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World Forum for Harmonization of Vehicle Regulations**Working Party on Brakes and Running Gear****Sixty-eighth session**

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Item 3(d) of the provisional agenda

Regulations Nos. 13 and 13-H (Braking) – Clarifications**Proposal for draft amendments to Regulation No. 13-H
(Brakes of M₁ and N₁ vehicles)****Submitted by the expert from India ***

The text reproduced below was prepared by the expert from India in order to ignore, in vehicles fitted with Brake Assist Systems (BAS), the lower limit value of applied force required in service and secondary braking system tests. This document is based on Informal document No. GRRF-67-18 distributed at the sixty-seventh session of the Working Party on Brakes and Running Gear (GRRF) (see report ECE/TRANS/WP.29/GRRF/67, para. 19). Modifications to the current provisions of the Regulation are marked in bold for new characters.

* In accordance with the programme of work of the Inland Transport Committee for 2006–2010 (ECE/TRANS/166/Add.1, 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

Annex 3

Paragraph 2.1.1., amend to read:

“2.1.1. The service brakes shall be tested under the conditions shown in the following table:

(A) Type-0 test with engine disconnected	v	100 km/h
	$s \leq$	$0.1 v + 0.0060 v^2$ (m)
	$d_m \geq$	6.43 m/s ²
(B) Type-0 test with engine connected	v	80% $v_{max} \leq 160$ km/h
	$s \leq$	$0.1 v + 0.0067 v^2$ (m)
	$d_m \geq$	5.76 m/s ²
	f ¹	6.5 - 50 daN

¹ The lower limit value of applied force ‘f’ less than 6.5 daN shall be ignored in case of vehicles fitted with BAS.

where:

- v = test speed, in km/h
- s = stopping distance, in metres
- d_m = mean fully developed deceleration, in m/s²
- f = force applied to foot control, in daN
- v_{max} = maximum speed of the vehicle, in km/h

Insert a new paragraph 2.2.1.1., to read:

“2.2.1.1. The performance of the secondary braking system having BAS shall be tested by the Type-0 test with the engine disconnected from an initial vehicle speed of 100 km/h and a force applied to the service brake control not exceeding 50 daN.”

II. Justification

Paragraph 2.1.1.

1. The Regulation specifies pedal force to be applied during the type-0 test. The clarity on acceptance is needed if the specified deceleration is achieved with a pedal force less than the specified lower limit of 6.5 daN.

2. This will take care of undue excessive braking which is difficult to modulate. In case of BAS activation, considering the emergency situation, the value of minimum brake pedal force is redundant.

Paragraph 2.2.1.1.

3. For secondary braking, the lower limit of 6.5 daN needs to be ignored, since the primary aim is to achieve the desired deceleration of 2.44 m/s^2 as rapidly as possible.
 4. For vehicle with diagonal split, meeting service deceleration level of 6.43 m/s^2 with pedal force just above 6.5 daN; in case of secondary performance it will mean 3.21 m/s^2 (50 per cent of 6.43 m/s^2) with pedal force of 6.5 daN. In other words 2.44 m/s^2 deceleration will be achieved with pedal force less than 6.5 daN.
 5. For vehicle with front/rear split (H circuit), the condition will be still worse for front only condition, since the contribution from the front is more than 50 per cent.
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