EUROPEAN
COMMISSION

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ANNEXES 1 to 2

ANNEXES

to the

Commission Regulation

amending Regulation (EU) 2017/1151 for the purpose of introducing devices for measuring the consumption of fuel and energy as a requirement for type approval

ANNEX I

(1)Annex I is amended as follows:

(a) Appendix 1 is amended as follows:

(i) Point 4 is replaced by the following:

"4. For all vehicles with the exception of those referred to in Article 4(a), for CO_2 and EC the normalised values for CO_2 and EC shall be used:

$x_i = CO_{2test-i}/CO_{2declared}$

$x_i = EC_{test-i}/EC_{DC,COP}$

In the case of CO_2 and EC the factor A is set at 1.01, and the value for L is set at 1. In the case of CO_2 and EC the criteria are simplified to:

(i) Pass the family if $X_{tests} < A – VAR$

(ii) Fail the family if

$X_{tests} > A – ((N – 3) / 13) \times VAR$

(iii) Take another measurement if:

$A – VAR \leq X_{tests} < A – ((N – 3) / 13) \times VAR$"

(ii) The following point 5 is added

"For vehicles referred to in Article 4a, for CO_2 and EC the normalised values for CO_2 and EC shall be used:

$x_i = CO_{2test-i}/CO_{2declared}$

$x_i = EC_{test-i}/EC_{DC,COP}$

$x_{i,FECM}$ = accuracy of the device for measuring the consumption of fuel and energy calculated in accordance with point 3.2 of Annex XXII

In the case of CO_2 and EC the factor A is set at 1.01, the value for L is set at 1, and the value for B is set at 1. In the case of CO_2 and EC the criteria are simplified to:

(i) Pass the family if $X_{tests} < A – VAR$ and $|X_{tests,FECM}| < B \times 0.04$

(ii) Fail the family if

$X_{tests} > A – ((N – 3) / 13) \times VAR$ or $|X_{tests,FECM}| \geq B \times 0.04$

(iii) Take another measurement if:

$A – VAR \leq X_{tests} < A – ((N – 3) / 13) \times VAR$";

(b) In Appendix 4, in the Addendum to the type approval certificate, the following entry 2.5.4 is inserted:

"2.5.4 Device for measuring the consumption of fuel and energy:

y/n….";

(c) In Appendix 6, point 1, Table 1, in the text under the heading "Key", "‘Euro 6d’ emissions standard = RDE testing against final conformity factors, otherwise full Euro 6 tailpipe emission requirements, revised evaporative emissions test procedure. " is replaced by the following:

"'Euro 6d' emissions standard = RDE testing against final conformity factors, otherwise full Euro 6 tailpipe emission requirements, revised evaporative emissions test procedure, devices for measuring the consumption of fuel and energy.";

(d) The following Appendix 7a is inserted:

"**Appendix 7a**

Manufacturer's declaration of compliance with the requirements as regards devices for measuring the consumption of fuel and energy

(Manufacturer)……

(Address of the manufacturer)……

Declares that

the vehicle types listed in the attachment to this declaration are in compliance with Annex XXII to Regulation 2017/1151.

Done at ……..[Place]

On ……..[Date]

……

Signature of the Manufacturer's Representative

Annexes

– List of vehicle types to which this declaration applies;

– Reports issued by the relevant technical service confirming:

(i) that the data listed in point 2 of Annex XXII to Regulation (EU) (EU) 2017/1151 is available and accessible

(ii) for the vehicles referred to in Article 4a of Regulation 2017/1151, that the accuracy requirements laid down in point 3.2 of Annex XXII to that Regulation are met.";

(2) Annex XI is amended as follows:

(a) In Appendix 1 the following point 2.12. is added:

"2.12. The information listed in point 2 of Annex XXII shall be made available as signals through the serial port connector referred to in paragraph 6.5.3.2 (c) of Appendix 1 to Annex 11 to UN/ECE Regulation No 83, understood as set out in Point 2.6 of Appendix 1 to Annex XI.".

ANNEX II

"**ANNEX XXII**

Devices for measuring the consumption of fuel and energy

1. DEFINITIONS

'Grid energy' means, for plug-in hybrid electric vehicles, the electric energy flowing into the battery when the vehicle is connected to an external power supply and the engine is turned off. It shall not include electrical losses between the external power source and the battery.

'Charge sustaining operation' means, for plug-in hybrid electric vehicles, the condition as specified in point 3.3.6 of Annex XXI of Regulation 2017/1151.

'Charge depleting operation' means, for plug-in hybrid electric vehicles, the operating condition as specified in point 3.3.5 of Annex XXI of Regulation 2017/1151.

'Driver-selectable charge increasing operation' means, for plug-in hybrid electric vehicles, the operating condition in which the driver has selected a mode of operation different than the default or normal mode of the vehicle that is intended to increase the battery state-of-charge.

2. INFORMATION TO BE STORED AND MADE AVAILABLE

The device for measuring the consumption of fuel and energy shall determine at least the following information and store it on board the vehicle:

2.1. For all vehicles referred to in Article 4a, with the exception of plug-in hybrid vehicles:

(a) Total fuel consumed (lifetime);

(b) total distance travelled (lifetime);

(c) engine fuel rate (instantaneous);

(d) vehicle fuel rate (instantaneous),

(e) vehicle speed sensor (instantaneous).

2.2. For plug-in hybrid electric vehicles:

(a) Total fuel consumed (lifetime);

(b) total fuel consumed in charge depleting operation (lifetime);

(c) total fuel consumed in driver-selectable charge increasing operation (lifetime);

(d) total distance travelled (lifetime);

(e) total distance travelled in charge depleting operation with engine off (lifetime);

(f) total distance travelled in charge depleting operation with engine running (lifetime);

(g) total distance travelled in driver-selectable charge increasing operation (lifetime);

(h) engine fuel rate (instantaneous);

(i) vehicle fuel rate (instantaneous);

(j) vehicle speed sensor (instantaneous).

(k) total grid energy into the battery (lifetime).

Instantaneous values of a certain quantity determined and stored at a time t mean the values of this quantity averaged over a time interval of one second prior to the time t.

Lifetime values of a certain quantity determined and stored at a time t shall be the values of this quantity accumulated since the completion of production of the vehicle until time t.

All instantaneous and lifetime values shall be updated simultaneously at a minimum rate of once per second.

3. ACCURACY

3.1 With regard to the information specified in point 2, the manufacturer shall ensure that the device provides the most accurate values that can be achieved by the measurement and calculation system of the engine control unit.

3.2 Notwithstanding point 3.1, the manufacturer shall ensure that the accuracy is higher than -0,04 and lower than 0,04 calculated with three decimals using the following formula:

$$Accuracy = \frac{Fuel\_Consumption_{WLTP} - Fuel\_Consumption_{FECM}}{Fuel\_Consumption_{WLTP}}$$

Where

Fuel_Consumption_$_{WLTP}$ is the fuel consumption combined determined for vehicle H or vehicle L on the Type 1 test, "the first test", set out in Annex XXI,

Fuel_Consumption_$_{FECM}$ is the fuel consumption determined using the differentials of the parameter "Total fuel consumed (lifetime)" as provided by the device on the same test.

For plug-in hybrid electric vehicles the charge-sustaining Type 1 test shall be used.

3.2.1 If the requirements set out in point 3.2 are not met, a second Type 1 test shall be performed for vehicle H or vehicle L as the case may be. The requirements set out in point 3.2. shall be deemed to be fulfilled where the accuracy is higher than -0,04 and lower than 0,04 calculated in accordance with the formula in point 3.2 using the cumulative fuel consumed and distances driven in the two tests.

3.2.2 If the requirements set out in point 3.2.1 are not met, a third Type 1 test shall be performed for vehicle H or vehicle L as the case may be. The requirements set out in point 3.2. shall be deemed to be fulfilled where the accuracy is higher than -0,04 and lower than 0,04 calculated in accordance with the formula in point 4.2 using the cumulative fuel consumed and distances driven in the three tests.

4. ACCESS TO INFORMATION STORED IN THE DEVICE

The device for measuring the consumption of fuel and energy shall provide for standardised and unrestricted access and shall conform to the standards referred to in points 6.5.3.1 (a) and 6.5.3.2 (a) of Paragraph 6.5.3. of Appendix 1 to Annex 11 to UN/ECE Regulation No 83, understood as set out in Point 2.6. of Appendix 1 to Annex XI.

Notwithstanding the specifications of the standards on reset conditions, once the vehicle has entered into service the values of the lifetime counters shall be preserved. In case of

malfunctioning affecting these values, the counters may be reset simultaneously to ensure that the values remain fully synchronised. "