# PROVIDING SHAFT CENTER INFORMATION FOR VARIOUS TYPES OF MACHINES

Shaft centers can routinely provide considerable information for various situations. This information will allow us to determine scoring pressures, trim knife overlap, knife penetration, nip clearances, etc., etc. It is also used as a check or proof for other measurements to insure accuracy.

Shaft centers can be obtained several different ways. The preferred method is to use the large digital calipers. You should measure from the top of the upper shaft to the bottom of the lower shaft. Make sure that no racks, keys, flats or other protrusions have affected your measurement.

The formula to determine the shaft center dimension is:

Measured dimension minus (the radius of the upper shaft plus the radius of the lower shaft). The sketch below illustrates how this calculation provides an accurate shaft center dimension.
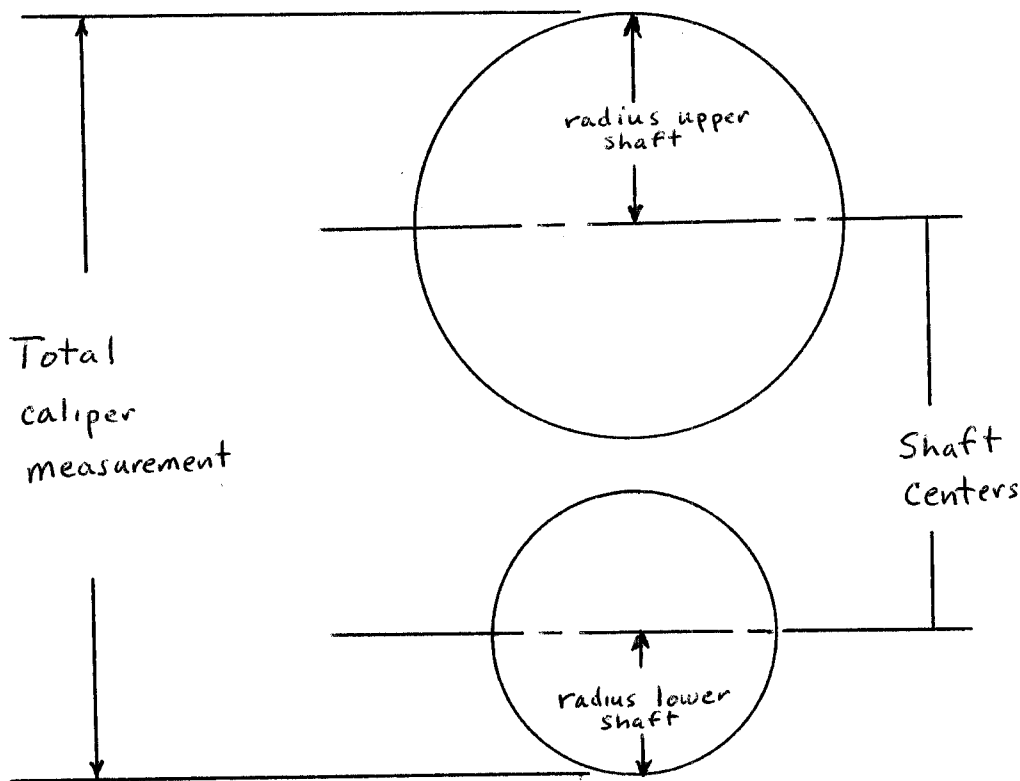
To insure accuracy, measurements should be taken at each end of the shafts and near their horizontal centers. Care must be taken to have the calipers square to the shafts and not tilted to a diagonal. It can be helpful to use the side of a collar to align the calipers. (It is imperative to describe the position of the shafts with each measurement provided. Examples are, shafts maximum open, minimum open, heads tangent, optimum scoring pressure etc.)

Everyone using the shaft center information must know why the information is being taken and provided. Each person is responsible to calculate the desired measurement and check or compare

it to corresponding data for its accuracy. **THIS MUST BE DONE BEFORE THE PROVIDER LEAVES THE PLANT.**

As an example, if the scoring heads measure 10.615" O.D. for both the upper and lower shafts, and the shaft centers were taken to see if this was the correct size for the machine, or to determine a proper sized corresponding trim knife, the two bits of information must confirm one another.

Suppose that the shaft center measurements indicated 10.750" c/c closed and 11.125" c/c open. Something is WRONG. The scorers could not possibly function with a 1/8" gap at the closest possible setting. The question then becomes which measurement is correct? All measurements must be retaken and this can only be done while at the machine.

If, for some reason, it is not possible to obtain shaft centers using the large calipers, a second, less desirable / less accurate method can be used. (This method can only be used if the upper and lower shafts are the same outer diameter.) The procedure is to wrap a flexible tape (inch increments) around both shafts. Provide this information to 1/32" (The locations and descriptive information should be the same as when using the digital caliper method.)

The formula to calculate the shaft centers is:

Total wrapped dimension minus the circumference of one shaft. Divide that number by 2. (The accuracy of this calculation is within 1/64") The sketch below illustrates how this calculation is determined.
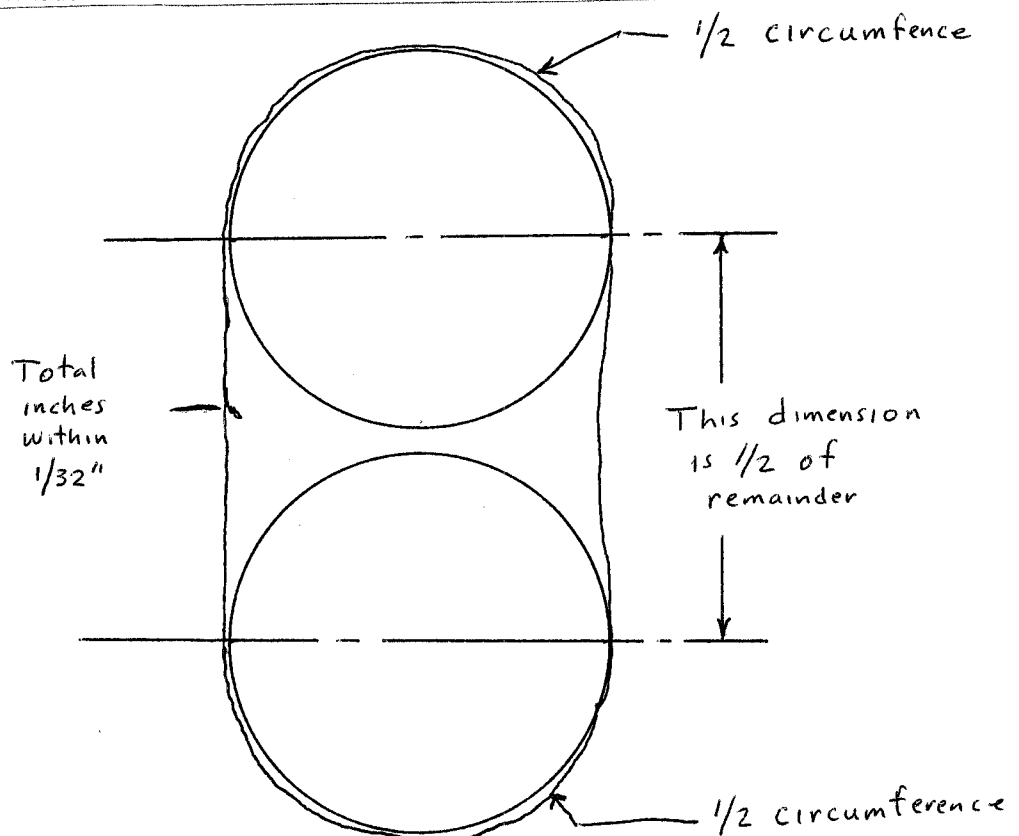
If there are any questions concerning the procedures, calculations, or various applications, please call Warren to discuss. It is imperative that we all understand not only how to do things, but also why they are being done.

11/6/06