United Nations ECE/TRANS/WP.29/2025/29

Economic and Social Council

Distr.: General
23 December 2024

Original: English

Economic Commission for Europe

Inland Transport Committee

World Forum for Harmonization of Vehicle Regulations

195th session
Geneva, 4–7 March 2025
Item 4.9.4 of the provisional agenda
1958 Agreement:
Consideration of draft amendments to existing UN Regulations submitted by GRPE

Proposal for Supplement 1 to UN Regulations No. 168 (Global Real Driving Emissions (Global RDE))

Submitted by the Working Party on Pollution and Energy*

The text reproduced below was adopted by the Working Party on Pollution and Energy (GRPE) at its ninety-first session (ECE/TRANS/WP.29/GRPE/91, para. 30.). It is based on ECE/TRANS/WP.29/GRPE/2024/20, GRPE-91-09-Rev.1 and GRPE-91-15-Rev.1 as amended by Annex IV of the session report. It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee (AC.1) for consideration at their March 2025 sessions.

* In accordance with the programme of work of the Inland Transport Committee for 2025 as outlined in proposed programme budget for 2025 (A/79/6 (Sect. 20), table 20.6), 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.

Paragraph 5.2.1. the explanation for Section 2, amend to read:

"The number of this UN Regulation, followed by the letter 'R', successively followed by:"

Paragraph 5.2.2., amend to read:

"5.2.2. Example of an Approval Number to this Regulation:

E11*168R01/02*0123*01

The first extension of the Approval numbered 0123, issued by the United Kingdom to Supplement 2 to Series of Amendments 01."

Paragraph 6.1., amend to read:

"6.1. Compliance requirements

For vehicle types approved according to this Regulation, the final emissions at any possible RDE test performed in accordance with the requirements of this Regulation, shall be calculated for evaluation with a 4-phase WLTC and for vehicles with a diesel engine additionally with a 3-phase WLTC.

Requirements for evaluation with 4 Phase WLTC	*Requirements for evaluation with 3 Phase WLTC*
The final emissions for the 4-phase analysis shall not be higher than any of the limits for the relevant criteria emissions (i.e. NO_X and PN) found in Table 1A of paragraph 6.3.10. of the 03 series of Amendments to UN Regulation No. 154 on WLTP.	The final emissions for the 3-phase analysis shall not be higher than the NO_X limits found in Table 1B of paragraph 6.3.10. of the 03 series of Amendments to UN Regulation No. 154 on WLTP.

The requirements of emission limits shall be fulfilled for the urban operation and the complete PEMS trip.

The RDE tests required by this Regulation provide a presumption of conformity. The presumed conformity may be reassessed by additional RDE tests.

The manufacturer shall ensure that all vehicles within the PEMS test family are compliant with UN Regulation No. 154 on WLTP, including conformity of production requirements.

The RDE performance shall be demonstrated by performing the necessary tests in the PEMS test family on the road operated over their normal driving patterns, conditions and payloads. The necessary tests shall be representative for vehicles operated on their real driving routes, with their normal load."

Paragraph 6.4.1.2., amend to read:

"6.4.1.2. The authority shall select additional vehicles according to the requirements of paragraph 6.4.3. for PEMS testing carried out by a Technical Service to demonstrate compliance of the selected vehicles with the requirements of this Regulation. The technical criteria for selection of an additional vehicle according to paragraph 6.4.3. shall be recorded with the test results."

Paragraph 6.4.1.3., amend to read:

"6.4.1.3. With agreement of the authority, a PEMS test can also be driven by a different operator witnessed by a Technical Service, provided that at least the tests of the vehicles required by paragraphs 6.4.3.2. and 6.4.3.6. and in total at least 50 per cent of the PEMS tests required by paragraph 6.4.3.7. for validating the PEMS test family are driven by a Technical Service. In such case the Technical Service remains responsible for the proper execution of all PEMS tests pursuant to the requirements of this Regulation."

Paragraph 9.2., amend to read:

"9.2. Required distance shares of trip speed bins

The following is the distribution of the speed bins in an RDE trip that are required for respecting the needs of evaluation for both the 4-phase WLTC and where applicable the 3-phase WLTC:

Requirements for evaluation with 4-Phase WLTC	*Requirements for evaluation with 3-Phase WLTC*
The trip shall consist of approximately 34 per cent urban, 33 per cent rural and 33 per cent motorway speed bins. ‘Approximately’ shall mean the interval of ±10 per cent points around the stated percentages. The urban speed bin shall however never be less than 29 per cent of the total trip distance.	The trip shall consist of approximately 55 per cent urban and 45 per cent expressway speed bins. ‘Approximately’ shall mean the interval of ±10 per cent points around the stated percentages. The urban speed bin however can be lower than 45 per cent but never be less than 40 per cent of the total trip distance.

The shares of urban, rural and motorway speed bins shall be expressed as a percentage of the total trip distance for analysis with 4-Phase WLTC.

Where applicable, the shares of urban and expressway speed bins shall be expressed as a percentage of the trip distance with speed not exceeding 100 km/h for analysis with 3-Phase WLTC.

The minimum distance of each, urban, rural and motorway or expressway speed bins shall be 16 km."

Paragraph 9.3., amend to read:

"9.3. RDE test to be performed

The RDE performance shall be demonstrated by testing vehicles on the road, operated over their normal driving patterns, conditions and payloads. RDE tests shall be conducted on paved roads (e.g. off-road operation is not permitted). For vehicles with a diesel engine, a single RDE trip or two dedicated RDE trips shall be driven in order to prove compliance with the emission requirements against both 3-Phase WLTC and 4-Phase WLTC."

Paragraph 10.7.1., amend to read:

"10.7.1. For vehicles with a diesel engine, in the case that a single RDE trip is not capable of complying with all validity requirements described in paragraphs 9.1.1., 9.2. and 9.3., paragraphs 4.5.1. and 4.5.2. of Annex 8 and paragraph 4. of Annex 9 simultaneously, then a second RDE trip shall be done. The second trip shall be designed to meet either the 3-phase or 4-phase WLTC trip requirements not yet satisfied, as well as all other relevant trip validity requirements, but it is not necessary to satisfy again the 4-phase or 3-phase WLTC trip requirements previously met by the first trip."

Paragraph 10.7.2., amend to read:

"10.7.2. For vehicles with a diesel engine, in case the emission calculated for the 3-phase RDE trip exceed the emission limits for the total trip due to the exclusion of all data points with speed above 100 km/h even though the trip is compliant, then a second trip with the speed limited to less than or equal to 100 km/h shall be made and evaluated for compliance with the 3-phase requirements."

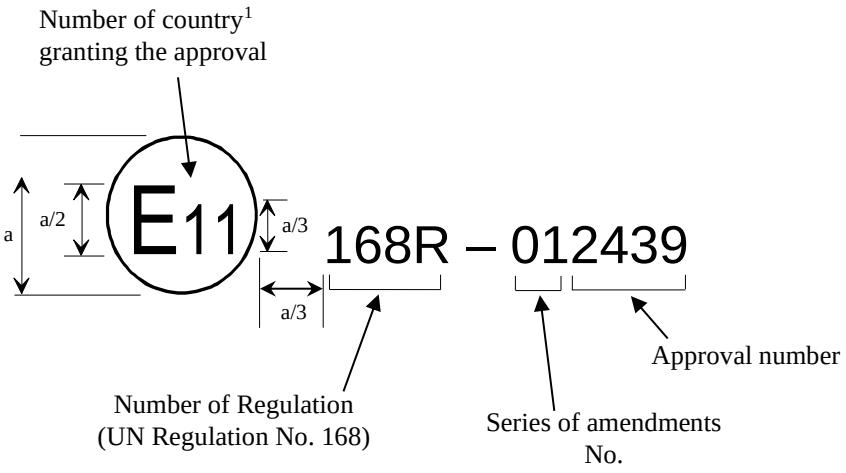
Annex 3, amend to read:

“This annex outlines the appearance of this mark and gives an example how it shall be composed.

The following schematic graphic presents the general lay-out, proportions and contents of the marking. The meaning of numbers and alphabetical character are identified, and sources to determine the corresponding alternatives for each approval case are also referred."

The first graphic in Annex 3, amend to read:

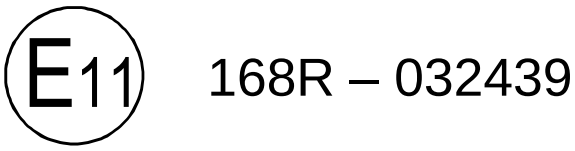
"



a = 8 mm (minimum) "

Paragraph after the 2nd graphic of Annex 3, add to read:

"The following graphic is a practical example of how the marking should be composed.



The preceding approval mark affixed to a vehicle in conformity with paragraph 5. of this Regulation shows that the vehicle type concerned has been approved in the United Kingdom (E 11), pursuant to UN Regulation No. 168 under approval number 2439, as defined in Section 3 of paragraph 5.2.1. This mark indicates that the approval was given in accordance with the requirements of this Regulation with the 03 series of amendments incorporated."

Annex 4, Paragraph 6.1., amend to read:

6.1. Checking the analysers for measuring gaseous emissions

The zero and span of the analysers of gaseous components shall be checked by using calibration gases identical to the ones applied under paragraph 4.5. to evaluate the analyser's zero and response drift compared to the pre-test calibration. It is permissible to zero the analyser prior to verifying the span drift, if the zero drift was determined to be within the permissible range. The post-test drift check shall be completed as soon as possible after the test and before the PEMS, or individual analysers or sensors, are turned off or have switched into a non-operating mode. The difference between the pre-test and post-test results shall comply with the requirements specified in Table A4/2.

Table A4/2
Permissible analyser drift over a PEMS test

Pollutant	*Absolute Zero response drift*	*Absolute Span response drift*[1]
CO_2	≤ 2000 ppm per test	≤ 2 % of reading or ≤ 2000 ppm per test, whichever is larger
CO	≤ 75 ppm per test	≤ 2 % of reading or ≤ 75 ppm per test, whichever is larger
NO_X	≤ 3 ppm per test	≤ 2 % of reading or ≤ 3 ppm per test, whichever is larger
CH_4	≤ 10 ppm C_1 per test	≤ 2 % of reading or ≤ 10 ppm C_1 per test, whichever is larger
THC	≤ 10 ppm C_1 per test	≤ 2 % of reading or ≤ 10 ppm C_1 per test, whichever is larger

If the difference between the pre-test and post-test results for the zero and span drift is higher than permitted, all test results shall be invalid and the test repeated.

At the request of the manufacturer and with approval of the approval authority, the permissible drifts may be exceeded if:

(i) the difference between the uncorrected and the corrected concentration values according to paragraph 5.0. of Annex 7 are lower than 6 per cent of the uncorrected concentration values, and

(ii) the uncorrected and the corrected emissions values give the same conclusion as to whether or not there is an exceedance of the emissions limits.

Annex 8, paragraph 1., amend to read:

"1. Introduction

The Moving Averaging Window method shall be used to assess the overall trip dynamics. The test is divided in sub-sections (windows) and the subsequent analysis aims at determining whether the trip is valid for RDE purposes. The 'normality' of the windows shall be assessed by comparing their CO2 distance-specific emissions with a reference curve obtained from the vehicle CO2 emissions measured in accordance with the WLTP test.

For compliance with this Regulation, the method shall be applied using the 4-phase and where applicable the 3-phase WLTC requirements."

Annex 10, paragraph 4.3.3., amend to read:

"4.3.3. Calculation of the final result

The positive cumulative elevation gain of a total trip shall be calculated by integrating all positive interpolated and smoothed road grades, i.e., $road_{grade,2}(d)$. The result should be normalized by the total test distance d_{tot} and expressed in meters of cumulative elevation gain per one hundred kilometres of distance.

[1] If the zero drift is within the permissible range, it is permissible to zero the analyser prior to verifying the span drift.

The waypoint vehicle speed v_w shall then be calculated over each discrete way point of 1m:

$$v_w = \frac{1}{(t_{w,i} - t_{w,i-1})}$$

Where applicable for 3-phase WLTP evaluation all datasets with $v_w \leq 100$ km/h are used for the calculation of the cumulative positive altitude gain of the complete trip.

All of the positive … "

Annex 11, paragraph 1., amend to read:

"1. Introduction

This annex describes the procedure to calculate the final criteria emissions for the complete and urban part of an RDE trip for the 4-phase and where applicable the 3-phase WLTP."

Annex 11, paragraph 3., amend to read:

"3. Calculation of the Intermediate RDE emissions results

…

$RF_{L1} = 1.30$ and $RF_{L2} = 1.50$;

The RDE result evaluation factors RF_k (k=t=total, k=u=urban) shall be obtained using the functions laid down in paragraph 3.1. for vehicles with ICE and NOVC-HEV, and in paragraph 3.2. for OVC-HEV. A graphical illustration of the method is provided in Figure A11/1 below, while the mathematical formulas are found in Table A11/1:

… "