

Transmitted by the expert from Japan

Modification proposal for “AEBS/LDWS-TF02-03-Rev.2”

New proposal 1-Opt.1

2.XX **“Warning brake” means the activation of the service braking system which causes the deceleration of 2.5m/s² or less.**

5.2.1.1. **provide the driver with the warning specified in paragraph 5.5.1. before starting the activation of the service braking system except the warning brake.**

Rephrase paragraph 6.6.2.2. and 6.6.3.2. of the proposal 11(AEBS/LDWS-TF-02-07) as follows;

6.6.2.2. **The AEBS shall warn the driver as mentioned in paragraph 5.2.1.1. at the latest [xx]sec before the deceleration of the subject vehicle exceeds 2.5m/s².**

6.6.3.2. **The AEBS shall warn the driver as mentioned in paragraph 5.2.1.1. at the latest 0.8sec before the deceleration of the subject vehicle exceeds 2.5m/s².**

New proposal 1-Opt.2

2.XX. **“Emergency braking” means the activation of the service braking system which causes the deceleration of 4.0m/s² or more.**

5.2.1.1. **provide the driver with the warning specified in paragraph 5.5.1. before starting the emergency braking.**

Rephrase the paragraph 6.6.2.2. and 6.6.3.2. of the proposal 11(AEBS/LDWS-TF-02-07) as follows;

6.6.2.2. **The AEBS shall warn the driver as mentioned in paragraph 5.2.1.1. at the latest [yy]sec before the deceleration of the subject vehicle exceeds 4.0m/s².**

6.6.3.2. **The AEBS shall warn the driver as mentioned in paragraph 5.2.1.1. at the latest 1.0sec before the deceleration of the subject vehicle exceeds 4.0m/s².**

Justification

See document XXX

Resume the proposal 5(AEBS/LDWS-TF-02-07) with the amendment as follows;

Rephrase the wording of point 5.2.1.2. as follows;

For Option 1

5.2.1.2. **activate the service braking system to reduce the relative speed in accordance with**

paragraph 6.6.2.3. and 6.6.3.3. with the suspension of the activation of the service braking system except the warning brake until TTC falls down to 2.5sec.

For Option 2

5.2.1.2. **activate the service braking system to reduce the relative speed in accordance with paragraph 6.6.2.3. and 6.6.3.3. with the suspension of the emergency braking until TTC falls down to 2.5sec.**

Justification

- (1) It is necessary for the AEBS to avoid the interference with the driver's ordinary maneuver. Therefore the operation of the service braking system should be inhibited when the driver takes any maneuver to avoid the collision like lane change under the ordinary driving conditions. (Same concept as the initial draft proposal AEBS/LDWS-01-05)
- (2) To avoid the driver's over-reliance, it is also important that the driver does not experience the AEBS operation under the ordinary driving.

New proposal 2

Amend the wording of point 5.2.2. as follows:

5.2.2. The AEBS shall be active at least within the vehicle speed range of 15km/h to [100]km/h **and when the relative speed is 15km/h or more**, unless manually de-activated as per paragraph 5.4 below.

Justification

The AEBS is able to function only when some relative speed, may be 15km/h, exists. In case of moving target which runs at the speed of 15km/h, the system can work only when running at more than 30km/h.

Resume the proposal 6(AEBS/LDWS-TF-02-07) as follows:

Rephrase the wording of point 5.3. as follows:

5.3. **The AEBS shall have some sort of means by which the driver can at any time indicate that the driver is intentionally driving and override the service braking system operation by the AEBS.**

Justification

Limit the overriding function into the service braking activation. The unnecessary warnings could be allowed even the driver can not suppress it because the destruction of the warning is negligible from the safety point of view.

Rephrase the paragraph 6.6.2.2. and 6.6.3.2. of the proposal 11(AEBS/LDWS-TF-02-07) as follows:

Amend point 6.6. to 6.7.3.4. as follows:

6.6. Test

6.6.1. Bulb check function test

6.6.1.1. With the subject vehicle stationary and the ignition locking system in the "Lock" or "Off" position, activate the ignition locking system to the "On" or "Run" position. The AEBS shall perform a check of lamp function as specified in paragraph 5.5.3. of this Regulation.

6.6.2. Performance test with stationary target

6.6.2.1. Drive the vehicle, enter the vehicle the test course and smoothly track the lane so that the posture of the vehicle is stable. Perform three trials at the respective constant speeds of 40 km/h and 80 km/h.

~~6.6.2.2. The AEBS shall warn the driver as mentioned in paragraph 5.2.1.1.~~

For Option 1

6.6.2.2. **The AEBS shall warn the driver as mentioned in paragraph 5.2.1.1. at the latest [xx]sec before the deceleration of the subject vehicle exceeds 2.5m/s².**

For Option 2

6.6.2.2. **The AEBS shall warn the driver as mentioned in paragraph 5.2.1.1. at the latest [yy]sec before the deceleration of the subject vehicle exceeds 4.0m/s².**

6.6.2.3. The AEBS shall activate the service braking system and reduce the subject vehicle speed as shown on the table XX.

Table XX

Subject vehicle speed	Minimum subject vehicle speed reduction
40km/h	6km/h
80km/h	10km/h

6.6.3. Performance test with moving target

6.6.3.1. Drive the moving target as in paragraph 6.5.4. and drive the subject vehicle, enter it the test course and smoothly track the lane so that the posture of the vehicle is stable. Perform three trials at the respective relative speeds between the subject vehicle and the target equalling to 40 km/h and 60 km/h.

~~6.6.3.2. The AEBS shall warn the driver as mentioned in paragraph 5.2.1.1.~~

For Option 1

6.6.3.2. **The AEBS shall warn the driver as mentioned in paragraph 5.2.1.1. at the latest 0.8sec before the deceleration of the subject vehicle exceeds 2.5m/s².**

For Option 2

6.6.3.2. **The AEBS shall warn the driver as mentioned in paragraph 5.2.1.1. at the latest 1.0sec before the deceleration of the subject vehicle exceeds 4.0m/s².**

6.6.3.3. The AEBS shall activate the service braking system and reduce the relative speed as shown on the table YY.

Table YY

Relative speed	Minimum relative speed reduction
40km/h	[14]km/h (heavy duty trucks with GVW of 20t or more)
60km/h	[18]km/h (heavy duty trucks with GVW of 20t or more)

Justification

- 1) Modified the order of the tests for better efficiency.
- 2) Took “speed reduction” to measure the performance of service brake activation to replace “service brake activation mandating time and the average deceleration”. For better understanding it is reasonable to specify the performance by the speed reduction which is directly linked to the collision energy reduction.
- 3) Deleted the subject vehicle speed of 20km/h for stationary target and relative speed of 20km/h for moving target. One representative for normal road and one for motor way is enough.
- 4) Performance for stationary target is the same as initial draft proposal AEBS/LDWS 01-05 i.e. speed reductions are equal to the sum of 3.3m/s² for 0.5sec when subject vehicle speed is 40km/h, and 3.3m/s² for 0.8sec when subject vehicle speed is 80km/s.
- 5) New specifications for moving target. When taking the possibilities of the interference between the AEBS brake operation and the driver’s ordinary maneuver and inappropriate operation on the normal road into consideration, the values on the table YY is feasible limits. At this moment, performance requirement only for the heavy duty trucks with GVW of 20t or more can be decided, which is the reason why the figures are in [].
- 6) Reflect the new proposal 1 on warning timing.