

Comments on OICA proposal

UNECE GRSP Task Force
Deployable Bonnet Systems for Pedestrian Safety
2nd meeting, 28 – 29 Mar. 2017

Comments/Proposals

1. Definition of Test Area
2. Simulation Tool for HIT
3. Definition/Requirement of Deployed Position
4. Activation Test to Certify Sensing Area
5. Low Speed Test
6. Determination of Headform Test Procedure
7. Testing Location for TRT/ST
8. Tolerance of Impact Location
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1. Definition of Test Area

Corresponding part in OICA proposal: Section 3.1. 3.13

OICA proposal

3.1., 3.13. ‘In case of deployable systems, the determination of that area is conducted in the **[un]deployed** position of the outer surface [as defined in paragraphs 3.19. or] 3.32. respectively.’”

Proposal

In case of an active system, that can be kept deployed fully before head contact, the determination of evaluation head impact area should be defined in the deployed position of the exposed outer surface. Otherwise, should be defined with un-deployed condition.

Reason for Proposal

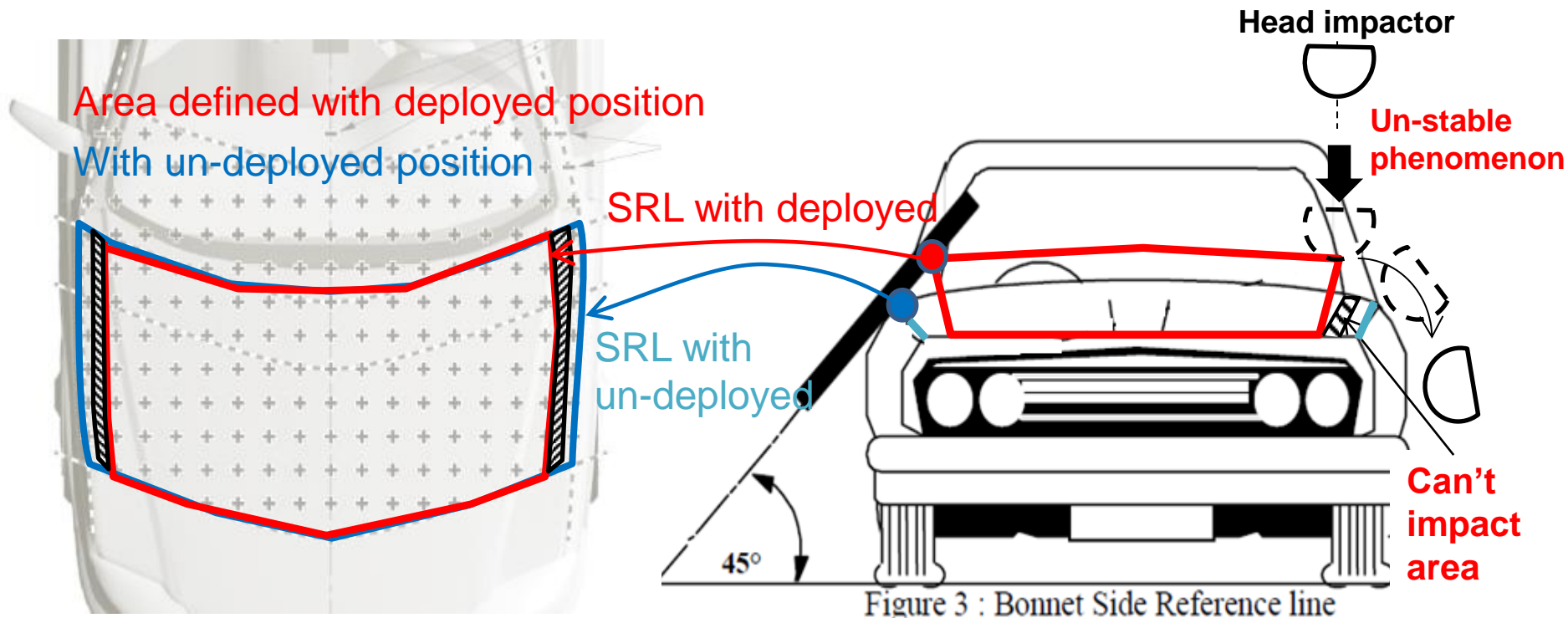
- Deployed position is the position where an accident victim actually comes in contact with the bonnet.
- The area defined with Un-deployed position may lead to unstable impact test results

1. Definition of Test Area (Appendix)

“Stability of test”

The area defined with Un-deployed position may lead to unstable impact test results :

1. The impactor rolls off at the edge of the hood leading to un-stable results.
2. Some areas exist on the outer surface which can NOT be impacted directly on the target point.



* To simplify, doesn't consider 82.5mm from the edge in this figure

2. Simulation Tool for HIT

Corresponding part in OICA proposal: Section 3.3., Annex.1 Section 4.

OICA proposal

3.3. 'Appropriate simulation tool' means a numerical or physical tool designed to represent human bodies in the percentiles referred to in Annex 1.

Annex.1

4.1. The walking posture of the model shall include the following conditions:

4.2. The walking pedestrian model shall be facing in a direction perpendicular to the vehicle centerline with the H-point in the same longitudinal plane as the vehicle centerline. The legs must be apart from the default standing posture of the model with the rearward leg being first impacted by the bumper. The heel-to-heel distances shall be as follows, including tolerances of ± 10 mm to account for the different simulation models that can be validated in slightly different positions of the values stated below:

6yo-child: 190 mm, 5%-female: 245 mm, 50%-male: 310 mm, 95%-male: 337 mm

Proposal

This part should be changed to "Manufacturer shall provide the enough evidences showing the biofidelity and appropriateness of the posture", meaning that approval of the use of the tool is at the discretion of Technical Services

Reason for Proposal

Complete clarifications of these definition would require a significant amount of time to conclude the discussion due to the lack of enough evidences. It would be appropriate to leave it at the discretion of Technical Service when considering the time frame proposed by the Republic of Korea

3. Definition/Requirement of Deployed Position

Corresponding part in OICA proposal: Section 3.19.

OICA proposal

3.19. 'Deployed position' means the position of **the lifted vehicle outer surface** specified by the manufacturer. **The lifted vehicle outer surface** shall reach a position equal to or above the deployed position during the time between the Total Response Time and the Head Impact Time that corresponds to the rear end of the test area. ”

Discussion in 1st TF-DPPS: Since this is a requirement it should move to section 6, shouldn't it?

Proposal

1. the lifted vehicle outer surface specified by the manufacturer
→the vehicle outer surface equipped with the deployable system capable of maintaining the position activated. Deployed position shall be specified by the manufacturer
2. Move the 2nd sentence of this section before Annex.1 Section 1.

Reason for Proposal

1. The focus of this test procedure is not only for the system which lifts the outer surface of the vehicle but also for the system which does not lift the outer surface of the vehicle
2. 2nd sentence of this section describes a requirement, not a definition

4. Activation Test to Certify Sensing Area

Corresponding part in OICA proposal: Not exist

Proposal

A section describing the clarification of detection performance of pedestrian in intended area to activate needs to be added before Annex.1 Section 2.

- A vehicle manufacturer shall specify the area intended to detect a pedestrian
- The system activation shall be confirmed by using the legform or upper legform impactor at the vehicle speed as specified in this regulation and at the outer most location of the intended area
- The deployable system may be activated in the headform test only for the area corresponding to the intended area

Reason for Proposal

No procedure is specified to confirm the system activation in whole intended area

5. Test at the Lowest Speed of Activation

Corresponding part in OICA proposal: Not exist

Proposal

Adding the following test procedure and requirement before Annex.1 Section 3.

1. A vehicle manufacturer shall specify the lowest speed of activation of the deployable system
2. The vehicle manufacturer shall provide the evidence showing that the headform test area with the deployable system activated meets the requirements as specified in this regulation at the lowest speed of activation of the deployable system in un-deployed position.
3. All the headform test shall be conducted in un-deployed position if the manufacturer does not show the enough evidence

Reason for Proposal

While HIC value in a vehicle without deployable system decrease at Low Speed, this may not apply to a vehicle with deployable system

6. Determination of Headform Test Procedure

Corresponding part in OICA proposal: Annex.1 Section 1. (title)

OICA proposal

1. **Static Headform Test Procedure**

Proposal

1. Change the section No.(1 -> 4) and the title to “Determination of Headform Test Procedure”
2. Add a new section 4.6.3 to specify test condition to read “If HIT is less than ST, perform a headform test in the un-deployed position”
3. Delete 2nd sentences of section 4. and 6.
4. Add a new sentence after the 1st sentence of section 4. to specify the test procedure for systems which cannot maintain its deployed position that reads “For the systems which cannot maintain its deployed position, Dynamic Headform Test Procedure as defined in section 3. of this Annex shall apply.”
5. Add a new section 5. to specify Static Test Procedure (Annex.1 Section 5.) to read as follows:
 5. Static Headform Test Procedure
 - 5.1 The outer surface of the vehicle shall represent the deployed position. The outer surface of the vehicle shall be set to that position by appropriate means.
 - 5.2 The test procedures specified in sections 7.2. to 7.4. shall apply.

6. Determination of Headform Test Procedure (Contd.)

Corresponding part in OICA proposal: Annex.1 Section1. (title)

Reason for Proposal

1. This section describes a procedure to determine the condition of a deployable system in headform tests, rather than specifying a static test procedure
2. There may be locations where HIT is less than ST, in which case the headform test shall be conducted in un-deployed position
3. Duplication with 1.6.1. and 1.6.2.
4. Dynamic Test shall always be apply to the systems which cannot maintain its deployed position
5. Static Headform Test Procedure is not specified

7. Testing Location for TRT/ST

Corresponding part in OICA proposal: Annex.1 1.3., 3.1.

OICA proposal

1.3. In this case, the TRT is measured during a legform to bumper test or during an upper legform to bumper test as appropriate for the vehicle **[center line]** to be tested, at the vehicle speed as specified in this regulation and at the **centreline** of the vehicle.

3.1. For contact sensors as defined in paragraph 3.14. of this regulation, the ST is measured during a legform to bumper test or during an upper legform to bumper test as appropriate for the vehicle to be tested, at the vehicle speed as specified in this regulation and at the **centreline** of the vehicle.

Proposal

- Change “center line” to “location which represents the sensing performance of the system”
- Add a new sentence at the end of each of these sections to read “Test may be omitted in case the representative location is the outer most of the intended area to activate”

Reason for Proposal

Vehicle center line may not be the location which represents the sensing performance of the system

8. Tolerance of Impact Location

Corresponding part in OICA proposal: Not exist

Proposal

Adding sections describing the tolerance of head impact location in dynamic test.

“6.5 The test procedures specified in sections 7.2. to 7.4. shall apply.

6.6 The tolerance shall be determined at the discretion of Technical Service in case the deviation from measuring points cannot be measured by existing appropriate technology”

Reason for Proposal

The deviation from measuring point can not be measured in dynamic tests for some deployable systems

9. Wording

Corresponding part in OICA proposal: Section 3.17.

OICA proposal

3.17. 'Deploying system' means a technical system, such as e.g. airbags, springs, pyrotechnic actuators etc. that **lifts** the vehicle outer surface as defined in paragraph 3.32. from a position of normal use in the vehicle to the deployed position as defined in paragraph 3.19.

Proposal

Change "lifts" to "changes"

Reason for Proposal

The focus of this test procedure is not only for the system which lifts the outer surface of the vehicle but also for the system which does not lift the outer surface of the vehicle

9. Wording

Corresponding part in OICA proposal: Section 3.24.

OICA proposal

3.24. 'Head Impact Time (HIT)' means the time from the first contact of a pedestrian **leg** with the bumper to the time of a pedestrian head to the outer surface contact.

Proposal

Deletion of "leg"

Reason for Proposal

It can not be said that the leg is the first contact body region in pedestrian crash situation