

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)

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ANNEX I

ADMINISTRATIVE PROVISIONS FOR EC TYPE-APPROVAL

1. REQUIREMENTS ON FUEL RANGE
 - 1.1. Requirements on universal fuel range type-approval
 - 1.1.1. The parent engine shall meet the requirements of this Regulation...

- 1.1.2. If the manufacturer permits to operate the engine family to...
 - 1.1.3. In the case of a natural gas fuelled engine the...
 - 1.1.3.1. At the manufacturer's request the engine may be tested on...
 - 1.1.4. In the case of an engine fuelled with natural gas...
 - 1.1.4.1. At the manufacturer's request the engine may be tested on...
 - 1.1.5. In the case of natural gas engines, the ratio of...
 - 1.1.6. In the case of LPG the manufacturer shall demonstrate the...
 - 1.1.6.1. The ratio of emission results 'r' shall be determined for...
 - 1.2. Requirements on restricted fuel range type-approval in case of positive-ignition...
 - 1.2.1. Exhaust emissions type-approval of an engine running on natural gas...
 - 1.2.1.1. At the manufacturer's request the engine may be tested on...
 - 1.2.1.2. The ratio of emission results 'r' shall be determined for...
 - 1.2.1.3. On delivery to the customer the engine shall bear a...
 - 1.2.2. Exhaust emissions type-approval of an engine running on natural gas...
 - 1.2.2.1. At the manufacturer's request the engine may be tested on...
 - 1.2.2.2. On delivery to the customer the engine shall bear a...
2. EXHAUST EMISSIONS TYPE-APPROVAL OF A MEMBER OF A FAMILY
 - 2.1. With the exception of the case mentioned in point 2.2,...
 - 2.2. If the technical service determines that, with regard to the...
3. ENGINE MARKINGS
 - 3.1. In the case of an engine type approved as a...
 - 3.2. Every engine conforming to the type approved under this Regulation...
 - 3.3. Labels for NG and LPG fuelled engines
 - 3.3.1. The following information shall be given on the label:
 - 3.3.2. Properties
 - 3.3.3. Placing
 - 3.4. In case of an application for EC type-approval of a...
4. INSTALLATION ON THE VEHICLE
 - 4.1. The engine installation on the vehicle shall be performed in...
 - 4.2. Installation of a type-approved engine on a vehicle
 - 4.3. Inlet to fuel tanks in the case of a petrol...
 - 4.3.1. The inlet orifice of the petrol or E85 tank shall...
 - 4.3.2. Point 4.3.1 shall not apply to a vehicle for which...
 - 4.3.3. Provision shall be made to prevent excess evaporative emissions and...
5. REQUIREMENTS AND TESTS FOR IN-SERVICE TESTING
 - 5.1. Introduction
 - 5.2. General Requirements
 - 5.2.1. For the purpose of in-service testing, the calculated load (engine...
 - 5.2.2. The output torque may be estimated by the ECU using...
 - 5.2.3. The engine torque in Nm resulting from the above data...
 - 5.2.4. Access to the information required in point 5.2.1 shall be...
 - 5.2.5. The average load at each operating condition in Nm calculated...
 - 5.2.6. External access to the information required in point 5.2.1 shall...
 - 5.3. Verification of the availability and conformity of the ECU information...
 - 5.3.1. The availability of the data stream information required in point...
 - 5.3.2. In the case where this information cannot be retrieved in...
 - 5.3.3. The conformity of the ECU torque signal to the requirements...
 - 5.3.4. In the case where the engine under test does not...

5.3.5. The conformity of the ECU torque signal is considered to...

6. ENGINE FAMILY

- 6.1. Parameters defining the engine family
- 6.2. Choice of the parent engine
- 6.3. Parameters for defining an OBD engine family

7. CONFORMITY OF PRODUCTION

- 7.1. General requirements
- 7.2. Emissions of pollutants
 - 7.2.1. If emissions of pollutants are to be measured and an...
 - 7.2.2. Conformity of the engine subjected to a pollutant test:
 - 7.2.2.1. Three engines shall be taken from the series production of...
 - 7.2.2.2. Where the approval authority is satisfied with the production standard...
 - 7.2.2.3. On the basis of tests of the engine by sampling...
 - 7.2.3. The tests shall be carried out on newly manufactured engines....
 - 7.2.3.1. At the request of the manufacturer, the tests may be...
 - 7.2.3.2. When the manufacturer requests to conduct a running-in procedure in...
 - 7.2.3.3. For diesel, ethanol (ED95), petrol, E85 and LPG fuelled engines,...
 - 7.2.3.4. For NG fuelled engines, all these tests may be conducted...
 - 7.2.3.5. In the case of dispute caused by the non-compliance of...
 - 7.2.3.6. Tests for conformity of production of a gas fuelled engine...
- 7.3. On-board diagnostics (OBD)
 - 7.3.1. When the approval authority determines that the quality of production...
 - 7.3.2. The production is deemed to conform if this engine meets...
 - 7.3.3. If the engine taken from the series production does not...
 - 7.3.4. The production is deemed to conform if at least three...
- 7.4. ECU information required for in-service testing
 - 7.4.1. The availability of the data stream information requested in point...
 - 7.4.2. In the case where this information cannot be retrieved in...
 - 7.4.3. The conformity of the ECU torque signal with the requirements...
 - 7.4.4. In the case where the test equipment does not match...
 - 7.4.5. The conformity of the ECU torque signal shall be considered...
 - 7.4.6. The availability and conformity checks of the ECU information required...
 - 7.4.7. The results of the manufacturer's survey shall be made available...
 - 7.4.8. At the request of the approval authority, the manufacturer shall...

8. DOCUMENTATION

- 8.1. The documentation package required by Articles 5, 7 and 9...
- 8.2. The formal documentation package may be brief, provided that it...
- 8.3. The extended documentation package shall include information on the operation...
 - 8.3.1. The extended documentation package shall remain strictly confidential. It may...

Appendix 1

Procedure for production conformity testing when standard deviation is satisfactory

1. This Appendix describes the procedure to be used to verify...

Appendix 2

Procedure for production conformity testing when
standard deviation is unsatisfactory or unavailable

1. This Appendix describes the procedure to be used to verify...

Appendix 3

Procedure for production conformity testing at manufacturer's request

1. This Appendix describes the procedure to be used to verify,...

Appendix 4

Models of information document

relating to:

EC type-approval of an engine or engine family as a...

The following information shall be supplied in triplicate and
include...

If the systems, components or separate technical units referred
to...

Part 1 ESSENTIAL CHARACTERISTICS OF THE (PARENT)
ENGINE AND THE...

Appendix to information document: Information on test
conditions

PHOTOGRAPHS AND/OR DRAWINGS OF THE PARENT
ENGINE, ENGINE TYPE AND,...

LIST FURTHER ATTACHMENTS IF ANY.

DATE, FILE

Explanatory notes (regarding filling in the table):

Appendix

to information document

Information on test conditions

1. Spark plugs
 - 1.1. Make:
 - 1.2. Type:
 - 1.3. Spark-gap setting:
2. Ignition coil
 - 2.1. Make:

- 2.2. Type:
3. Lubricant used
 - 3.1. Make:
 - 3.2. Type: (state percentage of oil in mixture if lubricant and...
4. Engine-driven equipment
 - 4.1. The power absorbed by the auxiliaries/equipment needs only be determined,...
 - 4.2. Enumeration and identifying details:
 - 4.3. Power absorbed at engine speeds specific for emissions test
5. Engine performance (declared by manufacturer) (8)
 - 5.1. Engine test speeds for emissions test according to Annex III (9)...
 - 5.2. Declared values for power test according to Annex XIV to...
6. Dynamometer load setting information (if applicable)
 - 6.3. Fixed load curve dynamometer setting information (if used)
 - 6.4. Adjustable load curve dynamometer setting information (if used)
7. Test conditions for OBD testing
 - 7.1. Test cycle used for the verification of the OBD system:...
 - 7.2. Number of preconditioning cycles used before OBD verification tests:

Appendix 5

Model of EC type-approval certificate of an engine type/component as separate technical unit

Explanatory foot notes can be found in Appendix 10 to...
Maximum format: A4 (210 × 297 mm)

EC TYPE-APPROVAL CERTIFICATE

SECTION I

0.1. Make (trade name of manufacturer):

- 0.1. Make (trade name of manufacturer):
- 0.2. Type:
- 0.3. Means of identification of type, if marked on the component/separate...
- 0.4. Name and address of manufacturer:
- 0.5. In the case of components and separate technical units, location...
- 0.6. Name(s) and address(es) of assembly plant(s):
- 0.7. Name and address of the manufacturer's representative (if any)

SECTION II

1. Additional information (where applicable): see Addendum

1. Additional information (where applicable): see Addendum
2. Technical service responsible for carrying out the tests:
3. Date of test report:
4. Number of test report:
5. Remarks (if any): see Addendum
6. Place:
7. Date:
8. Signature:

Addendum

to EC type-approval certificate No ...

1. ADDITIONAL INFORMATION
 - 1.1. Particulars to be completed in relation to the type-approval of...
 - 1.2. If the engine referred to in 1.1 has been type...
 - 1.3. Particulars to be completed in relation to the type-approval of...
 - 1.4. Emission levels of the engine/parent engine (1):
 - 1.4.1. WHSC test
 - 1.4.2. WHTC test
 - 1.4.3. Idle test
 - 1.5. Power measurement
 - 1.5.1. Engine power measured on test bench
 - 1.5.2. Additional data

Appendix 6

Model of ECT type-approval certificate of a type of vehicle with an approved engine

Explanatory foot notes can be found in Appendix 10 to...
Maximum format: A4 (210 × 297 mm)

EC TYPE-APPROVAL CERTIFICATE

SECTION I

0.1. Make (trade name of manufacturer):

- 0.1. Make (trade name of manufacturer):
- 0.2. Type:
- 0.3. Means of identification of type, if marked on the component/separate...
 - 0.3.1. Location of that marking:
- 0.4. Name and address of manufacturer:
- 0.5. In the case of components and separate technical units, location...
- 0.6. Name(s) and address(es) of assembly plant(s):
- 0.7. Name and address of the manufacturer's representative (if any)

SECTION II

1. Additional information (where applicable): see Addendum

1. Additional information (where applicable): see Addendum
2. Technical service responsible for carrying out the tests:
3. Date of test report:
4. Number of test report:
5. Remarks (if any): see Addendum
6. Place:
7. Date:
8. Signature:

Appendix 7

Model of EC type-approval certificate of a type of vehicle with regard to a system

Explanatory foot notes can be found in Appendix 10 to...

Maximum format: A4 (210 × 297 mm)

EC TYPE-APPROVAL CERTIFICATE

SECTION I

0.1. Make (trade name of manufacturer):

- 0.1. Make (trade name of manufacturer):
- 0.2. Type:
- 0.2.1. Commercial name(s) (if available):
- 0.3. Means of identification of type, if marked on the vehicle (1) (a):...
- 0.3.1. Location of that marking:
- 0.4. Category of vehicle (b):
- 0.5. Name and address of manufacturer:
- 0.6. Name(s) and address(es) of assembly plant(s):
- 0.7. Name and address of the manufacturer's representative (if any):

SECTION II

1. Additional information (where applicable): see Addendum

- 1. Additional information (where applicable): see Addendum
- 2. Technical service responsible for carrying out the tests:
- 3. Date of test report:
- 4. Number of test report:
- 5. Remarks (if any): see Addendum
- 6. Place:
- 7. Date:
- 8. Signature:

Addendum

to EC type-approval certificate No ...

- 1. ADDITIONAL INFORMATION
 - 1.1. Particulars to be completed in relation to the type-approval of...
 - 1.2. If the engine referred to in 1.1 has been type-approved...
 - 1.3. Particulars to be completed in relation to the type-approval of...
 - 1.4. Emission levels of the engine/parent engine (1):
 - 1.4.1. WHSC test
 - 1.4.2. WHTC test
 - 1.4.3. Idle test
 - 1.5. Power measurement
 - 1.5.1. Engine power measured on test bench
 - 1.5.2. Additional data

Appendix 8

Example of the EC type-approval mark

The approval mark in this Appendix affixed to an engine...

Appendix 9

EC Type-Approval Certification Numbering System

1. Section 3 of the EC type-approval number issued according to...

Appendix 10

Explanatory notes

- (1) Delete where not applicable (there are cases where nothing needs...
- (2) Specify the tolerance.
- (3) Please fill in here the upper and lower values for...
- (4) To be documented in case of a single OBD engine...
- (5) Fuel consumption for the combined WHTC including cold and hot...
- (6) To be documented if not documented in the documentation referred...
- (7) Delete as appropriate.
- (8) Information concerning engine performance shall only be given for the...
- (9) Specify the tolerance; to be within ± 3 % of the...
- (a) If the means of identification of type contains characters not...
- (b) Classified according to definitions listed in Section A of Annex...
- (l) This figure shall be rounded off to the nearest tenth...
- (m) This value shall be calculated and rounded off to the...
- (n) Determined in accordance with the requirements of Annex XIV.

ANNEX II

CONFORMITY OF IN-SERVICE ENGINES OR VEHICLES

1. INTRODUCTION
 - 1.1. This Annex sets out requirements for checking and demonstrating the...
2. PROCEDURE FOR IN-SERVICE CONFORMITY
 - 2.1. The conformity of in-service vehicles or engines of an engine...
 - 2.2. If the normal in-service conditions of a particular vehicle are...
 - 2.3. The manufacturer shall demonstrate to the approval authority that the...
 - 2.4. The manufacturer shall report the schedule and the sampling plan...
 - 2.5. Vehicles without a communication interface which permits the collection of...
 - 2.6. Vehicles where the collection of ECU data influences the vehicle...
3. ENGINE OR VEHICLE SELECTION
 - 3.1. After the granting of type-approval for an engine family the...
 - 3.1.1. With a minimum sample size of three engines the sampling...
 - 3.1.2. The test statistic quantifying the cumulative number of non-conforming tests...
 - 3.1.3. The pass or fail decision of the lot shall be...

- 3.2. The engines and vehicles selected shall be used and registered...
 - 3.3. Each vehicle tested shall have a maintenance record to show...
 - 3.4. The OBD system shall be checked for proper functioning of...
 - 3.5. The engine or vehicle shall exhibit no indications of abuse...
 - 3.6. All emission control system components on the vehicle shall be...
 - 3.7. In agreement with the approval authority, the manufacturer may run...
4. TEST CONDITIONS
 - 4.1. Vehicle payload
 - 4.2. Ambient conditions
 - 4.3. Engine coolant temperature
 - 4.4. The lubricating oil, fuel and reagent shall be within the...
 - 4.4.1. Lubricating oil
 - 4.4.2. Fuel
 - 4.4.2.1. If the manufacturer in accordance with Section 1 of Annex...
 - 4.4.3. Reagent
 - 4.5. Trip requirements
 - 4.5.1. For M1 and N1 vehicles the trip shall consist of...
 - 4.5.2. For M2 and M3 vehicles the trip shall consist of...
 - 4.5.3. For N2 vehicles the trip shall consist of approximately 45 %...
 - 4.5.4. For N3 vehicles the trip shall consist of approximately 20 %...
 - 4.5.5. The following distribution of the characteristic trip values from the...
 - 4.6. Operational requirements
 - 4.6.1. The trip shall be selected in such a way that...
 - 4.6.2. Emissions and other data sampling shall start prior to starting...
 - 4.6.3. It shall not be permitted to combine data of different...
 - 4.6.4. If the engine stalls, it may be restarted, but the...
 - 4.6.5. The minimum test duration shall be long enough to complete...
 - 4.6.6. The electrical power to the PEMS system shall be supplied...
 - 4.6.7. The installation of the PEMS equipment shall not influence the...
 - 4.6.8. It is recommended to operate the vehicles under normal daytime...
 - 4.6.9. If the approval authority is not satisfied with the data...
 - 4.6.10. The same route shall be used for the tests of...
5. ECU DATA STREAM
 - 5.1. Verification of the availability and conformity of the ECU data...
 - 5.1.1. The availability of the data stream information according to the...
 - 5.1.1.1. If that information cannot be retrieved by the PEMS system...
 - 5.1.1.1.1. In the case where this information can be retrieved by...
 - 5.1.1.1.2. In the case where that information cannot be retrieved in...
 - 5.1.2. The conformity of the torque signal calculated by the PEMS...
 - 5.1.2.1. The method used to check this conformity is described in...
 - 5.1.2.2. The conformity of the ECU torque signal is considered to...
 - 5.1.2.3. If the calculated torque does not remain within the full...
6. EMISSIONS EVALUATION
 - 6.1. The test shall be conducted and the test results shall...
 - 6.2. The conformity factors shall be calculated and presented for both...
 - 6.3. The 90 % cumulative percentile of the exhaust emission conformity factors...
7. EVALUATION OF IN-SERVICE CONFORMITY RESULTS

- 7.1. On the basis of the in-service conformity report referred to...
8. CONFIRMATORY VEHICLE TESTING
 - 8.1. Confirmatory testing is done for the purpose of confirmation of...
 - 8.2. Approval authorities may conduct confirmatory testing.
 - 8.3. The confirmatory test shall be performed as vehicle testing as...
 - 8.4. A test result may be regarded as non-satisfactory when, from...
9. PLAN OF REMEDIAL MEASURES
 - 9.1. The manufacturer shall submit a report to the approval authority...
 - 9.2. The manufacturer shall provide a copy of all communications related...
 - 9.3. The manufacturer shall assign a unique identifying name or number...
 - 9.4. The manufacturer shall present a plan of remedial measures which...
 - 9.4.1. A description of each engine system type included in the...
 - 9.4.2. A description of the specific modifications, alterations, repairs, corrections, adjustments,...
 - 9.4.3. A description of the method by which the manufacturer informs...
 - 9.4.4. A description of the proper maintenance or use, if any,...
 - 9.4.5. A description of the procedure to be followed by engine...
 - 9.4.6. A copy of the information transmitted to the engine or...
 - 9.4.7. A brief description of the system which the manufacturer uses...
 - 9.4.8. A copy of all instructions to be sent to those...
 - 9.4.9. A description of the impact of the proposed remedial measures...
 - 9.4.10. Any other information, reports or data the approval authority may...
 - 9.4.11. Where the plan of remedial measures includes a recall, a...
 - 9.5. The manufacturer may be required to conduct reasonably designed and...
10. REPORTING PROCEDURES
 - 10.1. A technical report shall be submitted to the approval authority...
 - 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...
 - 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...
 - 10.1.1.9 Means and location of identification of type, if marked on...
 - 10.1.1.10 Category of vehicle.
 - 10.1.1.11 Type of engine: petrol, ethanol (E85), diesel/NG /LPG/ethanol (ED95) (Delete...
 - 10.1.1.12 The numbers of the type-approvals applicable to the engine types...
 - 10.1.1.13 Details of extensions, field fixes/recalls to those type-approvals for the...
 - 10.1.1.14 The engine build period covered within the manufacturer's information (e.g....
 - 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.
 - 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,...)
 - 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 DeNOx 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)
 - 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...)
 - 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,...
 - 10.1.7.7 Shares of the time of the trip characterised by accelerating,...
- 10.1.8. Instantaneous measured data
 - 10.1.8.1 THC concentration [ppm].
 - 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...)
 - 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].

- 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 NOx 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 NOx conformity factor [-].
- 10.1.9.24 CO2 mass window CH4 conformity factor [-] for P.I. engines...
- 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 NOx 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 HHC emissions [g].
 - 10.1.10.9 EO emissions [g].
 - 10.1.10.10 NOx 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 NOx 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 [-].
 - 10.1.11.7 CO2 mass window CO conformity factor [-].
 - 10.1.11.8 CO2 mass window NOx conformity factor [-].
 - 10.1.11.9 CO2 mass window CH4 conformity factor [-] for P.I. engines...
 - 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...
 - 10.1.12.2 EO analyser zero, span and audit results, pre and post...
 - 10.1.12.3 NOx analyser zero, span and audit results, pre and post...
 - 10.1.12.4 CO2 analyser zero, span and audit results, pre and post...
 - 10.1.12.5 Data consistency check results, according to Section 3.2 of Appendix...
- 10.1.13. List of further attachments where these exist.

Appendix 1

Test procedure for vehicle emissions testing with portable emissions measurement systems

1. INTRODUCTION
2. TEST PROCEDURE
 - 2.1. General requirements
 - 2.2. Test parameters
 - 2.3. Preparation of the vehicle
 - 2.4. Installation of the measuring equipment
 - 2.4.1. Main Unit
 - 2.4.2. Exhaust flow meter
 - 2.4.3. Global Positioning System
 - 2.4.4. Connection with the vehicle ECU
 - 2.4.5. Sampling of gaseous emissions
 - 2.5. Pre-test procedures
 - 2.5.1. Starting and stabilising the PEMS instruments
 - 2.5.2. Cleaning the sampling system
 - 2.5.3. Checking and calibrating the analysers
 - 2.5.4. Cleaning the EFM
 - 2.6. Emissions test run
 - 2.6.1. Test start
 - 2.6.2. Test run
 - 2.6.3. End of test sequence
 - 2.7. Verification of the measurements
 - 2.7.1. Checking of the analysers
 - 2.7.2. Zero drift
 - 2.7.3. Span drift
 - 2.7.4. Drift verification
 - 2.7.5. Drift correction
3. CALCULATION OF THE EMISSIONS
 - 3.1. Time alignment of data
 - 3.1.1. Gas analysers data
 - 3.1.2. Gas analysers and EFM data
 - 3.1.3. PEMS and engine data
 - 3.1.4. Procedure for improved time-alignment of the PEMS data
 - 3.2. Data consistency checks
 - 3.2.1. Analysers and EFM data
 - 3.2.2. ECU torque data
 - 3.2.3. Brake-Specific Fuel Consumption
 - 3.2.4. Odometer
 - 3.2.5. Ambient pressure
 - 3.3. Dry-Wet correction
 - 3.4. NO_x correction for humidity and temperature
 - 3.5. Calculation of the instantaneous gaseous emissions
4. DETERMINATION OF EMISSIONS AND CONFORMITY FACTORS
 - 4.1. Averaging window principle
 - 4.2. Work based method
 - 4.2.1. Calculation of the specific emissions
 - 4.2.2. Selection of valid windows

- 4.2.2.1. If the percentage of valid windows is less than 50 %,...
- 4.2.2.2. In any case, the lower threshold shall not be lower...
- 4.2.2.3. The test shall be void if the percentage of valid...
- 4.2.3. Calculation of the conformity factors
- 4.3. CO₂ mass based method
 - 4.3.1. Selection of valid windows
 - 4.3.2. Calculation of the conformity factors

Appendix 2

Portable measurement equipment

- 1. GENERAL
- 2. MEASURING EQUIPMENT
 - 2.1. Gas analysers general specifications
 - 2.2. Gas analysers technology
 - 2.3. Sampling of gaseous emissions
 - 2.4. Other instruments
- 3. AUXILIARY EQUIPMENT
 - 3.1. Exhaust Gas Flow Meter (EFM) tailpipe connection
 - 3.2. PEMS location and mounting hardware
 - 3.3. Electrical power

Appendix 3

Calibration of portable measurement equipment

- 1. EQUIPMENT CALIBRATION AND VERIFICATION
 - 1.1. Calibration gases
 - 1.2. Leakage test
 - 1.3. Response time check of the analytical system

Appendix 4

Method to check the conformity of the ECU torque signal

- 1. INTRODUCTION
- 2. THE 'MAXIMUM TORQUE' METHOD
 - 2.1. The 'maximum torque' method consists of demonstrating that a point...
 - 2.2. If a point on the reference maximum torque curve as...

ANNEX III

VERIFYING EXHAUST EMISSIONS

- 1. INTRODUCTION
 - 1.1. This Annex sets out the test procedure for verifying exhaust...

2. GENERAL REQUIREMENTS
 - 2.1. The general requirements for conducting the tests and interpreting the...
 - 2.2. The appropriate reference fuels as described in Annex IX to...
 - 2.3. If the emissions are measured in the raw exhaust gas,...
 - 2.4. If the emissions are measured in the dilute exhaust gas,...
 - 2.5. Ammonia (NH₃) shall be determined in accordance with Appendix 1...
 - 2.6. The emissions from positive-ignition engines fuelled with petrol or E85...

Appendix 1

Procedure for the measurement of ammonia

1. This Appendix describes the procedure for measurement of ammonia (NH₃)...
2. Two measurement principles are specified for NH₃ measurement and either...
 - 2.1. Laser Diode Spectrometer (LDS)
 - 2.1.1. Measurement principle
 - 2.1.2. Installation
 - 2.1.3. Cross interference
 - 2.2. Fourier Transform Infrared (hereinafter 'FTIR') analyser
 - 2.2.1. Measurement principle
 - 2.2.2. Installation and sampling
 - 2.2.3. Cross interference
3. EMISSIONS TEST PROCEDURE AND EVALUATION
 - 3.1. Checking the analysers
 - 3.2. Collection of emission relevant data
 - 3.3. Operations after test
 - 3.4. Analyser drift
 - 3.4.1. As soon as practical but no later than 30 minutes...
 - 3.4.2. Determination of analyser drift is not required in the following...
 - 3.5. Data evaluation
4. ANALYSER SPECIFICATION AND VERIFICATION
 - 4.1. Linearity requirements
 - 4.2. Analyser specifications
 - 4.2.1. Minimum detection limit
 - 4.2.2. Accuracy
 - 4.2.3. Zero drift
 - 4.2.4. Span drift
 - 4.2.5. System response time
 - 4.2.6. Rise time
 - 4.2.7. NH₃ calibration gas

5. ALTERNATIVE SYSTEMS

Appendix 2

Determination of emissions from positive-ignition engines fuelled with petrol or E85

1. This Appendix describes the procedure for measurement of gaseous and...

- 2.1. The tests shall be conducted and evaluated as set out...
 - 2.1.1. Calculation of mass emission (raw exhaust gas)
 - 2.1.2. Calculation of mass emission (dilute exhaust gas)
 - 2.1.2.1. Background correction
- 2.2. For the dilute testing of positive-ignition engines, it is permitted...

ANNEX IV

EMISSIONS DATA REQUIRED AT TYPE-APPROVAL FOR ROADWORTHINESS PURPOSES

- 1. INTRODUCTION
 - 1.1. This Annex sets out the procedure for measuring carbon monoxide...
- 2. GENERAL REQUIREMENTS
 - 2.1. The general requirements shall be those set out in Sections...
 - 2.2. The atomic ratios set out in Section 5.3.7.3 shall be...
 - 2.3. The table in point 1.4.3 of Appendix 5 to Annex...
 - 2.4. The manufacturer shall confirm the accuracy of the Lambda value...
- 3. TECHNICAL REQUIREMENTS
 - 3.1. The technical requirements shall be those set out in Annex...
 - 3.2. The reference fuels specified in Section 2.1 of Annex 5...

ANNEX V

VERIFYING EMISSIONS OF CRANKCASE GASES

- 1. INTRODUCTION
 - 1.1. This Annex sets out the provisions and test procedures for...
- 2. GENERAL REQUIREMENTS
 - 2.1. No crankcase emissions shall be discharged directly into the ambient...
- 3. SPECIFIC REQUIREMENTS
 - 3.1. Points 3.1.1 and 3.1.2 shall apply to compression-ignition engines and...
 - 3.1.1. Engines equipped with turbochargers, pumps, blowers, or superchargers for air...
 - 3.1.2. Crankcase emissions that are routed into the exhaust upstream of...
 - 3.2. Points 3.2.1 and 3.2.2 shall apply to positive-ignition engines fuelled...
 - 3.2.1. The pressure in the crankcase shall be measured over the...
 - 3.2.2. Compliance with point 2.1 shall be deemed satisfactory if, in...

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...
- 2. DEFINITIONS

3. GENERAL REQUIREMENTS
 - 3.1. The general requirements shall be those set out in Sections...
4. PERFORMANCE REQUIREMENTS
 - 4.1. The performance requirements shall be those set out in Section...
 - 4.1.1. Section 5.1.2(a) of Annex 10 to UN/ECE Regulation No 49...
 - 4.1.2. Section 5.2.1. of Annex 10 to UN/ECE Regulation No 49...
 - 4.1.3. The applicable emission limits shall be the following:
 - 4.1.4. Sections 5.2.2 and 5.2.3 of Annex 10 to UN/ECE Regulation...
5. AMBIENT AND OPERATING CONDITIONS
 - 5.1. The ambient and operating conditions for the purpose of this...
6. OFF-CYCLE LABORATORY TESTING AT TYPE-APPROVAL
 - 6.1. The off-cycle test procedure during type-approval shall follow the World-harmonised...
 - 6.1.1. The off-cycle laboratory test requirements shall not apply for the...
 - 6.1.2. Section 7.2.1 of Annex 10 to UN/ECE Regulation No 49...
 - 6.1.3. Section 7.3 of Annex 10 to UN/ECE Regulation No 49...
 - 6.1.4. Section 7.5.4 of Annex 10 to UN/ECE Regulation No 49...
 - 6.1.5. Section 7.5.5 of Annex 10 to UN/ECE Regulation No 49...
 - 6.1.6. Section 7.5.6 of Annex 10 to UN/ECE Regulation No 49...
7. WORLD-HARMONISED NOT-TO-EXCEED DEFICIENCIES
8. WORLD-HARMONISED NOT-TO-EXCEED EXEMPTIONS
9. STATEMENT OF OFF-CYCLE EMISSION COMPLIANCE
 - 9.1. Sections 10.1 and 10.2 of Annex 10 to UN/ECE Regulation...
10. DOCUMENTATION

ANNEX VII

VERIFYING THE DURABILITY OF ENGINE SYSTEMS

1. INTRODUCTION
 - 1.1. This Annex sets out the procedures for selecting engines to...
 - 1.2. This Annex also sets out the emission and non-emission-related maintenance...
2. SELECTION OF ENGINES FOR ESTABLISHING USEFUL LIFE DETERIORATION FACTORS
 - 2.1. Engines shall be selected from the engine family defined in...
 - 2.2. Engines from different engine families may be further combined into...
 - 2.3. One engine representing the engine-aftertreatment system family as determined in...
 - 2.3.1. If the approval authority decides that the worst case emissions...
3. ESTABLISHING USEFUL LIFE DETERIORATION FACTORS
 - 3.1. General
 - 3.2. Service accumulation schedule
 - 3.2.1. In-service and dynamometer service accumulation

- 3.2.1.1. The manufacturer shall determine the form and extent of the...
- 3.2.1.2. The manufacturer shall determine the test points where gaseous and...
- 3.2.1.3. The emission values at the start point and at the...
- 3.2.1.4. At the request of the manufacturer and with the agreement...
- 3.2.1.5. Service accumulation schedules may be different for different engine-aftertreatment system...
- 3.2.1.6. Service accumulation schedules may be shorter than the useful life...
- 3.2.1.7. For engine dynamometer service accumulation, the manufacturer shall provide the...
- 3.2.1.8. Minimum service accumulation period
- 3.2.1.9. Accelerated ageing is permitted by adjusting the service accumulation schedule...
- 3.2.1.10. The service accumulation schedule shall be fully described in the...
- 3.2.2. If the type-approval authority decides that additional measurements need to...
- 3.3. Engine testing
 - 3.3.1. Engine system stabilisation
 - 3.3.1.1. For each engine-aftertreatment system family, the manufacturer shall determine the...
 - 3.3.1.2. The end of the stabilisation period determined in point 3.3.1.1...
 - 3.3.2. Service accumulation testing
 - 3.3.2.1. After stabilisation, the engine shall be run over the service...
 - 3.3.2.2. During the service accumulation schedule, maintenance shall be carried out...
 - 3.3.2.3. During the service accumulation schedule, unscheduled maintenance on the engine...
- 3.4. Reporting
 - 3.4.1. The results of all emission tests (hot WHTC and WHSC)...
 - 3.4.2. The manufacturer shall retain records of all information concerning all...
- 3.5. Determination of deterioration factors
 - 3.5.1. For each pollutant measured on the hot WHTC and WHSC...
 - 3.5.2. The emission values for each pollutant at the start of...
 - 3.5.3. The deterioration factor for each pollutant is defined as the...
- 3.6. Assigned deterioration factors
 - 3.6.1. As an alternative to using a service accumulation schedule to...
- 3.7. Application of deterioration factors
 - 3.7.1. The engines shall meet the respective emission limits for each...
 - 3.7.2. The manufacturer may choose to carry across the DFs determined...
 - 3.7.3. The deterioration factors for each pollutant on the appropriate test...
- 3.8. Checking of conformity of production
 - 3.8.1. Conformity of production for emissions compliance shall be checked on...
 - 3.8.2. The manufacturer may choose to measure the pollutant emissions before...
 - 3.8.3. For the purposes of type-approval, only the deterioration factors according...

4. MAINTENANCE

- 4.1. Emission-related scheduled maintenance
 - 4.1.1. Emission-related scheduled maintenance for purposes of conducting a service accumulation...
 - 4.1.2. The engine manufacturer shall specify for the service accumulation schedule...
 - 4.1.3. Critical emission-related scheduled maintenance shall only be performed if being...
- 4.2. Changes to scheduled maintenance
 - 4.2.1. The manufacturer shall submit a request to the approval authority...
- 4.3. Non-emission-related scheduled maintenance
 - 4.3.1. Non-emission-related scheduled maintenance which is reasonable and technically necessary such...
- 4.4. Repair
 - 4.4.1. Repairs to the components of an engine selected for testing...
 - 4.4.2. If the engine itself, the emission control system or the...

ANNEX VIII

CO2 EMISSIONS AND FUEL CONSUMPTION

- 1. INTRODUCTION
 - 1.1. This Annex sets out the provisions and test procedures for...
- 2. GENERAL REQUIREMENTS
 - 2.1. CO2 emissions and fuel consumption shall be determined over the...
 - 2.2. The test results shall be reported as cycle averaged brake...
- 3. DETERMINATION OF CO2 EMISSIONS
 - 3.1. Raw measurement
 - 3.1.1. Measurement
 - 3.1.2. Data evaluation
 - 3.1.3. Calculation of cycle averaged emission
 - 3.2. Dilute measurement
 - 3.2.1. Measurement
 - 3.2.2. Data evaluation
 - 3.2.3. Calculation of cycle averaged emission
 - 3.3. Calculation of brake specific emissions
 - 3.3.1. WHTC
 - 3.3.2. WHSC
- 4. DETERMINATION OF FUEL CONSUMPTION
 - 4.1. Measurement
 - 4.2. Data evaluation
 - 4.3. Calculation of cycle averaged fuel consumption
 - 4.4. Calculation of brake specific fuel consumption
 - 4.4.1. WHTC
 - 4.4.2. WHSC

Appendix 1

Provisions on CO₂ emissions and fuel consumption for extension of an EC type-approval for a vehicle type approved under Regulation (EC) No 595/2009 and this Regulation with a reference mass exceeding 2 380 kg but not exceeding 2 610 kg

1. INTRODUCTION
 - 1.1. This Appendix sets out the provisions and test procedures for...
2. GENERAL REQUIREMENTS
 - 2.1. In order to receive an extension of an EC type-approval...
 - 2.1.1. Section 2.2.1 of Annex XII to Regulation (EC) No 692/2008...
 - 2.1.2. Section 5.2.4 of UN/ECE Regulation 101 referred to in point...
 - 2.1.3. Point 1.4.3 of Annex 6 to UN/ECE Regulation 101 referred...
 - 2.1.4. The reporting requirements in Section 3.4 of Annex XII to...

ANNEX IX

SPECIFICATIONS OF REFERENCE FUELS

ANNEX X

ON-BOARD DIAGNOSTICS

1. INTRODUCTION
 - 1.1. This Annex sets out the functional aspects of on-board diagnostic...
2. GENERAL REQUIREMENTS
 - 2.1. The general requirements, including the specific requirements for electronic system...
 - 2.2. The reference to Driving cycle in Annex 9C to UN/ECE...
 - 2.3. Additional provisions concerning monitoring requirements
 - 2.3.1. In addition to the monitoring requirements set out in Appendix...
 - 2.3.1.1. The failure classification rules shall be the ones set out...
 - 2.3.2. In the case where the control of reagent injection is...
 - 2.3.2.1. Failures detected according to the provisions of 2.3.2 shall not...
 - 2.3.3. The monitoring requirements concerning particulate aftertreatment devices set out in...
 - 2.3.3.1. The performance of the particulate aftertreatment device including the filtration...
 - 2.3.3.2. The periodic regeneration shall be monitored against the ability of...
 - 2.3.3.3. Before the dates specified in Article 4(8) and in the...
 - 2.3.3.4. The Commission shall conduct a review of the monitoring requirements...
 - 2.4. Alternative approval
 - 2.4.1. If requested by the manufacturer, for vehicles of category M1,...
 - 2.4.2. Small series production
 - 2.4.3. A manufacturer shall not be permitted to use the alternative...
 - 2.4.4. The approval authority shall inform the Commission of the circumstances...

- 2.5. Conformity of production
3. PERFORMANCE REQUIREMENTS
 - 3.1. The performance requirements shall be those set out in Section...
 - 3.2. OBD threshold limits
 - 3.2.1. The OBD threshold limits (hereinafter ‘OTLs’) applicable to the OBD...
 - 3.2.2. Until the end of the phase-in period set out in...
4. DEMONSTRATION REQUIREMENTS
 - 4.1. The demonstration requirements shall be those set out in Section...
 - 4.2. In addition to the point 4.1 the manufacturer may use...
5. DOCUMENTATION REQUIREMENTS
 - 5.1. The documentation requirements shall be those set out in Section...
6. IN USE PERFORMANCE REQUIREMENTS
 - 6.1. Technical requirements
 - 6.1.1. The technical requirements for assessing the in-use performance of OBD...
 - 6.1.2. In particular, the in-use performance ratio (IUPR_m) of a specific...
 - 6.1.3. The in-use performance ratio (IUPR_g) of a group g of...
 - 6.2. Minimum in-use performance ratio
 - 6.2.1. The in-use performance ratio IUPR_m of a monitor m of...
 - 6.2.2. The value of minimum in-use-performance ratio IUPR(min) is 0,1 for...
 - 6.2.3. The requirement of Section 6.2.1 is deemed to be fulfilled...
 - 6.3. Documentation requirements
 - 6.3.1. The documentation associated with each monitored component or system and...
 - 6.3.1.1. Any criterion for disabling incrementation of the general denominator shall...
 - 6.4. Statement of OBD in-use Performance compliance
 - 6.4.1. In the application for type-approval, the manufacturer shall provide a...
 - 6.4.2. This statement referred to in point 6.4.1 shall be attached...
 - 6.4.3. The manufacturer shall maintain records which contain all test data,...
 - 6.4.4. During the phase-in period set out in Article 4(7), the...
 - 6.5. Assessment of the in-use performance
 - 6.5.1. The OBD in-use performance and compliance with Section 6.2.3 of...
 - 6.5.2. National authorities and their delegates may pursue further tests to...
 - 6.5.2.1. To demonstrate non-compliance with the requirements of Section 6.2.3 of...
 - 6.5.2.2. The manufacturer shall have the opportunity to establish compliance with...
 - 6.5.2.3. For tests performed according to Sections 6.5.2.1 and 6.5.2.2 both...
 - 6.5.3. If non-compliance with the requirements of Section 6.2.3 of this...
 - 6.5.4. The reference to driving cycle in Annex 9C to UN/ECE...
 - 6.5.5. During the phase-in period set out in Article 4(7) the...
 - 6.5.5.1. During the phase-in period set out in Article 4(7) compliance...

Appendix 1

Additional monitoring requirements

1. LOW EGR FLOW
 - 1.1. The following requirement shall apply in addition to those of...
2. EGR COOLER UNDERPERFORMANCE
 - 2.1. The following requirements shall apply in addition to those of...
 - 2.1.1. In the case where total failure of the EGR cooler...
3. LOW BOOST PRESSURE
 - 3.1. The following requirements shall apply in addition to those of...
 - 3.1.1. In the case where the emissions would not exceed the...
 - 3.1.2. In the case where the emissions would not exceed the...
4. MALFUNCTIONING INJECTORS
 - 4.1. The manufacturer shall submit to the approval authority an analysis...
 - 4.2. After the period set out in Article 4(7) the manufacturer...
 - 4.2.1. After approval of this plan by the authority, the manufacturer...

Appendix 2

Performance monitoring

1. GENERAL
 - 1.1. This Appendix sets out provisions relating to the demonstration process...
2. DEMONSTRATION OF PERFORMANCE MONITORING
 - 2.1. Approval of the failure classification
 - 2.1.1. As specified in Section 4.2.1.1 of Annex 9B to UN/ECE...
 - 2.2. Approval of the performance monitoring selected by the manufacturer
 - 2.2.1. In arriving at an approval decision on the choice of...
 - 2.2.2. The performance threshold selected by the manufacturer for the monitor...
 - 2.2.3. The performance criterion and the performance threshold approved for the...
 - 2.3. Qualification of a deteriorated component
 - 2.3.1. A deteriorated component that is qualified for the parent engine...
 - 2.4. Demonstration of the OBD performance
 - 2.4.1. The demonstration of the OBD performance shall be conducted according...

Appendix 3

Demonstration requirements in case of performance monitoring of a wall-flow diesel particulate filter

1. GENERAL
 - 1.1. This Appendix specifies the OBD demonstration process applicable in the...
 - 1.1.1. A deteriorated wall-flow DPF can be created, for example, by...

2. QUALIFICATION TEST
 - 2.1. Principle
 - 2.1.1. A deteriorated wall-flow DPF is considered as a Qualified Deteriorated...
 - 2.1.1.1. The manufacturer shall demonstrate that this clean and non-deteriorated wall-flow...
 - 2.1.2. Upon request of the manufacturer, the approval authority may accept...
 - 2.1.2.1. When granting such a derogation, the approval authority shall notify...
 - 2.2. Qualification process
 - 2.2.1. For qualifying a deteriorated wall-flow DPF, the engine equipped with...
 - 2.2.2. To qualify a deteriorated wall-flow DPF as a 'Qualified Deteriorated...
 - 2.3. Demonstration of the OBD performance
 - 2.3.1. The demonstration of the OBD performance shall be conducted in...

Appendix 4

Assessment of the in-use performance of the on-board diagnostic system

1. GENERAL
 - 1.1. This Appendix sets out the procedure to be followed when...
2. PROCEDURE FOR DEMONSTRATING OBD IN-USE PERFORMANCE
 - 2.1. The OBD in-use performance of an engine family shall be...
 - 2.1.1. The demonstration of OBD in-use performance shall be organised and...
 - 2.1.2. The manufacturer may use in the demonstration of conformity relevant...
 - 2.1.2.1. A manufacturer may not, however, then use these elements in...
 - 2.2. The demonstration of OBD in-use performance shall be performed at...
 - 2.3. The manufacturer shall report the initial schedule and the sampling...
 - 2.4. Vehicle types without a communication interface which permits the collection...
 - 2.4.1. Individual vehicles with mechanical or electrical faults which prevent the...
 - 2.5. Engine or vehicle types where the collection of in-use performance...
3. OBD IN-USE PERFORMANCE DATA
 - 3.1. The OBD in-use performance data to be considered for assessing...
4. ENGINE OR VEHICLE SELECTION
 - 4.1. Engine selection
 - 4.1.1. In the case where an OBD engine family is used...
 - 4.1.2. Any engine of a particular OBD engine family may be...
 - 4.2. Vehicle selection
 - 4.2.1. Vehicle segments
 - 4.2.1.1. For the purpose of classifying the vehicles subject to demonstration,...
 - 4.2.1.2. Where possible, vehicles shall be selected from each segment in...
 - 4.2.1.3. There shall be a minimum of 15 vehicles per segment....
 - 4.2.1.4. In the case where an OBD engine family is used...

- 4.2.2. Vehicle qualification
 - 4.2.2.1. The engines selected shall be fitted to vehicles registered and...
 - 4.2.2.2. Each vehicle selected shall have a maintenance record to show...
 - 4.2.2.3. The OBD system shall be checked for proper functioning. Any...
 - 4.2.2.4. The engine and vehicle shall exhibit no indications of abuse...
 - 4.2.2.5. All emission control system and OBD components on the vehicle...
- 5. IN-USE PERFORMANCE SURVEYS
 - 5.1. Collection of in-use performance data
 - 5.1.1. In accordance with the provisions of Section 6, the manufacturer...
 - 5.1.2. The results from the group of monitors under evaluation shall...
 - 5.2. Assessment of the in-use performance
 - 5.2.1. The actual performance ratio per group of monitors of an...
 - 5.2.2. The assessment of the in-use performance of the OBD engine...
 - 5.2.3. For any segment of vehicles defined in Section 4.2.1 of...
- 6. REPORT TO THE APPROVAL AUTHORITY

Appendix 5

Assessment of the in-use performance of the on-board diagnostic system during the phase-in period

- 1. GENERAL
 - 1.1. This Appendix specifies the process to be followed for the...
- 2. PROCEDURE FOR OBD IN-USE PERFORMANCE ASSESSMENT
 - 2.1. The in-use performance assessment during the phase-in period set out...
 - 2.2. Each manufacturer's first survey shall start when the first complete...
 - 2.3. The surveys shall be organised and conducted by each manufacturer,...
 - 2.4. Data Handling During the Phase-In Period set out in Article...
 - 2.4.1. In order to achieve the aim of the phase-in period...
 - 2.4.2. The passing of information considered confidential or commercially sensitive under...
 - 2.4.3. Examples of the kinds of aspects of the complementary data...
 - 2.5. Section 2.4 of Appendix 4 shall apply to the problems...
 - 2.6. Engines or vehicles where the collection of in-use performance data...
- 3. OBD IN-USE PERFORMANCE DATA
 - 3.1. The OBD in-use performance data to be considered for assessing...
- 4. VEHICLE AND ENGINE SELECTION
 - 4.1. Engine selection
 - 4.1.1. In each of the two surveys required by Section 2.1...
 - 4.1.2. If before 1 July 2015 a manufacturer has placed more...
 - 4.1.3. One of the surveys undertaken shall be performed using vehicles...
 - 4.1.4. Engines of a single engine family or OBD engine family...
 - 4.2. Vehicle selection
 - 4.2.1. The vehicle selection rules shall be those defined in Section...

5. IN-USE PERFORMANCE SURVEYS
 - 5.1. Collection of in-use performance data
 - 5.1.1. The rules concerning the collection of in-use performance data shall...
 - 5.2. Assessment of the in-use performance
 - 5.2.1. An assessment of the in-use performance shall be made for...
 - 5.2.2. The actual performance ratio per group of monitors for an...
 - 5.2.3. The assessment of the in-use performance of the OBD engine...
 - 5.2.4. If any of the conditions mentioned in Section 6.5.1 of...

6. REPORT TO THE APPROVAL AUTHORITY AND THE COMMISSION

Appendix 6

Model of an OBD in-use performance compliance statement

(Name of manufacturer) attests that the engines within this OBD...

ANNEX XI

EC TYPE-APPROVAL OF REPLACEMENT POLLUTION CONTROL DEVICES AS SEPARATE TECHNICAL UNIT

1. INTRODUCTION
 - 1.1. This Annex contains additional requirements for the type-approval of replacement...
2. GENERAL REQUIREMENTS
 - 2.1. Marking
 - 2.1.1. Each replacement pollution control device shall bear at least the...
 - 2.1.2. Each original replacement pollution control device shall bear at least...
 - 2.2. Documentation
 - 2.2.1. Each replacement pollution control device shall be accompanied by the...
 - 2.2.2. Each original replacement pollution control device shall be accompanied by...
 - 2.3. For an original replacement pollution control device, the vehicle or...
3. EC SEPARATE TECHNICAL UNIT TYPE-APPROVAL MARK
 - 3.1. Every replacement pollution control device conforming to the type approved...
 - 3.2. This mark shall consist of a rectangle surrounding the lower-case...
 - 3.3. The EC type-approval mark shall be affixed to the replacement...
 - 3.4. An example of the EC type-approval mark for a separate...
4. TECHNICAL REQUIREMENTS
 - 4.1. General requirements
 - 4.1.1. The replacement pollution control device shall be designed, constructed and...
 - 4.1.2. The installation of the replacement pollution control device shall be...
 - 4.1.3. If the original equipment pollution control device includes thermal protections,...
 - 4.1.4. Upon request of the applicant for the type-approval of the...

- 4.2. General durability requirements
 - 4.3. Requirements regarding emissions
 - 4.3.1. Outline of procedure for evaluation of emissions
 - 4.3.1.1. Where the replacement pollution control device does not comprise the...
 - 4.3.1.2. The emissions control system shall be aged according to the...
 - 4.3.2. Procedure for evaluation of emissions performance of a replacement pollution...
 - 4.3.2.1. The engine or engines shall be fitted with a new...
 - 4.3.2.2. Exhaust gas test with replacement pollution control device
 - 4.3.2.3. Initial evaluation of the emission of pollutants of engines equipped...
 - 4.3.2.4. Durability of emissions performance
 - 4.3.2.5. Exhaust gas test with aged replacement pollution control device
 - 4.3.2.6. Determination of ageing factor for the replacement pollution control device...
 - 4.3.2.7. Evaluation of the emission of pollutants of engines equipped with...
 - 4.3.3. Replacement pollution control device technology family
 - 4.3.4. Assessment of the durability of emissions performance of a replacement...
 - 4.3.4.1. Determination of durability performance of family members
 - 4.4. Requirements regarding exhaust back-pressure
 - 4.5. Requirements regarding OBD compatibility (applicable only to replacement pollution control...
 - 4.5.1. OBD compatibility demonstration is required only when the original pollution...
 - 4.5.2. The compatibility of the replacement pollution control device with the...
 - 4.5.3. The provisions in UN/ECE Regulation No 49 applicable to components...
 - 4.5.4. The replacement pollution control device manufacturer may use the same...
 - 4.5.5. In order to verify the correct installation and functioning of...
 - 4.5.6. The malfunction indicator shall not activate during vehicle operation required...
5. CONFORMITY OF PRODUCTION
- 5.1. Measures to ensure the conformity of production shall be taken...
 - 5.2. Special provisions
 - 5.2.1. The checks referred to in Section 2.2 of Annex X...
 - 5.2.2. For the application of Article 12(2) of Directive 2007/46/EC, the...

Appendix 1

MODEIInformation document No ...

- 0. GENERAL
 - 0.1. Make (trade name of manufacturer): ...
 - 0.2. Type ...
 - 0.3. Means of identification of type: ...

- 0.5. Name and address of manufacturer: ...
- 0.7. In the case of components and separate technical units, location...
- 0.8. Name(s) and address(es) of assembly plant(s): ...
- 0.9. Name and address of the manufacturer's authorised representative (if any):...
- 1. DESCRIPTION OF THE DEVICE
 - 1.1. Type of the replacement pollution control device: (oxidation catalyst, three-way...
 - 1.2. Drawings of the replacement pollution control device, identifying in particular...
 - 1.3. Description of the engine and vehicle type or types for...
 - 1.4. Description and drawings showing the position of the replacement pollution...

Appendix 2

MODEL (MULTIPLE-APPROVAL CERTIFICATE) EC TYPE-APPROVAL CERTIFICATE

SECTION I

0.1. Make (trade name of manufacturer): ...

- 0.1. Make (trade name of manufacturer): ...
- 0.2. Type: ...
- 0.3. Means of identification of type marked on the component/separate technical...
 - 0.3.1. Location of that marking: ...
- 0.5. Name and address of manufacturer: ...
- 0.7. In the case of components and separate technical units, location...
- 0.8. Name and address(es) of assembly plant(s): ...
- 0.9. Name and address of manufacturer's representative: ...

SECTION II

1. Additional information

- 1. Additional information
 - 1.1. Make and type of the replacement pollution control device: (oxidation...
 - 1.2. Engine and vehicle type(s) for which the pollution control device...
 - 1.3. Type(s) of engine on which the replacement pollution control device...
 - 1.3.1. Has the replacement pollution control device demonstrated compatibility with OBD...
- 2. Technical service responsible for carrying out the tests: ...
- 3. Date of test report: ...
- 4. Number of test report: ...
- 5. Remarks: ...
- 6. Place: ...
- 7. Date: ...
- 8. Signature: ...

Appendix 3

Ageing procedure for evaluation of durability

1. This Appendix set out the procedures for ageing a replacement...
2. For demonstrating the durability the replacement pollution control device shall...
 - 2.1. For the purpose of demonstrating durability of the replacement pollution...

ANNEX XII

CONFORMITY OF IN-SERVICE ENGINES AND VEHICLES TYPE-APPROVED UNDER DIRECTIVE 2005/55/EC

1. INTRODUCTION
 - 1.1. This Annex sets out requirements for the conformity of in-service...
2. PROCEDURE FOR IN-SERVICE CONFORMITY
 - 2.1. For in-service conformity testing the provisions set out in Annex...
 - 2.2. On the request of the manufacturer the approval authority that...
 - 2.3. If the procedures described in Annex II are used, the...

ANNEX XIII

REQUIREMENTS TO ENSURE THE CORRECT OPERATION OF NO_x CONTROL MEASURES

1. INTRODUCTION
2. GENERAL REQUIREMENTS
 - 2.1. Alternative approval
 - 2.2. Required information
 - 2.2.1. Information that fully describes the functional operational characteristics of an...
 - 2.2.2. In its application for type-approval, the manufacturer shall specify the...
 - 2.2.3. Detailed written information fully describing the functional operation characteristics of...
 - 2.2.4. When a manufacturer applies for an approval of an engine...
 - 2.3. Operating conditions
 - 2.3.1. Any engine system falling within the scope of this Annex...
 - 2.3.2. The emission control monitoring system shall be operational:
 - 2.4. Reagent freeze protection
 - 2.4.1. The manufacturer may use a heated or a non-heated reagent...
 - 2.4.1.1. The use of a non-heated reagent tank and dosing system...
 - 2.4.2. Heated reagent tank and dosing system
 - 2.4.2.1. If the reagent has frozen, the manufacturer shall ensure that...
 - 2.4.2.2. Demonstration
 - 2.4.2.2.1. The reagent tank and dosing system shall be soaked at...
 - 2.4.2.2.2. After the soak period provided in Section 2.4.2.2.1. the engine...

- 2.4.2.2.3 The reagent dosing system shall be fully functional at the...
 - 2.4.2.2.4 Demonstration of compliance with the requirements of Section 2.4.2.2 may...
 - 2.4.3. Non-heated reagent tank and dosing system
 - 2.4.3.1. The driver warning system described in Section 4 shall be...
 - 2.4.3.2. The severe inducement system described in Section 5.4 shall be...
 - 2.5. Each separate reagent tank installed on a vehicle shall include...
- 3. MAINTENANCE REQUIREMENTS
 - 3.1. The manufacturer shall furnish or cause to be furnished to...
 - 3.2. The instructions shall indicate requirements for the proper use and...
 - 3.3. The instructions shall be written in clear and non-technical language...
 - 3.4. The instructions shall specify if consumable reagents have to be...
 - 3.5. The instructions shall specify that use of, and refilling with,...
 - 3.6. The instructions shall state that it may be a criminal...
 - 3.7. The instructions shall explain how the warning system and driver...
- 4. DRIVER WARNING SYSTEM
 - 4.1. The vehicle shall include a driver warning system using visual...
 - 4.2. The vehicle on-board diagnostics (OBD) display system described in Annex...
 - 4.3. The driver warning system may display short messages, including messages...
 - 4.4. At the choice of the manufacturer, the warning system may...
 - 4.5. The driver warning system shall be activated as specified in...
 - 4.6. The driver warning system shall be deactivated when the conditions...
 - 4.7. The warning system may be temporarily interrupted by other warning...
 - 4.8. A facility to permit the driver to dim the visual...
 - 4.9. Details of the driver warning system activation and deactivation procedures...
 - 4.10. As part of the application for type-approval under this Regulation,...
- 5. DRIVER INDUCEMENT SYSTEM
 - 5.1. The vehicle shall incorporate a two-stage driver inducement system starting...
 - 5.2. The requirement for a driver inducement system shall not apply...
 - 5.3. Low-level inducement system
 - 5.4. Severe inducement system
 - 5.4.1. A 'disable after restart' system shall limit the vehicle speed...
 - 5.4.2. A 'disable after fuelling' system shall limit the vehicle speed...
 - 5.4.3. A 'disable after parking' system shall limit the vehicle speed...
 - 5.4.4. A 'disable on time limit' system shall limit the vehicle...
 - 5.5. The driver inducement system shall be activated as specified in...
 - 5.5.1. When the driver inducement system has determined that the severe...
 - 5.6. The driver inducement system shall be deactivated when the conditions...
 - 5.7. Details of the driver inducement system activation and deactivation procedures...
 - 5.8. As part of the application for type-approval under this Regulation,...
- 6. REAGENT AVAILABILITY
 - 6.1. Reagent indicator
 - 6.2. Activation of the driver warning system
 - 6.2.1. The driver warning system specified in Section 4 shall be...
 - 6.2.2. The warning provided shall be sufficiently clear for the driver...
 - 6.2.3. The driver warning system does not initially need to be...

- 6.2.4. The continuous warning shall not be easily disabled or ignored...
 - 6.2.5. It shall not be possible to turn off the driver...
 - 6.3. Activation of the driver inducement system
 - 6.3.1. The low-level inducement system described in Section 5.3 shall be...
 - 6.3.2. The severe inducement system described in Section 5.4 shall be...
 - 6.3.3. It shall not be possible to turn off the low-level...
- 7. REAGENT QUALITY MONITORING
 - 7.1. The vehicle shall include a means of determining the presence...
 - 7.1.1. The manufacturer shall specify a minimum acceptable reagent concentration CD_{min} ,...
 - 7.1.1.1. During the phase-in period specified in Article 4(7) and upon...
 - 7.1.1.2. The correct value of CD_{min} shall be demonstrated during type-approval...
 - 7.1.2. Any reagent concentration lower than CD_{min} shall be detected and...
 - 7.1.3. A specific counter (the reagent quality counter) shall be attributed...
 - 7.1.4. Details of the reagent quality counter activation and deactivation criteria...
 - 7.1.5. The reagent quality counter information shall be made available in...
 - 7.2. Activation of the driver warning system
 - 7.3. Activation of the driver inducement system
 - 7.3.1. The low-level inducement system described in Section 5.3 shall be...
 - 7.3.2. The severe inducement system described in Section 5.4 shall be...
 - 7.3.3. The number of hours prior to activation of the inducement...
- 8. REAGENT CONSUMPTION MONITORING
 - 8.1. The vehicle shall include a means of determining reagent consumption...
 - 8.2. Reagent consumption and dosing activity counters
 - 8.2.1. A specific counter shall be attributed to the reagent consumption...
 - 8.2.2. Details of the reagent consumption counter and dosing counter activation...
 - 8.2.3. The reagent consumption counter and the dosing counter information shall...
 - 8.3. Monitoring conditions
 - 8.3.1. The maximum detection period for insufficient reagent consumption is 48...
 - 8.3.2. In order to monitor reagent consumption, at least one of...
 - 8.4. Activation of the driver warning system
 - 8.4.1. The driver warning system described in Section 4 shall be...
 - 8.4.1.1. Until the end of the phase-in period specified in Article...
 - 8.4.2. The driver warning system described in Section 4 shall be...
 - 8.5. Activation of the driver inducement system
 - 8.5.1. The low-level inducement system described in Section 5.3 shall be...
 - 8.5.2. The severe inducement system described in Section 5.4 shall be...
 - 8.5.3. The number of hours prior to activation of the inducement...
- 9. MONITORING FAILURES THAT MAY BE ATTRIBUTED TO TAMPERING
 - 9.1. In addition to the level of reagent in the reagent...
 - 9.2. Monitoring requirements
 - 9.2.1. The anti-tampering monitoring system shall be monitored for electrical failures...
 - 9.2.2. EGR valve counter
 - 9.2.2.1. A specific counter shall be attributed to an impeded EGR...

- 9.2.2.2. Details of the EGR valve counter activation and deactivation criteria...
- 9.2.2.3. The EGR valve counter information shall be made available in...
- 9.2.3. Monitoring system counters
 - 9.2.3.1. A specific counter shall be attributed to each of the...
 - 9.2.3.2. Details of the criteria for activation and deactivation of the...
 - 9.2.3.3. The monitoring system counter information shall be made available in...
- 9.3. Activation of the driver warning system
- 9.4. Activation of the driver inducement system
 - 9.4.1. The low-level inducement system described in Section 5.3 shall be...
 - 9.4.2. The severe inducement system described in Section 5.4 shall be...
 - 9.4.3. The number of hours prior to activation of the inducement...

Appendix 1

Demonstration requirements

1. GENERAL
 - 1.1. The manufacturer shall submit to the approval authority a complete...
 - 1.2. Compliance with the requirements of this Annex shall be demonstrated...
2. ENGINE FAMILIES OR OBD ENGINE FAMILIES
 - 2.1. This demonstration may be performed by presenting to the approval...
 - 2.2. The test engine is selected by the manufacturer in agreement...
 - 2.3. In the case where engines of an engine family belong...
3. DEMONSTRATION OF THE WARNING SYSTEM ACTIVATION
 - 3.1. The compliance of the warning system activation shall be demonstrated...
 - 3.2. Selection of the failures to be tested
 - 3.2.1. For the purpose of demonstrating the activation of the warning...
 - 3.2.2. For the purpose of demonstrating the activation of the warning...
 - 3.2.2.1. Where activation of the warning system has been demonstrated by...
 - 3.2.3. For the purpose of demonstrating the activation of the warning...
 - 3.3. Demonstration
 - 3.3.1. For the purposes of this demonstration of the activation of...
 - 3.3.2. During a test, no failure shall be present other than...
 - 3.3.3. Prior to starting a test, all DTC shall have been...
 - 3.3.4. At the request of the manufacturer, and with the agreement...
 - 3.3.5. For failures other than lack of reagent, once the failure...
 - 3.3.5.1. The detection sequence shall be stopped once the DTC of...
 - 3.3.6. For the purpose of demonstrating the activation of the warning...
 - 3.3.6.1. The demonstration shall start with a level of reagent in...
 - 3.3.6.2. The warning system is deemed to have performed in the...
 - 3.4. The demonstration of the warning system activation is deemed to...
4. DEMONSTRATION OF THE INDUCEMENT SYSTEM
 - 4.1. The demonstration of the inducement system shall be done by...
 - 4.1.1. Any additional vehicle components or sub-systems, such as ambient temperature...

- 4.1.2. If the manufacturer chooses, and subject to the agreement of...
- 4.2. The test sequence shall demonstrate the activation of the inducement...
- 4.3. For the purpose of this demonstration,
- 4.4. The manufacturer shall, in addition, demonstrate the operation of the...
 - 4.4.1. These additional demonstrations shall, in particular, demonstrate to the satisfaction...
- 4.5. Demonstration test of the low-level inducement system
 - 4.5.1. This demonstration starts when the warning system, or when appropriate...
 - 4.5.2. When the system is being checked for its reaction to...
 - 4.5.2.1. The manufacturer may, with the agreement of the approval authority,...
 - 4.5.3. When the system is checked for its reaction in the...
 - 4.5.4. The demonstration of the low-level inducement system shall be deemed...
- 4.6. Demonstration test of the severe inducement system
 - 4.6.1. This demonstration shall start from a condition where the low-level...
 - 4.6.2. When the system is checked for its reaction in the...
 - 4.6.2.1. The manufacturer may, with the agreement of the approval authority,...
 - 4.6.3. When the system is checked for its reaction in the...
 - 4.6.4. The demonstration of the severe inducement system shall be deemed...
- 5. DEMONSTRATION OF THE VEHICLE SPEED LIMITATION FOLLOWING ACTIVATION OF THE...
 - 5.1. The demonstration of the vehicle speed limitation following activation of...
 - 5.1.1. Alternatively, if the manufacturer chooses, and subject to the agreement...
 - 5.2. When the manufacturer applies for an approval of an engine...
 - 5.3. If the approval authority is not satisfied with the evidence...
 - 5.4. Additional demonstration for confirming the effect of activation of the...
 - 5.4.1. This demonstration shall be performed at the request of the...
 - 5.4.2. One of the failures defined in Sections 6 to 9...
 - 5.4.3. The inducement system shall be brought by the manufacturer to...
 - 5.4.4. The vehicle shall be operated until the counter associated with...
 - 5.4.5. If the manufacturer has opted for the 'disable after restart'...
 - 5.4.6. If the manufacturer has opted for the 'disable after fuelling'...
 - 5.4.7. If the manufacturer has opted for the 'disable after parking'...

Appendix 2

Description of the driver warning and inducement activation and deactivation mechanisms

1. To complement the requirements specified in this Annex concerning the...
2. ACTIVATION AND DEACTIVATION MECHANISMS OF THE DRIVER WARNING SYSTEM
 - 2.1. The driver warning system shall be activated when the diagnostic...
 - 2.1.1. If the counter associated with the relevant failure is not...
 - 2.2. The driver warning system shall be deactivated when the diagnostic...
 - 2.2.1 Erasing of failure information by means of a scan-tool

- 2.2.1.1. Erasing of information, including DTCs relative to failures justifying the...
 - 2.2.1.2. The erasing of failure information shall only be possible under...
 - 2.2.1.3. When failure information, including DTCs, is erased, any counter associated...
- 3. ACTIVATION AND DEACTIVATION MECHANISM OF THE DRIVER INDUCEMENT SYSTEM
 - 3.1. The driver inducement system shall be activated when the warning...
 - 3.2. The driver inducement system shall be deactivated when the system...
 - 3.3. The driver warning and inducement systems shall be immediately activated...
- 4. COUNTER MECHANISM
 - 4.1. General
 - 4.1.1. To comply with the requirements of this Annex, the system...
 - 4.1.2. Each of these counters shall count up to the maximum...
 - 4.1.3. A manufacturer may use a single or multiple monitoring system...
 - 4.1.3.1. When the manufacturer decides to use multiple monitoring system counters,...
 - 4.2. Principle of counter mechanisms
 - 4.2.1. Each of the counters shall operate as follows:
- 5. ILLUSTRATION OF THE ACTIVATION AND DEACTIVATION AND COUNTER MECHANISMS
 - 5.1. This Section illustrates the activation and deactivation and counter mechanisms...
 - 5.2. Figure 2 illustrates the operation of the activation and deactivation...
 - 5.3. Figure 3 illustrates three cases of wrong urea quality:
 - 5.4. Figure 4 illustrates three cases of failure of the urea...

Appendix 3

Low-level inducement torque reduction scheme

This diagram illustrates the provisions of Section 5.3 on torque...

Appendix 4

Demonstration of correct installation on a vehicle in the case of engines EC type-approved as a separate technical unit

This Appendix applies when the vehicle manufacturer requests EC type-approval...

In this case, and in addition to the installation requirements...

Where appropriate, and if the manufacturer chooses, the evidence presented...

The demonstration shall address the conformity of the following elements...

the installation on board the vehicle as regards its compatibility...

Correct activation of the warning and inducement systems, and of...

Appendix 5

Access to 'NOx control information'

1. This Appendix describes the specifications permitting access to information required...
2. ACCESS METHODS
 - 2.1. The 'NOx control information' shall be provided only in accordance...
 - 2.2. Access to the 'NOx control information' shall not be dependent...
 - 2.3. It shall be possible to retrieve all 'NOx control information'...
 - 2.4. It shall be possible to retrieve all 'NOx control information'...
 - 2.5. The 'NOx control information' shall be available through 'read-only' access...
3. INFORMATION CONTENT
 - 3.1. The 'NOx control information' shall contain at least the following...

Appendix 6

Demonstration of the minimum acceptable reagent concentration CDmin

1. The manufacturer shall demonstrate the correct value of CDmin during...
2. The test shall follow the appropriate pre-conditioning cycle, permitting a...
3. The pollutant emissions resulting from this test shall be lower...

ANNEX XIV

MEASUREMENT OF NET ENGINE POWER

1. INTRODUCTION
 - 1.1. This Annex sets out requirements for measuring net engine power...
2. GENERAL
 - 2.1. The general specifications for conducting the tests and interpreting the...
 - 2.1.1. Measurement of net power according to this Annex shall be...
 - 2.2. Test fuel
 - 2.2.1. For positive-ignition engines fuelled with petrol or E85 Section 5.2.3.1...
 - 2.2.2. For positive-ignition engines fuelled with LPG:
 - 2.2.3. For positive-ignition engines fuelled with natural gas:
 - 2.2.4. For compression-ignition engines Section 5.2.3.4 of UN/ECE Regulation 85 shall...
 - 2.3. Engine-driven equipment
 - 2.3.1. For the purpose of measuring the net engine power the...
 - 2.3.2. For the purpose of emissions testing following the procedures in...

ANNEX XV

AMENDMENTS TO REGULATION (EC) No 595/2009

Annex I to Regulation (EC) No 595/2009 is replaced by...
'ANNEX I Euro VI Emission Limits The admissible level of...

ANNEX XVI

AMENDMENTS TO DIRECTIVE 2007/46/EC

Directive 2007/46/EC is amended as follows:
Annex I is amended as follows: the following point 3.2.1.11...

Status: This is the original version (as it was originally adopted).

- (1) OJ L 188, 18.7.2009, p. 1.
- (2) OJ L 263, 9.10.2007, p. 1.
- (3) OJ L 229, 31.8.2010, p. 1.