

21. The greatest height reported for a jump into an airbag is 99.4 m by stuntman Dan Koko. In 1984 he jumped from rest from the top of the Vegas World Hotel and Casino. He struck the airbag at a speed of 39 m/s (88 mi/h). To assess the effects of air resistance, determine how fast he would have been traveling on impact had air resistance been absent.

Basic equation is

$$v_f^2 = v_0^2 + 2ax = 2gh$$

Since initial velocity is zero so v_f is

$$v_f = \sqrt{2gh} = \sqrt{2(9.80 \text{ m/s}^2)(99.4 \text{ m})} = \sqrt{1948.24 \text{ m}^2/\text{s}^2} = 44.139 \text{ m/s}$$

$v_f = 44.1 \text{ m/s}$

Clearly air resistance did reduce the speed from what would happen without air resistance.

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