fig. 29

Step 16. In the Revolve Property Manger set:

under Axis of Revolution centerline will be selected, **Fig. 30**

click OK .

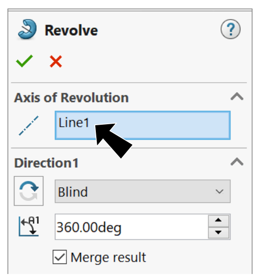


Fig. 30

Step 17. Save (**Ctrl-S**).

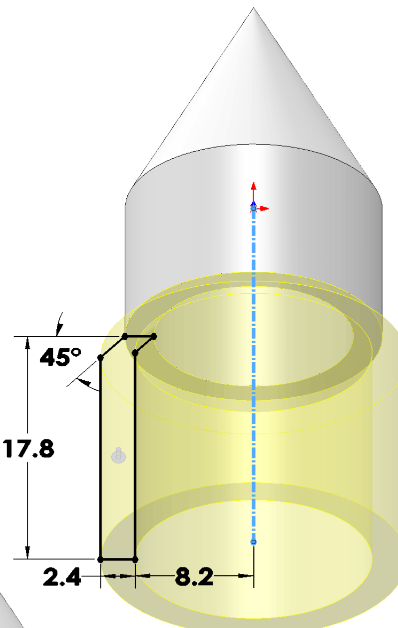


Fig. 31

G. Confirm Configs.

Step 1. Click **Configurations Manger** tab in the Feature Manager to display the Configuration Manager and double click **Rebar**, **Fig. 32**.

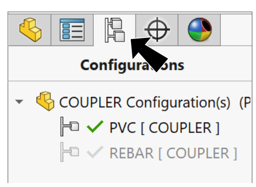


Fig. 32

Step 2. Save (**Ctrl-S**).

Fig. 33

Fig. 34

H. Appearance: Blue Plastic.

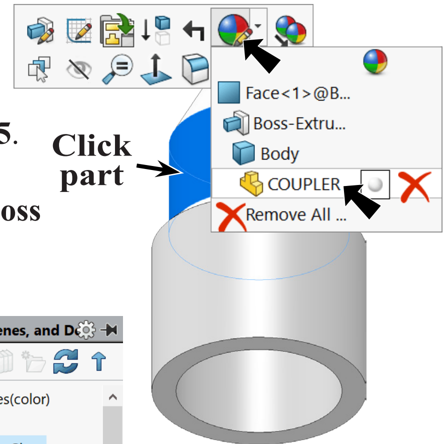


Fig. 35

Step 1. Click the Coupler to select part, click **Appearances Callout** on the context toolbar and click **COUPLER**, **Fig. 35**.

Step 2. In the Appearances Task pane, expand **Plastic**, click **High Gloss** and in the lower pane select **blue high gloss plastic**, **Fig. 36**.

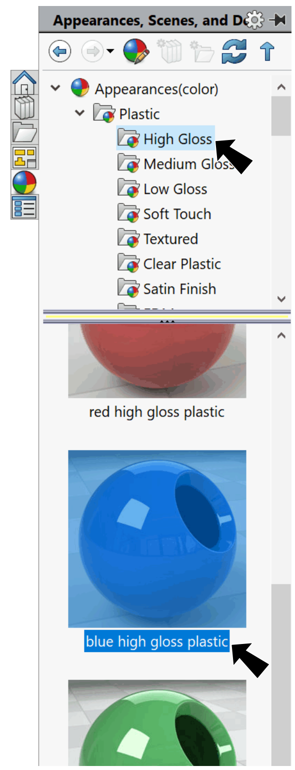


Fig. 36

Step 3. In the Appearances Property Manager set:
under Color, **Fig. 37**
set **RGB values**
R 144
G 166
B 209
click OK .

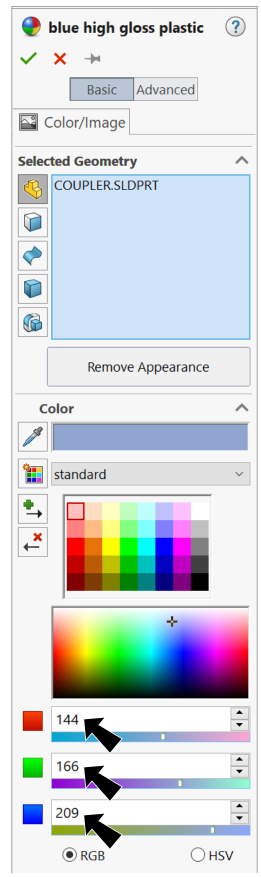


Fig. 37

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

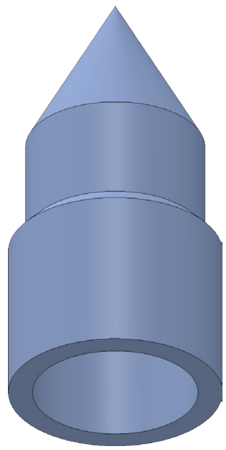


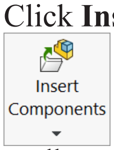
Fig. 38

I. Open Turbine Assembly and Insert Coupler.

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

Step 2. **Isolate Yaw Ring**, **Fig. 39**. To Isolate, **right click Yaw Ring component** in the graphics area and click **Isolate** from menu.

Step 3. Click **Insert Components**



on the Assembly toolbar.

Step 4. Select your **Coupler** file and place your file just below the Yaw Ring, **Fig. 39**.

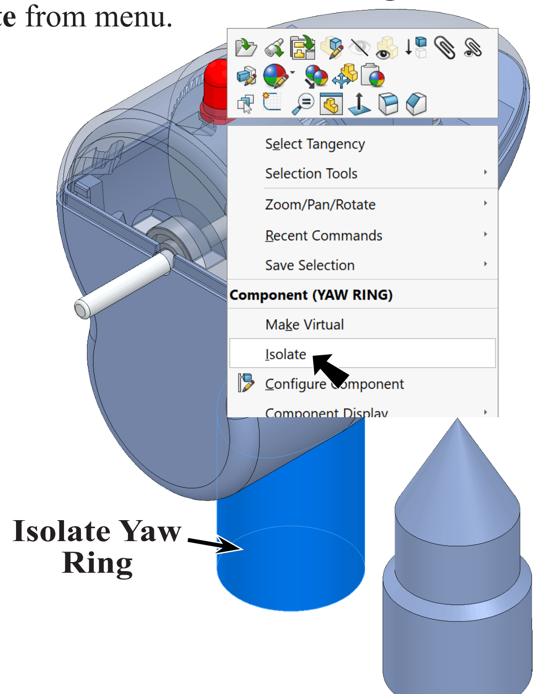


Fig. 39

J. Mate: Coupler.

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

Step 2. Click **cylindrical face of Ring** and **top cylindrical face of Coupler**, **Fig. 40**.

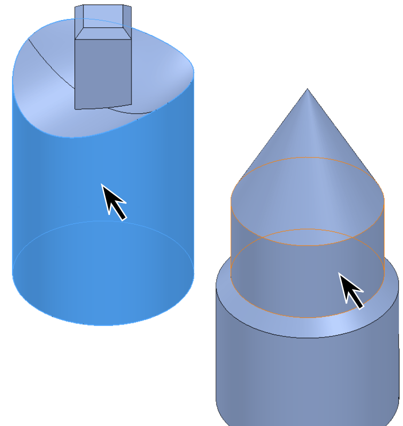


Fig. 40

Step 3. Check Add/Finish Mate in Mate pop-up toolbar to add a **Concentric** mate.

Step 4. Click **Wireframe** on the View toolbar.

Step 5. Click **inside top vertex of revolve in Ring** and **outside top vertex of revolve in Coupler**, **Fig. 41**.

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

Step 7. Click OK in the Property Manager.

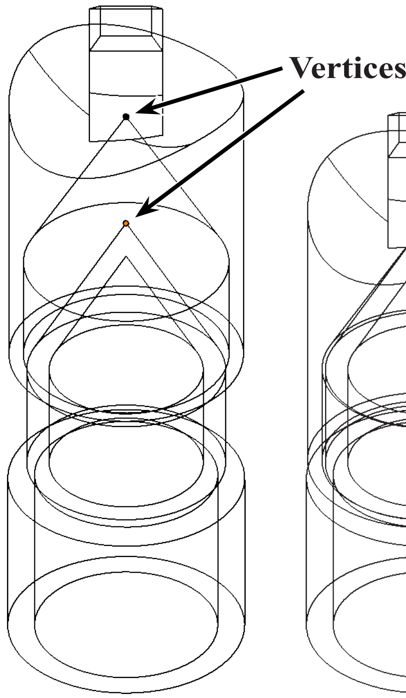


Fig. 41

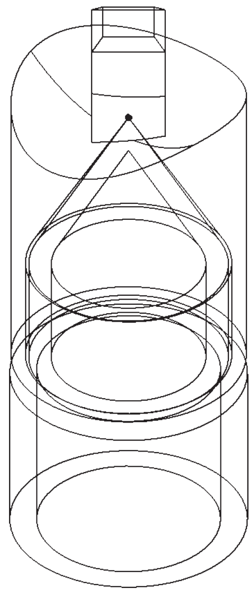


Fig. 42

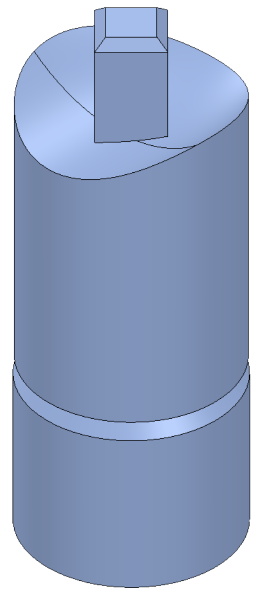


Fig. 43

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

Step 9. **Exit Isolate**. To Exit, click **Exit Isolate** [Exit Isolate] on the Isolate pop-up toolbar, **Fig. 44**.

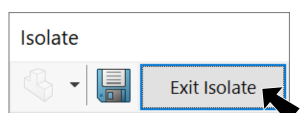
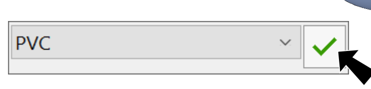


Fig. 44

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

K. Confirm Coupler Part Configurations.

Step 1. **Activate Coupler part** **Rebar configuration**. To activate, click the Coupler in graphics area, then set **configurations drop down to Rebar** and click OK, **Fig. 45**.



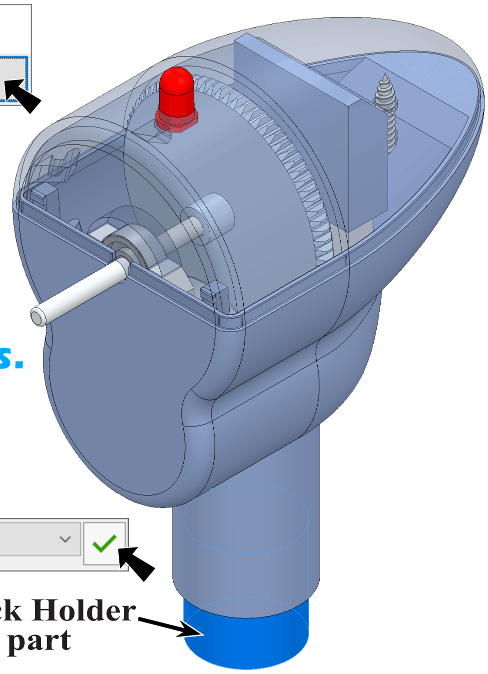


Fig. 45