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## Using a Caliper

A caliper has two jaws, one fixed, the other sliding. Move the sliding jaw by pressing your thumb on the bump on the bottom. Many calipers also have a knurled wheel that makes moving the jaw easier.

An electronic digital caliper has some buttons on the readout. One of them turns the caliper on; one sets the caliper to zero; and one switches from inches to millimeters. The precise location of each button and how it is labeled varies from model to model. Yours might have additional buttons.

## The First Step

Before you take a reading—and I mean before you take every reading—close the caliper and make sure the reading is 0.000. If not, do this:

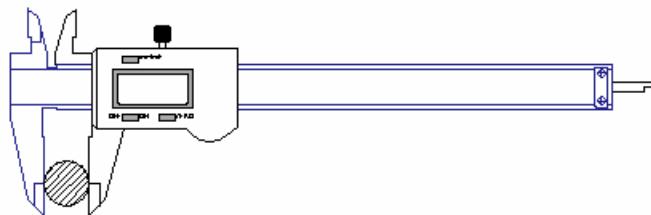
1. Open the jaws about three quarters of an inch. Then use the thumb of your free hand to wipe off the mating surfaces of the jaws.
2. Close the caliper again. On an electronic digital caliper, if the reading is not 0.000, press the zero button so that it does read 0.000. To zero a dial caliper, rotate the bezel so that the needle points to 0.

## Four Basic Readings

Your caliper can take four kinds of readings: outside, inside, depth, and step. Any caliper, whether it is a vernier caliper, dial caliper, or electronic digital caliper, can take these measurements. Let's take a look at how you take each of those readings.

## **Outside Measurement**

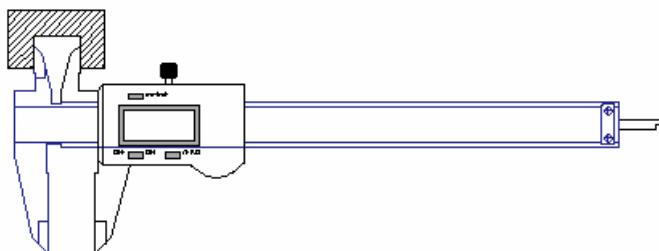
Outside measurements are the most basic you can do with a caliper. Slide the jaws open, place the caliper over the object to be measured, and slide the jaws until they contact the workpiece. Read the measurement.



It's easy, but if you don't do it correctly the measurement will not be accurate. If the calipers are not straight (that is, perpendicular to the workpiece) the measurement will not be accurate. Likewise, if there is dirt on the jaws or the workpiece the measurement will not be accurate.

## **Inside Measurement**

The smaller jaws on the top of the caliper are used for inside measurements. Slide the caliper closed, place the inside-measuring jaws into the space to be measured, and slide the jaws apart as far as they will go. Read the measurement.

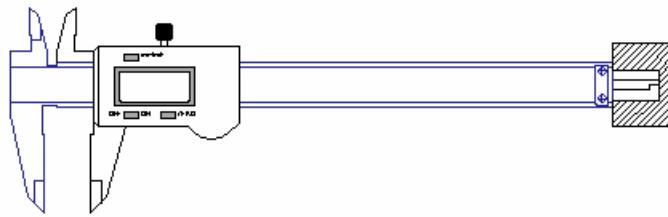


It's a little harder to keep things lined up correctly when you are taking an inside measurement. Be sure that the calipers are not cocked, or you will not get an accurate measurement.

## **Depth measurement**

As you open the caliper the depth blade extends out of the far end. Use this blade to take depth measurements. Press the machined end of the caliper against top of the hole you want to measure. Open the caliper until the depth blade contacts the bottom of the hole. Read the measurement.

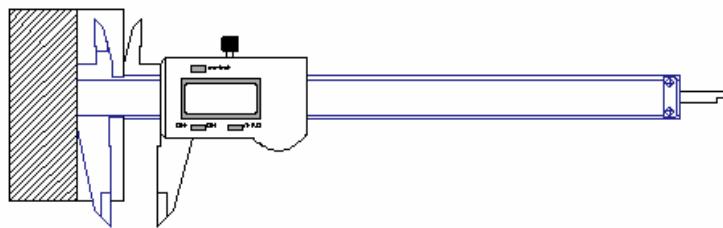
It can be tricky keeping the caliper straight over the hole, especially if only one side of the caliper is resting on the workpiece.



## Step Measurement

Step measurement is the hidden use of a caliper. Many instructions skip this important use. But once you know about it, you will find many uses for step measurement.

Open the caliper slightly. Place the sliding jaw on the upper step of the workpiece , then open the caliper until the fixed jaw contacts the lower step. Read the measurement.



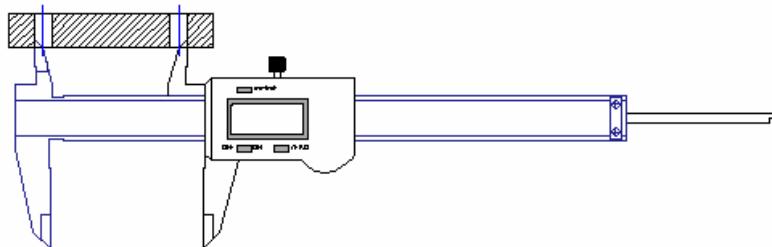
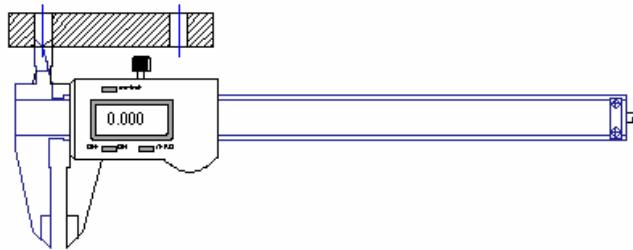
## Compound Measurements

Because you can zero an electronic digital caliper at any point, you can use it to do some of the arithmetic required for compound measurements.

### Center Distance

Use this procedure to measure the center distance between two holes of equal diameter.

1. Use the inside jaws to measure the diameter of one of the holes. Before you remove the caliper from the hole, press the button to zero the caliper while it is set to the diameter of the hole.
2. Still using the inside jaws, measure the distance between the far surfaces of the two holes. The caliper reading is the distance between centers of the two holes.

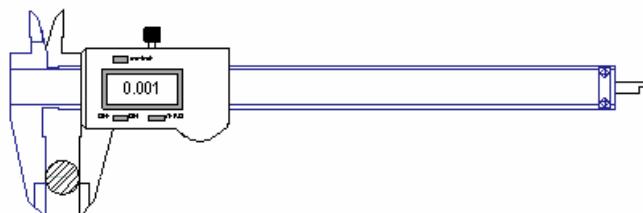
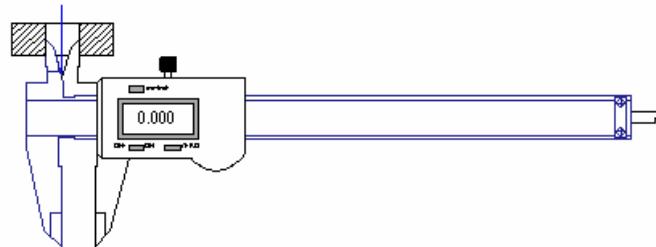


Be sure to use the same (inside) jaws for both measurements. And remember that this works only if the holes are the same size.

### ***Comparing a hole to a shaft***

Need to make a shaft or pin to fit an existing hole? Or are you boring a cylinder to fit a piston? You can use your electronic caliper to read the size difference directly.

1. Use the inside jaws to measure the diameter of the hole. Before you remove the caliper from the hole, press the button to zero the caliper while it is set to the diameter of the hole.
2. Use the outside jaws to measure the shaft. A positive reading (no minus sign displayed) shows that the shaft is larger than the hole. A negative reading (the minus sign appears to the left of the digits) shows that the shaft is smaller than the hole and will fit.



The caliper shows you how much material you need to remove, from either the shaft or the hole, to make them fit.

### ***Remaining Thickness***

When you need to put a hole in a workpiece that does not go through, you might want to know how much material remains between the bottom of the hole and the other side of the workpiece. Your electronic caliper can display this distance for you.

Use the outside jaws to measure the total thickness of the workpiece. Before you remove the caliper from the workpiece, press the button to zero the caliper while it is set to the thickness of the workpiece.

Now use the depth blade to measure the depth of the hole. The caliper reading (shown as a negative number) is the remaining thickness between the bottom of the hole and the other side of the workpiece.

