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

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Item 9(a) of the provisional agenda

**Steering equipment: Regulation No. 79****Proposal for amendments to Regulations Nos. 13, 13-H and 140****Submitted by the expert from the International Organization of Motor Vehicle Manufacturers\***

The text reproduced below was prepared by the experts from International Organization of Motor Vehicle Manufacturers (OICA). It is based on informal document GRRF-83-22-Rev.1. The modifications to the existing text of the Regulations are in "tracked changes".

\* In accordance with the programme of work of the Inland Transport Committee for 2016–2017 (ECE/TRANS/254, para. 159 and ECE/TRANS/2016/28/Add.1, cluster 3.1), 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.

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## I. Proposal

### A. Proposal for amendments to UN Regulation No. 13-H

(Annex 9 - Electronic stability control and brake assist systems; Part A. Requirements for electronic stability control systems, where fitted)

Paragraph 3.4.4., amend to read:

"3.4. ESC malfunction detection

The vehicle shall be equipped with a tell-tale that provides a warning to the driver of the occurrence of any malfunction that affects the generation or transmission of control or response signals in the vehicle's electronic stability control system.

3.4.1. The ESC malfunction tell-tale:

...

3.4.1.5. May also be used to indicate the malfunction of related systems/functions, including traction control, trailer stability assist, corner brake control, and other similar functions that use throttle and/or individual torque control to operate and share common components with ESC.

...

3.4.4. The manufacturer may use the ESC malfunction tell-tale in a flashing mode to indicate the interventions of ESC, ~~and/or~~ ESC-related systems (as listed in paragraph 3.4.1.5.), and/or the use of to indicate the intervention on the steering angle of one or more wheels for the purpose of vehicle stability, individual steering control for vehicle stability assist)." ~~individual steering control for vehicle stability assist).~~"

### B. Proposal for amendments to UN Regulation No. 13

(Annex 21 - Special requirements for vehicles equipped with a vehicle stability function)

Paragraph 2.1.4., amend to read:

"2.1.4. Interventions of the vehicle stability function shall be indicated to the driver by a flashing optical warning signal fulfilling the relevant technical requirements of Regulation No. 121. The indication shall be present as long as the vehicle stability function is in an intervention mode. The warning signal specified in paragraph 5.2.1.29.1.2. of this Regulation shall not be used for this purpose.

Additionally, interventions by systems related to the vehicle stability function (including traction control, trailer stability assist, corner brake control, ~~and~~ other similar functions that use throttle individual torque control to operate and share common components with vehicle stability function, **and functions intervening on the steering angle of one or more wheels for the purpose of vehicle stability using individual steering control for vehicle stability assist**) may also be indicated to the driver by this flashing optical warning signal.

Interventions of the vehicle stability function used in any learning process to determine the vehicle operational characteristics shall not generate the above signal."

## C. Proposal for amendments to UN Regulation No. 140

Paragraph 7.4., amend to read:

- "7.4. ESC malfunction detection
- The vehicle shall be equipped with a tell-tale that provides a warning to the driver of the occurrence of any malfunction that affects the generation or transmission of control or response signals in the vehicle's electronic stability control system.
- 7.4.1. The ESC malfunction tell-tale:
- ...
- 7.4.1.5. May also be used to indicate the malfunction of related systems/functions, including traction control, trailer stability assist, corner brake control, and other similar functions that use throttle and/or individual torque control to operate and share common components with ESC.
- ...
- 7.4.4. The manufacturer may use the ESC malfunction tell-tale in a flashing mode to indicate the interventions of ESC and/or ESC-related systems (as listed in paragraph 7.4.1.5.), the intervention on the steering angle of one or more wheels for the purpose of vehicle stability~~or using individual steering control for vehicle stability assist~~."

## II. Justification

1. Informal document GRRF-82-12-Rev.3 as amended requires in its para. 5.1.6.2.1. that all types CSF, including CSF for stability, indicate their interventions by an optical means:

"5.1.6.2.1. Every CSF intervention shall immediately be indicated to the driver by an optical signal which is displayed for at least 1s or as long as the compensation exists, whichever is longer."

2. The braking regulations explicitly permit the use of the ESC flashing symbol for the purpose of showing interventions of systems related to the vehicle stability function (e.g. traction control etc.). However, the use of individual steering control for vehicle stability assist is not explicitly specified, while such CSF systems are "related to the vehicle stability function". The proposals above explicitly open up for that option.

3. Such an option would be an opportunity for the manufacturer to simplify the indication to the driver, avoiding two tell-tales simultaneously flashing when a stability assistance including both ESC and CSF is intervening. It would also be of low added value for the driver to know which, from the steering or the braking system, is providing the stability assistance.

4. The combination of ESC and CSF to achieve stability assist is useful in lots of different situations (oversteer, understeer, split adhesion surface, etc.). The example below shows the basic functioning of an ESC/CSF combination in the case of oversteering: when the rear wheels are laterally slipping, both longitudinal forces (braking/accelerating control) and lateral forces (steering control) of the front and rear wheels can help stabilizing the vehicle. Stabilization moment is then generated not only by braking/accelerating forces but also by steering control, thus enhancing the vehicle stability.

