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ANNEX II

CONFORMITY OF IN-SERVICE ENGINES OR VEHICLES

10. REPORTING PROCEDURES

10.1. A technical report shall be submitted to the approval authority for each engine family tested. The report shall show the activities and results of the in-service conformity testing. The report shall include at least the following:

10.1.1. *General*

10.1.1.1. Name and address of the manufacturer.

10.1.1.2. Address(es) of assembly plant(s).

10.1.1.3. The name, address, telephone and fax numbers and e-mail address of the manufacturer's representative.

10.1.1.4. Type and commercial description (mention any variants).

10.1.1.5. Engine family.

10.1.1.6. Parent engine.

10.1.1.7. Engine family members.

10.1.1.8. The vehicle identification number (VIN) codes applicable to the vehicles equipped with an engine that is part of the in-service conformity check.

10.1.1.9. Means and location of identification of type, if marked on the vehicle.

10.1.1.10. Category of vehicle.

10.1.1.11. Type of engine: petrol, ethanol (E85), diesel/NG /LPG/ethanol (ED95) (Delete as appropriate).

10.1.1.12. The numbers of the type-approvals applicable to the engine types within the in-service family, including, where applicable, the numbers of all extensions and field fixes/recalls (reworks).

10.1.1.13. Details of extensions, field fixes/recalls to those type-approvals for the engines covered within the manufacturer's information.

10.1.1.14. The engine build period covered within the manufacturer's information (e.g. 'vehicles or engines manufactured during the 2014 calendar year').

10.1.2. *Engine/vehicle selection*

10.1.2.1. Vehicle or engine location method.

10.1.2.2. Selection criteria for vehicles, engines, in-service families.

10.1.2.3. Geographical areas within which the manufacturer has collected vehicles.

10.1.3. *Equipment*

10.1.3.1. PEMS Equipment, brand and type.

10.1.3.2. PEMS calibration.

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10.1.3.3. PEMS power supply.

10.1.3.4. Calculation software and version used (e.g. EMROAD 4.0).

10.1.4. *Test data*

10.1.4.1. Date and time of test.

10.1.4.2. Location of test including details information about the test route.

10.1.4.3. Weather/ambient conditions (e.g. temperature, humidity, altitude).

10.1.4.4. Distances covered per vehicle on the test route.

10.1.4.5. Test fuel specifications characteristics.

10.1.4.6. Reagent specification (if applicable).

10.1.4.7. Lubrication oil specification.

10.1.4.8. Emission test results according to Appendix 1 to this Annex.

10.1.5. *Engine information*

10.1.5.1. Engine fuel type (e.g. diesel, ethanol ED95, NG, LPG, petrol, E85).

10.1.5.2. Engine combustion system (e.g. compressed ignition or positive ignition).

10.1.5.3. Type-approval number.

10.1.5.4. Engine rebuilt.

10.1.5.5. Engine manufacturer.

10.1.5.6. Engine model.

10.1.5.7. Engine production year and month.

10.1.5.8. Engine identification number.

10.1.5.9. Engine displacement [litres].

10.1.5.10 Number of cylinders.

10.1.5.11 Engine rated power [kW @ rpm].

10.1.5.12 Engine peak torque [Nm @ rpm].

10.1.5.13 Idle speed [rpm].

10.1.5.14 Manufacturer supplied full-load torque curve available (yes/no).

10.1.5.15 Manufacturer supplied full-load torque curve reference number.

10.1.5.16 DeNO_x system (e.g. EGR, SCR).

10.1.5.17 Type of catalytic converter.

10.1.5.18 Type of Particulate trap.

10.1.5.19 After-treatment modified with respect to type-approval? (yes/no)

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10.1.5.20 Engine ECU information (Software calibration number).

10.1.6. *Vehicle information*

10.1.6.1. Vehicle owner.

10.1.6.2. Vehicle type (e.g. M₃, N₃) and application (e.g. rigid or articulated truck, city bus).

10.1.6.3. Vehicle manufacturer.

10.1.6.4. Vehicle Identification Number.

10.1.6.5. Vehicle registration number and country of registration.

10.1.6.6. Vehicle model.

10.1.6.7. Vehicle production year and month.

10.1.6.8. Transmission type (e.g. manual, automatic or other).

10.1.6.9. Number of forward gears.

10.1.6.10. Odometer reading at test start [km].

10.1.6.11. Gross vehicle combination weight rating (GVW) [kg].

10.1.6.12. Tire size [Not mandatory].

10.1.6.13. Tail pipe diameter [mm] [Not mandatory].

10.1.6.14. Number of axles.

10.1.6.15. Fuel tank(s) capacity [litres] [Not mandatory].

10.1.6.16. Number of fuel tanks [Not mandatory].

10.1.6.17. Reagent tank(s) capacity [litres] [Not mandatory].

10.1.6.18. Number of reagent tanks [Not mandatory].

10.1.7. *Test route characteristics*

10.1.7.1. Odometer reading at test start [km]

10.1.7.2. Duration [s]

10.1.7.3. Average ambient conditions (as calculated from the instantaneous measured data)

10.1.7.4. Ambient conditions sensor information (type and location of sensors)

10.1.7.5. Vehicle speed information (for example cumulative speed distribution)

10.1.7.6. Shares of the time of the trip characterised by urban, rural and motorway operation as described in point 4.5.

10.1.7.7. Shares of the time of the trip characterised by accelerating, decelerating, cruising and stop as described in point 4.5.5.

10.1.8. *Instantaneous measured data*

10.1.8.1. THC concentration [ppm].

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- 10.1.8.2. CO concentration [ppm].
- 10.1.8.3. NO_x concentration [ppm].
- 10.1.8.4. CO₂ concentration [ppm].
- 10.1.8.5. CH₄ concentration [ppm] for P.I. engines only.
- 10.1.8.6. Exhaust gas flow [kg/h].
- 10.1.8.7. Exhaust temperature [°C].
- 10.1.8.8. Ambient air temperature [°C].
- 10.1.8.9. Ambient pressure [kPa].
- 10.1.8.10 Ambient humidity [g/kg] [Not mandatory].
- 10.1.8.11 Engine torque [Nm].
- 10.1.8.12 Engine speed [rpm].
- 10.1.8.13 Engine fuel flow [g/s].
- 10.1.8.14 Engine coolant temperature [°C].
- 10.1.8.15 Vehicle ground speed [km/h] from ECU and GPS.
- 10.1.8.16 Vehicle latitude [degree] (Accuracy needs to be sufficient to enable the traceability of the test route).
- 10.1.8.17 Vehicle longitude [degree].
- 10.1.9. *Instantaneous calculated data*
 - 10.1.9.1. THC mass [g/s].
 - 10.1.9.2. CO mass [g/s].
 - 10.1.9.3. NO_x mass [g/s].
 - 10.1.9.4. CO₂ mass [g/s].
 - 10.1.9.5. CH₄ mass [g/s] for P.I. engines only.
 - 10.1.9.6. THC cumulated mass [g].
 - 10.1.9.7. CO cumulated mass [g].
 - 10.1.9.8. NO_x cumulated mass [g].
 - 10.1.9.9. CO₂ cumulated mass [g].
 - 10.1.9.10 CH₄ cumulated mass [g] for P.I. engines only.
 - 10.1.9.11 Calculated fuel rate [g/s].
 - 10.1.9.12 Engine power [kW].
 - 10.1.9.13 Engine work [kWh].

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10.1.9.14. Work window duration [s].

10.1.9.15. Work window average engine power [%].

10.1.9.16. Work window THC conformity factor [-].

10.1.9.17. Work window CO conformity factor [-].

10.1.9.18. Work window NO_x conformity factor [-].

10.1.9.19. Work window CH₄ conformity factor [-] for P.I. engines only.

10.1.9.20. CO₂ mass window duration [s].

10.1.9.21. CO₂ mass window THC conformity factor [-].

10.1.9.22. CO₂ mass window CO conformity factor [-].

10.1.9.23. CO₂ mass window NO_x conformity factor [-].

10.1.9.24. CO₂ mass window CH₄ conformity factor [-] for P.I. engines only.

10.1.10. *Averaged and integrated data*

10.1.10.1. Average THC concentration [ppm] [Not mandatory].

10.1.10.2. Average CO concentration [ppm] [Not mandatory].

10.1.10.3. Average NO_x concentration [ppm] [Not mandatory].

10.1.10.4. Average CO₂ concentration [ppm] [Not mandatory].

10.1.10.5. Average CH₄ concentration [ppm] for gas engines only [Not mandatory].

10.1.10.6. Average Exhaust gas flow [kg/h] [Not mandatory].

10.1.10.7. Average Exhaust temperature [°C] [Not mandatory].

10.1.10.8. THC emissions [g].

10.1.10.9. CO emissions [g].

10.1.10.10. NO_x emissions [g].

10.1.10.11. CO₂ emissions [g].

10.1.10.12. CH₄ emissions [g] for gas engines only.

10.1.11. *Pass-fail results*

10.1.11.1. Minimum, maximum, and 90 % cumulative percentile for:

10.1.11.2. Work window THC conformity factor [-].

10.1.11.3. Work window CO conformity factor [-].

10.1.11.4. Work window NO_x conformity factor [-].

10.1.11.5. Work window CH₄ conformity factor [-] for P.I. engines only.

10.1.11.6. CO₂ mass window THC conformity factor [-].

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- 10.1.11.7. CO₂ mass window CO conformity factor [-].
- 10.1.11.8. CO₂ mass window NO_x conformity factor [-].
- 10.1.11.9. CO₂ mass window CH₄ conformity factor [-] for P.I. engines only.
- 10.1.11.10. Work window: Minimum and maximum average window power [%].
- 10.1.11.11. CO₂ mass window: Minimum and maximum window duration [s].
- 10.1.11.12. Work window: Percentage of valid windows.
- 10.1.11.13. CO₂ mass window: Percentage of valid windows.
- 10.1.12. *Test verifications*
- 10.1.12.1. THC analyser zero, span and audit results, pre and post test.
- 10.1.12.2. CO analyser zero, span and audit results, pre and post test.
- 10.1.12.3. NO_x analyser zero, span and audit results, pre and post test.
- 10.1.12.4. CO₂ analyser zero, span and audit results, pre and post test.
- 10.1.12.5. Data consistency check results, according to Section 3.2 of Appendix 1 to this Annex.
- [^{F1}10.1.12.5. Results of the linear regression described in point 3.2.1 of Appendix 1 to this Annex including the slope of the regression line, m , coefficient of determination, r^2 and the intercept, b , of the y-axis of the regression line.
- Textual Amendments**

F1 Inserted by [Commission Regulation \(EU\) No 64/2012 of 23 January 2012 amending Regulation \(EU\) No 582/2011 implementing and amending Regulation \(EC\) No 595/2009 of the European Parliament and of the Council with respect to emissions from heavy duty vehicles \(Euro VI\) \(Text with EEA relevance\).](#)
- 10.1.12.5. Result of the consistency check of the ECU data in accordance with point 3.2.2 of Appendix 1 to this Annex.
- 10.1.12.5. Result of the consistency check of the Brake-specific fuel consumption in accordance with point 3.2.3 of Appendix 1 to this Annex, including the calculated Brake-specific fuel consumption and the ratio of the calculated Brake-specific fuel consumption from the PEMS measurement and the declared Brake-specific fuel consumption for the WHTC test.
- 10.1.12.5. Result of the consistency check of the Odometer in accordance with point 3.2.4 of Appendix 1 to this Annex.
- 10.1.12.5. Result of the consistency check of the ambient pressure in accordance with point 3.2.5 of Appendix 1 to this Annex.]
- 10.1.13. List of further attachments where these exist.

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Changes and effects yet to be applied to the whole legislation item and associated provisions

- Signature words omitted by [S.I. 2022/1273 reg. 65\(19\)](#)
- Annex list words substituted by [S.I. 2022/1273 reg. 65\(20\)](#)
- Annex 1 Appendix 4Pt. 3 omitted by [S.I. 2022/1273 reg. 66\(3\)\(g\)](#)
- Annex 1 Appendix 8 image substituted by [S.I. 2022/1273 reg. 66\(7\)\(b\)](#)
- Annex 1 Appendix 4Pt. 1 table words inserted by [S.I. 2022/1273 reg. 66\(3\)\(e\)\(i\)](#)
- Annex 1 Appendix 4Pt. 2 table words inserted by [S.I. 2022/1273 reg. 66\(3\)\(f\)\(i\)](#)
- Annex 1 Appendix 4 words omitted by [S.I. 2022/1273 reg. 66\(3\)\(b\)](#)
- Annex 1 Appendix 4 words omitted by [S.I. 2022/1273 reg. 66\(3\)\(c\)\(ii\)\(bb\)](#)
- Annex 1 Appendix 4 words omitted by [S.I. 2022/1273 reg. 66\(3\)\(c\)\(iii\)\(aa\)](#)
- Annex 1 Appendix 4 table words omitted by [S.I. 2022/1273 reg. 66\(3\)\(d\)\(i\)](#)
- Annex 1 Appendix 4 words omitted by [S.I. 2022/1273 reg. 66\(3\)\(d\)\(iii\)](#)
- Annex 1 Appendix 8 words omitted by [S.I. 2022/1273 reg. 66\(7\)\(c\)](#)
- Annex 1 Appendix 1 point 2.2 words omitted by [S.I. 2022/1273 reg. 66\(10\)\(e\)](#)
- Annex 1 Appendix 4 words substituted by [S.I. 2022/1273 reg. 66\(3\)\(a\)](#)
- Annex 1 Appendix 4 words substituted by [S.I. 2022/1273 reg. 66\(3\)\(c\)\(i\)](#)
- Annex 1 Appendix 4 words substituted by [S.I. 2022/1273 reg. 66\(3\)\(c\)\(ii\)\(aa\)](#)
- Annex 1 Appendix 4 words substituted by [S.I. 2022/1273 reg. 66\(3\)\(c\)\(iii\)\(bb\)](#)
- Annex 1 Appendix 4 table words substituted by [S.I. 2022/1273 reg. 66\(3\)\(d\)\(ii\)](#)
- Annex 1 Appendix 4Pt. 1 table words substituted by [S.I. 2022/1273 reg. 66\(3\)\(e\)\(ii\)](#)
- Annex 1 Appendix 4Pt. 2 table words substituted by [S.I. 2022/1273 reg. 66\(3\)\(f\)\(ii\)](#)
- Annex 1 Appendix 5 heading words substituted by [S.I. 2022/1273 reg. 66\(4\)\(a\)](#)
- Annex 1 Appendix 5 words substituted by [S.I. 2022/1273 reg. 66\(4\)\(a\)](#)
- Annex 1 Appendix 5s. 2 point 000.5 words substituted by [S.I. 2022/1273 reg. 66\(4\)\(b\)](#)
- Annex 1 Appendix 6 heading words substituted by [S.I. 2022/1273 reg. 66\(5\)\(a\)](#)
- Annex 1 Appendix 6 heading words substituted by [S.I. 2022/1273 reg. 66\(5\)\(b\)](#)
- Annex 1 Appendix 6 heading words substituted by [S.I. 2022/1273 reg. 66\(5\)\(c\)](#)
- Annex 1 Appendix 7 heading words substituted by [S.I. 2022/1273 reg. 66\(6\)](#)
- Annex 1 Appendix 7 words substituted by [S.I. 2022/1273 reg. 66\(6\)](#)
- Annex 1 Appendix 7 Addendum words substituted by [S.I. 2022/1273 reg. 66\(6\)](#)
- Annex 1 Appendix 8 heading words substituted by [S.I. 2022/1273 reg. 66\(7\)\(a\)](#)
- Annex 1 Appendix 9 heading words substituted by [S.I. 2022/1273 reg. 66\(8\)](#)
- Annex 1 Appendix 9 words substituted by [S.I. 2022/1273 reg. 66\(8\)](#)
- Annex 1 Appendix 10 words substituted by [S.I. 2022/1273 reg. 66\(9\)](#)
- Annex 10 Appendix 5 point 2.4.1 words omitted by [S.I. 2022/1273 reg. 66\(12\)\(f\)\(i\)](#)
- Annex 10 Appendix 5 point 6 heading words omitted by [S.I. 2022/1273 reg. 66\(12\)\(f\)\(iii\)](#)
- Annex 10 Appendix 5 point 6 words omitted by [S.I. 2022/1273 reg. 66\(12\)\(f\)\(iii\)](#)
- Annex 10 Appendix 5 point 5.2.4 words substituted by [S.I. 2022/1273 reg. 66\(12\)\(f\)\(ii\)](#)
- Annex 11 Appendix 1 point 2-2.3 omitted by [S.I. 2022/1273 reg. 66\(13\)\(k\)\(ii\)](#)
- Annex 11 Appendix 2 words inserted by [S.I. 2022/1273 reg. 66\(13\)\(l\)\(ii\)](#)
- Annex 11 Appendix 1 point 000.7 words substituted by [S.I. 2022/1273 reg. 66\(13\)\(k\)\(i\)](#)
- Annex 11 Appendix 2 words substituted by [S.I. 2022/1273 reg. 66\(13\)\(l\)\(i\)](#)
- Annex 11 Appendix 2 words substituted by [S.I. 2022/1273 reg. 66\(13\)\(l\)\(iii\)](#)
- Annex 11 Appendix 3 point 2.4.2.11 words substituted by [S.I. 2022/1273 reg. 66\(13\)\(m\)\(i\)](#)

- Annex 11 Appendix 3 point 2.4.6.5 words substituted by [S.I. 2022/1273 reg. 66\(13\)\(m\)\(ii\)](#)
- Art. 2(44) omitted by [S.I. 2022/1273 reg. 65\(2\)](#)
- Art. 5(4)(d) omitted by [S.I. 2022/1273 reg. 65\(6\)\(c\)](#)
- Art. 5(4)(g) omitted by [S.I. 2022/1273 reg. 65\(6\)\(c\)](#)
- Art. 6(1a)(a) words substituted by [S.I. 2022/1273 reg. 65\(7\)\(c\)\(ii\)](#)
- Art. 6(1a)(b) omitted by [S.I. 2022/1273 reg. 65\(7\)\(c\)\(iii\)](#)
- Art. 7(4)(c) omitted by [S.I. 2022/1273 reg. 65\(8\)\(c\)](#)
- Art. 7(4)(d) omitted by [S.I. 2022/1273 reg. 65\(8\)\(c\)](#)
- Art. 8(1a)(a) word substituted by [S.I. 2022/1273 reg. 65\(9\)\(d\)\(i\)](#)
- Art. 8(1a)(b) omitted by [S.I. 2022/1273 reg. 65\(9\)\(d\)\(ii\)](#)
- Art. 8(1a)(e) words substituted by [S.I. 2022/1273 reg. 65\(9\)\(d\)\(iii\)](#)
- Art. 10(1a)(a) word substituted by [S.I. 2022/1273 reg. 65\(11\)\(a\)](#)
- Art. 10(1a)(b) omitted by [S.I. 2022/1273 reg. 65\(11\)\(d\)\(ii\)](#)
- Art. 10(1a)(e) words substituted by [S.I. 2022/1273 reg. 65\(11\)\(d\)\(iii\)](#)