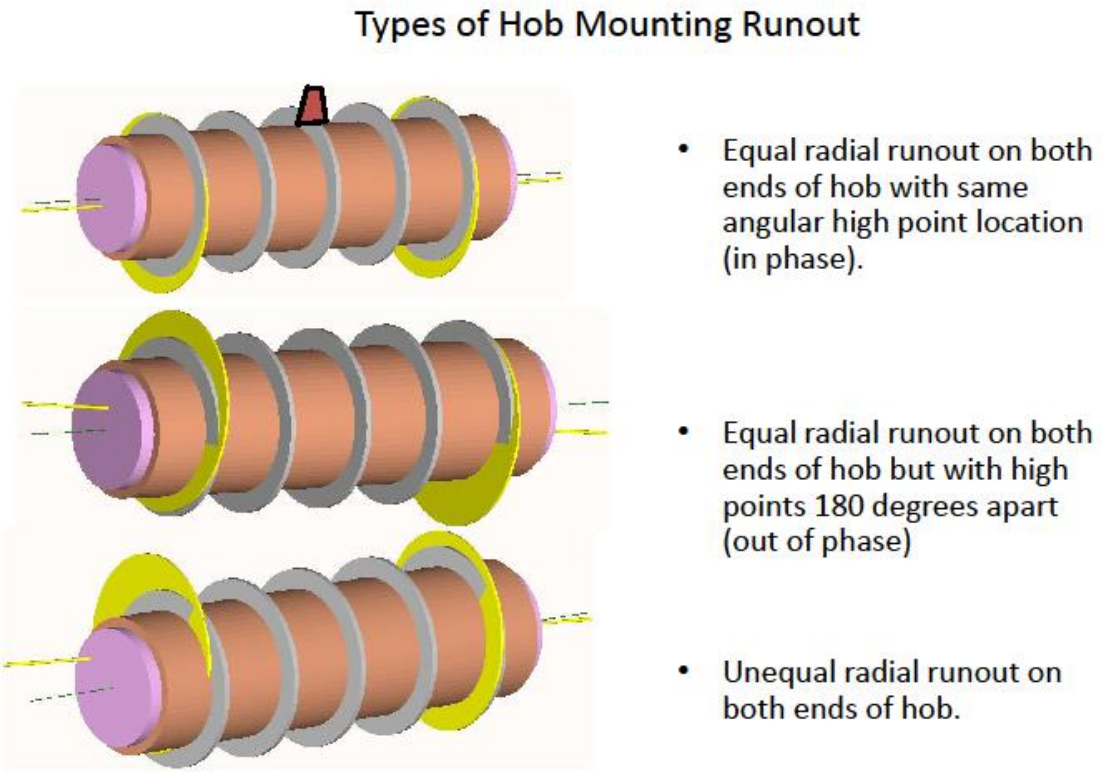
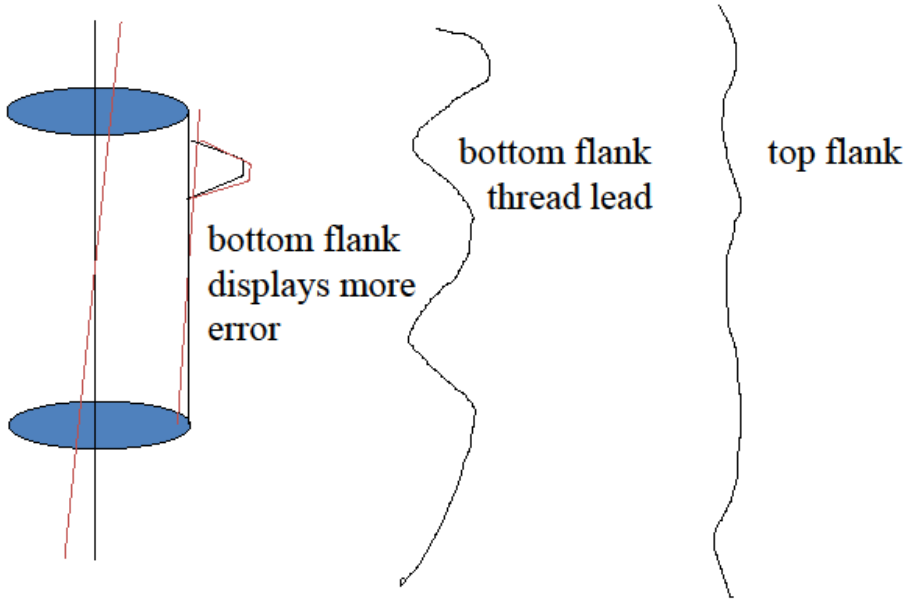
Indicate that hob! How to and why

Hobbing is a precision machining process. Small errors in setup can cause relatively large errors on the gear being cut. Accuracy requires close attention to setup. The time spent properly indicating and adjusting the hob to minimize runout pays off in more accurate gears.



Runout on either or both ends of a hob creates specific involute errors. Typically, a undulating wave pattern, reported on an inspection report as excessive FFα is an indication of hob runout. Equal runout on each end can be in phase or out of phase with each condition creating different error signatures. Unequal runout on both ends is also common.

Hob Runout - Influence on Hob Thread Lead



This is a typical result of a hob lead error where one flank appears significantly better than the other flank. This can be caused by out of phase mounting either at final grinding or at inspection. Note that because of the pressure angle the influence on one flank (top) may actually cancel the measured error while the bottom flank error is amplified.

You will need a dial indicator with a magnetic base capable of 0.001mm or 0.0001" resolution. Most NIDEC hobbing machines are equipped with a fixture mounted on the outside of the machine just for this purpose. Otherwise, a bench center fixture can be used.

With the hob mounted on the hob arbor, position the dial indicator contact point on the indicating band on the end of the hob. Zero out the dial and rotate the hob noting the T.I.R. (total indicated runout). If the value observed is greater than the recommended limit of 0.002mm, loosen the hob retaining nut, rotate the hob slightly and recheck the runout. Do this on both ends of the hob until the required runout is achieved. For best results, the ends should be in phase within 0.001mm.

For more information or to talk with our experts, contact NIDEC Machine Tool America at 248-669-6136. Be sure to visit our website at www.nidec-machinetoolamerica.com