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World Forum for Harmonization of Vehicle Regulations

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Geneva, 23 - 26 June 2009
Item 4.2.24 of the provisional agenda

1958 AGREEMENT

Consideration of draft amendments to existing Regulations

Proposal for the 01 series of amendments to Regulation No. 101
(CO_2 emissions/fuel consumption)

Submitted by the Working Party on Pollution and Energy ∗/

The text reproduced below was prepared by the expert from the European Commission to align the requirements of the Regulation with those of European Union Directives 715/2007/EC and 692/2008/EC. The Working Party on Pollution and Energy (GRPE) had agreed, at its fifty-seventh session, to submit this proposal for consideration to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee (AC.1), subject to a final review by GRPE at its June 2009 session (ECE/TRANS/WP.29/GRPE/57, para. 39).

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Paragraph 5.2.4., amend to read (and keeping footnote 3/ unchanged):

"5.2.4.   For the purpose of the calculation mentioned in paragraph 5.2.3., the fuel consumption shall be expressed in appropriate units and the following fuel characteristics shall be used:

(a) density: measured on the test fuel according to ISO 3675 or an equivalent method. For petrol, diesel, biodiesel and ethanol (E85) the density measured at 15 ºC will be used; for LPG and natural gas/biomethane a reference density will be used, as follows:

0.538 kg/litre for LPG

0.654 kg/m^3 for NG 3/

(b) hydrogen-carbon ratio: fixed values will be used which are:

$C_1H_{1,89}O_{0,016}$ for petrol,

$C_1H_{1,86}O_{0,005}$ for diesel,

$C_1H_{2,525}$ for LPG (liquefied petroleum gas),

CH_4 for NG (natural gas) and biomethane,

$C_1H_{2,74}O_{0,385}$ for ethanol (E85)."

Paragraph 9.3.1.1.2.4., amend to read:

"9.3.1.1.2.4. The reference fuels described in Annexes 10 and 10a of Regulation No. 83 shall be used for this test."

Annex 6

Paragraph 1.3.5., amend to read:

"1.3.5.   The tyres shall be of a type specified as original equipment by the vehicle manufacturer inflated to the pressure recommended for the test load and speeds. The pressures shall be indicated in the test report.

The choice of tyres shall be based on the rolling resistance. The tyres with the highest rolling resistance shall be chosen, measured according to ISO 28580.

If there are more than three tyre rolling resistances, the tyre with the second highest rolling resistance shall be chosen.

The rolling resistance characteristics of the tyres fitted to production vehicles shall reflect those of the tyres used for type-approval."

Paragraph 1.4.3., amend to read:

"1.4.3.   The fuel consumption, expressed in litres per 100 km (in the case of petrol, LPG, ethanol (E85) and diesel) or in m^3 per 100 km (in the case of NG/biomethane) is calculated by means of the following formulae:

(a) for vehicles with a positive ignition engine fuelled with petrol (E5):

$$FC = (0.118/D) \cdot [(0.848 \cdot HC) + (0.429 \cdot CO) + (0.273 \cdot CO2)]$$

(b) for vehicles with a positive ignition engine fuelled with LPG:

$$FC_{norm} = (0.1212 / 0.538) \cdot [(0.825 \cdot HC) + (0.429 \cdot CO) + (0.273 \cdot CO_2)]$$

If the composition of the fuel used for the test differs from the composition that is assumed for the calculation of the normalized consumption, on the manufacturer's request a correction factor cf may be applied, as follows:

$$FC_{norm} = (0.1212 / 0.538) \cdot (cf) \cdot [(0.825 \cdot HC) + (0.429 \cdot CO) + (0.273 \cdot CO_2)]$$

The correction factor cf, which may be applied, is determined as follows:

$$cf = 0.825 + 0.0693 \cdot n_{actual}$$

where:

n_{actual} = the actual H/C ratio of the fuel used

(c) for vehicles with a positive ignition engine fuelled with NG/biomethane:

$$Fc_{norm} = (0.1336 / 0.654) \cdot [(0.749 \cdot HC) + (0.429 \cdot CO) + (0.273 \cdot CO_2)]$$

(d) for vehicles with a compression ignition engine fuelled with diesel (B5):

$$FC = (0.116/D) \cdot [(0.861 \cdot HC) + (0.429 \cdot CO) + (0.273 \cdot CO2)]$$

(e) for vehicles with a positive ignition engine fuelled with ethanol (E85):

$$FC = (0.1742/D) \cdot [(0.574 \cdot HC) + (0.429 \cdot CO) + (0.273 \cdot CO2)]$$

In these formulae:

FC = the fuel consumption in litre per 100 km (in the case of petrol, LPG, diesel or biodiesel) or in m^3 per 100 km (in the case of natural gas)

HC = the measured emission of hydrocarbons in g/km

CO = the measured emission of carbon monoxide in g/km

CO_2 = the measured emission of carbon dioxide in g/km

D = the density of the test fuel.

In the case of gaseous fuels this is the density at 15 °C."

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