Proposal for an amendment to UN Regulation No. 115

I. Proposal

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:

$G_{LPG} = M_{LPG}*10000/(\text{~~FC}_{mean}\text{~~}FC_{norm}*dist*d)$

Where:

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

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

~~FC_{mean}: the mean fuel consumption (l/100 km) calculated in accordance with paragraph 6.1.2.4.3.2.~~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=0.538kg/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:

$G_{CNG} = M_{CNG}*cf*10000/(\text{~~FC}_{mean}\text{~~}FC_{norm}*dist*d)$

Where:

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

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

~~FC_{mean}: the mean fuel consumption (m^3/100 km) calculated in accordance with paragraph. 6.2.2.4.3.2.~~FC_{norm}: the fuel consumption (m^3/100 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=0.654kg/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."

II. Justification

FC_{mean}, as defined in paragraphs 6.1.2.4.3.2. (LPG) and 6.2.2.4.3.2. (CNG) of UN Regulation No. 115, is the mean value of the fuel consumptions of all the parent (test) vehicles, whereas the calculation of the gas ratio has to be made individually for each parent vehicle.

Therefore, FC_{mean} has to be replaced by FC_{norm} as defined in UN Regulation No. 101, Annex 6, paragraph 1.4.3., letter (b) and (c) respectively for LPG and CNG.

That correction would align UN Regulation No. 115 with the corresponding provisions set out in UN Regulation No. 83 (see ECE/TRANS/WP.29/2012/104 – Annex 12 – Appendices 1 and 2).

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