(A: text; B: tables; C: problems)

A. Errors in the printed book (Thermodynamics – An Interactive Approach by Bhattacharjee, Pearson, First edition).

Chapter 0:

Page 5: Right under 0.5 MASS INTERACTION, the first sentence should be deleted (it is same as the 3rd sentence).

Page 5: Right under 0.5 MASS INTERACTION, second sentence: 'Mass is the measure of amount of'-> 'Mass is the measure of'

Page 8, Table 0-1: '1015 BTU' -> 10^{15} BTU

Page 8, Table 0-1: '1015 kJ' -> 10^{15} kJ

Fig. 2.11 is modified by changing the Qdot arrow and Qdot_loss instead of Qdot. Also the caption is changed.

Ex. 2-4: In the discussion a new sentence is added:

Note that using the WinHip sign convention we substitute $\dot{Q} = -\dot{Q}_{\text{loss}} = -10 \text{ kW}$ and $\dot{W}_{\text{ext}} = \dot{W}_{\text{sh}} = 1132 \text{ kW}$

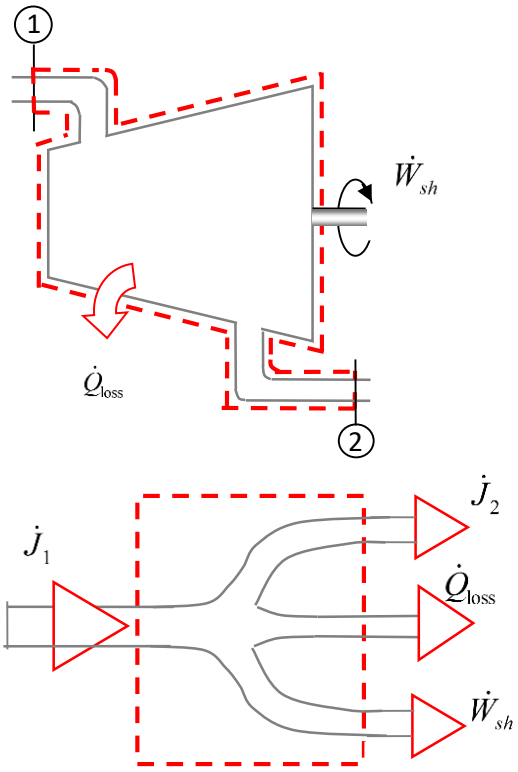

Fig. 2.11 Schematic of the turbine and the energy flow diagram for Ex. 2-4 (see Anim. 4.A.*turbine*). Note that $\dot{Q} = -\dot{Q}_{\text{loss}}$.

Chapter 2: page 76: Ex 2-4: A2 should be 677.8 cm2 instead of 680; Corrected in TEST

Chapter 2: Ex 2-12: QdotNet should be replaced in the problem statement as EdotNet.

Fig. 2.25 also changed, Qdot replaced with Qdot_loss and the arrow.

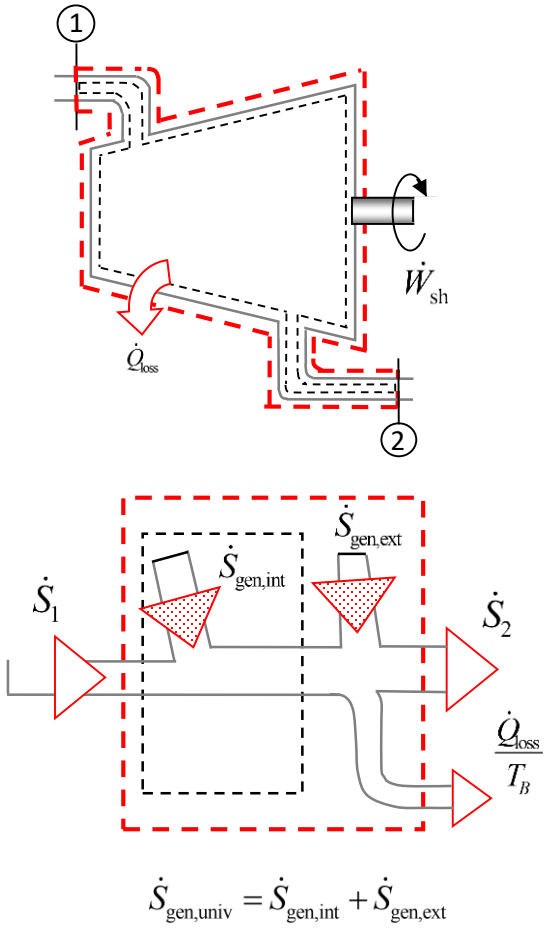

Fig. 2.25 System schematics and entropy flow diagram for Ex. 2-8.

Chapter 3:

Page 117: Ex 3-1: Second answer should be 0.613 and p and T value changed in parenthesis (see modified manuscript).

Page 118: Ex 3-2: right and left side in problem statement instead of left and rhs; deltas should have more significant figure and the result of part a will change (see TEST solution).

Page 120: 'since u = u(T) and v are constant' to 'since v as well as u=u(T) are constant'

Page 127: Ex 3-5: Analysis section: 'Table B-11' -> 'Table –B10'.

Page 130: Ex 3-6: Solution corrected. See thermofluids.net. Fig. 3.36 also needs correction as written below

Page 131: First sentence: 'between 100 kPa and 150 kPa' -> 'between 100 kPa and 200 kPa'.

Fig. 3-39: Caption should say 'T-v' diagram instead of 'T-s'.

Page 139: Para 3.5, Gas Models: Lines 3 and 4 contain a note to your editor.

P. 141: (after Eq. 3.41) 'only of the two' to 'only one of the two'.

'In the ideal …' to 'In the ideal gas tables (Tables D-3 trough D-15) a reference value of 0 is selected for the reference temperature is 0 K so that $h^{o}_{\text{ref}} = u^{o}_{\text{ref}} = 0$. In the TESTcalcs, however, a reference value of $h^{o}_{\text{ref}} = 0$ at the standard temperature of 298 K.

Page 147: In What-if Scenarito: "m1*(s3-s2)" should be "m1*(s3-s1)".

p. 151, last paragraph on the page: several lines of editorial comments starting with Redundant.

p. 152: Eq. 3.83: the definition of b and its uni should change (also note cr should not be italic)

$$\left(p+\frac{a}{v^2}\right)(v-b)=RT\ \left[\frac{\text{kJ}}{\text{kg}}\right],\ \text{where,}\ a=\frac{27R^2T_{\text{cr}}^2}{64p_{\text{cr}}}\ \left[\text{m}^6\right];\ \text{and}\ b=\frac{RT}{8p_{cr}}\left[\text{m}^3\right] \qquad (0.1)$$

->

$$\left(p+\frac{a}{v^2}\right)(v-b)=RT\ \left[\frac{\text{kJ}}{\text{kg}}\right],\ \text{where,}\ a=\frac{27R^2T_{\text{cr}}^2}{64p_{\text{cr}}}\ \left[\text{m}^6\right];\ \text{and}\ b=\frac{RT_{\text{cr}}}{8p_{\text{cr}}}\left[\frac{\text{m}^3}{\text{kg}}\right] \qquad (0.2)$$

Ex. 3-15: TEST solution had LK and NO reversed. Check with other solutions of RG model if that is correct.

Chapter 4:

p. 180: In Ex 4-4, the fourth equation has a sign mistake. Change

from: $\Rightarrow \; c_p\left(T_i - T_e\right) = \mathrm{ke}_e + \mathrm{ke}_i; \; \Rightarrow \; T_e = T_i - \dfrac{\mathrm{ke}_e - \mathrm{ke}_i}{c_p}$

To: $\Rightarrow \; c_p\left(T_i - T_e\right) = \mathrm{ke}_e - \mathrm{ke}_i; \; \Rightarrow \; T_e = T_i - \dfrac{\mathrm{ke}_e - \mathrm{ke}_i}{c_p}$

p-189: The problem is stated correctly (unit mass flow rate not mass). So the units are correct.

p. 195: TEST Analysis: 'select H2O' -> 'select Ammonia(NH3)'

Chapter 5:

p 212: Eq 5.5 should be changed (dot on top of m should be removed)

from: $S_{\text{gen,univ}} = \Delta S - \dfrac{Q}{T_0} = \dot{m}c_v \ln\dfrac{T_2}{T_1} - \dfrac{Q}{T_0}$

to: $S_{\text{gen,univ}} = \Delta S - \dfrac{Q}{T_0} = mc_v \ln\dfrac{T_2}{T_1} - \dfrac{Q}{T_0}$

p 215: In Ex 5-3 change

from: State-2: (given $p_2 = p_1, \cancel{V_2} = \cancel{V_1}, \; m_2 = m_1$):

to: State-2: (given $p_2 = p_1, \cancel{V_2} = 2\cancel{V_1}, \; m_2 = m_1$):

Ex 5-4: mistake in web portal solution corrected, what-if answer is wrong in the book.

Chapter 7:

p 293: Eq. 7.25 has redundant Qnet/Wnet. Should be:

$$\eta_{\text{th,Diesel}} = \frac{W_{\text{net}}}{Q_{\text{in}}} = 1 - \frac{Q_{\text{out}}}{Q_{\text{in}}} = 1 - \frac{c_v\left(T_4 - T_1\right)}{c_p\left(T_3 - T_2\right)} = 1 - \frac{T_1\left(T_4/T_1 - 1\right)}{kT_2\left(T_3/T_2 - 1\right)}$$

p. 297: Line 4: 'pressure at point 4' ->'pressure at point 4' ' (4 with a prime sign)

p. 285: under example 7-2 there is a typo, where discussion is spelled 'Discussoin".

p.287: ‘join the line ‘Using the isentropic relations for a perfect gas (Eq. 3.71),’ with the next line.

p. 298: On the second column of the table, ‘Constant-Volume Isothermal Heating’ to ‘Constant-Volume Internal Heating’; also, ‘Constant-Volume Cooling’ to ‘Constant-Volume Internal Cooling’.

Chapter 8:

p. 316: In Ex8-2 change

from: Device-B (2-3): $\dot{Q}_{\text{in}} = \dot{m}c_p\left(T_3 - T_2\right) = 913.3\dot{m}\ \text{kW}$

to: Device-B (2-3): $\dot{Q}_{\text{in}} = \dot{m}c_p\left(T_3 - T_2\right) = 911.6\dot{m}\ \text{kW}$

p. 317: In Example 8-3. ‘Use the IG power cycle TESTcalc (or Table D-3)’ to ‘Use the IG power cycle TESTcalc (select Air*) or Table D—3’ . Also change enthalpy values as posted in thermofluids.net

p. 323: In Ex. 8-7 change enthalpy values as posted in thermofluids.net

p. 326: In Ex. 8-8 change enthalpy values as posted in thermofluids.net

p 321: Eq. 8.18:

from:

$$\varepsilon_{\text{reg}} \equiv \frac{h_8 - h_3}{h_6 - h_3};\ \text{For the PG model, } \varepsilon_{\text{reg}} = \frac{T_8 - T_3}{T_6 - T_3}$$

To:

$$\varepsilon_{\text{reg}} \equiv \frac{h_7 - h_3}{h_6 - h_3};\ \text{For the PG model, } \varepsilon_{\text{reg}} = \frac{T_7 - T_3}{T_6 - T_3}$$

Chapter 9:

p. 359: Figure 9.18 and Figure 9.19 make a reference to animation 9.A.openFWH and 9.A.closedFWH. The actual animations are 9.B.openFWH and 9.B.closedFWH, respectively. (Change the A to B).

p 361: Table 9-6: first row middle column '0.4249' -> 0.4252

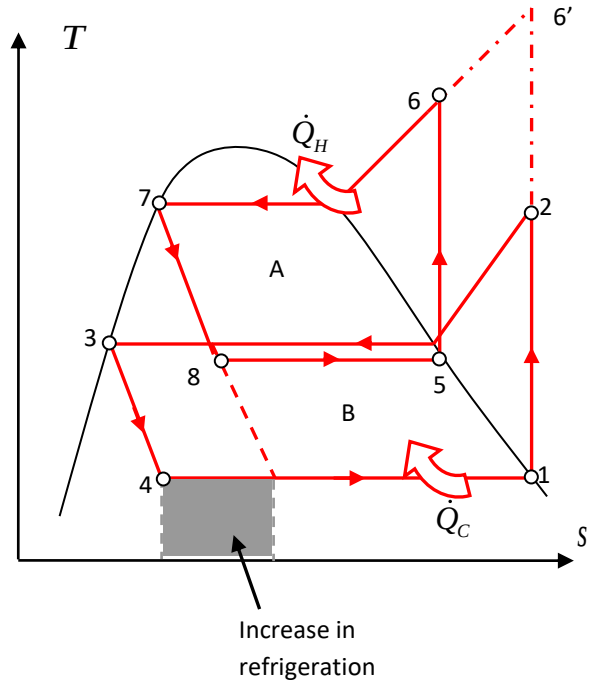

Fig. 10.17 The two-stage cascade refrigeration cycle described in Ex. 10-5.

Chapter 10:

p.385: Fig. 10.5. State number 2 is missing (the square should be 1-2-3-4)

p. 389: third paragraph, first sentence: 'In an actual cycle, compression is not be isentropic". The 'be' should be removed.

p. 387: Analysis table: In the row of the table for State 3, the subscripts on T and x in the Given column should be 3 instead of 1.

p. 394: Fig. 10.17 should be replaced by the one shown on the right (line 8-5 is stifted down, 5-6 moved slightly to the right).

p. 395: Example 10-5, State 5 says that x1=100%: it should say x5=100%. Also for state 7 it says x3=0; it should say x7=0

p. 397: Example 10-6, state 9 says that x1=100% when I think it should say x9=100%.

Chapter 11:

p. 420: Eq. 11.9: (x,y) should not be subscript, the equation should be:

$$dz = M(x,y)dx + N(x,y)dy; \quad \text{where, } M = \left(\frac{\partial z}{\partial x}\right)_y \text{ and } N = \left(\frac{\partial z}{\partial y}\right)_x$$

P 443: Ex 11-12: 'The gas mixture described' -> 'A portion of the gas mixture descried'. The table should be corrected as follows:

	N_2	H_2	CO_2
$n_k = \frac{m_k}{\bar{M}_k}$ $[\text{kmol}]$	$2/28$ $= 0.071$	$1/2$ $= 0.5$	$4/44$ $= 0.091$
$y_k = \frac{n_k}{n}$	$0.071/0.662$ $= 0.107$	$0.5/0.662$ $= 0.755$	$0.091/0.662$ $= 0.137$
$p_k = py_k$ $[\text{kPa}]$	$(0.107)(500)$ $= 53.5$	$(0.755)(500)$ $= 377.5$	$(0.137)(500)$ $= 68.5$
~~$V_k = Vy_k$~~ $[\text{m}^3]$	$(0.107)(2)$ $= 0.214$	$(0.755)(2)$ $= 1.51$	$(0.137)(2)$ $= 0.274$

p.449: What-ifscenario: '356 kPa and 396 deg-C respectively. The entropy generation increases to 0.369 kJ/K' -> '304 kPa and 344 deg-C respectively. The entropy generation increases to 0.328 kJ/K'.

Chapter 12:

p. 468: Eq. 12.18 needs to be modified with a factor m_a in front of R_a:

$$\Rightarrow Q = m_a(h_2 - h_1) - m_a R_a(T_2 - T_1) + m_{w3}h_{f2} + W_B; \qquad [\text{kJ}]$$

Chapter 13:

p. 507: Second line of the equations: '47,540' -> '-110,530''

p.524: Problem 13-1-15: ‘and 17% noncombustibles’-> ‘16% noncombustibles’

Chapter 14:

P 537: Eq. 14.25

From: $\dot{W}_{\text{rev,separation}} = -\dot{W}_{\text{rev,mixing}} = -\dot{n}_k \bar{R} T \sum_{k(\text{inlets})} y_k \ln(1/y_k); \qquad [\text{kW}]$

To: $\dot{W}_{\text{rev,separation}} = \dot{W}_{\text{rev,mixing}} = \dot{n} \bar{R} T \sum_{k(\text{inlets})} y_k \ln(1/y_k); \qquad [\text{kW}]$

P 557: change the following para and equation

Analysis In Table G.3, K for the oxidation of CO is listed at 1800 K and 2200 K. We use these values to estimate the heat of combustion at $T = 2000$ K from Eq. (14.57)

$$\ln \frac{K_2}{K_1} \cong \frac{\Delta h_T^0(T)}{\bar{R}} \left(\frac{1}{T_2} - \frac{1}{T_1} \right)$$

$$\Rightarrow \ln \frac{e^{-5.12}}{e^{-8.497}} \cong \frac{\Delta h_T^0(T)}{8.314} \left(\frac{1}{2200} - \frac{1}{1800} \right)$$

$$\Rightarrow \Delta h_T^0(T) \cong -277{,}956 \text{ kJ/kmol}$$

to:

Analysis In Table G.3, K for the inverse reaction, dissociation of CO_2, is listed at 1800 K and 2200 K. We use negative of these values for the inverse dissociation reaction to estimate the heat of combustion at $T = 2000$ K from Eq. (14.57).

$$\ln \frac{K_2}{K_1} \cong \frac{\Delta h_T^0(T)}{\bar{R}} \left(\frac{1}{T_2} - \frac{1}{T_1} \right)$$

$$\Rightarrow \ln \frac{e^{8.49}}{e^{5.12}} \cong \frac{\Delta h_T^0(T)}{8.314} \left(\frac{1}{2200} - \frac{1}{1800} \right)$$

$$\Rightarrow \Delta h_T^0(T) \cong -277{,}956 \text{ kJ/kmol}$$

B. Correction to Appendices (tables etc):

p. 608: Under Press. Column: ‘p,kPa’ -> ‘p, MPa’.

p. 612: Table B-3: 5th column (for entropy s) at the middle (p=0.5 MPa, T=600): ‘7.3522’ -> ‘8.3522’.

p. 612: Table B-3: 5th column (for entropy s) at the bottom (p=1.00 MPa T-700) : ‘9.2731’ -> ‘8.2731’.

p 614: Table B-3: The pressure and saturation temperatures in parenthesis should be as in red:

T	p = 4.0 MPa (T_{sat} = 250.40°C)				p = 4.5 MPa (T_{sat} = 257.49°C)				p = 5.0 MPa (T_{sat} = 263.99°C)			
	v	u	h	s	v	u	h	s	v	u	h	s
Sat.	0.04978	2602.3	2801.4	6.0701	0.04406	2600.1	2798.3	6.0198	0.03944	2597.1	2794.3	5.9734
275	0.05457	2667.9	2886.2	6.2285	0.04730	2650.3	2863.2	6.1401	0.04141	2631.3	2838.3	6.0544

p 620: Table B-7: the 0.14 Mpa table should be modified as (there is a gap as the saturation temperature is -18.8 deg-C and -20 deg.C cannot be superheated):

m^3/kg	kJ/kg	kJ/kg	kJ/kg·K
p = 0.14 MPa (T_{sat} = -18.80°C)			
v	u	h	s
0.13945	216.52	236.04	0.9322
-	-	-	-
0.14549	223.03	243.40	0.9606
0.15219	230.55	251.86	0.9922
0.15875	238.32	260.43	1.0230
0.16520	246.01	269.13	1.0532
0.17155	253.96	277.97	1.0828
0.17783	262.06	286.96	1.1120
0.18404	270.32	296.09	1.1407
0.19020	278.74	305.37	1.1690
0.19633	287.32	314.80	1.1969
0.20241	296.06	324.39	1.2244
0.20846	304.95	334.14	1.2516

Table D-3: v_r (5th column) corresponding to temperature (first column) of 1040 K should be 22.39

p. 668: Tale G-3: ‘where, K ‘ where should be centered to level with K.

p. 669: Tale G-3: ‘where, K ‘ where should be centered to level with K.

C. End of chapter problems corrections:

The corrections to problem statements can be found at www.thermofluids.net (which carries the latest statements).

0-6-8: mi/h should be mph

Ex: 1-5 (1-1-56) -132 instead of -100; The manual solution numbers for voltages are not correct in TEST but fine in the textbook. See new test-codes;

3-2-17: Using the SL model, determine (a)…

3-4-22: Solution to part (b) is corrected (avg Temp is 650 K)

5-1-1: Added c_v in the problem statement.

5-45: The answers in part c and d in Mastering Engineering are wrong. They should be (as in the TEST web site) (c) 527 ^{o}C, (d) -0.36 kJ

6-1-9: Assume the atmospheric temperature to be 298 K (replace 300 K with 298 K)

6-3-5: Problem statement slightly altered, but the answers and the solution are unchanged.

7-3-2: Solution corrected, answers to part c has been changed.

7-3-12: Problem statement corrected and changed slightly.

7-5-15: Manual solution corrected, the problem statement has been slightly modified.

9-2-17: Added a state-7 in the diagram.

11-2-6: Solution and answers changed. Problem statement slightly modified.

11-2-7: Solution and answers changed. Problem statement slightly modified.

14-3-32: problem modified (use TESTcalc instead of a K).

14-3-25 [BBQ]: fixed problem statement

14-3-33 [BBW]: changed problem statement to just use the TESTcalc

14-3-34 [BSO]: changed problem statement to just use the TESTcalc

14-3-35 [BSB]: changed problem statement to just use the interactive

14-3-41 [BSI]: changed problem statement slightly.