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UN Regulation No. 10 (Electromagnetic Compatibility)

Proposal for a Supplement to 07 series of amendments to UN Regulation No. 10 (Electromagnetic compatibility)

Submitted by the experts from the Informal Working Group on Electromagnetic Compatibility*

The text reproduced below was prepared by the experts from the Informal Working Group on Electromagnetic Compatibility (IWG EMC) with the aim to fit Automated Driving System (ADS) requirements into UN Regulation No.10. The proposed 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

Insert new paragraphs 0. and 0.1. to 0.1.3., to read:

"0. Introduction

0.1. Supplement [3] to the 07 series of amendments is introduced to take into account vehicles of categories X and Y [1], as well as conventional vehicles which are equipped with an Automated Driving System (ADS) [1].

0.1.1. The Regulation was originally drafted for vehicles with driver's compartment and manual driving controls. It is the intention of this amendment to keep the spirit of the Regulation and to extend its application to vehicles without driver, driver's compartment and without manual driving controls in the vehicle. In the absence of driver/driver's compartment/manual driving controls in the vehicle, provisions related to them shall not be taken into account if not already covered by this amendment.

0.1.2. In case of vehicles equipped with an ADS no special provisions or exemptions apply.

[0.1.3. While performing the EMC tests, it is important that all sensors etc. used by the ADS to perform the DDT [1], and to perform non-DDT related tasks, if applicable, are operational and function as they would in real-life. The Regulation is amended to clarify this.]"

Paragraph 0.1, insert new footnote 1, to read:

"[1] As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.8, para. 2"

Paragraph 1.3., amend to read:

"1.3. It covers:

(a) Requirements regarding the immunity to radiated and conducted disturbances for functions related to direct control of the vehicle, related to driver**, ADS**, passenger and other road users' protection, related to disturbances, which would cause confusion to the driver**, ADS** or other road users, related to vehicle data bus functionality, related to disturbances, which would affect vehicle statutory data;

…"

Paragraph 2.12., amend to read:

"2.12. "Immunity related functions" are the following functions; this list is not exhaustive and shall be adapted to the technical evolution of vehicle/technology:

(a) Functions related to the direct control of the vehicle:

(i) By degradation or change in: e.g. engine, gear, brake, suspension, active steering, speed limitation devices;

(ii) By affecting drivers position**, if applicable**: e.g. seat or steering wheel positioning;

(iii) By affecting driver's visibility: e.g. dipped beam, windscreen wiper, indirect vision systems, blind spot systems.

(iv) By affecting ADS sensor performance whilst an ADS feature is active; e.g. camera, radar.

(b) Functions related to driver, passenger and other road user protection:

(i) E.g. airbag and safety restraint systems, emergency calling systems;

(c) Functions which, when disturbed, cause confusion to the driver**[, ADS]** or other road users:

(i) Optical disturbances: incorrect operation of e.g. direction indicators, stop lamps, end outline marker lamps, rear position lamp, light bars for emergency system, wrong information from warning indicators, lamps or displays related to functions in Subparagraphs (a) or (b) which might be observed in the direct view of the driver.

(ii) Acoustical disturbances: incorrect operation of e.g. anti-theft alarm, horn.

[(iii) Disturbances in the logic signals transmitted to the ADS, if applicable.]

(d) Functions related to vehicle data bus functionality:

(i) By blocking data transmission on vehicle data bus-systems, which are used to transmit data, required to ensure the correct functioning of other immunity related functions.

(e) Functions which when disturbed affect vehicle statutory data: e.g. tachograph, odometer;

(f) Functions related to charging mode when coupled to the power grid:

(i) For vehicle test: by leading to unexpected vehicle motion;

(ii) For ESA test: by leading to an incorrect charging condition (e.g. over-current, over-voltage)."

Insert a new paragraph 3.1.9., to read:

"**3.1.9. If a driver's seat is fitted but it is not the front seat nearest to the opposing traffic, the applicant shall specify this seating position.**"

Insert a new paragraph 6.10.9. and its subparagraphs, to read:

"**6.10.9. Special requirements for vehicles equipped with an ADS**

6.10.9.1. If not otherwise specified, all requirements to this Regulation related to the "driver" or "manual operation", assume that no "ADS feature" is active.

6.10.9.2. The references to ADS features are only applicable whilst an ADS feature is active."

Paragraph 9.3.2., amend to read:

"9.3.2. When the conformity of a vehicle, component or ESA taken from the series is being verified, production shall be deemed to conform to the requirements of this Regulation in relation to immunity to electromagnetic radiation if the vehicle ESA does not exhibit any degradation relating to the direct control of the vehicle **by the ADS or** which could be observed by the driver or other road user when the vehicle is in the state defined in Annex 6, Paragraph 4., and is subjected to a field strength, expressed in V/m, up to 80% of the reference limits prescribed in Paragraph 6.4.2.1., and, if applicable, Paragraph 7.7.2.1. for vehicles and Paragraph 6.8.2.1. and, if applicable, Paragraph 7.18.2.1. for ESAs above."

Annex 2A, add new items 74. to 76., to read:

"74. Automated Driving System (ADS):
yes/no/optional[1]……

75. For vehicles with an ADS, description of system operation (including any electronic parts)
……..

76. A driver's seat is fitted:
yes/no/optional[1]……

The driver's seat is the front seat nearest to the opposing traffic:
yes/no[1]……...

If not, the position is to be specified:
……."

Annex 6, paragraph 2.1.1.2., amend to read:

"2.1.1.2. Basic Vehicle Conditions

The Paragraph defines minimum test conditions (as far as applicable) and failure criteria for vehicle immunity tests. Other vehicle systems, which can affect immunity related functions, shall be tested in a way to be agreed between manufacturer and Technical Service.

"50 km/h mode" vehicle test conditions	*Failure criteria*
Vehicle speed 50 km/h (respectively 25 km/h for L_1, L_2 vehicles) ±20 per cent (vehicle driving the rollers). If the vehicle is equipped with a cruise control system, it shall be used to maintain the required constant vehicle speed and maintained without any deactivation.	Speed variation greater than ±10 per cent of the nominal speed. In case of automatic gearbox: change of gear ratio inducing a speed variation greater than ±10 per cent of the nominal speed.
Dipped beams ON (manual mode)	Lighting OFF (front light and rear light)
Specific warning (e.g Rotating/flashing light, signaling bar, siren…) ON	Specific warning OFF
Cluster operate in normal mode	Unexpected warning Inconsistent variation of the odometer
Rear view system	Unexpected movement of rear view mirror Loss or freezing of the display (CMS)
Front wiper ON (manual mode) maximum speed	Complete stop of front wiper
Direction indicator on ~~driver's~~ **the** side **nearest to the opposing traffic** ON	Frequency change (lower than 0.75 Hz or greater than 2.25 Hz). Duty cycle change (lower than 25 per cent or greater than 75 per cent).
Adjustable suspension in normal position	Unexpected significant variation
Driver's seat **(if fitted)** and steering wheel **(if fitted)** in medium position	Unexpected variation greater than 10 per cent of total range
Alarm unset	Unexpected activation of alarm
Horn OFF	Unexpected activation of horn
Airbag and safety restraint systems operational with inhibited passenger airbag if this function exists	Unexpected activation
Automatic doors closed	Unexpected opening
Adjustable endurance brake lever in normal position	Unexpected activation

"50 km/h mode" vehicle test conditions	*Failure criteria*
Brake pedal not depressed	Unexpected activation of brake and unexpected activation of stop lights
ADS shall be operational **but without ADS feature(s) activated** ~~(1)~~	ADS does not remain in a failure safe mode or expected failure operational mode
[ADS feature activated]	**[Unexpected behaviour]**
~~(1): ADS are turned on by the driver but some or all ADS functions may revert to a mode where system is monitoring sensors but is not actively 'driving' the vehicle due to plausibility issues caused by the EMC laboratory environment.~~	

"Brake mode" vehicle test conditions	*Failure criteria*
Vehicle in a state that allows the braking system to operate normally, parking brake released, vehicle speed 0 km/h. Brake pedal depressed to activate the brake function and the stop lights without any dynamic cycle.	Stop lights inactivated during mode Brake warning light ON with loss of brake function.
Day running light (DRL) ON	DRL inactivated during mode
ADS shall be operational **but without ADS feature(s) activated** ~~(1)~~	ADS does not remain in a failure safe mode or expected failure operational mode
[ADS feature activated and braking initiated by the ADS]	**[Unexpected behaviour]**
~~(1): ADS are turned on by the driver but some or all ADS functions may revert to a mode where system is monitoring sensors but is not actively 'driving' the vehicle due to plausibility issues caused by the EMC laboratory environment.~~	

…"

Paragraph 2.1.1.3., amend to read:

"2.1.1.3. All equipment which can be switched on permanently by the driver**,** ~~or~~ passenger**, or ADS feature,** ~~should~~**shall** be in normal operation."

Paragraph 2.1.1.4., amend to read:

"2.1.1.4. All other systems which affect the driver's **or ADS feature's** control of the vehicle shall be (on) as in normal operation of the vehicle.

[In case of a conflict between the functioning of ADS sensors in the EMC (laboratory) test environment, the manufacturer, in agreement with the Type Approval Authority and Technical Service, shall propose alternative methods and/or subtests, to make sure the ADS feature(s) are tested as they operate on the road, and comply with the provisions of this Regulation.]"

Paragraph 2.2.1.3., amend to read:

"2.2.1.3. All other equipment which can be switched ON by the driver**,** ~~or~~ passenger~~s~~**, or ADS feature** shall be OFF."

II. Justification

1. This proposal is a result of a small group working on the fitness of ADS into 07 series of amendments to UN Regulation No.10.

2. IWG EMC has still to validate few items in square brackets.

3. An informal document will be submitted prior to GRE April session to amend this this working document.