

# SEI

*Safety Engineering Intl.*

## Vehicle Roof Structure Design Can Significantly Reduce Occupant Injury

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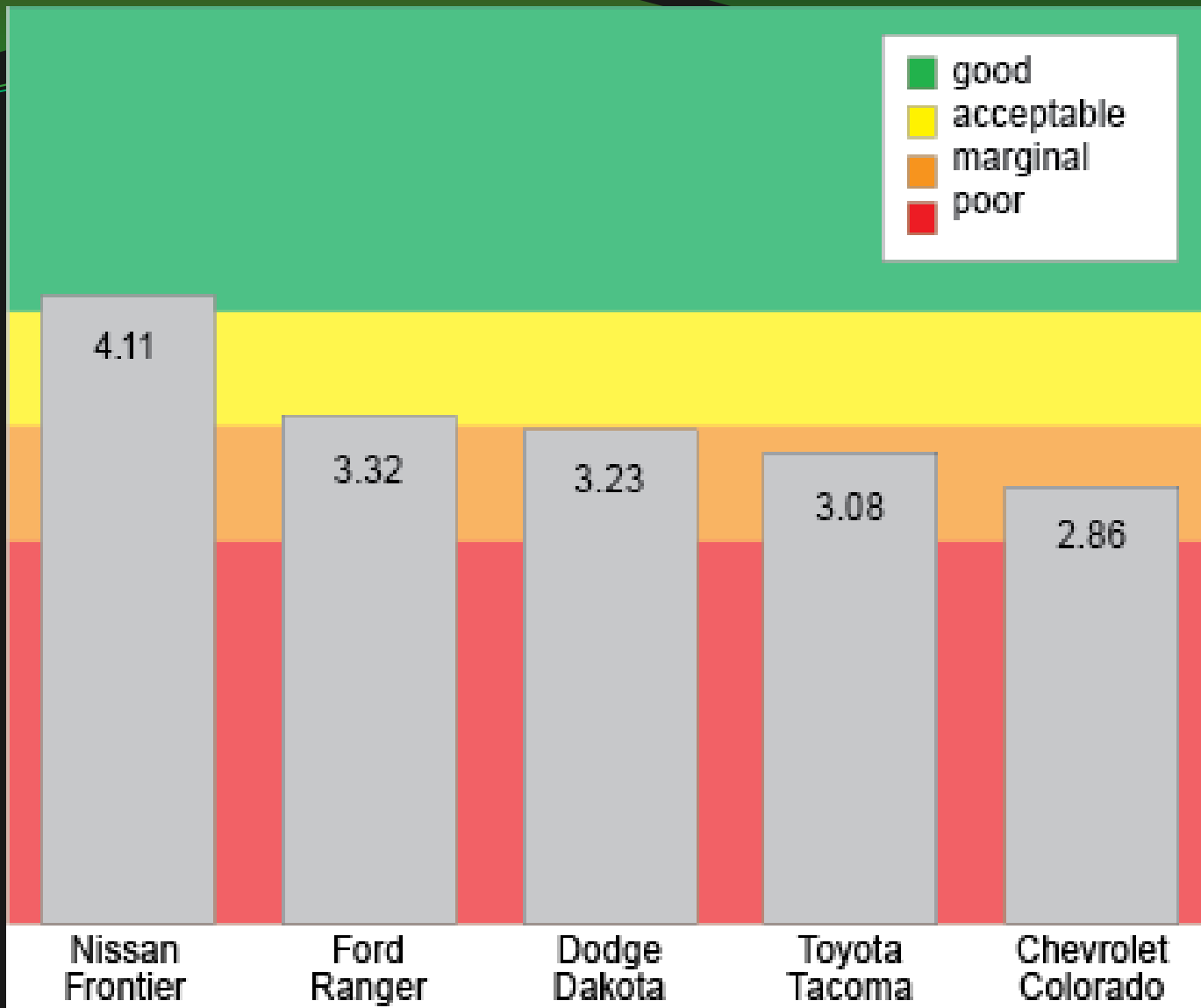


Figure 1. Roof strength-to-weight ratio within 5 inches of crush



Figure 2. Dynamic testing results of an early model Ford Ranger

1993 Jeep Grand Cherokee (Roll 1)  
18mph/29kph, 10° pitch, 244° /sec initial roll rate

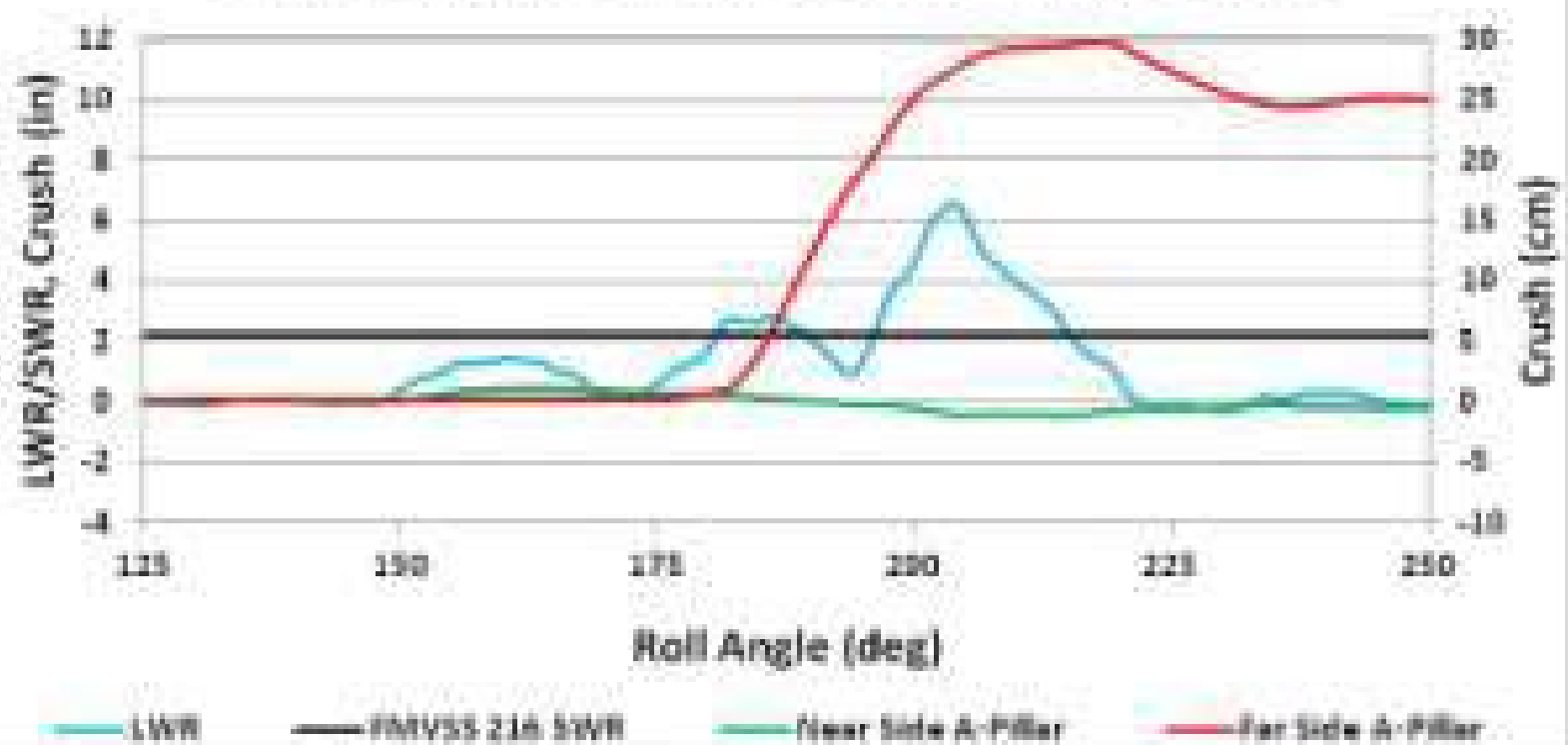


Figure 3. Red Line = Far Side A-Pillar intrusion for Production Jeep in Dynamic Rollover Testing

1993 Jeep Grand Cherokee (HALO™)(Roll 1)  
18mph/29kph, 10° pitch, 230°/sec initial roll rate

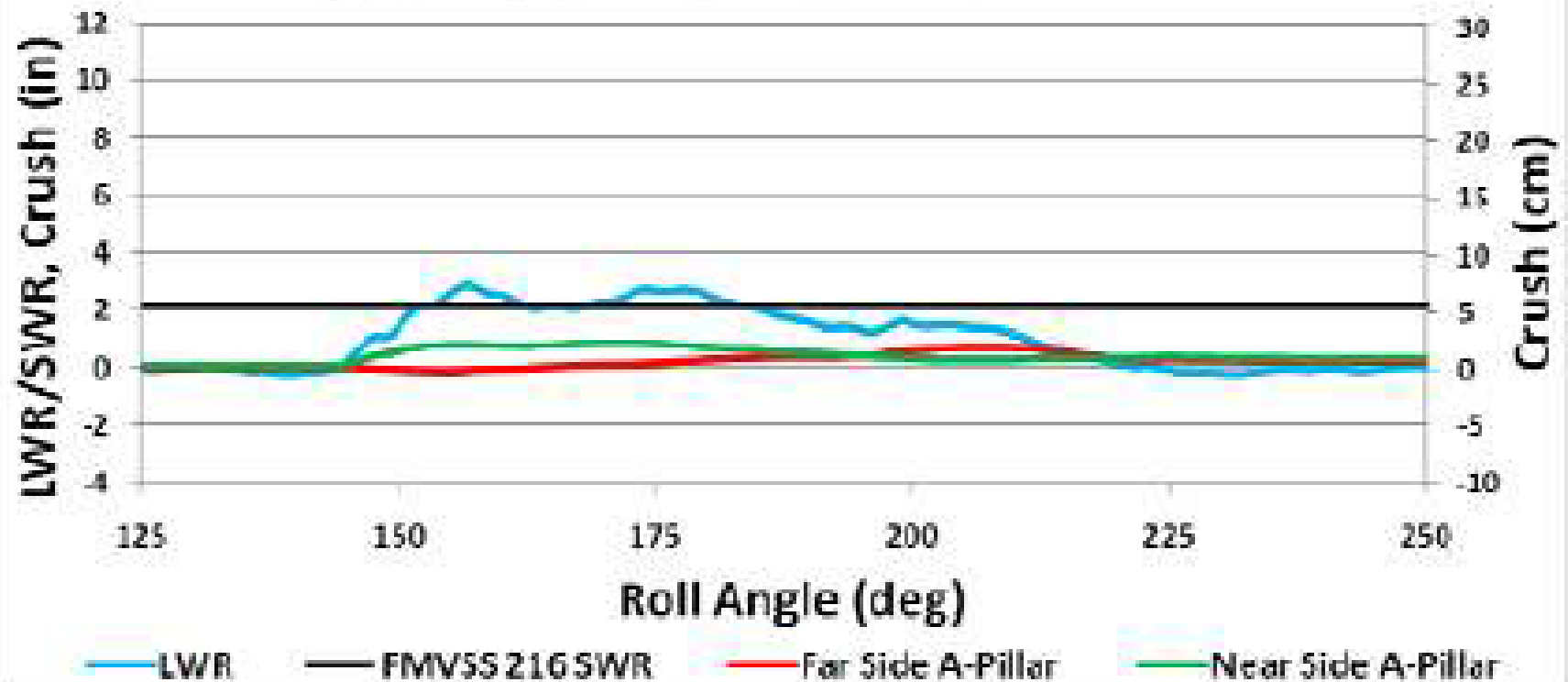


Figure 4. Far Side A-Pillar intrusion for HALO™ equipped Jeep in Dynamic Rollover Testing.



Figure 5. Post Rollover Position



Figure 6. Being dragged from ditch



Figure 7. Vehicle balanced on HALO™ ROPS



Figure 8. Vehicle after being righted



Figure 9. Single Cab HALO™ B-Pillar Reinforcement



Figure 10. Built in adjustment for variations in OEM products





Figure 11. Single-Cab HALO™ B-Pillar Cross-member



Figure 12. HALO™ roof top mounts to rear roll hoop



Figure 13. Finite element analysis model test run results of Single Cab with HALO™