COMMISSION REGULATION (EU) No 136/2014

of 11 February 2014

amending Directive 2007/46/EC of the European Parliament and of the Council, Commission Regulation (EC) No 692/2008 as regards emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and Commission Regulation (EU) No 582/2011 as regards emissions from heavy duty vehicles (Euro VI)

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2007/46/EC of the European Parliament and of the Council of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles (Framework Directive) ([1]), and in particular Article 39(2) thereof.

Having regard to Regulation (EC) No 715/2007 of the European Parliament and of the Council of 20 June 2007 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 ([2]), and in particular Article 5(3) thereof.

Having regard to Regulation (EC) No 595/2009 of the European Parliament and of the Council of 18 June 2009 on type-approval of motor vehicles and engines with respect to emissions from heavy duty vehicles (Euro VI) and on access to vehicle repair and maintenance information and amending Regulation (EC) No 715/2007 and Directive 2007/46/EC and repealing Directives 80/1269/EEC, 2005/55/EC and 2005/78/EC, and in particular Article 5(4) thereof,

Whereas:

(1) Regulation (EC) No 715/2007 and 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 ([3]) establish common technical requirements for the type-approval of motor vehicles and replacement parts with regard to their emissions and lay down rules for in-service conformity, durability of pollution control devices, on-board diagnostic (OBD) systems, measurement of fuel consumption and accessibility of vehicle repair and maintenance information.

(2) Directive 2007/46/EC of 5 September 2007 establishes a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles. It sets out the format of the type-approval documents and specifies the bases for outlining engine characteristics, including values of engine power and power-related parameters.

(3) The EC type-approval number issued pursuant to Regulation (EC) No 692/2008 includes alphabetical characters (Euro 5 and Euro 6 steps), which indicate the emission limit values and OBD requirements in accordance with which the approval was granted. Each step, identified by an alphabetical character, contains a mandatory implementation date for the certification of new types of vehicles and for all new vehicles, as well as a last date of registration.

(4) Vehicle manufacturers may request a type-approval of vehicles with more stringent requirements before those requirements become mandatory. New Euro 6 steps will enable certification of vehicles with lower emission levels before those emission levels enter into force.

(5) Regulation (EC) No 595/2009 of the European Parliament and of the Council of 18 June 2009 on type-approval of motor vehicles and engines with respect to emissions from heavy duty vehicles (Euro VI) and on access to vehicle repair and maintenance information and amending Regulation (EC) No 715/2007 and Directive 2007/46/EC ([4]), repealed Council Directive 80/1269/EEC of 16 December 1980 on the approximation of the laws of the Member States relating to the engine power of motor vehicles ([5]) with effect from 31 December 2013. Therefore, it is necessary to carry over the provisions of Directive 80/1269/EEC into Regulation (EC) No 715/2007.

(6) Regulation (EC) No 692/2008 and Regulation (EU) No 582/2011 specify the reference fuels which should be used by vehicle manufacturers to perform emission tests in accordance with Regulation (EC) No 715/2007 and Regulation (EC) No 595/2009. The characteristics of reference fuels reflect the characteristics of fuels most commonly used in the market at the time Regulation (EC) No 692/2008 was adopted. However, due to the increasing usage of biofuels in the market in recent years, specifications of reference fuels should be adapted to correspond to the fuels available currently and in the foreseeable future on the Union market.

([1]) OJ L 263, 9.10.2007, p. 1.
([2]) OJ L 171, 29.6.2007, p. 1.
([3]) OJ L 199, 28.7.2008, p. 1.
([4]) OJ L 188, 18.7.2009, p. 1.
([5]) OJ L 375, 31.12.1980, p. 46.

(7) The reference fuels in Regulation (EC) No 692/2008 and Regulation (EU) No 582/2011 need to be aligned in order to harmonize procedures for light and heavy-duty vehicles and therefore reduce costs related to type-approval.

(8) Directive 2007/46/EC, Regulation (EC) No 692/2008 and Regulation (EU) No 582/2011 should therefore be amended accordingly.

(9) The measures provided for in this Regulation are in accordance with the opinion of the Technical Committee – Motor Vehicles,

HAS ADOPTED THIS REGULATION:

Article 1

Amendments to Directive 2007/46/EC

Annexes I, III, IV, IX, and XI to Directive 2007/46/EC are amended in accordance with Annex I to this Regulation.

Article 2

Amendments to Regulation (EC) No 692/2008

Regulation (EC) No 692/2008 is amended as follows:

(1) In Article 2, the following points 37, 38, 39 and 40 are added:

'37. "net power" means the power obtained on a test bench at the end of the crankshaft or its equivalent at the corresponding engine or motor speed with the auxiliaries, tested in accordance with Annex XX (Measurements of net engine power, net power and the maximum 30 minutes power of electric drive train), and determined under reference atmospheric conditions;

38. "maximum net power" means the maximum value of the net power measured at full engine load;

39. "maximum 30 minutes power" means the maximum net power of an electric drive train at DC voltage as set out in paragraph 5.3.2. of UNECE Regulation No 85 ([1]);

40. "cold start" means an engine coolant temperature (or equivalent temperature) at engine start less than or equal to 35 °C and less than or equal to 7 K higher than ambient temperature (if available) at engine start'.

(2) In Article 3, paragraph 1 is replaced by the following:

'1. In order to receive an EC type-approval with regard to emissions and vehicle repair and maintenance information, the manufacturer shall demonstrate that the vehicles comply with the test procedures specified in Annexes III to VIII, X to XII, XIV, XVI and XX to this Regulation. The manufacturer shall also ensure compliance with the specifications of reference fuels set out in Annex IX to this Regulation.'.

([1]) OJ L 326, 24.11.2006, p. 55

(3) In Article 6, paragraph 1 is replaced by the following:

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

Without prejudice to the provisions of Annex VII to Directive 2007/46/EC, section 3 of the type-approval number shall be drawn up in accordance with Appendix 6 to Annex I to this Regulation.

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

For vehicles type approved to the Euro 5 emission limits given in Table 1 of Annex I of Regulation (EC) 715/2007 the relevant requirements shall be deemed to be met if all the following conditions are fulfilled:

(a) the requirements of Article 13 are met;

(b) the vehicle has been approved according to UN/ECE Regulations No 83, series of amendments 06, No 85, No 101, series of amendments 01 and in the case of compression ignition vehicles No 24 Part III, series of amendments 03.

In the case referred to in the fourth subparagraph Article 14 shall also apply.'.

(4) Annexes I, III, IV, IX, XI and XII are amended in accordance with Annex II to this Regulation.

(5) Annex XX is added, the text of which is set out in Annex III to this Regulation.

Article 3

Amendments to Regulation (EU) No 582/2011

Annexes VIII and IX to Regulation (EU) No 582/2011 are amended in accordance with Annex IV to this Regulation.

Article 4

Transitional provisions

1. As from 1 January 2015 manufacturers shall deliver certificates of conformity which are in accordance with this Regulation.

2. For the purpose of compliance with Annex XX to Regulation (EC) No 692/2008, certificates granted by demonstrating compliance with Directive 80/1269/EEC and/or UNECE Regulation No 85 issued before the date of entry into force of this Regulation shall remain valid until 31 August 2018.

3. Annex IV to this Regulation shall apply as from the dates set out in row C of Table 1 of Appendix 9 to Annex I to Regulation (EU) No 582/2011.

Article 5

Entry into force

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

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

Done at Brussels, 11 February 2014.

For the Commission
The President
José Manuel BARROSO

ANNEX I

Amendments to Directive 2007/46/EC

Annexes I, III, IV, IX, and XI to Directive 2007/46/EC are amended as follows:

(1) Annex I is amended as follows:

(a) the following points 3.3.1.1.1 and 3.3.1.1.2 are inserted:

'3.3.1.1.1. Maximum net power ([n]) ..... kW

(manufacturer's declared value)

3.3.1.1.2. Maximum 30 minutes power ([n]) ..... kW

(manufacturer's declared value)';

(b) in the explanatory notes, the explanatory note ([n]) is replaced by the following:

'([n]) Determined in accordance with the requirements of Regulation (EC) No 715/2007 or Regulation (EC) No 595/2009 as applicable.';

(2) in Part I, A, of Annex III, the following points 3.3.1.1.1 and 3.3.1.1.2 are inserted:

'3.3.1.1.1. Maximum net power ([n]) ..... kW

(manufacturer's declared value)

3.3.1.1.2. Maximum 30 minutes power ([n]) ..... kW

(manufacturer's declared value)';

(3) Annex IV is amended as follows:

(a) Part I is amended as follows:

(i) in the table, item 40 is deleted.

(ii) explanatory note (7) is deleted;

(b) Appendix 1 to Part I is amended as follows:

(i) in Table 1, item 2 is replaced by the following:

'2	Emissions (Euro 5 and 6) light duty vehicles/access to information	Regulation (EC) No 715/2007		A
			(a) On-board diagnostic (OBD)	The vehicle shall be fitted with an OBD system that fulfils the requirements of Article 4(1) and (2) of Regulation (EC) No 692/2008 (The OBD system shall be designed to record at least the malfunction of the engine management system). The OBD-interface shall be able to communicate with commonly available diagnostic tools.
			(b) In service conformity	N/A
			(c) Access to information	It is sufficient that the manufacturer provide access to repair and maintenance information in a readily accessible and prompt manner.

			(d) Power measurement	*(When the vehicle manufacturer uses an engine from another manufacturer)* Bench test data from the engine manufacturer are accepted provided that the engine management system is identical (i.e. having at least the same ECU). Power output test may be performed on a chassis dynamometer. It shall be taken into account of the power loss in the transmission.'

(ii) in Table 1, item 40 is deleted.

(iii) in Table 1, item 41A is replaced by the following:

'41A	Emissions (Euro VI) heavy duty vehicles/ access to information	Regulation (EC) No 595/2009		A With the exception of the set of requirements relating to OBDs and access to information.
			Power measurement	*(When the vehicle manufacturer uses an engine from another manufacturer)* Bench test data from the engine manufacturer are accepted provided that the engine management system is identical (i.e. having at least the same ECU). Power output test may be performed on a chassis dynamometer. It shall be taken into account of the power loss in the transmission.'

(iv) in Table 2, item 2 is replaced by the following:

'2	Emissions (Euro 5 and 6) light duty vehicles/access to information	Regulation (EC) No 715/2007		A
			(a) On-board diagnostic (OBD)	The vehicle shall be fitted with an OBD system that fulfils the requirements of Article 4(1) and (2) of Regulation (EC) No 692/2008 (The OBD system shall be designed to record at least the malfunction of the engine management system). The OBD-interface shall be able to communicate with commonly available diagnostic tools.
			(b) In service conformity	N/A

			(c) Access to information	It is sufficient that the manufacturer provide access to repair and maintenance information in a readily accessible and prompt manner.
			(d) Power measurement	*(When the vehicle manufacturer uses an engine from another manufacturer)* Bench test data from the engine manufacturer are accepted provided that the engine management system is identical (i.e. having at least the same ECU). Power output test may be performed on a chassis dynamometer. It shall be taken into account of the power loss in the transmission.'

(v) in Table 2, item 40 is deleted.

(vi) in Table 2, item 41A is replaced by the following:

'41A	Emissions (Euro VI) heavy duty vehicles/ access to information	Regulation (EC) No 595/2009		A With the exception of the set of requirements relating to OBDs and access to information.
			Power measurement	*(When the vehicle manufacturer uses an engine from another manufacturer)* Bench test data from the engine manufacturer are accepted provided that the engine management system is identical (i.e. having at least the same ECU). Power output test may be performed on a chassis dynamometer. It shall be taken into account of the power loss in the transmission.'

(c) Appendix 2 to Part I is amended as follows:

(i) in point 4, Part I, item 2a of the table is replaced by the following:

'2a	Regulation (EC) No 715/2007 (Emissions Euro 5 and 6 light duty vehicles/access to information)	*Tailpipe emissions* (a) A type I test shall be conducted in accordance with Annex III to Regulation (EC) No 692/2008 using the deterioration factors set out in point 1.4 of Annex VII to Regulation (EC) No 692/2008. The limits to be applied shall be those specified in Table I and Table II in Annex I to Regulation (EC) No 715/2007.

		(b) The vehicle shall not be required to exhibit 3 000 km as mentioned in Section 3.1.1 of Annex 4 to UNECE Regulation No 83. (c) The fuel to be used for the test shall be the reference fuel as prescribed in Annex IX to Regulation (EC) No 692/2008. (d) The dynamometer shall be set up in accordance with the technical requirements set out in Section 3.2 of Annex 4 to UNECE Regulation No 83. (e) The test referred to in point (a) shall not be conducted where it can be shown that the vehicle complies with the California Regulations referred to in Section 2 of Annex I to Regulation (EC) No 692/2008. *Evaporative emissions* For petrol-fuelled engines, the presence of an evaporate emissions control system shall be required (e.g. a charcoal canister). *Crankcase emissions* The presence of a device for recycling crankcase gases shall be required. *OBD* (a) The vehicle shall be fitted with an OBD system. (b) OBD-interface must be able to communicate with common diagnostic tools used for periodic technical inspections. *Smoke opacity* (a) Vehicles equipped with a diesel-fuelled engine shall be tested in accordance with the tests methods referred to in Appendix 2 to Annex IV to Regulation (EC) No 692/2008. (b) The corrected value of the absorption coefficient shall be affixed conspicuously and in a readily accessible place. *CO_2 emissions and fuel consumption* (a) A test shall be conducted in accordance with Annex XII to Regulation (EC) No 692/2008. (b) The vehicle shall not be required to exhibit 3 000 km as requested in Section 3.1.1 of Annex 4 to UNECE Regulation No 83. (c) Where the vehicle complies with the California Regulations referred to in Section 2 of Annex I to Regulation (EC) No 692/2008 and therefore no test of tailpipe emissions is required to be performed, Member States shall calculate CO_2 emissions and fuel consumption with the formulæ laid down in the explanatory notes ([b]) and ([c]).

		Access to information The provisions regarding access to information shall not apply. *Power measurement* (a) The applicant shall submit a statement from the manufacturer stating the maximum engine power output in kW as well as the corresponding engine speed in revolutions per minute. (b) An engine power output curve providing the same information may alternatively be referred to.'

(ii) in point 4, Part I, item 40 of the table is deleted.

(iii) in point 4, Part I, item 41a is inserted in the table

'41a	Regulation (EC) No 595/2009 Emissions (Euro VI) heavy-duty vehicles – OBD	*Tailpipe emissions* (a) A test shall be conducted in accordance with Annex III to Regulation (EU) No 582/2011 using the deterioration factors set out in point 3.6.1. of Annex VI to Regulation (EU) No 582/2011. (b) The limits to be applied shall be those set out in the table of Annex I to Regulation (EC) No 595/2009. (c) The fuel to be used for the test shall be the reference fuel as prescribed in Annex IX to Regulation (EU) No 582/2011. *CO_2 emissions* The CO_2 emissions and fuel consumption shall be determined in accordance with Annex VIII to Regulation (EU) No 582/2011. *OBD* (a) The vehicle shall be fitted with an OBD system. (b) The OBD-interface must be able to communicate with an external OBD scan-tool as described in Annex X to Regulation (EU) No 582/2011. *Requirements to ensure the correct operation of NO_x control measures* The vehicle shall be fitted with a system ensuring the correct operation of NO_x control measures in accordance with Annex XIII to Regulation (EU) No 582/2011. The provisions on alternative type-approval set out in point 2.1. of that Annex shall also apply. *Power measurement* (a) The applicant shall submit a statement from the manufacturer stating the maximum engine power output in kW as well as the corresponding engine speed in revolutions per minute. (b) An engine power output curve providing the same information may alternatively referred to.'

(iv) in point 4, Part II, item 2a of the table is replaced by the following:

'2a	Regulation (EC) No 715/2007 (Emissions Euro 5 and 6 light duty vehicles/access to information)	*Tailpipe emissions* (a) A type I test shall be conducted in accordance with Annex III to Regulation (EC) No 692/2008 using the deterioration factors set out in point 1.4 of Annex VII to Regulation (EC) No 692/2008. The limits to be applied shall be those specified in Table I and Table II in Annex I to Regulation (EC) No 715/2007. (b) The vehicle shall not be required to exhibit 3 000 km as mentioned in Section 3.1.1 of Annex 4 to UNECE Regulation No 83. (c) The fuel to be used for the test shall be the reference fuel as prescribed in Annex IX to Regulation (EC) No 692/2008. (d) The dynamometer shall be set up in accordance with the technical requirements set out in Section 3.2 of Annex 4 to UNECE Regulation No 83. (e) The test referred to in point (a) shall not be conducted where it can be shown that the vehicle complies with the California Regulations referred to in Section 2 of Annex I to Regulation (EC) No 692/2008. *Evaporative emissions* For petrol-fuelled engines, the presence of an evaporate emissions control system shall be required (e.g. a charcoal canister). *Crankcase emissions* The presence of a device for recycling crankcase gases shall be required. *OBD* (a) The vehicle shall be fitted with an OBD system. (b) OBD-interface must be able to communicate with common diagnostic tools used for periodic technical inspections. *Smoke opacity* (a) Vehicles equipped with a diesel-fuelled engine shall be tested in accordance with the tests methods referred to in Appendix 2 to Annex IV to Regulation (EC) No 692/2008. (b) The corrected value of the absorption coefficient shall be affixed conspicuously and in a readily accessible place. *CO_2 emissions and fuel consumption* (a) A test shall be conducted in accordance with Annex XII to Regulation (EC) No 692/2008. (b) The vehicle shall not be required to exhibit 3 000 km as requested in Section 3.1.1 of Annex 4 to UNECE Regulation No 83.

		(c) Where the vehicle complies with the California Regulations referred to in Section 2 of Annex I to Regulation (EC) No 692/2008 and therefore no test of tailpipe emissions is required to be performed, Member States shall calculate CO_2 emissions and fuel consumption with the formulae laid down in the explanatory notes ([b]) and ([c]). *Access to information* The provisions regarding access to information shall not apply. *Power measurement* (a) The applicant shall submit a statement from the manufacturer stating the maximum engine power output in kW as well as the corresponding regime in revolutions per minute. (b) An engine power output curve providing the same information may alternatively be referred to.'

(v) in point 4, Part II, item 40 of the table is deleted.

(vi) in point 4, Part II, item 41a is inserted in the table

'41a	Regulation (EC) No 595/2009 Emissions (Euro VI) heavy-duty vehicles – OBD	*Tailpipe emissions* (a) A test shall be conducted in accordance with Annex III to Regulation (EU) No 582/2011 using the deterioration factors set out in point 3.6.1. of Annex VI to Regulation (EU) No 582/2011. (b) The limits to be applied shall be those set out in the table of Annex I to Regulation (EC) No 595/2009. (c) The fuel to be used for the test shall be the reference fuel as prescribed in Annex IX to Regulation (EU) No 582/2011. *CO_2 emissions* The CO_2 emissions and fuel consumption shall be determined in accordance with Annex VIII to Regulation (EU) No 582/2011. *OBD* (a) The vehicle shall be fitted with an OBD system. (b) The OBD-interface must be able to communicate with an external OBD scan-tool as described in Annex X to Regulation (EU) No 582/2011. *Requirements to ensure the correct operation of NO_x control measures* The vehicle shall be fitted with a system ensuring the correct operation of NO_x control measures in accordance with Annex XIII to Regulation (EU) No 582/2011. The provisions on alternative type-approval set out in point 2.1. of that Annex shall also apply. *Power measurement* (a) The applicant shall submit a statement from the manufacturer stating the maximum engine power output in Kw as well as the corresponding regime (b) An engine power output curve providing the same information may alternatively referred to.'

(4) in the Appendix to Annex VI, item 40 of the table is deleted.

(5) Annex IX is amended as follows:

(a) Part I is amended as follows:

(i) point 27 of 'SIDE 2 VEHICLE CATEGORY M_1 (complete and completed vehicles)' is replaced by the following:

'27. Maximum power

27.1. Maximum net power (g): ..... kW at ..... min^{-1} (internal combustion engine) (1)

27.2. Maximum hourly output: ..... kW (electric motor) (1)

27.3. Maximum net power: ..... kW (electric motor) (1)

27.4. Maximum 30 minutes power: ..... kW (electric motor) (1)';

(ii) point 27 of 'SIDE 2 VEHICLE CATEGORY M_2 (complete and completed vehicles)' is replaced by the following:

'27. Maximum power

27.1. Maximum net power (g): ..... kW at ..... min^{-1} (internal combustion engine) (1)

27.2. Maximum hourly output: ..... kW (electric motor) (1)

27.3. Maximum net power: ..... kW (electric motor) (1)

27.4. Maximum 30 minutes power: ..... kW (electric motor) (1)';

(iii) point 27 of 'SIDE 2 VEHICLE CATEGORY M_3 (complete and completed vehicles)' is replaced by the following:

'27. Maximum power

27.1. Maximum net power (g): ..... kW at ..... min^{-1} (internal combustion engine) (1)

27.2. Maximum hourly output: ..... kW (electric motor) (1)

27.3. Maximum net power: ..... kW (electric motor) (1)

27.4. Maximum 30 minutes power: ..... kW (electric motor) (1)';

(iv) point 27 of 'SIDE 2 VEHICLE CATEGORY N_1 (complete and completed vehicles)' is replaced by the following:

'27. Maximum power

27.1. Maximum net power (g): ..... kW at ..... min^{-1} (internal combustion engine) (1)

27.2. Maximum hourly output: ..... kW (electric motor) (1)

27.3. Maximum net power: ..... kW (electric motor) (1)

27.4. Maximum 30 minutes power: ..... kW (electric motor) (1)';

(v) point 27 of 'SIDE 2 VEHICLE CATEGORY N_2 (complete and completed vehicles)' is replaced by the following:

'27. Maximum power

27.1. Maximum net power (g): ..... kW at ..... min^{-1} (internal combustion engine) (1)

27.2. Maximum hourly output: ..... kW (electric motor) (1)

27.3. Maximum net power: ..... kW (electric motor) (1)

27.4. Maximum 30 minutes power: ..... kW (electric motor) (1)';

(vi) point 27 of 'SIDE 2 VEHICLE CATEGORY N_3 (complete and completed vehicles)' is replaced by the following:

'27. Maximum power

27.1. Maximum net power (g): ..... kW at ..... min^{-1} (internal combustion engine) (1)

27.2. Maximum hourly output: ..... kW (electric motor) (1)

27.3. Maximum net power: ..... kW (electric motor) (1)

27.4. Maximum 30 minutes power: ..... kW (electric motor) (1)';

(b) Part II is amended as follows:

(i) point 27 of 'SIDE 2 VEHICLE CATEGORY M_1 (incomplete vehicles)' is replaced by the following:

'27. Maximum power

27.1. Maximum net power (g): ..... kW at ..... min^{-1} (internal combustion engine) (1)

27.2. Maximum hourly output: ..... kW (electric motor) (1)

27.3. Maximum net power: ..... kW (electric motor) (1)

27.4. Maximum 30 minutes power: ..... kW (electric motor) (1)';

(ii) point 27 of 'SIDE 2 VEHICLE CATEGORY M_2 (incomplete vehicles)' is replaced by the following:

'27. Maximum power

27.1. Maximum net power (g): ..... kW at ..... min^{-1} (internal combustion engine) (1)

27.2. Maximum hourly output: ..... kW (electric motor) (1)

27.3. Maximum net power: ..... kW (electric motor) (1)

27.4. Maximum 30 minutes power: ..... kW (electric motor) (1)';

(iii) point 27 of 'SIDE 2 VEHICLE CATEGORY M_3 (incomplete vehicles)' is replaced by the following:

'27. Maximum power

27.1. Maximum net power (g): ..... kW at ..... min^{-1} (internal combustion engine) (1)

27.2. Maximum hourly output: ..... kW (electric motor) (1)

27.3. Maximum net power: ..... kW (electric motor) (1)

27.4. Maximum 30 minutes power: ..... kW (electric motor) (1)';

(iv) point 27 of 'SIDE 2 VEHICLE CATEGORY N_1 (incomplete vehicles)' is replaced by the following:

'27. Maximum power

27.1. Maximum net power (g): ..... kW at ..... min^{-1} (internal combustion engine) (1)

27.2. Maximum hourly output: ..... kW (electric motor) (1)

27.3. Maximum net power: ..... kW (electric motor) (1)

27.4. Maximum 30 minutes power: ..... kW (electric motor) (1)';

(v) point 27 of 'SIDE 2 VEHICLE CATEGORY N_2 (incomplete vehicles)' is replaced by the following:

'27. Maximum power

27.1. Maximum net power (g): ..... kW at ..... min^{-1} (internal combustion engine) (1)

27.2. Maximum hourly output: ..... kW (electric motor) (1)

27.3. Maximum net power: ..... kW (electric motor) (1)

27.4. Maximum 30 minutes power: ..... kW (electric motor) (1)';

(vi) point 27 of 'SIDE 2 VEHICLE CATEGORY N_3 (incomplete vehicles)' is replaced by the following:

'27. Maximum power

27.1. Maximum net power (g): ..... kW at ..... min^{-1} (internal combustion engine) (1)

27.2. Maximum hourly output: ..... kW (electric motor) (1)

27.3. Maximum net power: ..... kW (electric motor) (1)

27.4. Maximum 30 minutes power: ..... kW (electric motor) (1)';

ANNEX II

Amendments to Regulation (EC) No 692/2008

Regulation (EC) No 692/2008 is amended as follows:

(1) in the list of Annexes, the Annex XX is added:

'*ANNEX XX* Measurement of net engine power';

(2) Annex I is amended as follows:

(a) Point 2.4 is replaced by the following:

'2.4. **Application of tests**

2.4.1. Figure I.2.4 illustrates the application of the tests for type-approval of a vehicle. The specific test procedures are described in Annexes II, III, IV, V, VI, VII, VIII, X, XI, XII, XVI ([1]) and XX.

([1]) Specific test procedures for hydrogen and flex fuel biodiesel vehicles will be defined at a later stage.

Figure I.2.4

Application of test requirements for type-approval and extensions

Vehicle category	Vehicles with positive ignition engines including hybrids									Vehicles with compression ignition engines including hybrids		Pure electric vehicles	Hydrogen Fuel cell vehicles
	Mono fuel				Bi-fuel (1)			Flex-fuel (1)		Flex fuel	Mono fuel		
Reference fuel	Petrol (E5/E10) (5)	LPG	NG/ Biomethane	Hydrogen	Petrol (E5/ E10) (5)	Petrol (E5/ E10) (5)	Petrol (E5/ E10) (5)	Petrol (E5/ E10) (5)	NG/ Biomethane	Diesel (B5/B7) (5)	Diesel (B5/B7) (5)	—	—
					LPG	NG/Biomethane	Hydrogen	Ethanol (E85)	H_2NG	Biodiesel			
Gaseous pollutants (Type 1 test)	Yes	Yes	Yes	Yes (4)	Yes (both fuels)	Yes (both fuels)	Yes (both fuels) (4)	Yes (both fuels)	Yes (both fuels)	Yes (B5/B7 only) (2) (5)	Yes	—	—
Particulate mass and particulate number (Type 1 test)	Yes	—	—	—	Yes (petrol only)	Yes (petrol only)	Yes (petrol only)	Yes (both fuels)	—	Yes (B5/B7 only) (2) (5)	Yes	—	—
Idle emissions (Type 2 test)	Yes	Yes	Yes	—	Yes (both fuels)	Yes (both fuels)	Yes (petrol only)	Yes (both fuels)	Yes (NG/biomethane only)	—	—	—	—
Crankcase emissions (Type 3 test)	Yes	Yes	Yes	—	Yes (petrol only)	Yes (petrol only)	Yes (petrol only)	Yes (petrol only)	Yes (NG/biomethane only)	—	—	—	—
Evaporative emissions (Type 4 test)	Yes	—	—	—	Yes (petrol only)	Yes (petrol only)	Yes (petrol only)	Yes (petrol only)	—	—	—	—	—
Durability (Type 5 test)	Yes	Yes	Yes	Yes	Yes (petrol only)	Yes (petrol only)	Yes (petrol only)	Yes (petrol only)	Yes (NG/ biomethane only)	Yes (B5/B7 only) (2) (5)	Yes	—	—
Low temperature emissions (Type 6 test)	Yes	—	—	—	Yes (petrol only)	Yes (petrol only)	Yes (petrol only)	Yes (3) (both fuels)	—	—	—	—	—

Vehicle category	Vehicles with positive ignition engines including hybrids									Vehicles with compression ignition engines including hybrids		Pure electric vehicles	Hydrogen Fuel cell vehicles
	Mono fuel				Bi-fuel (1)			Flex-fuel (1)		Flex fuel	Mono fuel		
In-service conformity	Yes	Yes	Yes	Yes	Yes (both fuels)	Yes (both fuels)	Yes (both fuels)	Yes (both fuels)	Yes (both fuels)	Yes (B5/B7 only) (2) (5)	Yes	—	—
On-board diagnostics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—
CO_2 emissions, fuel consumption, electric energy consumption and electric range	Yes	Yes	Yes	Yes	Yes (both fuels)	Yes (both fuels)	Yes (both fuels)	Yes (both fuels)	Yes (both fuels)	Yes (B5/B7 only) (2) (5)	Yes	Yes	Yes
Smoke opacity	—	—	—	—	—	—	—	—	—	Yes (B5/B7 only) (2) (5)	Yes	—	—
Engine power	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

(1) When a bi-fuel vehicle is combined with a flex fuel vehicle, both test requirements are applicable.
(2) This provision is temporary, further requirements for biodiesel shall be proposed later on.
(3) Test on petrol only before the dates set out in Article 10(6) of Regulation (EC) No 715/2007. The test will be performed on both fuels after these dates. The E75 test reference fuel specified in Annex IX, Section B, shall be used.
(4) Only NO_x emissions shall be determined when the vehicle is running on hydrogen.
(5) Upon the choice of the manufacturer vehicles with positive and compression ignition engines may be tested with either E5 or E10 and either B5 or B7 fuels, respectively. However:
— Not later than sixteen months after the dates set out in Article 10(4) of Regulation (EC) No 715/2007, new type -approvals shall only be performed with E10 and B7 fuels,
— Not later than three years after the dates set out in Article 10(5) of Regulation (EC) No 715/2007, all new vehicles shall be type-approved with E10 and B7 fuels.'

(b) the following text is added after Figure I.2.4:

'*Explanatory note*:

The dates of application of the reference fuels E10 and B7 for all new vehicles have been set out to minimise the test burden. If, however, technical evidence for vehicles certified with E5 or B5 reference fuels showing significantly higher emissions when tested with E10 or B7 is established, the Commission should make a proposal advancing these introduction dates.';

(c) Appendix 3 is amended as follows:

(i) in points 3.2.1.8 and 3.2.1.10, footnote ([a]) is replaced by the following:

'([a]) Determined in accordance with the requirements of Annex XX to this Regulation.';

(ii) point 3.3.1.1 is replaced by the following:

'3.3.1.1. Maximum hourly output: ..... kW

(manufacturer's declared value)

3.3.1.1.1. Maximum net power ([a]) ..... kW

(manufacturer's declared value)

3.3.1.1.2. Maximum 30 minutes power (a) ..... kW

(manufacturer's declared value)';

(iii) point 3.5.3. is replaced by the following:

'3.5.3. Electric energy consumption for electric vehicles';

(iv) the following points 3.5.3.1. and 3.5.3.2. are inserted:

'3.5.3.1. Electric energy consumption for pure electric vehicles ..... Wh/km

3.5.3.2. Electric energy consumption for externally chargeable hybrid electric vehicles

3.5.3.2.1. Electric energy consumption (Condition A, combined) ..... Wh/km

3.5.3.2.2. Electric energy consumption (Condition B, combined) ..... Wh/km

3.5.3.2.3. Electric energy consumption (weighted combined) ..... Wh/km';

(v) points 3.5.4. to 3.5.4.3. are deleted;

(d) in Appendix 4, the 'Addendum to EC type-approval certificate No …' is amended as follows:

(i) the following point 1.11.3 is inserted:

'1.11.3 Maximum net torque: ..... Nm, at ..... min^{-1}';

(ii) point 4. is replaced by the following:

‘4. Power measurement

Maximum engine net power of internal combustion engine, net power and maximum 30 minutes power of electric drive train

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 [1]

4.2.11. Variator: liquid/air [1]

[1] Delete where not applicable.’

(iii) the following point 5. is added:

‘5. Remarks: .....’;

(e) in Appendix 6, Table 1 is replaced by the following table:

'Table 1

Character	Emissions standard	OBD standard	Vehicle category and class	Engine	Implementation date: new types	Implementation date: new vehicles	Last date of registration
A	Euro 5a	Euro 5	M, N_1 class I	PI, CI	1.9.2009	1.1.2011	31.12.2012
B	Euro 5a	Euro 5	M_1 to fulfil specific social needs (excluding M_1G)	CI	1.9.2009	1.1.2012	31.12.2012
C	Euro 5a	Euro 5	M_1G to fulfil specific social needs	CI	1.9.2009	1.1.2012	31.8.2012
D	Euro 5a	Euro 5	N_1 class II	PI, CI	1.9.2010	1.1.2012	31.12.2012
E	Euro 5a	Euro 5	N_1 class III, N_2	PI, CI	1.9.2010	1.1.2012	31.12.2012
F	Euro 5b	Euro 5	M, N_1 class I	PI, CI	1.9.2011	1.1.2013	31.12.2013
G	Euro 5b	Euro 5	M_1 to fulfil specific social needs (excluding M_1G)	CI	1.9.2011	1.1.2013	31.12.2013
H	Euro 5b	Euro 5	N_1 class II	PI, CI	1.9.2011	1.1.2013	31.12.2013
I	Euro 5b	Euro 5	N_1 class III, N_2	PI, CI	1.9.2011	1.1.2013	31.12.2013
J	Euro 5b	Euro 5+	M, N_1 class I	PI, CI	1.9.2011	1.1.2014	31.8.2015
K	Euro 5b	Euro 5+	M_1 to fulfil specific social needs (excluding M_1G)	CI	1.9.2011	1.1.2014	31.8.2015
L	Euro 5b	Euro 5+	N_1 class II	PI, CI	1.9.2011	1.1.2014	31.8.2016
M	Euro 5b	Euro 5+	N_1 class III, N_2	PI, CI	1.9.2011	1.1.2014	31.8.2016
N	Euro 6a	Euro 6-	M, N_1 class I	CI			31.12.2012
O	Euro 6a	Euro 6-	N_1 class II	CI			31.12.2012
P	Euro 6a	Euro 6-	N_1 class III, N_2	CI			31.12.2012
Q	Euro 6b	Euro 6-	M, N_1 class I	CI			31.12.2013
R	Euro 6b	Euro 6-	N_1 class II	CI			31.12.2013

Character	Emissions standard	OBD standard	Vehicle category and class	Engine	Implementation date: new types	Implementation date: new vehicles	Last date of registration
S	Euro 6b	Euro 6-	N_1 class III, N_2	CI			31.12.2013
T	Euro 6b	Euro 6- plus IUPR	M, N_1 class I	CI			31.8.2015
U	Euro 6b	Euro 6- plus IUPR	N_1 class II	CI			31.8.2016
V	Euro 6b	Euro 6- plus IUPR	N_1 class III, N_2	CI			31.8.2016
W	Euro 6b	Euro 6-1	M, N_1 class I	PI, CI	1.9.2014	1.9.2015	31.8.2018
X	Euro 6b	Euro 6-1	N_1 class II	PI, CI	1.9.2015	1.9.2016	31.8.2019
Y	Euro 6b	Euro 6-1	N_1 class III, N_2	PI, CI	1.9.2015	1.9.2016	31.8.2019
ZA	Euro 6c	Euro 6-1	M, N_1 class I	PI, CI			31.8.2018
ZB	Euro 6c	Euro 6-1	N_1 class II	PI, CI			31.8.2019
ZC	Euro 6c	Euro 6-1	N_1 class III, N_2	PI, CI			31.8.2019
ZD	Euro 6c	Euro 6-2	M, N_1 class I	PI, CI	1.9.2017	1.9.2018	
ZE	Euro 6c	Euro 6-2	N_1 class II	PI, CI	1.9.2018	1.9.2019	
ZF	Euro 6c	Euro 6-2	N_1 class III, N_2	PI, CI	1.9.2018	1.9.2019	
ZX	n.a.	n.a.	All vehicles	Battery full electric	1.9.2009	1.1.2011	
ZY	n.a.	n.a.	All vehicles	Fuel cell full electric	1.9.2009	1.1.2011	
ZZ	n.a	n.a.	All vehicles using certificates according to point 2.1.1 of Annex I	PI, CI	1.9.2009	1.1.2011	

Key:

'Euro 5a' emissions standard = excludes revised measurement procedure for particulate matter, particle number standard and flex fuel vehicle low temperature emission testing with biofuel;
'Euro 5b' emissions standard = Full Euro 5 emission requirements including revised measurement procedure for particulate matter, particle number standard for CI vehicles and flex fuel vehicle low temperature emission testing with biofuel;
'Euro 6a' emissions standard = excludes revised measurement procedure for particulate matter, particle number standard and flex fuel vehicle low temperature emission testing with biofuel;
'Euro 6b' emissions standard = Euro 6 emission requirements including revised measurement procedure for particulate matter, particle number standards (preliminary values for PI vehicles) and flex fuel vehicle low temperature emission testing with biofuel;
'Euro 6c' emissions standard = Full Euro 6 emission requirements, i.e. Euro 6b emission standard and final particle number standards for PI vehicles and use of E10 and B7 reference fuel (where applicable);
'Euro 5' OBD standard = Base Euro 5 OBD requirements excluding in use performance ratio (IUPR), NO_x monitoring for petrol vehicles and tightened PM threshold limits for diesel;
'Euro 5+' OBD standard = includes relaxed in use performance ratio (IUPR), NO_x monitoring for petrol vehicles and tightened PM threshold limits for diesel;
'Euro 6-' OBD standard = relaxed OBD threshold limits;
'Euro 6- plus IUPR' OBD standard = includes relaxed OBD threshold limits and relaxed in use performance ratio (IUPR);
'Euro 6-1' OBD standard = Full Euro 6 OBD requirements but with preliminary OBD threshold limits as defined in point 2.3.4 of Annex XI and partially relaxed IUPR;
'Euro 6-2' OBD standard = Full Euro 6 OBD requirements but with final OBD threshold limits as defined in point 2.3.3 of Annex XI.'

(3) Annex III is amended as follows:

(a) point 3.4 is replaced by the following:

'3.4. The hydrocarbons ratios in paragraph 8.2 shall be understood as follows:

For petrol (E5) ($C_1H_{1,89}O_{0,016}$) d = 0,631 g/l

For petrol (E10) ($C_1H_{1,93}O_{0,033}$) d = 0,645 g/l

For diesel (B5) ($C_1H_{1,86}O_{0,005}$) d = 0,622 g/l

For diesel (B7) ($C_1H_{1,86}O_{0,007}$) d = 0,623 g/l

For LPG ($C_1H_{2,525}$) d = 0,649 g/l

For NG/biomethane (CH_4) d = 0,714 g/l

For ethanol (E85) ($C_1H_{2,74}O_{0,385}$) d = 0,932 g/l

For ethanol (E75) ($C_1H_{2,61}O_{0,329}$) d = 0,886 g/l

For H_2NG $d = \frac{9{,}104 \cdot A + 136}{1\,524{,}152 - 0{,}583A}$ g/l

A being the quantity of NG/biomethane within the H_2NG mixture, expressed in per cent volume.'

(b) in point 3.8, the table is replaced by the following:

'Fuel	X
Petrol (E5)	13,4
Petrol (E10)	13,4
Diesel (B5)	13,5
Diesel (B7)	13,5
LPG	11,9
NG/biomethane	9,5
Ethanol (E85)	12,5
Ethanol (E75)	12,7'

(4) in Appendix 1 of Annex IV, point 2.2 is replaced by the following:

'2.2. The atomic ratios specified in point 5.3.7.3 shall be understood as follows:

Hcv = Atomic ratio of hydrogen to carbon

— for petrol (E5) 1,89

— for petrol (E10) 1,93

— for LPG 2,53

— for NG/biomethane 4,0

— for ethanol (E85) 2,74

— for ethanol (E75) 2,61

Ocv = Atomic ratio of oxygen to carbon

— for petrol (E5) 0,016

— for petrol (E10) 0,033

— for LPG 0,0

— for NG/biomethane 0,0

— for ethanol (E85) 0,39

— for ethanol (E75) 0,329';

(5) Annex IX is amended as follows:

(a) Part A is amended as follows:

(i) in point 1, the following table is inserted between the table 'Type: Petrol (E5)' and the table 'Type: Ethanol (E85)':

'Type: Petrol (E10):

Parameter	Unit	Limits (1)		Test method
		Minimum	Maximum	
Research octane number, RON (3)		95,0	98,0	EN ISO 5164
Motor octane number, MON (3)		85,0	89,0	EN ISO 5163
Density at 1 5 °C	kg/m^3	743,0	756,0	EN ISO 12185
Vapour pressure (DVPE)	kPa	56,0	60,0	EN 13016-1
Water content		max 0,05 % v/v Appearance at – 7 °C: clear and bright		EN 12937
Distillation:				
— evaporated at 70 °C	% v/v	34,0	46,0	EN ISO 3405
— evaporated at 100 °C	% v/v	54,0	62,0	EN ISO 3405
— evaporated at 150 °C	% v/v	86,0	94,0	EN ISO 3405
— final boiling point	°C	170	195	EN ISO 3405
Residue	% v/v	—	2,0	EN ISO 3405
Hydrocarbon analysis:				
— olefins	% v/v	6,0	13,0	EN 22854
— aromatics	% v/v	25,0	32,0	EN 22854
— benzene	% v/v	—	1,00	EN 22854 EN 238
— saturates	% v/v	report		EN 22854

Parameter	Unit	Limits (1)		Test method
		Minimum	Maximum	
Carbon/hydrogen ratio		report		
Carbon/oxygen ratio		report		
Induction Period (4)	minutes	480	—	EN ISO 7536
Oxygen content (5)	% m/m	3,3	3,7	EN 22854
Solvent washed gum (Existent gum content)	mg/100 ml	—	4	EN ISO 6246
Sulphur content (6)	mg/kg	—	10	EN ISO 20846 EN ISO 20884
Copper corrosion 3 hrs, 50 °C		—	class 1	EN ISO 2160
Lead content	mg/l	—	5	EN 237
Phosphorus content (7)	mg/l	—	1,3	ASTM D 3231
Ethanol (5)	% v/v	9,0	10,0	EN 22854

(1) The values quoted in the specifications are "true values". In establishment of their limit values the terms of ISO 4259 Petroleum products - Determination and application of precision data in relation to methods of test have been applied and in fixing a minimum value, a minimum difference of 2R above zero has been taken into account; in fixing a maximum and minimum value, the minimum difference is 4R (R = reproducibility). Notwithstanding this measure, which is necessary for technical reasons, the manufacturer of fuels shall nevertheless aim at a zero value where the stipulated maximum value is 2R and at the mean value in the case of quotations of maximum and minimum limits. Should it be necessary to clarify whether a fuel meets the requirements of the specifications, the terms of ISO 4259 shall be applied.
(2) Equivalent EN/ISO methods will be adopted when issued for properties listed above.
(3) A correction factor of 0,2 for MON and RON shall be subtracted for the calculation of the final result in accordance with EN 228:2008.
(4) The fuel may contain oxidation inhibitors and metal deactivators normally used to stabilise refinery gasoline streams, but detergent/dispersive additives and solvent oils shall not be added.
(5) Ethanol is the only oxygenate that shall be intentionally added to the reference fuel. The Ethanol used shall conform to EN 15376.
(6) The actual sulphur content of the fuel used for the Type 1 test shall be reported.
(7) There shall be no intentional addition of compounds containing phosphorus, iron, manganese, or lead to this reference fuel.'

(ii) in point 2, the following table is added:

'Type: Diesel (B7):

Parameter	Unit	Limits (1)		Test method
		Minimum	Maximum	
Cetane Index		46,0		EN ISO 4264
Cetane number (2)		52,0	56,0	EN ISO 5165
Density at 15 °C	kg/m^3	833,0	837,0	EN ISO 12185
Distillation:				
— 50 % point	°C	245,0	—	EN ISO 3405
— 95 % point	°C	345,0	360,0	EN ISO 3405
— final boiling point	°C	—	370,0	EN ISO 3405

Parameter	Unit	Limits (1)		Test method
		Minimum	Maximum	
Flash point	°C	55	—	EN ISO 2719
Cloud point	°C	—	– 10	EN 23015
Viscosity at 40 °C	mm^2/s	2,30	3,30	EN ISO 3104
Polycyclic aromatic hydrocarbons	% m/m	2,0	4,0	EN 12916
Sulphur content	mg/kg	—	10,0	EN ISO 20846 EN ISO 20884
Copper corrosion 3 hrs, 50 °C		—	Class 1	EN ISO 2160
Conradson carbon residue (10 % DR)	% m/m	—	0,20	EN ISO 10370
Ash content	% m/m	—	0,010	EN ISO 6245
Total contamination	mg/kg	—	24	EN 12662
Water content	mg/kg	—	200	EN ISO 12937
Acid number	mg KOH/g	—	0,10	EN ISO 6618
Lubricity (HFRR wear scan diameter at 60 °C)	µm	—	400	EN ISO 12156
Oxidation stability at 110 °C (3)	h	20,0		EN 15751
FAME (4)	% v/v	6,0	7,0	EN 14078

(1) The values quoted in the specifications are "true values". In establishment of their limit values the terms of ISO 4259 Petroleum products – Determination and application of precision data in relation to methods of test have been applied and in fixing a minimum value, a minimum difference of 2R above zero has been taken into account; in fixing a maximum and minimum value, the minimum difference is 4R (R = reproducibility). Notwithstanding this measure, which is necessary for technical reasons, the manufacturer of fuels shall nevertheless aim at a zero value where the stipulated maximum value is 2R and at the mean value in the case of quotations of maximum and minimum limits. Should it be necessary to clarify whether a fuel meets the requirements of the specifications, the terms of ISO 4259 shall be applied.

(2) The range for cetane number is not in accordance with the requirements of a minimum range of 4R. However, in the case of a dispute between fuel supplier and fuel user, the terms of ISO 4259 may be used to resolve such disputes provided replicate measurements, of sufficient number to archive the necessary precision, are made in preference to single determinations.

(3) Even though oxidation stability is controlled, it is likely that shelf life will be limited. Advice shall be sought from the supplier as to storage conditions and life.

(4) FAME content to meet the specification of EN 14214.'

(b) in Part B, the following table is inserted between the table 'Type: Petrol (E5)' and the table 'Type: Ethanol (E75)':

'Type: Petrol (E10):

Parameter	Unit	Limits (1)		Test method
		Minimum	Maximum	
Research octane number, RON (3)		95,0	98,0	EN ISO 5164
Motor octane number, MON (3)		85,0	89,0	EN ISO 5163
Density at 15 °C	kg/m^3	743,0	756,0	EN ISO 12185
Vapour pressure (DVPE)	kPa	56,0	95,0	EN 13016-1
Water content		max 0,05 % v/v Appearance at – 7 °C: clear and bright		EN 12937

Parameter	Unit	Limits (1)		Test method
		Minimum	Maximum	
Distillation:				
— evaporated at 70 °C	% v/v	34,0	46,0	EN ISO 3405
— evaporated at 100 °C	% v/v	54,0	62,0	EN ISO 3405
— evaporated at 150 °C	% v/v	86,0	94,0	EN ISO 3405
— final boiling point	°C	170	195	EN ISO 3405
Residue	% v/v	—	2,0	EN ISO 3405
Hydrocarbon analysis:				
— olefins	% v/v	6,0	13,0	EN 22854
— aromatics	% v/v	25,0	32,0	EN 22854
— benzene	% v/v	—	1,00	EN 22854 EN 238
— saturates	% v/v	report		EN 22854
Carbon/hydrogen ratio		report		
Carbon/oxygen ratio		report		
Induction Period (4)	minutes	480	—	EN ISO 7536
Oxygen content (5)	% m/m	3,3	3,7	EN 22854
Solvent washed gum (Existent gum content)	mg/100 ml	—	4	EN ISO 6246
Sulphur content (6)	mg/kg	—	10	EN ISO 20846 EN ISO 20884
Copper corrosion 3 hrs, 50 °C		—	class 1	EN ISO 2160
Lead content	mg/l	—	5	EN 237
Phosphorus content (7)	mg/l	—	1,3	ASTM D 3231
Ethanol (5)	% v/v	9,0	10,0	EN 22854

(1) The values quoted in the specifications are "true values". In establishment of their limit values the terms of ISO 4259 Petroleum products - Determination and application of precision data in relation to methods of test have been applied and in fixing a minimum value, a minimum difference of 2R above zero has been taken into account; in fixing a maximum and minimum value, the minimum difference is 4R (R = reproducibility). Notwithstanding this measure, which is necessary for technical reasons, the manufacturer of fuels shall nevertheless aim at a zero value where the stipulated maximum value is 2R and at the mean value in the case of quotations of maximum and minimum limits. Should it be necessary to clarify whether a fuel meets the requirements of the specifications, the terms of ISO 4259 shall be applied.
(2) Equivalent EN/ISO methods will be adopted when issued for properties listed above.
(3) A correction factor of 0,2 for MON and RON shall be subtracted for the calculation of the final result in accordance with EN 228:2008.
(4) The fuel may contain oxidation inhibitors and metal deactivators normally used to stabilise refinery gasoline streams, but detergent/dispersive additives and solvent oils shall not be added.
(5) Ethanol is the only oxygenate that shall be intentionally added to the reference fuel. The ethanol used shall conform to EN 15376.
(6) The actual sulphur content of the fuel used for the Type 6 test shall be reported.
(7) There shall be no intentional addition of compounds containing phosphorus, iron, manganese, or lead to this reference fuel.'

(6) Annex XI is amended as follows:

(a) in point 2.3.3., the table 'Final Euro 6 OBD threshold limits' is replaced by the following table:

'**Final Euro 6 OBD threshold limits**

		Reference mass (RM) (kg)	Mass of carbon monoxide		Mass of non-methane hydrocarbons		Mass of oxides of nitrogen		Mass of particulate matter (1)		Number of particles (1)	
			(CO) (mg/km)		(NMHC) (mg/km)		(NO_x) (mg/km)		(PM) (mg/km)		(PN) (#/km)	
Category	Class		PI	CI	PI	CI	PI	CI	CI	PI	CI	PI
M	—	All	1 900	1 750	170	290	90	140	12	12		
N_1	I	RM ≤ 1 305	1 900	1 750	170	290	90	140	12	12		
	II	1 305 < RM ≤ 1 760	3 400	2 200	225	320	110	180	12	12		
	III	1 760 < RM	4 300	2 500	270	350	120	220	12	12		
N_2	—	All	4 300	2 500	270	350	120	220	12	12		

Key: PI = Positive Ignition, CI = Compression Ignition.
(1) Positive ignition particulate mass and number limits apply only to vehicles with direct injection engines.'

(b) in point 2.3.4., the table 'Preliminary Euro 6 OBD threshold limits' is replaced by the following table:

'**Preliminary Euro 6 OBD threshold limits**

		Reference mass (RM) (kg)	Mass of carbon monoxide		Mass of non-methane hydrocarbons		Mass of oxides of nitrogen		Mass of particulate matter (1)	
			(CO) (mg/km)		(NMHC) (mg/km)		(NOx) (mg/km)		(PM) (mg/km)	
Category	Class		PI	CI	PI	CI	PI	CI	CI	PI
M	—	All	1 900	1 750	170	290	150	180	25	25
N_1	I	RM ≤ 1 305	1 900	1 750	170	290	150	180	25	25
	II	1 305 < RM ≤ 1 760	3 400	2 200	225	320	190	220	25	25
	III	1 760 < RM	4 300	2 500	270	350	210	280	30	30
N_2	—	All	4 300	2 500	270	350	210	280	30	30

Key: PI = Positive Ignition, CI = Compression Ignition
(1) Positive ignition particulate mass limits apply only to vehicles with direct injection engines.'

(c) point 2.5 is replaced by the following:

'2.5. Section 3.3.3.1 of Annex 11 to UNECE Regulation No 83 shall be understood as:

The OBD system shall monitor the reduction in the efficiency of the catalytic converter with respect to emissions of NMHC and NOx. Manufacturers may monitor the front catalyst alone or in combination with the next catalyst(s) downstream. Each monitored catalyst or catalyst combination shall be considered malfunctioning when the emissions exceed the NMHC or NOx threshold limits provided for in Section 2.3 of this Annex. By way of derogation, the requirement of monitoring the reduction in the efficiency of the catalytic converter with respect to NOx emissions shall only apply as from the dates set out in Article 17.';

(7) Annex XII is amended as follows:

(a) point 2.2.2 is replaced by the following:

'2.2.2. For LPG and NG, the fuel to be used must be the one chosen by the manufacturer for the measurement of the net power in accordance with Annex XX to this Regulation. The chosen fuel shall be specified in the information document set out in Appendix 3 of Annex I to this Regulation.';

(b) point 2.3 is replaced by the following:

'2.3. Point 5.2.4 of UNECE Regulation No 101 shall be understood as:

(1) density: measured on the test fuel according to ISO 3675 or an equivalent method. For petrol, diesel, biodiesel and ethanol (E85 end E75), the density measured at 15 °C will be used; for LPG and natural gas/biomethane a reference density shall be used, as follows:

0,538 kg/litre for LPG,

0,654 kg/m^3 for NG (mean value of G20 and G23 reference fuels at 15 °C.)

(2) hydrogen-carbon-oxygen ratio: the following fixed values shall be used:

$C_1H_{1,89}O_{0,016}$ for petrol (E5),

$C_1H_{1,93}O_{0,033}$ for petrol (E10),

$C_1H_{1,86}O_{0,005}$ for diesel (B5),

$C_1H_{1,86}O_{0,007}$ for diesel (B7),

$C_1H_{2,525}$ for LPG (liquefied petroleum gas),

CH_4 for NG (natural gas) and biomethane,

$C_1H_{2,74}O_{0,385}$ for ethanol (E85),

$C_1H_{2,61}O_{0,329}$ for ethanol (E75).';

(c) point 3.3 is replaced by the following:

'3.3. In Annex 6 of UN/ECE Regulation 101, section 1.4.3 shall be replaced by the following:

1.4.3. The fuel consumption, expressed in litres per 100 km (in the case of petrol (E5/E10), LPG, ethanol (E85) and diesel (B5/B7)), in m^3 per 100 km (in the case of NG/biomethane and H_2NG) or in kg per 100 km (in the case of hydrogen) is calculated by means of the following formulae:

(a) for vehicles with a positive ignition engine fuelled with petrol (E5):

$$FC = (0{,}118/D) \cdot [(0{,}848 \cdot HC) + (0{,}429 \cdot CO) + (0{,}273 \cdot CO_2)]$$

(b) for vehicles with a positive ignition engine fuelled with petrol (E10):

$$FC = (0{,}120/D) \cdot [(0{,}830 \cdot HC) + (0{,}429 \cdot CO) + (0{,}273 \cdot CO_2)]$$

(c) for vehicles with a positive ignition engine fuelled with LPG:

$$FC_{norm} = (0{,}1212/0{,}538) \cdot [(0{,}825 \cdot HC) + (0{,}429 \cdot CO) + (0{,}273 \cdot CO_2)]$$

If the composition of the fuel used for the test differs from the composition that is assumed for the calculation of the normalised consumption, on the manufacturer's request a correction factor cf may be applied, as follows:

$$FC_{norm} = (0{,}1212/0{,}538) \cdot (cf) \cdot [(0{,}825 \cdot HC) + (0{,}429 \cdot CO) + (0{,}273 \cdot CO_2)]$$

The correction factor cf, which may be applied, is determined as follows:

$$cf = 0{,}825 + 0{,}0693\ n_{actual}$$

where:

n_{actual} = the actual H/C ratio of the fuel used

(d) for vehicles with a positive ignition engine fuelled with NG/biomethane:

$$FC_{norm} = (0{,}1336/0{,}654) \cdot [(0{,}749 \cdot HC) + (0{,}429 \cdot CO) + (0{,}273 \cdot CO_2)]$$

(e) for vehicles with a positive ignition engine fuelled with ethanol (E85):

$$FC = (0{,}1742/D) \cdot [(0{,}574 \cdot HC) + (0{,}429 \cdot CO) + (0{,}273 \cdot CO_2)]$$

(f) for vehicles with a compression ignition engine fuelled with diesel (B5):

$$FC = (0{,}116/D) \cdot [(0{,}861 \cdot HC) + (0{,}429 \cdot CO) + (0{,}273 \cdot CO_2)]$$

(g) for vehicles with a compression ignition engine fuelled with diesel (B7):

$$FC = (0{,}116/D) \cdot [(0{,}859 \cdot HC) + (0{,}429 \cdot CO) + (0{,}273 \cdot CO_2)]$$

(h) for vehicles with a positive ignition engine fuelled by H_2NG:

$$FC = \frac{910{,}4 \cdot A + 13\,600}{44{,}655 \cdot A^2 + 667{,}08 \cdot A}\left(\frac{7{,}848 \cdot A}{9{,}104 \cdot A + 136} \cdot HC + 0{,}429 \cdot CO + 0{,}273 \cdot CO_2\right)$$

(i) for vehicles fuelled by gaseous hydrogen:

$$FC = 0{,}024 \cdot \frac{V}{d} \cdot \left[\frac{1}{Z_2} \cdot \frac{p_2}{T_2} - \frac{1}{Z_1} \cdot \frac{p_1}{T_1}\right]$$

Under previous agreement with the type-approval authority, and for vehicles fuelled either by gaseous or liquid hydrogen, the manufacturer may choose as alternative to the method above, either the formula

$$FC = 0{,}1 \cdot (0{,}1119 \cdot H_2O + H_2)$$

or a method according to standard protocols such as SAE J2572.

In these formulae:

FC = the fuel consumption in litre per 100 km (in the case of petrol, ethanol, LPG, diesel or biodiesel) in m^3 per 100 km (in the case of natural gas and H_2NG) or in kg per 100 km in the case of hydrogen.

HC = the measured emission of hydrocarbons in g/km

CO = the measured emission of carbon monoxide in g/km

CO_2 = the measured emission of carbon dioxide in g/km

H_2O = the measured emission of H_2O in g/km

H_2 = the measured emission of H_2 in g/km

A = quantity of NG/biomethane within the H_2NG mixture, expressed in per cent volume

D = the density of the test fuel.

In the case of gaseous fuels D is the density at 15 °C.

d = the theoretical distance covered by a vehicle tested under the type 1 test in km.

p_1 = pressure in gaseous fuel tank before the operating cycle in Pa;

p_2 = pressure in gaseous fuel tank after the operating cycle in Pa;

T_1 = temperature in gaseous fuel tank before the operating cycle in K.

T_2 = temperature in gaseous fuel tank after the operating cycle in K.

Z_1 = compressibility factor of the gaseous fuel at p_1 and T_1

Z_2 = compressibility factor of the gaseous fuel at p_2 and T_2

V = inner volume of the gaseous fuel tank in m 3

The compressibility factor shall be obtained from the following table:

T(k) p(bar)\	33	53	73	93	113	133	153	173	193	213	233	248	263	278	293	308	323	338	353
5	0,8589	0,9651	0,9888	0,9970	1,0004	1,0019	1,0026	1,0029	1,0030	1,0028	1,0035	1,0034	1,0033	1,0032	1,0031	1,0030	1,0029	1,0028	1,0027
100	1,0508	0,9221	0,9911	1,0422	1,0659	1,0757	1,0788	1,0785	1,0765	1,0705	1,0712	1,0687	1,0663	1,0640	1,0617	1,0595	1,0574	1,0554	1,0535
200	1,8854	1,4158	1,2779	1,2334	1,2131	1,1990	1,1868	1,1757	1,1653	1,1468	1,1475	1,1413	1,1355	1,1300	1,1249	1,1201	1,1156	1,1113	1,1073
300	2,6477	1,8906	1,6038	1,4696	1,3951	1,3471	1,3123	1,2851	1,2628	1,2276	1,2282	1,2173	1,2073	1,1982	1,1897	1,1819	1,1747	1,1680	1,1617
400	3,3652	2,3384	1,9225	1,7107	1,5860	1,5039	1,4453	1,4006	1,3651	1,3111	1,3118	1,2956	1,2811	1,2679	1,2558	1,2448	1,2347	1,2253	1,2166
500	4,0509	2,7646	2,2292	1,9472	1,7764	1,6623	1,5804	1,5183	1,4693	1,3962	1,3968	1,3752	1,3559	1,3385	1,3227	1,3083	1,2952	1,2830	1,2718
600	4,7119	3,1739	2,5247	2,1771	1,9633	1,8190	1,7150	1,6361	1,5739	1,4817	1,4823	1,4552	1,4311	1,4094	1,3899	1,3721	1,3559	1,3410	1,3272
700	5,3519	3,5697	2,8104	2,4003	2,1458	1,9730	1,8479	1,7528	1,6779	1,5669	1,5675	1,5350	1,5062	1,4803	1,4570	1,4358	1,4165	1,3988	1,3826
800	5,9730	3,9541	3,0877	2,6172	2,3239	2,1238	1,9785	1,8679	1,7807	1,6515	1,6521	1,6143	1,5808	1,5508	1,5237	1,4992	1,4769	1,4565	1,4377
900	6,5759	4,3287	3,3577	2,8286	2,4978	2,2714	2,1067	1,9811	1,8820	1,7352	1,7358	1,6929	1,6548	1,6207	1,5900	1,5623	1,5370	1,5138	1,4926

In the case that the needed input values for *p* and *T* are not indicated in the table, the compressibility factor shall be obtained by linear interpolation between the compressibility factors indicated in the table, choosing the ones that are the closest to the sought value.'

ANNEX III

'ANNEX XX

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

1. INTRODUCTION

This Annex sets out requirements for measuring net engine power, net power and the maximum 30 minutes power of electric drive train.

2. GENERAL SPECIFICATIONS

2.1 The general specifications for conducting the tests and interpreting the results are those set out in paragraph 5 of UNECE Regulation No 85 ([1]), with the exceptions specified in this Annex.

2.2 **Test fuel**

Paragraphs 5.2.3.1., 5.2.3.2.1., 5.2.3.3.1., and 5.2.3.4. of UNECE Regulation No 85 shall be understood as follows:

The fuel used shall be the one available on the market. In any case of dispute, the fuel shall be the appropriate reference fuel specified in Annex IX to the Regulation (EC) No 692/2008.

2.3 **Power correction factors**

By way of derogation from paragraph 5.1 of Annex V to UNECE Regulation No 85, when a turbo-charged engine is fitted with a system which allows compensating the ambient conditions temperature and altitude, at the request of the manufacturer, the correction factors α_a or α_d shall be set to the value of 1.

([1]) OJ L 326, 24.11.2006, p. 55.'

ANNEX IV

Amendments to Regulation (EU) No 582/2011

Regulation (EU) No 582/2011 is amended as follows:

(1) Annex VIII is amended as follows:

(a) In Appendix 1, point 2.1.2.(2) is replaced by the following:

'(2) hydrogen-carbon-oxygen ratio: fixed values shall be used which are:

$C_1H_{1,93}O_{0,033}$ for petrol (E10),

$C_1H_{1,86}O_{0,007}$ for diesel (B7),

$C_1H_{2,525}$ for LPG (liquefied petroleum gas),

CH_4 for NG (natural gas) and biomethane,

$C_1H_{2,74}O_{0,385}$ for ethanol (E85),

$C_1H_{2,92}O_{0,046}$ for ethanol for dedicated C.I. engines (ED95).'

(b) In Appendix 1, point 2.1.3.(a) is replaced by the following:

'(a) for vehicles with a positive ignition engine fuelled with petrol (E10):

$$FC = (0{,}120/D) \cdot [(0{,}830 \cdot HC) + (0{,}429 \cdot CO) + (0{,}273 \cdot CO_2)]'$$

(c) In Appendix 1, point 2.1.3.(e) is replaced by the following:

'(e) for vehicles with a compression-ignition engine fuelled with diesel (B7):

$$FC = (0{,}116/D) \cdot [(0{,}859 \cdot HC) + (0{,}429 \cdot CO) + (0{,}273 \cdot CO_2)]'$$

(2) Annex IX is amended as follows:

(a) In the section 'Technical data on fuels for testing compression-ignition engines', the table with the title 'Type Diesel (B7)' is replaced by the following table:

'Type: Diesel (B7)

Parameter	Unit	Limits (1)		Test method
		Minimum	Maximum	
Cetane Index		46,0		EN ISO 4264
Cetane number (2)		52,0	56,0	EN ISO 5165
Density at 15 °C	kg/m^3	833,0	837,0	EN ISO 12185
Distillation: — 50 % point	°C	245,0	—	EN ISO 3405
— 95 % point	°C	345,0	360,0	EN ISO 3405
— final boiling point	°C	—	370,0	EN ISO 3405
Flash point	°C	55	—	EN ISO 2719
Cloud point	°C	—	– 10	EN 23015

Parameter	Unit	Limits (1)		Test method
		Minimum	Maximum	
Viscosity at 40 °C	mm^2/s	2,30	3,30	EN ISO 3104
Polycyclic aromatic hydrocarbons	% m/m	2,0	4,0	EN 12916
Sulphur content	mg/kg	—	10,0	EN ISO 20846 EN ISO 20884
Copper corrosion 3hrs, 50 °C		—	Class 1	EN ISO 2160
Conradson carbon residue (10 % DR)	% m/m	—	0,20	EN ISO 10370
Ash content	% m/m	—	0,010	EN ISO 6245
Total contamination	mg/kg	—	24	EN 12662
Water content	mg/kg	—	200	EN ISO 12937
Acid number	mg KOH/g	—	0,10	EN ISO 6618
Lubricity (HFRR wear scan diameter at 60 °C)	µm	—	400	EN ISO 12156
Oxidation stability at 110 °C (3)	h	20,0		EN 15751
FAME (4)	% v/v	6,0	7,0	EN 14078

(1) The values quoted in the specifications are "true values". In establishment of their limit values the terms of ISO 4259 Petroleum products – Determination and application of precision data in relation to methods of test have been applied and in fixing a minimum value, a minimum difference of 2R above zero has been taken into account; in fixing a maximum and minimum value, the minimum difference is 4R (R = reproducibility). Notwithstanding this measure, which is necessary for technical reasons, the manufacturer of fuels shall nevertheless aim at a zero value where the stipulated maximum value is 2R and at the mean value in the case of quotations of maximum and minimum limits. Should it be necessary to clarify whether a fuel meets the requirements of the specifications, the terms of ISO 4259 shall be applied.

(2) The range for cetane number is not in accordance with the requirements of a minimum range of 4R. However, in the case of a dispute between fuel supplier and fuel user, the terms of ISO 4259 may be used to resolve such disputes provided replicate measurements, of sufficient number to archive the necessary precision, are made in preference to single determinations.

(3) Even though oxidation stability is controlled, it is likely that shelf life will be limited. Advice shall be sought from the supplier as to storage conditions and life.

(4) FAME content to meet the specification of EN 14214.'

(b) In the section 'Technical data on fuels for testing positive-ignition engines', the table with the title 'Type Petrol (E10)' is replaced by the following:

'Type: Petrol (E10)

Parameter	Unit	Limits (1)		Test method
		Minimum	Maximum	
Research octane number, RON (3)		95,0	98,0	EN ISO 5164
Motor octane number, MON (3)		85,0	89,0	EN ISO 5163
Density at 15 °C	kg/m^3	743,0	756,0	EN ISO 12185
Vapour pressure (DVPE)	kPa	56,0	60,0	EN 13016-1

Parameter	Unit	Limits (1)		Test method
		Minimum	Maximum	
Water content		max 0,05 % v/v Appearance at – 7 °C: clear and bright		EN 12937
Distillation: — evaporated at 70 °C	% v/v	34,0	46,0	EN ISO 3405
— evaporated at 100 °C	% v/v	54,0	62,0	EN ISO 3405
— evaporated at 150 °C	% v/v	86,0	94,0	EN ISO 3405
— final boiling point	°C	170	195	EN ISO 3405
Residue	% v/v	—	2,0	EN ISO 3405
Hydrocarbon analysis: — olefins	% v/v	6,0	13,0	EN 22854
— aromatics	% v/v	25,0	32,0	EN 22854
— benzene	% v/v	—	1,00	EN 22854 EN 238
— saturates	% v/v	report		EN 22854
Carbon/hydrogen ratio		report		
Carbon/oxygen ratio		report		
Induction Period (4)	minutes	480	—	EN ISO 7536
Oxygen content (5)	% m/m	3,3	3,7	EN 22854
Solvent washed gum (Existent gum content)	mg/100 ml	—	4	EN ISO 6246
Sulphur content (6)	mg/kg	—	10	EN ISO 20846 EN ISO 20884
Copper corrosion 3hrs, 50 °C		—	class 1	EN ISO 2160
Lead content	mg/l	—	5	EN 237

Parameter	Unit	Limits (1)		Test method
		Minimum	Maximum	
Phosphorus content (7)	mg/l	—	1,3	ASTM D 3231
Ethanol (5)	% v/v	9,0	10,0	EN 22854

(1) The values quoted in the specifications are "true values". In establishment of their limit values the terms of ISO 4259 Petroleum products - Determination and application of precision data in relation to methods of test have been applied and in fixing a minimum value, a minimum difference of 2R above zero has been taken into account; in fixing a maximum and minimum value, the minimum difference is 4R (R = reproducibility). Notwithstanding this measure, which is necessary for technical reasons, the manufacturer of fuels shall nevertheless aim at a zero value where the stipulated maximum value is 2R and at the mean value in the case of quotations of maximum and minimum limits. Should it be necessary to clarify whether a fuel meets the requirements of the specifications, the terms of ISO 4259 shall be applied.

(2) Equivalent EN/ISO methods will be adopted when issued for properties listed above.

(3) A correction factor of 0,2 for MON and RON shall be subtracted for the calculation of the final result in accordance with EN 228:2008.

(4) The fuel may contain oxidation inhibitors and metal deactivators normally used to stabilise refinery gasoline streams, but detergent/dispersive additives and solvent oils shall not be added.

(5) Ethanol is the only oxygenate that shall be intentionally added to the reference fuel. The ethanol used shall conform to EN 15376.

(6) The actual sulphur content of the fuel used for the Type 6 test shall be reported.

(7) There shall be no intentional addition of compounds containing phosphorus, iron, manganese, or lead to this reference fuel.'