Free-Flex® Pivots – Centershift

There are many topics and nuances associated with the Free-Flex® Pivot product line. A common topic is the phenomena of "center shift." Centershift is a kinematic property of pivots that expresses a movement of axes off-center from each other.

The body of the pivot is essentially a cylinder split in two halves which rotate relative to one another by bending crossed leaf springs. Shifting of the axes, referred to as centershift, is the result of this rotation between the two halves of a pivot is illustrated in the image and details below.

The magnitude of centershift is a function of the diameter of the pivot and the angle of operation. Larger diameter pivots move off-center further than smaller pivots at the same angle. For most applications, the maximum centershift is less than 0.0005 inches. Additionally, the highly repeatable nature of centershift allows the displacement to be calibrated out of some equipment.

Simple approximations for centershift are detailed on page 10 of Riverhawk's Engineering Data. Using the chart, the calculation is made by multiplying the

pivots diameter by the factor corresponding to the angle of deflection. More specific information including theoretical calculations are shown in the whitepaper “Considerations in the Application of Flexural Pivots.”