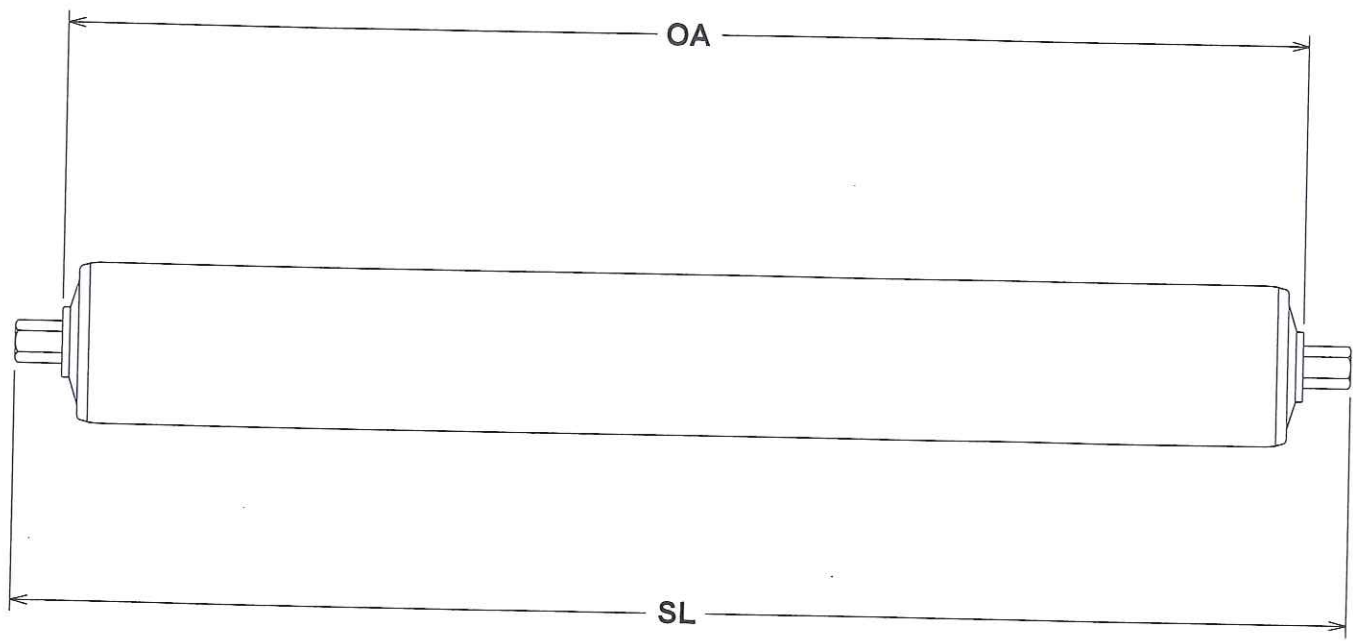


Drawing Based on Overall Roller Length



Starting Torque Calculations

$$F_{start} = W * \sin 4^\circ$$

$$F_{start} = 3lb * \sin 4^\circ$$

$$F_{start} = .157lb$$

$$F_{start_{roll}} = \frac{.157lb}{6rolls}$$

$$F_{start_{roll}} = .026lb$$

$$F_{start_{roll}} = \frac{Torque_{start}}{radius}$$

$$F_{start_{roll}} = \frac{T_0}{.95in}$$

$$T_0 = .026 * .95$$

$$T_0 = .025 \text{ in} - lb$$

