Transmitted by the expert from Japan (#9th Informal Group dated on 26-29 October)

Amendments to the draft proposal of AEBS/LDWS-09-01 rev.1

Paragraph 2.13., amend to read;

2.13. "Emergency braking phase" **for N2 and N3, means the phase during which the FCMS emits at least a demand for a deceleration of 4 m/s² to the service braking system of the vehicle.**

Insert the new paragraph 2.13.1., amend to read;

2.13.1 "Emergency braking phase" for M2 and M3, means the phase during which the FCMS emits at least a demand for a deceleration of 4 m/s² to the service braking system of the vehicle, or its maximum braking demand, whichever is earlier.

Insert the new paragraph 6.6.4. and 6.6.5., to read;

6.6.4. The Emergency braking phase shall not start before TTC reaches down to 3.0 seconds.

6.6.5. The maximum braking demand for N category shall be equal to or more than 4m/s^2

Insert the new paragraph 6.7.4. and 6.7.5., to read;

6.7.4. The Emergency braking phase shall not start before TTC reaches down to 3.0 seconds.

6.7.5. The maximum braking demand for N category shall be equal to or more than 4m/s^2

Following paragraph 6.6.1. and 6.7.1.is alternative proposal instead of paragraph 6.6.4. and 6.7.4.

6.6.1. The subject vehicle shall travel at a speed of 80±2km/h in a straight line for a ~~**minimum**~~ distance of 50m towards the stationary target with a vehicle centreline offset of not more than 0.5m.

6.7.1. The subject vehicle shall travel at a speed of 80±2km/h in a straight line for a ~~**minimum**~~ distance of 50m towards the moving target travelling in the same direction, with a vehicle centreline offset of not more than 0.5m.

Justification:

The purpose of this amendment proposal is to clarify the functions of AEBS.

Unlike ACC, AEBS is activated during an emergency. (ACC is used in the ordinary situation) It is necessary to clarify the difference between the emergency situation and the ordinary situation. The braking timing and deceleration are parameters to divide the emergency situation and the ordinary situation. A parameter of TTC 3.0 seconds means the emergency situation from Japanese investigation. TTC 3.0 seconds is based on 100% of overlap ratio in the following situation of the target vehicle. And then the current deceleration threshold for N2, N3, M2 and M3 at the time of emergency braking with ESS is 4 m/s^2, it's reasonable to use this value for the emergency brake threshold. However, considering the passenger safety, it was agreed to exclude the requirement of 4 m/s^2 for vehicles of category M at past meeting.

If the automatic braking is activated only in emergency situation, a driver does not have the overreliance on the automatic braking.

If the the distance of initial test condition is always 50m, Japan can accept the distance instead of TTC 3.0 seconds in paragraph 6.6.1. and 6.7.1. Therefore, Japan removed ‘minimum’ in paragraph 6.6.1. and 6.7.1.

<u>Paragraph 5.1.1.</u>, amend to read;

5.1.1. Any vehicle fitted with an FCMS complying with the definition of paragraph 2.2. shall meet the performance requirements contained in paragraphs 5.1 to 5.6.2. and 6 of this Regulation when used in highway conditions and shall be equipped with an anti-lock braking function. ~~[and a Vehicle Stability Function].~~

Justification:

(1) ABS secures the fundamental stability during braking. EVSC potentially gives additional improvement to the vehicle behavior. However AEBS rarely works in the situations like driving on the curved road where EVSC usually get into operation, because AEBS is often overridden by the driver’s positive steering maneuver in such a case. Therefore EVSC might be preferable for AEBS but it should not be mandatory.

(2) Exemption of EVSC is wider than ABS. If EVSC is mandated for AEBS, exemption of AEBS would get wider than expected minimum area of the vehicle category. Therefore it is not appropriate to mandate the adoption of EVSC.

Delete the paragraph 5.4.3.

~~**5.4.3 Where fitted, the Cruise Control or the Adaptive Cruise Control shall be automatically disabled when the FCMS function is disabled.**~~

Justification:

This provision doesn't prevent use of the off switch of FCMS from being encouraged.
CC(Cruise Control) or ACC(Adaptive Cruise Control) is thoroughly different from AEBS for the driver. If automatic switching off of CC or ACC happens when AEBS is canceled, it would give the confusion to the driver.

Insert the new paragraph 5.4.4., to read;

5.4.4. FCMS off control switch shall have measures which discourage the driver to operate the switch easily.

Justification:

Frequent off switch activation by the driver and unintended switch off should be prevented. This is a compromised proposal considering the last discussion.

Examples: A push and hold operating switch, a switch with a lid, a second layered switch or a switch located not to be reached easily by the driver in the his/her seat, etc.

Previous Japan proposal:

The mean to disable the AEBS function shall have a structure which prevent the driver in the driver's seat operating the mean easily. e.g. Locating the mean not to be reached easily by the driver in the driver's seat or having the cover on the means.

2.10. "Soft target" means a ~~**dummy vehicle fixture, having no rigid structure, and used as a target**~~ **object which doesn't cause significant damage on the subject vehicle by the test, and used as a target.**

Justification:

Soft target should include commonly used radar reflector which has some means to avoid damage.

Insert the new paragraph 6.5.2., to read;

6.5.2. When the soft target carries radar reflector(s), the target used for the test shall be made of two reflectors. Radar Cross Section (RCS) of each reflector is until 15dBsm. If a radar reflectivity is smaller than two reflectors with each radar cross section (RCS) of 15dBsm, the test may use the different target obstacle.

Justification:

The specifications for the radar reflector(s) should be added in consideration of the case that the target carries radar reflector(s).

Subsequent paragraph 6.5.2. to 6.5.4 (former), re-number as paragraph 6.5.3. to 6.5.5..

Paragraph 6.6.2.1., amend to read;

6.6.2.1. Where the warning signals **for Category N3 and M3** are provided in a cascade,

- the first of the 2 warning modes shall be provided no later than ~~[~~2.0 / 1.4 / 0.8~~]~~ s ~~[and shall occur not earlier than [2.5] s]~~, and ……
- the last of the 2 warning modes shall be provided no later than ~~[~~0.8~~]~~s

before the start of the Emergency Braking phase.

Paragraph 6.6.2.2., amend to read;

6.6.2.2. Where the warning signals **for Category N3 and M3** are not provided in a cascade, the 2 warning modes shall be provided no later than ~~[2.0 /~~ 1.4 ~~/ 0.8]~~ s ~~[and shall occur not earlier than [2.5] s]~~ before the start of the Emergency Braking phase.

Insert the new paragraph 6.6.2.3., to read;

6.6.2.3. For Category N2 and M2, the 2 warning modes shall be provided no later than 0.8s before the start of the Emergency Braking phase

Justification:

It would be appropriate as the minimum requirement considering the driver acceptance.

It will be most important to prescribe a appropriate latest warning to avoid the nuisance warning.

Subsequent paragraph 6.6.2.3. (former), re-number as paragraph 6.6.2.4..

Paragraph 6.7.2.1., amend to read;

6.7.2.1. Where the warning signals **for Category N3 and M3** are provided in a cascade,

- the first of the 2 warning modes shall be provided no later than ~~[~~2.0 / 1.4 / 0.8~~]~~ s ~~[and shall occur not earlier than [2.5] s]~~, and
- the last of the 2 warning modes shall be provided no later than ~~[~~0.8~~]~~s

before the start of the Emergency Braking phase.

Paragraph 6.7.2.2., amend to read;

6.7.2.2. Where the warning signals **for Category N3 and M3** are not provided in a cascade, the 2 warning modes shall be provided no later than ~~[~~2.0 / 1.4 / 0.8~~]~~ s ~~[and shall occur not earlier than [2.5] s]~~ before the start of the Emergency Braking phase.

Insert the new paragraph 6.7.2.3., to read;

6.7.2.3. For Category N2 and M2, the 2 warning modes shall be provided no later than 0.8s before the start of the Emergency Braking phase

Justification:

It would be appropriate as the minimum requirement considering the driver acceptance.

It will be most important to prescribe a appropriate latest warning to avoid the nuisance warning.

Subsequent paragraph 6.7.2.3. (former), re-number as paragraph 6.7.2.4..

Insert the new paragraph 6.10., to read;

6.10. Test of deactivation of service brakes of AEBS to the obstacles outside the lane

6.10.1. Stationary obstacles

6.10.1.1. The obstacles outside lane shall be the two stationary vehicles of category M1 AA saloon in the same direction in both right and left lanes. The width of a lane is 3.5m, each vehicle is located on the center of the lane.

6.10.1.2. Drive from more than 60m behind the obstacles outside the lane and trace the centre of the lane at the constant speed of 50+/- 2km/h, until passing over the obstacles outside the lane.

6.10.1.3. The FCMS shall not initiate the emergency braking phase.

6.10.2. Moving obstacles

6.10.2.1. The obstacles outside lane shall be two vehicles of category M1 AA saloon in the same direction as the subject vehicle travelling in both right and left lanes. The velocity of each vehicle is 30+/- 2km/h. The width of a lane is 3.5m, each vehicle shall be driven on the center of the lane.

6.10.2.2. Drive from more than 60m behind the obstacles outside the lane and trace the centre of the lane at the constant speed of 50+/- 2km/h, until passing over the obstacles outside the lane.

6.10.2.3. The FCMS shall not initiate the emergency braking phase.

Justification:

It is necessary to prescribe the false brake test. This test method will be appropriate as a representative test condition.