

## Errata for Elements of Propulsion – Gas Turbines and Rockets

Second Edition – Initial printing 2016

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- Page xx1, Fig 5 - Correct “Mortices” to “Vortices”
- Page 15, 4<sup>th</sup> line from top, change “1.8g” to “1.8f”
- Page 33, “bypasss” should read “bypass”
- Page 34, “Note on Propulsive Efficiency” 6<sup>th</sup> line  $(V_9 - V_0)/2g_c$  should be  $(V_9^2 - V_0^2)/2g_c$  and 6<sup>th</sup> line from the bottom, change “F” to “T”
- Page 58, in Fig. 1.35, the curves for EF and  $C_L/C_D$  are mislabeled; they should be switched
- Page 68, Equation 1.59, change “ $m_i$ ” to “ $m_f$ ”
- Page 82, Equation 2.4 should be  $c_v \equiv \left(\frac{\partial u}{\partial T}\right)_v$
- Page 103, line 3 after eq 2.30, “specific internal enthalpy”, should just be “specific enthalpy”
- Page 103, second line from bottom, units on Universal Gas Constant should be Btu/(lb-mol·°R) instead of Btu/(mol·°R)
- Page 105, 2nd term on right hand side of Eq. 2.41 should be NEGATIVE  $R \, dP / P$
- Page 112, RHS of Eq. 2.55 should read  $\left(\frac{\rho_2}{\rho_1}\right)^{\gamma-1}$
- Page 112, RHS of Eq. 2.56 should read  $\left(\frac{\rho_2}{\rho_1}\right)^\gamma$
- Page 124, last paragraph, 2<sup>nd</sup> line, change “Fig. 2.14” to “Fig. 2.15”
- Page 128, Problem 2.4, last equation, “+” should be changed to “-” before the last term in the equation. There are also sign errors in the solution.
- Page 145, Bottom of page – change “0.883” to “0.833” for sonic temperature ratio
- Page 165, 2nd equation should read  $T_2 = T_1 \frac{T_2}{T_1}$
- Page 167, just after eq. 3.33 –  $M_{2n}$  should read  $M_{2n}$
- Page 186, Table 3.1, 1<sup>st</sup> column, 4<sup>th</sup> dependent property  $dp/p$  should read  $dp/\rho$  (density)
- Page 240, problem 3.29a); change “stock” to “shock”
- Page 257, line 5 of Example 4.2, change “nacalle” to “nacelle”
- Page 259, last line, change “ $P_i$ ” to “ $P_1$ ”
- Page 276, last line of first paragraph of 4.6, change “dashed” to “blue”
- Page 284, Table 5.1, last column, first row under “Bypass Stream.” Change  $\tau_f$  to  $\pi_f$ .
- Page 297, RHS of eq. 5.25 should read  $\frac{c_p T_0}{h_{PR}} (\tau_{\lambda AB} - \tau_r)$
- Page 301, equation above 5.29:  $\dot{m}_F$  should read  $\dot{m}_B$

- Page 303, sentence below Eqn. (5.34), change “turbojet” to “turbofan”
- Page 327, RHS of eq. 5.65 is missing a factor of  $V_0$ . It should start with  $\frac{\dot{m}_{prop} V_0 (V_j - V_0)}{1/2 \dot{m}_{prop} (V_j^2 - V_0^2)}$
- Page 344, Prob. 5.8(c), change “thrust” to “specific thrust”
- Page 344, Prob. 5.9 should refer to Prob. 5.7. Also, heating value should be “42,000”
- Page 347, 2<sup>nd</sup> line of Prob. 5.22, change “ $\pi f$ ” to “ $\pi_i$ ”
- Page 367, 2<sup>nd</sup> to last sentence. Change “6.4” to “4.5” in parenthetical statement.
- Page 386, Eqn. (6.57), change “ $h_{r5i}$ ” to “ $h_{t5i}$ ”
- Page 398, denominator of first square-rooted term in expression for  $V_9/a_0$  should read “ $\gamma_c R_c T_0$ ,” not “ $\gamma_c R_c T_c$ ”
- Page 400, Example 7.2, Delete the 3<sup>rd</sup> sentence beginning with “The thrust specific fuel consumption no longer ...”
- Page 404, after “... external flow behavior,” add the following to continue the discussion at the bottom of Example 7.3: “(boattail drag, etc.). Note also that for a long-range transport or passenger aircraft, a 1% change in specific fuel consumption is very significant.”
- Page 412, Eq. 7.33:  $\dot{m}_F$  should read  $\dot{m}_B$
- Page 470, Eqn. (8.3), change second “ $\dot{m}_{ci}$ ” to “ $\dot{m}_i$ ”
- Page 472, Table 8.2, corrected mass flow rate equation, change “ $\dot{m}_t$ ” to “ $\dot{m}_i$ ”
- Page 476, Fig. 8.5c, change y-axis label to “ $P_{t4}/P_{t5}$ ”
- Page 491, last para. on page: line 2 & line 4, change  $T_{t4}=T_{t2}$  to  $T_{t4}/T_{t2}$ . Last line, change  $T_{t4}=T_{ref}$  to  $(T_{t4}/T_{t2})_R$ .
- Page 493, Equation below Fig. 8.13, correct to read  $\dot{m}_f = \frac{P_{t2}}{P_{t2R}} \sqrt{\frac{T_{t2}}{T_{t2R}}} \frac{\dot{m}_{fc}}{\dot{m}_{fcR}} \dot{m}_{fcR}$
- Page 500, Example 8.3, change  $T_{t4}$  value on line 4 or problem statement to 1500 K
- Page 501, line 3 equation uses wrong values for  $c_{pt}$  and  $T_{t4}$ : change “1.2329” to “1.239” and “1670” to “1500” and new answer is “8.0552”
- Page 507, Eqn (8.34a): insert “(“ before  $\pi_r$ . Also, 2<sup>nd</sup> eqn above (8.33), remove second “=” from left
- Page 529, x-axis of Fig. 8.35b, change first 0.2 to 0.1
- Page 585, equations listed as part of Figure 9.12: last line should read:  
 $v_1 + v_{1R} = \omega r = U$ , and  $v_2 + v_{2R} = \omega r = U$ . (velocities  $v$  are lowercase tangential velocities)
- Page 587, Table 9.1, change the “Static temperature Stator” entry from “0” to “+”
- Page 592, eq. 9.13a: subscript  $l$  (lower case  $l$ ) in the numerator should read 1 (one).
- Page 623, incorrect sign on the 2<sup>nd</sup> term inside the brackets of Eqns (9.58a) and (9.58b). They should read:

$$u_1^2 = u_{1m}^2 - 2 \left[ a^2 \left( \frac{r}{r_m} \right)^2 - 2ab \ln \frac{r}{r_m} - a^2 \right] \quad (9.58a)$$

$$u_2^2 = u_{2m}^2 - 2 \left[ a^2 \left( \frac{r}{r_m} \right)^2 + 2ab \ln \frac{r}{r_m} - a^2 \right] \quad (9.58b)$$

- Page 704, problem 9.4,  $u_2/u_t$  should read  $u_2/u_1$ . Also,  $v_1$  should read  $V_1$
- Page 726, an “h” is needed after the term in parentheses on the RHS of both Eqs. 10.9 and 10.10
- Page 757, Table 10.10. The last three entries (for  $\gamma=1.32$ ,  $\gamma=1.33$  and  $\gamma=1.34$ ) are incorrect. The correct values (from Eq. 10.35) are: 0.6709, 0.6726, 0.6744
- Page 853: The last two rows of table D.3 ( $M=3.98$ ;  $M=4.00$  for  $\gamma=1.3$ ) are incorrect. The correct values can be calculated from equations on p. 817 and are:

$M$	$T/T_t$	$P/P_t$	$\rho/\rho_t$	$A/A^*$	$MFP\sqrt{R/g_c}$	$\mu$	$\nu$
3.98	0.296203	0.005131	0.017323	15.596033	0.042784	14.551865	74.882774
4.00	0.294118	0.004977	0.016920	15.944129	0.041850	14.477512	75.210206

- Pages 864 – 873, the headers for the last two columns of Table F.1 are reversed. The 2<sup>nd</sup> last column should be  $\theta_{\max}$  and the last column should be  $\beta$
- Page 919, Problem 2.2, change answer “2970 lbf” to “2.97 lbf”
- Page 919, Problem 4.3, change “kM” to “kN”
- Page w24 (Ch. 11 suppl.), 4<sup>th</sup> line from bottom of page, change “ $A_{0e}$ ” to “ $A_0$ ”
- Page w25 (Ch. 11 suppl.), Fig. 11.26, change “ $A_{01}$ ” in figure to “ $A_{0i}$ ”