

ERRATA: Airplane Design Part VI

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 (Errata Revised June 19, 2018)

Please check the website www.darcorp.com for updated errata

- page 28, Line 3* Should read ‘ ε_t = wing twist angle in radians, positive for wash-in ...’
- page 73, Line 23* Should read ‘Figure 4.36 illustrates two possibilities. $\varepsilon_n > 0$ for upwash and $\varepsilon_n < 0$ for downwash.’
- page 88, Figure 4.52* ‘ $\frac{b_f}{b}$ ’, should be ‘ $\frac{b_{fo}}{b}$ ’,
- page 89, Figure 4.53* Add $\frac{b_{fi}}{b} = 0.6$ to bottom graph margin
- page 97, Figure 4.60* Horizontal axis title should read ‘TAKE-OFF WEIGHT ~ $W_{TO}/1,000$ ’
- page 104, Line 25* ‘inremental’ should be ‘incremental’
- page 115, Equation (4.88)* Should read: $C_{f_{wlam}} = \frac{1.328}{\left(R_{N_{wlam}}\right)^{1/2}}$
- page 115, Equation (4.90)* Should read: $C_{f_{fuslam}} = \frac{1.328}{\left(R_{N_{fuslam}}\right)^{1/2}}$
- page 146, Line 22* ‘form’ should be ‘from’
- page 200, Figure 6.38* Vertical axis units should be in 1,000 lb
- page 205, Line 9* Should read
- | | | | | | |
|---|-----|-----|-----|-----|-----|
| ‘ SHP_{av} | 285 | 248 | 206 | 172 | 140 |
| $\left(SHP_{av} \eta_{inl/inc} - P_{extr}\right)$ | 275 | 239 | 198 | 165 | 133 |

P_{av}

242 210 174 145 117'

page 212, Figure 7.5

Vertical axis units should be in 1,000 lb

page 224, Figure 8.9

'NACA 63-005' should be 'NACA 63-006'

page 229, Equation (8.7)

Should read:

$$\Delta c_l = \eta_1 \left(c_{l\delta_{f1}} \right) (\delta_{f1}) \left\{ \frac{(c+c_1)}{c} \right\} + \eta_2 \left(c_{l\delta_{f2}} \right) (\delta_{f1} + \delta_{f2}) \left(\frac{c'}{c} \right)$$

page 236 Figure 8.26

Vertical axis values should be negative

page 239, Equation (8.19)

Should read: $\Delta c_{l_{\max}} = \left(c_{l\delta_{\max}} \right) \eta_{\max} \delta_f \eta_\delta \left(\frac{c'}{c} \right)$

page 259, Line 9

Should read '... leading edge flaps at $\alpha = 0$ may be estimated from:'

page 269, Equation (8.37)

Should read:

$$\eta_h = 1 - \left[\left\{ \cos^2 \left(\frac{\pi z_{h_{wake}}}{2 \Delta z_{wake}} \right) \right\} \left\{ 2.42 \sqrt{C_{D_{ow}}} \right\} / \frac{x_{h_{wake}}}{\bar{c}} + 0.30 \right]$$

page 269, Line 23

Should read

'where: $z_{h_{wake}} = a \sin(\gamma_h - \alpha - i_w + \varepsilon_h)$ (8.38a)

$x_{h_{wake}} = a \cos(\gamma_h - \alpha - i_w + \varepsilon_h)$ (8.38b)

with $a, \gamma_h, \varepsilon_h, i_w$ and α shown in Fig. 8.63.'

page 269, Equation (8.39)

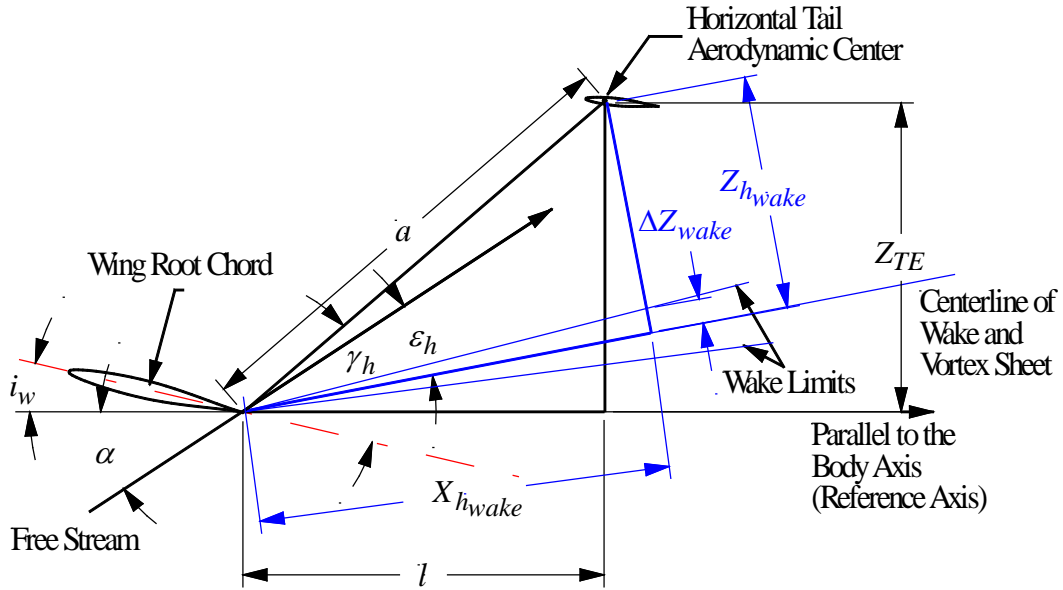
Should read: $\varepsilon_h = \varepsilon_{h_0} + \left(\frac{d\varepsilon_h}{d\alpha} \right)_{p.off} \alpha$

page 269, Equation (8.40)

$$\Delta z_{wake} = 0.68 \bar{c} \sqrt{C_{D_{ow}} \left(\frac{x_{h_{wake}}}{\bar{c}} + 0.15 \right)}$$

page 270, Figure 8.63

Should be



page 272, Equation (8.48)

Should read:
$$K_h = \frac{\left(1 - \left|\frac{h_h}{b}\right|\right)}{\left(\frac{2l_h}{b}\right)^{1/3}}$$

page 273, Figure 8.65c

' K_H ' should be ' K_h '

page 273, Figure 8.65c

' $\frac{2h_H}{b}$ ' should be ' $\frac{2h_h}{b}$ '

page 273, Figure 8.65c

' $\frac{2l_H}{b}$ ' should be ' $\frac{2l_h}{b}$ '

page 273, Figure 8.65c

' $K_H = \frac{1 - \frac{h_H}{b}}{\sqrt[3]{\frac{2l_H}{b}}}$ ' should be ' $K_h = \frac{1 - \left|\frac{h_h}{b}\right|}{\sqrt[3]{\frac{2l_h}{b}}}$ '

page 281, Equation (8.55)

Should read:

$$\Delta\alpha_g = -F_{tv} \left\{ \left(\frac{9.12}{A} \right) + 7.16 \left(\frac{c_r}{b} \right) \right\} (C_{L_{wf}}) +$$

$$- \left\{ \frac{A}{(2C_{L_{\alpha_{wf}}})} \right\} \left(\frac{c_r}{b} \right) \left\{ \left(\frac{L}{L_o} \right) - 1 \right\} (C_{L_{wf}}) r_g +$$

$$- \left\{ \frac{\left(\frac{\delta_f}{50} \right)^2}{(C_{L_{\alpha_{wf}}})} \right\} \Delta(\Delta C_L)_f$$

page 342, Equation (8.108)

Should read:

$$(dC_m/dC_L)_N = \sum_{i=1}^{i=n} \left[\frac{\left\{ (dC_N/d\alpha)_{P_i} (d\bar{\varepsilon}_{P_i}/d\alpha) (l_{P_i}) \left(\frac{\pi}{4} \right) (D_{P_i})^2 \right\}}{S\bar{c}C_{L_{\alpha_w}}} \right]$$

page 357, Table 9.1

Third row, second column '0.8' should be '-0.8'

page 390, Figure 10.16

' z_h = vertical distance...' should be ' z_h = vertical distance between the horizontal tail aerodynamic center to the fuselage center line'

page 398, Equation (10.44)

Should read:

$$C_{nT\beta} = - \sum_{i=1}^{i=n} \left[\frac{\left\{ \left(\frac{dC_N}{d\alpha} \right)_{P_i} \left(\frac{\pi}{4} \right) (D_{P_i})^2 (l_{P_i}) \right\}}{Sb} \right]$$

page 401, Line 19

Should read 'where: $\sigma_{\beta\alpha}$ is the sidewash contribution due to angle of attack, in deg^{-1} . It is found from Figures 10.30.'

page 401, Line 21

Should read ' α_f is the angle of attack of the fuselage, in deg .'

- page 401, Line 22* Should read ‘ $\sigma_{\beta_{\Gamma}}$ is the sidewash contribution due to wing dihedral, in deg^{-1} . It is found from Figures 10.31.’
- page 401, Line 24* Should read ‘ Γ is the wing dihedral angle, in deg , as defined in Figure 10.7.’
- page 401, Line 26* Should read ‘ $\sigma_{\beta_{\varepsilon_t}}$ is the sidewash contribution due to wing twist, in deg^{-1} , as obtained from Figures 10.32.’
- page 401, Line 28* Should read ‘ ε_t is the wing twist angle, in deg , as shown in Figure 10.26.’
- page 421, Equation (10.60)* Should read:
- $$C_{l_{P_v}} = \frac{2}{b_w^2} \left[(z_v \cos \alpha - l_v \sin \alpha) \left[(z_v \cos \alpha - l_v \sin \alpha) - (Z_{ac_v} - Z_{cg}) \right] \right] C_{y\beta_v}$$
- page 421, Line 14* Should read ‘where: z_v and l_v are defined in Figure 10.27’
- page 430, Figure 10.42* Vertical axis values should be divided by -4
- page 435, Equation (10.89)* Should read: $C_{D_{i_h}} = \frac{2C_{L_o}}{\pi A e} C_{L\alpha_h} \eta_h \frac{S_h}{S}$
- page 435, Line 36* Should read ‘where: C_{L_o} is the airplane zero-angle-of-attack lift coefficient follows from Eqn. (10.90).’
- page 436, Equation (10.90)* Should read:
- $$C_{L_o} = C_{L_{o_{wf}}} + C_{L\alpha_h} \eta_h (S_h/S) (-\alpha_{o_{L_h}} - \varepsilon_{o_h}) + C_{L\alpha_c} \eta_c (S_c/S) (-\alpha_{o_{L_c}} - \varepsilon_{o_c})$$
- page 436, Line 3-7* Remove Line 3-7
- page 439, Equation (10.97)* Should read: $C_{D_{i_c}} = \frac{2C_{L_o}}{\pi A e} C_{L\alpha_c} \eta_c \frac{S_c}{S}$
- page 439, Line 5* Should read ‘where: C_{L_o} is the airplane zero-angle-of-attack lift coefficient follows from Eqn. (10.98).’

page 439, Equation (10.98)

Should read:

$$C_{L_o} = C_{L_{o_{wf}}} + C_{L_{\alpha_h}} \eta_h (S_h/S) (-\alpha_{o_{L_h}} - \varepsilon_{o_h}) + \\ + C_{L_{\alpha_c}} \eta_c (S_c/S) (-\alpha_{o_{L_c}} - \varepsilon_{o_c})$$

page 439, Line 8-12

Remove Line 8-12

page 461, Line 10

Following Line 10, should read 'For single vertical tail:

$$C_{y_{\delta_r}} = K_b C_{L_{\alpha_v}} \frac{S_v}{S} \left\{ \frac{c_{l_{\delta}}}{(c_{l_{\delta}})_{theory}} \right\} (c_{l_{\delta}})_{theory} \left(\frac{k'}{c_{l_{\alpha_v}}} \right) \left\{ \frac{(\alpha_{\delta})_{C_L}}{(\alpha_{\delta})_{c_l}} \right\} \eta_v \quad (10.123a)'$$

page 461, Line 19

Following Line 19, should read 'For twin vertical tail:

$$C_{y_{\delta_r}} = 2 \left(\frac{C_{y_{\beta_v(wfh)}}}{C_{y_{\beta_{veff}}}} \right) K_b C_{L_{\alpha_v}} \frac{S_v}{S} \left\{ \frac{c_{l_{\delta}}}{(c_{l_{\delta}})_{theory}} \right\} (c_{l_{\delta}})_{theory} \left(\frac{k'}{c_{l_{\alpha_v}}} \right) \left\{ \frac{(\alpha_{\delta})_{C_L}}{(\alpha_{\delta})_{c_l}} \right\} \eta_v \quad (10.123b)$$

Where: $\left(\frac{C_{y_{\beta_v(wfh)}}}{C_{y_{\beta_{veff}}}} \right)$ is found from Figure 10.17'

page 486, Equation (10.149)

Should read: $(c^t_{h_{\delta}})_{\alpha, \delta_t} = \dots$

page 509, Line 20

Should read 'Note: These books are all published by:
Design, Analysis and Research Corporation, 1440
Wakarusa Drive, Suite 500, Lawrence, KS, 66049. Tel.
(785) 832-0434'