Economic Commission for Europe

Inland Transport Committee

World Forum for Harmonization of Vehicle Regulations

Working Party on Pollution and Energy

Eighty-seventh session
Geneva, 10-13 January 2023
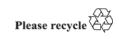Item 4 (a) of the provisional agenda
**Heavy duty vehicles: UN Regulations Nos. 49
(Emissions of compression ignition and positive
ignition (LPG and CNG) engines) and 132
(Retrofit Emissions Control devices (REC))**

Proposal for new Supplements to the 06 and 07 series of amendments to UN Regulation No. 49 (Emissions of compression ignition and positive ignition (LPG and CNG) engines)

Submitted by the experts from Australia and the European Commission*

The text reproduced below was prepared by the experts from Australia and the European Commission to correct drafting errors within the 06 and 07 series of amendments to UN Regulation No. 49. The modifications to the current text of the Regulation are marked in bold for new or strikethrough for deleted characters.

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* In accordance with the programme of work of the Inland Transport Committee for 2023 as outlined in proposed programme budget for 2023 (A/77/6 (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.

I. Proposal

06 and 07 series of amendments, Annex 4, paragraph 8.1.3., amend to read:

"8.1.3.   Diluent

$$k_{w,d} = (1 - k_{w3}) \times 1{,}008 \tag{21}$$

With

$$k_{\cancel{w2}\textbf{w3}} = \frac{1{,}608 \times H_d}{1000 + (1{,}608 \times H_d)} \tag{22}$$

Where:

H_d is the diluent humidity, g water per kg dry air"

06 and 07 series of amendments, Annex 4, paragraph 8.6.3., amend to read:

"8.6.3.   Calculation of the specific emissions

The specific emissions e_{gas} or e_{PM} (g/kWh) shall be calculated for each individual component in the following ways depending on the type of test cycle.

For the WHSC, hot WHTC, or cold WHTC, the following equation shall be applied:

$$e = \frac{m}{W_{act}} \tag{69}$$

$$\cancel{e = \frac{(0{,}14 \times m_{cold}) + (0{,}86 \times m_{hot})}{(0{,}14 \times W_{act,cold}) + (0{,}86 \times W_{act,hot})}} \tag{70}$$

Where:

m is the mass emission of the component, g/test

W_{act} is the actual cycle work as determined according to paragraph 7.8.6., kWh

For the WHTC, the final test result shall be a weighted average from cold start test and hot start test according to the following equation:

$$e = \frac{(0{,}14 \times m_{cold}) + (0{,}86 \times m_{hot})}{(0{,}14 \times W_{act,cold}) + (0{,}86 \times W_{act,hot})} \tag{70}$$

Where:

m_{cold} is the mass emission of the component on the cold start test, g/test

m_{hot} is the mass emission of the component on the hot start test, g/test

$W_{act,cold}$ is the actual cycle work on the cold start test, kWh

$W_{act,hot}$ is the actual cycle work on the hot start test, kWh

If periodic regeneration in accordance with paragraph 6.6.2. applies, the regeneration adjustment factors $k_{r,u}$ or $k_{r,d}$ shall be multiplied with or be added to, respectively, the specific emissions result e as determined in equations 69 and 70."

II. Justification

1.   Paragraph 8.1.3. – To correct an error introduced in Supplement 1 to the 06 series of amendments. Equation 21 refers to k_{w3}, but equation 22, which is intended to feed into equation 21, refers to k_{w2} in error. It has therefore been updated to refer to k_{w3}.

2.	Paragraph 8.6.3. – To correct an error introduced in the 06 series of amendments. Equation 70 is the formula for calculating the weighted average from the cold and hot start WHTC tests and therefore needs to be moved down to text to appear after the text "*For the WHTC, the final test result shall be a weighted average from cold start test and hot start test according to the following equation:*". This aligns with the structure of the text in the 05 series of amendments.