

Vehicle Accident Analysis and Reconstruction Methods

Raymond M. Brach and R. Matthew Brach, SAE, 2010, 2nd Edition (R-397)

August 20, 2023

page	Eq/Line	Correction (should be)	Comment
7	line 22	(33, 0.60) should be (32.0, 0.60)	
11	line 23	x^- should be \bar{X}	
	line 25	x^- should be \bar{X}	
12	lines 1,3,5	x^- should be \bar{X}	
29	line 33	... α , when $\alpha = \pi/2$ for any s .	
	line 35	... $\beta = \alpha$, $F_x = F \cos \alpha$, $F_y = -F \sin \alpha$	
35	Eq 2.20	$F_x(\alpha, s) = \frac{F_x(s)F_y(\alpha)s}{\sqrt{s^2 F_y^2(\alpha) + F_x^2(s) \tan^2 \alpha}} \frac{\sqrt{s^2 C_\alpha^2 + (1- s)^2 \cos^2 \alpha F_x^2(s)}}{s C_\alpha}$	
35	Eq 2.21	$F_y(\alpha, s) = \frac{F_x(s)F_y(\alpha) \tan \alpha}{\sqrt{s^2 F_y^2(\alpha) + F_x^2(s) \tan^2 \alpha}} \frac{\sqrt{(1- s)^2 \cos^2 \alpha F_y^2(\alpha) + \sin^2 \alpha C_s^2}}{C_s \sin \alpha}$	
40	line 17	... the values in Fig. 2.21 should be ...	“the above table” should be replaced by “Fig. 2.21”
46	Table 2.1	Column 5, <i>Sources</i> , should be (top to bottom) ...	2.25, 2.36, 2.13, 2.13, NHTSA FMVSS, blank, USDOT FM CER 2.37, 2.37, 2.37, 2.37, 2.39, 2.40, 2.41
52	Eq 3.6a	$d = -\frac{v_0^2}{2a} = \frac{v_0^2}{2fg}$	missing minus sign
53	line 1	$\tau = \frac{-11.11}{-7.37} = 1.51 \text{ s}$	incorrect denominator
53	last line	The vehicle skids to a stop in 1.51 s ...	
59	line 3	$f_r = \frac{F_{tr}}{F_{zr}} = \frac{T / R_w}{F_{zr}} = \frac{1935 / 0.34}{13947} = 0.408$	F_{tr} should be torque, T , divided by the rolling radius R_w
59	line 4	... equal to or higher than about 0.41 will allow	
63	line 9	$\sigma_\tau = \sigma_{PDR} = 0.083$	incorrect decimal point
63	line 12	... and a standard deviation of 0.083 s.	incorrect decimal point

66	Eq. 3.44	$\dot{y} = \dot{\theta}[b + (h_c - R)\theta]$	current/wrong equation is a repeat of Eq. 3.2
66	Eq. 3.50	$y(\tau) = c_1(e^{\eta\tau} - 1) + c_2(e^{-\eta\tau} - 1) + c_3(e^{2\eta\tau} - 1) + c_4(e^{-2\eta\tau} - 1)$	current/wrong equation is a repeat of Eq. 3.3
73	Eq. 4.1	$(x_i - a)^2 + (y_i - b)^2 = R^2, \quad i = 1, 2, 3$	current/wrong equation is a repeat of Eq. 4.4
150	Eq. 6.64	$\Delta V_i = \sqrt{(V_{in} - v_{in})^2 + (V_{it} - v_{it})^2}$	
189	Eg. 7.9	$W_1 = 2400 \text{ lb (10.7 kN)}$ and $W_2 = 3350 \text{ lb (14.9 kN)}$	The vehicle weights should be switched in the problem statement
227	line 3	Value for d_0 of 31.58 should be 46.31	
228	Eq. 9.4	$K_2 = L[C_1 + 2(C_2 + C_3 + C_4 + C_5) + C_6]/10$	current/wrong equation is from Example 9.1
236	Eq. 9.15	$C_{avg} = [C_1 + 2(C_2 + C_3 + C_4 + C_5) + C_6]/10$	current/wrong equation is a repeat of Eq. 9.12
387 - 389		Reference numbers should begin at top of page 387 as 2.21 and continue consecutively through 2.49 on page 389	