Proposal for supplements to the original version, the 01 and 02 series of amendments to UN Regulation No. 152

The following text is based on ECE/TRANS/WP.29/GRVA/2021/22 (amended by GRVA-11-07) and on the comments received during 11th GRVA session.

I.   Proposal

Paragraph 2.12., amend to read (including re-numbering of former Footnote 3):

"2.12.   "*Dry road **affording good adhesion***" means a road with a **sufficient** nominal[2] Peak Braking Coefficient **(PBC)** ~~of 0.9~~ **that would permit:**

(a)   **A mean fully developed deceleration of at least 9m/s^2 ; or**

(b)   **The design maximum deceleration of the relevant vehicle;**

whichever is lower.

***Footnote 2*: renumber as Footnote 3**

***Footnote 3*: renumber as Footnote 2**

Paragraph 2.14., amend to read:

"2.14.   "***Sufficient nominal** Peak Braking Coefficient (PBC)*": means **a road surface friction coefficient of** ~~the measure of tyre to road surface friction based on the maximum deceleration of a rolling tyre.~~

(a)   **0.9, when measured using the American Society for Testing and Materials (ASTM) of E1136-19 standard reference test tyre in accordance with ASTM Method E1337-19 at a speed of 40 mph**

(b)   **1.017, when measured using either:**

(i)   **The American Society for Testing and Materials (ASTM) of F2493-20 standard reference test tyre in accordance with ASTM Method E1337-19 at a speed of 40 mph; or**

(ii)   **The k-test method specified in Appendix 2 to Annex 6 of Regulation No. 13-H.**"

Insert a new paragraph 2.18., to read:

"**2.18.   "The mean fully developed deceleration (d_m) shall be calculated as the deceleration averaged with respect to distance over the interval v_b to v_e, according to the following formula:**

$$d_m = \frac{v_b^2 - v_e^2}{25.92(s_e - s_b)}$$

Where:

v_o = **initial vehicle speed in km/h,**

v_b = **vehicle speed at 0.8 v_o in km/h,**

v_e = **vehicle speed at 0.1 v_o in km/h,**

s_b = **distance travelled between v_o and v_b in metres,**

s_e = **distance travelled between v_o and v_e in metres.**

The speed and distance shall be determined using instrumentation having an accuracy of ±1 per cent at the prescribed speed for the test. The d_m may

be determined by other methods than the measurement of speed and distance; in this case, the accuracy of the d$_m$ shall be within ±3 per cent."

Paragraph 5.2.1.4, amend to read:

"5.2.1.4.   Speed reduction by braking demand

In absence of driver's input which would lead to interruption according to paragraph 5.3.2., the AEBS shall be able to achieve a relative impact speed that is less or equal to the maximum relative impact speed as shown in the following table:

(a)   For collisions with unobstructed and constantly travelling or stationary targets;

(b)   On flat, horizontal and dry roads **affording good adhesion**;

(c)   In maximum mass and mass in running order conditions;

(d)   In situations where the vehicle longitudinal centre planes are displaced by not more than 0.2 m;

(e)   In ambient illumination conditions of at least 1000 Lux without blinding of the sensors (e.g. direct blinding sunlight);

(f)   In absence of weather conditions affecting the dynamic performance of the vehicle (e.g. no storm, not below 0°C); and

(g)   When driving straight with no curve, and not turning at an intersection.

It is recognised that …"

Paragraph 5.2.2.4, amend to read:

"5.2.2.4.   Speed reduction by braking demand

In absence of driver's input which would lead to interruption according to paragraph 5.3.2., the AEBS shall be able to achieve an impact speed that is less or equal to the maximum relative impact speed as shown in the following table:

(a)   With unobstructed perpendicularly crossing pedestrians with a lateral speed component of not more than 5 km/h;

(b)   In unambiguous situations (e.g. not multiple pedestrians);

(c)   On flat, horizontal and dry roads **affording good adhesion**;

(d)   In maximum mass and mass in running order conditions;

(e)   In situations where the anticipated impact point is displaced by not more than 0.2 m compared to the vehicle longitudinal centre plane;

(f)   In ambient illumination conditions of at least 2000 Lux without blinding of the sensors (e.g. direct blinding sunlight).

(g)   In absence of weather conditions affecting the dynamic performance of the vehicle (e.g. no storm, not below 0°C) and

(h)   When driving straight with no curve, and not turning at an intersection.

It is recognised that …"

Paragraph 6.1.1., amend to read (including the **re-numbering** of the footnote 3)

6.   Test procedure

"6.1.   Test Conditions

6.1.1.   The test shall be performed on a flat, dry**,** concrete or asphalt**, road** ~~surface~~ affording good adhesion.

~~6.1.1.1.   The road test surface shall have a nominal³ peak braking coefficient (PBC) of 0.9, unless otherwise specified, when measured using either:~~

~~6.1.1.2.   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~~

~~6.1.1.3.   The k test method specified in Appendix 2 to Annex 6 of Regulation No. 13-H.~~

~~6.1.1.4.   The test surface has a consistent slope between level and 1 per cent."~~

Paragraph 6.3.1., amend to read:

"6.3.1.   The target used for the vehicle detection tests shall be a regular high-volume series production passenger car of Category M1 ~~AA saloon~~ or alternatively a "soft target" representative of ~~such~~ a **passenger** vehicle in terms of its identification characteristics applicable to the sensor system of the AEBS under test according to ~~ISO 19206-3:2020~~ **ISO 19206-3:2021**. The reference point for the location of the vehicle shall be the most rearward point on the centreline of the vehicle."

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