11/4/2002

PROJECT: Precision Underwater Positioner

ENGINEER: M.Brown

Title: Angular motion requirement

UNITS: $kip \equiv 1000 \cdot lbf \quad ksi \equiv \frac{kip}{in^2} \quad psi \equiv \frac{lbf}{in^2} \quad k \equiv kip \quad ksf \equiv \frac{kip}{ft^2} \quad psf \equiv \frac{lbf}{ft^2} \quad pcf \equiv \frac{lbf}{ft^3} \quad plf \equiv \frac{lbf}{ft}$

PROPERTIES & ASSUMTIONS:

180 degrees = π radians

Angle at vertex $\theta := .01 \cdot deg$

$\theta = 1.745 \times 10^{-4}\, rad$

Radius to laser endpoint L1 = R $r := 11.5 \cdot in$

$r_1 := 16 \cdot in$

One radian = deg $rad = 57.296\, deg$

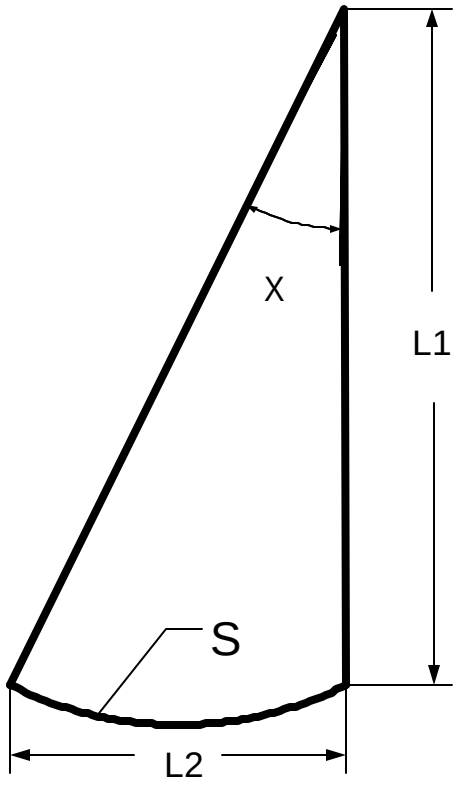
One degree - rad $deg = 0.017\, rad$

CALCULATION:

Arc Length = S & S_1

$S := \theta \cdot r \qquad S_1 := \theta \cdot r_1$

$S = 2.007 \times 10^{-3}\, in \qquad S_1 = 2.793 \times 10^{-3}\, in$



(Alternate check @ arc length = .002 inch)

$S_2 := .002 \cdot in$

$\theta_2 := \frac{S_2}{r} \qquad S_2 := \theta_2 \cdot r$

$\theta_2 = 1.739 \times 10^{-4}\, rad$

$\theta_2 = 9.964 \times 10^{-3}\, deg$

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