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# Testing outside Bumper Corners

7<sup>th</sup> (2) Meeting of Task Force Bumper Test Area (TF-BTA)  
WebEx, September 9<sup>th</sup>, 2014

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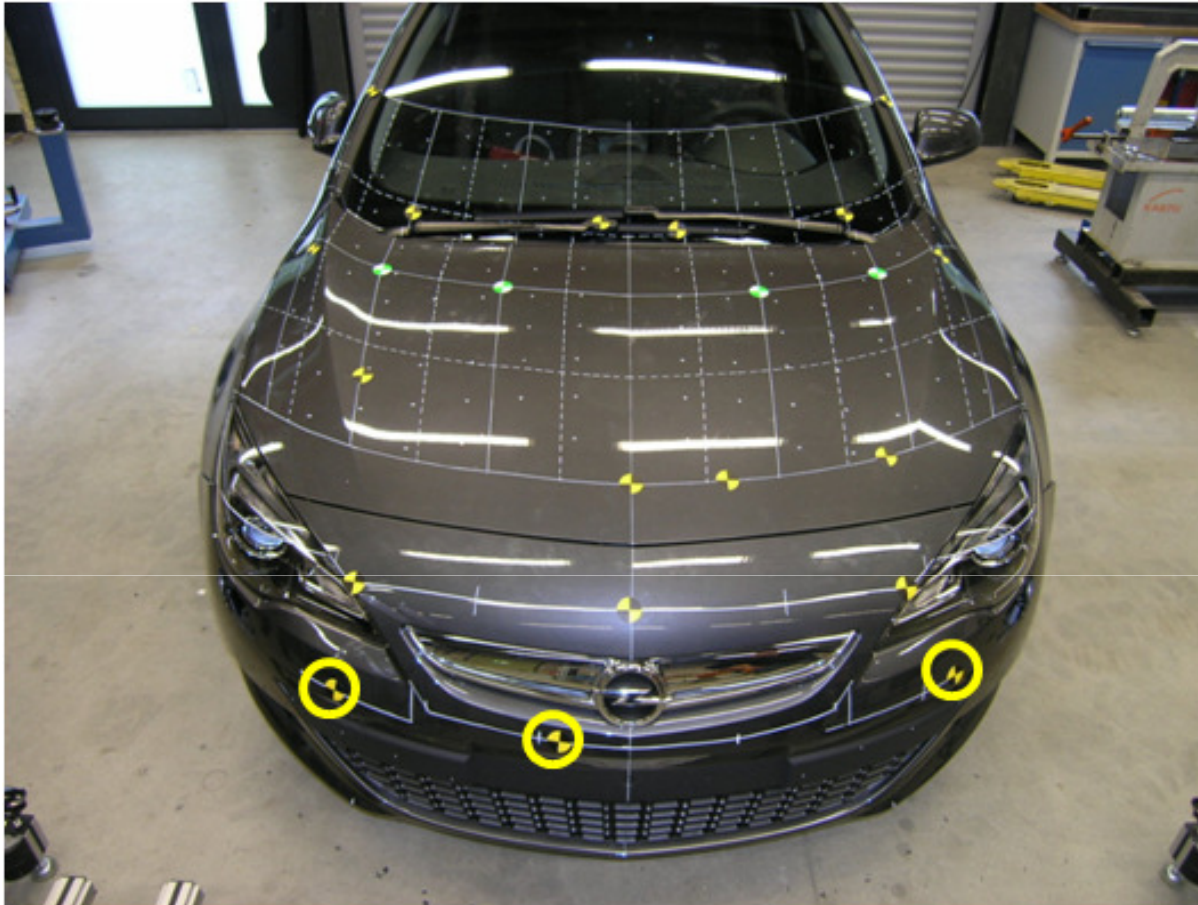
BGS Boehme & Gehring GmbH

**Bundesanstalt für Straßenwesen**

(Federal Highway Research Institute)

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# Example

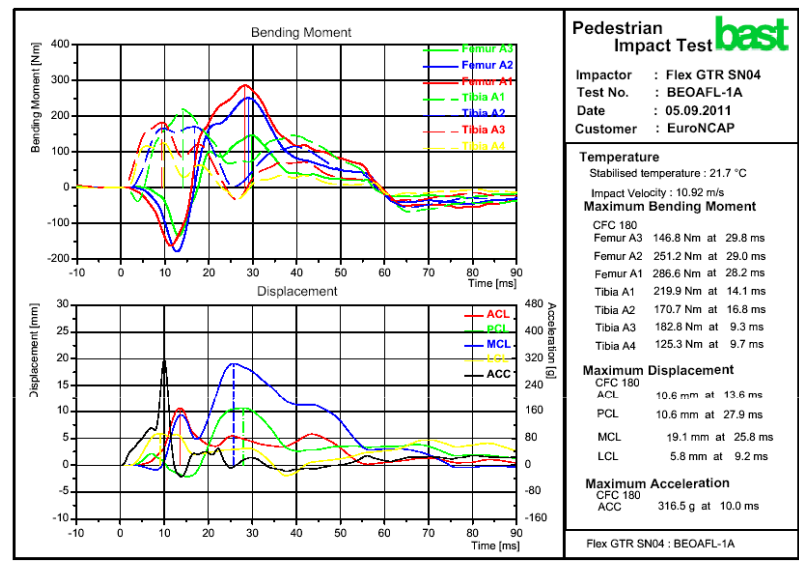


- L1a – Towing eye position**
- L2a – Most possible bending**
- L3b – Outermost point of bumper beam**

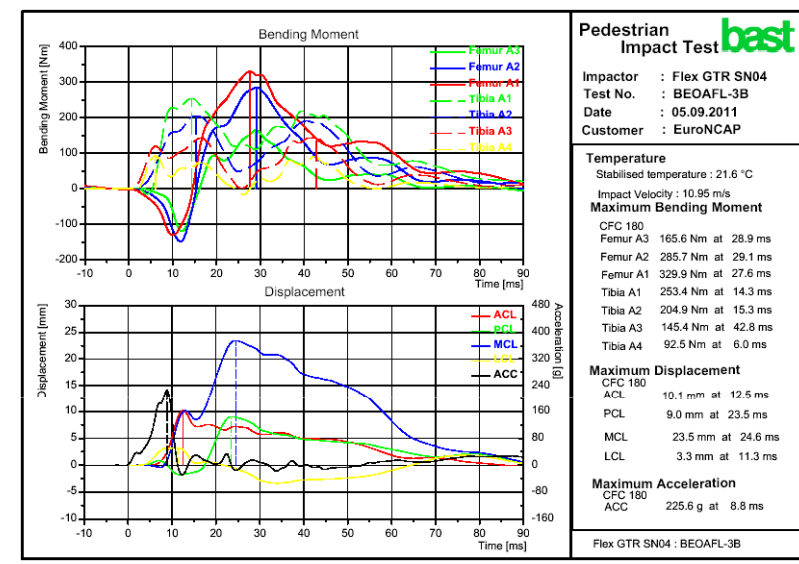
# Results – L1a & L3b



## Inside bumper corners



## Outside bumper corners



Max. Tibia bending moment	219,9 Nm
Max. ACL/PCL elongation	10,6 mm
MCL elongation	19,1 mm



Max. Tibia bending moment	253,4 Nm
Max. ACL/PCL elongation	10,1 mm
MCL elongation	23,5 mm



# Results – L1a & L3b



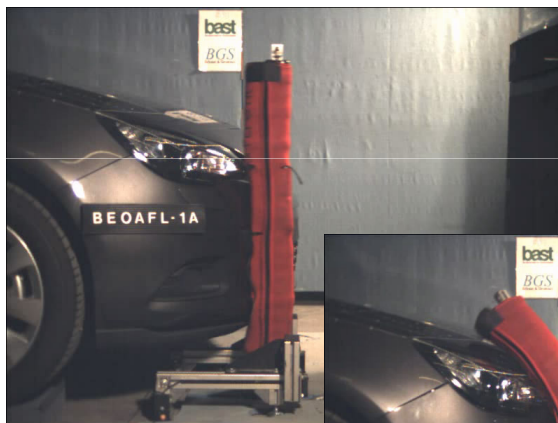
## Inside bumper corners

Max. Tibia bending moment	219,9 Nm
Max. ACL/PCL elongation	10,6 mm
MCL elongation	19,1 mm



## Outside bumper corners

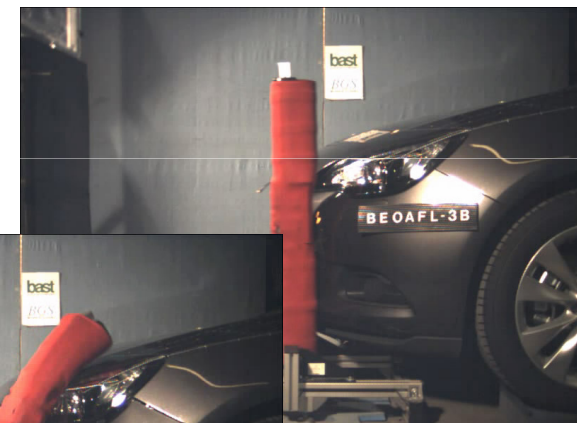
Max. Tibia bending moment	253,4 Nm
Max. ACL/PCL elongation	10,1 mm
MCL elongation	23,5 mm



valid ?

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invalid ?



## Euro NCAP Legform Test Zone

- Feasibility of testing oblique surfaces
  - Testing of the full bumper width was discounted so that Euro NCAP could avoid being forced into testing oblique structures.
  - Testing showed that some oblique surfaces do not provide reliable legform results, but others do.





TF-BTA-5-05

## ACEA Members' Proposal

- The definition of the bumper corners should consider the structural parts behind the bumper fascia
- This could be guaranteed by two possible approaches:
  - Applying the existing bumper corners in the height where today structural interaction is required by bumper regulations (445 mm for UN R42, 16 – 20 inches (406 – 508 mm) for CFR part 581)
  - Using the solution of Euro NCAP: Measuring the bumper corners at the 60° planes and measuring the overall width of the bumper structural parts and finally conducting the test against the wider of the two areas

# Stakeholder's opinions

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Bumper test area - Final report



- Outside of the current bumper test area there are hard structures which give results indicating their potentially injurious nature

# Conclusion

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- **A premature limitation of bumper test area by bumper corners defined by 60° planes / gauges is invalid.**
- **Also Euro NCAP stated that the impactor works outside of the current (legal) test area (TF-BTA-1-04)**
- **Even ACEA proposed to assess the structural parts behind the bumper cover (TF-BTA-5-05)**
- **TRL stated the potentially injurious nature of hard structures outside the current bumper test area**
- **BAST agrees with the general opinion that the structural injurious elements behind the bumper covers should be considered.**
- **Therefore, the consideration of the entire bumper beam width is indispensable.**





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# Thank you !