Proposal for a new supplement to the 03, 04, 05 and 06 series of amendments to UN Regulation No. 78

Proposal to adapt the deceleration threshold also to S-EPAC for the 03, 04, 05 and the new 06 series of amendments to UN Regulation No. 78.

1. Proposal

*Paragraph 9.3.2.*, amend to read:

"9.3. Stops on a high friction surface

9.3.2. Performance requirements

When the brakes are tested in accordance with the test procedures referred to in paragraph 9.3.1.:

(a) The stopping distance (S) shall be:

 (i) In general, S ≤ 0.0063V2 (where V is the specified test speed in km/h and S is the required stopping distance in metres) or the MFDD shall be ≥ 6,17m/s2; or

 (ii) In case of pedal-driven vehicles of Category L1 with auxiliary electric propulsion, S ≤ 0.0056V2/P (where V is the specified test speed in km/h, P is the peak braking coefficient and S is the required stopping distance in metres) or the MFDD shall be ≥ 6.87 x P, in m/s2; [and]

(b) There shall be no wheel lock and the vehicle wheels shall stay within the test lane.”

1. **Justification**

 A. Background

1. In certain conditions, ABS can offer benefit in terms of cycling safety as it optimizes the trade-off between bicycle stability and deceleration.

2. ABS can work only within the physical limits of the bicycle (friction of tire & road, center of gravity of rider & bicycle, etc.)

3. ABS has, as all technical systems, a level of efficiency compared to rider’s best performance (pro rider who knows when & how to brake).

 B. Applicable standards

4. ABS is optionally available for both type-approved and non type-approved e-bikes (such as the S-EPAC, which is a vehicle of subcategory L1e-B according
(EU) 168/2013)), hence UNECE R78 is applicable to S-EPAC.

5. Current design of the UN R78 targets ABS technology on powered two wheelers (PTWs) such as mopeds and motorcycles which have different physical limits (cf. slide 2 in informal document GRVA-18-39)

 C. Issue

6. The center of gravity (CoG) of S-EPACs combined with the level of efficiency of every ABS does not fit to the braking test “Stops on high friction surface” (chapter 9.3) which includes a vehicle independent deceleration threshold of 6.17m/s² (cf. slide 2 in informal document GRVA-18-39)

 D. Proposal:

7. Changing the deceleration threshold definition from a vehicle independent one to a vehicle dependent one as in braking test “Stops on low friction surface” (chapter 9.4) enables a better fit of UN R78 to S-EPACs (cf. slide 3 in informal document GRVA-18-39)

8. The definition introduced in para. a.2. is based on the definition used in UN R63 (noise), para. 1. Scope



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