



Council of the
European Union

019742/EU XXVI. GP
Eingelangt am 02/05/18

Brussels, 2 May 2018
(OR. en)

8527/18
ADD 1

ENT 84
MI 309
ENV 269
DELECT 77

COVER NOTE

From: Secretary-General of the European Commission,
signed by Mr Jordi AYET PUIGARNAU, Director

date of receipt: 27 April 2018

To: Mr Jeppe TRANHOLM-MIKKELSEN, Secretary-General of the Council of
the European Union

No. Cion doc.: C(2018) 2460 final ANNEXES 1 to 2

Subject: ANNEXES to the COMMISSION DELEGATED REGULATION amending
and correcting Delegated Regulation (EU) 2017/655 supplementing
Regulation (EU) 2016/1628 of the European Parliament and of the Council
with regard to monitoring of gaseous pollutant emissions from in-service
internal combustion engines installed in non-road mobile machinery

Delegations will find attached document C(2018) 2460 final ANNEXES 1 to 2.

Encl.: C(2018) 2460 final ANNEXES 1 to 2



Brussels, 27.4.2018
C(2018) 2460 final

ANNEXES 1 to 2

ANNEXES

to the

COMMISSION DELEGATED REGULATION

amending and correcting Delegated Regulation (EU) 2017/655 supplementing Regulation (EU) 2016/1628 of the European Parliament and of the Council with regard to monitoring of gaseous pollutant emissions from in-service internal combustion engines installed in non-road mobile machinery

ANNEX I

The Annex to Delegated Regulation (EU) 2017/655 is amended as follows:

(1) points 2.6.1.1. and 2.6.1.2. are replaced by the following:

"2.6.1.1. Testing 9 engines with an accumulated service of less than *a* % of the EDP, in accordance with Table 1. Test results shall be submitted to the approval authority by 31 December 2022.

2.6.1.2. Testing 9 engines with an accumulated service higher than *b* % of the EDP, in accordance with Table 1. Test reports shall be submitted to the approval authority by 31 December 2024.";

(2) in point 2.6.1.3., the following Table 1 is added:

"Table 1

% of EDP values

Reference power of selected engine (kW)	<i>a</i>	<i>b</i>
$56 \leq P < 130$	20	55
$130 \leq P \leq 560$	30	70";

(3) point 2.6.2.1. is replaced by the following:

"2.6.2.1. The test results of the first nine engines shall be submitted not later than 12 months after the first engine was installed in a non-road mobile machinery and not later than 18 months after starting the production of the approved engine type or engine family. ";

(4) point 3.1.1. is replaced by the following:

"3.1.1. The non-road mobile machinery's operator performing the in-service monitoring test may be other than the usual professional one if the manufacturer demonstrates to the approval authority that the designated operator has attained enough skills and training to operate the non-road mobile machine.";

(5) in Appendix 3, in point 4.1., the table is replaced by the following:

"Table

Tolerances

Slope of the regression line, <i>m</i>	0,9 to 1,1 – Recommended
Coefficient of determination, <i>r</i> ²	min. 0,90 – Mandatory";

(6) Appendix 5 is amended as follows:

(a) the following point 2.1.5. is inserted before Figure 1:

"2.1.5. The reference work and reference CO₂ mass of an engine type, or for all engine types within the same engine family, shall be those specified in points 11.3.1. and 11.3.2. of the addendum to the EU type approval certificate of the engine type or the engine family, as set out in Annex IV to Commission Implementing Regulation (EU) 2017/656*.

* Commission Implementing Regulation (EU) 2017/656 of 19 December 2016 laying down the administrative requirements relating to emission limits and type-approval of internal combustion engines for non-road mobile machinery in accordance with Regulation (EU) 2016/1628 of the European Parliament and of the Council (OJ L 102, 13.4.2017, p. 364).";

(b) point 3 is replaced by the following:

"3. Rounding of gaseous pollutant emissions calculations

In accordance with Standard ASTM E 29-06b (Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications), the final test results shall be rounded in one step to the number of places to the right of the decimal point indicated by the applicable exhaust emissions limit values set out in Article 18(2) of Regulation (EU) 2016/1628 plus one additional significant figure."

ANNEX II

The Annex to Delegated Regulation (EU) 2017/655 is corrected as follows:

- (1) point 5.1. is replaced by the following:

"5.1. The ECU shall provide data stream information to the measurement instruments or data logger of the Portable Emissions Measurement System (PEMS) in accordance with the requirements set out in Appendix 7.";
- (2) points 6.1. to 6.4. are replaced by the following:

"6.1. In-service monitoring tests shall be conducted using PEMS in accordance with Appendix 1.

6.2. Manufacturers shall comply with the test procedure set out in Appendix 2 with regard to the in-service monitoring of engines installed on non-road mobile machinery using a PEMS.

6.3. Manufacturers shall follow the procedures set out in Appendix 3 for the pre-processing of the data resulting of the in-service monitoring of engines installed on non-road mobile machinery using a PEMS.

6.4. Manufacturers shall follow the procedures set out in Appendix 4 for the determination of valid events during an in-service monitoring test of engines installed on non-road mobile machinery using a PEMS.";
- (3) point 8 is replaced by the following:

"8. Calculations

Manufacturers shall follow the procedures set out in Appendix 5 for the gaseous pollutant emissions calculations for the in-service monitoring of engines installed on non-road mobile machinery using a PEMS.";
- (4) in point 10.1., the first sentence is replaced by the following:

"Manufacturers shall draft a test report of the in-service monitoring of engines installed on non-road mobile machinery using a PEMS for each engine tested.";
- (5) Appendix 5 is corrected as follows:
 - (a) point 2.2.1. is replaced by the following:

"2.2.1. Calculations of the brake specific gaseous pollutant emissions

The brake-specific gaseous pollutant emissions e_{gas} (g/kWh) shall be calculated for each averaging window and each gaseous pollutant in the following way:

$$e_{gas} = \frac{m_i}{W(t_{2,i}) - W(t_{1,i})}$$

Where:

 - m_i is the mass emission of the gaseous pollutant during the i^{th} averaging window, g/averaging window,
 - $W(t_{2,i}) - W(t_{1,i})$ is the engine work during the i^{th} averaging window, kWh.";

(b) point 2.2.3. is replaced by the following:

"2.2.3. Calculations of the conformity factors

The conformity factors shall be calculated for each individual valid averaging window and each individual gaseous pollutant in the following way:

$$CF = \frac{e_{gas}}{L}$$

Where:

- e_{gas} is the brake-specific emission of the gaseous pollutant, g/kWh;
- L is the applicable limit, g/kWh.";

(c) in point 2.3., in the legend for the first equation, the indents relating to $m_{CO_2}(t_{j,i})$ and $m_{CO_2,ref}$ are replaced by the following:

- $m_{CO_2}(t_{j,i})$ is the CO₂ mass measured between the test start and time $t_{j,i}$, g;
- $m_{CO_2,ref}$ is the CO₂ mass determined for the NRTC, g;"

(d) in point 2.3.1., in the legend for the equation, the indent relating to P_{max} is replaced by the following:

"– P_{max} is the maximum net power, as defined in Article 3(28) of Regulation (EU) 2016/1628, kW.";

(e) point 2.3.2. is replaced by the following:

"2.3.2. Calculations of the conformity factors

The conformity factors shall be calculated for each individual averaging window and each individual pollutant in the following way:

$$CF = \frac{CF_I}{CF_C}$$

With

$$CF_I = \frac{m_i}{m_{CO_2}(t_{2,i}) - m_{CO_2}(t_{1,i})} \quad (\text{in service ratio}) \text{ and}$$

$$CF_C = \frac{m_L}{m_{CO_2,ref}} \quad (\text{certification ratio})$$

Where:

- m_i is the mass emission of the gaseous pollutant during the i^{th} averaging window, g/averaging window,
- $m_{CO_2}(t_{2,i}) - m_{CO_2}(t_{1,i})$ is the CO₂ mass during the i^{th} averaging window, g;

- $m_{CO_2,ref}$ is the engine CO₂ mass determined for the NRTC, g,
- m_L is the mass emission of gaseous pollutant corresponding to the applicable limit on the NRTC, g.";

(6) in Appendix 8, point 2.8. is replaced by the following:

"2.8. Engine total swept volume [cm³]".