

According To Joe

$$\sqrt{T_{SCOMB}} = TS_1 + TS_2$$

$$W_{FCOMB} = (TS_1 + TS_2) * \frac{(K_1 * K_2)}{K_1 + K_2} \quad \checkmark$$

$$K_1 = \frac{W_{F1}}{TS_1}$$

$$K_2 = \frac{W_{F2}/6h}{TS_2/6h}$$

My derivation

BB w/ GR for motor match is motor 2

$$\left(\frac{-TS_1}{W_{F1}} \right) W + TS_1 + \left(\frac{-TS_2}{W_{F2}} \right) W + TS_2$$

$$\left(\frac{-TS_1}{W_{F1}} - \frac{TS_2}{W_{F2}} \right) W + \overbrace{TS_1 + TS_2}^{T_{SCOMB}} \quad \checkmark$$

$$- \left(\frac{TS_1}{W_{F1}} + \frac{TS_2}{W_{F2}} \cdot \frac{W_{F1}}{W_{F2}} \right) \rightarrow - \left(\frac{TS_1 + TS_2 \cdot \frac{W_{F1}}{W_{F2}}}{W_{F1}} \right)$$

$$\frac{T_{S1} + T_{S2} \cdot \frac{WF1}{WF2}}{WF1}$$

WF1

$$(T_{S1} + T_{S2}) \left\{ \frac{WF1 \cdot WF2}{T_{S1} \cdot T_{S2}} \right\} = T_{S1} + T_{S2} \cdot \frac{WF1}{WF2}$$

$$= T_{S1} + T_{S2} \cdot \frac{WF1}{WF2}$$

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$$\begin{matrix} 8 & 4 \\ (6+2) & (1+3) \end{matrix}$$

$$6 \cdot 1 + 6 \cdot 3 + 2 \cdot 1 + 2 \cdot 3$$

$$\begin{matrix} 6 & 18 & 2 & 6 \end{matrix}$$

$$T_{S1} \cdot A + T_{S1} \cdot B + T_{S2} \cdot A + T_{S2} \cdot B = T_{S1} + T_{S2} \cdot \frac{WF1}{WF2}$$

$$T_{S2}(A+B) \Rightarrow A+B = \frac{WF1}{WF2}$$

$$T_{S1}(A+B) \Rightarrow A+B =$$

$$\bar{T} = m \cdot w + b$$

$$m = -T_s/w_f$$

$$b = T_s$$

$$\text{Joe's slope} \rightarrow m = -\frac{(\bar{T}_{s1} + \bar{T}_{s2})}{(\bar{T}_{s1} + \bar{T}_{s2}) \left(\frac{k_1 \cdot k_2}{k_1 + k_2} \right)}$$

$$m = -\frac{k_1 + k_2}{k_1 \cdot k_2}$$

$$M_q \text{ slope} = \frac{\bar{T}_{s1} + \bar{T}_{s2}}{w_{f1} \cdot w_{f2}} \rightarrow \frac{\bar{T}_{s1} \cdot w_{f2} \cdot \cancel{w_{f1}}}{\cancel{w_{f1}} \cdot w_{f2} \cdot w_{f1}} + \frac{\bar{T}_{s2}}{w_{f2}} \cdot \frac{\cancel{w_{f2}} \cdot w_{f1}}{w_{f2} \cdot w_{f1}}$$

$$\rightarrow \frac{\bar{T}_{s1} \cdot w_{f2} + \bar{T}_{s2} \cdot w_{f1}}{w_{f2} \cdot w_{f1}}$$

$$k_1 \cdot k_2 = w_{f2} \cdot w_{f1}$$

$$k_1 + k_2 = \bar{T}_{s1} \cdot w_{f2} + \bar{T}_{s2} \cdot w_{f1}$$

$$k_1 = \frac{w_{f1} \cdot w_{f2}}{k_2}$$

$$\frac{w_{f1} \cdot w_{f2}}{k_2} + k_2 = \bar{T}_{s1} \cdot w_{f2} + \bar{T}_{s2} \cdot w_{f1}$$

$$k_2^2 = \bar{T}_{s1} \cdot w_{f2} k_2 + \bar{T}_{s2} \cdot w_{f1} k_2 - w_{f1} \cdot w_{f2}$$

$$k_2^2 - (\bar{T}_{s1} \cdot w_{f2} + \bar{T}_{s2} \cdot w_{f1}) k_2 + w_{f1} \cdot w_{f2} = 0$$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{\bar{T}_{s1} \cdot w_{f2} + \bar{T}_{s2} \cdot w_{f1} \pm \sqrt{(\bar{T}_{s1} \cdot w_{f2} + \bar{T}_{s2} \cdot w_{f1})^2 - 4 \cdot w_{f1} \cdot w_{f2}}}{2}$$

3-0235 — 50 SHEETS — 5 SQUARES
3-0236 — 100 SHEETS — 5 SQUARES
3-0237 — 200 SHEETS — 5 SQUARES
3-0137 — 200 SHEETS — FILLER

COMET

$$\text{My slope} = - \left(\frac{T_{S1} \cdot w_{f2} + T_{S2} \cdot w_{f1}}{w_{f2} \cdot w_{f1}} \right)$$

$$\text{Joe's slope} = \left(\frac{-K_1 + K_2}{K_1 \cdot K_2} \right) \rightarrow K_1 = \frac{w_{f1}}{T_{S1}} \quad K_2 = \frac{w_{f2}}{T_{S2}}$$

$$= \left(\frac{\left(\frac{w_{f1}}{T_{S1}} + \frac{w_{f2}}{T_{S2}} \right) (T_{S1} \cdot T_{S2})}{w_{f1} \cdot w_{f2}} \right)$$

$$= \frac{\frac{w_{f1} \cdot T_{S2}}{T_{S1}} + \frac{w_{f2} \cdot T_{S1}}{T_{S2}}}{w_{f1} \cdot w_{f2}}$$

$$= \frac{w_{f1} \cdot T_{S2} + w_{f2} \cdot T_{S1}}{w_{f1} \cdot w_{f2}}$$

They match!

$$\frac{T_{S1} + T_{S2} \cdot \frac{w_{f1}}{w_{f2}}}{w_{f1}} \rightarrow (T_{S1} + T_{S2}) \cdot \frac{A \cdot B}{A + B}$$

$$\frac{T_{S1}}{w_{f1}} + \frac{T_{S2}}{w_{f2}}$$

$$\frac{T_{S1} \cdot A \cdot B}{A + B} + \frac{T_{S2} \cdot A \cdot B}{A + B}$$

$$\frac{w_{f1} \cdot w_{f2}}{T_{S1} \cdot T_{S2}}$$

$$\frac{w_{f1} \cdot w_{f2}}{T_{S1} \cdot T_{S2}}$$

$$\left(\frac{w_{f1}}{T_{S1}} + \frac{w_{f2}}{T_{S2}} \right) \cdot \frac{T_{S1} \cdot T_{S2}}{T_{S1} \cdot T_{S2}} \rightarrow \frac{w_{f1} T_{S2} + w_{f2} T_{S1}}{T_{S1} \cdot T_{S2}}$$

$$\frac{w_{f1} \cdot w_{f2}}{w_{f1} T_{S2} + w_{f2} T_{S1}} \cdot (T_{S1} + T_{S2})$$

$$TS1 \cdot wf2 + TS2 \cdot wf1 + \sqrt{(-TS1 \cdot wf2 - TS2 \cdot wf1)^2 - 4(1) \cdot wf1 \cdot wf2}$$

$$2(1)(wf1 \cdot wf2)$$

$$\sqrt{+TS1^2 wf2^2 + TS1 \cdot wf2 \cdot TS2 \cdot wf1 + TS2^2 \cdot wf1^2 - 4wf1 \cdot wf2}$$

$$TS1^2 \cdot wf2^2 + (TS1 \cdot TS2 - 4) wf1 \cdot wf2 + TS2^2 \cdot wf1^2$$

$$(TS1 + wf2)^2 (TS2 + wf1)^2$$

TSB