ERRATA: Airplane Design Part VI

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page 28, Line 3
Should read ‘\( \epsilon_i = \) wing twist angle in radians, positive for wash-in …’

page 200, Figure 6.38
Vertical axis units should be in 1,000 lb

page 205, Line 9
Should read:

\[
\begin{align*}
\text{avSHP} &: 285 \quad 248 \quad 206 \quad 172 \quad 140 \\
\left( \text{SHP}_{av} \eta_{\text{int/inc}} - P_{\text{extr}} \right) &: 275 \quad 239 \quad 198 \quad 165 \quad 133 \\
P_{av} &: 242 \quad 210 \quad 174 \quad 145 \quad 117
\end{align*}
\]

page 212, Figure 7.5
Vertical axis units should be in 1,000 lb

page 229, Equation (8.7)
Should read:

\[
\Delta c_l = \eta_n \left( c_l \delta_{f_1} \right) \left( \delta_{f_1} \right) \left( \frac{c + c_l}{c} \right) + \eta_n \left( c_l \delta_{f_2} \right) \left( \delta_{f_1} + \delta_{f_2} \right) \left( \frac{c'}{c} \right)
\]

page 236 Figure 8.26
Vertical axis values should be negative

page 239, Equation (8.19)
Should read: \( \Delta c_{\text{cl max}} = \left( c_l \delta_{\text{max}} \right) \eta_{\text{max}} \delta_f \eta_\delta \left( \frac{c'}{c} \right) \)

page 259, Line 9
Should read ‘… leading edge flaps at \( \alpha = 0 \) may be estimated from:’

page 269, Equation (8.37)
Should read:

\[
\eta_h = 1 - \left[ \cos^2 \left( \frac{\pi z_{h_{\text{wake}}}}{2 \Delta z_{\text{wake}}} \right) \right] \left[ 2.42 \sqrt{C_{D_{0w}}} \right] \left[ \frac{\chi_{h_{\text{wake}}}}{c} \right] + 0.30
\]

page 269, Line 23
Should read

\[
\text{where: } z_{h_{\text{wake}}} = a \sin \left( \gamma_h - \alpha - \iota_w + \epsilon_h \right) \quad (8.38a)
\]
\[ x_{h_{\text{wake}}} = a \cos \left( \gamma_h - \alpha - i_w + \varepsilon_h \right) \]  

(8.38b)

with \( a, \gamma_h, \varepsilon_h, i_w \) and \( \alpha \) shown in Fig. 8.63.'

page 269, Equation (8.39)  
Should read: \( \varepsilon_h = \varepsilon_{h_0} + \left( \frac{d \varepsilon_h}{d \alpha} \right)_{p, \text{off}} \alpha \)

page 269, Equation (8.40)  
\[ \Delta z_{\text{wake}} = 0.68 \sqrt{C_{D_{\text{w}}}} \left( x_{h_{\text{wake}}} \frac{x_{h_{\text{wake}}}}{c} + 0.15 \right) \]

page 270, Figure 8.63  
Should be

\[ \text{Horizontal Tail} \]  
\[ \text{Aerodynamic Center} \]  
\[ \text{Centerline of Wake and Vortex Sheet} \]  
\[ \text{Parallel to the Body Axis (Reference Axis)} \]

page 273, Figure 8.65c  
'\( K_H \)' should be '\( K_h \)'  

\[ \frac{2h_H}{b} \]  
'should be '\( \frac{2h_h}{b} \)'  

\[ \frac{2l_H}{b} \]  
'should be '\( \frac{2l_h}{b} \)'  

\[ \frac{1}{ \frac{h_H}{b} } \]  
'should be '\( \frac{1}{ \frac{h_h}{b} } \)'  

'\( K_h = \frac{1 - \frac{h_H}{b}}{ \frac{2l_H}{b} } \)' should be '\( K_h = \frac{1 - \frac{2l_h}{b}}{ \frac{2l_h}{b} } \)'}
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:

$$C_{n_T} = \sum_{i=1}^{i=n} \left[ \frac{\left( \frac{dC_N}{d\alpha} \right)_{p_i}}{Sb} \left( \frac{\pi}{4} \right)^2 \left( l_{p_i} \right)^2 \right]$$

page 401, Line 19  
Should read ‘where: $\beta_{\alpha}$ 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 ‘ $\alpha_f$ is the angle of attack of the fuselage, in deg.’

page 401, Line 22  
Should read ‘ $\beta_{\Gamma}$ is the sidewash contribution due to wing dihedral, in deg$^{-1}$. It is found from Figures 10.31.’

page 401, Line 24  
Should read ‘ $\Gamma$ is the wing dihedral angle, in deg, as defined in Figure 10.7.’

page 401, Line 26  
Should read ‘ $\beta_{\varepsilon_{t}}$ is the sidewash contribution due to wing twist, in deg$^{-1}$, as obtained from Figures 10.32.’

page 401, Line 28  
Should read ‘ $\varepsilon_{t}$ is the wing twist angle, in deg, as shown in Figure 10.26.’

page 430, Figure 10.42  
Vertical axis values should be divided by -4

page 435, Equation (10.89)  
Should read: $C_{D_{l_h}} = \frac{2C_{L_0}}{\pi Ae} C_{L_{\alpha_h}} \eta_h \frac{S_h}{S}$

page 435, Line 36  
Should read ‘where: $C_{L_0}$ is the airplane zero-angle-of-attack lift coefficient follows from Eqn. (10.90).’
page 436, Equation (10.90)  
Should read:
\[
C_{L_o} = C_{L_{\alpha h}} + C_{L_{\alpha h}} \eta_h \left( \frac{S_h}{S} \right) \left( -\alpha_{oLh} - \epsilon_{oLh} \right) + \\
+ C_{L_{\alpha c}} \eta_c \left( \frac{S_c}{S} \right) \left( -\alpha_{oLc} - \epsilon_{oLc} \right)
\]

page 436, Line 3-7  
Remove Line 3-7

page 439, Equation (10.97)  
Should read: 
\[
C_{D_{\alpha c}} = \frac{2C_{L_o}}{\pi A e} C_{L_{\alpha c}} \eta_c \frac{S_c}{S}
\]

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:
\[
C_{L_o} = C_{L_{\alpha h}} + C_{L_{\alpha h}} \eta_h \left( \frac{S_h}{S} \right) \left( -\alpha_{oLh} - \epsilon_{oLh} \right) + \\
+ C_{L_{\alpha c}} \eta_c \left( \frac{S_c}{S} \right) \left( -\alpha_{oLc} - \epsilon_{oLc} \right)
\]

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

page 461, Line 10  
Following Line 10, should read ‘For single vertical tail:
\[
C_{y_\delta_r} = K_b C_{L_{\alpha v}} \frac{S_v}{S} \left( \frac{c_{l_\delta}}{c_{l_\delta}_{\text{theory}}} \right) \left( c_{l_\delta}_{\text{theory}} \right) \left( k' \right) \left( \frac{\alpha_{cL}}{\alpha_{cL}} \right) \eta_v \quad (10.123a)
\]

page 461, Line 19  
Following Line 19, should read ‘For twin vertical tail:
\[
C_{y_\delta_r} = 2 \left( \frac{C_y \beta_{v(h)}}{C_y \beta_{v_{eff}}} \right) K_b C_{L_{\alpha v}} \frac{S_v}{S} \left( \frac{c_{l_\delta}}{c_{l_\delta}_{\text{theory}}} \right) \left( c_{l_\delta}_{\text{theory}} \right) \left( k' \right) \left( \frac{\alpha_{cL}}{\alpha_{cL}} \right) \eta_v \quad (10.123b)
\]

Where: 
\[
\left( \frac{C_y \beta_{v(h)}}{C_y \beta_{v_{eff}}} \right)
\]
is found from Figure 10.17’