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Item 5(a) of the provisional agenda

Motorcycle Braking - Regulation No. 78**Proposal of Supplement 3 to the 03 series of amendments to
Regulation No. 78 (Uniform provisions concerning the
approval of vehicles of category L with regard to braking)****Submitted by the expert from the European Commission***

The text reproduced below was prepared by the expert from the European Commission to introduce amendments adding the remaining vehicle categories to the provisions for testing of anti-lock braking systems (ABS), based on document GRRF-79-16, as agreed at the seventy-ninth GRRF session. The modifications to the current text of the Regulation are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2012–2016 (ECE/TRANS/224, para. 94 and ECE/TRANS/2012/12, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

I. Proposal

Paragraph 1., amend to read:

"1. ...
This Regulation applies to vehicles of **category L**.¹
..."

Paragraph 2.6., amend to read:

"2.6. "Combined brake system (CBS)" means:
For vehicle categories L₁ and L₃: a service brake system where at least two brakes on different wheels are operated by the actuation of a single control.
For vehicle categories **L₂, L₅, L₆ and L₇**: a service brake system where the brakes on all wheels are operated by the actuation of a single control.
..."

Paragraph 5.1.4., amend to read:

"5.1.4. Parking brake system
If a parking brake system is fitted, it shall hold the vehicle stationary on the slope prescribed in paragraph 1.1.4. of Annex 3.
The parking brake system shall:
(a) Have a control which is separate from the service brake system controls; and
(b) Be held in the locked position by solely mechanical means.
Vehicles shall have configurations that enable a rider to be able to actuate the parking brake system while seated in the normal driving position.
For **L₂, L₄, L₅, L₆ and L₇**, the parking brake system shall be tested in accordance with paragraph 8. of Annex 3."

Paragraph 5.1.7., amend to read:

"5.1.7. Three-wheeled vehicles of category L₂ **and four-wheeled vehicles of category L₆** shall be equipped with a parking brake system plus one of the following service brake systems:
..."

Paragraph 5.1.8., amend to read:

"5.1.8. Category L₅ vehicles **and category L₇ vehicles** shall be equipped with:"

Annex 3,

Paragraph 1.1.5., amend to read:

"1.1.5. Test lane width:
For two-wheeled vehicles (vehicle categories L₁ and L₃) the test lane width is 2.5 m.
For three-wheeled **and four-wheeled** vehicles (vehicle categories **L₂, L₄, L₅, L₆ and L₇**) the test lane width is 2.5 m plus the vehicle width."

Paragraph 3.2., amend to read:

- "3.2. Test conditions and procedure:
- (a) Initial brake temperature: $\geq 55\text{ }^{\circ}\text{C}$ and $\leq 100\text{ }^{\circ}\text{C}$;
 - (b) Test speed:
 - (i) Vehicle categories **L₁, L₂ and L₆** : 40 km/h or 0.9 V_{max}, whichever is lower;
 - (ii) Vehicle categories **L₃, L₄, L₅ and L₇**: 60 km/h or 0.9 V_{max}, whichever is lower;
 - (c) Brake application:
 - (i) Each service brake system control actuated separately;
 - (d) Brake actuation force:
 - (i) Hand control: $\leq 200\text{ N}$;
 - (ii) Foot control: $\leq 350\text{ N}$ for vehicle categories **L₁, L₂, L₃, L₄ and L₆**;
 $\leq 500\text{ N}$ for vehicle category **L₅ and L₇**;

..."

Paragraph 3.3., amend to read:

"3.3. Performance requirements

When the brakes are tested in accordance with the test procedure set out in paragraph 3.2., the stopping distance shall be as specified in column 2 or the MFDD shall be as specified in column 3 of the following table:

Column 1	Column 2	Column 3
Vehicle Category	STOPPING DISTANCE (S) (Where V is the specified test speed in km/h and S is the required stopping distance in metres)	MFDD
Single brake system, front wheel(s) braking only:		
L ₁	$S \leq 0.1 V + 0.0111 V^2$	$\geq 3.4\text{ m/s}^2$
L₂ and L₆	$S \leq 0.1 V + 0.0143 V^2$	$\geq 2.7\text{ m/s}^2$
L ₃	$S \leq 0.1 V + 0.0087 V^2$	$\geq 4.4\text{ m/s}^2$
L₅ and L₇	Not applicable	Not applicable
L ₄	$S \leq 0.1 V + 0.0105 V^2$	$\geq 3.6\text{ m/s}^2$
Single brake system, rear wheel(s) braking only:		
L ₁	$S \leq 0.1 V + 0.0143 V^2$	$\geq 2.7\text{ m/s}^2$
L₂ and L₆	$S \leq 0.1 V + 0.0143 V^2$	$\geq 2.7\text{ m/s}^2$
L ₃	$S \leq 0.1 V + 0.0133 V^2$	$\geq 2.9\text{ m/s}^2$
L₅ and L₇	Not applicable	Not applicable
L ₄	$S \leq 0.1 V + 0.0105 V^2$	$\geq 3.6\text{ m/s}^2$
Vehicles with CBS or split service brake systems: for laden and lightly loaded conditions:		
L₁ L₂ and L₆	$S \leq 0.1 V + 0.0087 V^2$	$\geq 4.4\text{ m/s}^2$
L ₃	$S \leq 0.1 V + 0.0076 V^2$	$\geq 5.1\text{ m/s}^2$
L₅ and L₇	$S \leq 0.1 V + 0.0077 V^2$	$\geq 5.0\text{ m/s}^2$
L ₄	$S \leq 0.1 V + 0.0071 V^2$	$\geq 5.4\text{ m/s}^2$
Vehicles with CBS – secondary service brake systems:		
ALL	$S \leq 0.1 V + 0.0154 V^2$	$\geq 2.5\text{ m/s}^2$

Paragraph 4.1., amend to read:

"4.1. Vehicle condition:

- (a) The test is applicable to vehicle categories **L₃, L₄, L₅ and L₇**;
- ..."

Paragraph 4.2., amend to read:

"4.2. Test conditions and procedure:

- ...
- (d) Brake actuation force:
Hand control: ≤ 250 N;
Foot control: ≤ 400 N for vehicle categories L₃ and L₄;
 ≤ 500 N for vehicle category **L₅ and L₇**;
- ..."

Paragraph 5.1., amend to read:

"5.1. Vehicle condition:

- (a) The test is applicable to vehicle categories **L₃, L₄, L₅ and L₇**;
- ..."

Paragraph 5.2., amend to read:

"5.2. Test conditions and procedure:

- ...
- (d) Brake actuation force:
Hand control: ≤ 200 N;
Foot control: ≤ 350 N for vehicle categories L₃ and L₄;
 ≤ 500 N for vehicle category **L₅ and L₇** ;
- ..."

Paragraph 7.1., amend to read:

"7.1. General:

- ...
- (b) The test is applicable to vehicle categories **L₃, L₄, L₅ and L₇**;
- ..."

Paragraph 7.2.2., amend to read:

"7.2.2. Test conditions and procedure:

- ...
- (d) Brake actuation force:
Hand control: ≤ 200 N;
Foot control: ≤ 350 N for vehicle categories L₃ and L₄;
 ≤ 500 N for vehicle category **L₅ and L₇** ;

..."

Paragraph 8.1., amend to read:

"8.1. Vehicle condition:

(a) The test is applicable to vehicle categories **L₂, L₄, L₅ and L₇**;

..."

Paragraph 9.1., amend to read:

"9.1. General:

(a) The tests are only applicable to the ABS ~~if fitted on vehicle categories L₁ and L₃~~

..."

Paragraph 10.2., amend to read:

"10.2. Vehicle condition:

(a) The test is applicable to vehicle categories **L₃, L₄, L₅ and L₇**;

..."

Paragraph 11.3., amend to read:

"11.3. Performance requirements

...

	Column 2		Column 3
Vehicle Category	STOPPING DISTANCE(S) (Where V is the specified test speed in km/h and S is the required stopping distance in metres)		MFDD
Single brake system			
L ₁	$S \leq 0.1 V + 0.0143 V^2$		$\geq 2.7 \text{ m/s}^2$
L₂ and L₆	$S \leq 0.1 V + 0.0143 V^2$		$\geq 2.7 \text{ m/s}^2$
L ₃	$S \leq 0.1 V + 0.0133 V^2$		$\geq 2.9 \text{ m/s}^2$
L ₄	$S \leq 0.1 V + 0.0105 V^2$		$\geq 3.6 \text{ m/s}^2$
Vehicles with CBS or SSBS			
ALL	$S \leq 0.1 V + 0.0154 V^2$		$\geq 2.5 \text{ m/s}^2$

..."

Paragraph 12.3., amend to read:

"12.3. Performance requirements

...

Column 1	Column 2	Column 3
Vehicle Category	STOPPING DISTANCE (S) (Where V is the specified test speed in km/h and S is the required stopping distance in metres)	MFDD
Front wheel(s) braking only		
L ₁	$S \leq 0.1 V + 0.0111 V^2$	$\geq 3.4 \text{ m/s}^2$
L ₂ and L ₆	$S \leq 0.1 V + 0.0143 V^2$	$\geq 2.7 \text{ m/s}^2$
L ₃	$S \leq 0.1 V + 0.0087 V^2$	$\geq 4.4 \text{ m/s}^2$
L ₄	$S \leq 0.1 V + 0.0105 V^2$	$\geq 3.6 \text{ m/s}^2$
L ₅ and L ₇	$S \leq 0.1 V + 0.0117 V^2$	$\geq 3.3 \text{ m/s}^2$
Rear wheel(s) braking only		
L ₁	$S \leq 0.1 V + 0.0143 V^2$	$\geq 2.7 \text{ m/s}^2$
L ₂ and L ₆	$S \leq 0.1 V + 0.0143 V^2$	$\geq 2.7 \text{ m/s}^2$
L ₃	$S \leq 0.1 V + 0.0133 V^2$	$\geq 2.9 \text{ m/s}^2$
L ₄	$S \leq 0.1 V + 0.0105 V^2$	$\geq 3.6 \text{ m/s}^2$
L ₅ and L ₇	$S \leq 0.1 V + 0.0117 V^2$	$\geq 3.3 \text{ m/s}^2$

"

Appendix 1,

Paragraph 1.2., amend to read:

"1.2. Vehicle condition:

(a) The test is applicable to **all vehicle categories**.

..."

II. Justification

1. The proposal is aimed to align the level of safety to that currently applicable in the European Union in terms of that offered by ABS on vehicles of category L, other than just on two-wheelers.
2. ABS requirements for tricycles already existed in Directive 93/14/EEC and were applied to quadricycles under the terms of Framework Directives 92/61/EEC and 2002/24/EC.
3. These provisions are currently lacking from UN regulation No. 78 and added in this proposal.
4. Although the requirements in the regulation are somewhat geared towards two-wheeled vehicles, (e.g. no split-mu for four-wheelers) they can and should also be applied vehicle categories L₆ and L₇ as has been the practise in the EU for many years.