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**Economic Commission for Europe****Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****172nd session**

Geneva, 20-23 June 2017

Item 4.7.3 of the provisional agenda

**1958 Agreement: Consideration of draft amendments  
to existing Regulations submitted by GRPE****Proposal for Supplement 1 to the original version of  
Regulation No. 143 (Heavy Duty Dual-Fuel Engine Retrofit  
Systems (HDDF-ERS))****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 seventy-fourth session (ECE/TRANS/WP.29/GRPE/74, para. 39). It is based on ECE/TRANS/WP.29/GRPE/2017/4 amended by GRPE-74-25 as reproduced in Annex VI to the 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 June 2017 sessions.

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\* In accordance with the programme of work of the Inland Transport Committee for 2016–2017 (ECE/TRANS/254, para. 159 and ECE/TRANS/2016/28/Add.1, cluster 3.1), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

GE.17-05465(E)



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## Supplement 1 to the original version of Regulation No. 143 (Heavy Duty Dual-Fuel Engine Retrofit Systems (HDDF-ERS))

*Annex 6,*

*Paragraph 10.1., amend to read:*

"10.1. Tests and requirements

An engine representative of the desired extension of the application range shall be tested in accordance with the provisions set out in paragraph 5.2.2. or 10.1.1. at the choice of the dual-fuel engine retrofit system manufacturer. Engine tests in accordance with paragraph 5.2.2. are always required for the extension of an application range with an engine family equipped with EGR.

The tests in accordance with paragraph 10.1.1. shall be carried out on a representative engine equipped with a member of the dual-fuel engine retrofit system family.

The same tests shall be performed in diesel mode and in dual-fuel mode in such a way that the operating points and conditions are as similar as possible.

The NO<sub>x</sub>, Non-Methane Hydrocarbons (NMHC), CO and PM emission test results in dual-fuel mode shall be lower than or equal to the results in diesel mode.

Alternatively, at the request of the engine retrofit system manufacturer, the following provisions apply:

- (a) As for Non-Methane Hydrocarbons (NMHC) and CO emissions only, the CO<sub>2</sub> specific emission results of the test in accordance with paragraph 10.1.1.1. in dual-fuel mode shall not exceed the applicable Regulation No. 49 original emission limits transposed into CO<sub>2</sub> specific emission limits with the following equation:

$$\text{CO}_2 \text{ specific emission limit} = 1.6 \times 1.5 \times \text{brake specific emission limit}$$

Where:

CO<sub>2</sub> specific emission limit is the equivalent limit expressed in [g/kgCO<sub>2</sub>]

1.6 is the conversion factor from brake specific to CO<sub>2</sub> specific emissions

1.5 is the Conformity Factor

brake specific emission limit is the applicable Regulation No. 49 original emission limit expressed in [g/kWh]

- (b) The NO<sub>x</sub> and PM emission test results in dual-fuel mode shall be lower than or equal to the results in diesel mode."