

Proposal for supplement 2 to the 05 series of amendments to UN Regulation No. 94 (Frontal collision protection)

The text reproduced below was prepared by the expert from Germany on behalf of the TF GRSP AVRS, to enable the application of the regulation to vehicles equipped with an ADS [feature type 2]. The modifications to the existing text of the UN Regulation are marked in bold for new or strikethrough for deleted characters.

I. Proposal

Title, amend to read:

Uniform provisions concerning the approval of vehicles with regard to the protection of the occupants, **fuel system integrity and protection against electrical shock** in the event of a frontal collision

Insert a new paragraph 0, to read:

“0. Introduction

0.1. For supplement 2 to the 05 series of amendments:

0.1.1. The Regulation is amended to account for vehicles of category X. [Vehicles of category Y are not in the scope of this Regulation as their crash performance is subject to UN Regulation N° 1XX.]

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

0.1.3. In case of vehicles with an ADS where those vehicles are also equipped with a manual driving mode operating at a speed of more than 6 km/h it is expected that in the manual driving mode the technical requirements can be applied as they would for a conventional vehicle. In a mode where an ADS feature is active the relevant ADS requirements have to be fulfilled.”

Paragraph 1., amend to read:

“1. Scope

This Regulation applies to vehicles of category M₁¹ of a total permissible mass not exceeding 3,500 kg and to vehicles of category N₁ of a total permissible mass not exceeding 2,500 kg; other vehicles may be approved at the request of the manufacturer. **[This regulation does not apply to vehicles of category Y.]”**

Paragraph 1., footnote 1, amend to read:

“¹ As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.78, para. 2 - <https://unece.org/transport/vehicle-regulations/wp29/resolutions>”

Paragraph 2.3., amend to read:

“2.3. "Vehicle width" means the distance between two planes parallel to the longitudinal median plane (of the vehicle) and touching the vehicle on either side of the said plane but excluding the external devices for indirect vision, side marker lamps, tyre pressure indicators, direction indicator lamps, position

lamps, **sensors for Advanced Driver Assistance Systems, sensors for Automated Driving Systems**, flexible mud-guards and the deflected part of the tyre side-walls immediately above the point of contact with the ground.”

Paragraph 2.6. (b), amend to read:

- “(b) The structure, dimensions, lines and materials of the part of the vehicle forward of the transverse plane through the "R" point of the driver's seat; **for vehicles of category X, the "R" point of the most forward passenger seat shall be taken instead of the R-point of the driver's seat.**”

Paragraph 3.1., amend to read:

- “3.1. The application for approval of a vehicle type with regard to the protection of the occupants of the front seats in the event of a frontal collision (offset deformable barrier test), **with regard to the fuel system integrity and with regard to the protection against electrical shock** shall be submitted by the vehicle manufacturer or by his duly accredited representative.”

Paragraph 5.2., amend to read:

- “5.2. Specifications

The test of the vehicle carried out in accordance with the method described in Annex 3 shall be considered satisfactory if all the conditions set out in paragraphs 5.2.1. to 5.2.7. below are all satisfied at the same time.

Additionally, vehicles equipped with electric power train shall meet the requirements of paragraph 5.2.8. below. This can be met by a separate impact test at the request of the manufacturer and after validation by the Technical Service, provided that the electrical components do not influence the occupant protection performance of the vehicle type as defined in paragraphs 5.2.1. to 5.2.5. of this Regulation. In case of this condition the requirements of paragraph 5.2.8. shall be checked in accordance with the methods set out in Annex 3 to this Regulation, except paragraphs, 2., 5. and 6. of Annex 3. But a dummy corresponding to the specifications for Hybrid III (see footnote 1 of Annex 3) fitted with a 45° angle and meeting the specifications for its adjustment shall be installed in each of the front outboard seats.

[For vehicles of category Y, only the applicable provisions of paragraphs 5.2.6. to 5.2.8. shall apply].”

Paragraph 5.2.2., amend to read:

- “5.2.2. Following the test the residual steering wheel displacement, when measured at the centre of the steering wheel hub, shall not exceed 80 mm in the upwards vertical direction and 100 mm in the rearward horizontal direction.

This paragraph does not apply to vehicles without manual driving controls inside the vehicle.”

Paragraph 5.2.3.1., amend to read:

- “5.2.3.1. In the case of automatically activated door locking systems which are installed optionally and/or which can be de-activated ~~by the driver~~, this requirement shall be verified by using one of the following two test procedures, at the choice of the manufacturer:”

Paragraph 5.2.4.2., amend to read:

- “5.2.4.2. In the case of vehicles equipped with automatically activated door locking systems which are installed optionally and/or which can be de-activated ~~by the driver~~, this requirement shall be verified by using one of the following two test procedures, at the choice of the manufacturer:”

[Insert new paragraph 5.2.9., to read:

- “5.2.9. Insert compatibility criterion for category Y vehicles.”]**

Paragraph 5.3.1., amend to read:

“5.3.1. Vehicles of category M₁ of a total permissible mass exceeding 2,500 kg that are based on vehicle types of category N₁ of a total permissible mass exceeding 2,500 kg are deemed to meet the requirements of paragraph 5. where the requirements of UN Regulation No. 137 are fully complied with and at least one of the following conditions is met:

- (a) The acute angle alpha (α), measured between a horizontal plane passing through the centre of the front axle and an angular transverse plane passing through the centre of the front axle and the R-point of the driver's seat (see Figure 4 below), is more than 22°;
- (b) Or the ratio between the distance from the driver's R-point to the centre of the rear axle (L101-L114) and the centre of the front axle and the driver's R-point (L114) is more than 1.30 (see Figure 4 below).

For vehicles of category X, the "R" point of the most forward passenger seat shall be taken instead of the R-point of the driver's seat.

This shall be verified by the Technical Service and subject to the decision of the Type Approval Authority, as well as stated under point 8.2. on the approval communication of Annex 1.”

Paragraph 5.3.2., amend to read:

“5.3.2. Vehicles of category N₁ of a total permissible mass exceeding 2,250 kg but not exceeding 2,500 kg are deemed to meet the requirements of paragraph 5, where their structural basis is a ladder frame and the requirements of UN Regulation No. 137 are fully complied with and at least one of the following conditions is met:

- (a) The acute angle alpha (α), measured between a horizontal plane passing through the centre of the front axle and an angular transverse plane passing through the centre of the front axle and the R-point of the driver's seat (see Figure 4 below), is more than 22°;
- (b) Or the ratio between the distance from the driver's R-point to the centre of the rear axle (L101-L114) and the centre of the front axle and the driver's R-point (L114) is more than 1.30 (see Figure 4 below).

For vehicles of category X, the "R" point of the most forward passenger seat shall be taken instead of the R-point of the driver's seat.

This shall be verified by the Technical Service and subject to the decision of the Type Approval Authority, as well as stated under point 8.2. on the approval communication of Annex 1.”

Paragraph 6.1., amend to read:

“6.1. For a vehicle fitted with airbag assemblies intended to protect ~~the driver and occupants other than the driver~~, compliance with paragraphs 8.1.8. to 8.1.9. of [UN Regulation No. 16 as amended by the 08 series of amendments] shall be demonstrated as from 1 September 2020 for new vehicle types. Before this date the relevant requirements of the preceding series of amendments apply.”

Annex 1, amend to read:

“...

Concerning ² :	Approval granted
	Approval extended
	Approval refused
	Approval withdrawn
	Production definitively discontinued

of a vehicle type with regard to the protection of the occupants, **fuel system integrity and protection against electrical shock** in the event of a frontal collision, pursuant to Regulation No. 94

...”

[Annex 1, insert new paragraph 5.4. to read:

“5.4. Vehicle equipped with an ADS: Yes/No”]

Annex 2, model A, paragraph under the figure, amend to read:

“ The above approval mark affixed to a vehicle shows that the vehicle type concerned has, with regard to the protection of the occupants, **fuel system integrity and protection against electrical shock** in the event of a frontal collision, been approved in the Netherlands (E 4) pursuant to UN Regulation No. 94 under approval number 051424. The approval number indicates that the approval was granted in accordance with the requirements of UN Regulation No. 94 as amended by the 05 series of amendments.”

Annex 3, paragraph 1.3., amend to read:

“1.3. Orientation of the barrier

The orientation of the barrier is such that the first contact of the vehicle with the barrier is on the steering-column side. Where there is a choice between carrying out the test with a right-hand or left-hand drive vehicle, the test shall be carried out with the less favourable hand of drive as determined by the Technical Service responsible for the tests.

~~For vehicles of category M1X and N1X [and N1Y], the orientation of the barrier shall be determined by the Technical Service.~~

In case of vehicles of category M1X and N1X [and N1Y], the manufacturer shall propose the tested side. The manufacturer shall provide to the Technical Service information regarding the compatibility of performances in comparison with the proposed side in comparison with the opposite side. The Technical Service, if concerned as to the construction of the vehicle, will decide to have the test performed on the side considered to be the least favourable.”

Annex 3, paragraph 1.4.3.5.2., amend to read:

“1.4.3.5.2. In the case of vehicles equipped with an automatically activated door locking system that is installed optionally and/or which can be de-activated by the driver, one of the following two procedures shall be used at the choice of the manufacturer:”

Annex 5, paragraph 1.2.2., amend to read:

“1.2.2. Outer passenger

The plane of symmetry of the dummy shall be symmetrical with that of the driver dummy relative to the longitudinal median plane of the vehicle. **In the absence of a driver dummy, the plane of symmetry of the dummy shall be symmetrical with that of the other passenger dummy relative to the longitudinal median plane of the vehicle.** If the seating position is determined by the shape of the bench, such seat shall be regarded as a separate seat.”

Annex 5, paragraph 2.4.1., amend to read:

“2.4.1. In vehicles equipped with bench seats, the upper torso of the driver and passenger test dummies shall rest against the seat back. The midsagittal plane of the driver dummy shall be vertical and parallel to the vehicle's longitudinal centreline, and pass through the centre of the steering wheel rim. The midsagittal plane of the passenger dummy shall be vertical and parallel to the vehicle's longitudinal centreline and the same distance from the vehicle's longitudinal centreline as the midsagittal plane of the driver dummy. In the

absence of a driver's seat, the midsagittal plane of the passenger dummies shall be vertical and parallel to the vehicle's longitudinal centreline using the Y-coordinate of the R-point as defined by the manufacturer."

Annex 5, paragraph 2.4.2., amend to read:

"2.4.2. In vehicles equipped with individual seats, the upper torso of the driver and passenger test dummies shall rest against the seat back. The midsagittal plane of the driver and the passenger dummy shall be vertical and shall coincide with the longitudinal centreline of the individual seat. **In the absence of a driver's seat, the midsagittal plane of the passenger dummies shall be vertical and coincide with the longitudinal centreline of the individual seat.**"

II. Justification

See paragraph 0. in the proposal.
