GTR7-01-10

Seat/Head Restraint Test Sled Pulse Summary

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Background

Email from Johan Davisson, Chalmers University of Technology

Dear Mike and Jerry,

Earlier we discussed briefly that there is a need for a new BioRID calibration pulse. I foresee that calibration at a higher velocity change and longer duration, i.e. impact conditions usually occurring in real seat tests, will address some of the issues on reproducibility. Please comment on the attached document. Is this something for next GBUM meeting to address?

Regards,
Johan

Davisson Proposed Sled Pulse

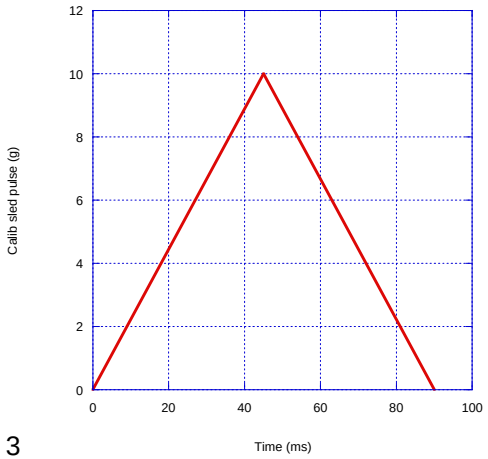
EuroNCAP Test

Table 1. BioRID II T8, L1 and Pelvis peak and average x-accelerations (m/s2) and durations (ms) for four different combinations of seat stiffness and sled pulses (kph).

Pulse	Seat	Peak acc. (g)			Duration (ms)	Suggested calibration sled characteritics	
		T8	L1	Pelvis	Pelvis	Peak acc. (g)	Duration (ms)
16 high	Soft	11.7	12.4	11.8	85	9.6	95
16 high	Soft	8.4	7.4	7.9	125		
16 high	Soft	7.9	6.9	11.8	75		
16 high	Stiff	10.6	11.9	14.6	75	12.2	87
16 high	Stiff	13.5	14.9	11.2	100		
16 high	Stiff	10.3	9.8	13.3	85		
24	Stiff	13.8	15.1	15.7	90	15.1	95
24	Stiff	16.4	16.1	13.5	100		
24	Soft	14.7	9.5	15.0	110	14.7	110

Proposed Mini-Sled Pulse

- Delta velocity 16 KPH
- Peak acceleration: 10g
- Sled duration: 90 ms



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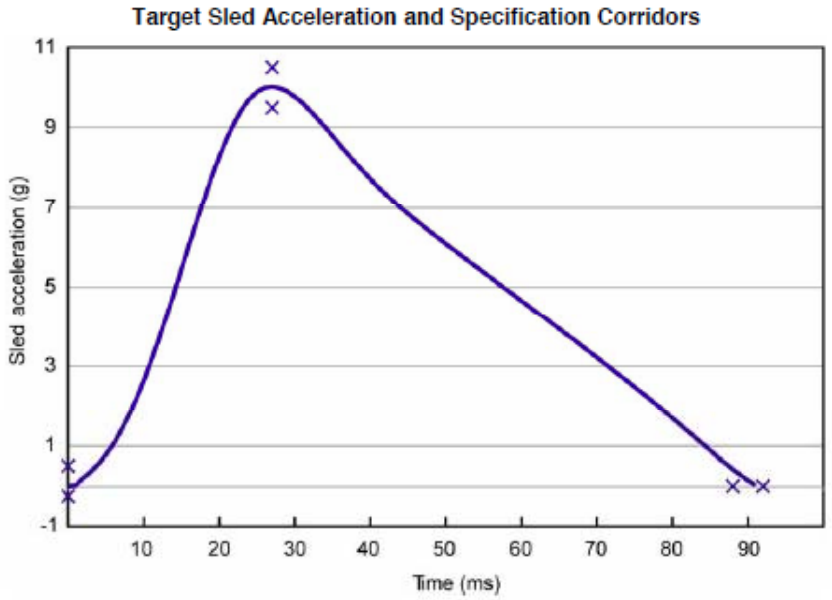
IIHS Sled Test Pulse

- Delta Velocity 16 KMH
- Major peak sled deceleration ~10g
- Total duration ~90 ms



http://www.iihs.org/ratings/head_restraints/head_restraint_info.html

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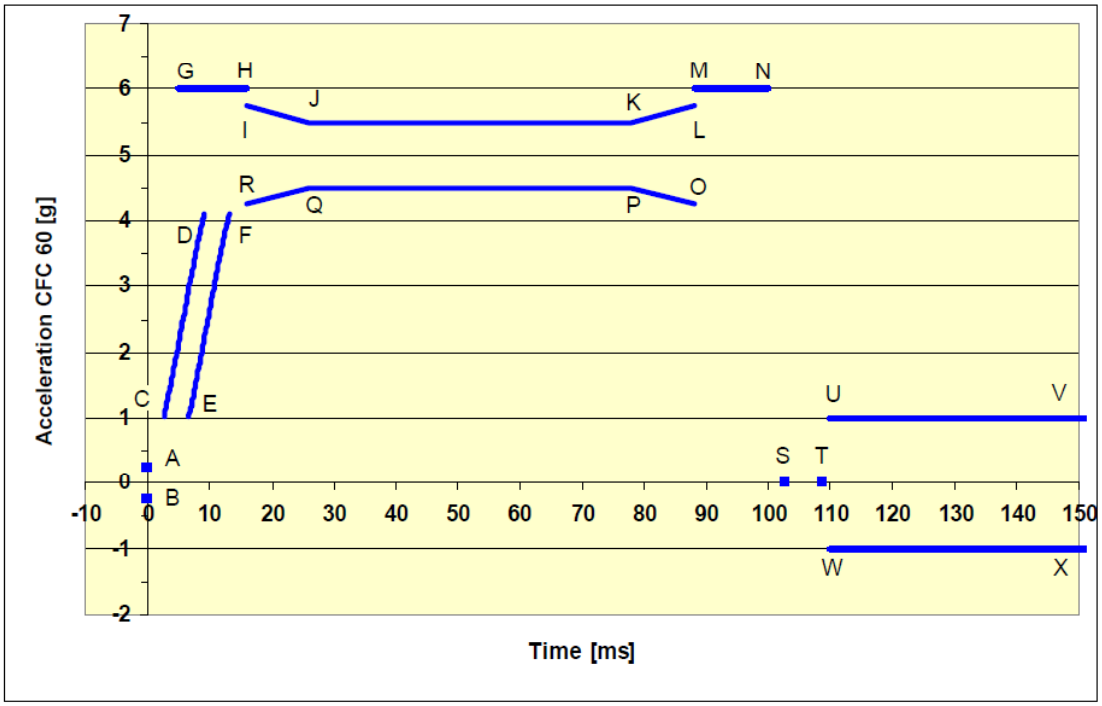
EuroNCAP Low Severity

- Delta velocity: 16.1 KMH
- Major peak sled acceleration: 5g
- Sled duration: ~105 ms



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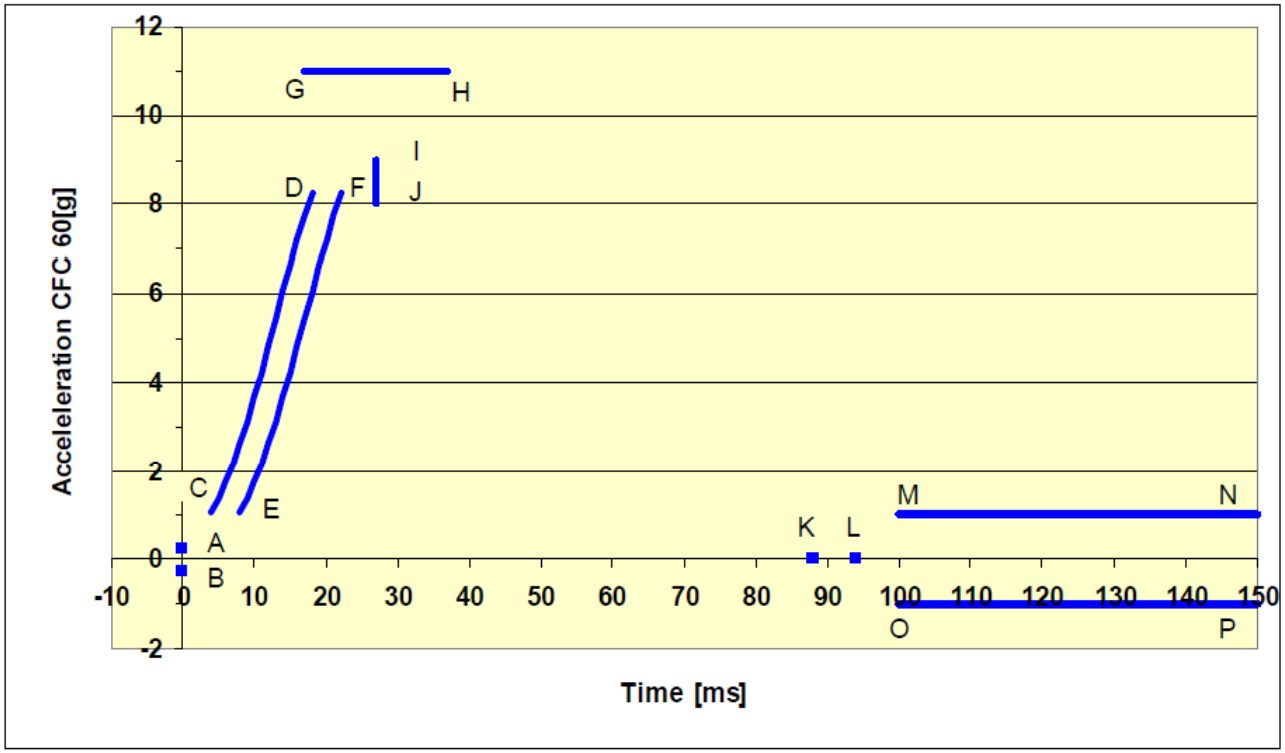
EuroNCAP Medium Severity

- Delta velocity: 15.65 KMH
- Major peak sled acceleration: 9.5g
- Sled duration: ~90 ms



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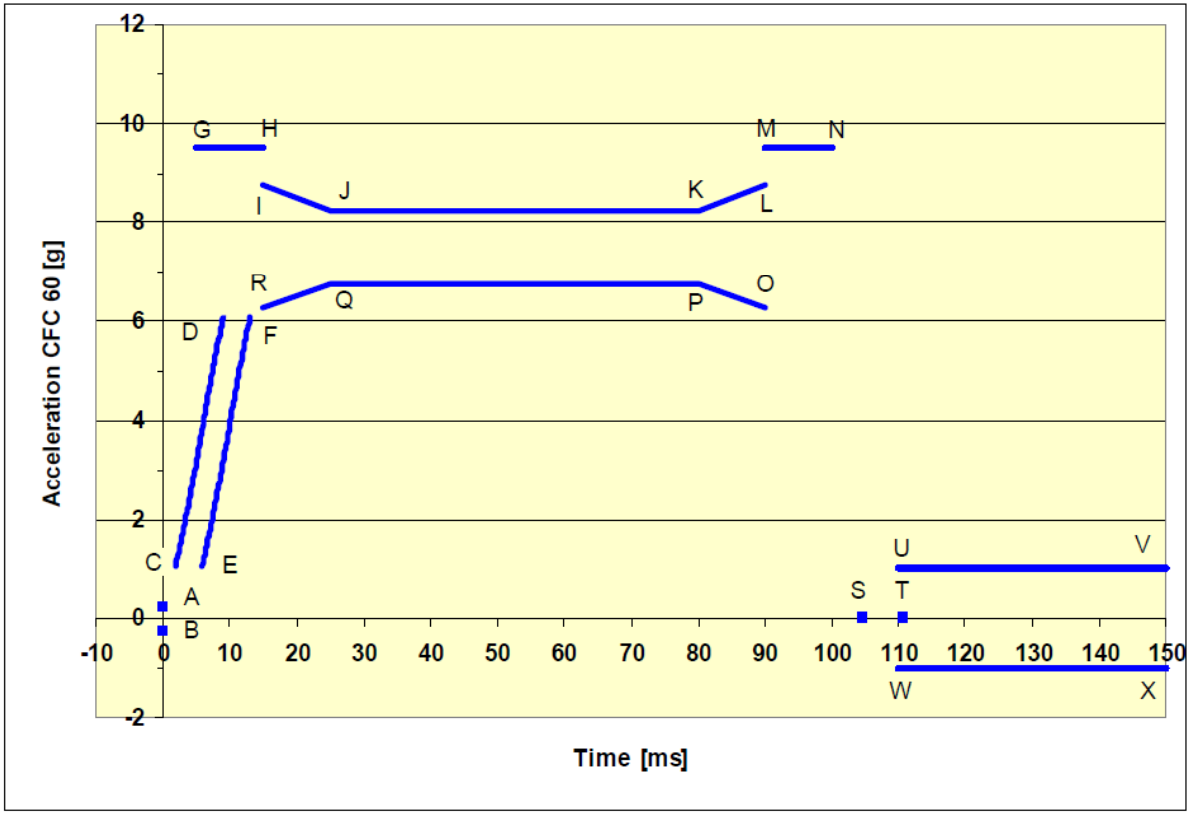
EuroNCAP High Severity

- Delta velocity: 24.45 KMH
- Major peak sled acceleration: 7.5 g
- Sled duration: ~108 ms



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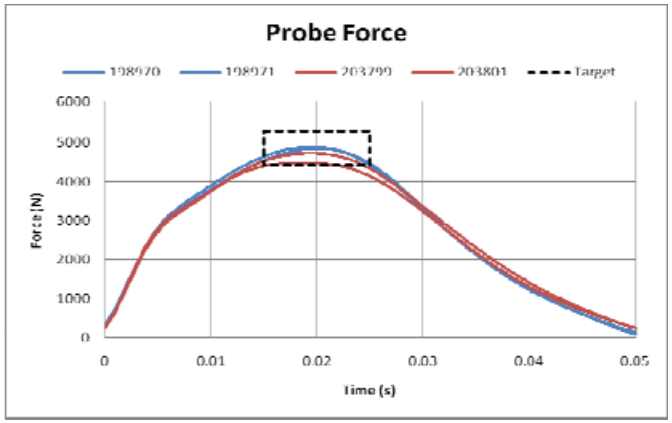
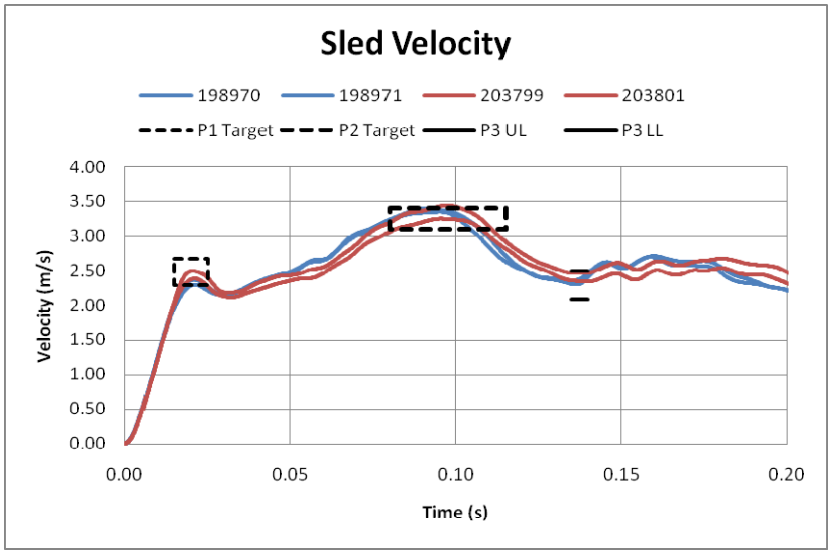
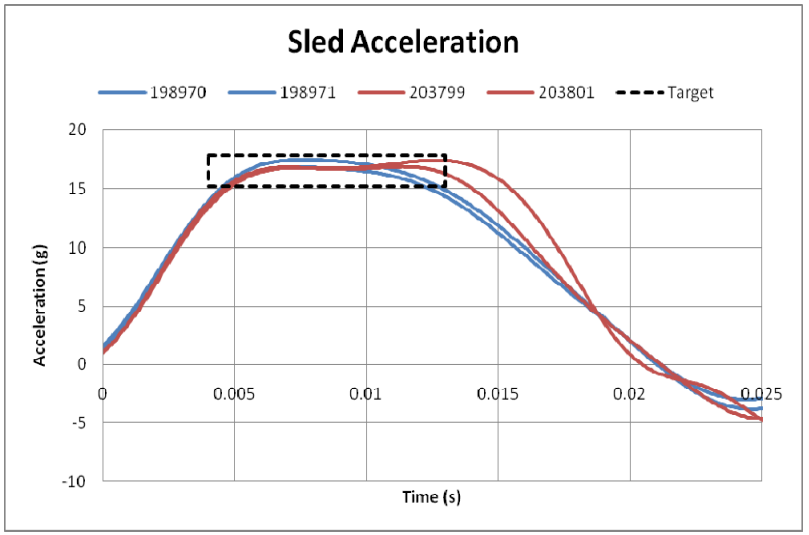
Chalmers Mini-Sled Pulse

- Delta Velocity: 3.25 m/s (11.7 KMH)
- Major peak sled acceleration: ~17 g
- Sled duration: ~50 ms







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Newly Proposed Denton Sled Pulse

- Delta Velocity: ~2.7 m/s (9.7 KMH)
- Major peak acceleration: ~13 g
- Sled duration: 35 m/s

Newly Proposed FTSS Sled Pulse

- Close to Chalmers mini-sled values
  - Delta Velocity: 3.3 m/s (11.9 KMH)
  - Mean peak sled acceleration: ~17 g
  - Sled duration: ~50 ms

Sled Pulse Summary

	Delta Velocity (KM/H)	Major Peak Acceleration (g)	Sled Duration (ms)
IIHS	16	10	90
EuroNCAP Low	16.1	5	105
EuroNCAP Medium	15.65	9.5	90
EuroNCAP High	24.5	7.5	108
Chalmers Mini-Sled	11.7	17	50
Denton Proposed Mini-Sled	9.7	13	35
FTSS Proposed Mini-Sled	11.9	17	50
Discussion and Recommendation?			