

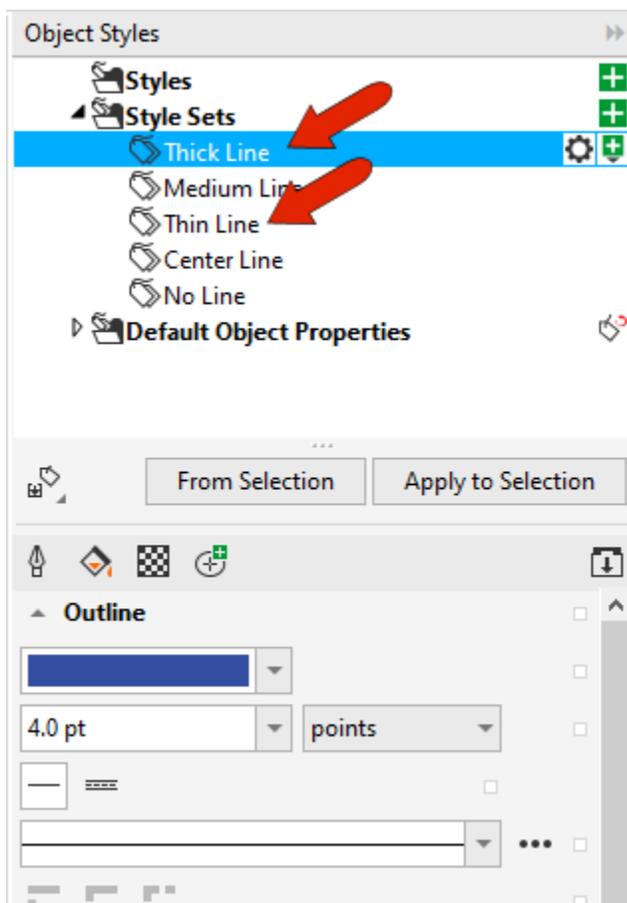
Working with Exact Values

This tutorial will demonstrate how to work with exact size and position values, while drawing in Parallel Perspective in Corel DESIGNER. Learn how to use the Projected Axes docker and Transform toolbar to create precise technical illustrations.

Getting Started

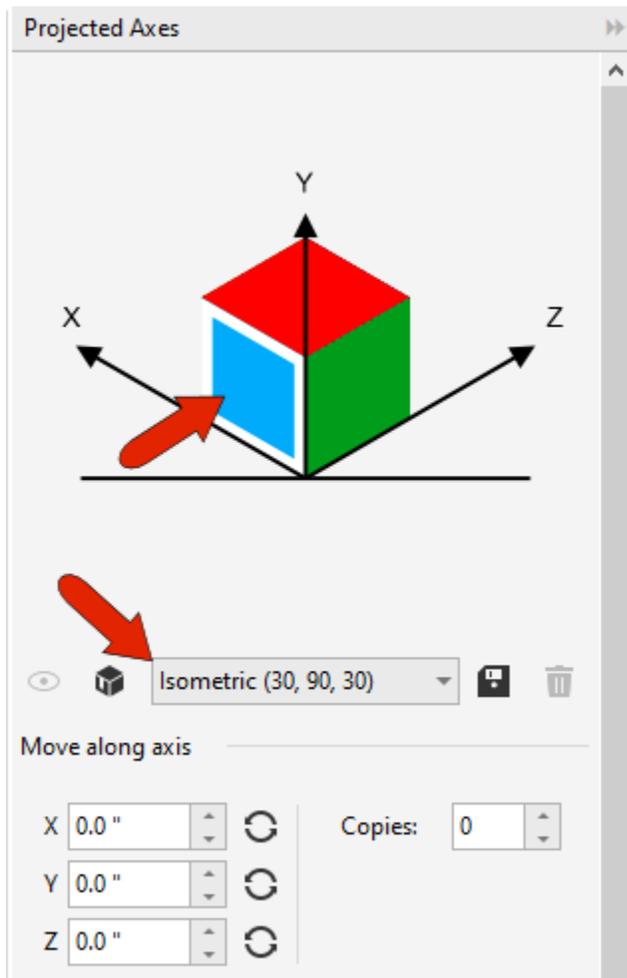
Before we start creating our sample mechanical part diagram, we first need to set up certain elements of the user interface.

- Enable the **Projected Axes** docker by going to **Window > Projected Axes** or press **Ctrl + F7**.
- Enable the **Object Styles** docker by going to **Window > Object Styles**. This is where we can define the properties for thick and thin lines used in perspective drawings. In this example, the **Thick Line** setting is a dark blue, 4pt line and the **Thin Line** setting is a light blue, 2pt line.

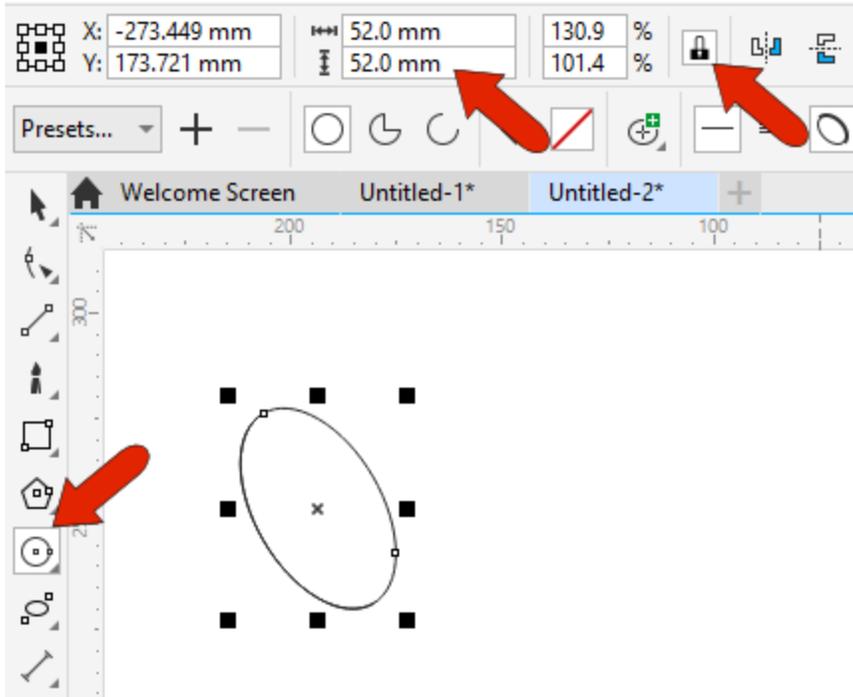


- Enable the **Transform** toolbar, either by going to **View > Toolbars > Transform** or by right-clicking on any toolbar icon and selecting **Transform** from the right-click menu list.

To start our mechanical part diagram, go to the **Projected Axes** docker, choose the **Isometric** drawing profile, and activate the blue (front) plane.

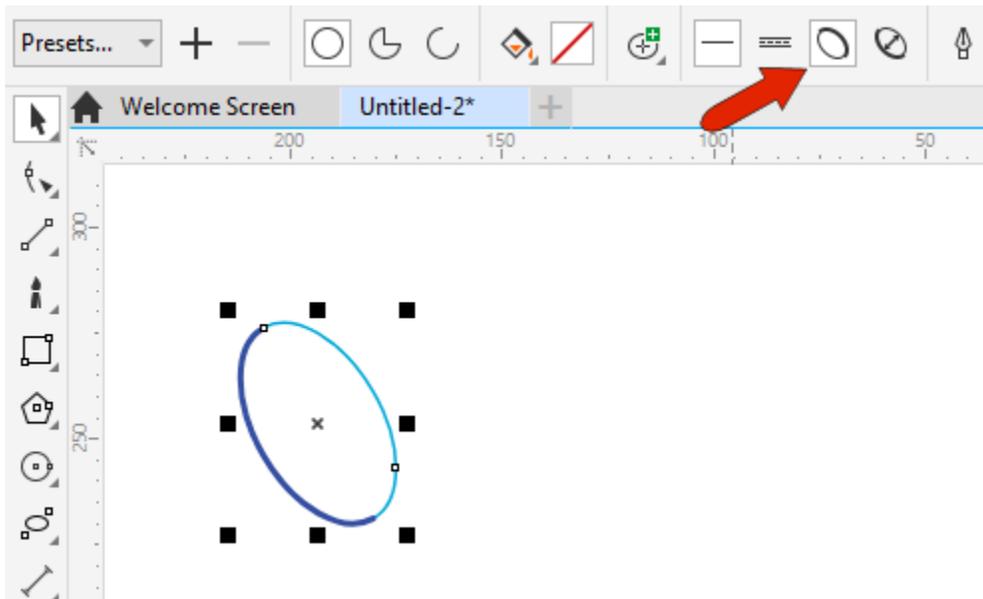


With the **Center-Point Circle** tool, draw the bottom of a bolt, and set its **Object Size** to 52 mm in the **Transform** toolbar. With the **Lock** icon enabled, both **X** and **Y** size values stay the same.



Even though this object appears to be an ellipse, it is actually a circle, projected onto the side of a box in **Isometric** view.

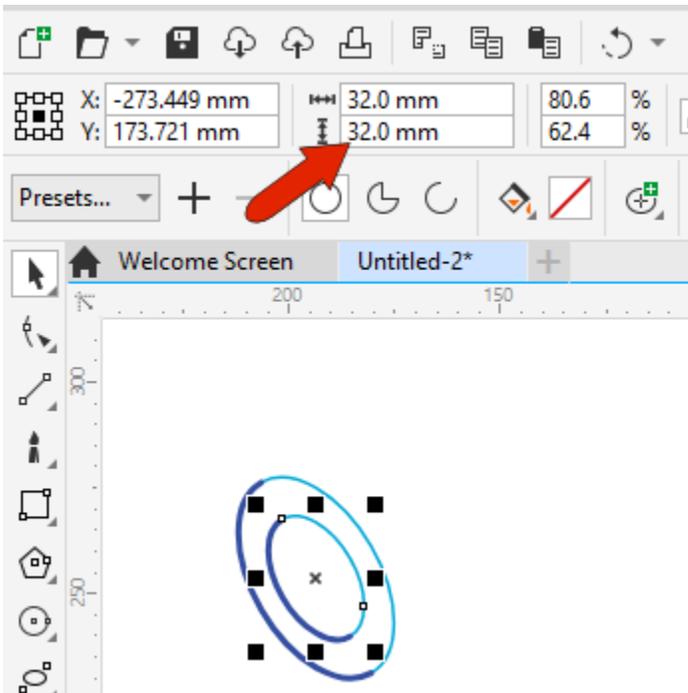
In the property bar, click on the icon to enable **Thick and thin lines**, so that outer edges appear thicker. Now your circle should have the thick and thin line properties.



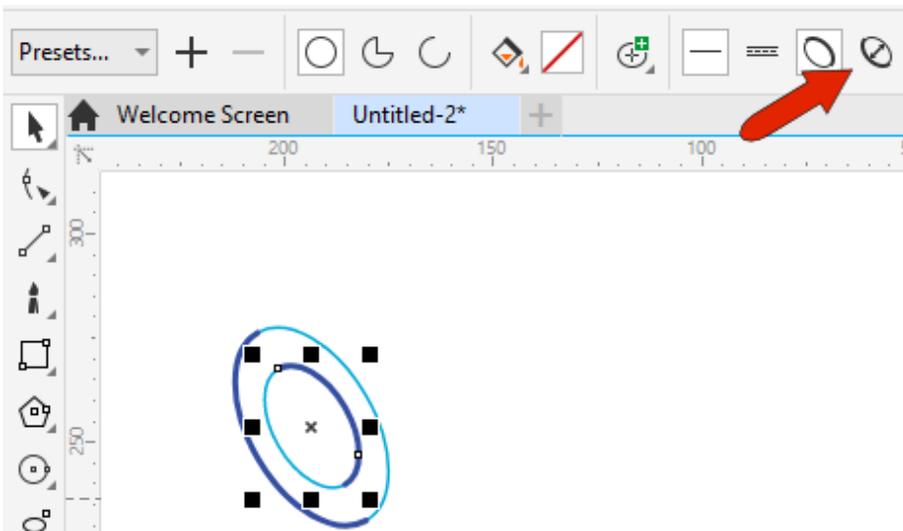
To illustrate the hollowness of the bolt, we'll add a 32 mm inner circle. With the first circle still selected, click the icon on the **Transform** toolbar to enable **Apply to duplicate**.



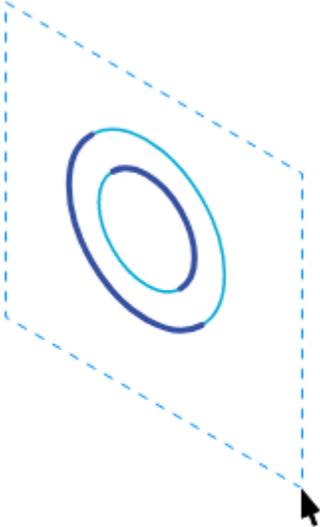
Enter the 32 mm dimension in **X** or **Y**, and the locked dimensions are applied to a duplicate of the original circle.



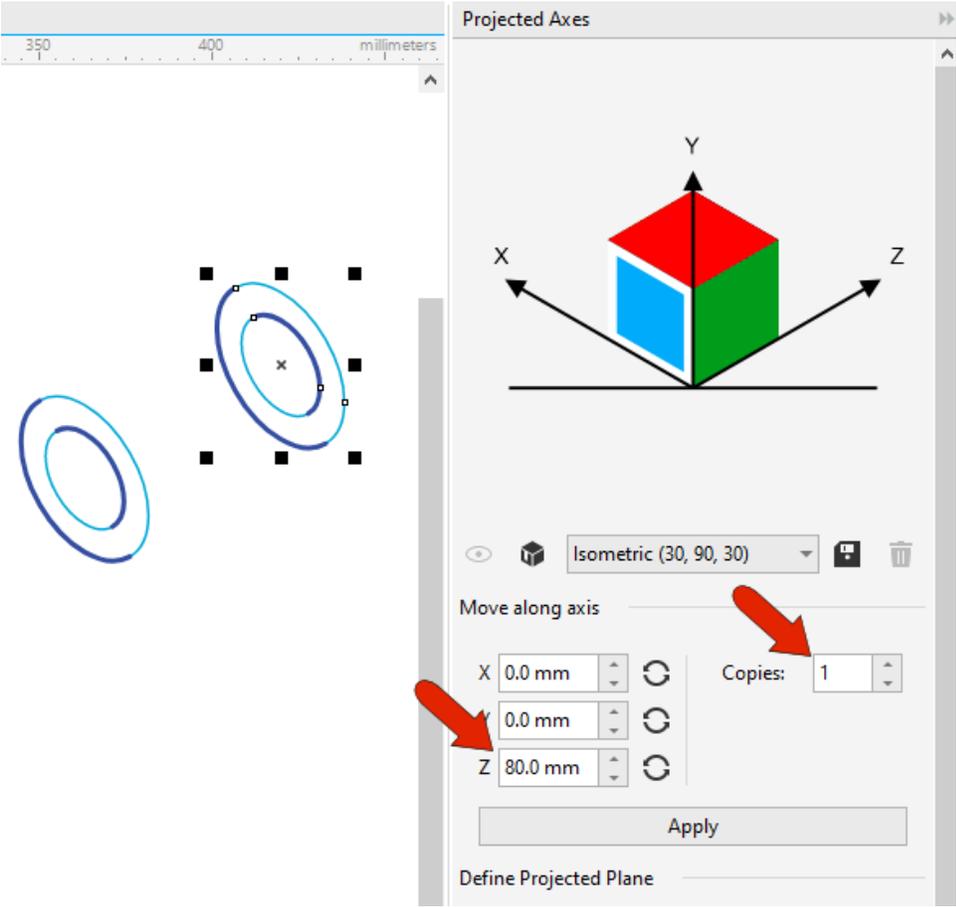
With the inner circle now selected, click the **Reverse line width** icon, because the top right part of the circle will be the outside edge.



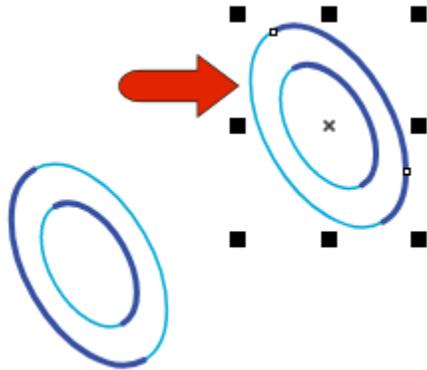
The bolt length is to be 80 mm along the **Z** axis. Press the **Spacebar** to activate the **Pick** tool and marquee-select both circles - the marquee window follows the isometric perspective as well.



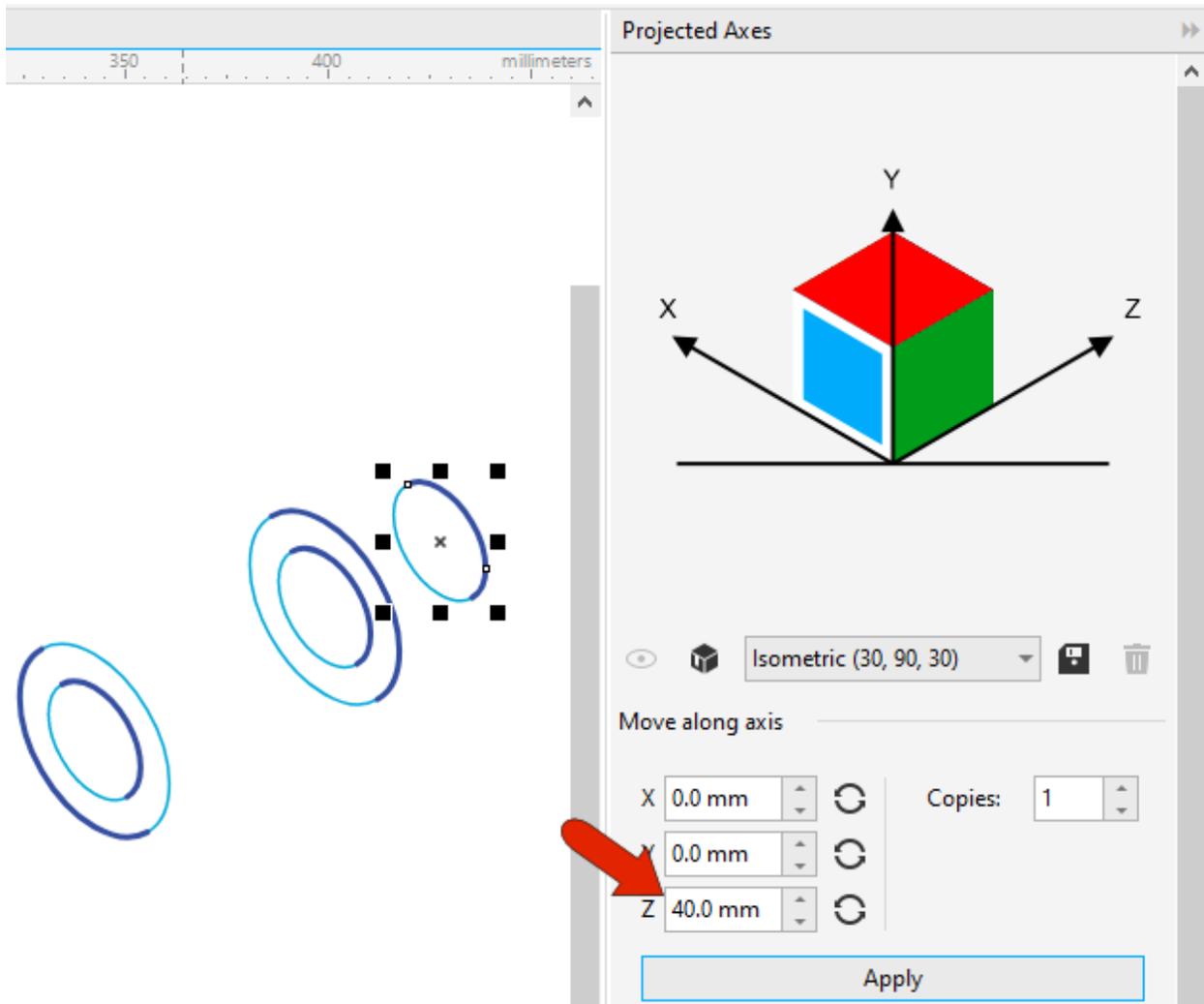
In the **Move along axis** section of the **Projected Axes** docker, set the 80 mm copy distance for the **Z** axis, set the number of **Copies** to 1, and click the **Apply** button.



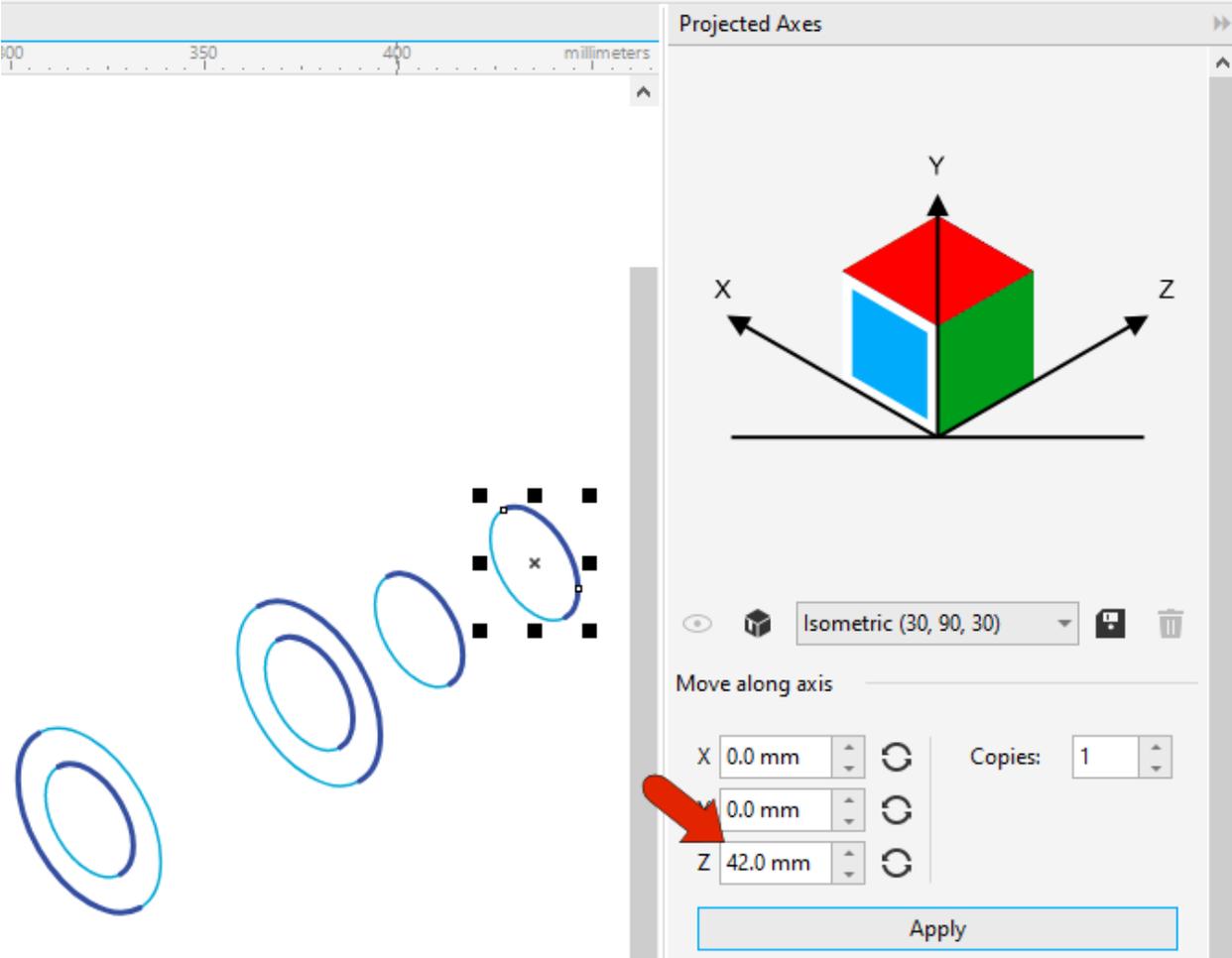
The outer copied circle needs its line width reversed, so select only this circle and click the **Reverse line width** icon.



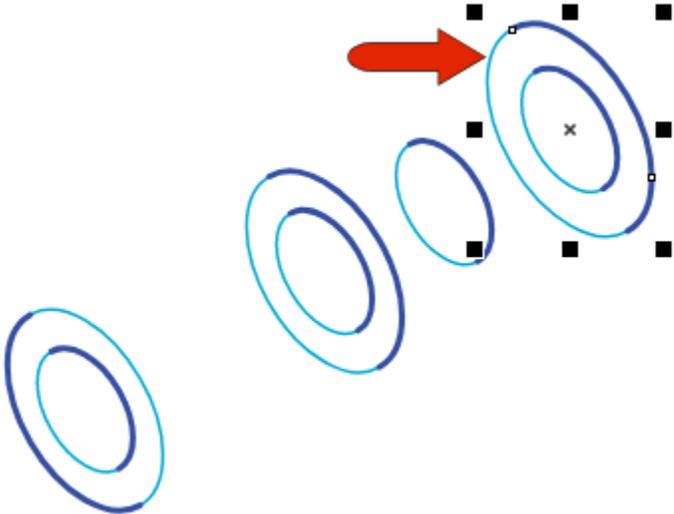
For the threaded pin that extends from the top of the bolt, select the copied inner circle and use the **Projected Axes** docker to make 1 copy 40 mm in the Z direction.



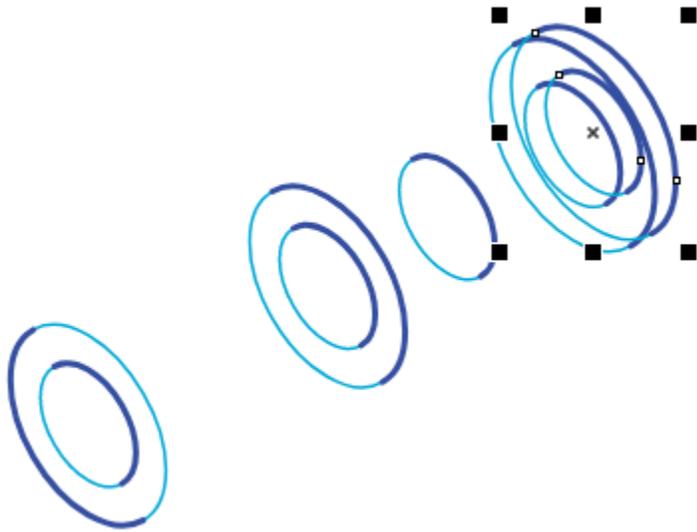
Next, we need a circle for the bottom of the washer, which will be a copy of the most recent circle, 42 mm in the Z direction.



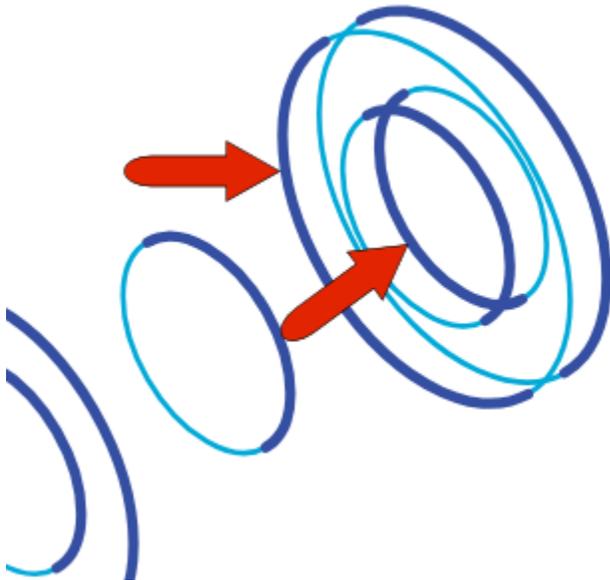
The outer dimension of the washer is 55 mm, so with the most recent circle selected, apply the new dimensions to the duplicate using the X or Y field on the **Transform** toolbar.



The last two circles we need are for the top of the washer. Select both washer circles and copy them 7 mm in the **Z** direction.

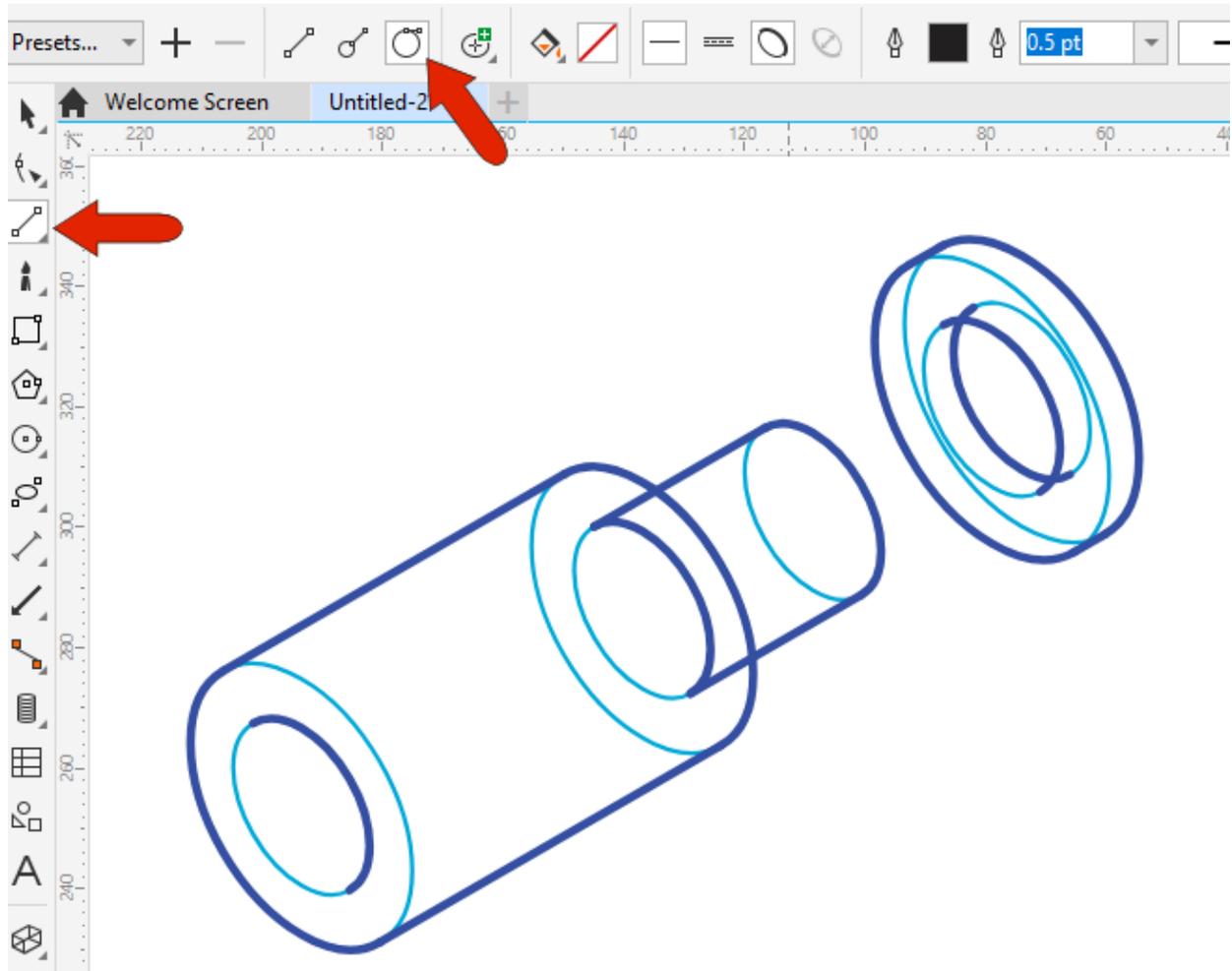


Two of the washer circles need line widths reversed. One is the bottom outer circle, which is easy to select and reverse. The top inner circle is a bit harder to select by clicking because of other objects in the way, so press the **Tab** key to scroll through objects until that circle is selected, then reverse widths.

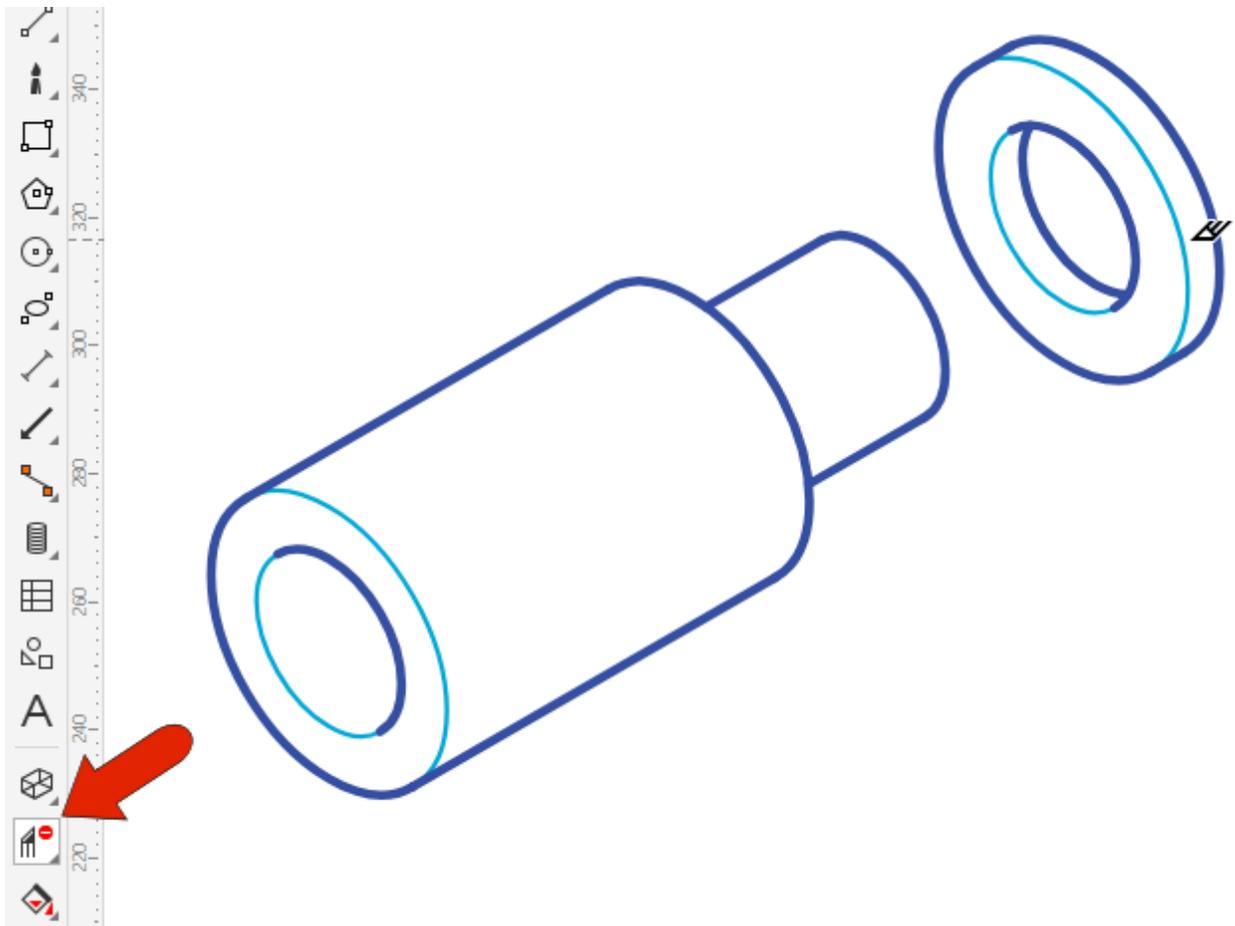


Now we can start connecting all these circles and trimming away the segments that wouldn't be seen in a solid view.

Starting with the washer, use the **2-Point Line** tool, with the **Tangential** option selected on the property bar, to connect the outer circles of the washer, making each line thick. Do the same for the sides of the threaded pin, and for the bolt.



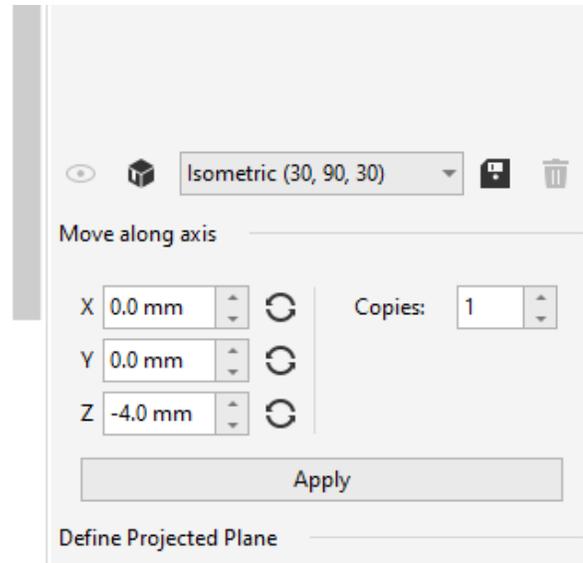
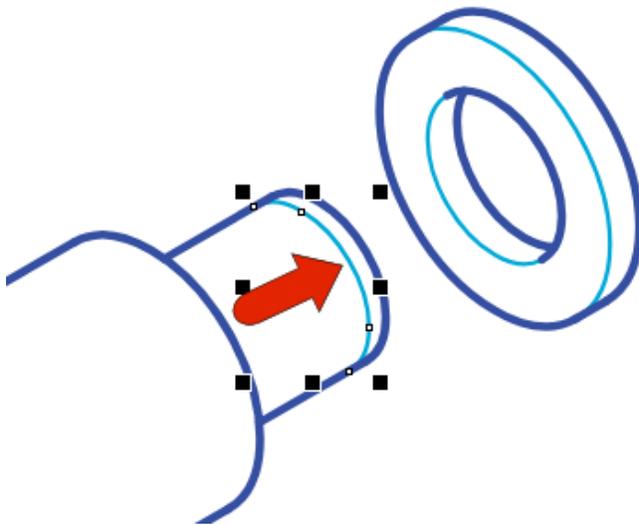
Now we can use the **Virtual Segment Delete** tool to remove the unseen segments of the bolt and pin, and do the same for the washer.



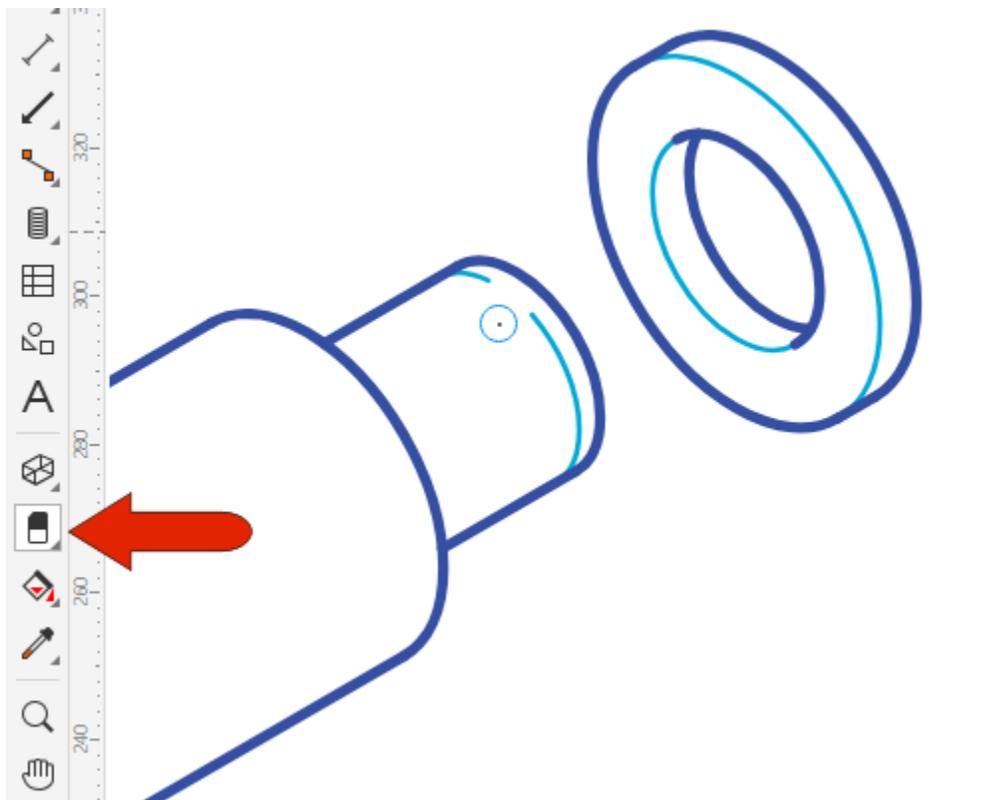
To learn more, watch the full tutorial [How to Use the Virtual Segment Delete Tool](#).

The last task is to draw the threads. There is a **Thread** tool for this purpose, but in this tutorial we'll demonstrate another method.

With the round end curve of the threaded pin selected with the **Pick** tool, make one copy a short distance in the negative **Z** direction, and make this new curve a thin line.



To break this curve, use the **Eraser** to remove a small portion.



With the same curve selected again, use the **Projected Axes** docker make a few more copies using the same distance and direction as the original thread curve.

