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Regulatory Fitness for Automated Driving Systems

Proposal for Supplement 2 to the 03 Series of Amendments to UN Regulation No. 64 (Temporary use spare unit, run flat tyres)

Submitted by the Task Force on Automated Vehicle Regulation Screening*

The text reproduced below was prepared by the expert from the European Commission on behalf of the Task Force on Automated Vehicle Regulation Screening (TF AVRS), to enable the application of the Regulation to vehicles equipped with automated driving systems (ADS). The modifications to the existing text of the UN 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 2026 as outlined in proposed programme budget for 2026 (A/80/6 (Sect. 20), table 20.7), 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. Proposal

Table of contents, Annexes, add a new Annex 5:

"5 Special provisions for the testing of vehicles equipped with an ADS……."

Paragraph 1., footnote 1, amend to read:

"[1] ~~M1 and N1 categories of vehicles are~~**As** defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.4~~8, para. 2.~~."

Paragraph 2.13., amend to read:

"2.13. 'Run-flat warning system' describes a system which delivers information to the driver **or the ADS**[1] that a tyre is operating in the flat tyre running mode."

Insert new paragraphs 2.14. to 2.19., to read:

"2.14. "Automated Driving System (ADS)" means the vehicle hardware and software that are collectively capable of performing the entire Dynamic Driving Task (DDT) on a sustained basis[1].

2.15. "Dynamic Driving Task (DDT)" means the real-time operational and tactical functions required to operate the vehicle[1].

2.16. "Category X vehicles" are vehicles of categories M, N, L and T meeting all of the following conditions[1]:

(a) They are equipped with an ADS

(b) They are not capable of being driven manually at speeds exceeding 6 km/h

(c) They are designed to carry occupants

2.17. "Category Y vehicles" are vehicles of categories N, L and T meeting all of the following conditions[1]:

(a) They are equipped with an ADS

(b) They are not capable of being driven manually at speeds exceeding 6 km/h

(c) They are not designed to carry occupants at any time

2.18. "Logical signal" means a signal used in a control system to indicate the state of a variable.

2.19. "Vehicle Master Control Switch" means the device by which the vehicle's on-board electronics system is brought, from being switched off, as in the case where a vehicle is parked without the diver being present, to normal operation mode (i.e. the vehicle status is "ready to drive")."

Footnote 2, amend to read:

"[2] The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to the Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev. ~~6~~**8**, Annex 3 - ~~www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html~~https://unece.org/transport/vehicle-regulations/wp29/resolutions"

Paragraphs 5.1.6.1. to 5.1.6.4., amend to read:

"5.1.6.1. **In the case of a vehicle designed to be driven manually only, T**~~t~~he warning indication shall be by means of an optical yellow warning signal.

In the case of a vehicle of category X or category Y, the warning indication shall be by means of a logical signal.

In the case of a vehicle equipped with an ADS, other than those of category X and Y, the warning indication shall be by means of an optical signal when operated by a driver, and a logical signal when operated by an ADS (an optical signal is optional).

5.1.6.2. The **optical** warning **indication**~~signal~~ shall be activated when the **vehicle master control**~~ignition (start)~~ switch is in the "on" (run) position (bulb check).

5.1.6.3. A **Run Flat System** warning **signal described in paragraph 5.1.6.1.** shall be indicated ~~to the driver~~ **at the latest when one tyre is detected to be in the flat tyre running mode** ~~by the operation of the warning signal referred to in paragraph 5.1.6.1. at the latest when one tyre is detected to be in the flat tyre running mode~~.

5.1.6.4. Electrical failure or sensor anomaly that affects the Run-Flat Warning System, including failure of the electrical source, supply or transmission of the output signal, shall be indicated to the driver by an optical yellow run-flat malfunction signal. If the warning signal described in paragraph 5.1.6.1. is used to indicate both a tyre in the run-flat mode and a malfunction in the run-flat warning system, the following shall apply: with the **vehicle master control**~~ignition (start)~~ switch in the "on" (run) position the warning signal shall flash to indicate a system failure. After a short period of time the warning signal shall remain continuously illuminated as long as the failure exists and the **vehicle master control**~~ignition (start)~~ switch is in the "on" (run) position. The flashing and illumination sequence shall be repeated each time the **vehicle master control**~~ignition (start)~~ switch is in the "on" (run) position until the failure has been corrected.

Whilst an ADS feature is active, electrical failure or sensor anomaly that affects the run-flat warning system, including failure of the electrical source, supply or transmission of the output signal, shall be indicated to the ADS by a logical signal."

Insert a new paragraph 6.1.2.2., to read:

"6.1.2.2. In case the vehicle is equipped with an ADS, an instruction how the ADS is informed to drive with caution in case a type 1, 2, 3 or 4 spare unit is fitted or a type 5 temporary-use spare unit is being used in the flat tyre running mode."

Annex 1, insert a new item 2.1., to read:

"2.1. Vehicle is equipped with an ADS: yes/no"

Insert new items 9.4.1. to 9.4.3., to read:

"9.4.1. According to Annex 5 to this regulation, mode(s) tested: manual operation /ADS operation/both[2]

9.4.2. Additional preparation of the test and vehicle for tests with ADS operation (if any)

9.4.3. Description of the mandatory logical signal from the run-flat warning system used by the ADS (if any) and information to read the logical signal for the purpose of testing."

Annex 3,

Paragraphs 2.2. and 2.3., amend to read:

"2.2. The test shall be carried out using the service braking system from an initial speed of 80 km/h with the engine disconnected.

In the case of vehicles equipped with an ADS, the special provisions of Annex 5 shall also be considered.

2.3. The braking performance shall correspond to the test procedure given in UN Regulation No. 13 or 13-H for categories M_1 and N_1 vehicles for the Type O

cold test with the engine disconnected, and is based on the stopping distance and the mean fully developed deceleration. The performance of the vehicle shall be determined by measuring the stopping distance in relation to the prescribed speed of the vehicle and/or by measuring the mean fully developed deceleration during the test.

In the case of vehicles equipped with an ADS, the special provisions of Annex 5 shall also be considered."

Annex 4,

Paragraph 2.1., amend to read:

"2.1. Test procedures for detection of a tyre in the flat tyre running mode.

The requirements of either paragraph 2.1.1. or 2.1.2. shall be met.

In the case of vehicles equipped with an ADS, the special provisions of Annex 5 shall also be considered."

Paragraphs 2.1.1.2. and 2.1.1.3., amend to read:

"2.1.1.2. With the vehicle stationary and the **vehicle master control**~~ignition (start)~~ switch in the "Lock" or "Off" position, turn the **vehicle master control**~~ignition (start)~~ switch to the "On" ("Run") position or, where applicable, the appropriate key position. Confirm the activation of the warning signal.

2.1.1.3. Turn off the **vehicle master control switch**~~ignition~~ and reduce the inflation pressure of any one of the tyres until the adjusted tyre inflation pressure is 100 kPa below the recommended cold inflation pressure."

Paragraphs 2.1.1.5. and 2.1.1.6., amend to read:

"2.1.1.5. The test is completed when either:

(a) The run-flat warning system as described in paragraph 5.1.6.1. has activated; or

(b) A period of 5 minutes has elapsed, when determined in accordance with paragraph 2.3., from the time the test speed has been reached. If the warning does not activate the test has failed.

The vehicle shall be brought to a halt and the **vehicle master control switch**~~ignition~~ switched off.

2.1.1.6. If the warning signal as required in paragraph 2.1.1.5. above has activated, wait 5 minutes before turning the **vehicle master control switch**~~ignition~~ on; the signal shall reactivate and remain active as long as the **vehicle master control** ~~ignition~~ switch is in the "on" ("run") position."

Paragraph 2.2., amend to read:

"2.2. Test procedures for detecting a failure of the Run-Flat Warning System.

In the case of vehicles equipped with an ADS, the special provisions of Annex 5 shall also be considered."

Paragraphs 2.2.3. and 2.2.4., amend to read:

"2.2.3. When:

(a) The run-flat malfunction signal as described in paragraph 5.1.6.4. has activated or;

(b) A period of 5 minutes has elapsed, when determined in accordance with paragraph 2.3., from the time the test speed has been reached. If the warning does not activate the test has failed.

The vehicle shall be brought to a halt and the **vehicle master control switch**~~ignition~~ switched off.

2.2.4. If the warning signal as required in paragraph 2.2.3. above has activated, wait 5 minutes before turning the **vehicle master control switch**~~ignition~~ on; the signal shall reactivate and remain active as long as the **vehicle master control**~~ignition~~ switch is in the "on" ("run") position."

Insert a new Annex 5, to read*:*

Special provisions for the testing of vehicles equipped with an ADS

1. General

This Annex explains how to adapt UN-R64 to vehicles equipped with an ADS. It does not add nor remove any requirement.

2. Specifications

2.1. Preparations

When performing the tests of this regulation, the conditions prescribed in the Annexes shall be fulfilled. Additional preparation of the test track, the vehicle or other equipment may be needed for vehicles equipped with an ADS. This additional preparation shall be approved by the Type Approval Authority and its designated Technical Service and described in the test report.

2.2. Vehicles equipped with an ADS, other than those of categories X and Y shall fulfil the requirements both in manual operation (illuminated tell-tale) and in ADS operation (logical signal) according to the applicable parts of this regulation.

2.2.1. Vehicles equipped with an ADS, other than those of categories X and Y shall therefore be tested in both manual operation and ADS operation.

2.2.2. By exception to paragraph 2.2.1. of this Annex, vehicles equipped with an ADS, other than those of categories X and Y may be tested in manual operation only when the three following conditions are fulfilled:

- **the vehicles equipped with an ADS, other than those of categories X and Y are operated by the ADS only in a limited number of very specific cases (example: valet parking with low speed and short duration and assessed as low risk by the manufacturer)**
- **the manufacturer declares that the logical signal is indicated to the ADS even in those limited very specific cases**
- **the Type Approval Authority and its designated Technical Service agree to this manual operation testing."**

II. Justification

1. The amendments in this document extend existing requirements for manual driven vehicles to vehicles equipped with an ADS.
2. Since this regulation might be used by applicants that are less involved in vehicles equipped with an ADS, the definitions of the RE.3 are repeated in the definition paragraph of this regulation to emphasize the type of changes and additions in this document.
3. The main effort for testing a vehicle equipped with an ADS is related to the run-flat system which is likely redundant since vehicles equipped with an ADS will usually be fitted with a TPMS (R141) system. The amendments in this regulation are similar to the ADS amendments in R141.