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Inland Transport Committee

**World Forum for Harmonization of Vehicle Regulations****Working Party on Automated/Autonomous and Connected Vehicles****Seventh session**

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Item 8 (c) of the provisional agenda

**UN Regulations Nos. 13, 13-H, 139, 140 and UN GTR No. 8:****Clarifications****Proposal for Supplement 02 to the 01 Series of amendments to  
UN Regulation No. 13-H (Braking of M<sub>1</sub> and N<sub>1</sub> vehicles)****Submitted by the experts from the International Organization of Motor  
Vehicle Manufacturers and the European Association of Automotive  
Suppliers\***

The text reproduced below was prepared by the experts from the International Organization of Motor Vehicle Manufacturers (OICA) and the European Association of Automotive Suppliers (CLEPA) for permitting uniform behaviour of the stop lamp illumination with regard to various types of braking systems, including those of electric vehicles. The modifications to the existing text of the Regulation are marked in bold for new and strikethrough for deleted characters.

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\* In accordance with the programme of work of the Inland Transport Committee for 2020 as outlined in proposed programme budget for 2020 (A/74/6 (part V sect. 20) para 20.37), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



## I. Introduction – recall of relevant definitions

In UN Regulation No. 13-H :

- 2.17. "Electric regenerative braking" means a braking system which, during deceleration, provides for the conversion of vehicle kinetic energy into electrical energy.
- 2.17.1. "Electric regenerative braking control" means a device which modulates the action of the electric regenerative braking system;
- 2.17.2. "Electric regenerative braking system of Category A" means an electric regenerative braking system which is not part of the service braking system;
- 2.17.3. "Electric regenerative braking system of Category B" means an electric regenerative braking system which is part of the service braking system;
- 2.20. "Automatically commanded braking" means a function within a complex electronic control system where actuation of the braking system(s) or brakes of certain axles is made for the purpose of generating vehicle retardation with or without a direct action of the driver, resulting from the automatic evaluation of on-board initiated information.
- 2.21. "Selective braking" means a function within a complex electronic control system where actuation of individual brakes is made by automatic means in which vehicle retardation is secondary to vehicle behaviour modification.

## II. Proposal

Paragraph 5.2.22.2. (and subparagraphs), amend to read (footnote 6 unchanged, paras. 5.2.22. and 5.2.22.1. for reference only):

- 5.2.22. Generation of a braking signal to illuminate the stop lamps.
- 5.2.22.1. Activation of the service braking system by the driver shall generate a signal that will be used to illuminate the stop lamps.
- 5.2.22.2. ~~Activation of the service braking system by "automatically commanded braking" shall generate the signal mentioned above. However, when the retardation generated is less than 0,7 m/s<sup>2</sup>, the signal may be suppressed<sup>(6)</sup>~~

**Requirements for vehicles equipped with automatically commanded braking and/or regenerative braking which produce a retarding force (e.g. upon release of the accelerator control) <sup>6</sup>.**

*Deceleration by automatically commanded braking and/or regenerative braking*

$\leq 1.3 \text{ m/s}^2$	$> 1.3 \text{ m/s}^2$
May generate the signal	Shall generate the signal

<sup>6</sup> At the time of type approval, compliance with this requirement shall be confirmed by the vehicle manufacturer.

**Once generated the signal shall be kept as long as a deceleration demand persists. However, the signal may be suppressed at standstill.**

**An appropriate measure (e.g. switch-of-hysteresis, averaging, time delay) shall be implemented in order to avoid fast changes of the signal resulting in flickering of the stop lamps.**

Paragraph 5.2.22.3., amend to read (footnote 7 unchanged)

- 5.2.22.3. Activation of part of the service braking system by "selective braking" or by **functions whose primary intention is not to decelerate the vehicle (e.g.**

**slight actuation of the friction brakes to clean the discs)** shall not generate the signal mentioned above<sup>7</sup>.

<sup>7</sup> During a "selective braking" event, the function may change to "automatically commanded braking"

Paragraph 5.2.22.4., amend to read (including deletion of reference to Footnote 8)

5.2.22.4. ~~Electric regenerative braking systems as defined in Paragraph 2.17., of this Regulation, which produce a retarding force upon release of the accelerator control, shall generate the signal mentioned above according to the following provisions.~~

<i>Vehicle decelerations</i>	<i>Signal generation</i>
$\leq 0.7 \text{ m/s}^2$	The signal shall not be generated
$\geq 0.7 \text{ m/s}^2$ and $\leq 1.3 \text{ m/s}^2$	The signal may be generated
$> 1.3 \text{ m/s}^2$	The signal shall be generated

In all cases the signal shall be de-activated at the latest when the deceleration has fallen below  $0.7 \text{ m/s}^2$ <sup>(8)</sup>.

**The signal shall not be generated when retardation is solely produced by the natural braking effect of the engine, air-/rolling resistance and/or road slope.**

### III. Justifications

1. The suggested modifications to paragraph 5.2.22., if adopted, would enable a vehicle design with a uniform behaviour of the stop lamp illumination with regard to various types of braking systems, including those of electric vehicles.
2. The requirements to illuminate the stop lamps should depend on the intention to decelerate and should be harmonised for various types of braking systems.
3. The intention to decelerate can be linked to:
  - (a) A driver's action;
  - (b) An activation of an automatically commanded braking system; or
  - (c) An activation of an electric regenerative braking system.
4. More detailed justifications can be found in a supporting presentation submitted in a parallel informal document.