Design, Analysis and Research Corporation (DARcorporation)

ERRATA: Airplane Design Part VI

Year of Print, 2000
(Errata Revised August 9, 2022)

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 '$\frac{b_{f_o}}{b}$'
page 89, Figure 4.53	Add $\frac{b_{f_i}}{b} = 0.6$ to bottom graph margin
page 97, Figure 4.60	Horizontal axis title should read 'TAKE-OFF WEIGHT $\sim W_{TO}/1{,}000$'
page 104, Line 25	'inremental' should be 'incremental'
page 115, Equation (4.88)	Should read: $C_{f_{w_{lam}}} = \frac{1.328}{\left(R_{N_{w_{lam}}}\right)^{1/2}}$
page 115, Equation (4.90)	Should read: $C_{f_{fus_{lam}}} = \frac{1.328}{\left(R_{N_{fus_{lam}}}\right)^{1/2}}$
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:

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

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:

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

page 269, Line 23 Should read

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

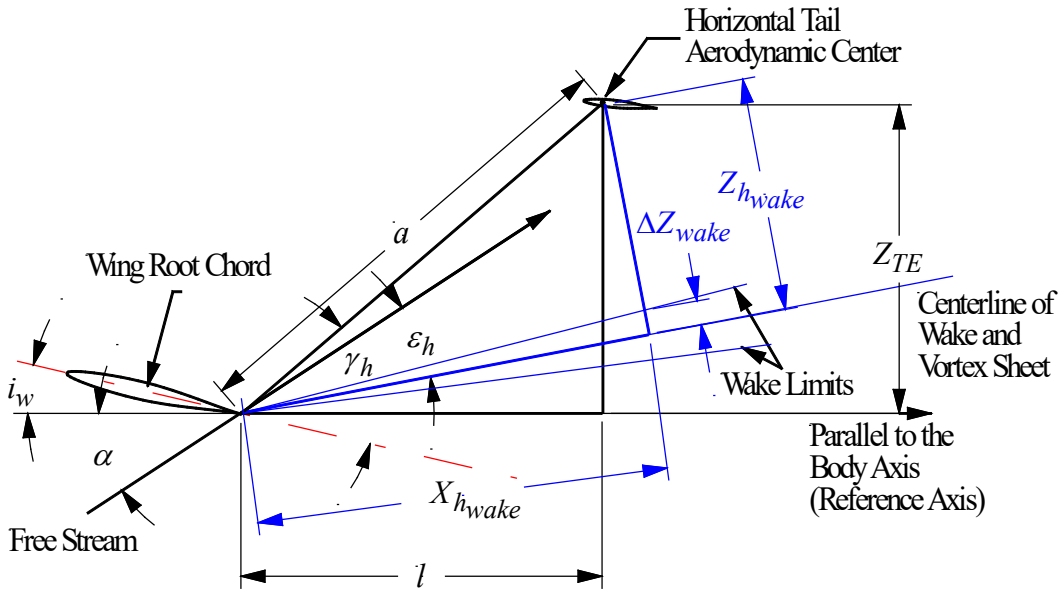
$x_{h_{wake}} = a \cos\left(\gamma_h - \alpha - i_w + \varepsilon_h \right)$ (8.38b)

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

page 269, Equation (8.39) Should read: $\varepsilon_h = \varepsilon_{h_o} + \left(\frac{d\varepsilon_h}{d\alpha} \right)_{p.\,off} \alpha$

page 269, Equation (8.40) $\Delta z_{wake} = 0.68 \overline{c} \sqrt{C_{D_{o_w}} \left(\frac{x_{h_{wake}}}{\overline{c}} + 0.15 \right)}$

page 270, Figure 8.63 Should be



page 272, Equation (8.48) Should read: $K_h = \dfrac{\left(1 - \left|\dfrac{h_h}{b}\right|\right)}{\left(\dfrac{2l_h}{b}\right)^{1/3}}$

page 273, Figure 8.65c ‘ K_H ’should be ‘ K_h ’

page 273, Figure 8.65c ‘ $\dfrac{2h_H}{b}$ ’should be ‘ $\dfrac{2h_h}{b}$,

page 273, Figure 8.65c ‘ $\dfrac{2l_H}{b}$ ’should be ‘ $\dfrac{2l_h}{b}$,

page 273, Figure 8.65c ‘ $K_H = \dfrac{1 - \dfrac{h_H}{b}}{\sqrt[3]{\dfrac{2l_H}{b}}}$ ’should be ‘ $K_h = \dfrac{1 - \left|\dfrac{h_h}{b}\right|}{\sqrt[3]{\dfrac{2l_h}{b}}}$,

page 281, Equation (8.55) Should read:

$$\Delta\alpha_g = -F_{tv}\left\{\left(\frac{9.12}{A}\right)+7.16\left(\frac{c_r}{b}\right)\right\}\left(C_{L_{wf}}\right)+$$
$$-\left\{\frac{A}{\left(2C_{L_{\alpha_{wf}}}\right)}\right\}\left(\frac{c_r}{b}\right)\left\{\left(\frac{L}{L_o}\right)-1\right\}\left(C_{L_{wf}}\right)r_g+$$
$$-\left\{\frac{\left(\frac{\delta_f}{50}\right)^2}{\left(C_{L_{\alpha_{wf}}}\right)}\right\}\Delta\left(\Delta C_L\right)_f$$

page 342, Equation (8.108) Should read:

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

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:

$$C_{n_{T_\beta}} = -\underset{i=1}{\overset{i=n}{Sum}}\left[\frac{\left\{\left(\frac{dC_N}{d\alpha}\right)_{p_i}\left(\frac{\pi}{4}\right)\left(D_{p_i}\right)^2\left(l_{p_i}\right)\right\}}{Sb}\right]$$

page 400, Equation (10.45) Should read: $C_{n_{T_\beta}} = -\underset{i=1}{\overset{i=n}{Sum}}\frac{0.035m_{a_i}l_{n_i}}{Sb\rho U_1}$

page 401, Line 19 Should read 'where: σ_{β_α} 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 'σ_{β_Γ} 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:

$$C_{l_{p_V}} = \frac{2}{{b_w}^2}\left|\left(z_v\cos\alpha - l_v\sin\alpha\right)\left[\left(z_v\cos\alpha - l_v\sin\alpha\right) - \left(Z_{ac_V} - Z_{cg}\right)\right]\right| C_{y_{\beta_V}}$$

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: $C_{D_{i_h}} = \frac{2C_{L_o}}{\pi Ae} C_{L_{\alpha_h}} \eta_h \frac{S_h}{S}$

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:

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

page 436, Line 3-7 — Remove Line 3-7

page 439, Equation (10.97) — Should read: $C_{D_{i_c}} = \frac{2C_{L_o}}{\pi Ae} C_{L_{\alpha_c}} \eta_c \frac{S_c}{S}$

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:

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

page 439, Line 8-12 — Remove Line 8-12

page 461, Line 10 — Following Line 10, should read 'For single vertical tail:

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

page 461, Line 19 — Following Line 19, should read 'For twin vertical tail:

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

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

page 486, Equation (10.149) — Should read: $\left(c^t{}_{h_\delta}\right)_{\alpha,\delta_t} = \ldots$

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'