
Status: Point in time view as at 03/02/2012.

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ANNEX VI

REQUIREMENTS TO LIMIT OFF-CYCLE EMISSIONS (OCE) AND IN-USE EMISSIONS

1. INTRODUCTION

- 1.1. This Annex sets out the performance requirements and prohibition of defeat strategies for engines and vehicles type-approved according to Regulation (EC) No 595/2009 and this Regulation so as to achieve effective control of emissions under a broad range of engine and ambient operating conditions encountered during normal in-use vehicle operation. This Annex also sets out the test procedures for testing off-cycle emissions during type-approval and in actual use of the vehicle.

2. DEFINITIONS

The definitions in Section 3 of Annex 10 to UN/ECE Regulation No 49 shall apply.

3. GENERAL REQUIREMENTS

- 3.1. The general requirements shall be those set out in Sections 4 and 4.1 of Annex 10 to UN/ECE Regulation No 49.

4. PERFORMANCE REQUIREMENTS

- 4.1. The performance requirements shall be those set out in Section 5 of Annex 10 to UN/ECE Regulation No 49 with the exceptions in points 4.1.1 to 4.1.4.

- 4.1.1. Section 5.1.2(a) of Annex 10 to UN/ECE Regulation No 49 shall be understood as follows:

- (a) its operation is substantially included in the applicable type-approval tests, including the off-cycle test procedures under Section 6 of Annex VI to Regulation (EU) No 582/2011 and the in-service provisions set out in Article 12 to Regulation (EU) No 582/2011.

- 4.1.2. Section 5.2.1. of Annex 10 to UN/ECE Regulation No 49 shall be understood as follows:

Exhaust emissions shall not exceed the applicable emission limits specified in point 4.1.3 of Annex VI to Regulation (EU) No 582/2011.

- 4.1.3. The applicable emission limits shall be the following:

- (a) for CO: 2 000 mg/kWh;

- (b) for THC: 220 mg/kWh;

- (c) for NO_x: 600 mg/kWh;

- (d) for PM: 16 mg/kWh.

- 4.1.4. Sections 5.2.2 and 5.2.3 of Annex 10 to UN/ECE Regulation No 49 shall not apply.

5. AMBIENT AND OPERATING CONDITIONS

- 5.1. The ambient and operating conditions for the purpose of this Annex shall be those set out in Section 6. of Annex 10 to UN/ECE Regulation No 49.

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[^{F1}6. OFF-CYCLE LABORATORY TESTING AND VEHICLE TESTING OF ENGINES AT TYPE-APPROVAL]

6.1. The off-cycle test procedure during type-approval shall follow the World-harmonised Not-To-Exceed Methodology as described in Section 7 of Annex 10 to UN/ECE Regulation No 49 with the exceptions in points 6.1.1 to 6.1.6.

6.1.1. The off-cycle laboratory test requirements shall not apply for the type-approval of positive-ignition engine under Regulation (EC) No 595/2009 and this Regulation.

6.1.2. Section 7.2.1 of Annex 10 to UN/ECE Regulation No 49 shall be understood as follows:

To determine compliance with the WNTE emissions limits specified in Section 5.2, the engine shall be operated within the WNTE control area defined in Section 7.1 and its emissions shall be measured and integrated over a minimum period of 30 seconds. A WNTE event is defined as a single set of integrated emissions over the period of time. For example, if the engine operates for 65 consecutive seconds within the WNTE control area and ambient conditions this would constitute a single WNTE event and the emissions would be averaged over the full 65-second period. In the case of laboratory testing, the integrating period defined in Section 7.5 shall apply.

[^{F1}6.1.3. Section 7.3 of Annex 10 to UN/ECE Regulation No 49 shall be understood as follows:

In-use testing

A PEMS demonstration test shall be performed at type-approval by testing the parent engine in a vehicle using the procedure described in Appendix 1 to this Annex.

Additional requirements with respect to in-use vehicle testing will be specified at a later stage in accordance with Article 14(3) to Regulation (EU) No 582/2011.]

[^{F2}6.1.3.1 The manufacturer may select the vehicle that shall be used for testing but the vehicle choice shall be subject to the agreement of the approval authority. The characteristics of the vehicle used for the PEMS demonstration test shall be representative for the category of vehicle intended for the engine system. The vehicle may be a prototype vehicle.

Textual Amendments

F2 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).

6.1.3.2. At the request of the approval authority, an additional engine within the engine family or an equivalent engine representing a different vehicle category may be tested in a vehicle.]

6.1.4. Section 7.5.4 of Annex 10 to UN/ECE Regulation No 49 shall be understood as follows:

The WNTE laboratory test shall meet the validation statistics of Section 7.8.7 of Annex 4B to UN/ECE Regulation No 49.

6.1.5. Section 7.5.5 of Annex 10 to UN/ECE Regulation No 49 shall be understood as follows:

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The measurement of the emissions shall be carried out in accordance with Sections 7.5, 7.7 and 7.8 of Annex 4B to UN/ECE Regulation No 49.

6.1.6. Section 7.5.6 of Annex 10 to UN/ECE Regulation No 49 shall be understood as follows:

The calculation of the test results shall be carried out in accordance with Section 8 of Annex 4B to UN/ECE Regulation No 49.

Textual Amendments

- F1** Substituted 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 \(Euro VI\) \(Text with EEA relevance\).](#)

7. WORLD-HARMONISED NOT-TO-EXCEED DEFICIENCIES

Section 8 of Annex 10 to UN/ECE shall not apply.

8. WORLD-HARMONISED NOT-TO-EXCEED EXEMPTIONS

Section 9 of Annex 10 to UN/ECE Regulation No 49 shall not apply.

9. STATEMENT OF OFF-CYCLE EMISSION COMPLIANCE

Section 10 of Annex 10 to UN/ECE Regulation No 49 shall be understood as follows:

In the application for type-approval, the manufacturer shall provide a statement that the engine family or vehicle complies with the requirements of Regulation (EU) No 582/2011 limiting off-cycle emissions. In addition to this statement, compliance with the applicable emission limits and in use requirements shall be verified through additional tests.

9.1. Sections 10.1 and 10.2 of Annex 10 to UN/ECE Regulation No 49 shall apply.

10. DOCUMENTATION

The documentation shall be those specified in Section 11 of Annex 10 to UN/ECE Regulation No 49.

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^{F2}Appendix 1

PEMS demonstration test at type-approval

1. INTRODUCTION

This Appendix describes the procedure for PEMS demonstration test at type-approval.

2. TEST VEHICLE

2.1. The vehicle used for demonstrating the PEMS demonstration test shall be representative for the vehicle category intended for the installation of the engine system. The vehicle may be a prototype vehicle or an adapted production vehicle.

2.2. The availability and conformity of the ECU data-stream information shall be demonstrated (for example following the provision of Section 5 of Annex II to this Regulation).

3. TEST CONDITIONS

3.1. **Vehicle payload**

The vehicle payload shall be 50-60 % of the maximum vehicle payload in accordance with Annex II.

3.2. **Ambient conditions**

The test shall be conducted under ambient conditions as described in point 4.2 of Annex II.

3.3. The engine coolant temperature shall be in accordance with point 4.3 of Annex II.

3.4. **Fuel, lubricants and reagent**

The fuel, lubricating oil and reagent for the exhaust after-treatment system shall follow the provisions of points 4.4 to 4.4.3 of Annex II.

3.5. **Trip and operational requirements**

The trip and operational requirements shall be those described in points 4.5 to 4.6.8 of Annex II.

4. EMISSIONS EVALUATION

4.1. The test shall be conducted and the test results calculated in accordance with Section 6 of Annex II.

5. REPORT

5.1. A technical report describing the PEMS demonstration test shall show the activities and results and give at least the following information:

- (a) General information as described in points 10.1.1 to 10.1.1.14 of Annex II.
- (b) Explanation as to why the vehicle(s)⁽¹⁾ used for the test can be considered to be representative for the category of vehicles intended for the engine system.
- (c) Information about test equipment and test data as described in points 10.1.3 to 10.1.4.8 of Annex II.
- (d) Information about the tested engine as described in points 10.1.5 to 10.1.5.20 of Annex II.

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- (e) Information about the vehicle used for the test as described in points 10.1.6 to 10.1.6.18 of Annex II.
- (f) Information about the route characteristics as described in points 10.1.7 to 10.1.7.7 of Annex II.
- (g) Information about instantaneous measured and calculated data as described in points 10.1.8 to 10.1.9.24 of Annex II.
- (h) Information about averaged and integrated data as described in points 10.1.10 to 10.1.10.12 of Annex II.
- (i) Pass-fail results as described in points 10.1.11 to 10.1.11.13 of Annex II.
- (j) Information about test verifications as described in points 10.1.12 to 10.1.12.5 of Annex II.]

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(1) [^{F2}Vehicle or vehicles in the case of a secondary engine.]

Textual Amendments

F2 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 \(Euro VI\) \(Text with EEA relevance\)](#).

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