

ENERGY LOSS AND SPEED CHANGE FROM CRASH
 ΔV VALUES (UNCORRECTED FOR TANGENTIAL IMPULSE)

g: 32.1740486 ft/s²

W₁: 3,696.00 lb
 W₂: 3,413.00 lb
 m₁: 114.88 lb-s²/ft
 m₂: 106.08 lb-s²/ft
 k₁: 4.61 ft
 k₂: 4.52 ft
 h₁: 2.39 ft
 h₂: 1.80 ft
 I₁: 2441.3 lb-ft-s²
 I₂: 2167.2 lb-ft-s²
 γ₁: 0.788
 γ₂: 0.863
 mbar: 45.52

VEHICLE 1 **Vehicle 1**
 Velocity Change 26.77 ft/s
 ΔV₁: 18.3 mph

VEHICLE 2 **Vehicle 2**
 Velocity Change 28.99 ft/s
 ΔV₂: 19.8 mph

Total Energy: 103,864.5 ft-lb
 1.2464E+6 in-lb

Veh 1: C₁: 21.30 C₂: 20.30 C₃: 13.80 C₄: 11.30 C₅: 5.30 C₆: 4.80 inches
 1.78 1.69 1.15 0.94 0.44 0.40 feet

crush width: 65.00 in
 5.42 ft

d₀: 35.00 sqrt(lb) A: 4025.00 lb/ft
 d₀: 35.00 sqrt(lb) A: 335.42 lb/in
 d₁: 115.00 sqrt(lb)/ft B: 13225.00 lb/ft²
 d₁: 9.58 sqrt(lb)/in B: 91.84 lb/in²
 G: 612.50 lb

Energy loss due to normal crush: 75,352.9 ft-lb VEHICLE 1 Vehicle 1
 904,234.4 in-lb

Veh 2: C₁: 3.00 C₂: 15.80 C₃: 13.50 C₄: 6.70 C₅: 3.30 C₆: 5.00 inches
 0.25 1.32 1.13 0.56 0.28 0.42 feet

crush width: 84.00 in
 7.00 ft

d₀: 30.00 sqrt(lb) A: 2325.00 lb/ft
 d₀: 30.00 sqrt(lb) A: 193.75 lb/in
 d₁: 77.50 sqrt(lb)/ft B: 6006.25 lb/ft²
 d₁: 6.46 sqrt(lb)/in B: 41.71 lb/in²
 G: 450.00 lb

Energy Loss Due to Normal Crush: 28,511.7 ft-lb VEHICLE 2 Vehicle 2
 342,139.9 in-lb

US UNIT CONVERSION

NOTATION

W₁: weight, Veh 1
 W₂: weight, Veh 2
 m₁: mass, Veh 1
 m₂: mass, Veh 2
 k₁: radius of gyration, Veh 1
 k₂: radius of gyration, Veh 2

$$d_1 = \sqrt{B}$$

$$d_0 = A / \sqrt{B}$$

$$k_i = \sqrt{I_i / m_i}$$

h₁: PDOF offset, Veh 1
 h₂: PDOF offset, Veh 2
 I₁: yaw moment of inertia, Veh 1
 I₂: yaw moment of inertia, Veh 2

$$\gamma_i = \frac{k_i^2}{k_i^2 + h_i^2}$$

$$mbar = \frac{\gamma_1 m_1 \gamma_2 m_2}{\gamma_1 m_1 + \gamma_2 m_2}$$

