



CRASH ATTENUATOR PROTECTS SEMI DRIVER

A semi-truck driver traveling down a Nevada road in November 2015 struck the Smart Cushion® attenuator at a speed of 55 to 60 mph. Smart Cushion protected the driver from making contact with the sound wall. All other attenuators designed for 70 mph are fixed force and would only have reduced the speed of this truck 4 miles per hour. Other systems would have bottomed out with the truck still going 51 mph and the truck would have climbed over into the wall.

"Semi-truck hit the Smart Cushion head-on. He was doing between 55 and 60 mph, he had about 13,000 pounds in the trailer. The driver walked away."

John R. Eiche
Nevada Department of Transportation

A 70 mph attenuator is designed to absorb 722,000 ft. lb. of energy. Assuming the lower speed of 55 mph and 52,000 lbs, this testimonial has a truck with 5,257,778 ft. lb. of energy. **Weight: 34,000lb truck and van + 18,000 payload = 52,000 lb.**

This vehicle had 9 or 11 times NCHRP 350 Criteria if it was going 55 or 60 mph, respectively. If this was another (fixed force) system, only a 10th of the energy would have been absorbed before the system bottomed out ($KE = 1/2 \text{mass} \times \text{Velocity}^2$).

The resulting bottom out speed of a fixed force system, if the truck was going 55 or 60 mph, would have been 52 or 57 mph, respectively. A standard fixed force attenuator (all attenuators except Smart Cushion) is designed to absorb 568,214 ft. lbs of energy so the truck would have 6,147,033 ft. lbs after the crash cushion was fully compressed. That means the truck would still be going 59.4 mph losing only 2.7 mph when it bottomed out and the truck would most likely have gone over the system and hit the wall

The Smart Cushion® attenuator is a revolutionary speed-dependent cushion that varies stopping resistance during an impact. Smart Cushion allows lighter and slower moving vehicles to have longer ride down distances and lower ride down g-forces. Unlike fixed-resistance attenuators, Smart Cushion does not reach maximum stopping resistance unless a vehicle is traveling at the maximum design speed. This fully re-directive, non-gating, bidirectional impact attenuator is designed for maximum safety and re-usability, as well as outstanding durability before, during and after an impact.



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