Commission Regulation (EU) No 582/2011 of 25 May 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) and amending Annexes I and III to Directive 2007/46/EC of the European Parliament and of the Council (Text with EEA relevance)

Article 1

Subject matter

This Regulation lays down measures for the implementation of Articles 4, 5, 6 and 12 of Regulation (EC) No 595/2009.

It also amends Regulation (EC) No 595/2009 and Directive 2007/46/EC.

Article 2

Definitions

For the purposes of this Regulation, the following definitions shall apply:

(1) 'engine system' means the engine, the emission control system and the communication interface (hardware and messages) between the engine system electronic control unit or units (hereinafter 'ECU') and any other powertrain or vehicle control unit;

(2) 'service accumulation schedule' means the ageing cycle and the service accumulation period for determining the deterioration factors for the engine-aftertreatment system family;

(3) 'engine family' means a manufacturers grouping of engines which, through their design as defined in Section 6 of Annex I, have similar exhaust emission characteristics; all members of the family shall comply with the applicable emission limit values;

(4) 'engine type' means a category of engines which do not differ in essential engine characteristics as set out in Appendix 4 to Annex I;

(5) 'vehicle type with regard to emissions and vehicle repair and maintenance information' means a group of vehicles which do not differ in essential engine and vehicle characteristics as set out in Appendix 4 to Annex I;

(6) '$deNO_x$ system' means a selective catalytic reduction (hereinafter 'SCR') system, NO_x adsorber, passive or active lean NO_x catalyst or any other exhaust after-treatment system designed to reduce emissions of oxides of nitrogen (NO_x);

(7) 'exhaust after-treatment system' means a catalyst (oxidation, 3-way or any other), particulate filter, $deNO_x$ system, combined $deNO_x$ particulate filter, or any other emission reducing device, that is installed downstream of the engine;

(8) 'on-board diagnostic (OBD) system' means a system on-board a vehicle or engine which has the capability:

(a) of detecting malfunctions, affecting the emission performance of the engine system; and

(b) of indicating their occurrence by means of an alert system; and

(c) of identifying the likely area of the malfunction by means of information stored in computer memory and communicating that information off-board;

(9) 'qualified deteriorated component or system' (hereinafter 'QDC') means a component or system that has been intentionally deteriorated such as by accelerated ageing or by having been manipulated in a controlled manner and which has been accepted by the approval authority according to the provisions set out in Section 6.3.2 of Annex 9B to UN/ECE Regulation No 49 and point 2.2 of Appendix 3 of Annex X to this Regulation for use when demonstrating the OBD performance of the engine system;

(10) 'ECU' means the engine system electronic control unit;

(11) 'diagnostic trouble code' (hereinafter 'DTC') means a numeric or alphanumeric identifier which identifies or labels a malfunction;

(12) 'portable emissions measurement system' (hereinafter 'PEMS') means a portable emissions measurement system meeting the requirements specified in Appendix 2 to Annex II;

(13) 'malfunction indicator' (hereinafter 'MI') means an indicator which is part of the alert system and which clearly informs the driver of the vehicle in the event of a malfunction;

(14) 'ageing cycle' means the vehicle or engine operation (speed, load, power) to be executed during the service accumulation period;

(15) 'critical emission-related components' means the following components which are designed primarily for emission control: any exhaust after-treatment system, the ECU and its associated sensors and actuators, and the exhaust gas recirculation (hereinafter 'EGR') system including all related filters, coolers, control valves and tubing;

(16) 'critical emission-related maintenance' means the maintenance to be performed on critical emission-related components;

(17) 'emission related maintenance' means the maintenance which substantially affects emissions or which is likely to affect emissions deterioration of the vehicle or the engine during normal in-use operation;

(18) 'engine aftertreatment system family' means a manufacturer's grouping of engines that comply with the definition of engine family, but which are further grouped into engines utilising a similar exhaust after-treatment system;

(19) 'Wobbe index (lower W_l or upper W_u)' means the ratio of the corresponding calorific value of a gas per unit volume and the square root of its relative density under the same reference conditions:

$$W = H_{gas} \times \sqrt{\rho_{air} / \rho_{gas}}$$

(20) 'λ-shift factor' (hereinafter 'S_λ') means an expression that describes the required flexibility of the engine management system regarding a change of excess-air-ratio λ if the engine is fuelled with a gas composition different from pure methane as specified in Section 4.1 of Annex 6 to UN/ECE Regulation No 49;

(21) 'non-emission-related maintenance' means the maintenance which does not substantially affect emissions and which does not have a lasting effect on the emissions deterioration of the vehicle or the engine during normal in-use operation once the maintenance is performed;

(22) 'OBD engine family' means a manufacturer's grouping of engine systems having common methods of monitoring and diagnosing emission-related malfunctions;

(23) 'scan-tool' means an external test equipment used for standardised off-board communication with the OBD system in accordance with the requirements of this Regulation;

(24) 'Auxiliary Emission Strategy' (hereinafter 'AES') means an emission strategy that becomes active and replaces or modifies a base emission strategy for a specific purpose and in response to a specific set of ambient and/or operating conditions and only remains operational as long as those conditions exist;

(25) 'Base Emission Strategy' (hereinafter 'BES') means an emission strategy that is active throughout the speed and load operating range of the engine unless an AES is activated;

(26) 'in-use performance ratio' means the ratio of the number of times that the conditions have existed under which a monitor, or group of monitors, should have detected a malfunction to the number of driving cycles of relevance to that monitor or group of monitors;

(27) 'engine start' consists of the ignition-On, cranking and start of combustion, and is completed when the engine speed reaches 150 min^{-1} below the normal, warmed-up idle speed;

(28) 'operating sequence' means a sequence consisting of an engine start, an operating period (of the engine), an engine shut-off, and the time until the next start, where a specific OBD monitor runs to completion and a malfunction would be detected if present;

(29) 'emission threshold monitoring' means monitoring of a malfunction that leads to an excess of the OBD threshold limits (OTLs) and which consists of either or both of the following:

(a) direct emissions measurement via a tailpipe emissions sensor(s) and a model to correlate the direct emissions to specific emissions of the applicable test-cycle;

(b) indication of an emissions increase via correlation of computer input and output information to test-cycle specific emissions;

(30) 'performance monitoring' means malfunction monitoring that consists of functionality checks, and the monitoring of parameters that are not directly correlated to emission thresholds, that is done on components or systems to verify that they are operating within the proper range;

(31) 'rationality failure' means a malfunction where the signal from an individual sensor or component differs from that expected when assessed against signals available from other sensors or components within the control system including cases where all of the measured signals and component output data are individually within the range associated with normal operation of the associated sensor or component and where none of the sensors or components is individually indicating a malfunction;

(32) 'total functional failure monitoring' means monitoring in order to detect a malfunction which will lead to a complete loss of the desired function of a system;

(33) 'malfunction' means a failure or deterioration of an engine system, including the OBD system, that might reasonably be expected to lead either to an increase in any of the regulated pollutants emitted by the engine system or to a reduction in the effectiveness of the OBD system;

(34) 'general denominator' means a counter indicating the number of times a vehicle has been operated, taking into account general conditions;

(35) 'ignition cycle counter' means a counter indicating the number of engine starts a vehicle has experienced;

(36) 'Driving cycle' means a sequence consisting of an engine start, an operating period (of the vehicle), an engine shut-off, and the time until the next engine start;

(37) 'group of monitors' means, for the purpose of assessing the in-use performance of an OBD engine family, a set of OBD monitors used for determining the correct operation of the emission control system;

(38) 'net power' means the power obtained on a test bench at the end of the crankshaft or its equivalent at the corresponding engine or motor speed with the auxiliaries according to Annex XIV and determined under reference atmospheric conditions;

(39) 'maximum net power' means the maximum value of the net power measured at full engine load;

(40) 'wall-flow diesel particulate filter' means a diesel particulate filter (hereinafter 'DPF') in which all the exhaust gas is forced to flow through a wall which filters out the solid matter;

(41) 'continuous regeneration' means the regeneration process of an exhaust after-treatment system that occurs either permanently or at least once per World Harmonized Transient Driving Cycle (hereinafter 'WHTC') hot start test.

Article 3

Requirements for type-approval

1 In order to receive an EC type-approval of an engine system or engine family as a separate technical unit, EC type-approval of a vehicle with an approved engine system with regard to emissions and vehicle repair and maintenance information, or an EC type-approval of a vehicle with regard to emissions and vehicle repair and maintenance information the manufacturer shall, in accordance with the provisions of Annex I, demonstrate that the vehicles or engine systems are subject to the tests and comply with the requirements set out in Annexes III to VIII, X, XIII, and XIV. The manufacturer shall also ensure compliance with the specifications of reference fuels set out in Annex IX.

2 In order to receive EC type-approval of a vehicle with an approved engine system with regard to emissions and vehicle repair and maintenance information, or an EC type-approval of a vehicle with regard to emissions and vehicle repair and maintenance information the manufacturer shall ensure compliance with the installation requirements set out in Section 4 of Annex I.

3 In order to receive an extension of the EC type-approval of a vehicle with regard to emissions and vehicle repair and maintenance information type-approved under this Regulation with a reference mass exceeding 2 380 kg but not exceeding 2 610 kg the manufacturer shall meet the requirements set out in Appendix 1 to Annex VIII.

4 The provisions for alternative approval specified in point 2.4.1 to Annex X and point 2.1 to Annex XIII shall not apply for the purpose of an EC type-approval of an engine system or engine family as a separate technical unit.

5 Any engine system and any element of design liable to affect the emission of gaseous and particulate pollutants shall be designed, constructed, assembled and installed so as to enable the engine, in normal use, to comply with the provisions of Regulation (EC) No 595/2009 and those of this Regulation. The manufacturer shall also ensure compliance with off-cycle requirements set out in Article 14 and Annex VI to this Regulation.

6 In order to receive an EC type-approval of an engine system or engine family as a separate technical unit or an EC type-approval of a vehicle with regard to emissions and vehicle repair and maintenance information the manufacturer shall ensure compliance with the requirements on fuel range for a universal fuel approval or in case of a positive-ignition engine fuelled with natural gas and LPG a restricted fuel range approval as specified in Section 1 of Annex I.

7 In order to receive an EC type-approval in the case of a petrol or E85 fuelled engine, the manufacturer shall ensure that the specific requirements for inlets to fuel tanks for petrol and E85 fuelled vehicles laid down in Section 4.3 of Annex I are fulfilled.

8 In order to receive an EC type-approval the manufacturer shall ensure that the specific requirements for electronic system security laid down in point 2.1 of Annex X are fulfilled.

9 The manufacturer shall take technical measures so as to ensure that the tailpipe emissions are effectively limited, in accordance with this Regulation, throughout the normal life of the vehicle and under normal conditions of use. Those measures shall include ensuring that the security of hoses, joints and connections, used within the emission control systems, are constructed so as to conform to the original design intent.

10 The manufacturer shall ensure that the emissions test results comply with the applicable limit value under the test conditions specified in this Regulation.

11 The manufacturer shall determine deterioration factors that will be used to demonstrate that the gaseous and particulate emissions of an engine family or engine-aftertreatment system family remain in conformity with the emission limits set out in Annex I to Regulation (EC) No 595/2009 over the normal useful life periods set out in Article 4(2) of that Regulation.

The procedures for demonstrating the compliance of an engine system or engine-aftertreatment system family over the normal useful life periods are set out in Annex VII to this Regulation.

12 For positive-ignition engines subject to the test set out in Annex IV, the maximum permissible carbon monoxide content in the exhaust gases at normal engine idling speed shall be that stated by the vehicle manufacturer. However, the maximum carbon monoxide content shall not exceed 0,3 % vol.

At high idle speed, the carbon monoxide content by volume of the exhaust gases shall not exceed 0,2 % vol., with the engine speed being at least 2 000 min^{-1} and Lambda being 1 ± 0,03 or in accordance with the specifications of the manufacturer.

13 In the case of a closed crankcase, manufacturers shall ensure that for the test set out in Annex V, the engine's ventilation system does not permit the emission of any crankcase gases into the atmosphere. If the crankcase is of an open type the emissions shall be measured and added to the tailpipe emissions following the provisions set out in Annex V.

14 When applying for type-approval, manufacturers shall present to the approval authority information showing that the deNO_x system retains its emission control function during all conditions regularly pertaining in the territory of the Union, especially at low temperatures.

In addition, manufacturers shall provide the approval authority with information on the operating strategy of any EGR system, including its functioning at low ambient temperatures.

This information shall also include a description of any effects on emissions of operating the system under low ambient temperatures.

15 Vehicles and engines shall only be type-approved according to Regulation (EC) No 595/2009 and this Regulation once measurement procedures for measuring PM number as set out in Annex I to Regulation (EC) No 595/2009, any specific provisions regarding multi-setting engines that are needed and provisions implementing Article 6 of that Regulation have been adopted.

Article 4

On-board diagnostics

1 Manufacturers shall ensure that all engine systems and vehicles are equipped with an OBD system.

2 The OBD system shall be designed, constructed and installed on a vehicle in accordance with Annex X, so as to enable it to identify, record, and communicate the types of deterioration or malfunction specified in that Annex over the entire life of the vehicle.

3 The manufacturer shall ensure that the OBD system complies with the requirements set out in Annex X, including the OBD in-use performance requirements, under all normal and reasonably foreseeable driving conditions encountered in the Union, including the conditions of normal use specified in Annex X.

4 When tested with a qualified deteriorated component, the OBD system malfunction indicator shall be activated in accordance with Annex X. The OBD system malfunction indicator may also be activated at levels of emissions below the OBD thresholds limits specified in Annex X.

5 The manufacturer shall ensure that the provisions for in-use performance of an OBD engine family laid down in Annex X are followed.

6 The OBD in-use performance related data shall be stored and made available without any encryption through the standard OBD communication protocol by the OBD system in accordance with the provisions of Annex X.

7 If the manufacturer chooses, during a period of 3 years after the dates specified in Article 8(1) and (2) of Regulation (EC) No 595/2009 OBD systems may comply with alternative provisions as specified in Annex X to this Regulation and referring to this paragraph.

8 If the manufacturer chooses, until 1 September 2014 in the case of new types of vehicles or engines and until 1 September 2015 for all new vehicles sold, registered or put into service within the Union, he may use alternative provisions for the monitoring of the DPF as set out in point 2.3.3.3 of Annex X.

Article 5

Application for EC type-approval of an engine system or engine family as a separate technical unit

1 The manufacturer shall submit to the approval authority an application for EC type-approval of an engine system or engine family as a separate technical unit.

2 The application referred to in paragraph 1 shall be drawn up in accordance with the model of the information document set out in Appendix 4 to Annex I. For that purpose Part 1 of that Appendix shall apply.

3 Together with the application, the manufacturer shall provide a documentation package that fully explains any element of design which affects emissions, the emission control strategy of the engine system, the means by which the engine system controls the output variables which have a bearing upon emissions, whether that control is direct or indirect, and fully explains the warning and inducement system required by Sections 4 and 5 of Annex XIII. The documentation package shall consist of the following parts including the information set out in Section 8 to Annex I:

a a formal documentation package that shall be retained by the approval authority. The formal documentation package may be made available to interested parties upon request;

b an extended documentation package that shall remain confidential. The extended documentation package may be kept by the approval authority, or be retained by the manufacturer, at the discretion of the approval authority, but shall be made available for inspection by the approval authority at the time of approval or at any time during the validity of the approval. When the documentation package is retained by the manufacturer, the approval authority shall take the necessary measures to ensure that the documentation is not being altered after approval.

4 In addition to the information referred to in paragraph 3, the manufacturer shall submit the following information:

a in the case of positive-ignition engines, a declaration by the manufacturer of the minimum percentage of misfires out of a total number of firing events that either would result in emissions exceeding the limits set out in Annex X if that percentage of misfire had been present from the start of the emission test as set out in Annex III or could lead to an exhaust catalyst, or catalysts, overheating prior to causing irreversible damage;

b a description of the provisions taken to prevent tampering with and modification of the emission control computer(s) including the facility for updating using a manufacturer-approved programme or calibration;

c documentation of the OBD system, in accordance with the requirements set out in Section 5 to Annex X;

d OBD related information for the purpose of access to OBD and repair and maintenance information, in accordance with the requirements of this Regulation;

e a Statement of Off-Cycle Emission compliance with the requirements of Article 14 and Section 9 to Annex VI;

f a Statement of OBD in-use Performance compliance with the requirements of Appendix 6 to Annex X;

g a Statement of compliance with the requirements on access to OBD and repair and maintenance information;

h the initial plan for in-service testing according to point 2.4 of Annex II;

i where appropriate, copies of other type-approvals with the relevant data to enable extension of approvals and establishment of deterioration factors.

5 The manufacturer shall submit to the technical service responsible for the type-approval tests an engine or, as appropriate, a parent engine representative of the type to be approved.

6 Changes to the make of a system, component or separate technical unit that occur after a type-approval shall not automatically invalidate a type-approval, unless its original characteristics or technical parameters are changed in such a way that the functionality of the engine or pollution control system is affected.

Article 6

Administrative provisions for EC type-approval of an engine system or engine family as a separate technical unit

1 If all the relevant requirements are met, the approval authority shall grant an EC type-approval of an engine system or engine family as a separate technical unit and issue a type-approval number in accordance with the numbering system set out in Annex VII to Directive 2007/46/EC.

Without prejudice to the provisions of Annex VII to Directive 2007/46/EC, Section 3 of the type-approval number shall be drawn up in accordance with Appendix 9 to Annex I to this Regulation.

An approval authority shall not assign the same number to another engine type.

2 When granting an EC type-approval under paragraph 1, the approval authority shall issue an EC type-approval certificate using the model set out in Appendix 5 to Annex I.

Article 7

Application for EC type-approval of a vehicle with an approved engine system with regard to emissions and access to vehicle repair and maintenance information

1 The manufacturer shall submit to the approval authority an application for EC type-approval of a vehicle with an approved engine system with regard to emissions and access to vehicle repair and maintenance information.

2 The application referred to in paragraph 1 shall be drawn up in accordance with the model of the information document set out in Part 2 of Appendix 4 to Annex I. This application shall be accompanied by a copy of the EC type-approval certificate for the engine system or engine family as a separate technical unit issued in accordance with Article 6.

3 The manufacturer shall provide a documentation package that fully explains the elements of the warning and inducement system that is on board the vehicle and required by Annex XIII. This documentation package shall be provided in accordance with Article 5(3).

4 In addition to the information referred to in paragraph 3, the manufacturer shall submit the following information:

a a description of the measures taken to prevent tampering with and modification of the vehicle control units covered by this Regulation including the facility for updating using a manufacturer-approved programme or calibration;

b a description of the OBD components on board of the vehicle, in accordance with the requirements of Section 5 of Annex X;

c information related to the OBD components on board the vehicle for the purpose of access to OBD and repair and maintenance information;

d a statement of compliance with the requirements on access to OBD and repair and maintenance information;

e where appropriate, copies of other type-approvals with the relevant data to enable extension of approvals.

5 Changes to the make of a system, component or separate technical unit that occur after a type-approval shall not automatically invalidate a type-approval, unless its original characteristics or technical parameters are changed in such a way that the functionality of the engine or pollution control system is affected.

Article 8

Administrative provisions for EC type-approval of a vehicle with an approved engine system with regard to emissions and access to vehicle repair and maintenance information

1 If all the relevant requirements are met, the approval authority shall grant an EC type-approval of a vehicle with an approved engine system with regard to emissions and access to vehicle repair and maintenance information and issue a type-approval number in accordance with the numbering system set out in Annex VII to Directive 2007/46/EC.

Without prejudice to the provisions of Annex VII to Directive 2007/46/EC, Section 3 of the type-approval number shall be drawn up in accordance with Appendix 9 to Annex I to this Regulation.

An approval authority shall not assign the same number to another vehicle type.

2 When granting an EC type-approval under paragraph 1, the approval authority shall issue an EC type-approval certificate using the model set out in Appendix 6 to Annex I.

Article 9

Application for EC type-approval of a vehicle with regard to emissions and access to vehicle repair and maintenance information

1 The manufacturer shall submit to the approval authority an application for EC type-approval of a vehicle with regard to emissions and access to vehicle repair and maintenance information.

2 The application referred to in paragraph 1 shall be drawn up in accordance with the model of the information document set out in Appendix 4 to Annex I. For that purpose Parts 1 and 2 of that Appendix shall apply.

3 The manufacturer shall provide a documentation package that fully explains any element of design which affects emissions, the emission control strategy of the engine system, the means by which the engine system controls the output variables which have a bearing upon emissions, whether that control is direct or indirect, and fully explains the warning and inducement system required by Annex XIII. This documentation package shall be provided in accordance with Article 5(3).

4 In addition to the information referred to in paragraph 3, the manufacturer shall submit the information required by Article 5(4)(a) to (i) and Article 7(4)(a) to (e).

5 The manufacturer shall submit to the technical service responsible for the type-approval tests an engine representative of the type to be approved.

6 Changes to the make of a system, component or separate technical unit that occur after a type-approval shall not automatically invalidate a type-approval, unless its original characteristics or technical parameters are changed in such a way that the functionality of the engine or pollution control system is affected.

Article 10

Administrative provisions for EC type-approval of a vehicle with regard to emissions and access to vehicle repair and maintenance information

1 If all the relevant requirements are met, the approval authority shall grant an EC type-approval of a vehicle with regard to emissions and access to vehicle repair and maintenance information and issue a type-approval number in accordance with the numbering system set out in Annex VII to Directive 2007/46/EC.

Without prejudice to the provisions of Annex VII to Directive 2007/46/EC, Section 3 of the type-approval number shall be drawn up in accordance with Appendix 9 to Annex I to this Regulation.

An approval authority shall not assign the same number to another vehicle type.

2 When granting an EC type-approval under paragraph 1, the approval authority shall issue an EC type-approval certificate using the model set out in Appendix 7 to Annex I.

Article 11

Conformity of production

1 Measures to ensure the conformity of production shall be taken in accordance with the provisions of Article 12 of Directive 2007/46/EC.

2 Conformity of production shall be checked on the basis of the description in the type-approval certificates set out in Appendices 5, 6 and 7 to Annex I, as applicable.

3 Conformity of production shall be assessed in accordance with the specific conditions laid down in Section 7 of Annex I and the relevant statistical methods laid down in Appendices 1, 2 and 3 to that Annex.

Article 12

In-service conformity

1 Measures to ensure in-service conformity of vehicles or engine systems type-approved under this Regulation or Directive 2005/55/EC of the European Parliament and of the Council[(1)] shall be taken in accordance with Article 12 of Directive 2007/46/EC, and complying with the requirements of Annex II to this Regulation in the case of vehicles or engine systems type-approved under this Regulation and with the requirements of Annex XII to this Regulation in the case of vehicles or engine systems type-approved under Directive 2005/55/EC.

2 The technical measures taken by the manufacturer shall be such as to ensure that the tailpipe emissions are effectively limited, throughout the normal life of the vehicles under normal conditions of use. The conformity with the provisions of this Regulation shall be checked over the normal useful life of an engine system installed in a vehicle under normal conditions of use as specified in Annex II to this Regulation.

3 The manufacturer shall report the results of the in-service testing to the approval authority which granted the original type-approval in accordance with the initial plan submitted at type-approval. Any deviation from the initial plan shall be justified to the satisfaction of the approval authority.

4 If the approval authority which granted the original type-approval is not satisfied with the manufacturer's reporting in accordance with Section 10 of Annex II, or has reported evidence of unsatisfactory in-service conformity, the authority may order the manufacturer to run a test for confirmatory purposes. The approval authority shall examine the confirmatory test report supplied by the manufacturer.

5 Where the approval authority which granted the original type-approval is not satisfied with the results of in-service tests or confirmatory tests in accordance with the criteria set out in Annex II, or based on in-service testing conducted by a Member State, it shall require the manufacturer to submit a plan of remedial measures to remedy the non-conformity in accordance with Article 13 and Section 9 of Annex II.

6 Any Member State may conduct and report its own surveillance testing, based on the in-service conformity testing procedure set out in Annex II. Information on the procurement, maintenance, and manufacturer's participation in the activities shall be recorded. On request by an approval authority the approval authority that granted the original type-approval shall provide the necessary information about the type-approval to enable testing in accordance with the procedure set out in Annex II.

7 If a Member State demonstrates that an engine or vehicle type does not conform to the applicable requirements of this Article and Annex II, it shall notify through its own approval authority without delay the approval authority which granted the original type-approval in accordance with the requirements of Article 30(3) of Directive 2007/46/EC.

Following that notification and subject to the provision of Article 30(6) of Directive 2007/46/EC, the approval authority of the Member State which granted the original type-approval shall promptly inform the manufacturer that an engine or vehicle type fails to satisfy the requirements of these provisions.

8 Following the notification referred to in paragraph 7 and in cases where earlier in-service conformity testing showed conformity, the approval authority which granted the original

type-approval may require the manufacturer to perform additional confirmatory tests after consultation with the experts of the Member State that reported the failing vehicle.

If no such test data is available, the manufacturer shall, within 60 working days after receipt of the notification referred to in paragraph 7, either submit to the approval authority which granted the original type-approval a plan of remedial measures in accordance with Article 13 or perform additional in-service conformity testing with an equivalent vehicle to verify whether the engine or vehicle type fails the requirements. In the case where the manufacturer can demonstrate to the satisfaction of the approval authority that further time is required to perform additional testing, an extension may be granted.

9 Experts of the Member State that reported the failing engine or vehicle type in accordance with paragraph 7 shall be invited to witness the additional in-service conformity tests referred to in paragraph 8. Additionally, the results of the tests shall be reported to that Member State and the approval authorities.

If these in-service conformity tests or confirmatory tests confirm the non-conformance of the engine or vehicle type, the approval authority shall require the manufacturer to submit a plan of remedial measures to remedy the non-conformity. The plan of remedial measures shall comply with the provisions of Article 13 and Section 9 of Annex II.

If those in-service conformity tests or confirmatory tests show conformity the manufacturer shall submit a report to the approval authority which granted the original type-approval. The report shall be submitted by the approval authority which granted the original type-approval to the Member State that reported the failing vehicle type and the approval authorities. It shall contain the test results according to Section 10 of Annex II.

10 The approval authority which granted the original type-approval shall keep the Member State which had established that the engine or vehicle type did not conform to the applicable requirements informed of the progress and results of the discussions with the manufacturer, the verification tests and the remedial measures.

Article 13

Remedial measures

1 On request of the approval authority and following in-service testing in accordance with Article 12 the manufacturer shall submit the plan of remedial measures to the approval authority no later than 60 working days after receipt of the notification from the approval authority. Where the manufacturer can demonstrate to the satisfaction of the approval authority that further time is required to investigate the reason for the non-compliance in order to submit a plan of remedial measures, an extension may be granted.

2 The remedial measures shall apply to all engines in service belonging to the same engine families or OBD engine families and be extended also to engine families or OBD engine families which are likely to be affected with the same defects. The need to amend the type-approval documents shall be assessed by the manufacturer and the result reported to the approval authority.

3 The approval authority shall consult the manufacturer in order to secure agreement on a plan of remedial measures and on executing the plan. If the approval authority which granted the original type-approval establishes that no agreement can be reached, the procedure set out in Article 30(1) and 30(5) of Directive 2007/46/EC shall be initiated.

4 The approval authority shall within 30 working days from the date on which it has received the plan of remedial measures from the manufacturer, approve or reject the plan of remedial measures. The approval authority shall within the same time also notify the manufacturer and all Member States of its decision to approve or reject the plan of remedial measures.

5 The manufacturer shall be responsible for the execution of the approved plan of remedial measures.

6 The manufacturer shall keep a record of every engine system or vehicle recalled and repaired or modified and of the workshop which performed the repair. The approval authority shall have access to that record on request during the execution and for a period of 5 years after the completion of the execution of the plan.

7 Any repair or modification referred to in paragraph 6 shall be recorded in a certificate supplied by the manufacturer to the owner of the engine or vehicle.

Article 14

Requirements to limit off-cycle emissions

1 The manufacturer shall take all necessary measures, in accordance with this Regulation and Article 4 of Regulation (EC) No 595/2009, so as to ensure that the tailpipe emissions are effectively limited throughout the normal life of the vehicle and under all normal conditions of use.

Those measures shall take the following into account:

a the general requirements including the performance requirements and the prohibition of defeat strategies;

b the requirements to effectively limit the tailpipe emissions under the range of ambient conditions under which the vehicle may be expected to operate, and under the range of operating conditions that may be encountered;

c the requirements with respect to off-cycle laboratory testing at type-approval;

d any additional requirements with respect to off-cycle in-use vehicle testing, as provided for in this Regulation;

e the requirement for the manufacturer to provide a statement of compliance with the requirements limiting off-cycle emissions.

2 The manufacturer shall fulfil the specific requirements, together with the associated test procedures, set out in Annex VI.

3 Any additional requirements with respect to off-cycle in-use vehicle testing referred to in point (d) of paragraph 1 shall be introduced after the assessment of the PEMS procedures set out in Annex II. The assessment shall be finalised by 31 December 2014.

Article 15

Pollution control devices

1 The manufacturer shall ensure that replacement pollution control devices intended to be fitted to EC type-approved engine systems or vehicles covered by Regulation (EC) No 595/2009 are EC type-approved, as separate technical units in accordance with the requirements of this Article and of Articles 16 and 17.

Catalytic converters, deNO$_x$ devices and particulate filters shall be considered to be pollution control devices for the purposes of this Regulation.

2 Original replacement pollution control devices, which fall within the type covered by point 3.2.12 of Appendix 4 to Annex I and are intended for fitment to a vehicle to which the relevant type-approval document refers, do not need to comply with all provisions of Annex XI provided that they fulfil the requirements of points 2.1, 2.2 and 2.3 of that Annex.

3 The manufacturer shall ensure that the original pollution control device carries identification markings.

4 The identification markings referred to in paragraph 3 shall comprise the following:

a the vehicle or engine manufacturer's name or trade mark;

b the make and identifying part number of the original pollution control device as recorded in the information referred to in point 3.2.12.2 of Appendix 4 to Annex I.

5 Replacement pollution control devices shall only be type-approved according to Regulation (EC) No 595/2009 and this Regulation once the specific testing requirements are introduced in Annex XI to this Regulation.

Article 16

Application for EC type-approval of a type of replacement pollution control device as a separate technical unit

1 The manufacturer shall submit to the approval authority an application for EC type-approval of a type of replacement pollution control device as a separate technical unit.

2 The application shall be drawn up in accordance with the model of the information document set out in Appendix 1 to Annex XI.

3 The manufacturer shall submit a statement of compliance with the requirements on access to OBD and repair and maintenance information.

4 The manufacturer shall submit to the technical service responsible for the type-approval test the following:

a an engine system or engine systems of a type-approved in accordance with this Regulation equipped with a new original equipment pollution control device;

b one sample of the type of the replacement pollution control device;

c an additional sample of the type of the replacement pollution control device, in the case of a replacement pollution control device intended to be fitted to a vehicle equipped with an OBD system.

5 For the purposes of point (a) of paragraph 4, the test engines shall be selected by the applicant with the agreement of the approval authority.

The test conditions shall comply with the requirements set out in Section 6 of Annex 4B to UN/ECE Regulation No 49.

The test engines shall respect the following requirements:

a they shall have no emission control system defects;

b any malfunctioning or excessively worn emission-related original part shall be repaired or replaced;

c they shall be tuned properly and set to the manufacturer's specification prior to emission testing.

6 For the purposes of points (b) and (c) of paragraph 4, the sample shall be clearly and indelibly marked with the applicant's trade name or mark and its commercial designation.

7 For the purposes of point (c) of paragraph 4, the sample shall be a qualified deteriorated component.

Article 17

Administrative provisions for EC type-approval of replacement pollution control device as separate technical unit

1 If all the relevant requirements are met, the approval authority shall grant an EC type-approval for replacement pollution control devices as separate technical units and issue a type-approval number in accordance with the numbering system set out in Annex VII to Directive 2007/46/EC.

The approval authority shall not assign the same number to another replacement pollution control device type.

The same type-approval number may cover the use of that replacement pollution control device type on a number of different vehicle or engine types.

2 For the purposes of paragraph 1, the approval authority shall issue an EC type-approval certificate established in accordance with the model set out in Appendix 2 to Annex XI.

3 If the manufacturer is able to demonstrate to the approval authority that the replacement pollution control device is of a type referred to in point 3.2.12.2 of Appendix 4 to Annex I, the granting of a type-approval shall not be dependent on verification of compliance with the requirements set out in Section 4 of Annex XI.

Article 18

Amendments to Regulation (EC) No 595/2009

Regulation (EC) No 595/2009 is amended in accordance with Annex XV to this Regulation.

Article 19

Amendments to Directive 2007/46/EC

Directive 2007/46/EC is amended in accordance with Annex XVI to this Regulation.

Article 20

Entry into force

This Regulation shall enter into force on the 20th day following its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 25 May 2011.

For the Commission

The President

José Manuel BARROSO

(**1**) OJ L 275, 20.10.2005, p. 1.