

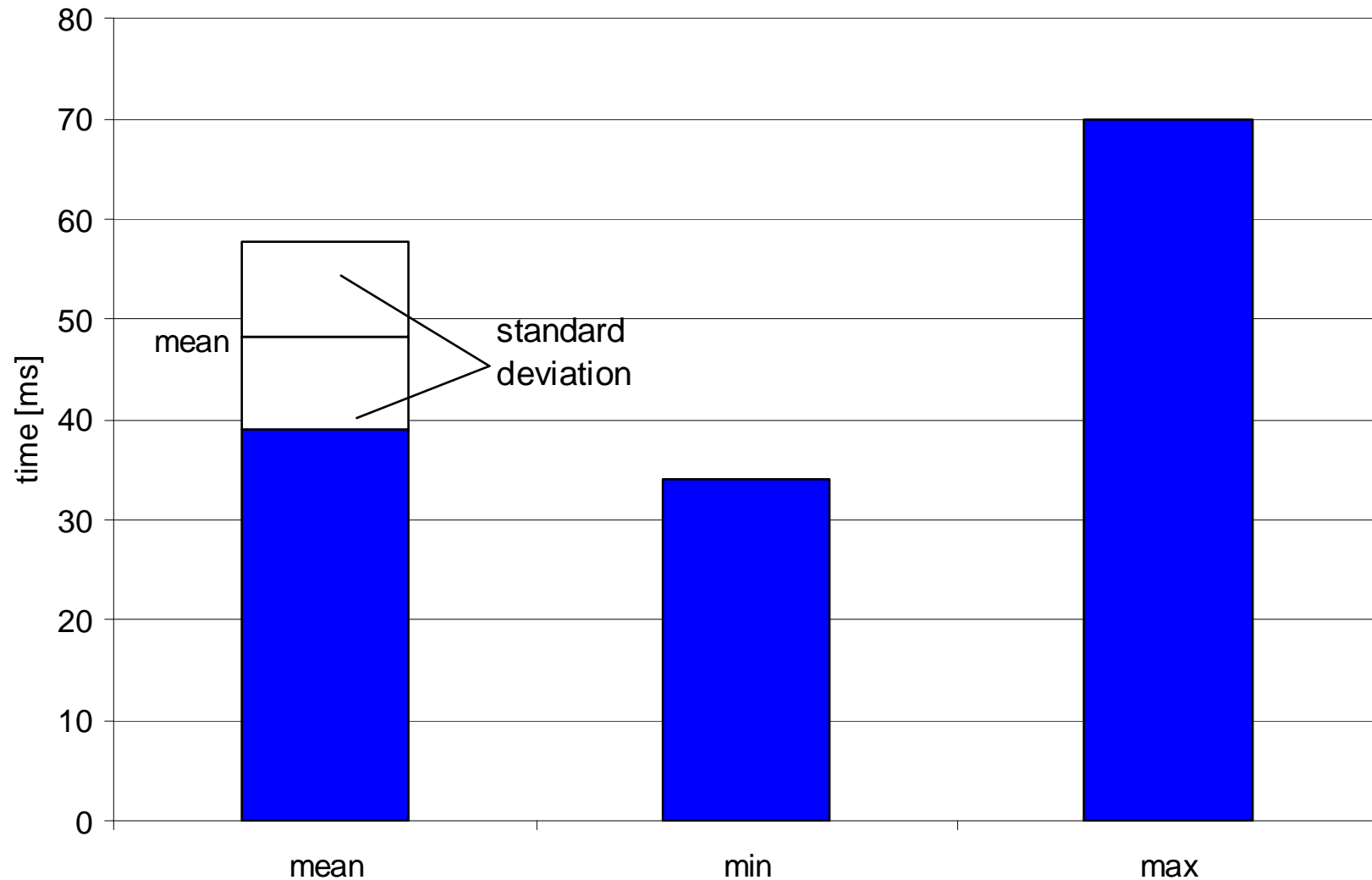
Lateral Impact Test Procedure

GRSP IG CRS December 7th 2010 Geneva

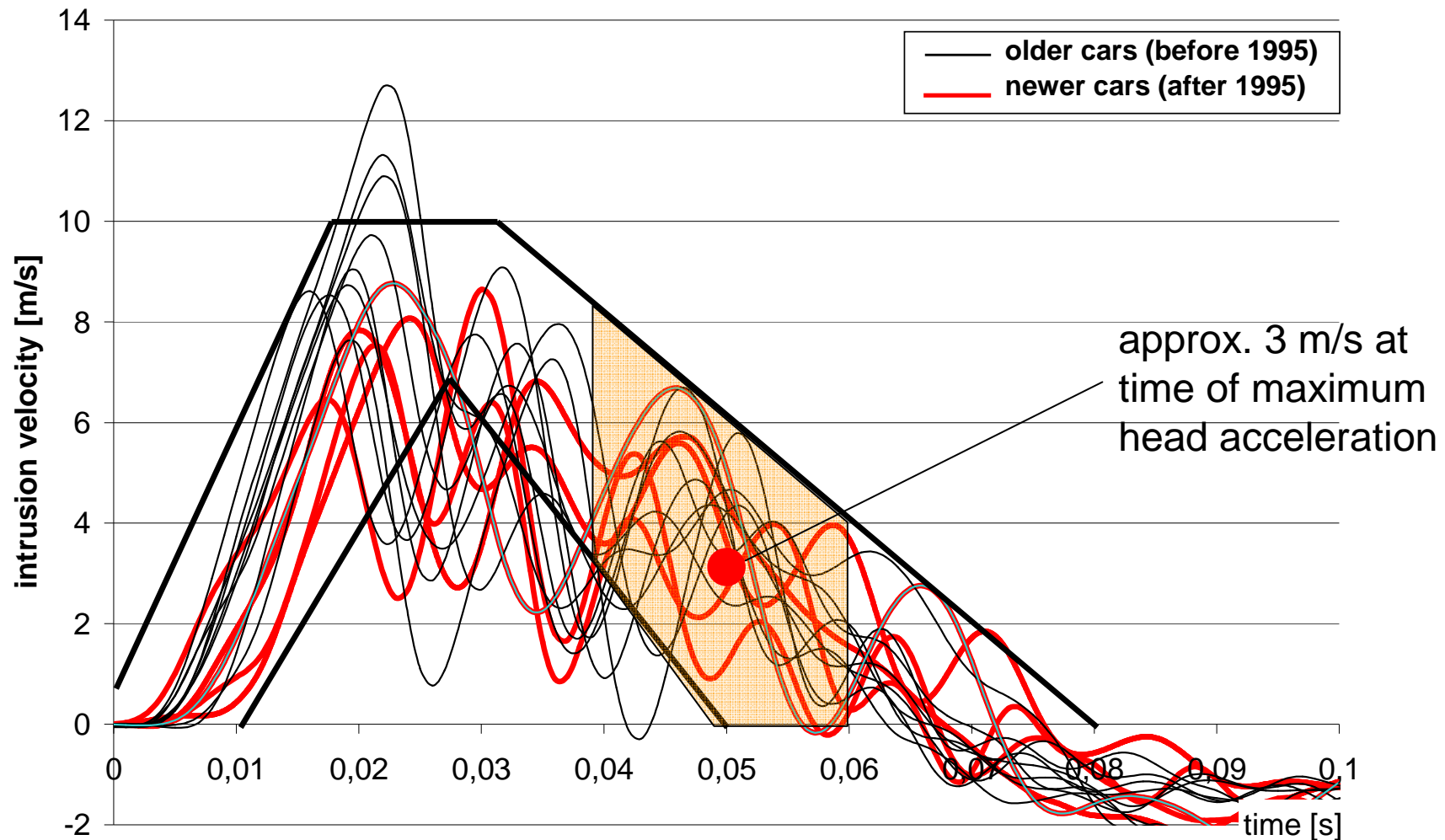
Mandate from September Meeting

- Review severity level and corridor in order to
 - address timing issues of ISO Corridor
 - address severity resulting from UTAC/LAB tests
 - address PU tube capabilities
- Review head containment plane
 - location
 - feasibility with booster seats

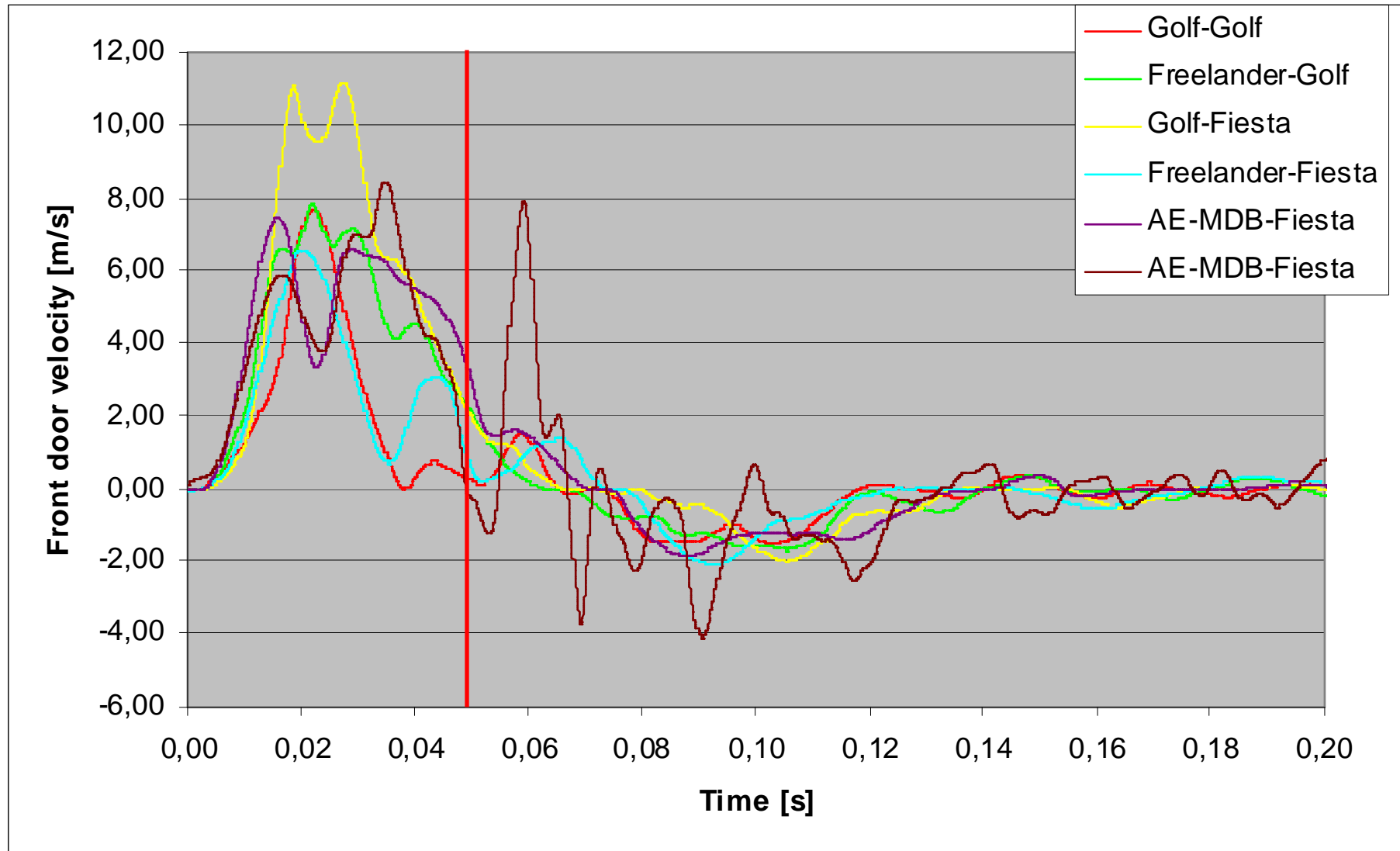
Analysis Timing Maximum Head Acceleration



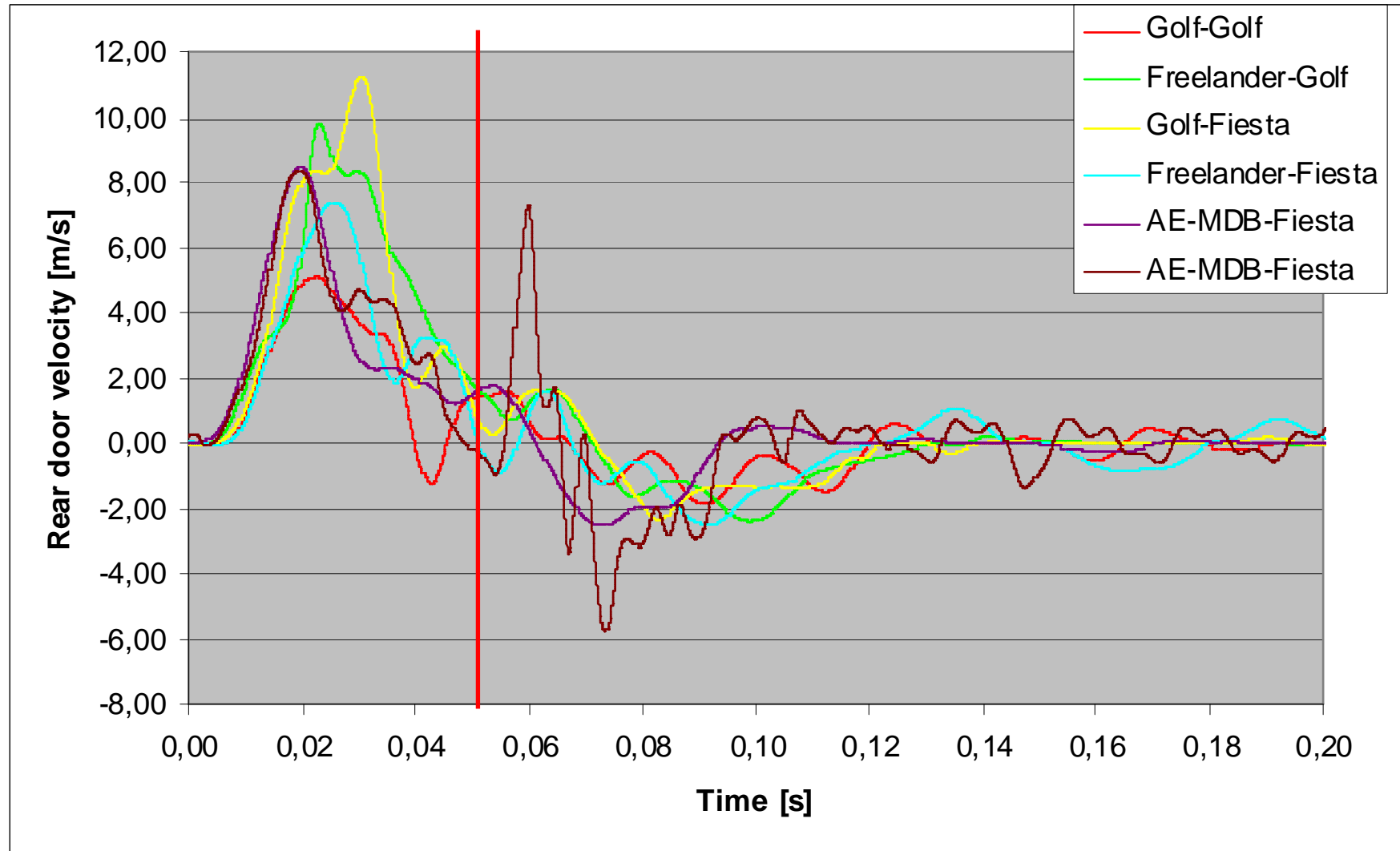
Consideration of Timing in Intrusion Velocity Corridor according to ISO PAS 13396



Intrusion Velocity from Car-to-Car Tests



Intrusion Velocity from Car-to-Car Tests



Discussion of Corridor

- An optimal test method would represent
 - Car acceleration
 - Intrusion velocity profile
- The proposed test procedure is a simplified test method
- For the simplified test method it is important to represent car data at crucial point in time

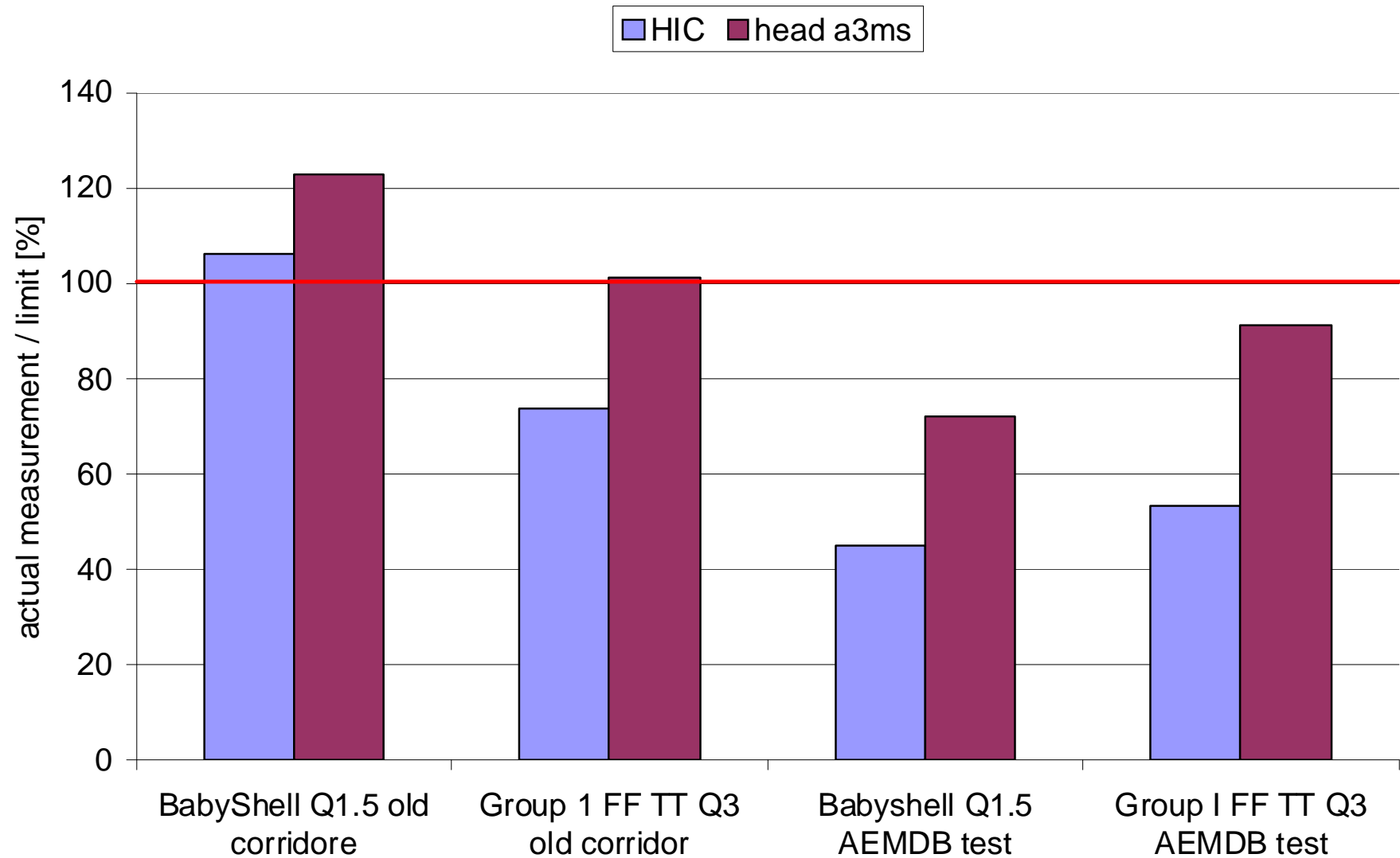
Discussion of Corridor

- It is felt that the period between start of dummy loading from intrusion and maximum dummy loading is most important
- Original corridor is representative with respect of intrusion velocity at time of first contact between CRS and car
- New corridor proposal is representative with respect to intrusion velocity at time of maximum head acceleration

Proposed Criteria According to latest Draft Version of Standard

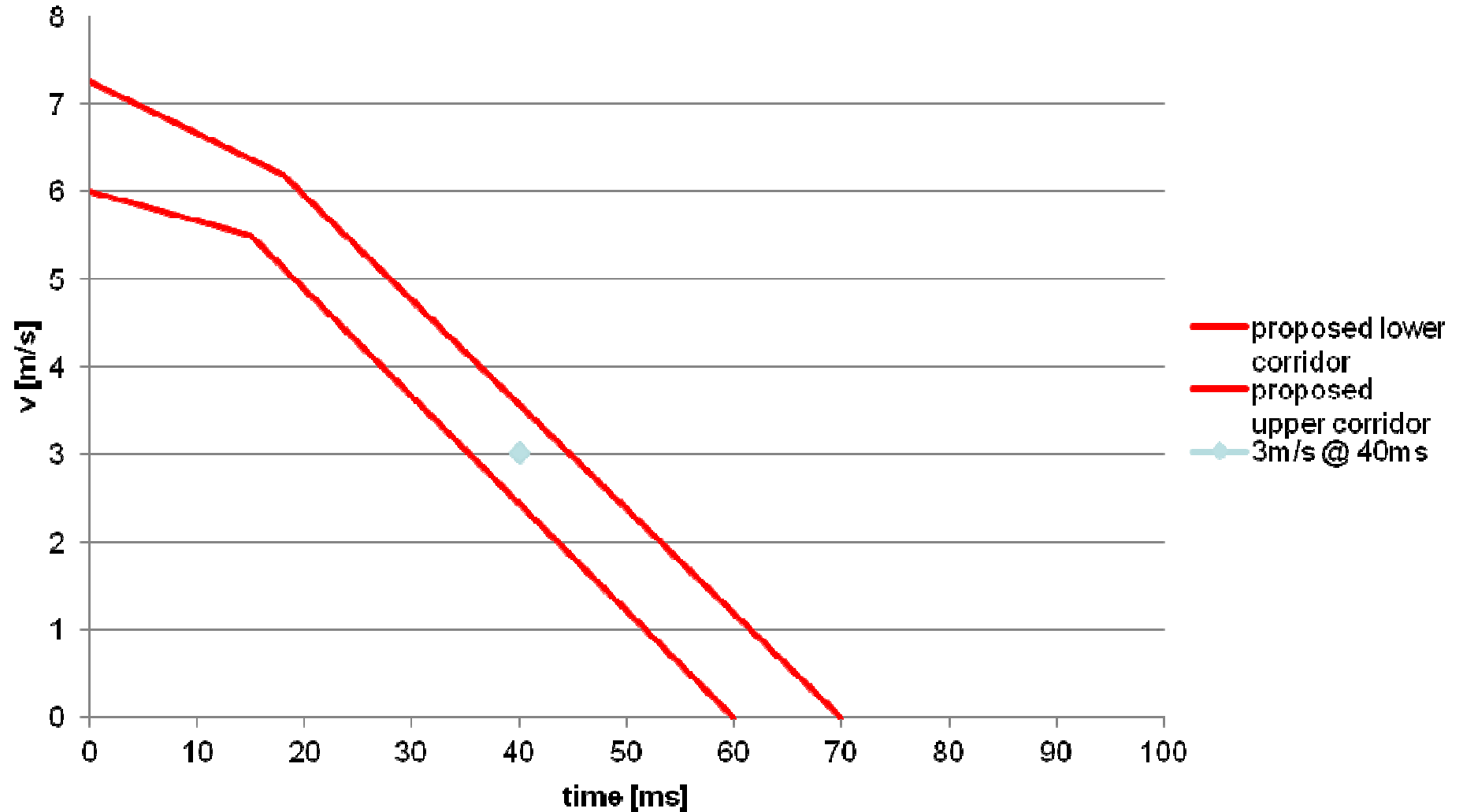
	Q0	Q1	Q1.5	Q3	Q6
HIC	600	600	600	800	800
a3ms head	75g	75g	75g	80g	80g

Comparison Sled old Corridor with UTAC/LAB Tests

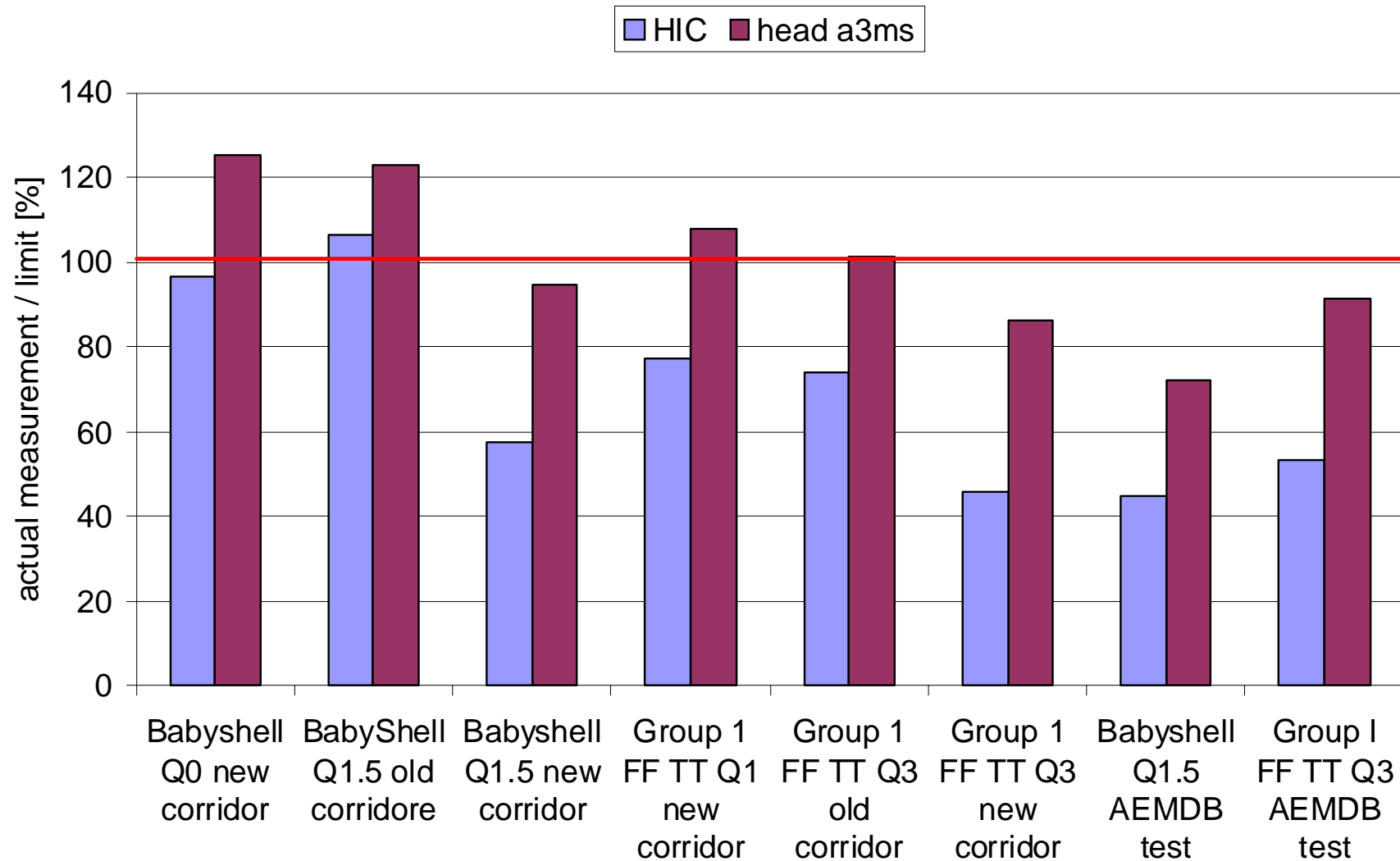


New Corridor

Side Impact Velocity-Time Corridor



Comparison Sled new Corridor with UTAC/LAB Tests



Proposal for Head Containment Plane

- Location of the head containment plane has a distance of [55 mm] to the padding material (i.e., first contact surface of the CRS)
- Dummy's head must not cross this head containment plane

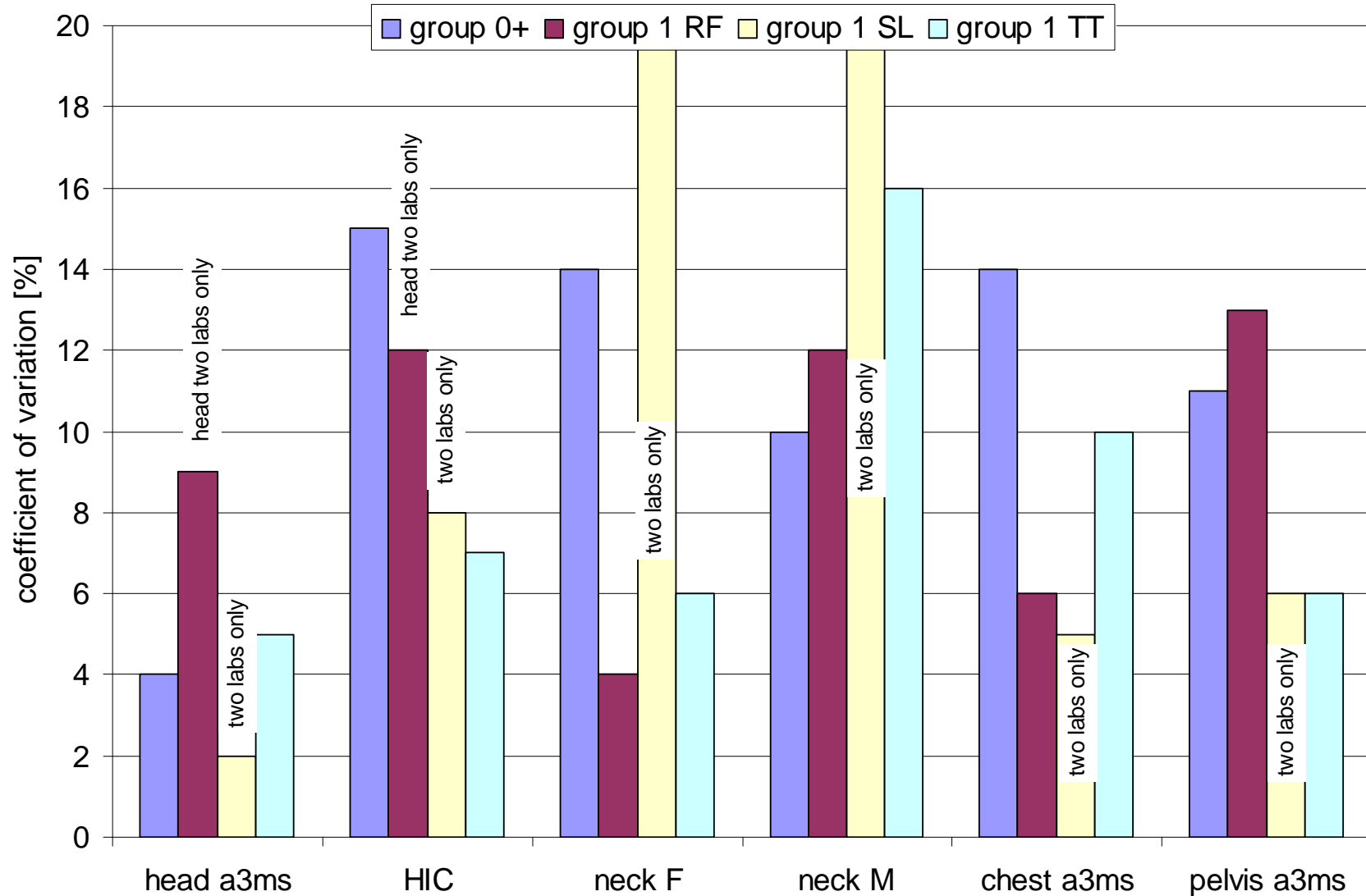
Reproducibility Tests

- Labs
 - Britax (PU tubes)
 - Dorel (hydraulic brake)
 - IDIADA (acceleration sled / sled on sled)
 - TUB (bar brakes)
- Approach
 - 3 labs conducting 2 tests
 - coefficient of variation for all tests in one batch

Reproducibility Tests

- Products
 - Baby shell SL (Q1.5)
 - Group 1 RF SL (Q3)
 - Group 1 FF SL (Q1)
 - Group 1 FF TT (Q3)

Reproducibility Tests



Newest Issues

- Problem
 - description in the draft standard seems not to be sufficiently clear
 - meaning of delta-v corridor for acceleration sled
- Solution
 - statement in the text:
 - relative velocity corridor between dorr panel and test bench

Cooperation within the Group

- Subgroup for lateral impact test procedure
 - started December 2009
 - open for everyone willing to contribute
- Contributors sled tests:
 - BASt (planned)
 - Britax
 - CSI (planned)
 - Dorel
 - IDIADA
 - TNO (planned)
 - TUB

Cooperation within the Group

- Contributors dummy tests:
 - Humanetics
- Contributors CRS:
 - Bellelli
 - Britax
 - Dorel
 - Graco
 - RECARO
 - TUB (seats available on stock Bobob, TeamTex, ...)
 - HTS

Cooperation within the Group

- Contributors car test results:
 - UTAC/LAB (new barrier to car tests)
 - RDW (analysis of crash worthiness car-to-car test data)
 - TUB (analysis of old car test data)

Cooperation within the Group

- Task force:
 - BAST
 - Britax
 - CSI
 - CORS International
 - Dorel
 - Humanetics
 - IDIADA
 - RDW
 - TNO
 - TUB

Cooperation within the Group

- Contributors invested in the lateral impact test procedure
- Looking at the current discussion concerning frontal impact test procedure some members fear that this investment could be wasted
- It is unlikely that large testing programme could be repeated

Latest Discussions

- Forward component was not taken into account
 - ISO analysed
 - accident data from Germany, Sweden and US
 - Influence of forward component in a test with intrusion
 - ISO concluded
 - purely perpendicular tests are most severe w.r.t. dummy readings
 - Influence of forward component w.r.t. head containment is minor

Latest Discussions

- Forward component was not taken into account
 - DOREL tested
 - 90° door
 - 80° door
 - DOREL concluded
 - Almost no difference in dummy readings
 - Influence of forward component w.r.t. head containment is minor

Latest Discussion

- Moveable ISOFIX anchorages are unrealistic
 - The moveable anchorages avoid severe damages on test equipment and following increase repeatability and reproducibility
 - Analysis of CRS movement in the tests shows that the CRS is mainly moving after the loading phase of the dummy
 - Dorel conducted tests with a restriction in anchorages moveability up to 40 mm without differences to the free anchorages