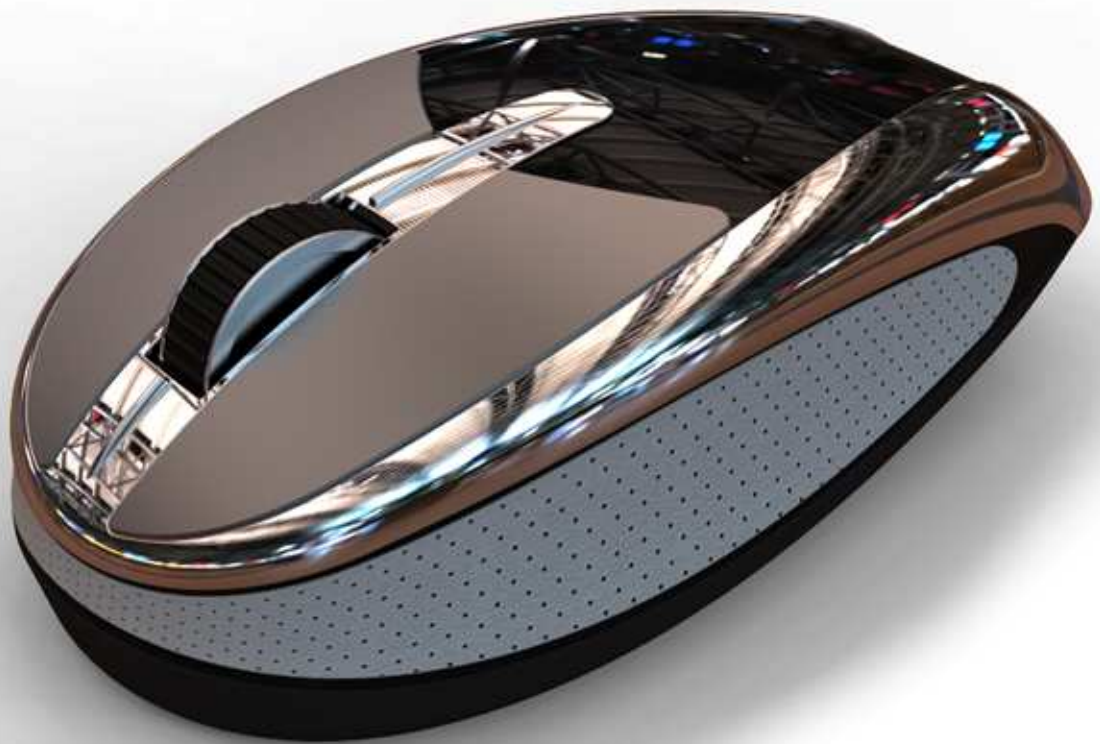




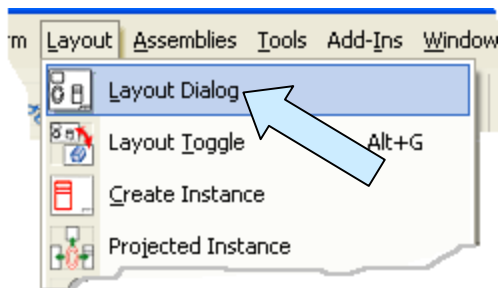
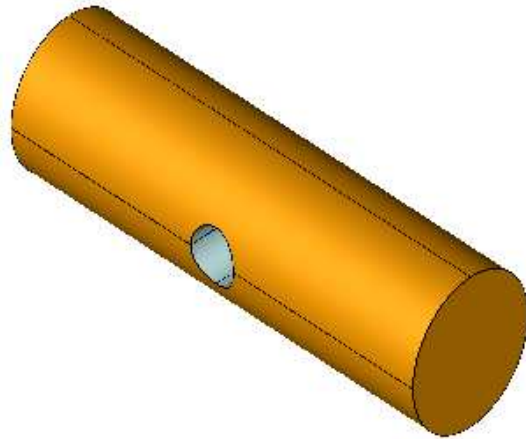
Tips And Tricks



Dimensioning Arcs on Curved Surfaces

Users will often call with the complaint that they cannot dimension an arc on a curved surface. A typical example of this is a cotter pin hole drilled in a shaft. I've illustrated an example to the right.

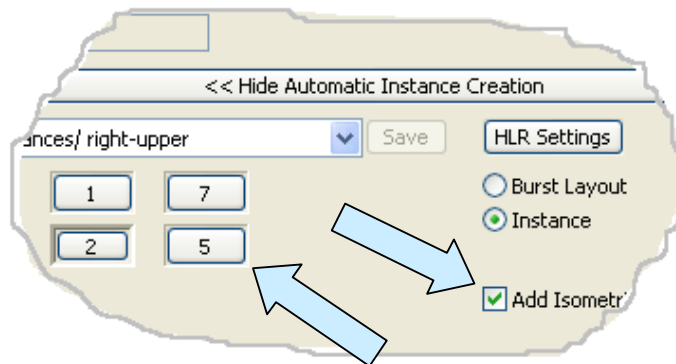
You can download this part as "Shaft01" with this lesson.



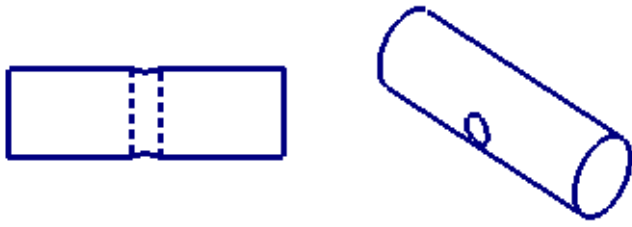
Let's suppose that we create a simple associated layout for this part.

Click on the LAYOUT DIALOG Icon.

We'll use the automatic instance creation with isometric view checked to create a drawing with a top, front, right side and isometric view.



Let's make the three orthographic views hidden line dashed rendering style and the isometric view hidden line removed.

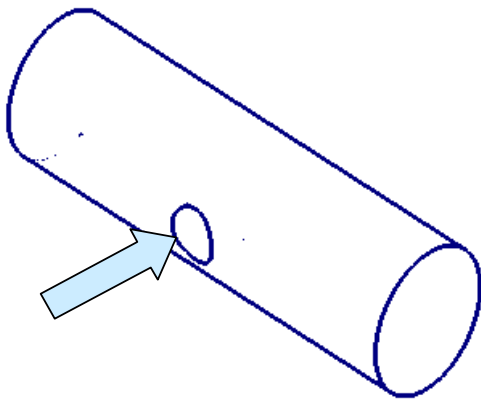
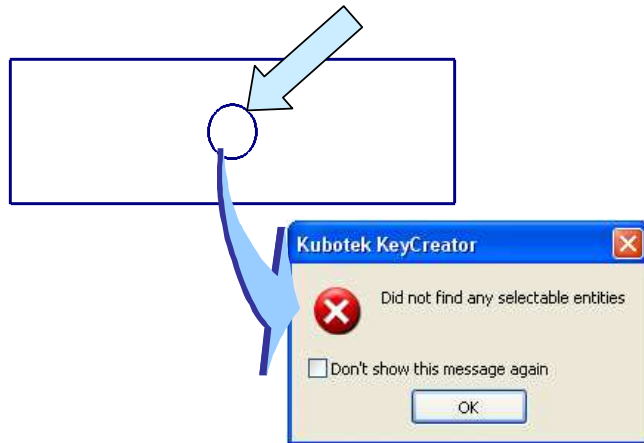


Your drawing views should look like this: (I haven't bothered to add a border since it has no bearing on our current discussion.)

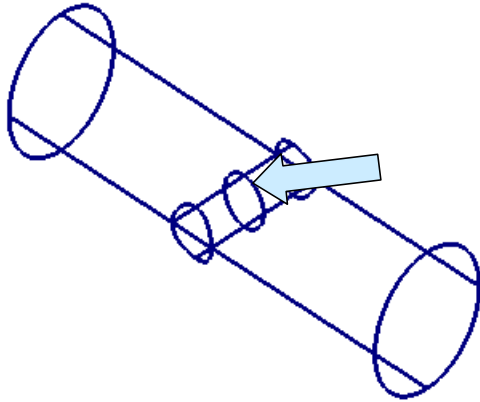


If you try to place a diameter dimension on the hole in the front view, you get a message that there are no selectable entities.

This happens because what appears to be a circle in the hidden line dashed rendering is really the saddle curve that lies on the cylindrical surface.



If you toggle back to model mode, you can clearly see this on the model.

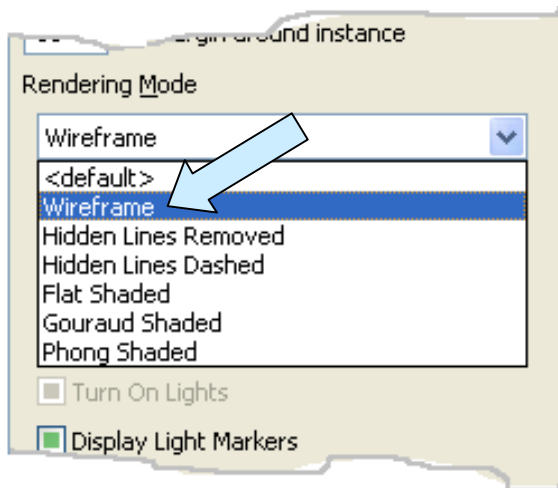
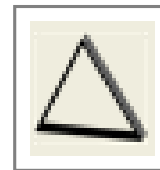


If you look at the model in wireframe mode, you'll notice that the through hole has a circle at the midpoint. Whenever a hole is created through a curved surface, KeyCreator creates this extra circle at the geometric center of the hole.

We can take advantage of this to solve our dimensioning problem.

Toggle back to the layout that you made.

Now, click on the GENERIC EDIT Icon and then on the front instance in the layout.



The MODIFY INSTANCE Dialog Box appears.

Scroll down in the Rendering Mode Field and select the Wireframe Option.

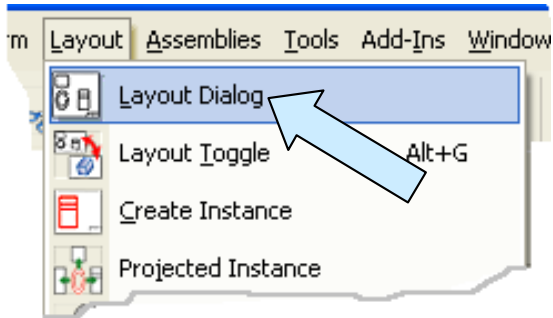
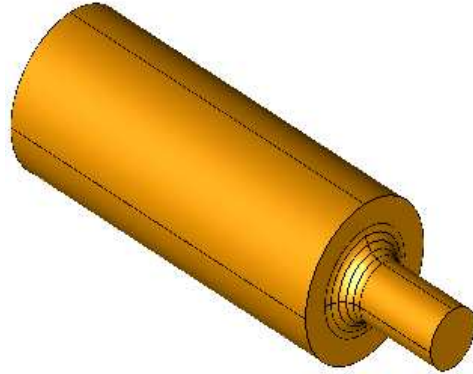
You will find that you can now easily add the diameter dimension since the circle is on the screen superimposed on the front and rear saddle curves.

Once you place the dimension you can quickly use the GENERIC EDIT Tool to change the rendering style of the front instance back to Hidden Line Dashed.

Now, while a crosshole through a cylinder is the most common example of this problem, it does crop up in other constructions as well. Let's look at another example to give you a more comprehensive feel for the problem and the solution.

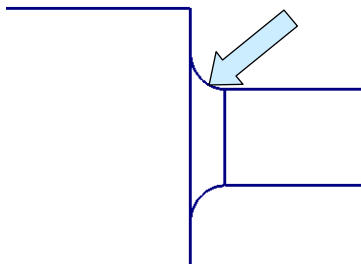
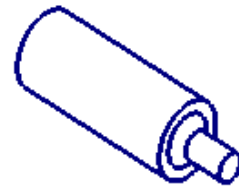
In this exercise, we're going to work with the part illustrated to the right.

This is available in this lesson for download as "ToolPiece01."



Let's click on the LAYOUT DIALOG Icon and make an associated layout of this part with a front view, right side view, and isometric view. (The top view would be redundant because of the part symmetry.)

Your drawing should look like this:

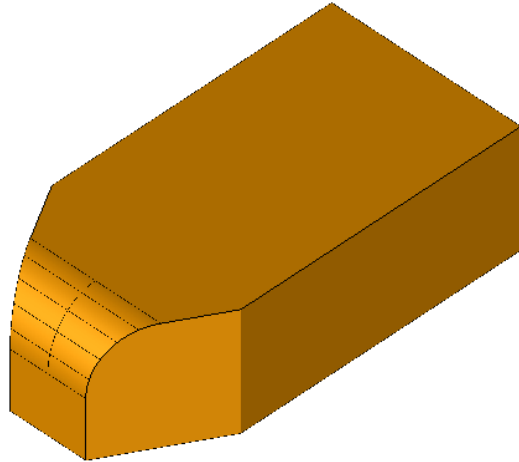


Try placing a radial dimension on the arc in the front view and you'll run into the same roadblock that we had with our previous part.

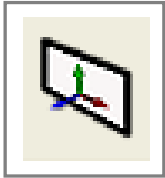
We can quickly get around the issue by using the GENERIC EDIT function to temporarily change the front view to wireframe display.

Place the dimension and then change the rendering back to hidden line dashed.

Let's look at one last example. The part illustrated at right has a 0.375 circular blend on the front, top edge of the part. (This part is available for download as "FormBlock01.")



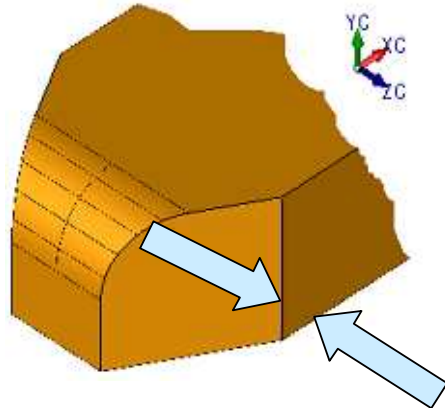
Let's suppose that we want to create a four view drawing of the part and that we want to place a live, isometric dimension on the blend in the isometric view of the drawing.



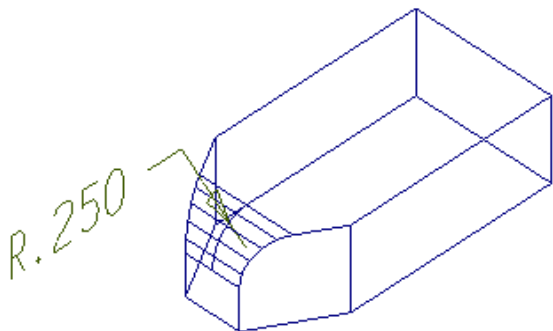
Before we create the layout, let's switch to wireframe display in model mode.

Click on the CONSTRUCTION PLANE Icon.

Now, click on the front end of the bottom, right edge and then on the lower end of the vertical edge indicated by arrows in the illustration to the right.

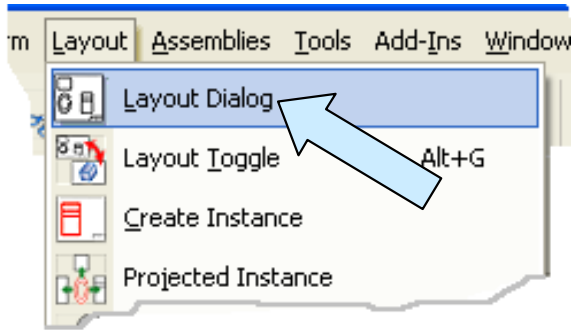


This creates a construction plane oriented like the one in the illustration.



With this construction plane active, you can dimension the arc at the midpoint of the blend. (This arc serves the same purpose as the circle at the center of the cotter pin hole did earlier! The curves at the ends are not circular arcs.)

Your dimension should look like this:

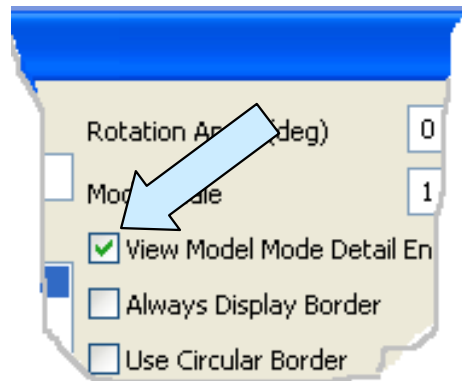


Now, click on the LAYOUT DIALOG Icon.

When the Dialog Box appears, select the top, front and right side views with hidden line dashed rendering.

Then, click on the HLR Setting button for the Isometric View.

Click to place a check on the View Model Mode Detail Entities Option. This will display the isometric dimension in the layout.



Remember that whenever a hole or blend intersects a curved surface you can have a situation where you have to dimension to the wireframe arc. Blends at the roots of cylinders as illustrated in the second example also create the same problem. And finally, when a blend intersects a sloped surface as in our last example, you also have to be creative when you add your dimensions!