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### Economic Commission for Europe

#### Inland Transport Committee

#### World Forum for Harmonization of Vehicle Regulations

##### 161<sup>st</sup> session

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Item 4.9.5. of the provisional agenda

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

### **Proposal for Supplement 6 to Regulation No. 115 (LPG and CNG retrofit systems)**

#### **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 sixty-sixth session (ECE/TRANS/WP.29/GRPE/66, para. 43.). It is based on GRPE-66-19, as reproduced in Annex IV of the report (ECE/TRANS/WP.29/GRPE/66). It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee AC.1 for consideration.

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\* In accordance with the programme of work of the Inland Transport Committee for 2010–2014 (ECE/TRANS/208, para. 106 and ECE/TRANS/2010/8, programme activity 02.4), 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.

*Annex 6A, paragraph 2, amend to read:*

"2. Calculation of the LPG energy ratio

The fuel consumption value shall be calculated from the emissions of hydrocarbons, carbon monoxide, and carbon dioxide determined from the measurement results assuming that only LPG is burned during the test.

The LPG ratio of the energy consumed in the cycle is then determined as follows:

$$G_{LPG} = M_{LPG} * 10000 / (FC_{norm} * dist * d)$$

Where:

$G_{LPG}$ : the LPG energy ratio (%);

$M_{LPG}$ : the LPG mass consumed during the cycle (kg);

$FC_{norm}$ : the fuel consumption (l/100 km) calculated in accordance with paragraph 1.4.3. (b) of Annex 6 to Regulation No. 101. If applicable, the correction factor  $cf$  in the equation used to determine  $FC_{norm}$  shall be calculated using the H/C ratio of the gaseous fuel;

$dist$ : distance travelled during the cycle (km);

$d$ : density  $d=0.538\text{kg/liter}$ ."

*Annex 6B, paragraph 2, amend to read:*

"2. Calculation of the CNG energy ratio

The fuel consumption value shall be calculated from the emissions of hydrocarbons, carbon monoxide, and carbon dioxide determined from the measurement results assuming that only CNG is burned during the test.

The CNG ratio of the energy consumed in the cycle is then determined as follows:

$$G_{CNG} = M_{CNG} * cf * 10000 / (FC_{norm} * dist * d)$$

Where:

$G_{CNG}$ : the CNG energy ratio (%);

$M_{CNG}$ : the CNG mass consumed during the cycle (kg);

$FC_{norm}$ : the fuel consumption ( $\text{m}^3/100\text{ km}$ ) calculated in accordance with paragraph 1.4.3. (c) of Annex 6 to Regulation No. 101;

$dist$ : distance travelled during the cycle (km);

$d$ : density  $d=0.654\text{kg/m}^3$ ;

$cf$ : correction factor, assuming the following values:

$cf = 1$  in case of G20 reference fuel;

$cf = 0.78$  in case of G25 reference fuel."

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