

$$\tan \alpha_1 + \tan \alpha_2 = W \quad , \text{ and} \quad \tan \alpha_1 = \frac{V_1}{H_1} \quad , \text{ and} \quad \tan \alpha_2 = \frac{V_2}{H_2}$$

$$\text{so: } \frac{V_1}{H_1} + \frac{V_2}{H_2} = W$$

$$\text{Now, } \left(\frac{V_1}{H_1} = F_1^V \right)$$

and

$$\left(\frac{V_2}{H_2} = F_2^V \right)$$

$$\boxed{\frac{V_1}{H_1} + \frac{V_2}{H_2} = W \quad || \quad \frac{V_1}{H_1} = F_1^V}$$

$$\boxed{\frac{V_1}{H_1} + \frac{V_2}{H_2} = W \quad || \quad \frac{V_2}{H_2} = F_2^V}$$

$$\frac{\frac{V_1}{H_1} + \frac{V_2}{H_2}}{W} = \frac{\frac{V_1}{H_1}}{F_1^V}$$

$$\frac{\frac{V_1}{H_1} + \frac{V_2}{H_2}}{W} = \frac{\frac{V_2}{H_2}}{F_2^V}$$

$$F_1^V = \frac{W \cdot \frac{V_1}{H_1}}{\frac{V_1 \cdot H_2 + V_2 \cdot H_1}{H_1 \cdot H_2}}$$

$$F_2^V = \frac{W \cdot \frac{V_2}{H_2}}{\frac{V_1 \cdot H_2 + V_2 \cdot H_1}{H_1 \cdot H_2}}$$

$$F_1^V = \frac{W \cdot V_1 \cdot H_1 \cdot H_2}{H_1 \cdot (V_1 \cdot H_2 + V_2 \cdot H_1)}$$

$$F_2^V = \frac{W \cdot V_2 \cdot H_1 \cdot H_2}{H_2 \cdot (V_1 \cdot H_2 + V_2 \cdot H_1)}$$

$$\boxed{F_1^V = \frac{W \cdot V_1 \cdot H_2}{V_1 \cdot H_2 + V_2 \cdot H_1}}$$

$$\boxed{F_2^V = \frac{W \cdot V_2 \cdot H_1}{V_1 \cdot H_2 + V_2 \cdot H_1}}$$

Now,

$$\frac{V_1}{F_1^V} = \frac{D_1}{F_1^D} \quad \Rightarrow \quad F_1^D = \frac{D_1 \cdot F_1^V}{V_1}$$

$$\frac{V_2}{F_2^V} = \frac{D_2}{F_2^D} \quad \Rightarrow \quad F_2^D = \frac{D_2 \cdot F_2^V}{V_2}$$

$$F_1^D = \frac{D_1 \cdot \frac{W \cdot V_1 \cdot H_2}{V_1 \cdot H_2 + V_2 \cdot H_1}}{V_1}$$

$$F_2^D = \frac{D_2 \cdot \frac{W \cdot V_2 \cdot H_1}{V_1 \cdot H_2 + V_2 \cdot H_1}}{V_2}$$

$$F_1^D = \frac{D_1 \cdot W \cdot V_1 \cdot H_2}{V_1 \cdot (V_1 \cdot H_2 + V_2 \cdot H_1)}$$

$$F_2^D = \frac{D_2 \cdot W \cdot V_2 \cdot H_1}{V_2 \cdot (V_1 \cdot H_2 + V_2 \cdot H_1)}$$

$$\boxed{F_1^D = \frac{W \cdot D_1 \cdot H_2}{V_1 \cdot H_2 + V_2 \cdot H_1}}$$

$$\boxed{F_2^D = \frac{W \cdot D_2 \cdot H_1}{V_1 \cdot H_2 + V_2 \cdot H_1}}$$

and,

$$\frac{V_1}{F_1^V} = \frac{H_1}{F_1^H} \quad \Rightarrow \quad F_1^H = \frac{H_1 \cdot F_1^V}{V_1}$$

$$\frac{V_2}{F_2^V} = \frac{H_2}{F_2^H} \quad \Rightarrow \quad F_2^H = \frac{H_2 \cdot F_2^V}{V_2}$$

$$F_1^H = \frac{H_1 \cdot \frac{W \cdot V_1 \cdot H_2}{V_1 \cdot H_2 + V_2 \cdot H_1}}{V_1}$$

$$F_2^H = \frac{H_2 \cdot \frac{W \cdot V_2 \cdot H_1}{V_1 \cdot H_2 + V_2 \cdot H_1}}{V_2}$$

$$F_1^H = \frac{H_1 \cdot W \cdot V_1 \cdot H_2}{V_1 \cdot (V_1 \cdot H_2 + V_2 \cdot H_1)}$$

$$F_2^H = \frac{H_2 \cdot W \cdot V_2 \cdot H_1}{V_2 \cdot (V_1 \cdot H_2 + V_2 \cdot H_1)}$$

$$\boxed{F_1^H = \frac{W \cdot H_1 \cdot H_2}{V_1 \cdot H_2 + V_2 \cdot H_1}}$$

$$\boxed{F_2^H = \frac{W \cdot H_1 \cdot H_2}{V_1 \cdot H_2 + V_2 \cdot H_1}}$$