

Commission Regulation (EC) No 692/2008 of 18 July 2008 implementing and amending Regulation (EC) No 715/2007 of the European Parliament and of the Council on type-approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information (Text with EEA relevance)

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ANNEX I

ADMINISTRATIVE PROVISIONS FOR EC TYPE-APPROVAL

1. ADDITIONAL REQUIREMENTS FOR GRANTING OF EC TYPE-APPROVAL
 - 1.1. Additional requirements for mono fuel gas vehicles, bi-fuel gas vehicles...
 - 1.1.1. For the purposes of section 1.1 the following definitions shall...
 - 1.1.1.1. A family means a group of vehicle types fuelled by...
 - 1.1.1.2. A parent vehicle means a vehicle that is selected to...
 - 1.1.1.3. A member of the family means a vehicle that shares...
 - 1.1.2. In case of vehicles fuelled by LPG, NG/biomethane, H2NG, EC...
 - 1.1.2.1. For the type-approval of a parent vehicle, the parent vehicle...
 - 1.1.2.2. In the case of vehicles fuelled by LPG, NG/biomethane, the...

- 1.1.2.3. The vehicle is considered to conform if, under the tests...
 - 1.1.2.4. In the case of vehicles fuelled by LPG or NG/biomethane,...
 - 1.1.2.5. In the case of flex fuel H2NG vehicles, two ratios...
 - 1.1.3. For the type-approval of a mono- fuel gas vehicle and...
 - 1.1.4. For the type-approval of a flex fuel H2NG vehicle as...
 - 1.2. Additional requirements for flex fuel vehicles
 - 1.2.1. For the type-approval of a flex fuel ethanol or biodiesel...
 - 1.2.2. For flex fuel vehicles, the transition from one reference fuel...
2. ADDITIONAL TECHNICAL REQUIREMENTS AND TESTS
 - 2.1. Small volume manufacturers
 - 2.1.1. List of legislative acts referred to in Article 3(3):
 - 2.2. Inlets to fuel tanks
 - 2.2.1. The inlet orifice of the petrol or ethanol tank shall...
 - 2.2.2. Section 2.2.1 shall not apply to a vehicle for which...
 - 2.2.3. Provision shall be made to prevent excess evaporative emissions and...
 - 2.3. Provisions for electronic system security
 - 2.3.1. Any vehicle with an emission control computer shall include features...
 - 2.3.2. Computer-coded engine operating parameters shall not be changeable without the...
 - 2.3.3. In the case of mechanical fuel-injection pumps fitted to compression-ignition...
 - 2.3.4. Manufacturers may apply to the approval authority for an exemption...
 - 2.3.5. Manufacturers using programmable computer code systems (e.g. electrical erasable programmable...
 - 2.4. Application of tests
 - 2.4.1. Figure I.2.4 illustrates the application of the tests for type-approval...
Explanatory note :
3. EXTENSIONS TO TYPE-APPROVALS
 - 3.1. Extensions for tailpipe emissions (type 1, type 2 and type...
 - 3.1.1. Vehicles with different reference masses
 - 3.1.1.1. The type-approval shall be extended only to vehicles with a...
 - 3.1.1.2. For category N vehicles, the approval shall be extended only...
 - 3.1.2. Vehicles with different overall transmission ratios
 - 3.1.2.1. The type-approval shall be extended to vehicles with different transmission...
 - 3.1.2.2. To determine whether type-approval can be extended, for each of...
 - 3.1.2.3. If, for each transmission ratio, $E \leq 8 \%$, the...
 - 3.1.2.4. If, for at least one transmission ratio, $E > 8\%$...
 - 3.1.3. Vehicles with different reference masses and transmission ratios
 - 3.1.4. Vehicles with periodically regenerating systems The type-approval of a vehicle...
 - 3.1.4.1. Identical parameters for extending approval are:
 - 3.1.4.2. Use of Ki factors for vehicles with different reference masses...
 - 3.1.5. Application of extensions to other vehicles
 - 3.2. Extensions for evaporative emissions (type 4 test)
 - 3.2.1. The type-approval shall be extended to vehicles equipped with a...
 - 3.2.1.1. The basic principle of fuel/air metering (e.g. single point injection)...
 - 3.2.1.2. The shape of the fuel tank and the material of...

- 3.2.1.3. The worst-case vehicle with regard to the cross-section and approximate...
 - 3.2.1.4. The fuel tank volume is within a range of \pm ...
 - 3.2.1.5. The setting of the fuel tank relief valve is identical....
 - 3.2.1.6. The method of storage of the fuel vapour is identical,...
 - 3.2.1.7. The method of purging of the stored vapour is identical...
 - 3.2.1.8. The method of sealing and venting of the fuel metering...
 - 3.2.2. The type-approval shall be extended to vehicles with:
 - 3.2.2.1. different engine sizes;
 - 3.2.2.2. different engine powers;
 - 3.2.2.3. automatic and manual gearboxes;
 - 3.2.2.4. two and four wheel transmissions;
 - 3.2.2.5. different body styles; and
 - 3.2.2.6. different wheel and tyre sizes.
 - 3.3. Extensions for durability of pollution control devices (type 5 test)...
 - 3.3.1. The type-approval shall be extended to different vehicle types, provided...
 - 3.3.1.1. Vehicle;
 - 3.3.1.2. Engine
 - 3.3.1.3. Pollution control system parameters;
 - 3.3.1.4. The durability test may be carried out using a vehicle,...
 - 3.4. Extensions for on-board diagnostics
 - 3.4.1. The type-approval shall be extended to different vehicles with identical...
 - 3.5. Extensions for CO₂ emissions and fuel consumption
 - 3.5.1. Vehicles powered by an internal combustion engine only, except vehicles...
 - 3.5.1.1. The type-approval shall be extended to vehicles differing with regard...
 - 3.5.2. Vehicles powered by an internal combustion engine only and equipped...
 - 3.5.2.1. The type-approval shall be extended to vehicles, differing with regard...
 - 3.5.2.2. The type-approval shall be extended to vehicles with a different...
 - 3.5.3. Vehicles powered by an electric power train only
 - 3.5.4. Vehicles powered by a hybrid electric power train
 - 3.5.5. Extension of type-approval of vehicles of category N within a...
 - 3.5.5.1. For vehicles of category N that are approved as members...
 - 3.5.5.2. For vehicles of category N that are type-approved as members...
 - 3.6. Type-approval of vehicles of category N within a family for...
 - 3.6.1. N vehicles may be grouped together into a family for...
 - 3.6.1.1. Identical parameters shall be the following:
 - 3.6.1.2. The following parameters shall be within the following limits:
 - 3.6.2. A vehicle family, as defined in point 3.6.1, may be...
 - 3.6.3. Vehicles that are grouped in a family as defined in...
4. CONFORMITY OF PRODUCTION
- 4.1. Introduction
 - 4.1.1. Where applicable the tests of types 1, 2, 3, 4,...
 - 4.2. Checking the conformity of the vehicle for a type 1...
 - 4.2.1. The type 1 test shall be carried out on a...

- 4.2.2. After selection by the approval authority, the manufacturer shall not...
 - 4.2.2.1. Three vehicles shall be selected at random in the series...
 - 4.2.2.2. If the approval authority is satisfied with the production standard...
 - 4.2.2.3. The production of a series shall be deemed to conform...
- 4.2.3. Notwithstanding the requirements of Annex III, the tests shall be...
 - 4.2.3.1. However, at the request of the manufacturer, the tests may...
 - 4.2.3.2. If the manufacturer wishes to run in the vehicles, ('x'...
 - 4.2.3.3. All these tests shall be conducted with commercial fuel. However,...
- 4.3. Checking the conformity of the vehicle for CO₂ emissions
 - 4.3.1. If a vehicle type has had one or several extensions,...
 - 4.3.2. If the approval authority is not satisfied with the auditing...
 - 4.3.3. For the purpose of this section and Appendices 1 and...
 - 4.3.4. The conformity of the vehicle for CO₂ emissions shall be...
 - 4.3.4.1. The provisions of Section 4.2.2.1 shall be replaced by the...
 - 4.3.4.2. The provisions of Section 4.2.3.1 shall be replaced by the...
 - 4.3.4.3. The provisions of Section 4.2.3.2 shall be replaced by the...
 - 4.3.4.4. The provisions of Section 4.2.3.3 shall be replaced by the...
 - 4.3.4.5. When checking the conformity of vehicle for CO₂ emissions, as...
 - 4.3.5. Vehicle fitted with eco-innovations
 - 4.3.5.1. In the case of a vehicle type fitted with one...
 - 4.3.5.2. Points 4.3.1, 4.3.2 and 4.3.4 shall apply.
- 4.4. Vehicles powered by an electric power train only
 - 4.4.1. The holder of the approval shall, in particular:
 - 4.4.1.1. Ensure the existence of procedures for the effective control of...
 - 4.4.1.2. Have access to the equipment necessary for checking conformity with...
 - 4.4.1.3. Ensure that the data concerning the test result are recorded...
 - 4.4.1.4. Analyse the results of each type of test so as...
 - 4.4.1.5. Make sure that for each type of vehicle tests referred...
 - 4.4.1.6. Make sure that any collections of samples or test pieces...
 - 4.4.2. The approval authorities may verify at any time the methods...
 - 4.4.2.1. In every inspection, the records of tests and production monitoring...
 - 4.4.2.2. The inspector may select at random the samples to be...
 - 4.4.2.3. When the quality standard does not seem satisfactory or when...
 - 4.4.2.4. The approval authorities may carry out all the tests set...
- 4.5. Vehicles powered by a hybrid electric power train
 - 4.5.1. Measures to ensure the conformity of production with regard to...
 - 4.5.2. The control of production conformity shall be based on an...
 - 4.5.3. If the approval authority is not satisfied with the standard...
 - 4.5.4. Conformity for CO₂ emissions shall be checked using the statistical...
- 4.6. Checking the conformity of the vehicle for a type 3...
 - 4.6.1. If a type 3 test is to be carried out,...
- 4.7. Checking the conformity of the vehicle for a type 4...
 - 4.7.1. If a type 4 test is to be carried out,...
- 4.8. Checking the conformity of the vehicle for On-board Diagnostics (OBD)...
- 4.8.1. If a verification of the performance of the OBD system...

- 4.8.1.1. When the approval authority determines that the quality of production...
 - 4.8.1.2. The production shall be deemed to conform if this vehicle...
 - 4.8.1.3. If the vehicle taken from the series does not satisfy...
 - 4.8.1.4. The production shall be deemed to conform if at least...
- 4.9. Checking the conformity of a vehicle fuelled by LPG, natural...
- 4.9.1. Tests for conformity of production may be performed with a...
- 4.10. Checking the conformity of vehicle for smoke opacity
- 4.10.1. Conformity of the vehicle with the approved type as regards...
 - 4.10.2. In addition to point 10.1, where a check is carried...

Appendix 1

Verification of conformity of production — First statistical method

- 1. The first statistical method shall be used to verify the...
- 1.1. In paragraph 3, the reference to paragraph 5.3.1.4 shall be...
 - 1.2. In paragraph 3, the reference to Figure 2 shall be...

Appendix 2

Verification of conformity of production — Second statistical method

- 1. The second statistical method shall be used to verify the...
- 1.1. In paragraph 3, the reference to paragraph 5.3.1.4 shall be...

Appendix 3

MODEL

relating to EC type-approval of a vehicle with regard to...

- 0. GENERAL
 - 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...
 - 0.3.1. Location of that marking:
 - 0.4. Category of vehicle:
 - 0.5. Name and address of manufacturer:
 - 0.8. Name(s) and address(es) of assembly plant(s):
 - 0.9. Name and address of the manufacturer's representative (if any)
- 1. GENERAL CONSTRUCTION CHARACTERISTICS OF THE VEHICLE
 - 1.1. Photographs and/or drawings of a representative vehicle:
 - 1.3.3. Powered axles (number, position, interconnection):
- 2. MASSES AND DIMENSIONS (in kg and mm)
 - 2.6. Mass of the vehicle with bodywork and, in the case...
 - 2.8. Technically permissible maximum laden mass stated by the manufacturer
 - 2.17. Vehicle submitted to multi-stage type-approval (only in the case of...

- 2.17.1. Mass of the base vehicle in running order: kg
- 2.17.2. Default added mass, calculated in accordance with Section 5 of...
- 3. PROPULSION ENERGY CONVERTER (k)
 - 3.1. Manufacturer of the propulsion energy converter(s):
 - 3.1.1. Manufacturer's code (as marked on the propulsion energy converter or...
 - 3.2. Internal combustion engine
 - 3.2.1. Working principle: positive ignition/compression ignition ...
 - 3.2.1.2. Number and arrangement of cylinders:
 - 3.2.1.2.1 Bore: mm
 - 3.2.1.2.2 Stroke: mm
 - 3.2.1.2.3 Firing order:
 - 3.2.1.3. Engine capacity (s): ... cm³
 - 3.2.1.4. Volumetric compression ratio
 - 3.2.1.5. Drawings of combustion chamber, piston crown and, in the case...
 - 3.2.1.6. Normal engine idling speed ... min⁻¹
 - 3.2.1.6.1 High engine idling speed ... min⁻¹
 - 3.2.1.7. Carbon monoxide content by volume in the exhaust gas with...
 - 3.2.1.8. Rated engine power (n): ... kW at ... min⁻¹...
 - 3.2.1.9. Maximum permitted engine speed as prescribed by the manufacturer:
 -
 - 3.2.1.10 Maximum net torque: Nm at ... min⁻¹ (manufacturer's declared value)...
 - 3.2.2. Fuel
 - 3.2.2.1. Light-duty vehicles: Diesel/Petrol/LPG/NG or Biomethane/Ethanol (E85) /Biodiesel /Hydrogen/H₂NG
 - 3.2.2.1.1 RON, unleaded:
 - 3.2.2.3. Fuel tank inlet: restricted orifice/label
 - 3.2.2.4. Vehicle fuel type: Mono fuel, Bi fuel, Flex fuel
 - 3.2.2.5. Maximum amount of biofuel acceptable in fuel (manufacturer's declared value):...
 - 3.2.4. Fuel feed
 - 3.2.4.2. By fuel injection (compression ignition only): yes/no
 - 3.2.4.2.1 System description (common rail/unit injectors/distribution pump etc.):
 - 3.2.4.2.2 Working principle: direct injection/pre-chamber/swirl chamber
 - 3.2.4.2.3 Injection/Delivery pump
 - 3.2.4.2.3.1 Make(s):
 - 3.2.4.2.3.2 Type(s):
 - 3.2.4.2.3.3 Maximum fuel delivery mm³/stroke or cycle at an engine speed...
 - 3.2.4.2.3.4 Injection advance curve:
 - 3.2.4.2.4 Engine speed limitation control
 - 3.2.4.2.4.1 Cut-off point
 - 3.2.4.2.4.1.1 Cut-off point under load ... min⁻¹
 - 3.2.4.2.4.1.2 Cut-off point without load ... min⁻¹
 - 3.2.4.2.5 Injector(s)
 - 3.2.4.2.5.1 Make(s):
 - 3.2.4.2.5.2 Type(s):
 - 3.2.4.2.6 Cold start system
 - 3.2.4.2.6.1 Make(s):

- 3.2.4.2.7 Type(s):
- 3.2.4.2.8 Description:
- 3.2.4.2.8 Auxiliary starting aid
- 3.2.4.2.8 Make(s):
- 3.2.4.2.8 Type(s):
- 3.2.4.2.8 System description:
- 3.2.4.2.9 Electronic controlled injection: yes/no
- 3.2.4.2.9 Make(s):
- 3.2.4.2.9 Type(s):
- 3.2.4.2.9 Description of the system
 - 3.2.4.2.9 Make and type of the control unit:
 - 3.2.4.2.9 Make and type of the fuel regulator:
 - 3.2.4.2.9 Make and type of air-flow sensor:
 - 3.2.4.2.9 Make and type of fuel distributor:
 - 3.2.4.2.9 Make and type of throttle housing:
 - 3.2.4.2.9 Make and type or working principle of water temperature sensor:...
 - 3.2.4.2.9 Make and type or working principle of air temperature sensor:...
 - 3.2.4.2.9 Make and type or working principle of air pressure sensor:...
- 3.2.4.3. By fuel injection (positive ignition only): yes/no
- 3.2.4.3.1 Working principle: intake manifold (single-/multi-point)/direct injection/other (specify)
- 3.2.4.3.2 Make(s):
- 3.2.4.3.3 Type(s):
- 3.2.4.3.4 System description, in the case of systems other than continuous...
 - 3.2.4.3.4 Make and type of the control unit:
 - 3.2.4.3.4 Make and type or working principle of air-flow sensor:
 - 3.2.4.3.4 Make and type of micro switch:
 - 3.2.4.3.4 Make and type of throttle housing:
 - 3.2.4.3.4 Make and type or working principle of water temperature sensor:...
 - 3.2.4.3.4 Make and type or working principle of air temperature sensor:...
 - 3.2.4.3.4 Make and type or working principle of air pressure sensor:...
- 3.2.4.3.5 Injectors
 - 3.2.4.3.5 Make(s):
 - 3.2.4.3.5 Type(s):
- 3.2.4.3.6 Injection timing:
- 3.2.4.3.7 Cold start system
 - 3.2.4.3.7 Operating principle(s):
 - 3.2.4.3.7 Operating limits/settings :
- 3.2.4.4. Feed pump
 - 3.2.4.4.1 Pressure: ... kPa or characteristic diagram:
- 3.2.5. Electrical system
 - 3.2.5.1. Rated voltage: V, positive/negative ground
 - 3.2.5.2. Generator
 - 3.2.5.2.1 Type:
 - 3.2.5.2.2 Nominal output: ... VA

- 3.2.6. Ignition
 - 3.2.6.1. Make(s):
 - 3.2.6.2. Type(s):
 - 3.2.6.3. Working principle:
 - 3.2.6.4. Ignition advance curve:
 - 3.2.6.5. Static ignition timing: ... degrees before TDC
- 3.2.7. Cooling system: liquid/air
 - 3.2.7.1. Nominal setting of the engine temperature control mechanism:
 - 3.2.7.2. Liquid
 - 3.2.7.2.1. Nature of liquid:
 - 3.2.7.2.2. Circulating pump(s): yes/no
 - 3.2.7.2.3. Characteristics, or
 - 3.2.7.2.3.1. Make(s):
 - 3.2.7.2.3.2. Type(s):
 - 3.2.7.2.4. Drive ratio(s):
 - 3.2.7.2.5. Description of the fan and its drive mechanism:
 - 3.2.7.3. Air
 - 3.2.7.3.1. Blower: yes/no
 - 3.2.7.3.2. Characteristics, or
 - 3.2.7.3.2.1. Make(s):
 - 3.2.7.3.2.2. Type(s):
 - 3.2.7.3.3. Drive ratio(s):
- 3.2.8. Intake system
 - 3.2.8.1. Pressure charger: yes/no
 - 3.2.8.1.1. Make(s):
 - 3.2.8.1.2. Type(s):
 - 3.2.8.1.3. Description of the system (e.g. maximum charge pressure: ... kPa,...
 - 3.2.8.2. Intercooler: yes/no
 - 3.2.8.2.1. Type: air-air/air-water
 - 3.2.8.3. Intake depression at rated engine speed and at 100 %...
 - 3.2.8.4. Description and drawings of the inlet pipes and their accessories...
 - 3.2.8.4.1. Intake manifold description (include drawings and/or photos):
 - 3.2.8.4.2. Air filter, drawings: ... or
 - 3.2.8.4.2.1. Make(s):
 - 3.2.8.4.2.2. Type(s):
 - 3.2.8.4.3. Intake silencer, drawings: ... or
 - 3.2.8.4.3.1. Make(s):
 - 3.2.8.4.3.2. Type(s):
- 3.2.9. Exhaust system
 - 3.2.9.1. Description and/or drawing of the exhaust manifold:
 - 3.2.9.2. Description and/or drawing of the exhaust system:
 - 3.2.9.3. Maximum allowable exhaust back pressure at rated engine speed and...
- 3.2.10. Minimum cross-sectional areas of inlet and outlet ports:
- 3.2.11. Valve timing or equivalent data
 - 3.2.11.1. Maximum lift of valves, angles of opening and closing, or...
 - 3.2.11.2. Reference and/or setting ranges:
- 3.2.12. Measures taken against air pollution
 - 3.2.12.1. Device for recycling crankcase gases (description and drawings):

3.2.12.2 Pollution control devices (if not covered by another heading)

3.2.12.2.1 Catalytic converter

3.2.12.2.1.1 Number of catalytic converters and elements
(provide the information below...)

3.2.12.2.1.2 Dimensions, shape and volume of the
catalytic converter:

3.2.12.2.1.3 Type of catalytic action:

3.2.12.2.1.4 Total charge of precious metals:

3.2.12.2.1.5 Relative concentration:

3.2.12.2.1.6 Substrate (structure and material):

3.2.12.2.1.7 Cell density:

3.2.12.2.1.8 Type of casing for the catalytic converter(s):

3.2.12.2.1.9 Location of the catalytic converter(s) (place
and reference distance in...)

3.2.12.2.1.10 Heat shield: yes/no

3.2.12.2.1.11.

3.2.12.2.1.11.1.

3.2.12.2.1.11.2.

3.2.12.2.1.11.3.

3.2.12.2.1.11.4.

3.2.12.2.1.11.5.

3.2.12.2.1.11.6.

3.2.12.2.1.11.7.

3.2.12.2.1.11.8.

3.2.12.2.1.11.9.

3.2.12.2.1.11.10.

3.2.12.2.1.12 Make of catalytic converter:

3.2.12.2.1.13 Identifying part number:

3.2.12.2.2 Sensors

3.2.12.2.2.1 Oxygen sensor: yes/no

3.2.12.2.2.1.1 Make:

3.2.12.2.2.1.2 Location:

3.2.12.2.2.1.3 Control range:

3.2.12.2.2.1.4 Type of working principle: ...

3.2.12.2.2.1.5 Identifying part number: ...

3.2.12.2.3 Air injection: yes/no

3.2.12.2.3.1 Type (pulse air, air pump etc.):

3.2.12.2.4 Exhaust gas recirculation: yes/no

3.2.12.2.4.1 Characteristics (make, type, flow, high
pressure / low pressure /...)

3.2.12.2.4.2 Water-cooled system (to be specified for each
EGR system e.g....)

3.2.12.2.5 Evaporative emissions control system (petrol and
ethanol engines only): yes/no...

3.2.12.2.5.1 Detailed description of the devices:

3.2.12.2.5.2 Drawing of the evaporative emissions control
system:

3.2.12.2.5.3 Drawing of the carbon canister:

3.2.12.2.5.4 Mass of dry charcoal: ... g

3.2.12.2.5.5 Schematic drawing of the fuel tank with
indication of capacity...

3.2.12.2.5.6 Description and schematic of the heat shield
between tank and...

- 3.2.12.2.5.7 permeability factor : ...
- 3.2.12.2.6 Particulate trap: yes/no
 - 3.2.12.2.6.1 dimensions, shape and capacity of the particulate trap:
 - 3.2.12.2.6.2 type and design of the particulate trap:
 - 3.2.12.2.6.3 location (reference distance in the exhaust line):
 - 3.2.12.2.6.4.
 - 3.2.12.2.6.4.1.
 - 3.2.12.2.6.4.2.
 - 3.2.12.2.6.4.3.
 - 3.2.12.2.6.4.4.
 - 3.2.12.2.6.5 make of particulate trap: ...
 - 3.2.12.2.6.6 identifying part number: ...
- 3.2.12.2.7 On-board-diagnostic (OBD) system: (yes/no)
 - 3.2.12.2.7.1 written description and/or drawing of the MI:
 - 3.2.12.2.7.2 list and purpose of all components monitored by the OBD...
 - 3.2.12.2.7.3 written description (general working principles) for:
 - 3.2.12.2.7.3.1 positive-ignition engines
 - 3.2.12.2.7.3.1.1 catalyst monitoring:
 - 3.2.12.2.7.3.1.2 misfire detection:
 - 3.2.12.2.7.3.1.3 oxygen sensor monitoring:
 - 3.2.12.2.7.3.1.4 other components monitored by the OBD system:
 - 3.2.12.2.7.3.2 compression-ignition engines
 - 3.2.12.2.7.3.2.1 catalyst monitoring:
 - 3.2.12.2.7.3.2.2 particulate trap monitoring:
 - 3.2.12.2.7.3.2.3 electronic fuelling system monitoring:
 - 3.2.12.2.7.3.2.4 other components monitored by the OBD system:
 - 3.2.12.2.7.4 criteria for MI activation (fixed number of driving cycles or...
 - 3.2.12.2.7.5 list of all OBD output codes and formats used (with...
 - 3.2.12.2.7.6 the following additional information shall be provided by the vehicle...
 - 3.2.12.2.7.6.1 description of the type and number of the pre-conditioning...
 - 3.2.12.2.7.6.2 description of the type of the OBD demonstration cycle...
 - 3.2.12.2.7.6.3 comprehensive document describing all sensed components with the strategy...
 - 3.2.12.2.7.6.4 information required by this section may, for example, be...
- 3.2.12.2.8 other system:
- 3.2.12.2.9 periodically regenerating system: (provide the information below for each separate...
- 3.2.12.2.10 method or system of regeneration, description and/or drawing: ...

- 3.2.12.2.10.2 The number of Type 1 operating cycles, or equivalent engine...
 - 3.2.12.2.10.2.1 Description of method employed to determine the number of cycles...
- 3.2.12.2.10.3 Parameters to determine the level of loading required before regeneration...
- 3.2.12.2.10.5 Description of method used to load system in the test...
- 3.2.12.2.11 Catalytic converter systems using consumable reagents (provide the information below...
 - 3.2.12.2.11.1 Type and concentration of reagent needed: ...
 - 3.2.12.2.11.2 Normal operational temperature range of reagent: ...
 - 3.2.12.2.11.3 International standard: ...
 - 3.2.12.2.11.4 Frequency of reagent refill: continuous/maintenance (where appropriate):
 - 3.2.12.2.11.5 Reagent indicator: (description and location)
 - 3.2.12.2.11.6 Reagent tank
 - 3.2.12.2.11.6.1 Capacity: ...
 - 3.2.12.2.11.6.2 Heating system: yes/no
 - 3.2.12.2.11.6.3 Description or drawing
 - 3.2.12.2.11.7 Reagent control unit: yes/no
 - 3.2.12.2.11.8 Make(s)...
 - 3.2.12.2.11.9 Type...
 - 3.2.12.2.11.10 Reagent injector (make, type and location): ...
- 3.2.13. Location of the absorption coefficient symbol (compression ignition engines only):...
- 3.2.14. Details of any devices designed to influence fuel economy (if...)
- 3.2.15. LPG fuelling system: yes/no
 - 3.2.15.1 Type-approval number according to Regulation (EC) No 661/2009 (OJ...)
 - 3.2.15.2 Electronic engine management control unit for LPG fuelling
 - 3.2.15.2.1 Make(s):
 - 3.2.15.2.2 Type(s):
 - 3.2.15.2.3 Emission-related adjustment possibilities:
 - 3.2.15.3 Further documentation
 - 3.2.15.3.1 Description of the safeguarding of the catalyst at switch-over from...
 - 3.2.15.3.2 System lay-out (electrical connections, vacuum connections compensation hoses, etc.):
 - 3.2.15.3.3 Drawing of the symbol:
- 3.2.16. NG fuelling system: yes/no
 - 3.2.16.1 Type-approval number according to Regulation (EC) No 661/2009 (OJ...)
 - 3.2.16.2 Electronic engine management control unit for NG fuelling
 - 3.2.16.2.1 Make(s):
 - 3.2.16.2.2 Type(s):
 - 3.2.16.2.3 Emission-related adjustment possibilities:
 - 3.2.16.3 Further documentations
 - 3.2.16.3.1 Description of the safeguarding of the catalyst at switch-over from...

- 3.2.16.3~~S~~ystem lay-out (electrical connections, vacuum connections compensation hoses, etc.):
 - 3.2.16.3~~D~~rawing of the symbol:
 - 3.2.18. Hydrogen fuelling system: yes/no
 - 3.2.18.1EC type-approval number according to Regulation (EC) No 79/2009:
 - 3.2.18.2Electronic engine management control unit for hydrogen fuelling
 - 3.2.18.2~~M~~ake(s):
 - 3.2.18.2~~T~~ype(s):
 - 3.2.18.2~~B~~mission-related adjustment possibilities:
 - 3.2.18.3Further documentation
 - 3.2.18.3~~D~~escription of the safeguarding of the catalyst at switch-over from...
 - 3.2.18.3~~S~~ystem lay-out (electrical connections, vacuum connections compensation hoses, etc.):
 - 3.2.18.3~~D~~rawing of the symbol:
 - 3.2.19. H2NG fuelling system: yes/no
 - 3.2.19.1Percentage of hydrogen in the fuel (the maximum specified by...
 - 3.2.19.2EC type-approval number according to UN/ECE Regulation No 110
 - 3.2.19.3Electronic engine management control unit for H2NG fuelling
 - 3.2.19.3~~M~~ake(s):
 - 3.2.19.3~~T~~ype(s):
 - 3.2.19.3~~B~~mission-related adjustment possibilities:
 - 3.2.19.4Further documentation
 - 3.2.19.4~~D~~escription of the safeguarding of the catalyst at switch-over from...
 - 3.2.19.4~~S~~ystem lay-out (electrical connections, vacuum connections compensation hoses, etc.):
 - 3.2.19.4~~D~~rawing of the symbol:
 - 3.3. Electric machine
 - 3.3.1. Type (winding, excitation): ...
 - 3.3.1.1. Maximum hourly output: kW
 - 3.3.1.1.1Maximum net power (a) kW
 - 3.3.1.1.2Maximum 30 minutes power (a) kW
 - 3.3.1.2. Operating voltage: ... V
 - 3.3.2. REESS
 - 3.3.2.1. Number of cells:
 - 3.3.2.2. Mass: kg
 - 3.3.2.3. Capacity: ... Ah (Amp-hours)
 - 3.3.2.4. Position:
 - 3.4. Combinations of propulsion energy converters
 - 3.4.1. Hybrid Electric Vehicle: yes/no
 - 3.4.2. Category of Hybrid Electric vehicle
 - 3.4.3. Operating mode switch: with/without
 - 3.4.3.1. Selectable modes
 - 3.4.3.1.1Pure electric: yes/no
 - 3.4.3.1.2Pure fuel consuming: yes/no
 - 3.4.3.1.3Hybrid modes: yes/no
 - 3.4.4. Description of the energy storage device: (REESS, capacitor, flywheel/ generator)

- 3.4.4.1. Make(s):
 - 3.4.4.2. Type(s):
 - 3.4.4.3. Identification number:
 - 3.4.4.4. Kind of electrochemical couple:
 - 3.4.4.5. Energy: ... (for REESS: voltage and capacity Ah in 2...
 - 3.4.4.6. Charger: on board/external/without
 - 3.4.5. Electric machine (describe each type of electric machine separately)
 - 3.4.5.1. Make:
 - 3.4.5.2. Type:
 - 3.4.5.3. Primary use: traction motor/generator
 - 3.4.5.3.1. When used as traction motor: monomotor/
multimotors (number):
 - 3.4.5.4. Maximum power: kW
 - 3.4.5.5. Working principle:
 - 3.4.5.5.1. Direct current/alternating current/number of phases:
 - 3.4.5.5.2. Separate excitation/series/compound
 - 3.4.5.5.3. Synchronous/asynchronous
 - 3.4.6. Control unit
 - 3.4.6.1. Make(s):
 - 3.4.6.2. Type(s):
 - 3.4.6.3. Identification number:
 - 3.4.7. Power controller
 - 3.4.7.1. Make:
 - 3.4.7.2. Type:
 - 3.4.7.3. Identification number:
 - 3.4.8. Vehicle electric range ... km (in accordance to Annex...
 - 3.4.9. Manufacturer's recommendation for preconditioning:
- 3.5. Manufacturer's declared values for determination of CO₂ emissions/fuel consumption/electric...
 - 3.5.1. CO₂ mass emissions (provide for each reference fuel tested)
 - 3.5.1.1. CO₂ mass emissions (urban conditions): ... g/km
 - 3.5.1.2. CO₂ mass emissions (extra-urban conditions): ... g/km
 - 3.5.1.3. CO₂ mass emissions (combined): ... g/km
 - 3.5.2. Fuel consumption (provide for each reference fuel tested)
 - 3.5.2.1. Fuel consumption (urban conditions) ... l/100 km or m³/100...
 - 3.5.2.2. Fuel consumption (extra-urban conditions) ... l/100 km or m³/100...
 - 3.5.2.3. Fuel consumption (combined) ... l/100 km or m³/100...
 - 3.5.3. Electric energy consumption for electric vehicles
 - 3.5.3.1. Type/Variant/Version of the baseline vehicle as defined in Article 5...
 - 3.5.3.1.1. Electric energy consumption for pure electric vehicles ... Wh/km
 - 3.5.3.1.2. Interactions existing between different eco-innovations: yes/
no
 - 3.5.3.1.3. Electric energy consumption for externally chargeable hybrid electric vehicles
 - 3.5.3.1.3.1. Electric energy consumption (Condition A, combined) Wh/km
 - 3.5.3.1.3.2. Electric energy consumption (Condition B, combined) Wh/km
 - 3.5.3.1.3.3. Electric energy consumption (weighted combined) Wh/km

- 3.5.3.3. Emissions data related to the use of eco-innovations
 - 3.5.4. Electric energy consumption for externally chargeable hybrid electric vehicles
 - 3.5.4.1.
 - 3.5.4.2.
 - 3.5.4.3.
 - 3.5.6. Vehicle fitted with an eco-innovation within the meaning of Article...
 - 3.5.6.1. Type/Variant/Version of the baseline vehicle as referred to in Article...
 - 3.5.6.2. Interactions existing between different eco-innovations: yes/no
 - 3.5.6.3. Emissions data related to the use of eco-innovations
 - 3.6. Temperatures permitted by the manufacturer
 - 3.6.1. Cooling system
 - 3.6.1.1. Liquid cooling
 - 3.6.1.2. Air cooling
 - 3.6.1.2.1. Reference point: ...
 - 3.6.1.2.2. Maximum temperature at reference point: K
 - 3.6.2. Maximum outlet temperature of the inlet intercooler: K
 - 3.6.3. Maximum exhaust temperature at the point in the exhaust pipe(s)...
 - 3.6.4. Fuel temperature
 - 3.6.5. Lubricant temperature
 - 3.8. Lubrication system
 - 3.8.1. Description of the system
 - 3.8.1.1. Position of the lubricant reservoir:
 - 3.8.1.2. Feed system (by pump/injection into intake/mixing with fuel, etc.)
 - 3.8.2. Lubricating pump
 - 3.8.2.1. Make(s):
 - 3.8.2.2. Type(s):
 - 3.8.3. Mixture with fuel
 - 3.8.3.1. Percentage:
 - 3.8.4. Oil cooler: yes/no
 - 3.8.4.1. Drawing(s): ..., or
 - 3.8.4.1.1. Make(s):
 - 3.8.4.1.2. Type(s):
4. TRANSMISSION
 - 4.3. Moment of inertia of engine flywheel:
 - 4.3.1. Additional moment of inertia with no gear engaged:
 - 4.4. Clutch(es)
 - 4.4.1. Maximum torque conversion:
 - 4.5. Gearbox
 - 4.5.1. Type (manual/automatic/CVT (continuously variable transmission))
 - 4.6. Gear ratios
6. SUSPENSION
 - 6.6. Tyres and wheels
 - 6.6.1. Tyre/wheel combination(s)
 - 6.6.1.1. Axles
 - 6.6.1.1.1. Axle 1:
 - 6.6.1.1.1.1. Tyre size designation
 - 6.6.1.1.2. Axle 2:

- 6.6.1.1. Tyre size designation
 - 6.6.2. Upper and lower limits of rolling radii
 - 6.6.2.1. Axle 1:
 - 6.6.2.2. Axle 2:
 - 6.6.3. Tyre pressure(s) as recommended by the vehicle manufacturer: kPa
- 9. BODYWORK
 - 9.1. Type of bodywork using the codes defined in Part C...
 - 9.10.3. Seats
 - 9.10.3.1 Number:
- 16. ACCESS TO VEHICLE REPAIR AND MAINTENANCE INFORMATION
 - 16.1. Address of principal website for access to vehicle repair and...
 - 16.1.1. Date from which it is available (no later than 6...
 - 16.2. Terms and conditions of access to website referred to in...
 - 16.3. Format of vehicle repair and maintenance information accessible through website...

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:
- 4. Dynamometer load setting information (repeat information for each dynamometer test)...
 - 4.1. Vehicle bodywork type (variant/version)
 - 4.2. Gearbox type (manual/automatic/CVT)
 - 4.3. Fixed load curve dynamometer setting information (if used)
 - 4.3.1. Alternative dynamometer load setting method used (yes/no)
 - 4.3.2. Inertia mass (kg):
 - 4.3.3. Effective power absorbed at 80km/h including running losses of the...
 - 4.3.4. Effective power absorbed at 50km/h including running losses of...
 - 4.4. Adjustable load curve dynamometer setting information (if used)
 - 4.4.1. Coast down information from the test track.
 - 4.4.2. Tyres make and type:
 - 4.4.3. Tyre dimensions (front/rear):
 - 4.4.4. Tyre pressure (front/rear) (kPa):
 - 4.4.5. Vehicle test mass including driver (kg):
 - 4.4.6. Road coast down data (if used)
 - 4.4.7. Average corrected road power (if used)

Appendix 4

MODEL OF EC TYPE-APPROVAL CERTIFICATE

SECTION I

- 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...
 - 0.3.1. Location of that marking:
- 0.4. Category of vehicle
- 0.5. Name and address of manufacturer:
- 0.8. Name(s) and address(es) of assembly plant(s):
- 0.9. Representative of the manufacturer:

SECTION II

- 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 ...

concerning the type-approval of a vehicle with regard to emissions and access to
vehicle repair and maintenance information according to Regulation (EC) No 715/2007

- 1. Additional information
 - 1.1. Mass of the vehicle in running order:
 - 1.2. Maximum mass:
 - 1.3. Reference mass:

- 1.4. Number of seats:
 - 1.6. Type of bodywork:
 - 1.6.1. for M1, M2: saloon, hatchback, station wagon, coupé, convertible, multipurpose...
 - 1.6.2. for N1, N2: lorry, van
 - 1.7. Drive wheels: front, rear, 4 x 4
 - 1.8. Pure electric vehicle: yes/no
 - 1.9. Hybrid electric vehicle: yes/no
 - 1.9.1. Category of Hybrid Electric vehicle: Off Vehicle Charging/Not Off Vehicle...
 - 1.9.2. Operating mode switch: with/without
 - 1.10. Engine identification:
 - 1.10.1. Engine displacement:
 - 1.10.2. Fuel supply system: direct injection/indirect injection
 - 1.10.3. Fuel recommended by the manufacturer:
 - 1.10.4. Maximum power: kW at min'
 - 1.10.5. Pressure charging device: yes/no
 - 1.10.6. Ignition system: compression ignition/positive ignition
 - 1.11. Power train (for pure electric vehicle or hybrid electric vehicle)...
 - 1.11.1. Maximum net power: ... kW, at: ... to ... min⁻¹...
 - 1.11.2. Maximum thirty minutes power: ... kW
 - 1.11.3. Maximum net torque: ... Nm, at ... min⁻¹
 - 1.12. Traction battery (for pure electric vehicle or hybrid electric vehicle)...
 - 1.12.1. Nominal voltage: V
 - 1.12.2. Capacity (2 h rate): Ah
 - 1.13. Transmission: ...,
 - 1.13.1. Type of gearbox: manual/automatic/variable transmission
 - 1.13.2. Number of gear ratios:
 - 1.13.3. Total gear ratios (including the rolling circumferences of the tyres...
 - 1.13.4. Final drive ratio:
 - 1.14. Tyres: ..., ...
2. Test results
- 2.1. Tailpipe emissions test results Emissions classification: Euro 5/Euro 6 Type...
 - 2.1.1. For bi fuel vehicles, the type 1 table shall be...
 - 2.1.2. Written description and/or drawing of the MI:
 - 2.1.3. List and function of all components monitored by the OBD...
 - 2.1.4. Written description (general working principles) for:
 - 2.1.4.1. Misfire detection:
 - 2.1.4.2. Catalyst monitoring:
 - 2.1.4.3. Oxygen sensor monitoring:
 - 2.1.4.4. Other components monitored by the OBD system:
 - 2.1.4.5. Catalyst monitoring:
 - 2.1.4.6. Particulate trap monitoring:
 - 2.1.4.7. Electronic fuelling system actuator monitoring:
 - 2.1.4.8. Other components monitored by the OBD system:
 - 2.1.5. Criteria for MI activation (fixed number of driving cycles or...
 - 2.1.6. List of all OBD output codes and formats used (with...
 - 2.2. Emissions data required for roadworthiness testing
 - 2.3. Catalytic converters yes/no
 - 2.3.1. Original equipment catalytic converter tested to all relevant requirements of...
 - 2.4. Smoke opacity test results

- 2.4.1. At steady speeds: See technical service test report number:
 - 2.4.2. Free acceleration tests
 - 2.4.2.1. Measured value of the absorption coefficient: ... m-1
 - 2.4.2.2. Corrected value of the absorption coefficient: ... m-1
 - 2.4.2.3. Location of the absorption coefficient symbol on the vehicle:
 - 2.5. CO2 emissions and fuel consumption test results
 - 2.5.1. Internal combustion engine vehicle and Not Externally Chargeable (NOVC) Hybrid...
 - 2.5.1.1. CO2 mass emissions (provide declared values for each reference fuel...
 - 2.5.1.1.1. CO2 mass emissions (urban conditions): ... g/km
 - 2.5.1.1.2. CO2 mass emissions (extra-urban conditions): ... g/km
 - 2.5.1.1.3. CO2 mass emissions (combined): ... g/km
 - 2.5.1.2. Fuel consumption (provide declared values for each reference fuel tested)...
 - 2.5.1.2.1. Fuel consumption (urban conditions): ... l/100 km
 - 2.5.1.2.2. Fuel consumption (extra-urban conditions): ... l/100 km
 - 2.5.1.2.3. Fuel consumption (combined): ... l/100 km
 - 2.5.1.3. For vehicles powered by an internal combustion engine only which...
 - 2.5.1.3.1. Information about regeneration strategy for CO2 emissions and fuel consumption...
 - 2.5.2. Pure electric vehicles
 - 2.5.2.1. Electric energy consumption (declared value).
 - 2.5.2.1.1. Electric energy consumption: Wh/km
 - 2.5.2.1.2. Total time out of tolerance for the conduct of the...
 - 2.5.2.2. Range (declared value): km
 - 2.5.3. Externally chargeable (OVC) Hybrid Electric Vehicle:
 - 2.5.3.1. CO2 mass emission (Condition A, combined): g/km
 - 2.5.3.2. CO2 mass emission (Condition B, combined): g/km
 - 2.5.3.3. CO2 mass emission (weighted, combined): g/km
 - 2.5.3.4. Fuel consumption (Condition A, combined): ... l/100 km
 - 2.5.3.5. Fuel consumption (Condition B, combined): ... l/100 km
 - 2.5.3.6. Fuel consumption (weighted, combined): ... l/100 km
 - 2.5.3.7. Electric energy consumption (Condition A, combined): Wh/km
 - 2.5.3.8. Electric energy consumption (Condition B, combined): Wh/km
 - 2.5.3.9. Electric energy consumption (weighted and combined): Wh/km
 - 2.5.3.10. Pure electric range: km
 - 2.6. Test results of eco-innovations
 - 2.6.1. General code of the eco-innovation(s) : ...
3. Vehicle repair information
 - 3.1. Address of website for access to vehicle repair and maintenance...
 - 3.1.1. Date from which it is available (up to 6 months...
 - 3.2. Terms and conditions of access (i.e. duration of access, price...
 - 3.3. Format of vehicle repair and maintenance information accessible through website...

- 3.4. Manufacturer's certificate on access to vehicle repair and maintenance information...
- 4. Power measurement
 - 4.1. Internal combustion engine net power
 - 4.1.1. Engine speed (rpm)
 - 4.1.2. Measured fuel flow (g/h)
 - 4.1.3. Measured torque (Nm)
 - 4.1.4. Measured power (kW)
 - 4.1.5. Barometric pressure (kPa)
 - 4.1.6. Water vapour pressure (kPa)
 - 4.1.7. Intake air temperature (K)
 - 4.1.8. Power correction factor when applied
 - 4.1.9. Corrected power (kW)
 - 4.1.10. Auxiliary power (kW)
 - 4.1.11. Net power (kW)
 - 4.1.12. Net torque (Nm)
 - 4.1.13. Corrected specific fuel consumption (g/kWh)
 - 4.2. Electric drive train(s):
 - 4.2.1. Declared figures
 - 4.2.2. Maximum net power: ... kW, at ... min⁻¹
 - 4.2.3. Maximum net torque: ... Nm, at ... min⁻¹
 - 4.2.4. Maximum net torque at zero speed: Nm
 - 4.2.5. Maximum 30 minutes power: ... kW
 - 4.2.6. Essential characteristics of the electric drive train
 - 4.2.7. Test DC voltage: ... V
 - 4.2.8. Working principle:
 - 4.2.9. Cooling system:
 - 4.2.10. Motor: liquid/air
 - 4.2.11. Variator: liquid/air
- 5. Remarks:

Appendix 5

Vehicle OBD information

- 1. The information required in this Appendix shall be provided by...
- 2. Upon request, the following information shall be made available to...
 - 2.1. A description of the type and number of the preconditioning...
 - 2.2. A description of the type of the OBD demonstration cycle...
 - 2.3. A comprehensive document describing all sensed components with the strategy...
- 3. Information required for the manufacture of diagnostic tools
 - 3.1. Communication Protocol Information
 - 3.2. Test and diagnosis of OBD monitored components
 - 3.3. Data required to perform the repair

Appendix 6

EC Type –Approval Certification Numbering System

1. Section 3 of the EC type-approval number issued according to...
2. Examples of type-approval certification numbers.
 - 2.1. An example is provided below of a first approval without...
 - 2.2. This second example shows a fourth approval for the second...

Appendix 7

ANNEX II

IN-SERVICE CONFORMITY

1. INTRODUCTION
 - 1.1. This Annex sets out the tailpipe emissions and OBD (inclusive...
2. AUDIT OF IN-SERVICE CONFORMITY
 - 2.1. The audit of in-service conformity by the approval authority shall...
 - 2.2. The figure referred to in point 9 of Appendix 2...
 - 2.3. As part of the information provided for the in-service conformity...
 - 2.4. Parameters defining the tailpipe emissions in-service family
 - 2.5. Information requirements
3. SELECTION OF VEHICLES FOR IN-SERVICE CONFORMITY
 - 3.1. The information gathered by the manufacturer shall be sufficiently comprehensive...
 - 3.2. In selecting the Member States for sampling vehicles, the manufacturer...
 - 3.3. The emissions testing may be done at a test facility...
 - 3.4. The in-service tailpipe emissions conformity tests by the manufacturer shall...
 - 3.5. Sample size
 - 3.5.1. When applying the statistical procedure defined in Appendix 2 (i.e....
 - 3.5.2. For IUPR, the number of sample lots to be taken...
4. On the basis of the audit referred to in Section...
 - 4.1. Where type 1 tests are considered necessary to check the...
 - 4.2. The approval authority, in cooperation with the manufacturer, shall select...
 - 4.3. The manufacturer shall be authorised, under the supervision of the...

Appendix 1

In-service conformity check

1. INTRODUCTION
 - 1.1. This Appendix sets out the criteria referred to in Section...
2. SELECTION CRITERIA
 - 2.1. The vehicle shall belong to a vehicle type that is...
 - 2.2. The vehicle shall have been in service for at least...
 - 2.2.1. For checking IUPR M , the test sample shall include...

- 2.3. There shall be a maintenance record to show that the...
- 2.4. The vehicle shall exhibit no indications of abuse (e. g....
- 2.5. There shall have been no unauthorised major repair to the...
- 2.6. The lead content and sulphur content of a fuel sample...
- 2.7. There shall be no indication of any problem that might...
- 2.8. All anti-pollution system components on the vehicle shall be in...
3. DIAGNOSIS AND MAINTENANCE
 - 3.1. The following checks shall be carried out: checks on air...
 - 3.2. The OBD system shall be checked for proper functioning. Any...
 - 3.3. The ignition system shall be checked and defective components replaced,...
 - 3.4. The compression shall be checked. If the result is unsatisfactory...
 - 3.5. The engine parameters shall be checked to the manufacturer's specifications...
 - 3.6. If the vehicle is within 800 km of a scheduled...
 - 3.7. Upon acceptance of the vehicle, the fuel shall be replaced...
4. IN-SERVICE TESTING
 - 4.1. When a check on vehicles is deemed necessary, emission tests...
 - 4.2. Vehicles equipped with an OBD system may be checked for...
 - 4.3. The OBD system may be checked, for example, for levels...
 - 4.4. If a component or system operates in a manner not...
5. EVALUATION OF EMISSION TEST RESULTS
 - 5.1. The test results shall be submitted to the evaluation procedure...
 - 5.2. Test results shall not be multiplied by deterioration factors.
6. PLAN OF REMEDIAL MEASURES
 - 6.1. The approval authority shall request the manufacturer to submit a...
 - 6.2. The plan of remedial measures shall be filed with the...
 - 6.3. The remedial measures shall apply to all vehicles likely to...
 - 6.4. The manufacturer shall provide a copy of all communications related...
 - 6.5. The plan of remedial measures shall include the requirements specified...
 - 6.5.1. A description of each vehicle type included in the plan...
 - 6.5.2. A description of the specific modifications, alterations, repairs, corrections, adjustments...
 - 6.5.3. A description of the method by which the manufacturer informs...
 - 6.5.4. A description of the proper maintenance or use, if any,...
 - 6.5.5. A description of the procedure to be followed by vehicle...
 - 6.5.6. A copy of the information transmitted to the vehicle owner....
 - 6.5.7. A brief description of the system which the manufacturer uses...
 - 6.5.8. A copy of all instructions to be sent to those...
 - 6.5.9. A description of the impact of the proposed remedial measures...
 - 6.5.10. Any other information, reports or data the type-approval authority may...
 - 6.5.11. Where the plan of remedial measures includes a recall, a...
 - 6.6. The manufacturer may be required to conduct reasonably designed and...
 - 6.7. The manufacturer is responsible for keeping a record of every...
 - 6.8. The repair and modification or addition of new equipment shall...

Appendix 2

Statistical procedure for tailpipe emissions in-service conformity testing

1. This procedure shall be used to verify the in-service conformity...
2. Note 1 shall not apply.
3. Point 3.2 shall be understood as follows:
4. Point 3.2.1 shall not apply.
5. In point 3.2.2, the reference to row B of the...
6. In points 3.2.3.2.1 and 3.2.4.2, the reference to Section 6...
7. In notes 2 and 3, the reference to row A...
8. In point 4.2, the reference to point 5.3.1.4 shall be...
9. Figure 4/1 shall be replaced by the following figure:

Appendix 3

Responsibilities for in-service conformity

1. The process of checking in-service conformity check is illustrated in...
2. The manufacturer shall compile all the information needed to comply...
3. The approval authority shall conduct all the procedures and tests...
4. In the event of discrepancies or disagreements in the assessment...
5. The manufacturer shall establish and implement a plan of remedial...

ANNEX III

VERIFYING AVERAGE EXHAUST EMISSIONS AT AMBIENT CONDITIONS

1. INTRODUCTION
2. GENERAL REQUIREMENTS
 - 2.1. The general requirements shall be those set out in paragraph...
 - 2.2. The vehicles that are subject to the test set out...
 - 2.3. The pollutants specified in paragraph 5.3.1.2.4 shall be understood as...
 - 2.4. The reference to the deterioration factors from paragraph 5.3.6 in...
 - 2.5. The emission limits referred to in paragraph 5.3.1.4 shall be...
 - 2.6. Requirements for vehicles fuelled by LPG, natural gas or biomethane...
 - 2.6.1. The general requirements for testing vehicles fuelled by LPG, natural...
3. TECHNICAL REQUIREMENTS
 - 3.1. The technical requirements shall be those set out in Annex...
 - 3.2. The reference fuels specified in paragraph 3.2 shall be understood...
 - 3.3. The exhaust gases mentioned in paragraph 4.3.1.1 shall be understood...
 - 3.3.a. The pure gases mentioned in paragraph 4.5.1. shall be understood...
 - 3.4. The hydrocarbons ratios in paragraph 8.2 shall be understood as...
 - 3.5. From the relevant dates set out in Article 10(4) and...
 - 3.6. Paragraph 2.2.2 of Appendix 5 to Annex 4 shall be...
 - 3.7. Paragraph 1 of Appendix 8 to Annex 4 shall be...
 - 3.8. The second subparagraph of paragraph 1.3 of Appendix 8 to...
 - 3.9. An addition to the requirements of Paragraph 1.3. of Appendix...
 - 3.10. Paragraph 1.5.2.3 of Appendix 8 to Annex 4 shall be...
 - 3.11. References to HC should be understood as references to THC...

- 3.12. References to hydrocarbons should be understood as references to total...
- 3.13. Technical requirements for a vehicle equipped with a periodically regenerating...
 - 3.13.1. The technical requirements shall be those set out in section...
 - 3.13.2. The reference to Annex 1, items 4.2.11.2.1.10.1 to 4.2.11.2.1.10.4 or...
 - 3.13.3. At the request of the manufacturer, the test procedure specific...
 - 3.13.4. For a periodically regenerating device, during cycles where regeneration occurs,...
- 3.14. As from the dates laid down in Article 2 of...

ANNEX IIIA

VERIFYING REAL DRIVING EMISSIONS

1. INTRODUCTION, DEFINITIONS AND ABBREVIATIONS

- 1.1. Introduction
- 1.2. Definitions
 - 1.2.1. 'Accuracy' means the deviation between a measured or...
 - 1.2.2. 'Analyser' means any measurement device that is not...
 - 1.2.3. 'Axis intercept' of a linear regression (a_0)...
 - 1.2.4. 'Calibration' means the process of setting the response...
 - 1.2.5. 'Coefficient of determination' (r^2) means:
 - 1.2.6. 'Cross-correlation coefficient' (r) means:
 - 1.2.7. 'Delay time' means the time from the gas flow switching...
 - 1.2.8. 'Engine control unit (ECU) signals or data' means...
 - 1.2.9. 'Engine control unit' means the electronic unit that...
 - 1.2.10. 'Emissions' also referred to as 'components'...
 - 1.2.11. 'Exhaust', also referred to as exhaust gas,...
 - 1.2.12. 'Exhaust emissions' means the emissions of particles, characterised...
 - 1.2.13. 'Full scale' means the full range of an...
 - 1.2.14. 'Hydrocarbon response factor' of a particular hydrocarbon species means the...
 - 1.2.15. 'Major maintenance' means the adjustment, repair or replacement...
 - 1.2.16. 'Noise' means two times the root mean square...
 - 1.2.17. 'Non-methane hydrocarbons' (NMHC) means the total hydrocarbons (THC) excluding methane...
 - 1.2.18. 'Particle number' (PN) means as the total number...
 - 1.2.19. 'Precision' means 2,5 times the standard deviation of...
 - 1.2.20. 'Reading' means the numerical value displayed by an...
 - 1.2.21. 'Response time' (t_{90}) means the sum of...
 - 1.2.22. 'Rise time' means the time between the 10 per cent...
 - 1.2.23. 'Root mean square' (x_{rms}) means the square...
 - 1.2.24. 'Sensor' means any measurement device that is not...
 - 1.2.25. 'Span' means the calibration of an analyser, flow-measuring...
 - 1.2.26. 'Span response' means the mean response to a...
 - 1.2.27. 'Span response drift' means the difference between the...
 - 1.2.28. 'Slope' of a linear regression (a_1) means:...
 - 1.2.29. 'Standard error of estimate' (SEE) means:
 - 1.2.30. 'Total hydrocarbons' (THC) means the sum of all...
 - 1.2.31. 'Traceable' means the ability to relate a measurement...
 - 1.2.32. 'Transformation time' means the time difference between a change of...
 - 1.2.33. 'Type of analyser', also referred to as...

- 1.2.34. 'Type of exhaust mass flow meter' means a...
- 1.2.35. 'Validation' means the process of evaluating the correct...
- 1.2.36. 'Verification' means the process of evaluating whether the...
- 1.2.37. 'Zero' means the calibration of an analyser, flow-measuring...
- 1.2.38. 'Zero response' means the mean response to a...
- 1.2.39. 'Zero response drift' means the difference between the...
- 1.3. Abbreviations
- 2. GENERAL REQUIREMENTS
 - 2.1 Not-to-exceed emission limits
 - 2.1.1 Final conformity factors
 - 2.1.2 Temporary conformity factors
 - 2.1.3 Transfer functions
 - 2.2. The manufacturer shall confirm compliance with point 2.1 by completing...
 - 2.3. The RDE tests required by this Annex at type-approval and...
 - 2.4. Member States shall ensure that vehicles can be tested with...
 - 2.5. Manufacturers shall ensure that vehicles can be tested with PEMS...
- 3. RDE TEST TO BE PERFORMED
 - 3.1. The following requirements apply to PEMS tests referred to in...
 - 3.1.0. The requirements of point 2.1 shall be fulfilled for the...
 - 3.1.1. For type-approval, the exhaust mass flow shall be determined by...
 - 3.1.2. If the approval authority is not satisfied with the data...
 - 3.1.3. Reporting and dissemination of RDE test information
 - 3.1.3.1. A technical report prepared by the manufacturer in accordance with...
 - 3.1.3.2. The manufacturer shall ensure that the following information is made...
 - 3.1.3.3. Upon request, without costs and within 30 days, the manufacturer...
 - 3.1.3.4. Upon request, the type-approval authority shall make available the information...
- 4. GENERAL REQUIREMENTS
 - 4.1. The RDE performance shall be demonstrated by testing vehicles on...
 - 4.2. The manufacturer shall demonstrate to the approval authority that the...
 - 4.3. The approval authority shall propose a test trip in urban,...
 - 4.4. If for a vehicle the collection of ECU data influences...
- 5. BOUNDARY CONDITIONS
 - 5.1. Vehicle payload and test mass
 - 5.1.1. The vehicle's basic payload shall comprise the driver, a witness...
 - 5.1.2. For the purpose of testing some artificial payload may be...
 - 5.2. Ambient conditions
 - 5.2.1. The test shall be conducted under ambient conditions laid down...
 - 5.2.2. Moderate altitude conditions: Altitude lower or equal to 700 metres...
 - 5.2.3. Extended altitude conditions: Altitude higher than 700 metres above sea...
 - 5.2.4. Moderate temperature conditions: Greater than or equal to 273 K...
 - 5.2.5. Extended temperature conditions: Greater than or equal to 266 K...
 - 5.2.6. By way of derogation from the provisions of points 5.2.4...
 - 5.3.
 - 5.4. Dynamic conditions

- 5.4.1. The overall excess or insufficiency of driving dynamics during the...
 - 5.4.2. If the trip results as valid following the verifications according...
- 5.5. Vehicle condition and operation
 - 5.5.1. Auxiliary systems
 - 5.5.2. Vehicles equipped with periodically regenerating systems
 - 5.5.2.1. ' Periodically regenerating systems ' shall be understood according to...
 - 5.5.2.2. If periodic regeneration occurs during a test, the test may...
 - 5.5.2.3. The manufacturer may ensure the completion of the regeneration and...
 - 5.5.2.4. If regeneration occurs during the repetition of the RDE test,...
- 6. TRIP REQUIREMENTS
 - 6.1. The shares of urban, rural and motorway driving, classified by...
 - 6.2. The trip sequence shall consist of urban driving followed by...
 - 6.3. Urban operation is characterised by vehicle speeds up to 60...
 - 6.4. Rural operation is characterised by vehicle speeds between 60 and...
 - 6.5. Motorway operation is characterised by speeds above 90 km/h.
 - 6.6. The trip shall consist of approximately 34 % per cent...
 - 6.7. The vehicle velocity shall normally not exceed 145 km/h. This...
 - 6.8. The average speed (including stops) of the urban driving part...
 - 6.9. The speed range of the motorway driving shall properly cover...
 - 6.10. The trip duration shall be between 90 and 120 minutes....
 - 6.11. The start and the end point shall not differ in...
 - 6.12. The minimum distance of each operation: urban, rural and motorway,...
- 7. OPERATIONAL REQUIREMENTS
 - 7.1. The trip shall be selected in such a way that...
 - 7.2. Electrical power shall be supplied to the PEMS by an...
 - 7.3. The installation of the PEMS equipment shall be done in...
 - 7.4. RDE tests shall be conducted on working days as defined...
 - 7.5. RDE tests shall be conducted on paved roads and streets...
 - 7.6. Prolonged idling shall be avoided after the first ignition of...
- 8. LUBRICATING OIL, FUEL AND REAGENT
 - 8.1. The fuel, lubricant and reagent (if applicable) used for RDE...
 - 8.2. Samples of fuel, lubricant and reagent (if applicable) shall be...
- 9. EMISSIONS AND TRIP EVALUATION
 - 9.1. The test shall be conducted in accordance with Appendix 1...
 - 9.2. The trip shall fulfil the requirements set out in points...
 - 9.3. It shall not be permitted to combine data of different...
 - 9.4. After establishing the validity of a trip according to Point...
 - 9.5. If during a particular time interval the ambient conditions are...
 - 9.6. The cold start is defined in accordance with point 4...

Appendix 1

Test procedure for vehicle emissions testing with a Portable Emissions...

- 1. INTRODUCTION
- 2. SYMBOLS

3. GENERAL REQUIREMENTS
 - 3.1. PEMS
 - 3.1.1. Analysers to determine the concentration of pollutants in the exhaust...
 - 3.1.2. One or multiple instruments or sensors to measure or determine...
 - 3.1.3. A Global Positioning System to determine the position, altitude and,...
 - 3.1.4. If applicable, sensors and other appliances being not part of...
 - 3.1.5. An energy source independent of the vehicle to power the...
 - 3.2. Test parameters
 - 3.3. Preparation of the vehicle
 - 3.4. Installation of PEMS
 - 3.4.1. General
 - 3.4.2. Permissible backpressure
 - 3.4.3. Exhaust mass flow meter
 - 3.4.4. Global Positioning System
 - 3.4.5. Connection with the Engine Control Unit
 - 3.4.6. Sensors and auxiliary equipment
 - 3.5. Emissions sampling
4. PRE-TEST PROCEDURES
 - 4.1. PEMS leak check
 - 4.2. Starting and stabilising the PEMS
 - 4.3. Preparing the sampling system
 - 4.4. Preparing the EFM
 - 4.5. Checking and calibrating the analysers for measuring gaseous emissions
 - 4.6. Checking the analyser for measuring particle emissions
 - 4.7. Measuring vehicle speed
 - 4.8. Check of PEMS set-up
5. EMISSIONS TEST
 - 5.1. Test start
 - 5.2. Test
 - 5.3. Test end
6. POST-TEST PROCEDURE
 - 6.1. Checking the analysers for measuring gaseous emissions
 - 6.2. Checking the analyser for measuring particle emissions
 - 6.3. Checking the on-road emission measurements

Appendix 2

Specifications and calibration of PEMS components and signals

1. INTRODUCTION
2. SYMBOLS
3. LINEARITY VERIFICATION
 - 3.1. General
 - 3.2. Linearity requirements
 - 3.3. Frequency of linearity verification
 - 3.4. Procedure of linearity verification
 - 3.4.1. General requirements
 - 3.4.2. General procedure

- 3.4.3. Requirements for linearity verification on a chassis dynamometer
- 4. ANALYSERS FOR MEASURING GASEOUS COMPONENTS
 - 4.1. Permissible types of analysers
 - 4.1.1. Standard analysers
 - 4.1.2. Alternative analysers
 - 4.2. Analyser specifications
 - 4.2.1. General
 - 4.2.2. Accuracy
 - 4.2.3. Precision
 - 4.2.4. Noise
 - 4.2.5. Zero response drift
 - 4.2.6. Span response drift
 - 4.2.7. Rise time
 - 4.2.8. Gas drying
 - 4.3. Additional requirements
 - 4.3.1. General
 - 4.3.2. Efficiency test for NO X converters
 - 4.3.3. Adjustment of the Flame Ionisation Detector
 - (a) Optimisation of the detector response
 - (b) Hydrocarbon response factors
 - (c) Oxygen interference check
 - 4.3.4. Conversion efficiency of the non-methane cutter (NMC)
 - 4.3.5. Interference effects
 - (a) General
 - (b) CO analyser interference check
 - (c) NO X analyser quench check
 - (i) CO 2 quench check
 - (ii) Water quench check
 - (iii) Maximum allowable quench
 - (d) Quench check for NDUV analysers
 - (e) Sample dryer
 - (f) Sample dryer NO 2 penetration
 - 4.4. Response time check of the analytical system
- 5. GASES
 - 5.1. General
 - 5.2. Gas dividers
 - 5.3. Oxygen interference check gases
- 6. ANALYSERS FOR MEASURING PARTICLE EMISSIONS
- 7. INSTRUMENTS FOR MEASURING EXHAUST MASS FLOW
 - 7.1. General
 - 7.2. Instrument specifications
 - 7.2.1. Calibration and verification standards
 - 7.2.2. Frequency of verification
 - 7.2.3. Accuracy
 - 7.2.4. Precision
 - 7.2.5. Noise
 - 7.2.6. Zero response drift
 - 7.2.7. Span response drift
 - 7.2.8. Rise time
 - 7.2.9. Response time check
- 8. SENSORS AND AUXILIARY EQUIPMENT

Appendix 3

Validation of PEMS and non-traceable exhaust mass flow rate

1. INTRODUCTION
2. SYMBOLS
3. VALIDATION PROCEDURE FOR PEMS
 - 3.1. Frequency of PEMS validation
 - 3.2. PEMS validation procedure
 - 3.2.1. PEMS installation
 - 3.2.2. Test conditions
 - 3.2.3. Data analysis
 - 3.3. Permissible tolerances for PEMS validation
4. VALIDATION PROCEDURE FOR THE EXHAUST MASS FLOW RATE DETERMINED BY...
 - 4.1. Frequency of validation
 - 4.2. Validation procedure
 - 4.3. Requirements

Appendix 4

Determination of emissions

1. INTRODUCTION
2. SYMBOLS
3. TIME CORRECTION OF PARAMETERS
 - 3.1. Time correction of component concentrations
 - 3.2. Time correction of exhaust mass flow rate
 - 3.3. Time alignment of vehicle data
 - 3.3.1. Vehicle speed from different sources
 - 3.3.2. Vehicle speed with exhaust mass flow rate
 - 3.3.3. Further signals
4. COLD START
5. EMISSION MEASUREMENTS DURING ENGINE STOP
6. CONSISTENCY CHECK OF VEHICLE ALTITUDE
7. CONSISTENCY CHECK OF GPS VEHICLE SPEED
8. CORRECTION OF EMISSIONS
 - 8.1. Dry-wet correction
 - 8.2. Correction of NO_x for ambient humidity and temperature
9. DETERMINATION OF THE INSTANTANEOUS GASEOUS EXHAUST COMPONENTS
 - 9.1. Introduction
 - 9.2. Calculating NMHC and CH₄ concentrations
10. DETERMINATION OF EXHAUST MASS FLOW
 - 10.1. Introduction
 - 10.2. Calculation method using air mass flow rate and fuel mass...
 - 10.3. Calculation method using air mass flow and air-to-fuel ratio
 - 10.4. Calculation method using fuel mass flow and air-to-fuel ratio
11. CALCULATING THE INSTANTANEOUS MASS EMISSIONS
12. CALCULATING THE INSTANTANEOUS PARTICLE NUMBER EMISSIONS
13. DATA REPORTING AND EXCHANGE

Appendix 5

Verification of trip dynamic conditions with method 1 (Moving Averaging...

1. INTRODUCTION
2. SYMBOLS, PARAMETERS AND UNITS
3. MOVING AVERAGING WINDOWS
 - 3.1. Definition of averaging windows
 - 3.2. Calculation of window emissions and averages
4. EVALUATION OF WINDOWS
 - 4.1. Introduction
 - 4.2. CO₂ characteristic curve reference points
 - 4.2.1. Point P 1
 - 4.2.2. Point P 2
 - 4.2.3. $v_{P2} = 56,6 \text{ km/h}$ (average...
 - 4.2.4. Point P 3
 - 4.2.5. $v_{P3} = 92,3 \text{ km/h}$ (average...
 - 4.3. CO₂ characteristic curve definition
 - 4.4. Urban, rural and motorway windows
 - 4.4.1. Urban windows are characterised by average vehicle ground speeds v_{avg}
 - 4.4.2. Rural windows are characterised by average vehicle ground speeds v_{avg}
 - 4.4.3. Motorway windows are characterised by average vehicle ground speeds v_{avg}
5. VERIFICATION OF TRIP COMPLETENESS AND NORMALITY
 - 5.1. Tolerances around the vehicle CO₂ characteristic curve
 - 5.2. Verification of test completeness
 - 5.3. Verification of test normality
6. CALCULATION OF EMISSIONS
 - 6.1. Calculation of weighted distance-specific emissions
 - 6.2. Calculation of severity indices
 - 6.3. Calculation of emissions for the total trip
7. NUMERICAL EXAMPLES
 - 7.1. Averaging window calculations
 - 7.2. Evaluation of windows
 - 7.3. Urban, rural and motorway windows — Trip completeness

Appendix 6

Verification of trip dynamic conditions with method 2 (Power Binning)...

1. INTRODUCTION
2. SYMBOLS, PARAMETERS AND UNITS
3. EVALUATION OF THE MEASURED EMISSIONS USING A STANDARDISED WHEEL POWER...
 - 3.1. Sources for the actual wheel power
 - 3.2. Classification of the moving averages to urban, rural and motorway...
 - 3.3. Calculation of the moving averages of the instantaneous test data...
 - 3.4. Set up of the wheel power classes for emission classification...
 - 3.4.1. The power classes and the corresponding time shares of the...
 - 3.4.2. Correction of the wheel power classes
 - 3.5. Classification of the moving average values

- 3.6. Check of power class coverage and of normality of power...
- 3.7. Averaging of the measured values per wheel power class
- 3.8. Weighting of the average values per wheel power class
- 3.9. Calculation of the weighted distance-specific emission value
- 4. ASSESSMENT OF THE WHEEL POWER FROM THE INSTANTANEOUS CO 2...

Appendix 7

Selection of vehicles for PEMS testing at initial type approval...

- 1. INTRODUCTION
- 2. SYMBOLS, PARAMETERS AND UNITS
- 3. PEMS TEST FAMILY BUILDING
 - 3.1. Administrative criteria
 - 3.1.1. The approval authority issuing the emission type approval according to...
 - 3.1.2. A single vehicle manufacturer.
 - 3.2. Technical criteria
 - 3.2.1. Propulsion type (e.g. ICE, HEV, PHEV).
 - 3.2.2. Type(s) of fuel(s) (e.g. petrol, diesel, LPG, NG, ...). Bi-...
 - 3.2.3. Combustion process (e.g. two stroke, four stroke)
 - 3.2.4. Number of cylinders
 - 3.2.5. Configuration of the cylinder block (e.g. in-line, V, radial, horizontally...
 - 3.2.6. Engine volume
 - 3.2.7. Method of engine fuelling (e.g. indirect or direct or combined...
 - 3.2.8. Type of cooling system (e.g. air, water, oil)
 - 3.2.9. Method of aspiration such as naturally aspirated, pressure charged, type...
 - 3.2.10. Types and sequence of exhaust after-treatment components (e.g. three-way catalyst,...
 - 3.2.11. Exhaust gas recirculation (with or without, internal/external, cooled/non-cooled, low/high pressure)....
 - 3.3. Extension of a PEMS test family
 - 3.4. Alternative PEMS test family
- 4. VALIDATION OF A PEMS TEST FAMILY
 - 4.1. General requirements for validating a PEMS test family
 - 4.1.1. The vehicle manufacturer presents a representative vehicle of the PEMS...
 - 4.1.2. The authority responsible for issuing the emission type-approval in accordance...
 - 4.1.3. With agreement of the type-approval authority, a PEMS test can...
 - 4.1.4. A PEMS test results of a specific vehicle may be...
 - 4.2. Selection of vehicles for PEMS testing when validating a PEMS...
 - 4.2.1. For each combination of fuels (e.g. petrol-LPG, petrol-NG, petrol only),...
 - 4.2.2. The manufacturer shall specify a value PMR H (= highest...
 - 4.2.3. At least one vehicle for each transmission type (e.g. manual,...
 - 4.2.4. At least one four-wheel drive vehicle (4 × 4 vehicle)...

- 4.2.5. For each engine volume occurring on a vehicle in the...
 - 4.2.6. At least one vehicle for each number of installed exhaust...
 - 4.2.7. Notwithstanding the provisions in points 4.2.1 to 4.2.6, at least...
- 5. REPORTING
 - 5.1. The vehicle manufacturer provides a full description of the PEMS...
 - 5.2. The manufacturer attributes a unique identification number of the format...
 - 5.3. The type approval authority and the vehicle manufacturer shall maintain...
 - 5.4. The type approval authority and the vehicle manufacturer shall maintain...

Appendix 7a

Verification of overall trip dynamics

- 1. INTRODUCTION
- 2. SYMBOLS
- 3. TRIP INDICATORS
 - 3.1. Calculations
 - 3.1.1. Data pre-processing
 - 3.1.2. Calculation of distance, acceleration and $v \cdot a$
 - 3.1.3. Binning of the results
 - 3.1.4. Calculation of $v \cdot a$ pos $_{[95]}$ per speed bin...
- 4. VERIFICATION OF TRIP VALIDITY
 - 4.1.1. Verification of $v \cdot a$ pos $_{[95]}$ per speed bin (with v in...
 - 4.1.2. Verification of RPA per speed bin

Appendix 7b

Procedure to determine the cumulative positive elevation gain of a...

- 1. INTRODUCTION
- 2. SYMBOLS
- 3. GENERAL REQUIREMENTS
- 4. CALCULATION OF CUMULATIVE POSITIVE ELEVATION GAIN
 - 4.1. General
 - 4.2. Screening and principle verification of data quality
 - 4.3. Correction of instantaneous vehicle altitude data
 - 4.4. Final calculation of the cumulative positive elevation gain
 - 4.4.1. Establishment of a uniform spatial resolution
 - 4.4.2. Additional data smoothing
 - 4.4.3. Calculation of the final result
- 5. NUMERICAL EXAMPLE
 - 5.1. Screening and principle verification of data quality
 - 5.2. Correction of instantaneous vehicle altitude data
 - 5.3. Calculation of the cumulative positive elevation gain
 - 5.3.1. Establishment of a uniform spatial resolution
 - 5.3.2. Additional data smoothing
 - 5.3.3. Calculation of the final result

Appendix 8

Data exchange and reporting requirements

1. INTRODUCTION
2. SYMBOLS, PARAMETERS AND UNITS
3. DATA EXCHANGE AND REPORTING FORMAT
 - 3.1. General
 - 3.2. Data exchange
 - 3.3. Intermediate and final results
4. TECHNICAL REPORTING TABLES
 - 4.1. Data exchange
 - 4.2. Intermediate and final results
 - 4.2.1. Intermediate results
 - 4.2.2. Results of the data evaluation
 - 4.3. Vehicle and engine description

Appendix 9

Manufacturer's certificate of compliance

Manufacturer's certificate of compliance with the Real Driving Emissions requirements...

ANNEX IV

EMISSIONS DATA REQUIRED AT TYPE-APPROVAL FOR ROADWORTHINESS PURPOSES

Appendix 1

MEASURING CARBON MONOXIDE EMISSION AT IDLING SPEEDS

1. INTRODUCTION
 - 1.1. This appendix describes the procedure for the type 2 test,...
2. GENERAL REQUIREMENTS
 - 2.1. The general requirements shall be those specified in paragraphs 5.3.7.1...
 - 2.2. The atomic ratios specified in point 5.3.7.3 shall be understood...
 - 2.3. The table in section 2.2 of Appendix 4 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 paragraph 2.1 of Annex 5...

Appendix 2

MEASUREMENT OF SMOKE OPACITY

1. INTRODUCTION
 - 1.1. This Appendix describes the requirements for measuring the opacity of...
2. SYMBOL OF THE CORRECTED ABSORPTION COEFFICIENT
 - 2.1. A symbol of the corrected absorption coefficient shall be affixed...
 - 2.2. The symbol shall be clearly legible and indelible. It shall...
 - 2.3. Figure IV.2.1 gives an example of the symbol.
3. SPECIFICATIONS AND TESTS
 - 3.1. The specifications and tests shall be those set out in...
 - 3.2. The reference to Annex 2 in paragraph 24.1 of UN/ECE...
4. TECHNICAL REQUIREMENTS
 - 4.1. The technical requirements shall be those set out in Annexes...
 - 4.2. Test at steady speeds over the full load curve
 - 4.2.1. The references to Annex 1 in paragraph 3.1. of Annex...
 - 4.2.2. The reference fuel specified in paragraph 3.2 of Annex 4...
 - 4.3. Test under free acceleration
 - 4.3.1. The references to Table 2, Annex 2 in paragraph 2.2...
 - 4.3.2. The references to paragraph 7.3 of Annex 1 in paragraph...
 - 4.4. 'ECE' method of measuring the net power of C.I. engines...
 - 4.4.1. The references in paragraph 7 of Annex 10 to UN/ECE...

ANNEX V

VERIFYING EMISSIONS OF CRANKCASE GASES

1. INTRODUCTION
 - 1.1. This Annex describes the procedure for the type 3 test...
2. GENERAL REQUIREMENTS
 - 2.1. The general requirements for conducting the type 3 test shall...
3. TECHNICAL REQUIREMENTS
 - 3.1. The technical requirements shall be those set out in section...

ANNEX VI

1. Introduction
 - 1.1. This Annex describes the procedure for the Type 4 test,...
2. Technical requirements
 - 2.1. Introduction
 - 2.2. The evaporative emissions test consists of:
3. Vehicle and fuel
 - 3.1. Vehicle

- 3.1.1. The vehicle shall be in good mechanical condition and have...
 - 3.2. Fuel
 - 3.2.1. The Type I E10 reference fuel specified in Annex IX...
- 4. Test equipment for evaporative test
 - 4.1. Chassis dynamometer
 - 4.2. Evaporative emission measurement enclosure
 - Figure 1Determination of evaporative emissions
 - Notes: Evaporative emission control families — as in point 3.2 of...
 - 4.3. Analytical systems
 - 4.4. Temperature recording
 - 4.5. Pressure recording
 - 4.6. Fans
 - 4.7. Gases
 - 4.8. Additional Equipment
- 5. Test procedure
 - 5.1. Canister(s) bench aging
 - Figure 2Canister bench aging procedure
 - 5.1.1. Temperature conditioning test
 - Figure 3Temperature conditioning cycle
 - 5.1.2. Canister vibration conditioning test
 - 5.1.3. Canister Fuel aging test
 - 5.1.3.1. Fuel Aging for 300 cycles
 - 5.1.3.1.1After the temperature conditioning test and vibration test, the canister(s)...
 - 5.1.3.1.1The E10 market fuel used for this test shall fulfil...
 - 5.1.3.1.2The canister(s) shall be purged according the procedure of paragraph...
 - 5.1.3.1.3The steps of the procedure set out in points 5.1.3.1.1...
 - 5.1.3.1.4After 50 and 300 Fuel aging cycles, a measurement of...
 - 5.1.3.2. If the canister(s) is (are) provided by the Suppliers, the...
 - 5.1.3.3. The manufacturer shall provide to the Type-Approval Authorities a test...
 - 5.2. Determination of the Permeability Factor of the Fuel System (Figure...
 - Figure 4Determination of the Permeability Factor
 - 5.2.1. The tank is filled with fresh E10 reference fuel at...
 - 5.2.2. At the end of the third week, the tank is...
 - 5.2.3. The rig with the fuel system is placed again in...
 - 5.2.4. At the end of the remaining 17th week, the tank...
 - 5.2.5. The Permeability Factor is the difference between HC 20W and...
 - 5.2.6. If the Permeability Factor is determined by the Suppliers, the...
 - 5.2.7. The manufacturer shall provide to the Type-Approval Authorities a test...
 - 5.2.8. As an exception to points 5.2.1 to 5.2.7 above, the...
 - 5.2.8.1 Where the manufacturer chooses to use Assigned Permeability Factors, the...
 - 5.3. Sequence of measurement of hot soak and diurnal losses
 - 5.3.1. Soak
 - 5.3.2. Fuel drain and refill
 - 5.3.3. Preconditioning drive

- 5.3.4. Soak
- 5.3.5. Canister breakthrough
- 5.3.6. Dynamometer test
 - 5.3.6.1. Within one hour from completing of canister loading, the vehicle...
 - 5.3.6.2. Within two minutes of completing the Type I Test drive...
- 5.3.7. Hot Soak
- 5.3.8. Soak
- 5.3.9. Diurnal test
 - 5.3.9.1. After the soak, a first measurement of Diurnal Losses over...
 - 5.3.9.2. After the first 24 hours diurnal test, a second measurement...
- 5.3.10. Calculation
- 5.3.11. The manufacturer shall provide to the Type-Approval Authorities a test...

ANNEX VII

VERIFYING THE DURABILITY OF POLLUTION CONTROL DEVICES

- 1. INTRODUCTION
 - 1.1. This Annex describes the tests for verifying the durability of...
 - 1.2. The whole vehicle durability test represents an ageing test of...
 - 1.3. The manufacturer may choose to use a bench ageing durability...
 - 1.4. As an alternative to durability testing, a manufacturer may choose...
 - 1.5. At the request of the manufacturer, the technical service may...
 - 1.6. In the absence of assigned deterioration factors for Euro 6...
 - 1.7. Deterioration factors are determined using either the procedures set out...
- 2. TECHNICAL REQUIREMENTS
 - 2.1. The technical requirements and specifications shall be those set out...
 - 2.1.1. As an alternative to the operating cycle described in paragraph...
 - 2.1.2. In paragraph 5.3 and paragraph 6 of Annex 9 of...
 - 2.1.3. The reference to paragraph 5.3.1.4, in the first section of...
 - 2.1.4. In Section 6 of Annex 9 of UN/ECE Regulation No...
 - 2.2. Bench Ageing Durability Test
 - 2.2.1. In addition to the technical requirements for the bench ageing...
 - 2.3.1. Vehicles with Positive Ignition Engines
 - 2.3.1.1. The following bench ageing procedure shall be applicable for positive-ignition...
 - 2.3.1.2. Standard bench cycle (SBC). Standard catalyst bench ageing shall be...
 - 2.3.1.3. Catalyst time-at-temperature data. Catalyst temperature shall be measured during at...
 - 2.3.1.4. Bench-ageing time. Bench ageing time shall be calculated using the...
 - 2.3.1.5. Effective reference temperature on the SBC. The effective reference temperature...
 - 2.3.1.6. Catalyst Ageing Bench. The catalyst ageing bench shall follow the...
 - 2.3.1.7. Required Testing. For calculating deterioration factors at least two Type...
 - 2.3.2. Vehicles with Compression Ignition Engines
 - 2.3.2.1. The following bench ageing procedure is applicable for compression-ignition vehicles...

- 2.3.2.2. Standard Diesel Bench Cycle (SDBC). Standard bench ageing is conducted...
- 2.3.2.3. Regeneration data. Regeneration intervals shall be measured during at least...
- 2.3.2.4. Diesel bench-ageing duration. Bench ageing duration is calculated using the...
- 2.3.2.5. Ageing Bench. The ageing bench shall follow the SDBC and...
- 2.3.2.6. Required Testing. For calculating deterioration factors at least two Type...

Appendix 1

Standard Bench Cycle (SBC)

1. Introduction
2. Catalyst Temperature Control
 - 2.1. Catalyst temperature shall be measured in the catalyst bed at...
 - 2.2. Control the catalyst temperature at stoichiometric operation (01 to 40...
 - 2.3. If a low control temperature other than 800 °C is...
3. Ageing Bench Equipment and Procedures
 - 3.1. Ageing Bench Configuration. The ageing bench shall provide the appropriate...
 - 3.2. Exhaust System Installation. The entire catalyst(s)-plus-oxygen sensor(s) system, together with...
 - 3.3. Temperature Measurement. Catalyst temperature shall be measured using a thermocouple...
 - 3.4. Air/Fuel Measurement. Provisions shall be made for the measurement of...
 - 3.5. Exhaust Flow Balance. Provisions shall be made to assure that...
 - 3.6. Setup. The engine speed, load, and spark timing are selected...
 - 3.7. Ageing Cycle. The standard bench ageing procedures use the standard...
 - 3.8. Quality Assurance. The temperatures and A/F ratio in paragraphs 3.3....
 - 3.9. Startup and Shutdown. Care should be taken to assure that...
4. Experimentally Determining the R-Factor for Bench Ageing Durability Procedures
 - 4.1. The R-Factor is the catalyst thermal reactivity coefficient used in...
 - 4.1.1. Using the applicable bench cycle and ageing bench hardware, age...
 - 4.1.2. Estimate the value of R and calculate the effective reference...
 - 4.1.3. Plot emissions (or catalyst inefficiency) versus ageing time for each...
 - 4.1.4. Calculate the slope of the best-fit line for each ageing...
 - 4.1.5. Plot the natural log (ln) of the slope of each...
 - 4.1.6. Compare the R-factor to the initial value that was used...
 - 4.1.7. Compare the R-factor determined separately for each exhaust constituent. Use...

Appendix 2

Standard Diesel Bench Cycle (SDBC)

1. Introduction
2. The Standard Diesel Bench Cycle reproduces the engine speed and...

3. Ageing Bench Equipment and Procedures
 - 3.1. The standard ageing bench consists of an engine, engine controller,...
 - 3.2. Exhaust System Installation. The entire aftertreatment system, together with all...

Appendix 3

Standard Road Cycle (SRC)

Introduction

Standard Road cycle

ANNEX VIII

VERIFYING THE AVERAGE EMISSIONS AT LOW AMBIENT TEMPERATURES

1. INTRODUCTION
 - 1.1. This Annex describes the equipment required and the procedure for...
2. GENERAL REQUIREMENTS
 - 2.1. The general requirements for the Type 6 test are those...
 - 2.2. The reference to 'hydrocarbons' in 5.3.5.1.4 of UN/ECE Regulation 83...
 - 2.3. The limit values referred to in point 5.3.5.2 of UN/ECE...
3. TECHNICAL REQUIREMENTS
 - 3.1. The technical requirements and specifications are those set out in...
 - 3.2. The reference to paragraph 3. of Annex 10 in paragraph...
 - 3.3. The references to 'hydrocarbons' shall be read as 'total hydrocarbons'...

ANNEX IX

SPECIFICATIONS OF REFERENCE FUELS

- A. REFERENCE FUELS
 1. Technical data on fuels for testing vehicles with positive-ignition engines...
 2. Technical data on fuels for testing vehicles with compression ignition...
- B. REFERENCE FUELS FOR TESTING EMISSIONS AT LOW AMBIENT TEMPERATURES —...

ANNEX X

EMISSIONS TEST PROCEDURE FOR HYBRID ELECTRIC VEHICLES (HEV)

1. INTRODUCTION
 - 1.1. This annex sets out the additional specific provisions regarding type-approval...
2. TECHNICAL REQUIREMENTS
 - 2.1. The technical requirements and specifications shall be those set out...
 - 2.2. The references to paragraph 5.3.1.4 in sections 3.1.2.6, 3.1.3.5, 3.2.2.7...

ANNEX XI

ON-BOARD DIAGNOSTICS (OBD) FOR MOTOR VEHICLES

1. INTRODUCTION
 - 1.1. This Annex sets out the functional aspects of on-board diagnostic...
2. REQUIREMENTS AND TESTS
 - 2.1. The requirements and tests for OBD systems are those specified...
 - 2.2. The durability distance mentioned in section 3.1 and 3.3.1 of...
 - 2.3. The threshold limits specified in section 3.3.2 of Annex 11...
 - 2.3.1. The OBD thresholds limits for vehicles that are type approved...
 - 2.3.2. The OBD thresholds limits for compression ignition vehicles that comply...
 - 2.3.3. The OBD thresholds limits for vehicles that are type approved...

Explanatory note:
 - 2.3.4. Until three years after the dates specified in Article 10(4)...
 - 2.4. In addition to the provisions of section 3.2.1 of Annex...
 - 2.5. Section 3.3.3.1 of Annex 11 to UNECE Regulation No 83...
 - 2.6. Section 3.3.3.3 of Annex 11 to UN/ECE Regulation 83 shall...
 - 2.7. In addition to the requirements of section 3.3.3 of Annex...
 - 2.8. In addition to the requirements of section 3.3.4 of Annex...
 - 2.9. In addition to the requirements of section 3.3.4 of Annex...
 - 2.10. In addition to the requirements of section 3.3.4 of Annex...
 - 2.11. In addition to the requirements of section 6.3.2 of Appendix...
 - 2.12. References to 'HC' (hydrocarbons) shall be read as 'NMHC' (non-methane...
 - 2.13. In addition to the requirements of section 6.5.1.3 of Appendix...
 - 2.14. Contrary to point 3.3.5 of Annex 11 to UN/ECE Regulation...
3. ADMINISTRATIVE PROVISIONS FOR DEFICIENCIES OF OBD SYSTEMS
 - 3.1. In considering the request for granting type-approval to a vehicle...
 - 3.2. The approval authority shall take into consideration data from the...
 - 3.3. The approval authority shall not accept any deficiency request that...
 - 3.4. The approval authority will not accept any deficiency request that...
 - 3.5. In determining the identified order of deficiencies, deficiencies relating to...
 - 3.6. Prior to or at the time of type-approval, no deficiency...
 - 3.6. Deficiency period
 - 3.6.1. A deficiency may be carried-over for a period of two...
 - 3.6.2. A manufacturer may request that the approval authority grant a...
 - 3.7. The approval authority shall notify its decision in granting a...
4. ACCESS TO OBD INFORMATION
 - 4.1. Requirements for access to OBD information are specified in section...
 - 4.2. References to Appendix 1 of Annex 2 to UN/ECE Regulation...
 - 4.3. References to section 4.2.11.2.7.6 of Annex 1 to UN/ECE Regulation...
 - 4.4. References to 'contracting parties' shall be understood as references to...
 - 4.5. References to approval granted under Regulation 83 shall be understood...
 - 4.6. UN/ECE type-approval shall be understood as EC type-approval.

Appendix 1

FUNCTIONAL ASPECTS OF ON-BOARD DIAGNOSTIC (OBD) SYSTEMS

1. INTRODUCTION
 - 1.1. This Appendix describes the procedure of the test according to...
2. TECHNICAL REQUIREMENTS
 - 2.1. The technical requirements and specifications shall be those set out...
 - 2.2. The references to the OBD threshold limits set out in...
 - 2.3. The reference fuels specified in paragraph 3.2 of Appendix 1...
 - 2.4. The reference to Annex 11 in paragraph 6.5.1.4 of Appendix...
 - 2.5. For vehicles approved to Euro 6 limit values contained in...
3. IN-USE PERFORMANCE
 - 3.1. General Requirements
 - 3.1.1. Each monitor of the OBD system shall be executed at...
 - 3.1.2. The in-use performance ratio (IUPR) of a specific monitor M...
 - 3.1.3. Comparison of Numerator and Denominator gives an indication of how...
 - 3.1.4. If, according to the requirements of this Annex, the vehicle...
 - 3.1.5. Vehicles shall comply with the requirements of section 3.1.4 for...
 - 3.1.6. The requirements of this section are deemed to be met...
 - 3.1.7. The manufacturer shall demonstrate to the approval authority and, upon...
 - 3.1.8. For the entire test sample of vehicles the manufacturer must...
 - 3.1.9. Public authorities and their delegates may pursue further tests on...
 - 3.1.10. Non-compliance with the requirements of point 3.1.6 established by tests...
 - 3.2. NumeratorM
 - 3.2.1. The numerator of a specific monitor is a counter measuring...
 - 3.3. DenominatorM
 - 3.3.1. The purpose of the denominator is to provide a counter...
 - 3.3.2. In addition to the requirements of section 3.3.1:
 - 3.3.3. For hybrid vehicles, vehicles that employ alternative engine start hardware...
 - 3.4. Ignition Cycle Counter
 - 3.4.1. The ignition cycle counter indicates the number of ignition cycles...
 - 3.5. General Denominator
 - 3.5.1. The general denominator is a counter measuring the number of...
 - 3.6. Reporting and increasing counters
 - 3.6.1. The OBD system shall report in accordance with the ISO...
 - 3.6.2. For specific components or systems that have multiple monitors, which...
 - 3.6.3. All counters, when incremented, shall be incremented by an integer...
 - 3.6.4. The minimum value of each counter is 0, the maximum...
 - 3.6.5. If either the numerator or denominator for a specific monitor...
 - 3.6.6. Each counter shall be reset to zero only when a...
 - 3.6.7. The manufacturer shall take measures to ensure that the values...
 - 3.7. Disablement of Numerators and Denominators and of the General Denominator...
 - 3.7.1. Within 10 seconds of a malfunction being detected, which disables...
 - 3.7.2. Within 10 seconds of the start of a power take-off...

- 3.7.3. The OBD system shall disable further incrementing of the numerator...
- 3.7.4. The OBD system shall disable further incrementing of the general...

Appendix 2

ESSENTIAL CHARACTERISTICS OF THE VEHICLE FAMILY

- 1. PARAMETERS DEFINING THE OBD FAMILY
 - 1.1. The OBD family means a manufacturer's grouping of vehicles which,...
 - 1.2. The OBD family may be defined by basic design parameters...
- 2. To this end, those vehicle types whose parameters described below...

ANNEX XII

DETERMINATION OF CO₂ EMISSIONS, FUEL CONSUMPTION, ELECTRIC ENERGY CONSUMPTION AND ELECTRIC RANGE

- 1. INTRODUCTION
- 2. GENERAL REQUIREMENTS
 - 2.1. The general specifications for conducting the tests and interpreting the...
 - 2.2. Test fuel
 - 2.2.1. The appropriate reference fuels as defined in Annex IX of...
 - 2.2.2. For LPG and NG, the fuel to be used must...
 - 2.3. Point 5.2.4 of UNECE Regulation No 101 shall be understood...
- 3. TECHNICAL REQUIREMENTS
 - 3.1. The technical requirements and specifications for the measurement of CO...
 - 3.2. In Annex 6, section 1.3.5 of UN/ECE Regulation 101 the...
 - 3.3. In Annex 6 of UN/ECE Regulation 101, section 1.4.3 shall...
 - 3.4. In Annex 8 of UN/ECE Regulation 101, references to Annex...
 - 3.5. During the test cycle used for determining the CO₂...
- 4. TYPE-APPROVAL OF VEHICLES FITTED WITH ECO-INNOVATIONS
 - 4.1. According to Article 11(1) of Regulation (EU) No 725/2011 for...
 - 4.2. The CO₂ emissions savings from the vehicle fitted with...
 - 4.3. The performance of the necessary tests for the determination of...
 - 4.4.
- 5. DETERMINATION OF CO₂ EMISSIONS AND FUEL CONSUMPTION FROM N...
 - 5.1. For the purpose of determining the CO₂ emissions and...
 - 5.2. The reference mass to be used for the testing shall...
 - 5.3. The default added mass shall be calculated according to the...
 - 5.4. The multiplying factor shall be calculated according to the following...
 - 5.5. The manufacturer of the base vehicle is responsible for the...
 - 5.6. The manufacturer of the completed vehicle shall include, in the...
 - 5.7. In the case of vehicles submitted to individual vehicle approval,...
 - 5.8. The procedure set out in points 5.1 to 5.7 shall...

ANNEX XIII

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

1. INTRODUCTION
 - 1.1. This Annex contains additional requirement for the type-approval as separate...
2. GENERAL REQUIREMENTS
 - 2.1. Marking
 - 2.2. Documentation
 - 2.3. The vehicle manufacturer shall provide to the technical service and/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. Appendix 3 to this Annex gives example of the EC...
4. TECHNICAL REQUIREMENTS
 - 4.1. The requirements for the type-approval of replacement pollution control devices...
 - 4.1.1. The terms ‘catalytic converter’ and ‘converter’ used in section 5...
 - 4.1.2. The regulated pollutants referred to throughout section 5.2.3 of UN/ECE...
 - 4.1.3. For replacement pollution control devices standards intended to be fitted...
 - 4.1.4. Reference to Appendix 1 of the type-approval communication in section...
 - 4.2. For vehicles with positive-ignition engines, if the THC and NMHC...
 - 4.3. The revised OBD threshold limits will apply during the tests...
 - 4.4. Requirements for replacement periodically regenerating systems
 - 4.4.1. Requirements regarding emissions
 - 4.4.1.1. The vehicle(s) indicated in Article 11(3), equipped with a replacement...
 - 4.4.2. Determination of the basis for comparison
 - 4.4.2.1. The vehicle shall be fitted with a new original periodically...
 - 4.4.2.2. Upon request of the applicant for the approval of the...
 - 4.4.3. Exhaust gas test with a replacement periodically regeneration system
 - 4.4.3.1. The original equipment periodically regenerating system of the test vehicle(s)...
 - 4.4.3.2. To determine the D-factor of the replacement periodically regenerating system,...
 - 4.4.4. Other requirements
5. DOCUMENTATION
 - 5.1. Each replacement pollution control device shall be clearly and indelibly...
6. CONFORMITY OF PRODUCTION
 - 6.1. Measures to ensure the conformity of production shall be taken...
 - 6.2. Special provisions
 - 6.2.1. The checks referred to in point 2.2 of Annex X...
 - 6.2.2. For the application of Article 12(2) of Directive 2007/46/EC, the...

Appendix 1

MODEL

0. GENERAL
 - 0.1. Make (trade name of manufacturer):
 - 0.2. Type:
 - 0.2.1. Commercial name(s), if available:
 - 0.5. Name and address of manufacturer:
 - 0.7. In the case of components and separate technical units, location...
 - 0.8. Address(es) of assembly plant(s):
1. DESCRIPTION OF THE DEVICE
 - 1.1. Make and type of the replacement pollution control device:
 - 1.2. Drawings of the replacement pollution control device, identifying in particular...
 - 1.3. Description of the vehicle type or types for which the...
 - 1.3.1. Number(s) and/or symbol(s) characterising the engine and vehicle type(s):
 - 1.3.2. Is the replacement pollution control device intended to be compatible...
 - 1.4. Description and drawings showing the position of the replacement pollution...

Appendix 2

MODEL EC TYPE-APPROVAL CERTIFICATE

SECTION I

- 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:
- 0.5. 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 (if any):

SECTION II

1. Additional information
 - 1.1. Make and type of the replacement pollution control device:
 - 1.2. Vehicle type(s) for which the pollution control device type qualifies...
 - 1.3. Type(s) of vehicles 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

Example of the EC type-approval marks

ANNEX XIV

Access to vehicle OBD and vehicle repair and maintenance information

1. INTRODUCTION
 - 1.1. This Annex lays down technical requirements for the accessibility of...
2. REQUIREMENTS
 - 2.1. Vehicle OBD and vehicle repair and maintenance information available through...
 - 2.2. Access to vehicle security features used by authorised dealers and...
 - 2.3. Reprogramming of control units of vehicles manufactured later than 31...
 - 2.4. All emission-related fault codes shall be consistent with Appendix 1...
 - 2.5. For access to any vehicle OBD and vehicle repair and...
 - 2.6. In the event that vehicle OBD and vehicle repair and...
 - 2.7. Manufacturers shall indicate in their repair information websites the type-approval...
 - 2.8. Manufacturers shall establish fees for hourly, daily, monthly, annual and...

Appendix 1

ANNEX XV

IN-SERVICE CONFORMITY OF VEHICLES TYPE-
APPROVED UNDER DIRECTIVE 70/220/EEC

1. CONFORMITY OF IN-SERVICE VEHICLES
 - 1.1. An audit of in-service conformity shall be conducted by the...
 - 1.2. The Figure referred to under point 4 of Appendix 2...
 - 1.3. Parameters defining the in-service family
 - 1.3.1. combustion process (two stroke, four stroke, rotary).
 - 1.3.2. number of cylinders.
 - 1.3.3. configuration of the cylinder block (in-line, V, radial, horizontally opposed,...
 - 1.3.4. method of engine fuelling (e.g. indirect or direct injection).
 - 1.3.5. type of cooling system (air, water, oil).
 - 1.3.6. method of aspiration (naturally aspirated, pressure charged).
 - 1.3.7. fuel for which the engine is designed (petrol, diesel, NG,...
 - 1.3.8. type of catalytic converter (three-way catalyst or other(s)).
 - 1.3.9. type of particulate trap (with or without).
 - 1.3.10. exhaust gas recirculation (with or without).
 - 1.3.11. engine cylinder capacity of the largest engine within the family...
 - 1.4. An audit of in-service conformity shall be conducted by the...
 - 1.4.1. the name and address of the manufacturer;
 - 1.4.2. the name, address, telephone and fax numbers and e-mail address...
 - 1.4.3. the model name(s) of the vehicles included in the manufacturer's...
 - 1.4.4. where appropriate, the list of vehicle types covered within the...
 - 1.4.5. the vehicle identification number (VIN) codes applicable to these vehicle...
 - 1.4.6. the numbers of the type-approvals applicable to these vehicle types...
 - 1.4.7. details of extensions, field fixes/recalls to those type-approvals for the...
 - 1.4.8. the period of time over which the manufacturer's information was...
 - 1.4.9. the vehicle build period covered within the manufacturer's information (e.g....
 - 1.4.10. the manufacturer's in-service conformity checking procedure, including:
 - 1.4.11. the results from the manufacturer's in-service conformity procedure, including:
 - 1.4.12. records of indication from the OBD system.
2. The information gathered by the manufacturer shall be sufficiently comprehensive...
3. On the basis of the audit referred to in Section...
 - 3.1. Where type 1 tests are considered necessary to check the...
 - 3.2. The approval authority, in cooperation with the manufacturer, shall select...
 - 3.3. The manufacturer shall be authorized, under the supervision of the...
 - 3.4. Where the approval authority is not satisfied with the results...
 - 3.5. If a Member State has established that a vehicle type...

Appendix 1

In-service conformity check

1. INTRODUCTION
2. SELECTION CRITERIA
 - 2.1. The vehicle shall belong to a vehicle type that is...
 - 2.2. The vehicle shall have been in service for at least...
 - 2.3. There shall be a maintenance record to show that the...
 - 2.4. The vehicle shall exhibit no indications of abuse (e. g....
 - 2.5. There shall have been no unauthorized major repair to the...
 - 2.6. The lead content and sulphur content of a fuel sample...
 - 2.7. There shall be no indication of any problem that might...
 - 2.8. All anti-pollution system components on the vehicle shall be in...
3. DIAGNOSIS AND MAINTENANCE
 - 3.1. The following checks shall be carried out: checks on air...
 - 3.2. The OBD system shall be checked for proper functioning. Any...
 - 3.3. The ignition system shall be checked and defective components replaced,...
 - 3.4. The compression shall be checked. If the result is unsatisfactory...
 - 3.5. The engine parameters shall be checked to the manufacturer's specifications...
 - 3.6. If the vehicle is within 800 km of a scheduled...
 - 3.7. Upon acceptance of the vehicle, the fuel shall be replaced...
4. IN-SERVICE TESTING
 - 4.1. When a check on vehicles is deemed necessary, emission tests...
 - 4.2. Vehicles equipped with an OBD system may be checked for...
 - 4.3. The OBD system may be checked, for example, for levels...
 - 4.4. If a component or system operates in a manner not...
5. EVALUATION OF RESULTS
 - 5.1. The test results are submitted to the evaluation procedure in...
 - 5.2. Test results shall not be multiplied by deterioration factors.
6. PLAN OF REMEDIAL MEASURES
 - 6.1. The approval authority shall request the manufacturer to submit a...
 - 6.2. The plan of remedial measures shall be filed with the...
 - 6.3. The remedial measures shall apply to all vehicles likely to...
 - 6.4. The manufacturer shall provide a copy of all communications related...
 - 6.5. The plan of remedial measures shall include the requirements set...
 - 6.5.1. A description of each vehicle type included in the plan...
 - 6.5.2. A description of the specific modifications, alterations, repairs, corrections, adjustments,...
 - 6.5.3. A description of the method by which the manufacturer informs...
 - 6.5.4. A description of the proper maintenance or use, if any,...
 - 6.5.5. A description of the procedure to be followed by vehicle...
 - 6.5.6. A copy of the information transmitted to the vehicle owner....
 - 6.5.7. A brief description of the system which the manufacturer uses...
 - 6.5.8. A copy of all instructions to be sent to those...
 - 6.5.9. A description of the impact of the proposed remedial measures...
 - 6.5.10. Any other information, reports or data the approval authority may...
 - 6.5.11. Where the plan of remedial measures includes a recall, a...

- 6.6. The manufacturer may be required to conduct reasonably designed and...
- 6.7. The manufacturer shall be responsible for keeping a record of...
- 6.8. The repair and/or modification or addition of new equipment shall...

Appendix 2

Statistical procedure for in-service conformity testing

- 1. This procedure shall be used to verify the in-service conformity...
- 2. Footnote 1 shall not apply.
- 3. In paragraphs 3.2.3.2.1 and 3.2.4.2 of Appendix 4 to UN/ECE...
- 4. In Figure 4/1. of Appendix 4 to UN/ECE Regulation No...

ANNEX XVI

REQUIREMENTS FOR VEHICLES THAT USE A REAGENT FOR THE EXHAUST AFTERTREATMENT SYSTEM

- 1. INTRODUCTION
- 2. REAGENT INDICATION
 - 2.1. The vehicle shall include a specific indicator on the dashboard...
- 3. DRIVER WARNING SYSTEM
 - 3.1. The vehicle shall include a warning system consisting of visual...
 - 3.2. The warning system shall escalate in intensity as the reagent...
 - 3.3. The visual warning shall display a message indicating a low...
 - 3.4. The warning system does not initially need to be continuously...
 - 3.5. The warning system shall activate at a distance equivalent to...
- 4. IDENTIFICATION OF INCORRECT REAGENT
 - 4.1. The vehicle shall include a means of determining that a...
 - 4.2. If the reagent in the storage tank does not correspond...
- 5. REAGENT CONSUMPTION MONITORING
 - 5.1. The vehicle shall include a means of determining reagent consumption...
 - 5.2. Average reagent consumption and average demanded reagent consumption by the...
 - 5.3. In order to monitor reagent consumption, at least the following...
 - 5.4. A deviation of more than 50 % between the average...
 - 5.5. In the case of interruption in reagent dosing activity the...
- 6. MONITORING NO_x EMISSIONS
 - 6.1. As an alternative to the monitoring requirements in section 4...
 - 6.2. The manufacturer shall demonstrate that use of the sensors referred...
- 7. STORAGE OF FAILURE INFORMATION
 - 7.1. Where reference is made to this point, non-erasable Parameter Identifiers...
 - 7.2. Malfunctions in the reagent dosing system attributed to technical failures...

8. DRIVER INDUCEMENT SYSTEM
 - 8.1. The vehicle shall include a driver inducement system to ensure...
 - 8.2. The inducement system shall activate at the latest when the...
 - 8.3. The manufacturer shall select which type of inducement system to...
 - 8.3.1. A 'no engine restart after countdown' approach allows a countdown...
 - 8.3.2. A 'no start after refuelling' system results in a vehicle...
 - 8.3.3. A 'fuel-lockout' approach prevents the vehicle from being refuelled by...
 - 8.3.4. A 'performance restriction' approach restricts the speed of the vehicle...
 - 8.4. Once the inducement system has fully activated and disabled the...
 - 8.5. The driver warning system referred to in section 3 shall...
 - 8.6. The driver inducement system shall be deactivated when the conditions...
 - 8.7. Detailed written information fully describing the functional operation characteristics of...
 - 8.8. As part of the application for type-approval under this Regulation,...
9. INFORMATION REQUIREMENTS
 - 9.1. The manufacturer shall provide all owners of new vehicles written...
 - 9.2. The instructions shall indicate requirements for the proper use and...
 - 9.3. The instructions shall specify if consumable reagents have to be...
 - 9.4. The instructions shall specify that use of, and refilling of,...
 - 9.5. The instructions shall state that it may be a criminal...
 - 9.6. The instructions shall explain how the warning system and driver...
10. OPERATING CONDITIONS OF THE AFTERTREATMENT SYSTEM

ANNEX XVII

AMENDMENTS TO REGULATION (EC) No 715/2007

1. The following paragraph 6 shall be added to Article 10:...
2. Tables 1 and 2 of Annex I are replaced by...

ANNEX XVIII

SPECIAL PROVISIONS REGARDING ANNEX I TO COUNCIL DIRECTIVE 70/156/EEC

- 3.2.1.1. Working principle: positive ignition/compression ignition
- 3.2.2. Fuel: Diesel/Petrol/LPG/NG-Biomethane/Ethanol(E85)/Biodiesel/Hydrogen Four stroke/two stroke/rotary cycle
 - 3.2.2.4. Vehicle fuel type: Mono fuel, Bi fuel, Flex fuel Four...
 - 3.2.2.5. Maximum amount of biofuel acceptable in fuel (manufacturer's declared value):...
- 3.2.4.2. Maximum fuel delivery Four stroke/two stroke/rotary cycle : ... mm³/stroke...
- 3.2.4.2. Electronic controlled injection: yes/no
 - 3.2.4.2.1. Type(s):

- 3.2.4.2. Description of the system, in the case of systems other...
 - 3.2.4.2. Make and type of the control unit:
 - 3.2.4.2. Make and type of the fuel regulator:
 - 3.2.4.2. Make and type of air-flow sensor:
 - 3.2.4.2. Make and type of fuel distributor:
 - 3.2.4.2. Make and type of throttle housing:
 - 3.2.4.2. Make and type of water temperature sensor:
 - 3.2.4.2. Make and type of air temperature sensor:
 - 3.2.4.2. Make and type of air pressure sensor:
- 3.2.4.3. System description, in the case of systems other than continuous...
 - 3.2.4.3. Make and type of the control unit:
 - 3.2.4.3. Make and type of air-flow sensor:
 - 3.2.4.3. Make and type of micro switch:
 - 3.2.4.3. Make and type of throttle housing:
 - 3.2.4.3. Make and type of water temperature sensor:
 - 3.2.4.3. Make and type of air temperature sensor:
 - 3.2.4.3. Make and type of air pressure sensor:
- 3.2.4.3. Make(s):
- 3.2.4.3. Type(s):
- 3.2.8.2. Type: air-air/air-water
- 3.2.8.3. Intake depression at rated engine speed and at 100 %...
- 3.2.9.3. Maximum allowable exhaust back pressure at rated engine speed and...
- 3.2.11.1 Maximum lift of valves, angles of opening and closing, or...
- 3.2.12.2 Additional pollution control devices (if any, and if not covered...
 - 3.2.12.2. Number of catalytic converters and elements (provide the information below...
 - 3.2.12.2. Regeneration systems/method of exhaust after-treatment systems, description:
 - 3.2.12.2. The number of Type 1 operating cycles, or equivalent engine...
 - 3.2.12.2. Description of method employed to determine the number of cycles...
 - 3.2.12.2. Parameters to determine the level of loading required before regeneration...
 - 3.2.12.2. Description of method used to load system in the test...
 - 3.2.12.2. Normal operating temperature range (K):
 - 3.2.12.2. Consumable reagents (where appropriate):
 - 3.2.12.2. Type and concentration of reagent needed for catalytic action (where...)
 - 3.2.12.2. Normal operational temperature range of reagent (where appropriate):
 - 3.2.12.2. International standard (where appropriate):
 - 3.2.12.2. Frequency of reagent refill: continuous/maintenance (where appropriate)
 - 3.2.12.2. Make of catalytic converter:
 - 3.2.12.2. Identifying part number:
 - 3.2.12.2. Make of oxygen sensor:
 - 3.2.12.2. Identifying part number:
 - 3.2.12.2. Water cooled system: yes/no
 - 3.2.12.2. The number of Type 1 operating cycles, or equivalent engine...
 - 3.2.12.2. Description of method employed to determine the number of cycles...

- 3.2.12.2 Parameters to determine the level of loading required before regeneration...
- 3.2.12.2 Description of method used to load system in the test...
- 3.2.12.2 Make of particulate trap:
- 3.2.12.2 Identifying part number:
- 3.2.12.2 The following additional information shall be provided by the vehicle...
 - 3.2.12.2.A Description of the type and number of the pre-conditioning...
 - 3.2.12.2.A Description of the type of the OBD demonstration cycle...
 - 3.2.12.2.A Comprehensive document describing all sensed components with the strategy...
 - 3.2.12.2.B The information required by this section may, be defined by...

3.2.15.1 EC type-approval number according to Council Directive 70/221/EEC (OJ L...

3.2.16.1 EC type-approval number according to Directive 70/221/EEC (when the Directive...

- 3.4. Engines or motor combinations
 - 3.4.1. Hybrid Electric Vehicle: yes/no
 - 3.4.2. Category of Hybrid Electric vehicle
 - 3.4.3. Operating mode switch: with/without
 - 3.4.3.1. Selectable modes
 - 3.4.3.1.1 Pure electric: yes/no
 - 3.4.3.1.2 Pure fuel consuming: yes/no
 - 3.4.3.1.3 Hybrid modes: yes/no
 - 3.4.4. Description of the energy storage device: (battery, capacitor, flywheel/generator)
 - 3.4.4.1. Make(s):
 - 3.4.4.2. Type(s):
 - 3.4.4.3. Identification number:
 - 3.4.4.4. Kind of electrochemical couple:
 - 3.4.4.5. Energy: ... (for battery: voltage and capacity Ah in 2...
 - 3.4.4.6. Charger: on board/external/without
 - 3.4.5. Electric machines (describe each type of electric machine separately)
 - 3.4.5.1. Make:
 - 3.4.5.2. Type:
 - 3.4.5.3. Primary use: traction motor/generator
 - 3.4.5.3.1 When used as traction motor: monomotor/multimotors (number):
 - 3.4.5.4. Maximum power: kW
 - 3.4.5.5. Working principle:
 - 3.4.5.5.1 direct current/alternating current/number of phases:
 - 3.4.5.5.2 separate excitation/series/compound
 - 3.4.5.5.3 synchronous/asynchronous
 - 3.4.6. Control unit
 - 3.4.6.1. Make(s):
 - 3.4.6.2. Type(s):
 - 3.4.6.3. Identification number:
 - 3.4.7. Power controller
 - 3.4.7.1. Make:
 - 3.4.7.2. Type:
 - 3.4.7.6. Identification number:
 - 3.4.8. Vehicle electric range ... km (according to Annex 9 to...
 - 3.4.9. Manufacturer's recommendation for preconditioning:

- 3.5.2. Fuel consumption (provide for each reference fuel tested)
- 6.6.1. Tyre/wheel combination(s)
- 9.1. Type of bodywork: (use codes defined in Annex II, section...
- 16. Access to vehicle repair and maintenance information
 - 16.1. Address of principal website for access to vehicle repair and...
 - 16.1.1. Date from which it is available (no later than 6...
 - 16.2. Terms and conditions of access to website referred to in...
 - 16.3. Format of vehicle repair and maintenance information accessible through website...

ANNEX XIX

SPECIAL PROVISIONS REGARDING ANNEX III TO COUNCIL DIRECTIVE 70/156/EEC

- 3.2.1.1. Working principle: positive ignition/compression ignition
- 3.2.2. Fuel: Diesel/Petrol/LPG/NG-Biomethane/Ethanol(E85)/Biodiesel/Hydrogen
 - 3.2.2.4. Vehicle fuel type: Mono fuel, Bi fuel, Flex fuel
 - 3.2.2.5. Maximum amount of biofuel acceptable in fuel (manufacturer's declared value):...
- 3.2.12.2. Additional pollution control devices (if any, and if not covered...
- 3.4. Engines or motor combinations
 - 3.4.1. Hybrid Electric Vehicle: yes/no
 - 3.4.2. Category of Hybrid Electric vehicle
- 6.6.1. Tyre/wheel combination(s)
- 9.1. Type of bodywork: (use codes defined in section C of...
- 16. Access to vehicle repair and maintenance information
 - 16.1. Address of principal website for access to vehicle repair and...

ANNEX XX

MEASUREMENT OF NET ENGINE POWER, NET POWER AND THE MAXIMUM 30 MINUTES POWER OF ELECTRIC DRIVE TRAIN

- 1. INTRODUCTION
- 2. GENERAL SPECIFICATIONS
 - 2.1 The general specifications for conducting the tests and interpreting the...
 - 2.2 Test fuel
 - 2.3 Power correction factors

Changes to legislation: There are currently no known outstanding effects for the
Commission Regulation (EC) No 692/2008. (See end of Document for details)

- (1) [OJ L 171, 29.6.2007, p. 1.](#)
- (2) [OJ L 42, 23.2.1970, p. 1](#) Directive as last amended by Regulation (EC) No 715/2007
- (3) [OJ L 263, 9.10.2007, p. 1.](#)

Changes to legislation:

There are currently no known outstanding effects for the Commission Regulation (EC) No 692/2008.