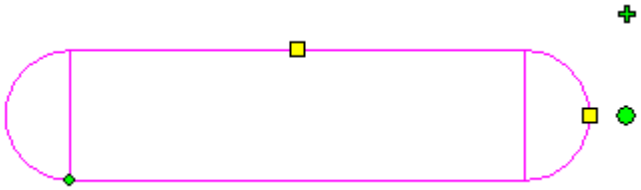
Creating a Parametric Symbol

In this exercise we will create a horizontal vessel, similar to the one below. This vessel will be parametric, meaning that the dimensions of the vessel will drive the graphics via parameters in the *Attribute Viewer*. In the second exercise we will create a SmartLabel for the vessel.



Attribute Viewer

Name	Value
Right	**6 5/8 in**
Top	**1 1/2 in**
Class	Vessel Equipment Group
Code	1B2I04
Description	Horizontal Drum

Part 1 - Sketching the Graphics

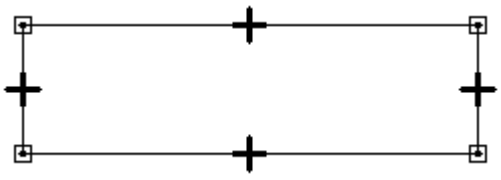
In this portion of the exercise, we will sketch out the basic geometry for the horizontal vessel.

1. From the **File** menu, click **New** and create a drawing from *Normal.sha*.

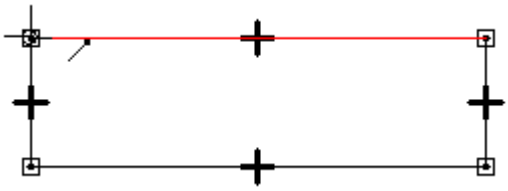
2. From the **Tools** menu, make sure that **Maintain Relationships** and **Relationship Handles** are turned on.

3. From the **Draw** toolbar, click on the **Line** command.  Click on the left side of the sheet and place a horizontal line 5 inches long.

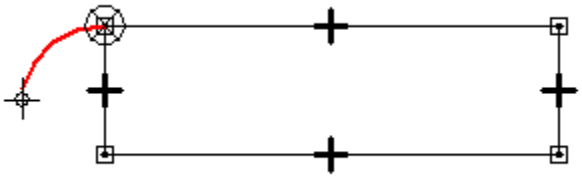
4. Continue placement of another line in a vertical direction 1½ inches long. Continue placing another horizontal line that ends at the start of the first line. Complete the rectangle by placing another vertical line. The four lines should be endpoint connected. Your drawing should look like this:



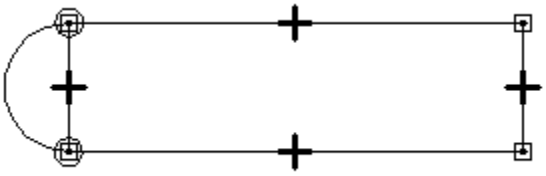
5. From the **Draw** toolbar, click on the **Tangent Arc** command.  Place your cursor over the top horizontal line and move it to the end of the line so that the line is highlighted in red and the endpoint indicator is displayed.



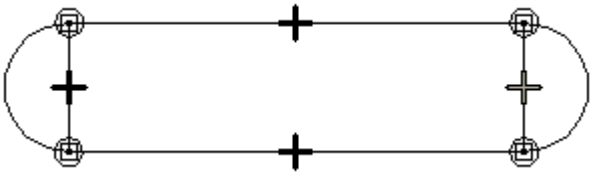
Click to place the start of the arc.



Move the cursor to the end of the bottom horizontal line (make sure the line is highlighted) and then click to place the end of the arc.



6. Place another tangent arc on the other side of the vessel, using the same steps as above.



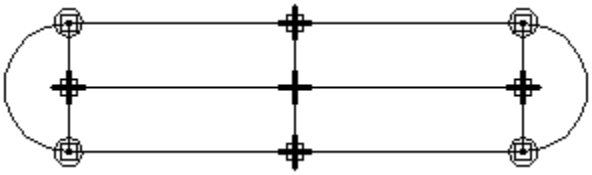
Part 2 - Adding Construction Graphics and Dimensions

In this portion of the exercise, we will add construction lines and dimensions to the symbol so that we can control how the geometry reacts to changes in size.

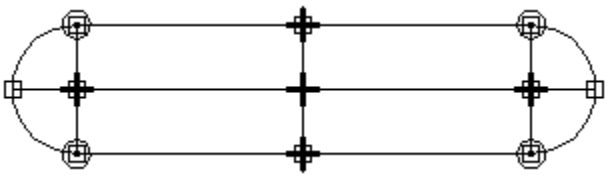
7. From the Tools menu, click on the **Layers** command. On the **Layer** ribbon bar, key in a new Layer named *Construction* and press the **Enter** key. The new layer is now the active layer.

8. Select the **Line** command  and place a vertical line from the midpoint of the top horizontal line to the midpoint of the bottom horizontal line.

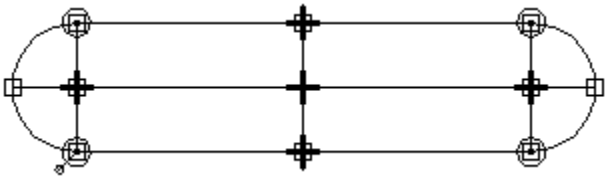
9. Place a horizontal line from the midpoint of the left vertical line to the midpoint of the right vertical line.



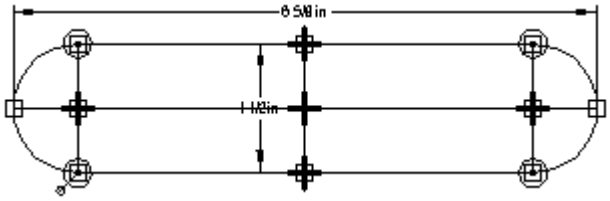
10. From the **Draw** toolbar, click on the **Extend to Next** command.  Place your cursor over the left side of the new horizontal line you just placed and click to extend it to the left arc. Do the same for the right arc.



11. From the **Main** toolbar, select the **Relationships** command to bring up the **Relationship** toolbar. From the **Relationship** toolbar, click on the **Lock** command. Place your cursor over the bottom end of the left-most vertical line and click when you see the endpoint indicator. This will lock the left hand side of the vessel so that it will remain fixed during modifications. Dismiss the **Relationships** toolbar.



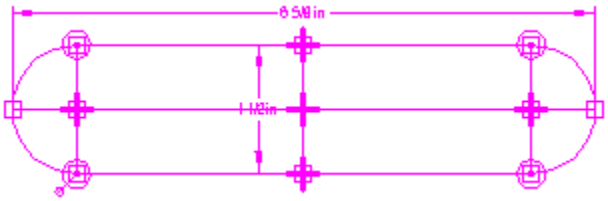
12. From the **Main** toolbar, select the **Dimension** command. On the **Dimension** toolbar, click on the **SmartDimension** command. Place your cursor over the middle horizontal line and then click when the line is highlighted. Click again to place the dimension. Place another dimension for the middle vertical line. Dismiss the **Dimension** toolbar.



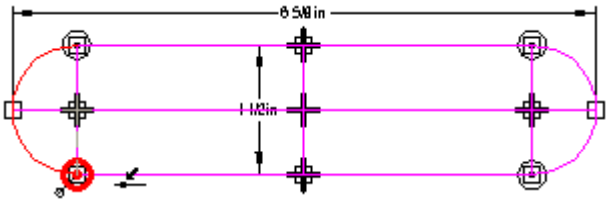
Part 3 - Creating the Symbol

In this section, we will create the symbol from the graphics, hook-up parameters to the dimensions on the symbol, and then add attributes to the symbol.

13. Click on the **Select Tool** and select the graphics for the symbol.



14. Click on the **Create Symbol** command on the **Draw** toolbar. Move your cursor to the bottom end of the left-most vertical line (same location as the lock relationship) and click to place the symbol origin.



In the **Save as Symbol** dialog, browse to the main training folder and name the symbol *vessel_1.sym*.

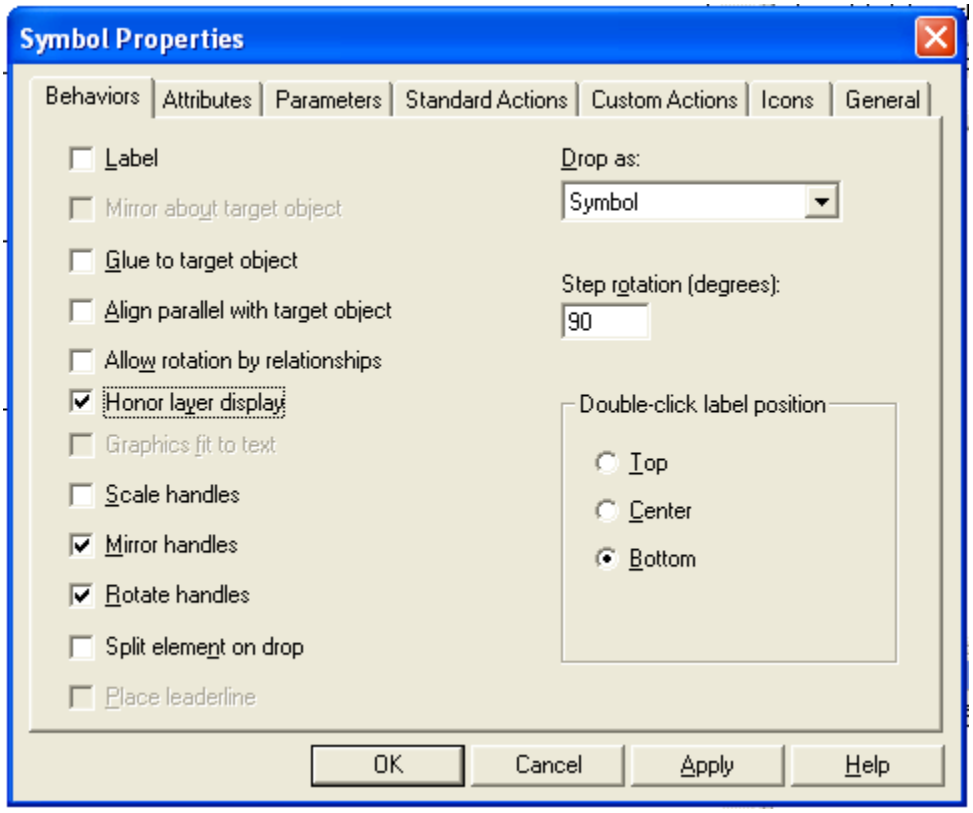
15. In the **Symbol Explorer**, browse to the main training folder. You should now see the *vessel_1.sym* document displayed in the **Symbol Explorer**.

16. From the **Symbol Explorer**, double-click on *vessel_1.sym* to open the new symbol. The **Symbol Authoring Tools** toolbar should be displayed.

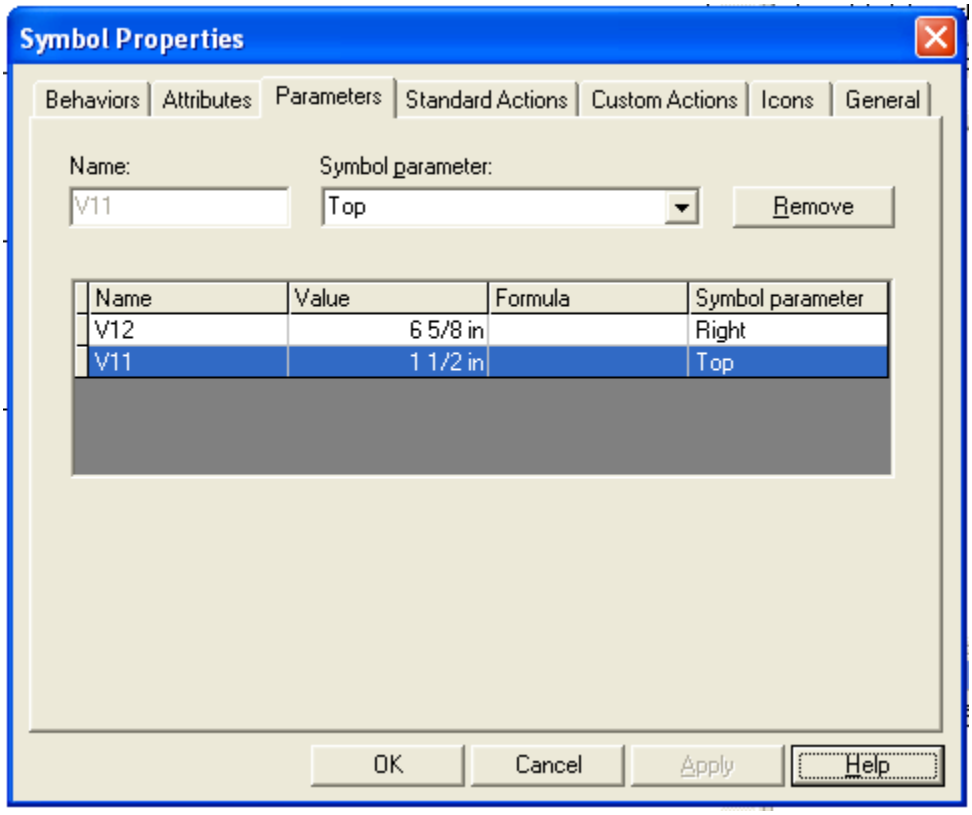
Note: If this toolbar is not activated, go to **Tools > Add-Ins** and make sure there is a check next to **Symbol Authoring Tools**. If the add-in is selected and this still does not bring up the **Symbol Authoring Tools** toolbar, then go to **View > Toolbars** and make sure **Symbol Authoring Tools** is selected.

17. From the **Symbol Authoring Tools** toolbar, click on **Symbol Properties**. 

On the **Behaviors** tab, turn on *Honor layer display* and turn off *Scale handles*.

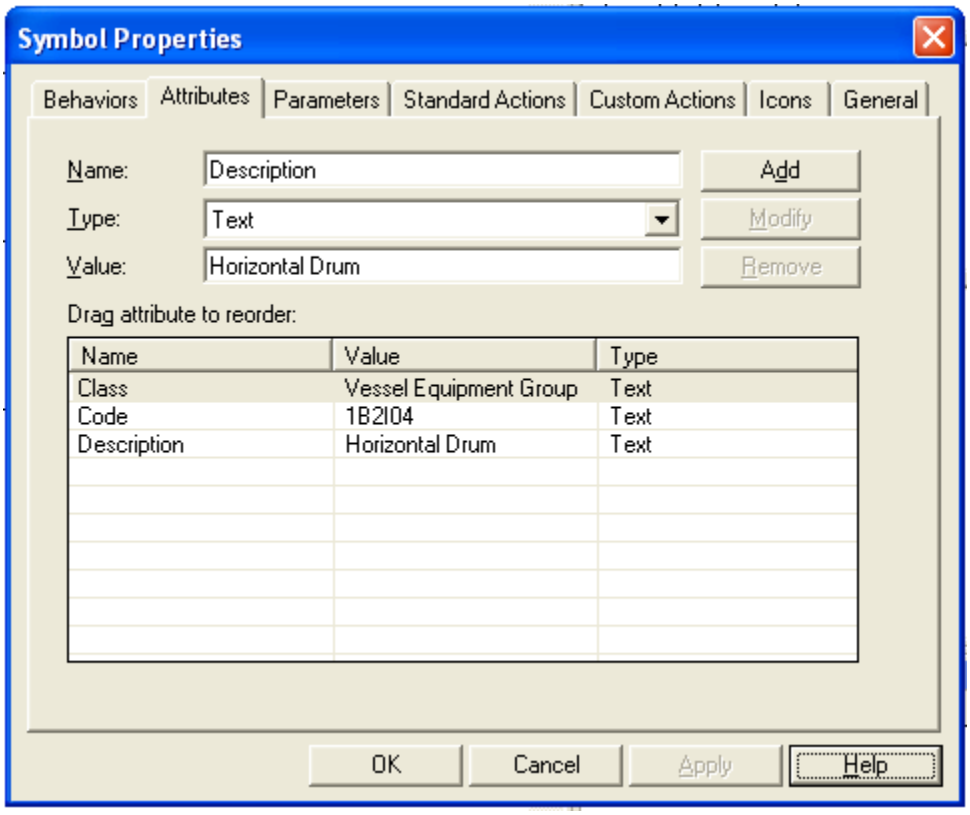


18. Click on the **Parameters** tab. From the table of dimensions, make sure that the dimension for the horizontal line is selected (larger value). Click on the **Symbol parameter** dropdown list and select *Right*. From the table of dimensions, select the second (smaller) dimension. Click on the **Symbol parameter** dropdown list and select *Top*. Click on the **Apply** button, but don't dismiss the dialog.



19. From the **Symbol Properties** dialog, click on the **Attributes** tab. In the *Name* field, key in *Class*. Click on the *Type* dropdown list and select *Text*. In the *Value* field, key in *Vessel Equipment Group*. Click the **Add** button to add the new attribute. Add the following additional attributes:

Name: Code	Name: Description
Type: Text	Type: Text
Value: 1B2I04	Value: Horizontal Drum

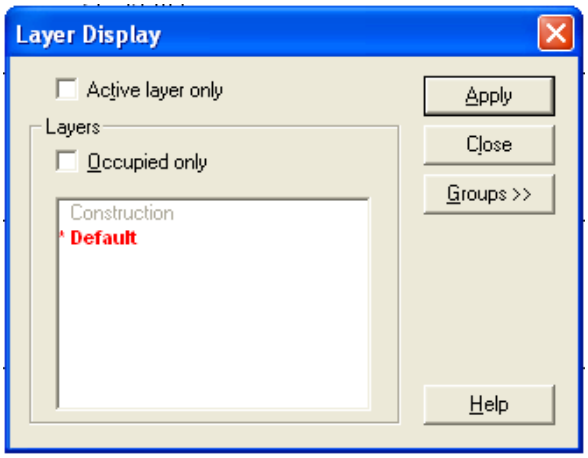


On the **Symbols Properties** dialog, click the **OK** button.

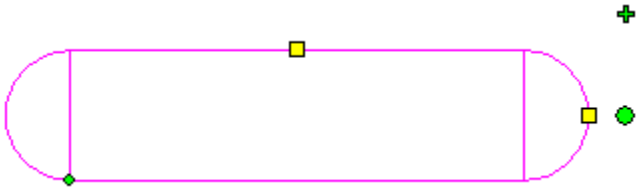
20. From the **File** menu, click on **Save** and then **Close**.

The new symbol is complete! Now let's place the symbol in the document to see how it behaves.

21. On the **Layer** ribbon bar, click on the *Layer Display* command.  (Note: If this ribbon bar is no longer active, select **Layers** from the **Tools** menu.) On the **Layer Display** dialog, double-click on the *Default* layer to make it the active layer, and click once on the *Construction* layer to turn it off. Click the **Apply** button and then close the dialog.



22. From the **Symbol Explorer**, click on *vessel_1.sym*. Move your cursor over the drawing sheet and click to place the symbol.



23. Click on the right yellow parametric handle on the symbol and drag your cursor to the right. Notice that the symbol changes. Do the same using the top yellow parametric handle. Also notice that the values in the **Attribute Viewer** change. Click on one of the bold values in the **Attribute Viewer** and change it. Notice that the symbol changes to reflect the new value.

Part 4 - Adding a SmartLabel to the Symbol

In this part of the exercise, we will create a SmartLabel for the vessel that will display attribute information when the symbol is placed in a document.

24. From the **Symbol Explorer**, double-click on *vessel_1.sym*. From the **Symbol Authoring Tools** toolbar, click on the **Symbol Properties** command. 

From the **Symbol Properties** dialog, click on the **Attributes** tab. Add the following additional attributes (be sure to enter the values exactly as shown below):

Name: Tag Prefix	Name: Tag Number
Type: Text	Type: Text
Value: ??	Value: xxx

Click **OK** on the **Symbol Properties** dialog.

25. From the **File** menu, click on **Save** and then click on **Close**.

26. From the **Draw** toolbar, click on the **Text Box** command.  Move your cursor over the drawing sheet and click once to place a text box. Key in the word *Label* in the text box.

Label

27. Using the **Select Tool**  , click on the new text box to select it. From the **Draw** toolbar, click on the **Create Symbol** command.  Click on the text box to place the origin. In the **Save as Symbol** dialog, name the symbol *label.sym* and save it in the main training folder.

28. From the **Symbol Explorer**, double-click on *label.sym*. Using the **Select Tool**, select the *Label* text box and press the **Delete** key to delete it. (Note: You may have to Fit the drawing to see the text box.)

29. From the **Symbol Authoring Tools** toolbar, click on **Edit SmartText.**  In the **SmartText Editor** dialog, enter the following values and then click on the **Insert Field** button:

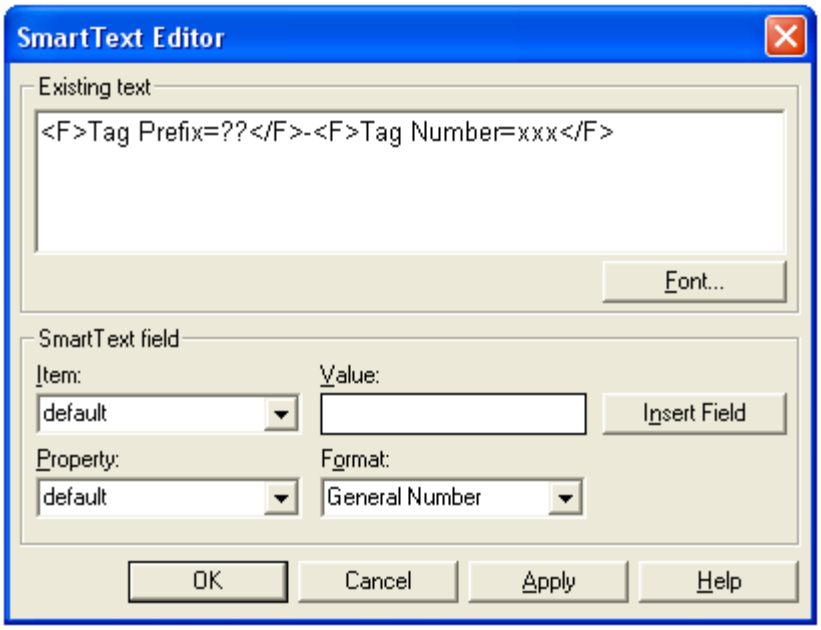
Property: Tag Prefix
Value: ??
Format: String

Note: These values are similar to the attributes you just added to the vessel symbol.

In the ***Existing text*** field, add a dash "-" after the string "<F>Tag Prefix=??</F>"

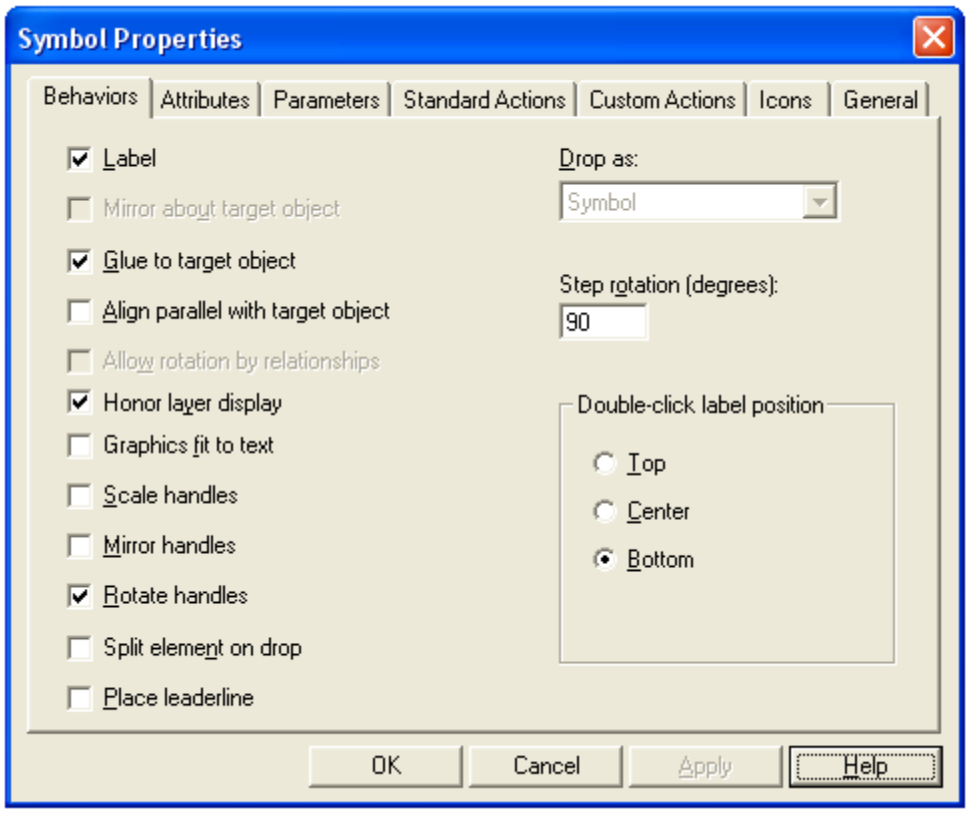
Insert another field with the following values:

Property: Tag Number
Value: xxx
Format: String



Click the **Apply** button and then click the **OK** button to dismiss the dialog.

30. From the **Symbol Authoring Tools** toolbar, click on the **Symbol Properties** command. On the **Behaviors** tab, turn on *Label*, *Glue to target object*, *Honor layer display*, and *Rotate handles*. Turn off *Scale handles* and *Mirror handles*.



Click the **OK** button to dismiss the dialog.

31. From the **Symbol Authoring Tools** toolbar, click on **Symbol Origin**. Place your cursor over the middle of the *??-xxx* text and click to place the origin.

32. From the **File** menu, click on **Save** to save the symbol and then click on **Close** to close the symbol document.

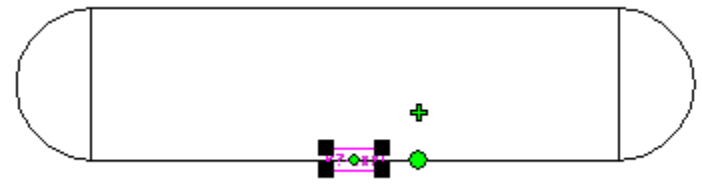
We will now create the wrapper symbol that will contain the vessel graphics and the label.

33. From the **Draw** toolbar, click on the **Line** command. Place a line anywhere in the document.

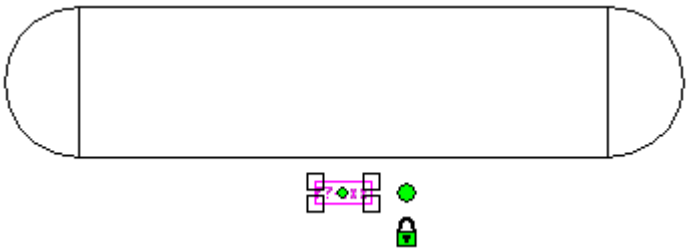
34. Select the line. From the **Draw** toolbar, click on the **Create Symbol** command. Click anywhere on the line to place the origin. In the **Save as Symbol** dialog, browse to the main training folder and name the symbol *final.sym*. You should now see *final.sym* in the **Symbol Explorer**.

35. From the **Symbol Explorer**, double-click on *final.sym* to open the symbol document. Click on the **Fit** command. Select the line and delete it.

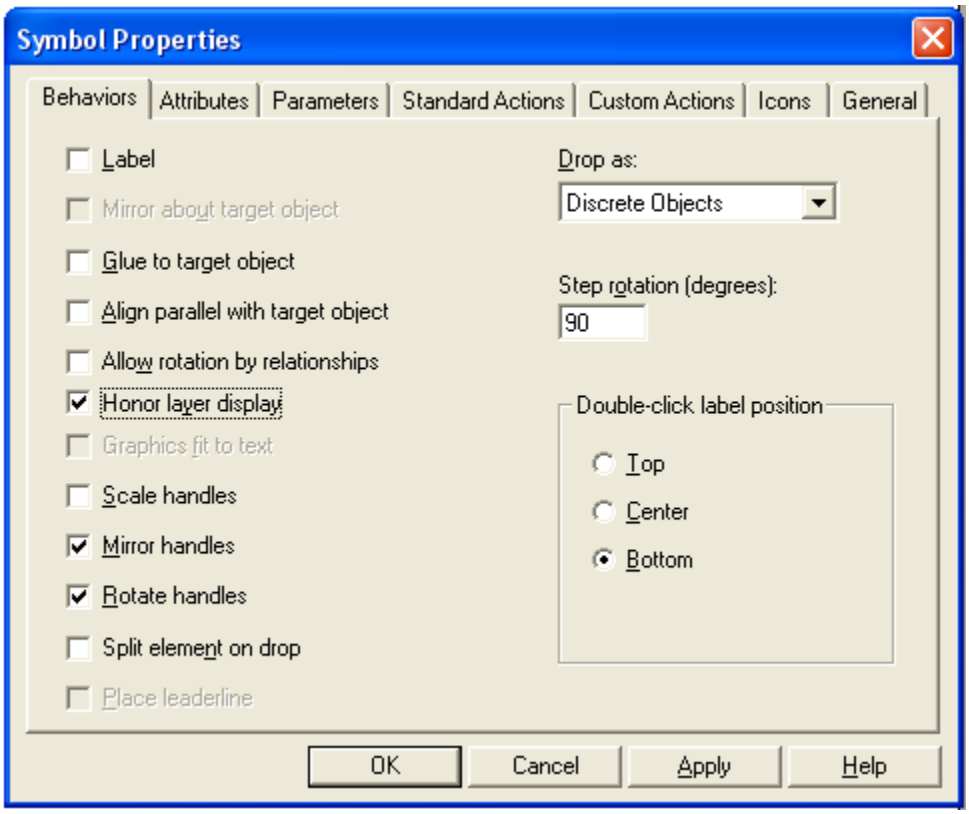
36. From the **Symbol Explorer,** click on *vessel_1.sym*. Move your cursor over the drawing sheet and click to place it. Select *label.sym* and place it on the drawing sheet on the bottom of the vessel by touching the bottom horizontal line. (Note: If you see any construction graphics on the vessel, you may need to turn off the *Construction* layer.)



37. Select the label, click on the **Lock** handle next to the label, and move the label just below the vessel.



38. From the **Symbol Authoring Tools** toolbar, click on the **Symbol Properties** command. On the **Behaviors** tab, turn on *Honor layer display*, *Mirror handles,* and *Rotate handles*. Turn off *Scale handles*. From the **Drop as** dropdown list, select *Discrete Objects*. Click the **OK** button.



39. From the **Symbol Authoring Tools** toolbar, click on **Symbol Origin**.  Place your cursor over the bottom left side of the vessel and click to place the origin.

40. From the **File** menu, click on **Save** to save the symbol and then click on **Close**.

The final symbol is complete!