2.61 Internal Combustion Engines
Spring 2008

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Corrections to text (current printing):  (JBH 10/29/01)

p. 77  Table 3.2. The enthalpies of formation for C₈H₁₈ are for n-octane. For isooctane they are –224.1 and –259.3 MJ/kmol for gas and liquid C₈H₁₈, respectively.

p. 89:  Middle of page:  x₇CO₂, x₇CO and x₇O₂ should be x̂₇CO₂, x̂₇CO, and x̂₇O₂.

p. 122: Figure 4-10 is a repeat of Fig. 4-3 due to an editing error, though Fig. 4-10 is correctly labeled “burned mixture properties.” A correct Fig. 4-10 is attached. It is only slightly different: e.g., at 1000 K the burned mixture uₜ for φ = 1.2 is 4% lower than the unburned mixture value, and hₜ is 1% lower than the unburned mixture value. These differences scale, approximately, with φ.

p. 151 Underneath Eq (4.65) insert:

K is given by Eq. (4.63)

p. 152:  Line 5.  CₗₘHₙOᵣ should be CₙHₘOᵣ.

p. 188 In Eq. (5.66c), m is omitted. It should read:

S₃b − S₂ = mcv ln(T₃a / T₂) + mcᵥ ln(T₃b / T₃a) = mcv lnα + mcᵥ ln β

p. 306:  Equation (7.18): The sign at the beginning of the second line of the equation (a minus sign) should be a plus sign.

p. 388:  Equation (9.27). The sign in front of the third term in the square bracket should be –, not +:

i.e.,  \[ \frac{T'}{T_w} + \frac{T}{T_w(γ - 1)} - \frac{1}{bT_w} \ln \left( \frac{γ - 1}{γ' - 1} \right) \]

p. 553:  Equation (10.37). There should be a + sign between the two round brackets within the square bracket., i.e.,

\[ τ_{id}(CA) = (0.36 + 0.22S_p) \exp \left[ E_a \left( \frac{1}{RT} - \frac{1}{17,190} \right) + \left( \frac{21.2}{p - 12.4} \right)^{0.63} \right] \]

p. 620:  The reference for Fig. 11-33 should be Yu, R.C., Wong, V.W., and Shahed, S.M., “Sources of Hydrocarbon Emissions from Direct Injection Diesel Engines,” SAE paper 800048, SAE Trans., vol. 89, 1980. (This is a new reference; make it reference 87 and add it to p. 667.)

p. 679:  In the inserted graph in Figure 12-5, the scale for thermal conductivity kl is not correct. The values should be multiplied by 5 x 10⁵: e.g., the peak value of 10 x 10⁻⁸ = 10⁻⁷ W/m.K should be 10⁻⁷ x (5 x 10⁵) = 5 x 10⁻² W/m.K.

p. 880:  In Fig. 15-45, the units for pressure (middle left) should be kPa and not MPa.
BURNED GAS PROPERTIES
Fuel: Isooctane, C₈H₁₈

Sensible Enthalpy and Internal Energy, kJ/kg air

Temperature, K

Correct Figure 4-10 (5/30/00)