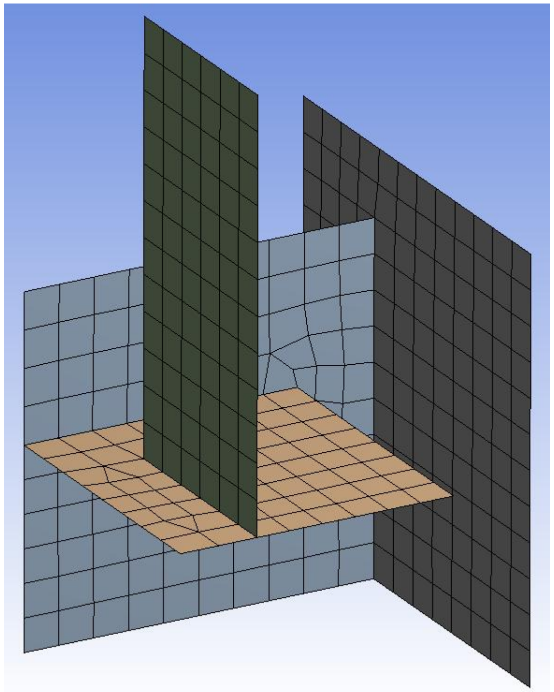
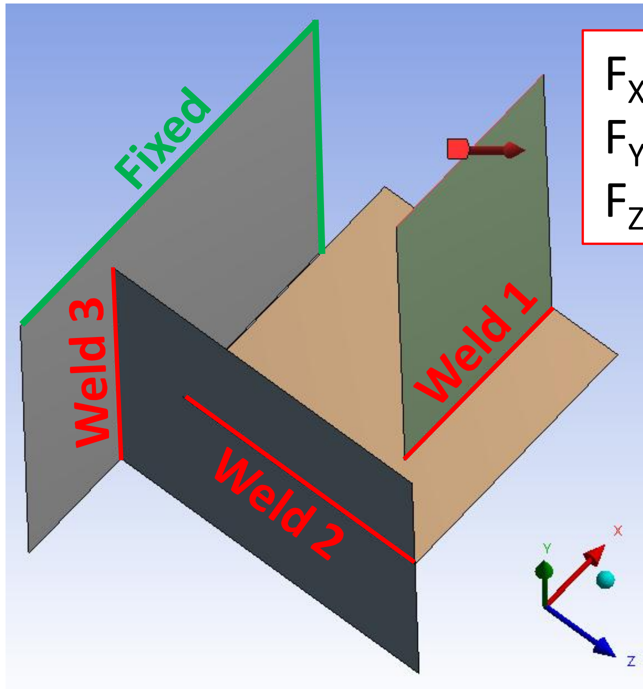
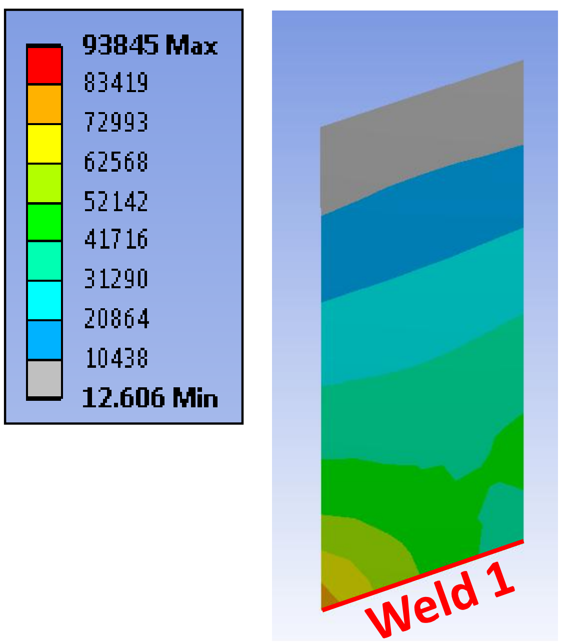




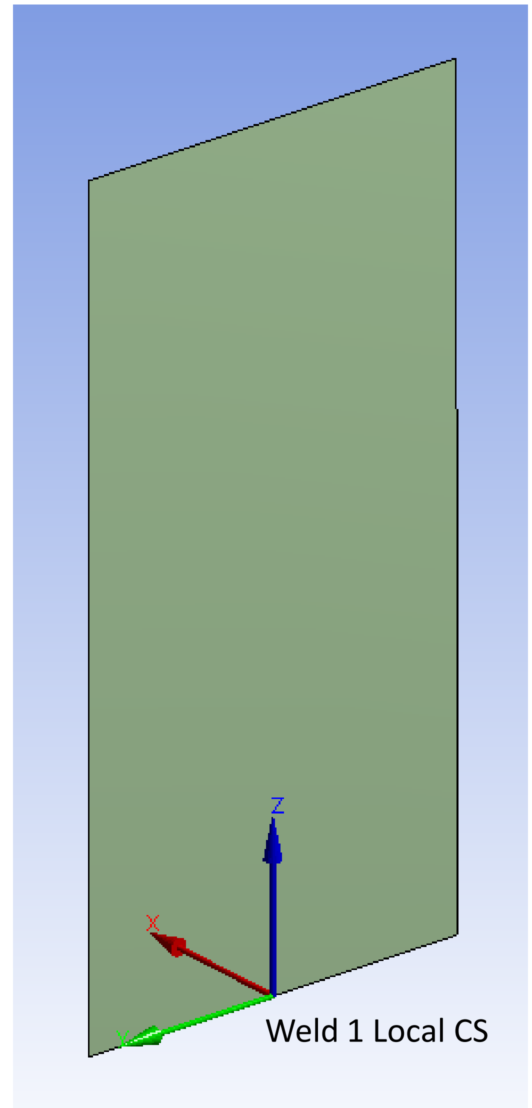
F_X = 100 lbs
F_Y = 200 lbs
F_Z = 300 lbs

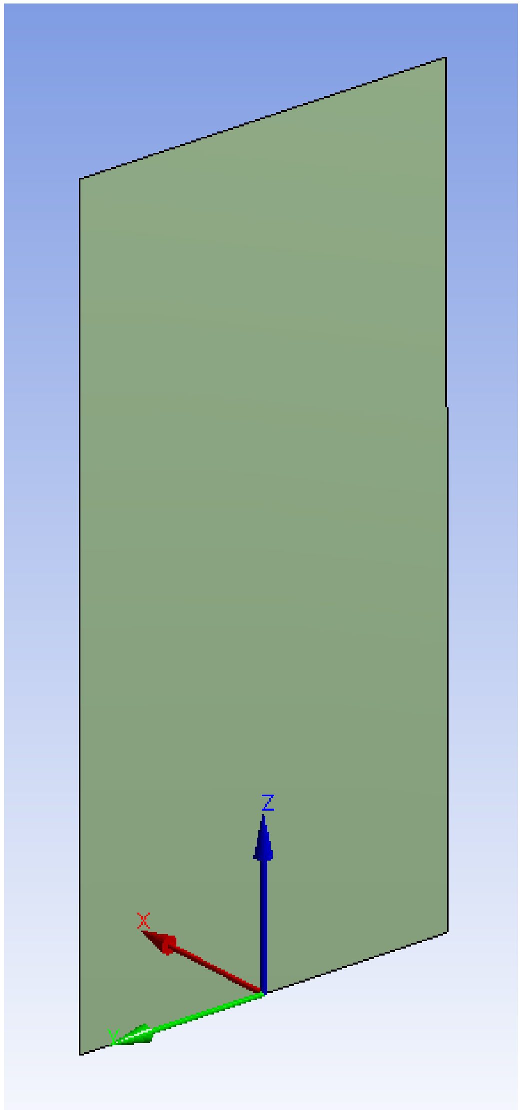


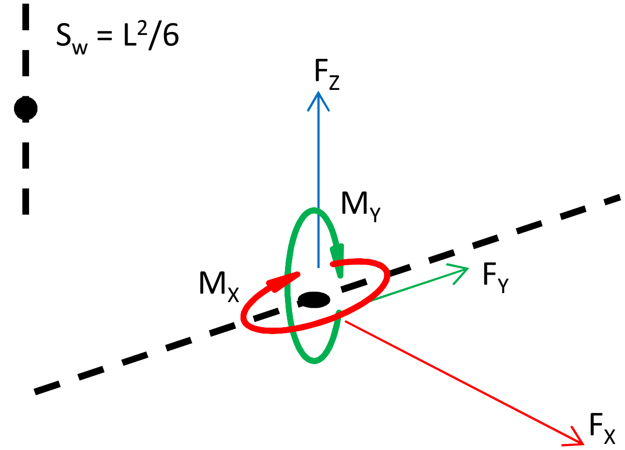
<u>From ANSYS:</u>

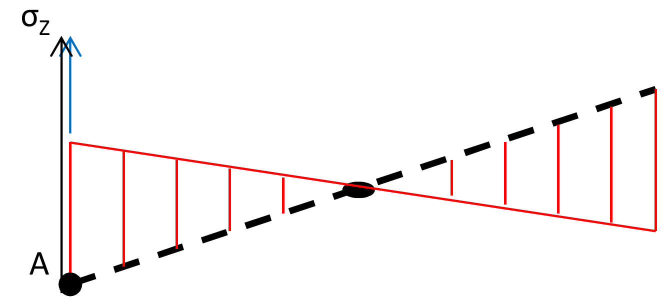
F_X = -300 lbs
F_Y = -100 lbs
F_Z = 200 lbs
M_X = 612.5 in-lbs
M_Y = -1837.5 in-lbs
M_Z = 0 in-lbs

Forces and moments probed from "Weld 1" about the local coordinate system.





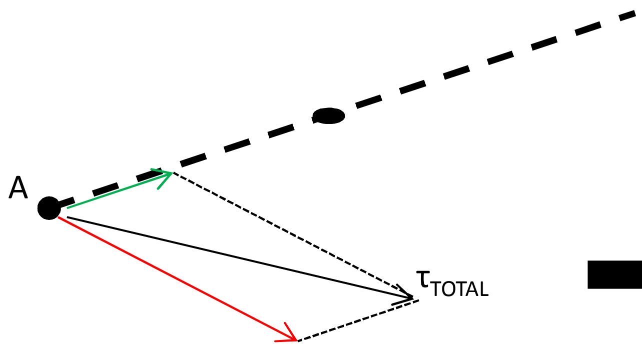




$\sigma_{BENDING, Z} = M_X/S_W$

$\sigma_{NORMAL, Z} = F_Z/L$

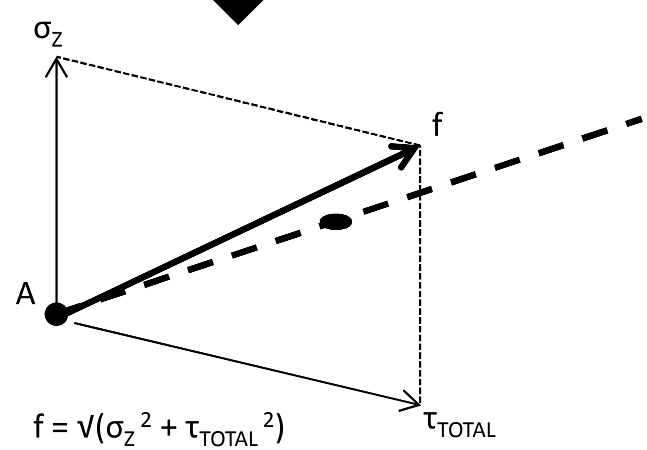
$\sigma_Z = |\sigma_{NORMAL, Z} + \sigma_{BENDING, Z}|$



$\tau_{LONGITUDINAL, Y} = F_Y/L$

$\tau_{TRANSVERSE, X} = F_X/L$

$\tau_{TOTAL} = \sqrt{(\tau_{LONGITUDINAL, Y}{}^2 + \tau_{TRANSVERSE, X}{}^2)}$



$f = \sqrt{(\sigma_Z{}^2 + \tau_{TOTAL}{}^2)}$

(Compare f to allowable f for weld size)

Notes:

If $M_z > 0$, then solve for torsional stress at point A and add to $\tau_{TRANSVERSE, X}$ as well.

M_Y not used in these calculations because the section modulus about Y-Y equals zero for a line.