
Informal document GRSP-55-40
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agenda item 3(b))

Status of the Task Force Bumper Test Area

**55th Session of the Working Party on Passive Safety (GRSP)
Geneva, 19 -23 May 2014**

Oliver Zander (BAST), Thomas Kinsky (OICA)

on behalf of the chair of the Task Force Bumper Test Area

Background

- **TF-BTA started in March 2012 as a Subgroup of the Informal Group on GTR9-PH2.**
- **Focus: revision of the bumper test area to counteract measures of narrowing the bumper test area by any design means.**
- **Six meetings held.**
- **During the course of the Task Force, several options of how the bumper test area could be revised were discussed.**
- **At the last meeting (15 May 2014 in Paris), several proposals for a modification were concluded for further consideration.**
- **This document outlines the principles of these proposals and their general pros and cons.**
- **The TF-BTA seeks guidance of GRSP on how to further proceed.**

Current Wording of Gtr No 9

7. TEST PROCEDURES

7.1. Legform to bumper test procedures

7.1.1. Lower legform to bumper test procedure:

Each test shall be completed within two hours of when the impactor to be used is removed from the controlled storage area.

7.1.1.1. The selected target points shall be in the bumper test area.

[...]

7.1.2. Upper legform to bumper test procedure:

Each test shall be completed within two hours of when the impactor to be used is removed from the controlled storage area.

7.1.2.1. The selected target points shall be in the bumper test area as defined in paragraph 3.10.

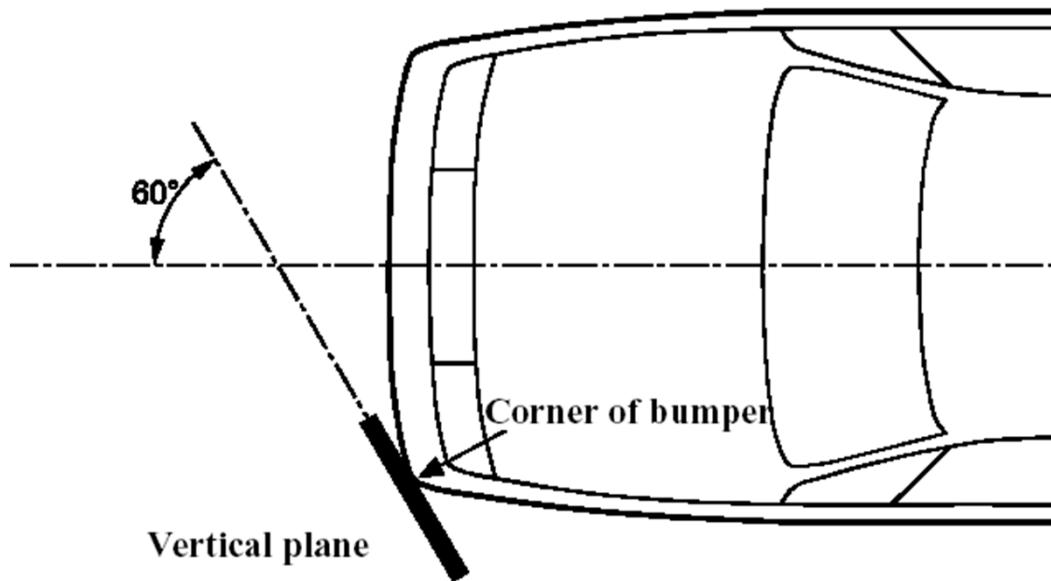
Current Wording of Gtr No 9 (continued)

- 3.10. "Bumper test area" means the frontal surface of the bumper limited by two longitudinal vertical planes intersecting the corners of the bumper and moved 66 mm parallel and inboard of the corners of the bumpers.

[...]

- 3.13. "Corner of bumper" means the vehicle's point of contact with a vertical plane which makes an angle of 60° with the vertical longitudinal plane of the car and is tangential to the outer surface of the bumper (see Figure 5).

[...]

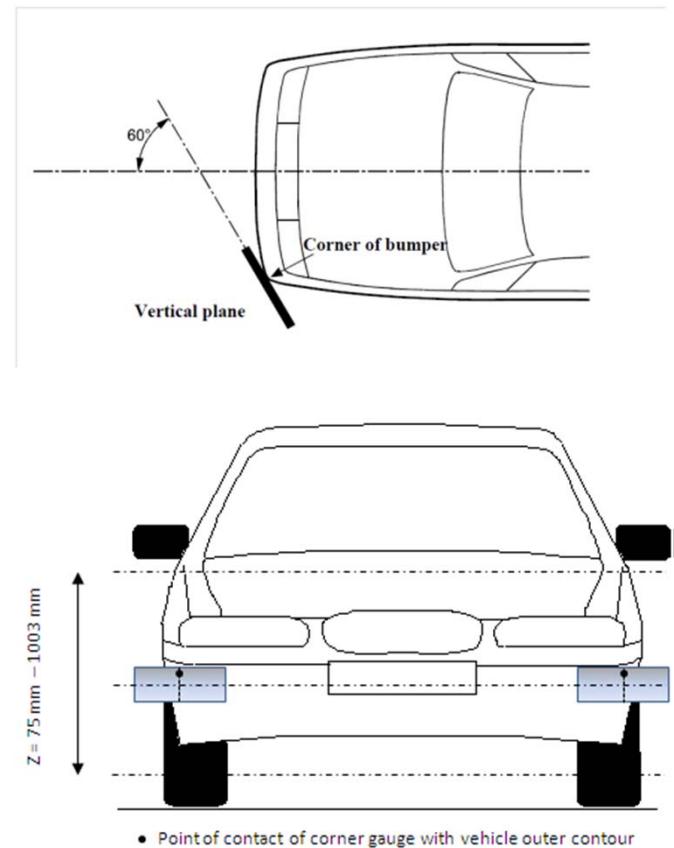


Proposal 1

Based on the proposals outlined in documents TF-BTA-6-03 to TF-BTA-6-06:

Definition of the Bumper Test Area as the area between the bumper corners, moving on either side 42 mm inboard parallel to a lateral vertical vehicle plane.

Definition of the bumper corners by the outermost contact point defined by contacting the vehicle with the vertical centerline of a 610 mm * 114 mm corner gauge at a height of the corner gauge's horizontal centerline between 75 mm and 1003 mm above ground level, with the gauges having an angle of 60° to the vertical longitudinal plane of the vehicle, and with the actual assessment area limited by lower and upper bumper reference lines



Justification for Proposal 1

1. So far, accident data does not give evidence for high injury severities caused by pedestrians being impacted by the outer ends of vehicles with a rounded front.
2. Oblique impacts can cause the legform test tools to rotate (particularly as the angle to the vehicle surface decreases) in a way that a human leg (as part of a full body) would not.
3. The test procedure needs to be robust, using a test area where an appropriate impactor is producing repeatable and reproducible test results.
4. Thus, the assessment of injury risks for vulnerable road users in this proposal considers areas with impact angles $> 60^\circ$ to the outer skin / bumper cover only.
5. Legislative language has to be clear without the need for interpretation. Definitions based on functional features (e.g. bumper beam, pedestrian protection devices) are considered, by some task force members, not to fulfil that requirement.

Proposal 2

Based on the proposal outlined in document TF-BTA-6-07:

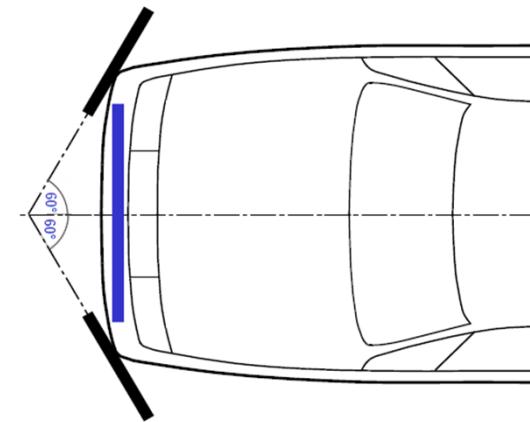
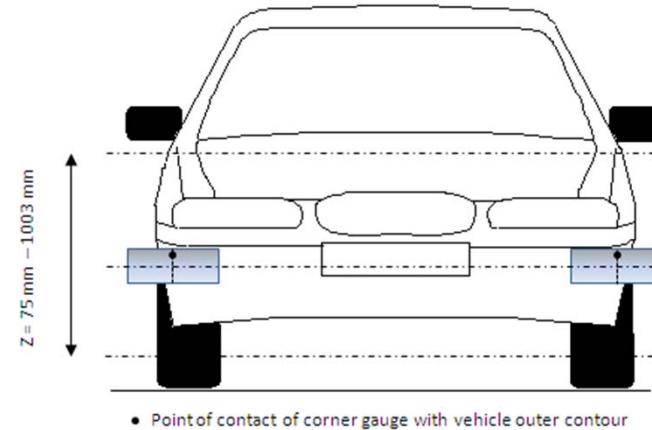
Definition of the Bumper Test Area as either the area limited by the bumper corners or the outermost ends of the bumper beam/lower rails/cross beam structures, whichever area is larger.

In addition to proposal 1:

Definition of the bumper beam as the structural cross member under the bumper fascia protecting the front of the vehicle.

“Beam” does not include foam, cover support or any pedestrian protection devices.

The wider area of proposals 1 and 2 is to be considered as test area.



Justification for Proposal 2

- 1. In depth accident data gives evidence of an equal distribution of first pedestrian contact at the front of passenger cars in crashes with at least one injury suffered from contact with a part of the vehicle frontend.**
- 2. Also during testing, injurious points have been continuously found outside test areas defined by measurements depending on the outer contour, especially at the ends of the bumper beam.**
- 3. Thus, the assessment of injury risks for vulnerable road users should be basically done considering the entire vehicle width.**
- 4. However, if a limitation of the test area is necessary due to feasibility reasons for whatever nature, at least no potentially injurious structures should be prematurely excluded from the test area.**
- 5. As procedures based on the outer vehicle contour do not necessarily include the relevant injurious vehicle structures (bumper beam), at least the entire bumper beam should be included within the test area.**
- 6. A robust definition of what is the bumper beam is provided by RCAR.**

Latest Discussion of the Task Force

- Unfortunately, the Task Force could finally not achieve a common position and therefore kindly request the experts of GRSP to discuss the details.**
- However, there is agreement that the changes should enter into force together with the FlexPLI amendment and should apply only to this new legform.**
- If further discussion is needed, the status of the TF-BTA group may need clarification.**

Thank you!