

DRAFT AGENDA

6th meeting of the Informal Working Group (IWG) on Advanced Emergency Braking Systems (AEBS) for light vehicles

1-2 October 2018,
in Paris, France,
OICA offices

Time: Start at 10:00 am on 1 October
Finish at 15:00 pm on 2 October
Venue: OICA offices, 4 rue de Berri – 75008 Paris – France

Chairman: Mr. Antony Lagrange (EC) and Mr. Toshiya Hirose (Japan)
Secretariat: Mr. Olivier Fontaine (OICA) and Mr. Yukihiro Shiomi (Japan)

1. **Welcome and Introduction**

2. **Approval of the agenda**

Document: AEBS-06-01 (Chair)

Adopted with addition of document references. Input from OICA and N expected in the course of the session.

3. **Adoption of the report of the 5th meeting of the Informal Working Group**

Document: AEBS-05-09

D had comments, and expected adoption the 2nd day.

4. **Review of the action points from the 5th meeting in London and 1st GRVA in Geneva**

Document: AEBS-05-09

The chair recalled that the last meeting decided tabling a document to GRVA, i.e. GRVA-01-02. The justifications as document GRSG-01-10, and the main target of this session will be the test methods, the D input and the OICA homework. The chair presented document GRVA-01-10 and the requests for guidance to GRVA. GRVA did not agree the change of terms of reference according to the GRVA-01-09 but exchanged the mandate by 1 year.

UN Secr and GRVA chair report to WP29 will request to postpone the C2P and C2B, for the next GRVA meeting. For manual deactivation, there was no consensus in GRVA.

OICA wondered how will this be captured. The whole package will be extended by one year, yet GRVA-02 will vote on the C2C scenario.

CND wondered whether the motorcycle would be included into the C2B. D said that the C2M have a different accidentology, and different technology. The chair clarified that the motorcycles are in a 2nd step according to the terms of reference, because of accidentology and technology. CND insisted that the scenario as for the C2B. this was considered doubtful, also in view that the maturity of the techno for C2B is questionable as well.

UK understood that the terms of reference were agreed. The AEBS informal group understood the outcomes of GRVA-01 as :

- No delay for C2C
- Delay for the other scenarios.

N committed to provide accidentology on C2B as soon as possible.

D informed flexibility for the manual de-activation. OICA and D were mutually requesting evidence of the relevancy of their positions. The chair suggested bilateral discussions between OICA and D

Conclusion:

- Official document for next GRVA on C2C.
- No discussion 2-step approach
-

5. Discussion for draft proposal of AEBS (car to car, car to pedestrians, car to bicycle)

Document: GRVA-01-02 (Chair and Secretary)
AEBS-06-03 (D)

The group took the document AEBS-06-03 (D) as reference, and went through the document.

Paragraph 2.14.

D claimed the current definition does not fit the crossing scenario.

Paragraph 2.15.

OICA claimed that the 0.9 is present in the test procedures. CND pointed out that the ESC regulation (R140) has a method for detecting the friction coefficient. The expert proposed copy/pasting that regulation. In addition, R140 sets a defined value.

OICA supported the change.

The group agreed to copy/paste UN R140

- | | |
|----------|---|
| 8.2. | Road test surface |
| 8.2.1. | Tests are conducted on a dry, uniform, solid-paved surface. Surfaces with irregularities and undulations, such as dips and large cracks, are unsuitable. |
| 8.2.2. | The road test surface has a nominal ¹ peak braking coefficient (PBC) of 0.9, unless otherwise specified, when measured using either: |
| 8.2.2.1. | The American Society for Testing and Materials (ASTM) E1136 standard reference test tyre, in accordance with ASTM Method E1337-90, at a speed of 40 mph; or |
| 8.2.2.2. | The k-test method specified in Appendix 2 to Annex 6 of Regulation No. 13-H. |
| 8.2.3. | The test surface has a consistent slope between level and 1 per cent. |

The European Commission questioned the “unless otherwise”. OICA and CND said it is for the manufacturer at lower coefficient

Conclusion : copy/paste R140 with few change

Paragraph 2.16 “constantly travelling”

OICA proposed a tolerance of +/- 1 km/h

Adopted, see paragraph 6.5.1.

Paragraph 5.1.1. mandatory ESC

The chair proposed referring to R140 (scopes are the same). J found that ABS is sufficient as the behaviour is similar. CLEPA pointed out that the Mu-split braking stability is fully covered by the ABS. AUS stressed that the LPS scenario makes ESC necessary. Yet J explained that the scenario on LPS does not consider AEBS activation. The avoidance scenario indeed requests ESC, but not the emergency braking scenario. But as the approach is based on LPS, and avoiding scenario is based on ESC presence. CLEPA stressed that AEBS is not mandatory in all contracting parties.

OICA pointed out that R140 applies only to N1 approved to R13H.

¹ The "nominal" value is understood as being the theoretical target value.

D said that they accepted the argument of the Mu-split braking and said that, not referring to R140 would close the door to automatic deactivation by ESC deactivation and changed hence their mind, they withdraw their proposal. AUS voiced having ESC mandatory in their territory anyway.

The chair stressed the AUS argument about the avoidance LPS approach, the logics of making ESC not mandatory.

Cc: item parked for the time being.

Paragraph 5.1.4.1.2.

OICA voiced that the time should not be the reference criterion; distance under nominal conditions, and need for a warning as well. CLEPA pointed out that after starting, the system needs checks. In addition, mis-alignment can only be checked if there are obstacles to be detected. Look also at the ESC regulation, where there is also a learning phase.

Conclusion: Industry to provide an alternative wording. Can also be merged with previous paragraph.

Paragraph 5.2.1.2.

Industry showed slides 7 and 8 of their 06-04 for removing the provisions against misuse as an ACC (comfort system). In addition, braking not at the maximum physical capabilities permits avoiding dangerous situations in the real world (following vehicle). D was not attached to this item, yet had test results not well confirming the values proposed by Industry. NL insisted that the driver should not rely on AEBS, a good driver should never experience AEBS activation. AUS proposed a pre-warning, OICA confirmed this would probably be provided. N shared the experience of driver deactivating the AEBS if there are too much false positives. Industry showed by the slide 8 the difference between comfort driving and AEBS activation.

Bilateral discussions

Outcomes: situation at low speed is different, need for other values. NL had still concerns about overreliance. Would put the limit at around 55 km/h (see slide 7 – OICA pointed out that this is relative speed).

Conclusion: no conclusion, group to review this later.

Paragraph 5.2.1.4.

D found this the main paragraph.

The chair recalled that the regulation approach is usually worst case (vs. normal conditions) and that the informal group agreed the philosophy of accidentology based requirements

OICA accepted the principle but had few comments on the speeds and tolerances.

J and ROK found inconstancy in the speed ranges of 5.2.1.3.

Speeds in the table

OICA proposed that the speed > 40 are conducted on stationary obstacles only. Or 2 tables (stationary and moving obstacles). D challenged this approach.

Conclusion: 2 tables for best readability, one stopping at 42, the other stopping at 60. Confirmation upon revision of the tables

Proposed addition for conditions

OICA stressed that the proposed conditions are under test situation. And GRVA agreed that a new group will address the question of normal driving conditions. The chair proposed “maximum test conditions”.

OICA presented their input.

AUS pointed out the similarity of the behaviour to that of the motorcycle..

UK stressed that the dynamic of these vehicles (N1) in lateral axis is also different, hence no big change in LPS vs. braking capabilities.

OICA suggested more time for this item.

J stressed the typical J small N1 vehicles

D proposed that some categories are removed nationally. D in addition questioned the influence of load with regard to braking capabilities and requested data on this. The chair suggested coming back to this later N presented their question about trailer: in case of unbraked trailer. In addition, there is no PTI in N on this. This led to a question on deactivation: manual vs. automatic deactivation.

NL, supported by UK, found AEBS not more dangerous in case of a trailer, yet some false activation may be a point.

D proposed to decrease the minimum mandatory deceleration.

Conclusion:

- Item parked aside
- Document to be made available on the website.

Concerning the loading question, Industry suggested having a different table for the 2nd day of the session.

Offset - [0.5] m lateral position.

UK supported the D proposal of 0.5

Industry recalled the assumptions of the last session where all was based on fully central overlap. If the overlap is high, the driver needs less lateral avoidance, hence this changes the LPS. The contracting parties feared that the system would not work out of the full overlap in this case.

If the axis are parallel to each other, then risk of false alerts with [0,5 m], if the axis are converging, then OK. OICA suggested an offset of 0,1 m.

Mobileye stressed the impact of the small steering correction of the ego and the target, which could calculate the impact point. (yaw rate of the ego vehicle, such that the expected collision point is in stake) CLEPA insisted that the driver does not expect the system to activate when there is a big offset (in the good direction)

D proposed removing the offset from the requirements section, and add it in the test procedure. NL and European Commission wondered how the system detect the offset. Yet this is not detected, only the driver changes his behaviour. The system would brake later with a high offset, hence the collision speed would be higher.

The chair and UK suggesting finetuning the last sentence “Systems should not deactivate or drastically change the control strategy in other road conditions”.

Conclusion for the offset:

- Finetune the last sentence
- Industry to provide a proposal

Load conditions:

Industry recalled the approach of the group that the required deceleration is of 9 m/s² in nominal load conditions, hence maxi load would be acceptable if the group re-discusses the deceleration value.

D expected test values.

OICA suggested sticking to the deceleration value accepted at the beginning, since changing the load can also change the dynamic behaviour. The chair then questioned the criteria, or the value to of deceleration should the fully laden condition be chosen. Would be quite complicate. The chair was keen to know how much the dynamic behaviour can change according to the loading conditions.

Conclusion:

- Stick with current deceleration
- Industry to provide values on relationship load vs. deceleration (see also AEBS/LDWS-18-03)

C2P

Paragraph 5.2.2.5.

D: if there is no impact, this is a “pass”.

2nd table (2nd step):

copy/paste the C2C scenario

speed range (paragraph 5.2.2.3.: all agreed t keep 20 km/h as the lower speed, except J, for reducing the fatalities in J – look at J presentation: 17% of pedestrian fatalities take place < 20 km/h. no distinction about vehicle category and rear vs. front driving.

OICA recalled the field of vision item, + some figures showed at the 2nd or 3rd meeting.

Conclusion: 2 1st rows deleted, J to provide evidence of impact of speeds < 20 km/h. seems AEBS cannot address the J problem.

1st table:

See document.

2-step approach:

Let GRVA on the base of the package.

C2B

Paragraph 5.2.3.3.

The group agreed on a speed range of 20-60 km/h

UK suggested 10 (alignment on C2C) for longitudinal and 20 (alignment on the C2P) for the crossing.

Yet Industry argued that the lateral movement in case of ego vehicle in case of bicycle is small, hence easy to avoid. The group at 5th meeting questioned the necessity of the longitudinal scenario.

UK said that the last meeting agreed for a warning only, even if in the UK the cyclist should have the same right.

Conclusion:

- 10-60 in longi
- 20-60 in crossing, bicycle at 15
- Warning only for the time being.

Test procedure

Paragraph 6.1.5. (ambient illumination)

D keen that the minimum value be 1000 Lux. Yet 2000 represents daylight.

UK stressed that there is no such limitation in UN R131. Yet R131 addresses metal vehicles, not pedestrians, i.e. less easy to detect by radar. The European Commission suggested putting the 1000 Lux in the requirements section. UK wondered what would be the benefits if the system functions in daylight only. Yet the cost / benefit ratio was already addressed at the beginning of the exercise. Discussion on the "strong shadows" UK and CND were keen that the lower value is 1000 Lux. UK wants the text technology neutral (lower value targets the camera technology. Debate on best approach, test repeatability etc. Industry proposed removing the strong shadows limitation, but keeping the low angle sun. In real world, the driver would be notified of the low sun. both the AEBS and the human are annoyed by the facing sun.

ISO19237: 2000 Lux.

Conclusion:

- Keep the text unchanged
- 1000 Lux in the requirements
- Warning in case of blindness

Paragraph 6.2.1. (test weight)

Proposal from D. Industry keen to re-consider until the next meeting. 9m/s^2 with 200 kg, or 6.4 m/s^2 (R13/R13H) with fully laden vehicles. D committed that BASt perform test of the same vehicle light and fully laden for having an idea. D found it possible to brake early and hence profit of AEBS even at fully laden. Industry informed that there is a wide range of N1 vehicles. CLEPA promoted "laden and unladen conditions", as in the braking regulation. NL supported this. The chair questioned then the performance in laden conditions. D was keen to get data on pressure increase time, performance drop, etc. Yet for Industry these requirements are addressed by the braking regulation and there is no need for further data

The chair suggested adding tables for fully laden vehicles. CND questioned whether the unladen performance requirements only address the stability.

Conclusion:

- Test vehicle at nominal and max mass
- Industry to inform about relevancy of the performance tables in these conditions.
- Argument on the logics of approach rejected.

Paragraph 6.3.1.

D about "compact class": would fulfil the current fleet in EU, Ford Fiesta is the most sold vehicles. The ISO made a meeting on 24 August, no ISO standard for the vehicle target. Target in the current text is from ISO 19206-03 where "compact class". Status: committee draft, i.e. will be changes, yet not fundamental.

In VRU-Proxi, the reference is to the standard, with CS (Committee Standard).

Conclusion:

- Stefan Benz to provide the ISO references to the secretary: 19206-01-02-03-04-05
- Chair to investigate how to refer to ISO standards.

- For the time being, text to refer to the ISO relevant documents.
- OF to check the approach at GRSG

Paragraph 6.5.1.

Industry questioned the 30 and 40 values since the moving target scenario are there for validating only. Suggested deleting the 40 scenario.

Paragraph 6.6.1.:

Deletion of between etc. see document D proposal broadly adopted.

Child pedestrian: seems to be the worst case. Industry not against,

Conclusion: child target only, 6-year old as the child at this age is assumed not “reasonable”.

Paragraph 6.7.2.1.

EuroNCAP protocol: Accidentology shows that C2B is in rural road, 50-80 and bicyclist at 20 longitudinal on the side (25% impact point), hence warning only.

Paragraph 6.10.1.1. (false reaction test)

D suggested deleting this paragraph since lots of situations could be addressed as challenging.

NL found the current text not demanding and suggested adding 5 or 6 demanding tests. Difference with UN R131: designed for highway monotone driving where the lane width is about 3.75 m. asking for this scenario would not bring added value. In addition, the radar technology evolved such that this current test is not demanding anymore. In addition, a complete list of scenarios is impossible to set up. On the other hand, leaving the regulation with no provision at all would not be reasonable neither.

Industry proposed to have a check at the ACSF for the ESF

Conclusion: ESF false detection test to be source of inspiration.

Paragraph 6.10.2. (pedestrian target false reaction scenario)

UK keen to make a pedestrian test with one stationary pedestrians at each side of the vehicle.

J pointed out paragraph 5.1.5., such to delete the false reaction test, with a good wording to capture the necessity for Industry to provide evidence of the good functioning.

2nd day

Definition:

TTC: adopted

Addition of a definition of PBC: debate on the connection between dry road and 0.9 PBC. “nominal” vs. “at least”: “nominal gives flexibility to have variations within the track, and “at least” ensures that the AEBS can rely on a high adhesion surface to function correctly. + footnote 6 of R140

Paragraph 5.1.1. mandatory ESC

D and AUs agreed to have no mandatory ESC

The chair was keen that the braking capabilities of the vehicle be mandatory

Conclusion: addition of a reference to R13 and R13H, text to be fine-tuned.

Paragraph 5.1.4.1.2.

Difference between electrical failures that can be detected by internal self check, and non-electrical failures that need a learning time. debate on the proper time and for discriminating the different conditions. Need to align 20 obstacle, have some braking, curves, accelerations, etc.

Conclusion: Industry to construct a proposal for the learning phase before the next meeting. All to check whether the 300 seconds are valid.

Examples of existing learning phases:

R141: “Drive the vehicle for a minimum of twenty minutes with an average speed of eighty km/h (□10 km/h). It is allowed to be outside the speed range for a maximum cumulative time of two minutes during the learning phase.”

R140: “With the vehicle initially stationary and the ignition locking system in the "Lock" or "Off" position, switch the ignition locking system to the "Start" position and start the engine. Drive the vehicle forward to obtain a vehicle speed of 48 ± 8 km/h. 30 seconds, at the latest, after the engine has been started and within the next two minutes at this speed, conduct at least one left and one right smooth turning

manoeuvre without losing directional stability and one brake application. Verify that the ESC malfunction indicator illuminates in accordance with paragraph 7.4. by the end of these manoeuvres.”

Paragraph 5.1.5. (former)

Many cases of possible false positives, and the CEL annex addresses this.

Conclusion: UK to provide a test procedure on the false positives for paragraph 6.10. Industry to collaborate.

Paragraph 5.2.1.2.

OICA proposed that after a certain number of multiple AEBS interventions, the system may automatically deactivate.

J found a peak of 6.43 is sufficient, the demand of 3.8 and the ABS fully cycling are not necessary.

Industry recalled having showed in their presentation that XXXX such value is never reached at speeds <30 km/h. Industry supported the Japanese proposal

NL was not convinced since

D proposed that after a certain number of activation, a big warning and the obligation to stop and go to the garage.

NL found the Japanese proposal lacking a time in the demand.

Fully cycling ABS: agreed to delete.

NL informed that the ISO on ACC mentions a maximum value of 3.5 m/s² and found the value of 3.8 relevant.

Industry proposal of shutting off the system when there are too many activations within a certain time.

Conclusion:

- Text remains unchanged
- NL provides proposal for measurement of the average braking demand
- Industry to make a proposal for switching the system off

Paragraph 5.2.1.4.

The text from D was adopted.

Loading conditions:

Industry presented their data on laden vs. unladen conditions.

Conclusion: 2 tables for laden/unladen, (+ 2 others for moving / stationary target).

D to define “*Maximum relative Impact Speed in the inertial system of the struck vehicle*”

“

Daylight conditions:

D finds night detection easy to achieve in night. OICA finds this design restrictive. In case of nighttime light conditions, the target are assumed to have their lamps on.

Conclusion: item to be checked by all until next meeting.

Control strategy:

“Systems shall not deactivate or drastically change the control strategy in other road conditions”:

Conclusion: 2 sentences, see Industry proposal

Special NI vehicles

Conclusion Industry to provide relevant proposal, based on braking capability and design rather than on geometry of the vehicles.

C2P

Paragraph 5.2.2.3

Keeping the [] until J provides further proposal.

Paragraph 5.2.2.5.

Conclusion: align on C2C, except 1st bullet and daytime

Table 1st step: changed as proposed in Day 1

UK still keen to decrease the impact speed as from the 1st stage, (35 km/h as from 2020).

Industry informed that the state of the art make 40 km/h speed reduction starting at 50 km/h. Industry also pointed out the difference between NCAP and a regulation. Asking for the NCAP performances in 2020 for all vehicles would be too demanding for Industry.

The chair stressed that the idea for the 1st step is to reflect the current market situation. The 2nd step will increase severity.

AUS pointed out their accidentology that they have twice as much fatality at 40 vs. 30 km/h. the UK proposal would be a step in the proper direction.

Industry said that mitigation already saves lives as well.

Table 2nd step

Industry claimed the proposal too demanding. The proposed values are those that EuroNCAP might require in 2023. Such values would cause additional problems on the road, Industry cannot guarantee that the system will work appropriately.

The chair requested Industry to clarify their proposal. They clarified the approach as LPS/LPB in the case of C2P.

Conclusion:

- Temporary state of play

45	15	[15 / 30]
50	15	[25 / 35]
55	15	[30 / 40]
60	15	[35 / 45]

- Item to be re-discussed at next meeting.

C2B

Industry was keen discussing 1st the broad, i.e. what the group should deliver to GRVA.

Longitudinal scenario

The chair suggested a warning only emitted earlier than 1.7s TTC.

EuroNCAP is currently considering a steering reaction.

Industry found 1.7s too long as the consequence of failing the regulation requirements is the prohibition of selling only one vehicle, while failing EuroNCAP make only losing points there.

AUS found safety benefits in braking capabilities.

Basic philosophy: as long as the driver can avoid by steering, the vehicle should not brake.

Conclusion:

- Warning only
- Braking not precluded.
- [1.7s TTC]
- Editorial team to arrange the paragraph accordingly.

Paragraph 5.2.3.3.

Conclusion:

- 10-60 in both scenarios
- Values can be adapted according to the scenarios (10 vs. 20 as threshold value).
- bicycle at 15

table:

call for input,

Industry provided EuroNCAP cyclists performances. The result is that simple mitigation in C2B permits having good points.

EuroNCAP.com provides relevant video about the different scenarios.

Industry approach: having minimum but reasonable requirements.

conclusion:

- NL to provide input about the vehicle they tested

Manual deactivation

D needed ideas for having appropriate justifications and arguments for European Commission:

- Need to justify why the manual deactivation is linked to fatalities
- Call to Industry on their proposal for manual deactivation.

Industry presented their arguments per the document AEBS-06-04.

D was disappointed that the Industry did not provide fruit for compromise. The expert suggested:

- Permitting deactivating after numerous times
- Having a trace of the AEBS status (activated/deactivated, and when the change of status occurred, as D may mandate switching on AEBS in their traffic laws

OICA recalled having proposed a 2-movement deactivation, and:

- On multiple deactivation: there are circumstances where this does not function. A number of deactivation per ignition cycle.
- Recording: OK
- Industry was not requested to provide an exhaustive list of situations where the deactivation is
- D did not present any figure demonstrating the safety decrease of using the deactivation.
- What about accident data showing the AEBS was switched off.

The chair then requested D justifications on deactivation use.

AUS informed having a study, seems [94%] of users have not deactivated

In addition:

- Truck driver vs. PC drivers
- Industry showed openness of recording the changes of status of the AEBS

Conclusion

Test procedure

Paragraph 6.1.4.: 2000 Lux adopted, Daylight conditions in the requirements section

UK keen to perform the test at 1000 Lux since the performance requirements mandate the system to work down to 1000 Lux

Industry was concerned that this would lead to another design of the system.

The chair recalled the possibility to adapt according to the scenario: 1000 Lux for C2C, 2000 Lux for C2P and C2B.

Conclusion:

- C2C: check whether possible to go < 1000 Lux
- C2P: testing at daylight (i.e. > 2000 Lux)

Test weight:

Conclusion:

- Inclusion of the table
- Item to be re-visited at next meeting.

Paragraph 6.3.1. (Test target)

Conclusion:

- "compact class"
- Refer to ISO descriptions
- "hatchback passenger car" as requested by France (see RE3)

Paragraph 6.6.

Industry requested that next meeting addresses yaw rate for subject vehicle and target vehicle of +/- 1°
Industry to review the necessity of checking at 20 km/h. UK keen to keep 20 km/h.

Conclusion: 20 km/h kept "for the moment".

Industry committed to make a proposal for the reference point of the bicycle: crankshaft position.

Paragraph 6.7.2.1.

The chair suggested describing the EuroNCAP scenario. 25% overlap.

Conclusion: copy/paste the EuroNCAP configuration. 50-80 and bicyclist at 20 longitudinal on the side (25% impact point), warning only

Paragraph 6.10.1.1.

Conclusion: OICA to make a proposal

AUS wondered whether adding a sensor blindness test

Conclusion: Industry to provide a proposal for testing the 300 seconds.

Note:

Chair and secretary circulated this draft regulation on 13 July 2018, please provide your proposal based on this draft regulation.

6. Other business

7. List of action items

8. Next meeting

12-13 November in Geneva, starting as soon as possible, i.e. 10:00 am.

Yet possibility of performing demonstration tests e.g. in Frankfurt or BAST.

All to investigate the possibility of another place for testing capabilities, proposals to be sent prior 9 October.

Plan of next meetings:

~~7th meeting: 1st week of December (2 days meeting)~~