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## Economic Commission for Europe

### Inland Transport Committee

### World Forum for Harmonization of Vehicle Regulations

#### 169<sup>th</sup> session

Geneva, 21-24 June 2016

Item 4.7.2 of the provisional agenda

**1958 Agreement – Consideration of draft amendments  
to existing Regulations submitted by GRPE**

### **Proposal for Supplement 4 to the 06 series of amendments to Regulation No. 49 (Emissions of compression ignition and positive ignition (LPG and CNG) engines)**

#### **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-second session (ECE/TRANS/WP.29/GRPE/72, paras. 42, 44 and 46). It is based on ECE/TRANS/WP.29/GRPE/2016/6, ECE/TRANS/WP.29/GRPE/2016/7 amended by GRPE-72-11 as reproduced in Annex IV of the report, and ECE/TRANS/WP.29/GRPE/2016/8 amended by GRPE-72-04 as reproduced in Annex V of 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 2016 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.

## Supplement 4 to the 06 series of amendments to Regulation No. 49 (Emissions of compression ignition and positive ignition (LPG and CNG) engines)

Annex 4, paragraphs 9.2.1. and 9.2.1.1., amend to read:

"9.2.1. Linearity verification

9.2.1.1. Introduction

A linearity verification shall be performed for each measurement system listed in Table 7. At least 10 reference values, or as specified otherwise, shall be introduced to the measurement system. For stand-alone pressure and temperature linearity verifications, at least three reference values shall be selected. The measured values shall be compared to the reference values by using a least squares linear regression in accordance with equation 11 in paragraph 7.8.7. The maximum limits in Table 7 refer to the maximum values expected during testing."

Annex 9A, paragraph 2.3.1., amend to read:

"2.3.1. Malfunctioning injectors

As an alternative to the monitor specified in line (d) of the table in item 7 of Appendix 3 to Annex 9B to this Regulation, the manufacturer may opt for compliance with the provisions specified in paragraphs 2.3.1.1. to 2.3.1.2.1. of this annex."

Annex 9B, Appendix 3, Item 7, amend to read:

"Fuel System monitoring

The OBD system shall monitor the following elements of the fuel system on engines so-equipped for proper operation:

	<i>Diesel</i>	<i>Gas</i>
(a) Fuel system pressure control: fuel system ability to achieve the commanded fuel pressure in closed loop control - performance monitoring.	X	
(b) Fuel system pressure control: fuel system ability to achieve the commanded fuel pressure in closed loop control in the case where the system is so constructed that the pressure can be controlled independently of other parameters - performance monitoring.	X	
(c) Fuel injection timing: fuel system ability to achieve the commanded fuel timing for at least one of the injection events when the engine is equipped with the appropriate sensors - performance monitoring.	X	
(d) Fuel injection quantity: fuel system ability to achieve the commanded fuel quantity by detecting errors from desired fuel quantity in at least one of the injection events when the engine is equipped with the appropriate sensors (e.g. in pre- main- or post-injection) – emission threshold monitoring.	X	

	<i>Diesel</i>	<i>Gas</i>
(e) Fuel injection system: ability to maintain the desired air-fuel ratio (incl. but not limited to self-adaptation features) – performance monitoring.		X

"

Annex 10, paragraph 11., amend to read:

"11. Documentation

The Type Approval Authority shall require that the manufacturer provides a documentation package. This should describe any element of design and emission control strategy of the engine system and the means by which it controls its output variables, whether that control is direct or indirect.

The information shall include a full description of the emission control strategy. In addition, this shall include information on the operation of all AES and BES, including a description of the parameters that are modified by any AES and the boundary conditions under which the AES operate, and indication of which AES and BES are likely to be active under the conditions of the test procedures in this annex.

This information shall be made available in the "extended documentation package" according to the documentation requirements specified in paragraph 5.1.4."

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