CASPER

CHILD ADVANCED SAFETY PROJECT FOR EUROPEAN ROADS

CASPER Status of Activities on Test Procedures

COVER Workshop November 29th/30th
Munich, Germany

Agenda

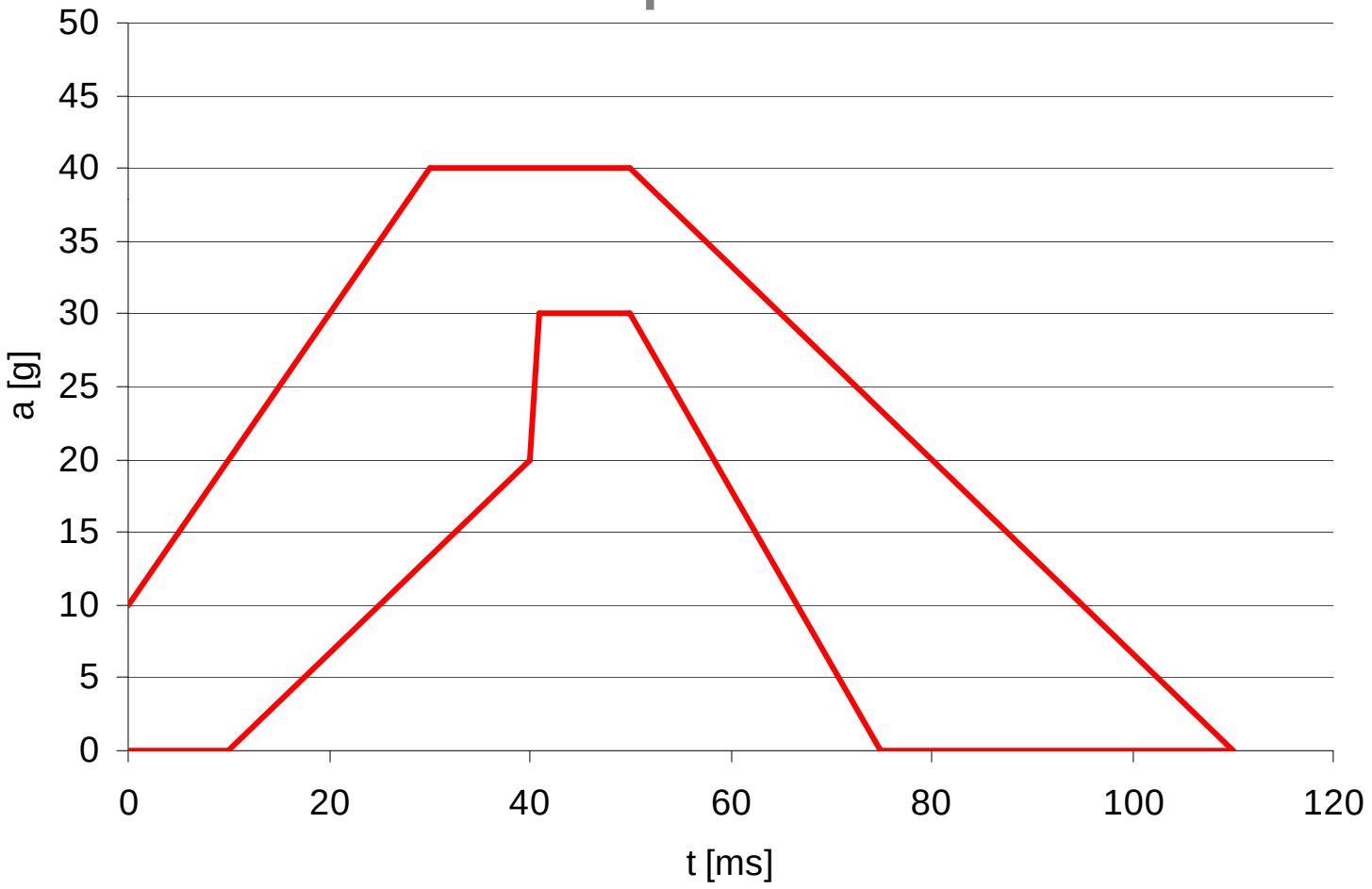
1. Situation at the beginning of CASPER
2. CASPER priorities for impact types
3. Activities for test procedures

1. Situation at the Beginning of CASPER

- Results from CREST and CHILD
  - Frontal impact test procedure
    - pulse defined based on CREST frontal impact accident reconstruction results
    - pulse confirmed by CHILD reconstruction results
    - test bench design taking into account seat ramps etc.

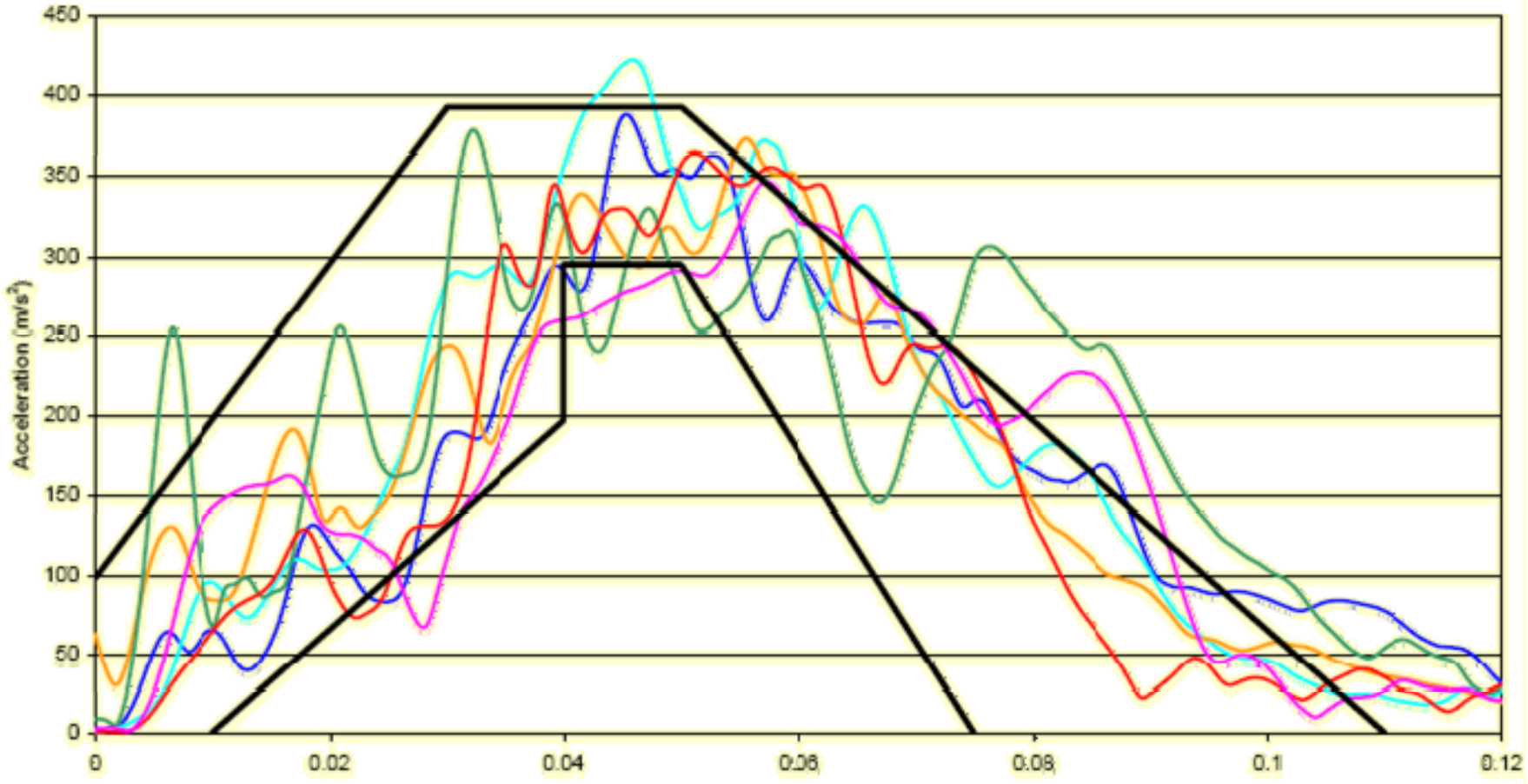
1. Situation at the Beginning of CASPER

CREST frontal impact corridor



1. Situation at the Beginning of CASPER

CREST corridor with CHILD data

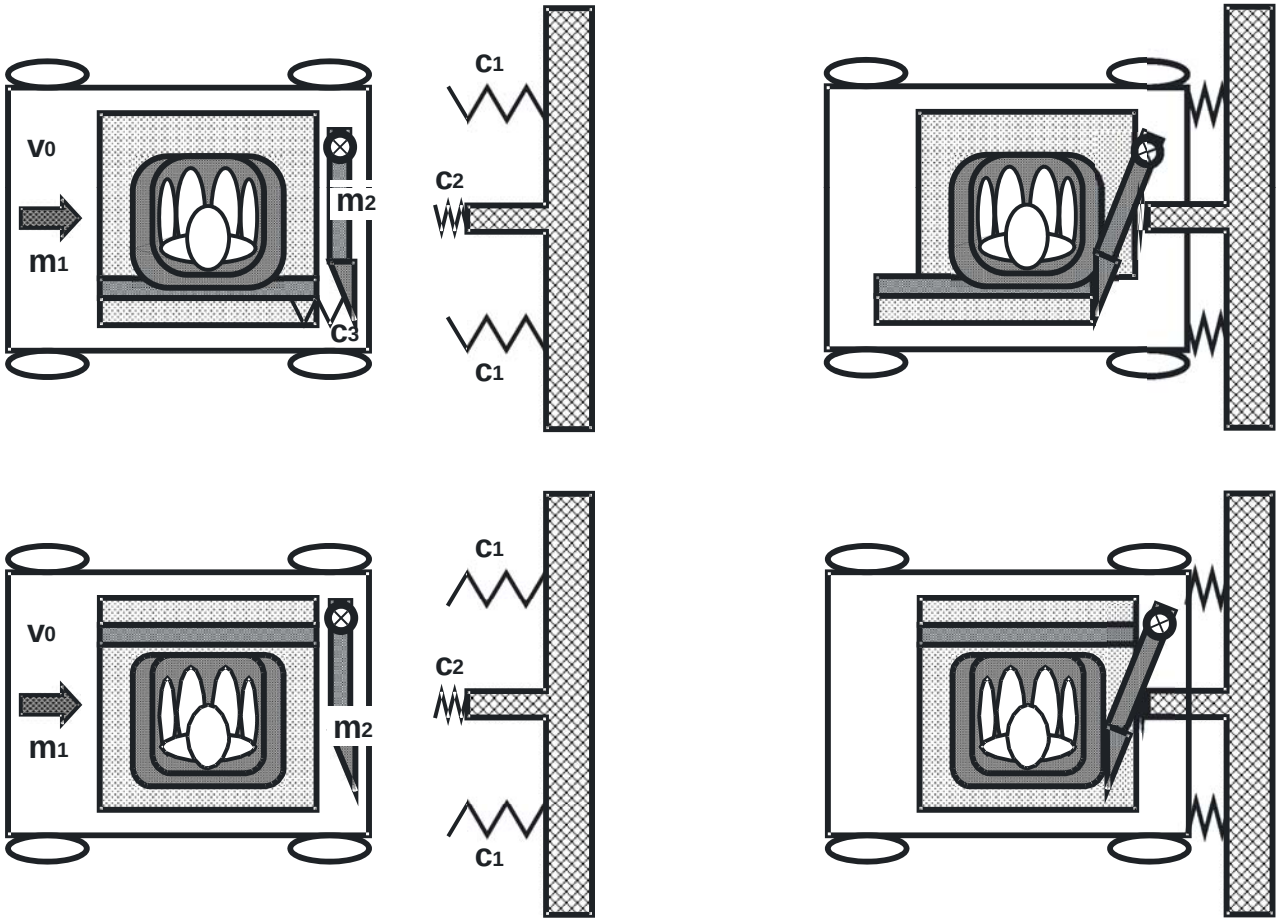


1. Situation at the Beginning of CASPER

- CHILD proposal side impact procedure
  - Modified NPACS procedure (reduced severity) (note: different to what has presented in CHILD workshop)
    - hinged door procedure
    - worst case scenario

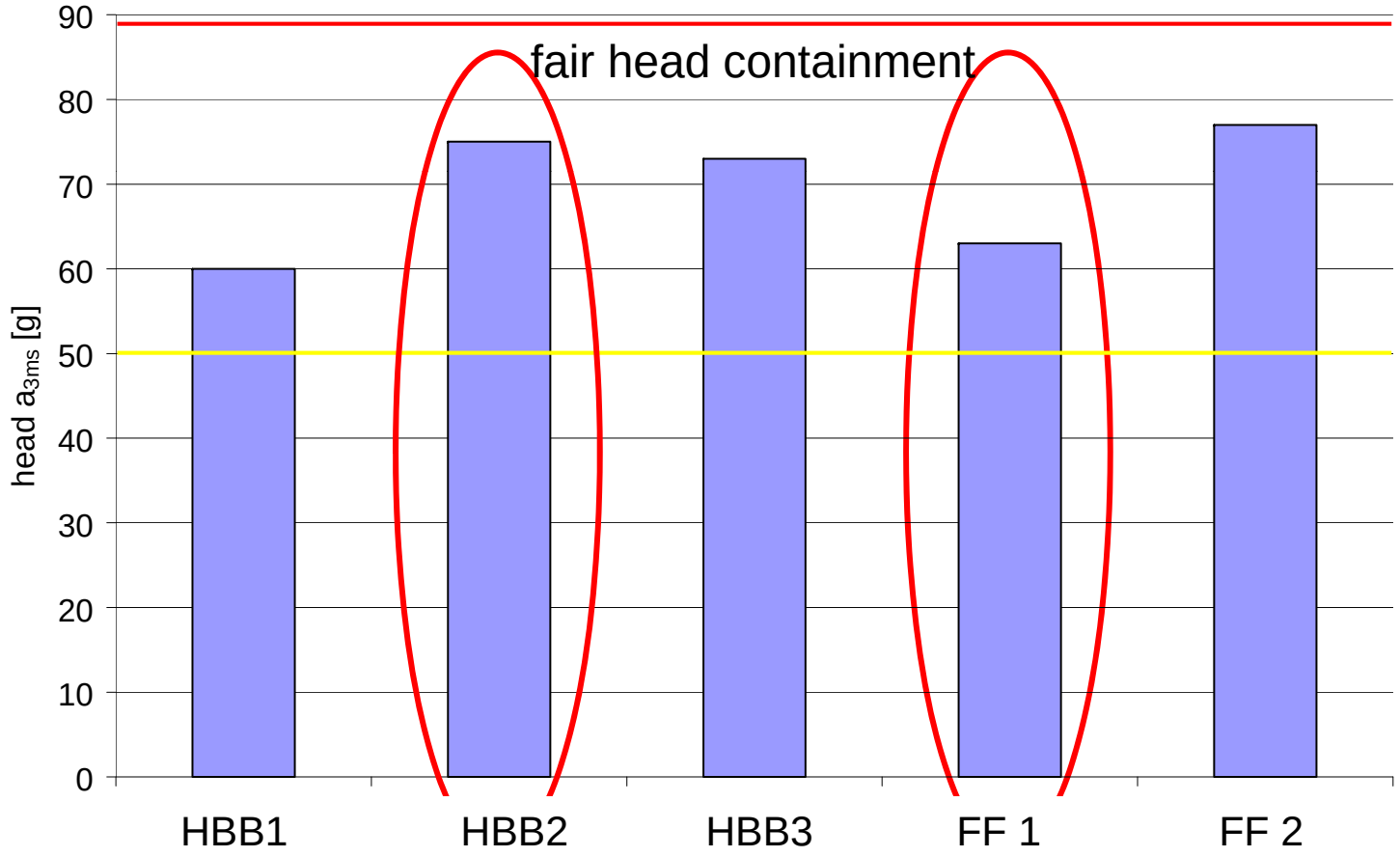
1. Situation at the Beginning of CASPER

CHILD proposal side impact procedure



1. Situation at the Beginning of CASPER

CHILD proposal side impact procedure



1. Situation at the Beginning of CASPER

- GRSP Informal Group on CRS
  - IG CRS started to develop new regulation for homologation of CRS in 2008
    - start with ISOFIX integral harness system

1. Situation at the Beginning of CASPER

- GRSP Informal Group on CRS
  - Agenda GRSP IG CRS
    - review frontal impact and rear impact
    - introduction of side impact test procedure
    - introduction of Q dummy family
    - new classification system
    - universal support leg definition
    - …

1. Situation at the Beginning of CASPER

GRSP Informal Group on CRS

- Lateral impact test procedure
  - review of different protocols
    - ISO / NPACS
    - ADAC
    - NHTSA / TAKATA
    - Australia / New Zealand
  - none of the reviewed test procedure accepted

1. Situation at the Beginning of CASPER

- GRSP Informal Group on CRS
  - Lateral impact test procedure (2)
    - decision to develop own test procedure taking into account
      - energy management
      - kinematics
    - request to ISO TC22 SC 12 WG1 to support

1. Situation at the Beginning of CASPER

- GRSP Informal Group on CRS
  - CASPER decided to allocate resources to support GRSP IG CRS
    - CASPER asked GRSP what the most preferred contribution would be
    - answer: validation of lateral impact test procedure

2. CASPER Priorities for Impact Types

- Frontal Impact Test Procedure
  - Not yet reviewed
  - Accident data supports high priority of frontal impact test procedure

2. CASPER Priorities for Impact Types

- Lateral Impact Test Procedure
  - Accident data supports high priority of lateral impact test procedure
  - Injuries are mainly connected with intrusion

2. CASPER Priorities for Impact Types

Rear Impact Test Procedure

- Accident data indicates: rarely fatal and severe injuries even with heavy car deformation
- ECE R44 + Australia/NZ regulation consider rear impact for RF CRS
- CASPER considers existing procedures as sufficient

2. CASPER Priorities for Impact Types

Roll Over Test Procedure

- Accident data: rarely fatal and severe injuries for restrained children
- ECE R44 considers roll over
  - quasi static roll over
  - 360° turn (X and Y)
- CASPER considers proposal for improvement (see next slides)

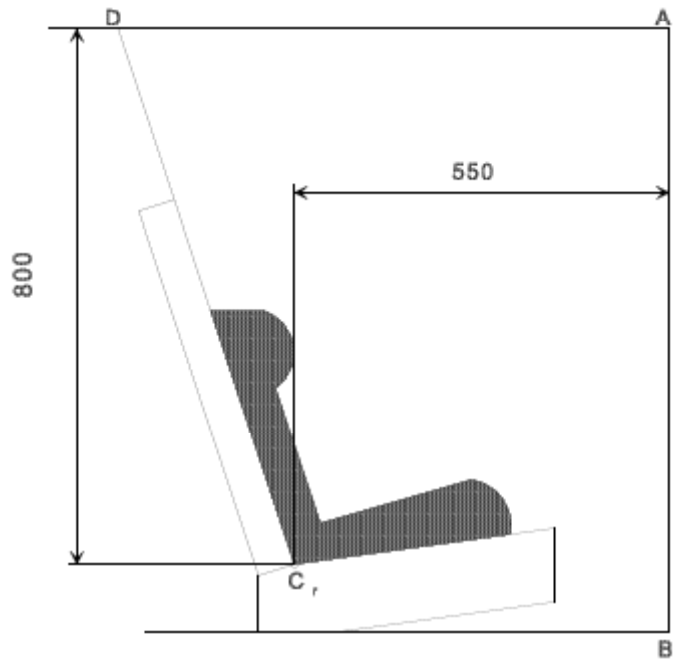
3. Activities for Test Procedures

- Roll Over Test Procedure
  - Current assessment ECE R44
    - relative movement of head in upside down position

3. Activities for Test Procedures

Roll Over Test Procedure (2)

- Proposal for improvement ECE R44
  - add absolute limit for head excursion (i.e., plane AD)



Dimensions in mm

3. Activities for Test Procedures

Lateral Impact Test Procedure

- GRSP test procedure
  - based on ECE R44 rear impact
  - new frontal impact test bench 90°
  - relative movement between flat door and test bench
  - flat door panel with padding according to ISO proposal

3. Activities for Test Procedures

- Lateral Impact Test Procedure (2)
  - GRSP test procedure (2)
    - initial velocity originally 7 to 7.4 m/s (new proposal 6 to 7.2 m/s)
    - stopping distance originally 300 mm corresponding to 250 mm intrusion (new proposal 250 mm with 200 mm intrusion)

3. Activities for Test Procedures

Lateral Impact Test Procedure (3)

- Proposed Criteria

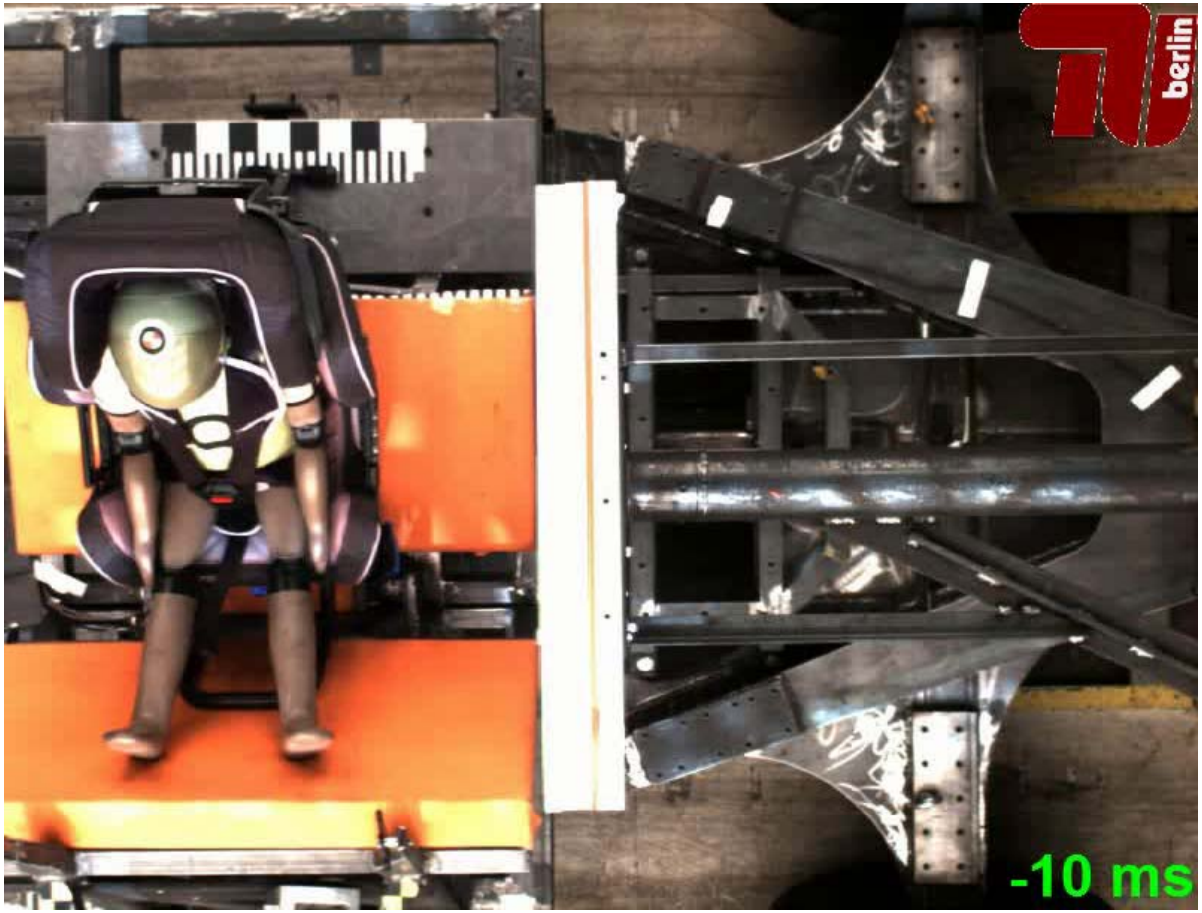
	Q0	Q1	Q1.5	Q3	Q6
HIC	600	600	600	800	800
a_{3ms} head	75g	75g	75g	80g	80g
head contain-ment	Head shall not pass through head containment plane which is positioned in a distance of [55] mm from panel outside				

3. Activities for Test Procedures

Lateral Impact Test Procedure (4)

3. Activities for Test Procedures

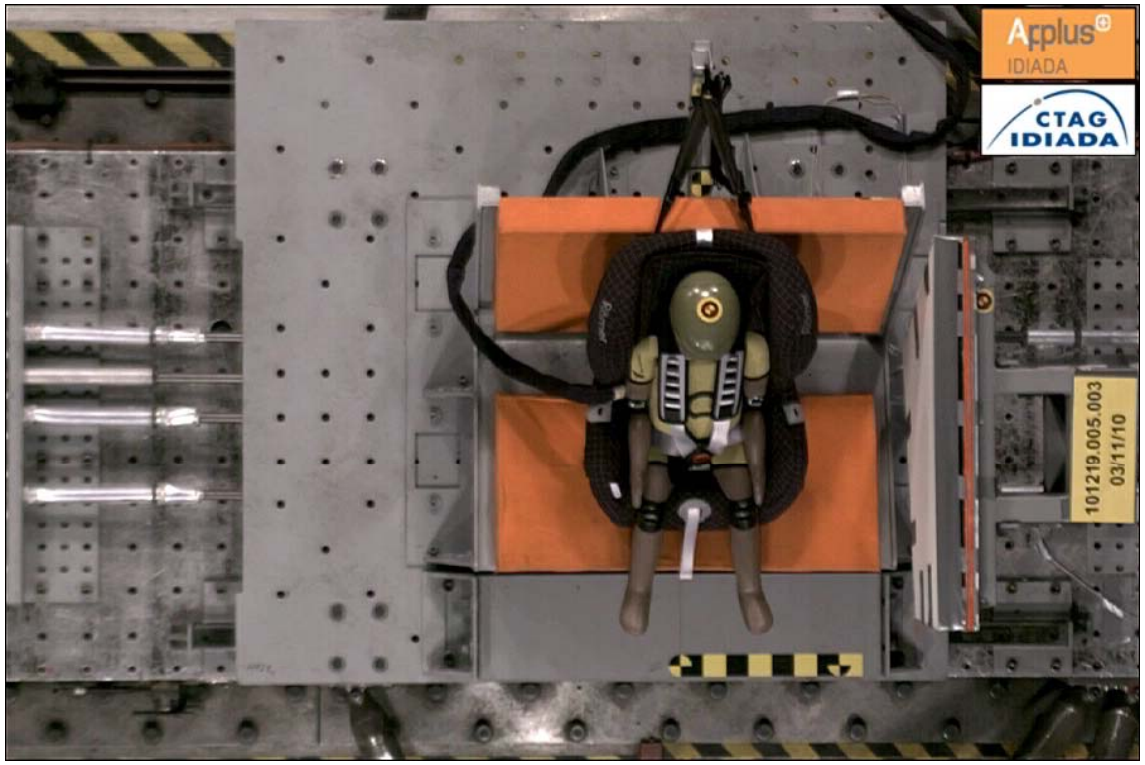
Lateral Impact Test Procedure (5)



3. Activities for Test Procedures

Lateral Impact Test Procedure (6)

- Feasability (acceleration sled)



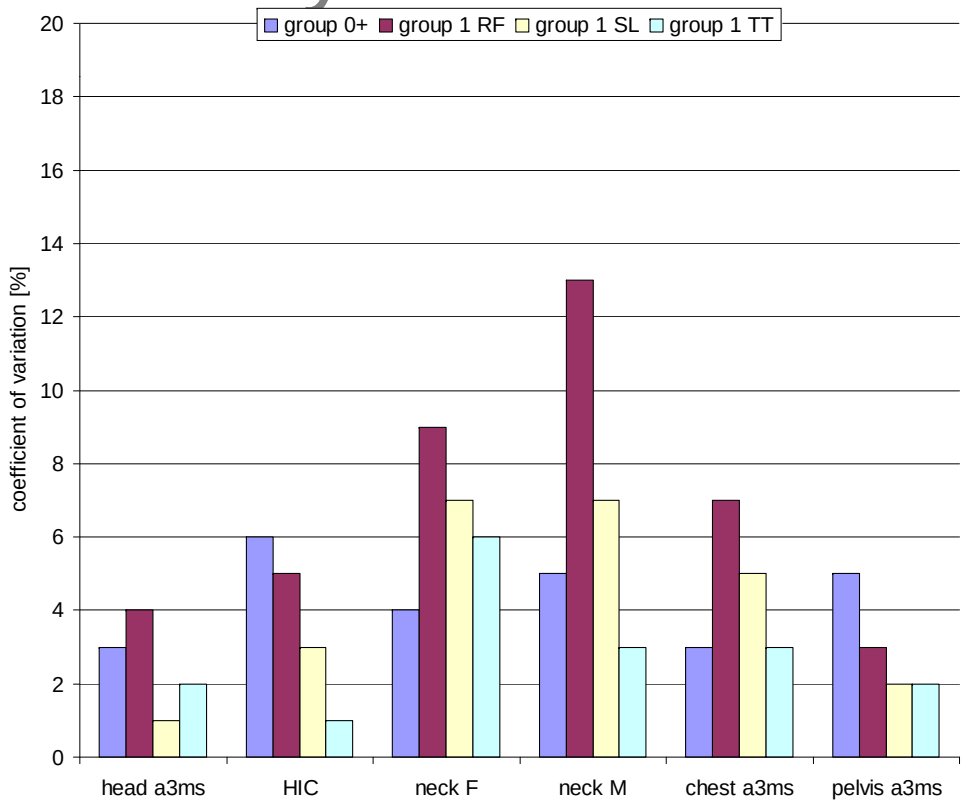
3. Activities for Test Procedures

- Lateral Impact Test Procedure (7)
  - Check of repeatability and reproducibility
    - cooperation with
      - Britax
      - Dorel
      - CSI and TNO planned

3. Activities for Test Procedures

Lateral Impact Test Procedure (8)

- Repeatability



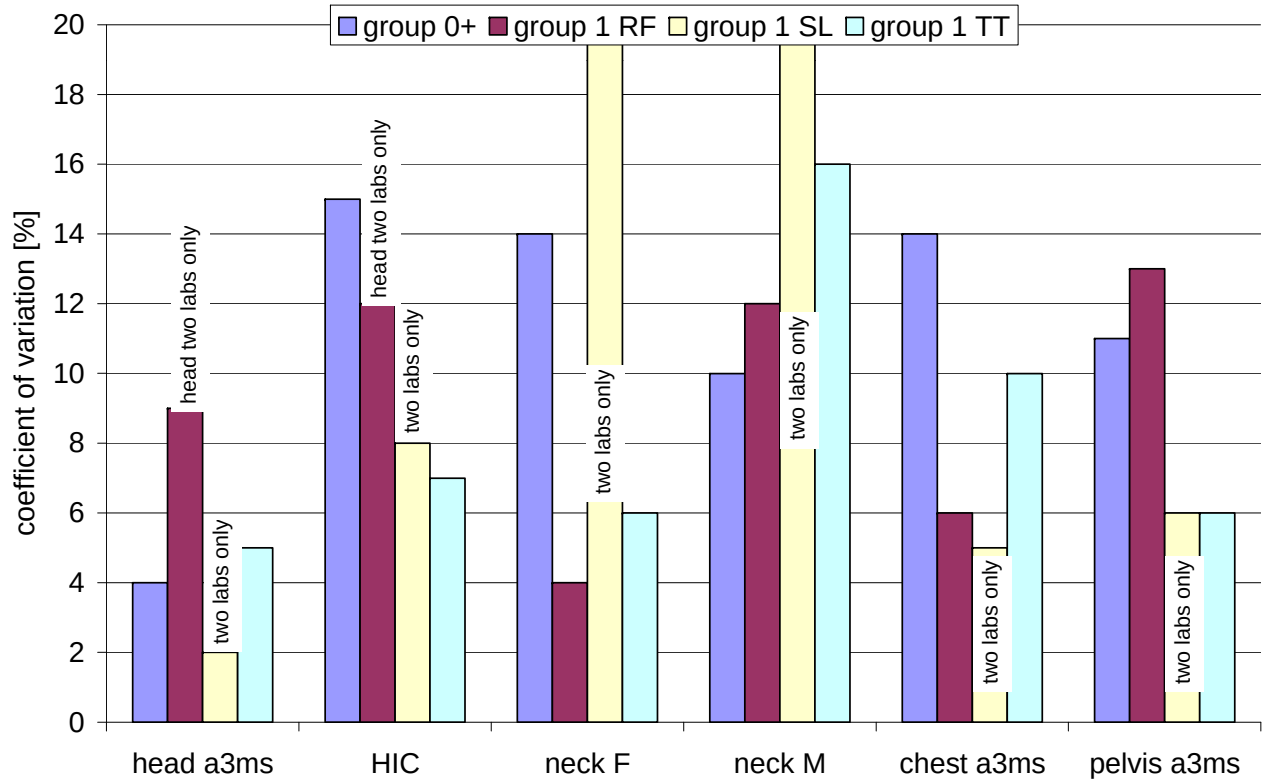
3. Activities for Test Procedures

- Lateral Impact Test Procedure (9)
  - Reproducibility
    - Tests conducted at
      - Britax (PU tubes)
      - Dorel (hydraulic brake)
      - IDIADA (acceleration sled)
      - TUB (bar brake)

3. Activities for Test Procedures

Lateral Impact Test Procedure (10)

- Reproducibility



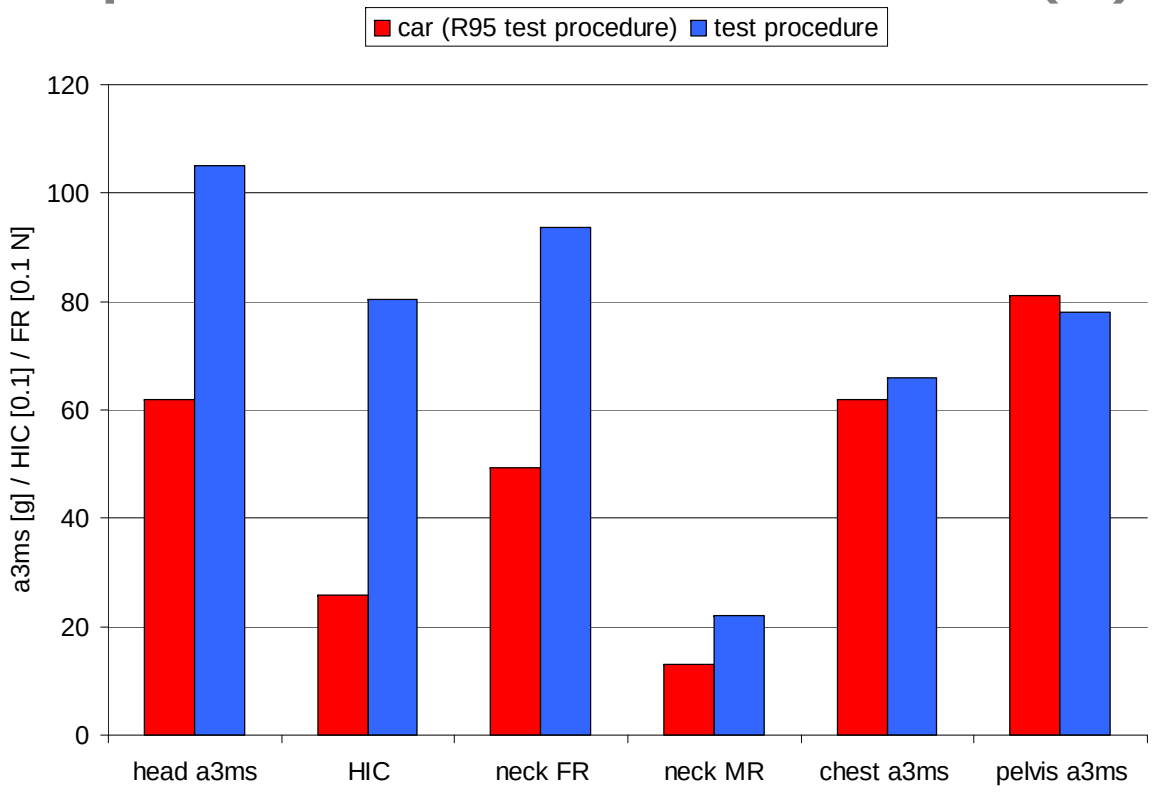
3. Activities for Test Procedures

- Lateral Impact Test Procedure (11)
  - Comparison with car tests (1)
    - TUB conducted Euro NCAP like test with car of early 2000
      - group I FF in front at struck side with ISOFIX
      - group 0+ in rear at struck side with SL

3. Activities for Test Procedures

Lateral Impact Test Procedure (12)

- Comparison with car tests (2)



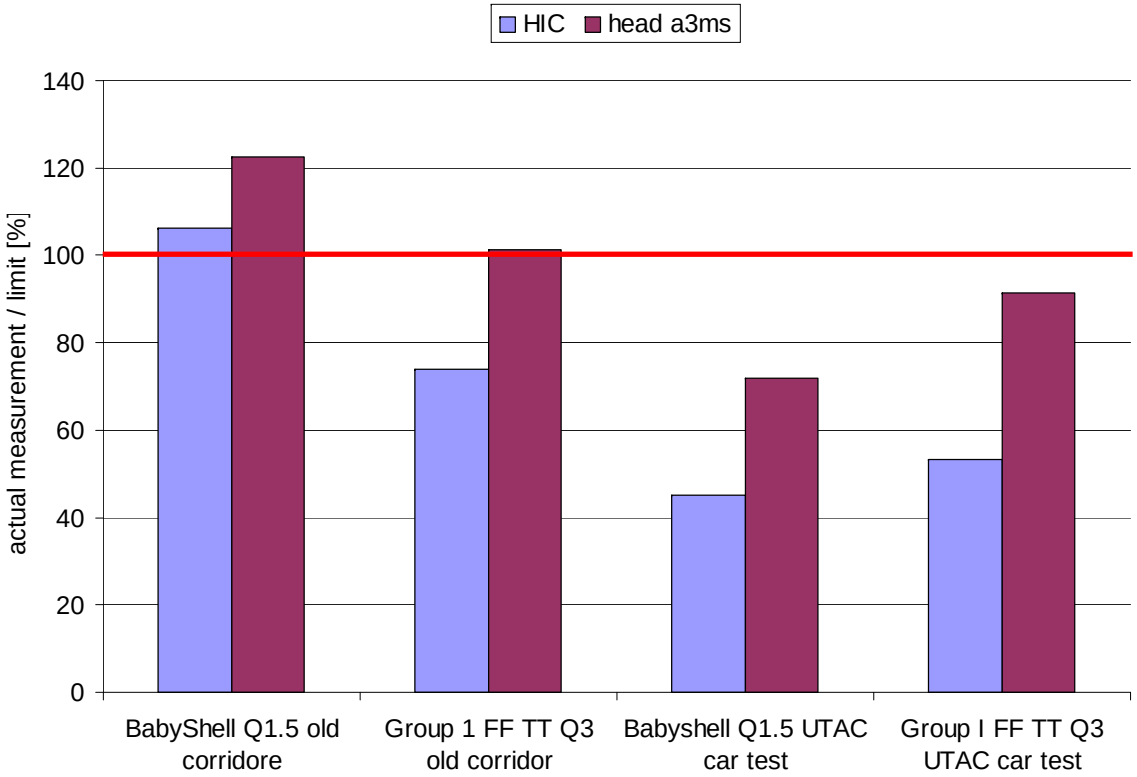
3. Activities for Test Procedures

- Lateral Impact Test Procedure (13)
  - Comparison with FST (3)
    - LAB and UTAC conducted side impact tests with recent car with ISOFIX
      - AEMDB
      - group I FF in front at struck side with ISOFIX and TT
      - group 0+ in rear at struck side with SL
      - tests with and w/o side airbag

3. Activities for Test Procedures

Lateral Impact Test Procedure (14)

- Comparison with FST (4)



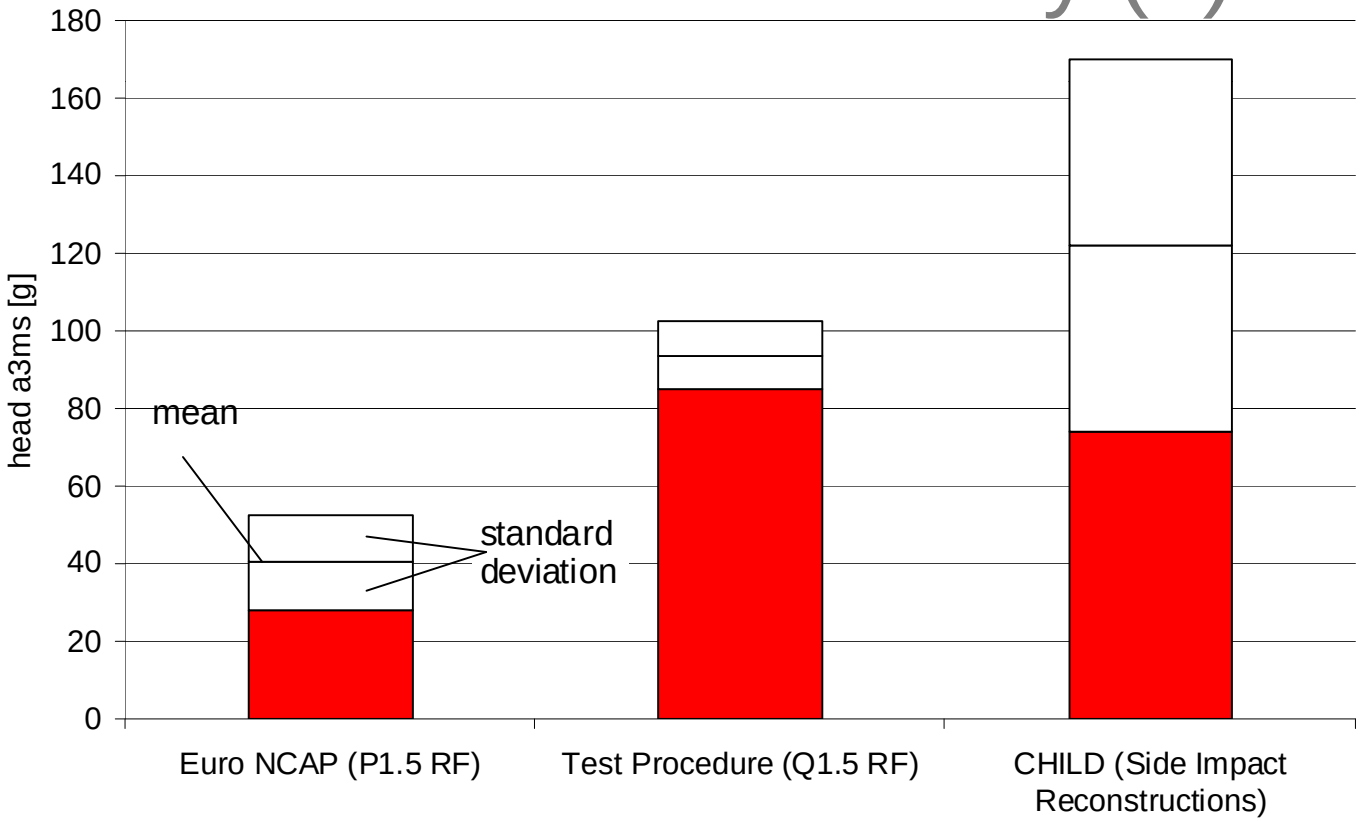
3. Activities for Test Procedures

- Lateral Impact Test Procedure (15)
  - Discussion of test severity (1)
    - Compared to car tests the severity of the procedure seems to be too high
    - CRS optimisations at TUB to fulfill requirements of test procedure resulted in worse dummy loads in car-to-car tests
    - Experience show more challenging dummy readings in smaller dummies

3. Activities for Test Procedures

Lateral Impact Test Procedure (16)

- Discussion of test severity (2)

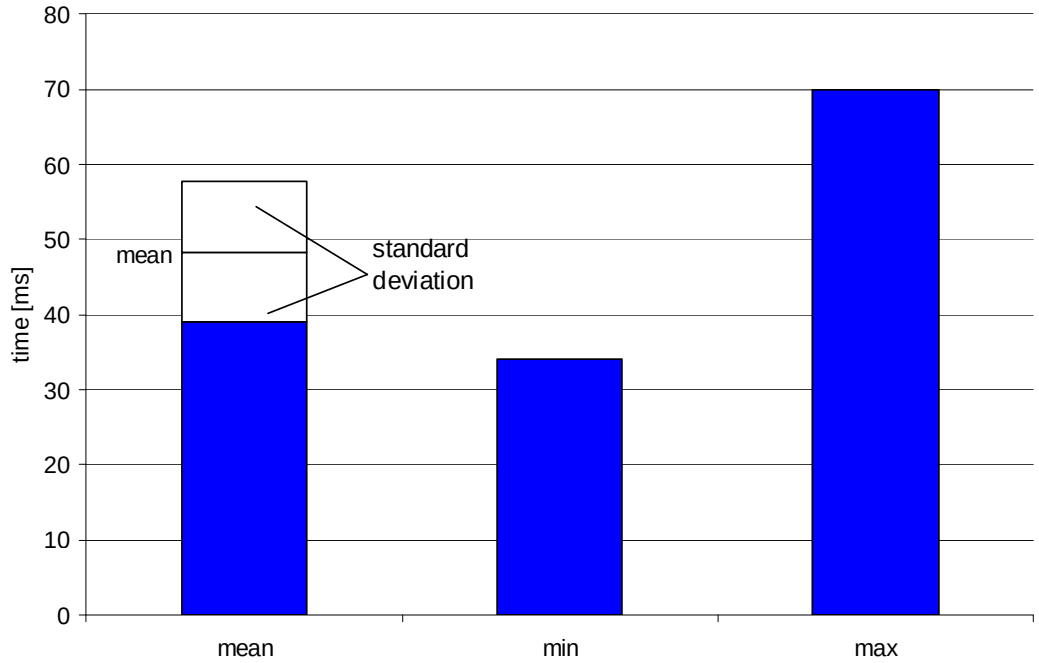


3. Activities for Test Procedures

- Lateral Impact Test Procedure (17)
  - Discussion of test severity (3)
    - corridors for the test procedure were based on findings presented in ISO PAS 13396
    - timing issues have not been considered

3. Activities for Test Procedures

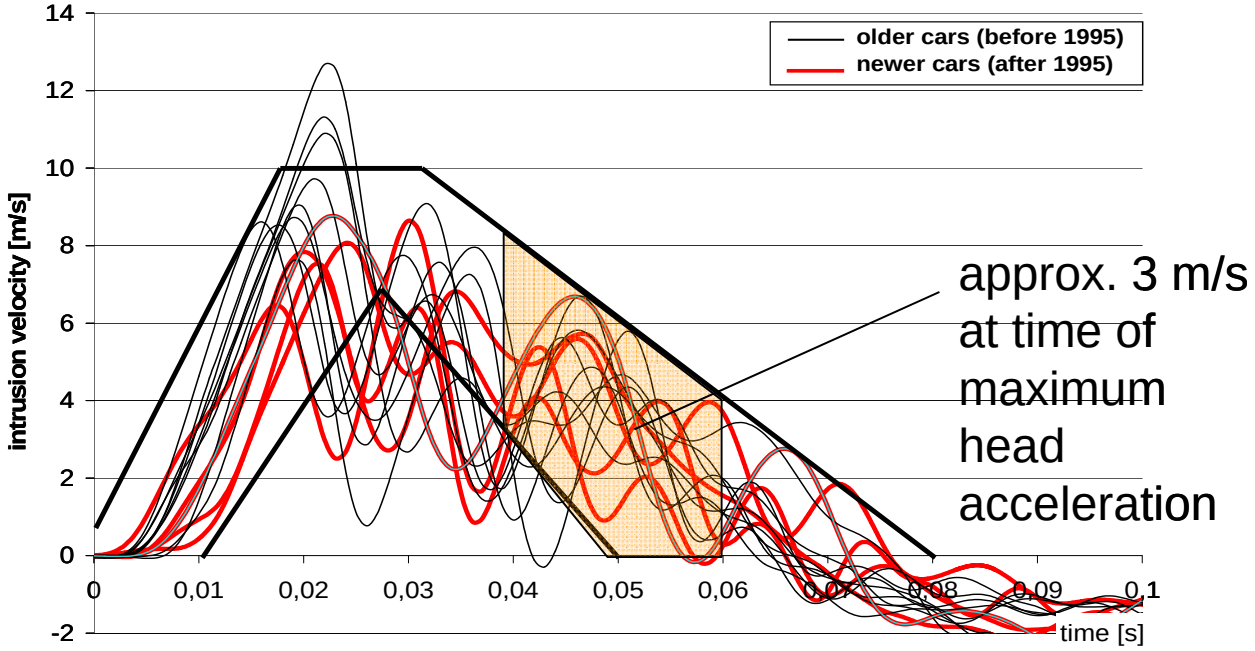
- Lateral Impact Test Procedure (18)
  - Discussion of test severity (4)
    - time of head acceleration max. (FST)



3. Activities for Test Procedures

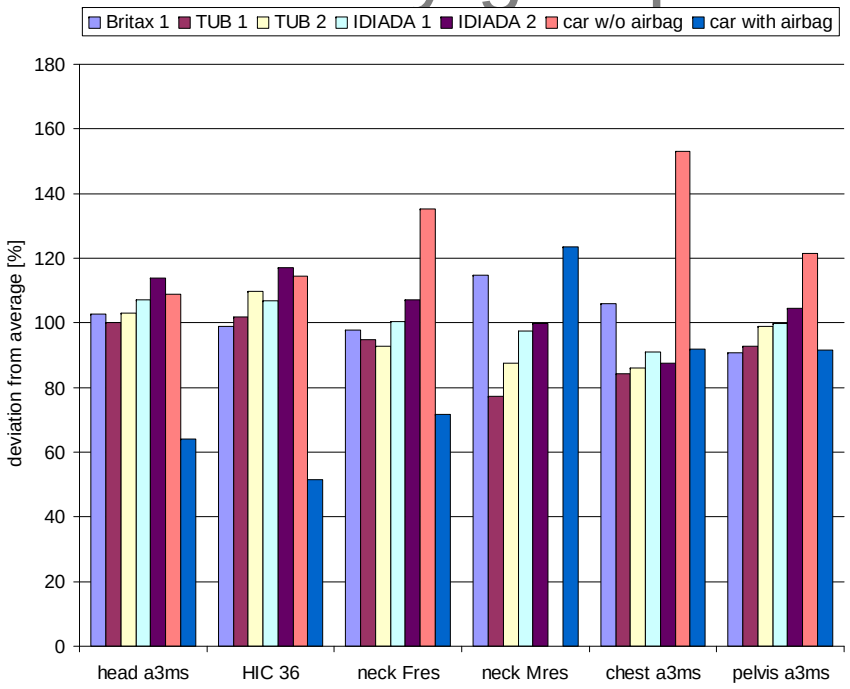
Lateral Impact Test Procedure (19)

- Discussion of test severity (5)
  - ISO corridor with consideration of timing



3. Activities for Test Procedures

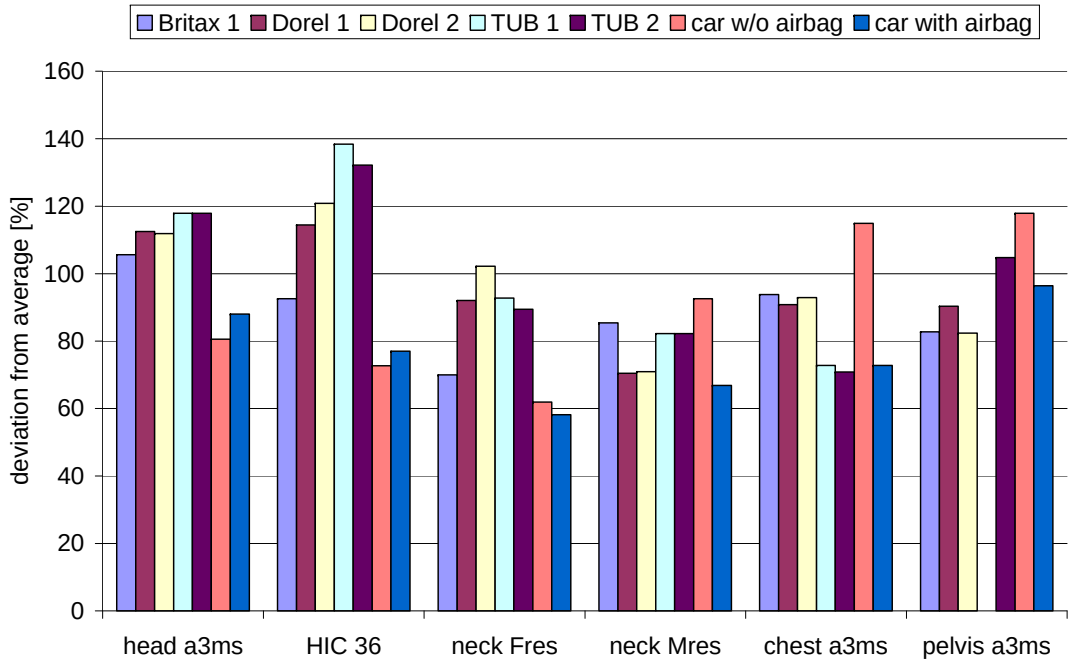
- Lateral Impact Test Procedure (20)
  - Discussion of test severity (6)
    - new test severity group 1 FF TT



3. Activities for Test Procedures

Lateral Impact Test Procedure (21)

- Discussion of test severity (7)
  - new test severity group 0+ SL



Questions?

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