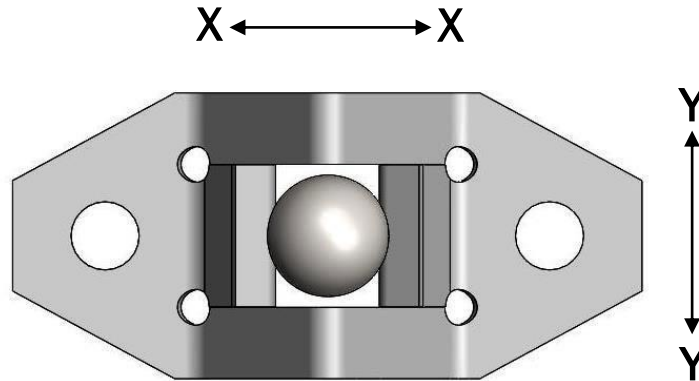


## Allowable Ball Stud and Clip Misalignment

The misalignment between a ball stud and clip can occur in two different directions, X-X and Y-Y, and each allowable tolerance must be evaluated differently.



Allowable misalignment in the X-X direction is subjective and more difficult to quantify as an excessively off-center position may change the pull-out tension of the ball stud but still be acceptable. The flexibility of the ball stud clip “ears” allow for a  $\pm 0.010$ ” standard manufacturing hole placement tolerance. Acceptability of further misalignment should be determined by testing in the application.

The Y-Y direction perpendicular to the long axis of the clip is more easily determined. The minimum opening width of a PENCOM ball stud clip is .21” and the maximum diameter of a ball stud .192”. Allowing for a small clearance of .001” per side between the ball stud and clip, the calculated theoretical misalignment tolerance is  $\pm 0.008$ ” from center.