technical proof

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TP A.25

The relationship between spin-rate-factor and percent-English

supporting:
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Refer to the drawings in TP A.12 and A.22 for an illustration of the variables.

From TP A.12, defining the "natural roll" rate as ω_r = v/R, the spin rate factor (SRF) is defined by:

$$SRF = \frac{\omega}{\omega_r} = \frac{5}{2}\left(\frac{x}{R}\right) \qquad R := \frac{2.25 \cdot in}{2} \qquad SRF(x) := \frac{5}{2}\cdot\frac{x}{R}$$

From TP A.22, the maximum recommended tip offset for maximum English is x = R/2, and the percentage English (PE) is defined by:

$$PE = 2\left(\frac{x}{R}\right)\cdot 100\% \qquad PE(x) := 2\left(\frac{x}{R}\right)\cdot 100\%$$

Therefore, SRF and PE are related by:

$$PE = \frac{4}{5}\cdot SRF \cdot 100\% \qquad SRF = \frac{5}{4}\cdot\frac{PE}{100\%}$$

At the maximum recommended tip offset:

$$x := \frac{R}{2} \qquad PE(x) = 100\,\% \qquad SRF(x) = 1.25$$