Decree on: '*Biofuel conversion systems intended to be installed on vehicles already type-approved with a compression-ignition engine to enable the use of these biofuels in the propulsion system, pursuant to Article 75(3)(a) of Legislative Decree No 285 of 30 April 1992*".

The Minister for Infrastructure and Transport

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;

HAVING REGARD TO Commission Regulation (EU) No 582/2011 of 25 May 2011 implementing and amending Regulation (EC) No 595/2009 of the European Parliament and of the Council with respect to emissions from heavy duty vehicles (Euro VI) and amending Annexes I and III to Directive 2007/46/EC of the European Parliament and of the Council;

HAVING REGARD TO Regulation (EU) 2018/858 of the European Parliament and of the Council of 30 May 2018 on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles, amending Regulations (EC) No 715/2007 and (EC) No 595/2009 and repealing Directive 2007/46/EC;

HAVING REGARD TO Regulation (EU) No 2019/2144 of the European Parliament and of the Council of 27 November 2019 on type-approval requirements for motor vehicles and their trailers, and systems, components and separate technical units intended for such vehicles, as regards their general safety and the protection of vehicle occupants and vulnerable road users, amending Regulation (EU) 2018/858 of the European Parliament and of the Council and repealing Regulations (EC) No 78/2009, (EC) No 79/2009 and (EC) No 661/2009 of the European Parliament and of the Council and Commission Regulations (EC) No 631/2009, (EU) No 406/2010, (EU) No 672/2010, (EU) No 1003/2010, (EU) No 1005/2010, (EU) No 1008/2010, (EU) No 1009/2010, (EU) No 19/2011, (EU) No 109/2011, (EU) No 458/2011, (EU) No 65/2012, (EU) No 130/2012, (EU) No 347/2012, (EU) No 351/2012, (EU) No 1230/2012 and (EU) No 2015/166;

HAVING REGARD TO Commission Implementing Regulation (EU) 2021/535 of 31 March 2021 laying down rules for the application of Regulation (EU) No 2019/2144 of the European Parliament and of the Council as regards uniform procedures and technical specifications for the type-approval of vehicles, and of systems, components and separate technical units intended for such vehicles, as regards their general construction characteristics and safety;

HAVING REGARD TO Commission Regulation (EU) 2022/2383 of 6 December 2022 amending Regulation (EU) No 2011/582 as regards the emissions type-approval of heavy duty vehicles using pure biodiesel;

HAVING REGARD TORegulation (EU) 2024/1257 of the European Parliament and of the Council of 24 April 2024 on type-approval of motor vehicles and engines and of systems, components and separate technical units intended for such vehicles, with respect to their emissions and battery durability (Euro 7), amending Regulation (EU) 2018/858 of the European Parliament and of the Council, and repealing Regulations (EC) No 715/2007 and (EC) No 595/2009 of the European Parliament and of the Council, Commission Regulation (EU) No 582/2011, Commission Regulation (EU) 2017/1151, Commission Regulation (EU) 2017/2400 and Commission Implementing Regulation (EU) 2022/1362;

HAVING REGARD TO Article 17(3) of Law No 400 of 23 August 1988; 'Discipline of Government activity and Order of the Presidency of the Council of Ministers';

HAVING REGARD TO Law No 64 of 5 February 1992 on 'Provisions on road traffic safety and the regulation of self-repair activities';

HAVING REGARD TO Legislative Decree No 285 of 30 April 1992 on 'New Highway Code', and in particular Articles 71, 75(3a) and 78(1) thereof,

HAVING REGARD TO Presidential Decree No 495 of 16 December 1992 laying down the 'Regulation for the execution and implementation of the new Highway Code', and in particular Article 236(2), which identifies the components of the vehicle the modification of which is subject to the issue of a specific authorisation by the manufacturer;

HAVING REGARD TO Decree No 277 of the Minister for Transport and Navigation of 2 May 2001 laying down: 'Provisions concerning the type-approval procedures for motor vehicles, trailers, agricultural machinery, operating machinery and their systems, components and separate technical units', published in the Official Gazette of the Italian Republic No 160 of 12 July 2001;

Having regard to UN Regulation (UNECE) No 155 laying down: 'Uniform provisions concerning the type-approval of vehicles with regard to computer security and IT security management system;

HAVING REGARD TO Legislative Decree No 128 of 30 May 2005 (as amended by Legislative Decree No 55 of 31 March 2011), on: 'Implementation of Directive 2003/30/EC on the promotion of the use of biofuels or other renewable fuels for transport', and in particular the provision of Article 2(2) thereof (Annex I) as regards the extension of the category 'biofuels';

HAVING REGARD TO Legislative Decree No 199 of 8 November 2021 laying down: 'Implementation of Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources', as amended by Decree-Law No 17 of 1 March 2022, converted, with amendments, by Law No 34 of 27 April 2022.

HAVING REGARD TO Decree No 107 of the Ministry of the Environment and Energy Security of 16 March 2023 laying down: 'Conditions, criteria and modalities for the implementation of the obligation to use energy from renewable sources in transport between different types of biofuels, including advanced

biofuels, renewable energy carriers of biological origin, RFNBO and RCF'.

HAVING REGARD TO the Decree of the Head of the Department of Transport, Shipping and Information and Statistical Systems of 21 April 2009 and its subsequent amendments, on: 'Verification procedures of the conformity control system of the production process and of the conformity of the product with the type approved for vehicles, systems, components and technical units', published in Official Gazette No. 107 of 11 May 2009;

HAVING CONSIDERED the need to establish the procedures for the national approval of electric conversion systems for vehicles powered by compression ignition engines to run on biofuels, pursuant to the aforementioned Article 75(3a) of Legislative Decree No 285 of 30 April 1992;

HAVING COMPLETED the procedure for the provision of information on technical standards and regulations laid down in Law No 317 of 21 June 1986;

Hereby decrees:

Article 1
(Scope of application)

1. This Decree lays down the procedures for the approval and installation of conversion systems on compression-ignition motor vehicles to allow the use of biofuels in the original propulsion system.
2. These processing systems may be installed, pursuant to this Decree, on vehicles–registered in Italy pursuant to Article 93 of Legislative Decree No No 285 of 30 April 1992, belonging to categories M and N referred to in Article 47 ofLegislative Decree No 285 of 30 April 1992.
3. It must be possible for vehicles equipped with these systems to be fuelled either with the original fuel or, as a result of the system, with pure biofuels or in any blending proportion between them and the original fuel, in accordance with the indications provided by the system manufacturer.
4. The system manufacturer shall always ensure that any change in engine operating parameters which may affect the basic performance of the engine shall be kept within the limits specified by the engine manufacturer.
5. The conversion system shall be assessed only in relation to the emissions of pollutants and CO_2, while the safety of the system and its durability shall be the responsibility of the system manufacturer only.

Article 2
(Definitions)

1. The following definitions and their explanations are used in this decree:

a) '*field of use*': the families of vehicles on which the systems referred to in Article 1 may be installed in accordance with the requirements laid down in Article 10;
b) '*approval authority*": Division 3 of the Directorate-General for Motor Vehicles;
c) "*technical service*': the Higher Research Centre, Testing of Motor Vehicles and Equipment, a Vehicle Test Centre and Division 3 of the Directorate-General for Motor Vehicles;
d) '*system manufacturer/manufacturer*' means the natural or legal person who, before the approval authority, is responsible for all aspects of the type-approval or authorisation process, for ensuring conformity of production and is, in addition, responsible for market surveillance issues for the

processing systems produced, regardless of whether the natural or legal person is directly involved in all stages of the design and manufacture of the system subject to the type-approval procedure;

e) '*manufacturer's representative*': the natural or legal person established in Italy who, duly appointed by the manufacturer, represents them before the approval authority and acts on their behalf in the matters covered by this Decree;

f) '*importer*': a natural or legal person established in Italy who places on the market a conversion system built in a third country;

g) '*installer*': a company carrying out vehicle repair activities, within the meaning of Article 1 of Law No 122 of 5 February 1992, which may assume technical responsibility for the correct and safe installation of a type-approved conversion system and which is authorised by the manufacturer to carry out the conversion;

h) '*biofuel conversion system*' means a set of electronic and/or mechanical components or other components necessary for the conversion to enable the biofuel supply of a vehicle powered by a compression-ignition engine. The components shall comply with the specific type-approval rules, where applicable. Systems that do not differ from each other with respect to the following characteristics can be considered to belong to the same type:
   i. the manufacturer of a retrofit system;
   ii. the methodology for testing pollution emissions, as defined in the Union Directive or Regulation on emissions from vehicles for which the conversion system is intended;
   iii. the fuel used in the vehicle for which the conversion system is intended;
   iv. fuel storage modes (mono-fuel, bi-fuel, flex-fuel, bi-fuel with dedicated flex-fuel tank);
   v. risk assessment, in accordance with UN Regulation (UNECE) No 155, in the case of biofuel conversion systems to be used on vehicles approved under that Regulation;
   vi. the type of SCU of the same manufacturer;
   vii. the types of sensors and actuators envisaged by the manufacturer of the retrofit system;
   viii. the basic software principles and control strategy;

i) "*compression-ignition engine*" means an engine in which the ignition of the fuel takes place by injection into the combustion chamber at a high temperature of pulverised fuel, which self-ignites by compression;

j) '*original fuel*' means a fuel obtained from the distillation of oil or other processes and intended for the propulsion of compression-ignition engines, which is used by a vehicle in its original state of approval before the installation of the system;

k) '*biofuel*' means transport fuel produced from biomass;

l) "*mixture*": product obtained by mixing multiple fuels in varying percentages;

m) 'mono-fuel*vehicle*' means a vehicle that is designed to run primarily on a single fuel type;

n) '*bi-fuel vehicle*' means a vehicle, equipped with two separate fuel storage systems, designed to use primarily, for most of the time, one fuel at a time;

o) '*flex-fuel vehicle*' means a vehicle, equipped with a single fuel storage system, which may run on different mixtures of two or more fuels;

p) '*bi-fuel vehicle with dedicated flex-fuel tank*' means a vehicle equipped with two separate fuel storage systems and designed to run on only one fuel at a time. One of the two tanks is intended to contain original fuel; the other tank is intended to contain different mixtures of two or more fuels and operates in the same way as provided for in letter (o) for flex-fuel systems. The simultaneous use of

both fuels is limited in quantity and duration;

q) '*vehicle family*': a set of vehicles having the characteristics set out in Annex 1 to this Decree on which the system can be installed;
r) '*parent vehicle*' means a vehicle chosen as the vehicle on which the tests intended to verify compliance with the requirements of this Decree are to be carried out and to which the members of a family refer;
s) '*standard ambient conditions*' means the conditions at a temperature of 298,15 K (25 °C) and a pressure of 100 kPa (1 bar);
t) "*original vehicle*": vehicle in its state of approval prior to the installation of the system;
u) '*original tank*' means the tank of the vehicle in its type approval status prior to the installation of the system;
v) "*replacement tank*": a tank approved for the vehicle's original fuel and with minimum capacity to ensure correct operation, installed in place of the original tank when the system manufacturer deems it to be a necessary component for the conversion as per letter (h) of this Article.
w) '*mixture recognition device*': a system for recognising the composition of the mixture of original fuel and biofuel that is fuelling the engine;
x) *'statutory plate' means* a plate or label, prepared by the manufacturer of the conversion system and affixed by the installer, indicating the main technical characteristics necessary for the identification of the conversion system, as shown in Annex 8. On the statutory plate, the manufacturer may provide for the presence of a two-dimensional barcode (QR code) containing the information referred to in Article 4(6)(g) (installation manual) and Article 4(6)(h) (end user manual);
y) '*certificate of conformity*' means the document issued by the manufacturer attesting that the conversion system produced conforms to the type of conversion system approved and drawn up in accordance with the model set out in Annex 5;
z) '*original emission-related component*': any component of the intake system, engine and exhaust system that sends an input or receives an output from the original fuel control device;
aa) '*emission-related biofuel conversion system component*': any electronic component of the intake system or exhaust system that sends an input to or receives an output from the biofuel and/or mixture control device;
bb) *"ECU"*: any control unit(s) responsible for the electronic control of the original vehicle;
cc) "*SCU (System Control Unit)*": the electronic control unit(s) of the biofuel conversion system which controls the biofuel supply and/or blend to the engine and/or automatically activates the safety valve, if any, and the other components of the biofuel conversion system in the event of engine failure and/or accidental shut-down;
dd) '*master-slave system*' means a biofuel conversion system into which the SCU electronic control unit is able to translate the ECU control strategies;
ee) '*safety valve*': a valve responsible for re-establishing operation in the original fuel mode in the event that the bi-fuel or bi-flex-fuel system malfunctions or failures;
ff) '*UPR (universal recognition of malfunctions)*' means a malfunction indicator of the biofuel conversion system.

Article 3

(General characteristics required for the type approval of the biofuel conversion system)

1. Each biofuel conversion system shall be designed, constructed and installed in such a way that, under

normal conditions of use and despite the stresses to which it may be subjected, it does not affect the original safety characteristics of the vehicle.

2. No authorisation from the vehicle manufacturer is required for modifications falling within the categories referred to in Article 236 (2) of Presidential Decree No 495 of 16 December 1992.

Article 4

(Approval of the biofuel conversion system)

1. The application for approval of a biofuel conversion system shall be submitted by the manufacturer or their legal representative to a technical service, in accordance with the provisions of Article 4 of Decree No 277 of the Minister for Transport and Navigation of 2 May 2001, which shall carry out the tests provided for in this Decree.
2. After installation of the conversion system, the vehicle thus modified must meet all the provisions relating to the pollutant emissions pursuant to which the type-approval was originally granted; in particular, it must comply with the same limit values for the pollutant emissions into the atmosphere indicated in Annex 2.
3. Following the positive outcome of the verification, each biofuel conversion system shall be approved, with any extensions of approval referred to in Article 7 (5) (c) of Decree No 277 of the Minister for Transport and Navigation of 2 May 2001, in relation to one or more vehicle families.
4. Each approved conversion system shall be assigned a number in accordance with the scheme provided for in Annex IV to Ministerial Decree No 277 of 2 May 2001, as amended.

   In particular, the first character of the first field is 'N', since it is a national type-approval and the first character of the second field is 'D'.
5. At the end of the procedure referred to in this Article, the type-approval authority shall issue the type-approval certificate for the conversion system, including any extensions, in accordance with the model set out in Annex 3.
6. The application for type-approval shall be accompanied by the following documents, signed digitally by the applicant, and by the following specific data:
   a) description of the conversion system with all relevant information and drawings, including the approval numbers of each component for which a mandatory type-approval is requested;
   b) information sheet in accordance with the requirements of Annex 4;
   c) description of the parent vehicle(s) on which the tests to verify compliance with the requirements of this Regulation will be carried out;
   d) description of all modifications made to the original parent vehicle;
   e) specimens of the certificate of conformity, as set out in Annex 5, with the list of persons authorised to sign the certificate and a declaration relating to their duties in the company;
   f) verification of compliance with the specifications for the installation of the conversion systems referred to in Article 10;
   g) installation manual of the conversion system on the parent vehicle(s) containing the minimum requirements laid down in Annex 6 or a shortened version thereof where the manufacturer expects the presence of a two-dimensional barcode (QR code) on the statutory plate;

h) the end user manual containing the minimum requirements laid down in Annex 7, including the requirements referred to in Article 12, or a reduced version thereof where the manufacturer envisages the presence of a two-dimensional barcode (QR code) on the statutory plate;
i) specimen of the statutory plate referred to in Article 2(1)(x);
j) list of workshops suitable for carrying out the system installation;
k) certificates of payments made according to the rates indicated in the tables annexed to Law No 870 of 1 December 1986 and subsequent updates, as well as those made for the payment of stamp duties.

7. The approval authority shall group the documents referred to in paragraph 6(a), (b), (e), (g), (h), (i) and (j) together in an approval file.
8. The manufacturer of biofuel processing systems must guarantee the original characteristics of the entire system for the specific vehicle family for which the type-approval has been granted.
9. The transformation systems shall remain valid as long as the type-approvals of the components of which they are constituted are valid. At the expiry date of the type-approval of at least one component, the conversion system may no longer be produced.

Article 5

(Modification of the type-approval of a type of biofuel conversion system)

1. Any change in the installation of the conversion system shall be notified to the approval authority via a technical service, enclosing the duly amended pages of the approval file, clearly indicating on each amended page the nature of the change and the date of re-issue. The manufacturer shall also prepare an updated and consolidated version of the documents constituting the amended information package.
2. An amendment is regarded as a 'revision' when the information contained in the information package changes without the need for inspections or tests to be repeated, or if there is a need to update the information contained in the information package which has been incorrectly reported.
3. An amendment is considered an 'extension' if the data recorded in the approval file have changed and any of the following occurs:
   a) further inspections or tests are required;
   b) any of the information contained in the type-approval certificate, with the exception of its attachments, has changed;
   c) new requirements for the approval of components forming part of the conversion system become applicable.

Article 6

(Requirements for the manufacturer of biofuel conversion systems)

1. The manufacturer shall be responsible for the type-approval of the conversion system referred to in Article 4 and for the conformity of production of all related components.

2. For each conversion system produced in conformity with the approved type, the manufacturer shall issue a certificate of conformity, as referred to in Article 2(1)(y), and a statutory plate as referred to in Article 2(1)(x).
3. For each approved system, the conversion system manufacturer shall draw up and make available the installation requirements referred to in Article 10, including general indications and any specific requirements.
4. Each individual conversion system that is manufactured shall come with information on its use, maintenance, installation and, where possible, disposal, intended for both the installer and the user. The system shall also be accompanied by instructions and warnings.
5. The manufacturer of the conversion system shall provide repair and maintenance information on the converted vehicle in compliance with the provisions of Annex X to Regulation (EU) 2018/858, as subsequently amended and supplemented, and shall be responsible for ensuring the installed product.

Article 7

(Requirements for the manufacturer of biofuel conversion systems)

6. Production facilities for biofuel conversion systems are subject to the procedure for checking the conformity of the production process and of the product with the approved type, in accordance with the Decree of 21 April 2009 of the Head of the Department for Transport, Shipping and Information and Statistical Systems and the procedures contained in Regulation (EU) 2018/858.

Article 8

(Final cessation of production)

1. In the event of definitive cessation of production of a type of biofuel conversion system approved in accordance with this Decree, the holder of the approval shall inform the approval authority within three months of the cessation.

Article 9

(Requirements for technical services)

1. The technical services receive requests for type-approval and modification of the conversion systems.
2. Having examined the documentation submitted by the conversion system manufacturer, the technical service shall carry out the checks and tests indicated in Annex 2 on one or more vehicles representative of the family to which the system is intended to be installed.
3. At the end of the procedure, the technical service shall send to the approval authority:
   a) the conversion system approval file including the documents referred to in Article 4(6)(a), (b), (e), (g), (h), (i) and (j);
   b) report of checks and tests;
   c) a copy of the certificates of approval for the devices making up the conversion system, where applicable;
   d) draft of the special adaptation system type-approval certificate drawn up in accordance with Annex 3.

Article 10

(Requirements for the installation of the biofuel conversion system on in-service vehicles)

1. Each biofuel conversion system shall be installed in vehicles in circulation either by the manufacturer or by an approved installer.

2. The installation of a biofuel conversion system on a vehicle shall take place following a visit and test in accordance with Article 78 of Legislative Decree No 285 of 30 April 1992. In this case, the installer of the biofuel conversion system shall first ensure the compatibility of the installation of the system on the vehicle itself and, after installation, shall certify, by means of a declaration in accordance with Annex 9, that the installation has been carried out in full compliance with the installation requirements laid down by the manufacturer of the conversion system.

3. The installer of the conversion system shall affix the statutory plate referred to in Article 2(1)(x) and fix it to the vehicle structure, preferably close to the vehicle plate and provide the vehicle owner with the end user manual referred to in Article 4(6)(h).

Section 11.

(Obligations for Civil Vehicle Registration Offices and updating of the single vehicle registration and ownership document)

1. The installation of a biofuel conversion system in a vehicle in circulation shall, pursuant to Article 78 of Legislative Decree No 285 of 30 April 1992, in accordance with the procedures laid down by decision of the Directorate-General for Motor Vehicles of the Department of Transport and Navigation of the Ministry of Infrastructure and Transport, record the following information on the single registration document and ownership of it:
   a) classification of the vehicle as belonging to the categories ‘mono-fuel’, ‘bi-fuel’, ‘flex-fuel’ or ‘bi-flex-fuel’;
   b) fuels and mixtures usable by the vehicle following installation of the conversion system;
   c) name and approval number of the installed biofuel conversion system;
   d) system installer and test date.

2. When updating the single registration and ownership document, any changes concerning the technical characteristics of the vehicle shall be checked and recorded.

Section 12.

(Recognition of systems approved by other Member States of the European Union or of the European Economic Area)

1. Equivalent biofuel conversion systems, approved according to national law by Member States of the European Union or the European Economic Area, shall be subject to verification of the product safety and user protection conditions.

2. The verification referred to in paragraph 1 shall be carried out by a technical service at the request of the manufacturer of the retrofit system or its legal representative on the basis of appropriate documentation issued by the State which granted the type-approval. This shall only be recognised nationally if it is clear, from a review of such documentation, that the system's safety and user protection conditions are equivalent to or exceed those required by this Decree. It is also necessary that the characteristics required for type approval are equivalent to those laid down in this Decree.

Section 13.
(Final provisions)

1. The Annexes constitute an integral part of this Decree. The Directorate-General for Motor Vehicles shall update them by means of its own measure.
2. The Directorate-General for Motor Vehicles shall, by its own decision, issue the technical and administrative procedures not governed by this Decree.
3. Any reference to UN (UNECE) Regulations refers to the latest series of amendments/updates applicable under Union law unless specifically stated otherwise.
4. This Decree shall enter into force six months after its publication in the Official Gazette, but may be immediately applicable at the request of the manufacturer.

This Decree shall be published in the Official Gazette.

The Minister

Attached table of contents:

Annex 1

Parameters defining a vehicle family (Article 2(1)(q))

1. For the purposes of this Decree, 'family member' means a vehicle that shares the following essential characteristics with its parent vehicle:

a) the same fuel type as the original engine;

b) the same emission test methodology;

c) the engine has an approved power output that is between 0.6 and 1.2 times that of the engine of the parent vehicle;

d) the ratio of power to cylinder capacity of the engine shall be between 0,75 and 1,3 times that of the parent vehicle;

e) risk assessment, according to UN Regulation (UNECE) No 155, in the case of biofuel conversion systems to be used on vehicles approved under that Regulation.

2. In the case of multiple parent vehicles sharing the above characteristics, except for the type-approval power which is P1 and P2 respectively (with P1 < P2), it is still possible to include in the same family all engines with type-approval power delivered within the range 0.6*P1 and 1.2*P2.

Annex 2

Procedure for verifying the suitability and conformity of a biofuel conversion system for vehicles in circulation (Article 4 (2))

1. General requirements

1.1 Biofuel conversion systems must comply with the mandatory standards for system type-approval (EU Directives and Regulations and related UN (UNECE) Regulations). References to EU or UN (UNECE) standards shall be understood as referring to the latest applicable series of amendments/updates in accordance with Union legislation, unless specifically indicated otherwise, for the type-approval of a new type in force at the time of submission of the application for type-approval of the biofuel conversion system referred to in Article 4 (1).

1.2 For the characteristics of the vehicle not directly affected by the installation of the conversion system, full compliance with the technical requirements on the basis of which the original vehicle approval was granted shall be ensured, without the need for adaptation to subsequent standards.

2. Evidence

The verification of the suitability of a biofuel conversion system shall be carried out, on one or more parent vehicles, through the tests described below.

These tests may be carried out with different biofuels or mixtures, provided that they are repeated for each selected biofuel or mixture. A positive test result shall permit the scheme to be approved for the relevant biofuel(s) and/or mixture(s).

2.1. Power test

The parent vehicle(s) shall be subjected to the following tests:

2.1.1. A sample of the biofuel conversion system, as defined in Article 2(1) of this Decree, installed in the parent vehicle(s), shall be subjected to the test procedures referred to in point 2.1.1.1. or 2.1.1.2., according to the procedure used at the stage of approval of the unprocessed vehicle or engine.

The power measured with the biofuel(s) and/or mixture(s) shall be equal to or less than, by no more than 10%, that measured with the original fuel.

2.1.1.1. Engine dynamometer method

The maximum power at the crankshaft is measured on the engine of each parent vehicle by means of an engine dynamometer, in accordance with the procedures followed during the approval of the engine, using the following fuels:

a) original fuel without installation of the system;

b) biofuel or mixture.

The average of the power measurements shall be calculated as follows:

$$Power_{CO} = \frac{1}{n} \sum_{i=1}^{n} Power_{CO.i}$$

$$Power_{BIO} = \frac{1}{n} \sum_{i=1}^{n} Power_{BIO.i}$$

With:
OF = Original fuel
BIO = Biofuel or mixture

The ratio of engine power shall be calculated as follows:

$$K_{Power} = \frac{Power_{BIO}}{Power_{CO}}$$

With $0.9 \leq K_{Power} \leq 1.0$.

For each vehicle in the family, the values of engine power declared by the manufacturer are multiplied by the above ratios.

2.1.1.2. Roller dynamometer method

The maximum power at the wheels is measured on each parent vehicle by means of a roller dynamometer, in accordance with the procedures followed during the approval, using the following fuels:

a) original fuel without installation of the system;

b) biofuel or mixture.

The average of the power measurements shall be calculated as follows:

$$Power_{CO} = \frac{1}{n} \sum_{i=1}^{n} Power_{CO.i}$$

$$Power_{BIO} = \frac{1}{n} \sum_{i=1}^{n} Power_{BIO.i}$$

With:

OF = Original fuel BIO = biofuel or mixture

The ratio of engine power shall be calculated as follows:

$$K_{Power} = \frac{Power_{BIO}}{Power_{CO}}$$

With $0.9 \leq K_{Power} \leq 1.0$.

For each vehicle in the family, the official values of engine power are multiplied by the above ratios.

2.1.2. For 'flex-fuel' and 'bi-flex-fuel' vehicles, the test described in point 2.1 shall be carried out with a mixture whose biofuel content is not less than 60%. The test result shall be deemed to be valid for all mixtures of the same fuels as the mixture being tested.

2.2. Electronic Security Test

2.2.1. The electronic control unit (SCU) must meet the relevant electromagnetic compatibility (EMC) standards set out in UN Regulation (UNECE) No. 10.

2.2.2. The activation time of the safety valve after diagnosis of a fault in the biofuel conversion system must not exceed one second.

2.2.3. A failure of the vehicle's electrical installation must not lead to the uncontrolled implementation of a component of the biofuel conversion system.

2.3. Diagnostic test

2.3.1. If necessary to correctly install the biofuel conversion system on the vehicle, it is permitted to simulate the correct functioning of the original emission-related components that are not used in biofuel mode.

2.3.2. The biofuel conversion system, installed in the parent vehicle(s), shall comply with the diagnostic requirements and tests laid down in Union legislation at the stage of type-approval of the original vehicle in both original and biofuel mode.

2.3.3. Specific OBD requirements and tests for master-slave retrofit systems:

a) the ECU shall remain activated for engine management in both original and biofuel mode;

b) during biofuel operation, the ECU must continue to monitor the original emission-related components, with the exception of those which are not in use;

c) during biofuel operation, the SCU shall monitor the emission-related biofuel conversion system components, if any, as well as their electrical connections.

2.3.4. Fuel use and conversion system diagnostics

2.3.4.1. The SCU must be able to identify the fuel in use at any time, in the case of bi-fuel and bi-flex-fuel systems.

2.3.4.2. The SCU may store this information and indicate it clearly and unambiguously to the driver, via the dedicated panel/screen, if present.

2.3.5. The parent vehicle fitted with the biofuel conversion system shall be subjected to the following tests:

a) The SCU must follow the ECU in terms of fuel use strategies. This can be demonstrated by using a monitoring (diagnostic) programme and at the same time by modifying the signal of one of the sensors of the original fuel system;

b) during an emission test with original fuel, the original malfunction indicator (MI) shall activate due to the electrical disconnection of the original emission-related components;

c) during a biofuel emission test, the transformation system malfunction indicator (UPR) shall be activated due to the electrical disconnection of emission-related biofuel conversion system components, if any, that are in use during biofuel operation.

2.3.5.1. During emission testing, the following tests shall be carried out on the parent vehicle equipped with the biofuel conversion system only in biofuel operation mode:

a) electrical disconnection of an emission-related component of the biofuel conversion system, if any;

b) replacement of an emission-related biofuel conversion system component, if any, by another deteriorated or defective component, or electronic simulation of such a failure.

The original malfunction indicator (MI) and/or the UPR indicator of the conversion system must activate before the end of the tests under all the conditions described above. Alternatively, in the case of bi-fuel and bi-flex-fuel systems, the conversion system shall automatically switch between the original fuel mode and the biofuel mode before the end of the tests, using the safety valve.

2.3.5.2. Fault codes due to malfunctions of emission-related components of the biofuel conversion system, if any, as well as their electrical connections must be stored in the SCU.

2.3.5.3. The system manufacturer shall provide specific instructions to interpret the fault codes of the biofuel conversion system referred to in point 2.3.5.2.

2.4. Leakage test

2.4.1. As regards gaseous biofuels under standard environmental conditions (Article 2 (1) (s)), the installer must comply with the requirements of the installation manual provided by the system manufacturer. Once the installation is completed, the installer must fill the gaseous biofuel system and check with a detector for leaks of all system fittings and connections. The solenoid valves must be in open position, so that all components of the system are subjected to service pressure. No leakage is permitted.

2.4.2. For liquid biofuels under standard environmental conditions (Article 2(1)(s)), the installer must comply with the requirements of the installation manual supplied by the system manufacturer. Once the installation has been completed, the installer must switch on the vehicle. Leakage is not allowed during the entire cycle of first ignition of the vehicle.

2.5. Component corrosion test

2.5.1. Metallic components designed to contain biofuel in a gaseous state under standard ambient conditions shall comply with the leakage tests specified in paragraph 2.4. after having been subjected to a salt mist test in accordance with ISO 9227 for 144 hours, with all connections closed.

2.5.2. Copper or brass components containing gaseous biofuel under standard environmental conditions shall pass the leakage tests referred to in point 2.4 after having been submitted to 24 hours immersion in ammonia in accordance with ISO 6957 with all connections closed.

2.6. Emissions tests

2.6.1. Tests for emissions of pollutants and carbon dioxide (CO_2) shall be carried out on the parent vehicle or the engine, depending on the applicable regulations, with and without the biofuel conversion system using the Union regulations provided for at the time of type approval of the original vehicle.

2.6.1.1. ‘Polluting substances’ means:

a) carbon monoxide (CO);
b) unburned hydrocarbons (THC, NMHC);
c) Methane (CH4)
d) nitrogen oxides (NOx);
e) combination of unburned hydrocarbons and nitrogen oxides (THC+NOx);
f) particulate matter;
g) number of particles.

2.6.1.2. Measurements of exhaust emissions must be carried out:

a) with original reference fuel without the installation of the system;

b) with biofuel or reference mixture.

2.6.1.3. Special provisions for vehicles in flex-fuel and bi-flex-fuel configuration

In the caseof vehicles in flex-fuel and bi-flex-fuel configuration, it is permitted to use a mixture during the entire test cycle where the biofuel percentage is not less than 60%. The positive test result shall be considered valid for all mixtures of the same fuels as the mixture used for testing.

2.6.1.4. Special provisions for vehicles in bi-fuel and bi-flex-fuel configuration

It is permitted to start the engine with the original fuel and switch to the biofuel or blend after a period of time that cannot exceed 300 seconds.
During the test cycle it is permitted to power the engine with the original fuel for time intervals, provided that the total time does not exceed 120 seconds.

2.6.2. For each pollutant or combination of pollutants, the results of the exhaust emission measurements may exceed, by not more than 10 %, the limit values set out in the relevant type-approvals of the original vehicle(s), provided that the arithmetic mean of three results is below that limit. In this case the prescribed limits may be exceeded for more than one pollutant in the same test or in different tests.

2.6.3. Vehicles equipped with a particulate filter or other equivalent filters, for which the requirements of the applicable legislation referred to in point 2.6.1. provide for their continuous regeneration as a test condition, shall be exempted from these requirements where the biofuel conversion system does not have any emission-related components or, if any, these do not affect the particulate filter or other equivalent filters in any way.

2.6.4. The test results are positive if:

- The values of the pollutants of the converted vehicle or engine shall not be higher than those of the original vehicle or engine;
- The pollutant values of the converted vehicle or engine do not exceed the limit values for each pollutant laid down in Union law for the unprocessed vehicle or engine;
- the value of carbon dioxide (CO_2) is within a tolerance of + 10% compared to the value measured on the unprocessed vehicle or engine.

2.7. Test of the mixture recognition device

2.7.1. If the biofuel conversion system is equipped with a mixture recognition device, two different mixtures of the same fuels shall be sampled:

a) the first mixture must have a higher concentration by volume of fuel of fossil origin, with a minimum

biofuel content of 15% but not more than 30%;

b) the second mixture must have a biofuel concentration of not less than 60%.

After completion of the test with the first mixture, the test container shall be replaced or emptied in order to carry out the test with the second mixture without contamination of the results.

The biofuel conversion system, installed on the engine or vehicle, must run on both mixtures, for a maximum test duration of 5 minutes from start to shut down.

2.7.2.1. During the test cycle, the device must be able to identify the composition of the mixture used in both tests, with a maximum permissible error margin of 10%.

2.7.2.2. The test shall be conducted for a maximum of 5 cycles and shall be deemed to have been passed if the arithmetic mean of the results of the individual cycles remains within the overall margin of error of 10%.

2.7.2.2.1. By way of derogation from point 2.7.2.2., in the event that the result of the first cycle is positive, there is no need to conduct the following.

2.7.2. The mixture recognition device shall allow real time detection of the fuel or mixture that is powering the engine, storing the data and indicating it in the control interface, if any.

2. Additional compliance requirements for the parts modified with the installation of a biofuel conversion system.

3.1. Depending on the modifications made compared to the original vehicle, it is necessary to verify the conformity, for the modified parts, with the requirements of the same Union law applied to the original vehicle.

The vehicle shall be deemed compliant if the location of the biofuel conversion system and related bodies does not substantially change the vehicle's layout. The requirement is deemed to be met if the mass in running order does not differ by ± 10% from that of the original vehicle, while respecting the permissible maximum masses, both per axle and overall and relative distribution.

The tests must be carried out on one or more complete vehicles that have been registered in Italy and are representative of the vehicle family, as identified by the biofuel conversion system manufacturer in agreement with the technical department in charge of testing.

The vehicles must be in good condition and fit to undergo the conversion necessary for the installation of the biofuel conversion system, as certified by the system manufacturer. The verifications and tests necessary to ensure that the modifications made guarantee a level of safety and performance that at least match that of the original vehicle must be carried out on the vehicle type for which the biofuel conversion system is intended.

4. Additional regulations

The installation of the biofuel conversion system must not result in the modification of the active and

passive safety devices of the original vehicle, which are mandatory for type-approval. Otherwise, the corresponding tests already carried out during the approval of the original vehicle must be repeated. If the vehicle has been type-approved in accordance with UN Regulation (UNECE) No 155, the system manufacturer shall demonstrate to the technical service that they have carried out an appropriate risk assessment in order to minimise any possible risk in accordance with UN Regulation (UNECE) No 155.

Annex 3

Model national type-approval certificate for biofuel conversion systems

The Ministry for Infrastructure and Transport

Department of Transport and Navigation

Directorate-General For Motor Vehicles

Division 3 – Technical rules for vehicles

National type-approval certificate for a biofuel conversion system, pursuant to the Ministerial Decree …. with:

- "mono-fuel";
- "bi-fuel";
- "flex fuel";
- "bi-fuel with dedicated flex-fuel tank" (or "bi-flex-fuel")

Certificate regarding [(1)]

a) INITIAL TYPE-APPROVAL
b) EXTENDED TYPE-APPROVAL
c) REVISION OF TYPE-APPROVAL
d) DENIED TYPE-APPROVAL
e) WITHDRAWN TYPE-APPROVAL
f) DISCONTINUATION OF PRODUCTION

of a biofuel conversion system:

Approval No NAD xxxx Extension / Revision No ……

Designation ……

Reason for extension / revision ……

1. Manufacturer of the biofuel conversion system……

2. Designation of system type: ……

3. System manufacturer's address: ……

4. Where applicable, name and address of the system manufacturer's representative: ……

5. Date of submission of the system for type-approval tests: ……

6. Technical service responsible for performance of type-approval tests: .....

7. Date of the test report issued by the technical department: .....

8. Number of the test report issued by the technical department: .....

9. Remarks: .....

10. Type-approval is granted/refused/extended/withdrawn (2)

11. Reasons for extension (where applicable): .....

12 Indication of the vehicle family or families for which the biofuel conversion system is intended:

12.1 Family 1: .....

12.2 Family 2: .....

12.3 Family 3: .....

13. Place: .....

14. Date: .....

15. Signature/Name: .....

16. Attached is a list of the documents which constitute the approval file and which

shall be filed with the authority that granted the approval.

Addendum

(Type-approval No. ..... Extension/Revision No.....)

1. Parent vehicles

Vehicle No	1	2	3
Manufacturer / Trademark / Trade name:			
Type/Variant/Version:			
Type approval:			
Category:			
2 Emission limits			
Power / Cylinder capacity (1)			
Type of pollution control system:			
Vehicle complying with UN Regulation (UNECE) No 155 YES / NO (1)			

2. Test result:

power $_{CO}$ to $_{BIO}$ power ratio: …… [(2)]

2. Results of the exhaust emission tests

2.1.1. Emissions test

Number of the Union legislative act								
Test procedure carried out								
Fuel used	CO	THC	NMHC	CH4	NOx	THC + NOx	Mass of particulate matter (PM) (if applicable)	Number of particles (PN) (if applicable)

3. Characteristics of the vehicles for which the type of biofuel retrofit system is appropriate:

- Original vehicle fuel:……;
- Emission test methodology:……;
- Power / Cylinder capacity ratio (kW/cm^3): …
- Power output (kW) ……;

(1) Cross out whichever does not apply.

Annex 4

Template of the information document

Part I - Refers exclusively to liquid biofuels under standard environmental conditions

Information document relating to the type-approval of a biofuel conversion system.

0. Name, company name and address of the manufacturer: ……

0.1 Names and addresses of assembly plants: ……

0.2 Name and address of the manufacturer's authorised representative, if any: ……

DESCRIPTION OF THE BIOFUEL CONVERSION SYSTEM:

1. Description of the parent vehicle.

1.1. Name and address of manufacturer ……

1.2. Category and type identification ……

1.3. Chassis identification number ……

1.4. Certification number ……

1.5. Identification of the type of internal combustion engine ……

1.5.1. Working principle and thermodynamic cycle ……

1.5.2. Natural suction/ supercharging ……

1.5.3. Cylinder capacity ……

1.5.4. Catalytic system ……

2. Brief description of the biofuel transformation system……

2.1. Brand or trade name of the system ……

2.2. System type identification ……

2.3. Drawings/flow diagrams of the installation on the vehicle……

2.4. Master-slavesystem: yes/no [1]

2.5. List of components [3]

2.5.1. Replacement fuel tank(s) for the original fuel: …… yes/no [1]

2.5.1.1. Brands ……

2.5.1.2. Type(s) (include drawings) ……

2.5.1.3. Number of tanks……

2.5.1.4. Capacity (in litres) ……

2.5.1.5. Original fuel pump in the tank: yes/no [1]

2.5.1.5.1. Identification number ……

2.5.1.5.2. Installation plans in the tank……

2.5.1.6. Accessories to the replacement fuel tank for the original fuel:

2.5.1.6.1. Level indicator

2.5.1.6.1.1. Brands……

2.5.1.6.1.2. Types……

2.5.1.6.1.3. Operating principle: float/other (include description or drawings)……

2.5.1.6.2. Temperature sensor: YES/NO[1] ;

2.5.1.6.2.1. Brands……

2.5.1.6.2.2. Types……

2.5.1.6.2.3. Operating principle (include description or drawings) ……

2.5.2. Biofuel tank(s) and/or mixture: yes/no [1]

2.5.2.1. Brands ……

2.5.2.2. Type(s) (include drawings) ……

2.5.2.3. Number of tanks……

2.5.2.4. Capacity (in litres) ……

2.5.2.5. Biofuel pump in tank: yes/no [2]

2.5.2.5.1 Certification number ……

2.5.2.5.2. Installation drawings in the tank ……

2.5.2.6. Biofuel tank accessories

2.5.2.6.1. Level indicator ……

2.5.2.6.1.1. Brands ……

2.5.2.6.1.2. Types ……

2.5.2.6.1.3. Operating principle: float/other (include description or drawings)

2.5.2.6.2. Temperature sensor

2.5.2.6.2.1. Brands ……

2.5.2.6.2.2. Types ……

2.5.2.6.2.3. Working principle (description or drawings).....

2.5.3. Safety valve (for bi-fuel and bi-flex-fuel systems) (1)

2.4.3.1. Brands .....

2.5.3.2. Types .....

2.5.3.3. Description and drawings.....

2.5.3.4. Operating pressure(s) (2)..... kPa

2.5.4. Flexible and/or rigid fuel tube(s)

2.5.4.1. Brands .....

2.5.4.2. Types .....

2.5.4.3. Description .....

2.5.4.4. Operating pressure(s) (2):..... kPa

2.5.5. Pressure and/or temperature sensor(s)

2.5.5.1. Brands .....

2.5.5.2. Type .....

2.5.5.3. Description

2.5.5.4. Operating pressure(s)(2):..... KPa

2.5.5.5. Operating temperature(s) (1):.....°C

2.5.6. Biofuel and/or mixture filter(s) (2)

2.5.6.1. Brands .....

2.5.6.2. Types.....

2.5.6.3. Description.....

2.5.6.4. Operating pressure(s) (2): ..... kPa

2.5.7. Service connection(s): yes/no

2.5.7.1. Brands.....

2.5.7.2. Types.....

2.5.7.3. Installation descriptions and diagrams.....

2.5.8. Thermal conditioning system connected to the biofuel conversion system

: yes/no (1)

2.5.8.1. Brands .....

2.5.8.2. Type .....

2.5.8.3. Description and installation diagrams .....

2.5.8.4. Accessories to the thermal conditioning system

2.5.8.4.1. Fuel and/or coolant pump(s): YES/NO[(1)];

2.5.8.4.1.1. Brands.....

2.5.8.4.1.2. Types.....

2.5.8.4.1.3. Installation description and diagrams.....

2.5.8.4.2. Fuel and/or coolant ducts: YES/NO[(1)];

2.5.8.4.2.1. Brands.....

2.5.8.4.2.2. Types.....

2.5.8.4.2.3. Installation description and diagrams .....

2.5.8.4.3. Cooling liquid management valve(s): YES/NO[(1)];

2.5.8.4.3.1. Brands.....

2.5.8.4.3.2. Types.....

2.5.8.4.3.3. Installation description and diagrams.....

2.5.8.4.4. Heat exchanger(s): YES/NO[(1)];

2.5.8.4.4.1. Brands.....

2.5.8.4.4.2. Types.....

2.5.8.4.4.3. Installation description and diagrams.....

2.5.9. Fuel management valves (for bi-fuel and bi-flex-fuel systems) [(2)]

2.5.9.1. Brands .....

2.5.9.2. Types .....

2.5.9.3. Installation description and diagrams .....

2.5.10. Fuel mixing valve (for bi-fuel and bi-flex-fuel systems): YES/NO[(1)];

2.5.10.1. Brands.....

2.5.10.2. Types.....

2.5.10.3. Installation description and diagrams.....

2.5.11. Biofuel pump(s) external to the tank: yes/no

2.5.11.1. Brands .....

2.5.11.2. Types.....

2.4.11.3. Installation description and diagrams.....

2.5.12. Electronic control unit

2.4.12.1. Brands ……

2.4.12.2. Types……

2.4.12.3. Installation description and diagrams ……..

2.5.13. After-treatment management device(s): YES/NO[(1)] ;

2.4.13.1. Brands ……

2.4.13.2. Types……

2.4.13.3. Installation description and diagrams ……

2.5.14. Mixture recognition device (for flex-fuel and bi-flex-fuel systems): yes/no [(1)]

2.4.14.1. Brands ……

2.4.14.2. Types……

2.4.14.3. Installation description and diagrams ……..

2.5.15. UPR signal

2.4.15.1. Brands ……

2.4.15.2. Types……

2.4.15.3. Installation description and diagrams ……

2.5.16. Control interface: yes/no [(1)]

2.4.16.1. Brands ……

2.4.16.2. Types……

2.4.16.3. Installation description and diagrams ……

2.5.17. Original fuel filter(s): yes/no [(1)]

2.4.17.1. Brands ……

2.4.17.2. Types……

2.4.17.3. Description

2.5.17.1. Operating pressure(s) [(2)]: …… KPa

2.5.18. Switch: yes/no [(1)]

2.4.18.1. Brands ……

2.4.18.2. Types ……

2.4.18.3. Installation description and diagrams……

2.5.19. Feed line cleaning valve: YES/NO[(1)] ;

2.4.19.1. Brands .....

2.4.19.2. Types .....

2.4.19.3. Installation description and diagrams .....

2.5.20 Biofuel accumulator: YES/NO[1] ;

2.4.20.1. Brands .....

2.4.20.2. Types.....

2.4.20.3. Installation description and diagrams.....

2.6. Additional documentation

2.6.1. Description of the biofuel conversion system and the physical protection of the catalyst at switching from original fuel to biofuel or vice versa.

2.6.2. System configuration (electrical connections, fuel ducts, cooling/heating liquid ducts, etc.): .....

2.6.2.1. Representation of the symbol .....

2.6.2.2. Adjustment data

2.6.2.3. Cooling system: (liquid/air) [1]

2.6.3. Diagrams relating to the biofuel conversion system.

2.7. Vehicle family or families for which the biofuel conversion system is intended:

2.7.1. Family 1: .....

2.7.2. Family 2: .....

2.7.3. Family 3: .....

2.8. The system may be installed in vehicles approved by UN Regulation (UN/ECE) 155: yes/no.

[1] cross out whichever does not apply.
[2] specify tolerance.
[3] components must be type-approved where there is a specific regulation providing for this.

Part II - Refers exclusively to gaseous biofuels under standard environmental conditions

Information document relating to the type-approval of a biofuel conversion system.

0.1 Names and addresses of assembly plants: .....

0.2 Name and address of the manufacturer's authorised representative, if any: .....

DESCRIPTION OF THE BIOFUEL CONVERSION SYSTEM [3]:

1. Description of the parent vehicle.

1.1. Name and address of manufacturer .....

1.2. Category and type identification .....

1.3. Chassis identification number .....

1.4. Certification number .....

1.5. Identification of the type of internal combustion engine .....

1.5.1. Working principle and thermodynamic cycle .....

1.5.2. Natural suction/ supercharging .....

1.5.3. Cylinder capacity .....

1.5.4. Catalytic system .....

2. Brief description of the biofuel conversion system.....

2.1. Brand or trade name of the system .....

2.2. System type identification .....

2.3. Drawings/flow diagrams of the installation on the vehicle.....

2.4. Master-slavesystem: yes/no [1]

2.5. Vaporiser/pressure regulator (s)

2.5.1. Brands.....

2.5.2. Types

2.5.3. Certification number .....

2.5.4. Identification.....

2.5.5. Drawings.....

2.5.6. Number of main adjustment points .....

2.5.7. Description of the adjustment principle at the main adjustment points ……

2.5.8. Number of minimum adjustment points……

2.5.9. Description of the adjustment principles at the minimum adjustment points……

2.5.10. Other adjustment possibilities: if there are, which (description and diagrams) ……

2.5.11. Operating pressure(s) [2]:…… KPa

2.6. Mixer: yes/no [1]

2.6.1. Number……

2.6.2. Brands……

2.6.3. Types……

2.6.4. Drawings……

2.6.5. Installation location (include drawing(s))……

2.6.6. Adjustment possibilities……

2.6.7. Operating pressure(s) [2]:…… KPa

2.7. Gas dosage unit: yes/no [1]

2.7.1. Numer……

2.7.2. Brands……

2.7.3. Types……

2.7.4. Drawings……

2.7.5. Installation position (include drawing(s)) ……

2.7.6. Adjustment possibility ……

2.7.7. Operating pressure(s) [2]: …… KPa

2.8. Gas injection device(s) or injector(s): yes/no [1]

2.8.1. Brands……

2.8.2. Types……

2.8.3. Identification……

2.8.4. Operating pressure(s) [2]: …… KPa

2.8.5. Installation diagrams……

2.9. Electronic control unit

2.9.1. Brands……

2.9.2. Types……

2.9.3. Installation position.....

Brands..... Adjustment possibilities

2.10. Biofuel tank

2.10.1. Brands.....

2.10.2. Type(s) (include drawings).....

2.10.3. Number of tanks.....

2.10.4. Capacity..... litres

2.10.5. Biofuel pump in tank: yes/no [(1)].....

2.10.6. Certification number

2.10.7. Tank installation diagrams.....

2.11. Biofuel tank accessories

2.11.1. 80% gas shut-off valve

2.11.1.1. Brands

2.11.1.2. Types.....

2.11.1.3. Operating principle: float/other [(1)] (include description or drawings)

2.11.2. Level indicator

2.11.2.1. Brands.....

2.11.2.2. Types.....

2.11.2.3. Operating principle: float/other [(1)] (include description or drawings)

2.11.3. Pressure relief valve (discharge valve):

2.11.3.1. Brands.....

2.11.3.2. Types.....

2.11.4. Pressure relief device

2.11.4.1. Brands.....

2.11.4.2. Types.....

2.11.5. Remotely controlled service valve with excess flow valve

2.11.5.1. Brands.....

2.11.5.2. Types.....

2.11.6. Multivalve: yes/no [(1)]

2.11.6.1. Brands……

2.11.6.2. Types……

2.11.6.3. Multivalve description (include drawings) ……

2.11.7. Ventilation container

2.11.7.1. Brands ……

2.11.7.2. Types……

2.11.8. Power supply bushing (fuel pump/actuators)

2.11.8.1. Brands……

2.11.8.2. Types……

2.11.8.3. Drawings……

2.12. Fuel pump (biofuel): yes/no [1]

2.12.1. Brands……

2.12.2. Types……

2.12.3. Pump mounted in the biofuel tank: yes/no [1]

2.12.4. Operating pressure(s) [2]: …… KPa

2.13. Shut-off valve/non-return valve/gas-tube pressure relief valve: yes/no [1]

2.13.1. Brands ……

2.13.2. Types ……

2.13.3. Description and drawings……

2.13.4. Operating pressure(s) [2]:…… KPa

2.14. Filling unit

2.14.1. Brands……

2.14.2. Types……

2.14.3. Description and drawings

2.15. Flexible or rigid fuel pipe(s)

2.15.1. Brands……

2.15.2. Types……

2.15.3. Description……

2.15.4. Operating pressure(s) [2]: …… KPa

2.16. Pressure and temperature sensor(s).

2.16.1. Brands……

2.16.2. Types……

2.16.3. Description……

2.16.4. Operating pressure(s) [2]: …… KPa

2.17. Biofuel filter(s) [2]

2.17.1. Brands……

2.17.2. Types……

2.17.3. Description……

2.17.4. Operating pressure(s) [2]: …… KPa

2.18. Service connection(s):

2.18.1. Brands……

2.18.2. Types……

2.18.3. Installation descriptions and diagrams

2.19. Heating system connected to the biofuel system: yes/no [1]

2.19.1. Brands……

2.19.2. Types……

2.19.3. Installation description and diagrams……

2.20. Additional documentation

2.20.1. Description of the biofuel conversion system and the physical protection of the catalyst at the switch from diesel to biofuel or vice versa……

2.20.2. System configuration (electrical connections, suction ducts, compensation ducts, etc.):

2.20.3. Representation of the symbol ……

2.20.4. Adjustment data ……

2.21. Cooling system: (liquid/air) [1]

2.21.1. System description/diagrams for the biofuel conversion system.

2.22. Vehicle family or families for which the biofuel conversion system is intended:

2.22.1. Family 1: ……

2.22.2. Family 2: ……

2.22.3. Family 3: ……

2.23 The system may be installed in vehicles approved by UN Regulation (UN/ECE) 155: yes/no.

(1) cross out whichever does not apply
(2) specify tolerance.
(3) components must be type-approved where there is a specific regulation providing for this.

Annex 5

Model of the manufacturer's certificate of conformity (Article 6 (2))

SYSTEM MANUFACTURER LOGO

The undersigned…… acting as …… ……
of the firm/company…… based in……

CERTIFIES

that the biofuel conversion system indicated below complies in all its parts with the type approved by the Ministry of Infrastructure and Transport, Department of Transport and Navigation - Directorate-General for Road Traffic, with certificate no. ……dated ……/……/……
System type……
Vehicle family:
1……
2……
3……

Signature

……[1]

[1](1) Application to be signed by an authorised person

Annex 6

Installation manual for the biofuel conversion system (Article 6 (4))

1.1. Area of application

This section lists the minimum requirements to be contained in the installation manual.

1.2. List of reference standards

1.3. General obligations

1.3.1. The purpose of the installation manual is to guide the installer in carrying out the correct procedures to be followed when installing biofuel conversion systems.

1.3.2. The installation manual shall be drawn up by the manufacturer of the biofuel conversion system.

1.3.3. The installation manual is part of the biofuel conversion system and must therefore be provided for each biofuel processing system installed.

1.3.4. The installation manual shall be drawn up in Italian and in French or in German if delivered in the regions or provinces where multilingualism applies

1.3.5. The installation manual is divided into two parts:

I) Part containing the description of the biofuel conversion system sample (section 'a') and the list of components indicated as alternative by the manufacturer (section 'b').

II) Part containing instructions for installation on a vehicle.

1.3.6. The installation manual for the system on the parent vehicle(s) shall be submitted to the approval authority.

1.3.7. The installation manual of the system on vehicles in the family must be submitted by the manufacturer of the biofuel conversion system within a period of time to be determined in agreement with the approval authority.

1.4. Content of Part I, Section 'a' of the installation manual

1.4.1. Description of the biofuel conversion system:

1.4.1.1. Operational principles of the biofuel conversion system.

1.4.1.2. Operational principles for each component of the biofuel conversion system.

1.4.2. Verification that the installation is carried out correctly

1.4.2.1. The installation manual shall indicate the detailed procedures and actions to be carried out by

the installer to verify that the biofuel conversion system has been assembled so as to operate safely and that all installation instructions have been complied with.

1.4.3. Starting procedures

1.4.3.1. The installation manual shall explain the start-up operations to be carried out by the installer.

1.4.4. instruction for maintenance

1.4.4.1. The installation manual shall contain the maintenance schedule, specifying all the ordinary maintenance (by type) to which both individual components and the biofuel conversion system must be subjected during their useful life (depending on the time and number of km travelled by the vehicle).

1.4.4.2. The installation manual shall specify the technical skills required for the installation and maintenance of the biofuel conversion system.

1.4.5. System malfunction

1.4.5.1. The installation manual shall indicate the actions to be taken in the event of a malfunction of the biofuel conversion system.

1.4.6. Diagnosis

1.4.6.1. If a diagnostic system is contained in the biofuel conversion system, the installation manual must contain a detailed description of the system and indicate the corrective measures to be taken in the event of malfunction.

1.5. Content of Part II of the installation manual

1.5.1. Identification of the biofuel conversion system:

1.5.1.1. Biofuel conversion system approval number;

1.5.1.2. Installability characteristics:

- Fuel used by the original vehicle……..
- emission test methodology ……
- Power: between ……. and …….. kW;
- The system may be installed in vehicles approved by UN Regulation (UN/ECE) 155: yes/no.
- Vehicle family:
- 1……
- 2……

- 3.……

1.5.1.3. assembly instructions;

1.5.1.4. General scheme of the biofuel conversion system containing, for each component, the following information:

a) identification number:

b) constructor code;

c) type approval, if it exists;

d) for tanks: capacity/manufacturer/type/expiry or replacement date, if any.

1.5.1.5. Description (including drawings, if applicable) of the devices for mounting the tank on the vehicle.

1.5.2. Assembly instructions:

1.5.2.1. Assembly instructions for all components, including diagrams or photographs that clearly show the layout of the individual components in the vehicle.

1.5.2.2. Drawing or photograph showing the exact location at which the installer is to affix the approval plate of the biofuel conversion system.

1.5.2.3. A scheme of the electrical system clearly indicating the mechanical components to which the cables are to be connected.

Annex 7

End User Manual (Article 6(4))

1.1 General requirements:

1.1.1 The purpose of the end user manual is to inform the end-user about the characteristics and safety features of the installed biofuel conversion systems.

1.1.2 The end user manual shall be drawn up by the manufacturer of the biofuel conversion system.

1.1.3 The manufacturer of the biofuel conversion system shall include in the manual all the information necessary for the correct use and safe operation of biofuel conversion systems.

1.1.4 The end user manual should be considered as an integral part of the biofuel conversion system and should therefore be delivered together with that system.

1.1.5 The end user manual must be drawn up in Italian and in French or in German if delivered in the regions or provinces where multilingualism applies.

1.1.6 The end user manual must contain an indication of the type, version and year of production of the product it refers to.

1.1.7 The end user manual must provide information on use under extreme environmental conditions.

1.2 Content of the End User Manual:

1.2.1 Technical specifications

The end user manual shall contain at least the following information:

a) operating instructions;

b) performance under normal operating conditions;

c) extreme environmental conditions.

1.2.2 Safety instructions:

The end user manual shall contain warnings about health and safety hazards, which shall be classified as follows:

a) SUGGESTIONS for optimal use of the system;

b) ATTENTION for possible problems due to misuse;

c) WARNINGS for damage to persons or property in the event of non-compliance with the procedures indicated. If safety symbols are used, they must comply with the International System and their meaning must be clearly specified in the end user manual.

1.2.3 Description of the biofuel conversion system

The end user manual must clearly describe the purpose, use and function of the biofuel conversion system.

1.2.4 First use and adjustment of biofuel conversion systems

The end user manual shall contain all the information necessary for the end user for the first use and/or for the adjustment of the system in case of need.

1.2.5 Use of the biofuel conversion system

1.3. Supply of the biofuel conversion system

The end user manual shall indicate the sequence of operations to be carried out to fill the biofuel tank(s).

1.3.1. Switch over between fuels

In the case of a bi-fuel or bi-flex-fuel system equipped with a fuel switch, the end user manual shall clearly describe the method to be followed to switch from one fuel to another, indicating the sequence of operations to be performed.

1.3.2. System cleaning operation

In the case of a bi-fuel or bi-flex-fuel system equipped with a fuel line cleaning valve, the end-user manual shall clearly describe the method to be followed to carry out the cleaning of the system, indicating the sequence of operations to be carried out.

1.3.3 Opening/closing of manual valves

If the system is equipped with manual controls, the end user manual shall indicate the correct procedure for operating these controls.

1.3.4 Level indicator

The end user manual shall indicate the location of the level indicator, e.g. on the dashboard or tank. The meaning of the indicated level must be clearly explained to the user.

1.3.5 Maintenance

If the biofuel conversion system is subject to maintenance, the end user manual must specify the frequency and type of interventions to be carried out.

1.3.6. Anomalies and repair

The end user manual must indicate the actions to be taken in the event of anomalies occurring in the biofuel conversion system. If the biofuel conversion system is equipped with a diagnostic system, the end user manual shall describe the system and indicate the correct actions to be taken.

1.4. Product scrapping

The user manual shall indicate the precautions to be taken when removing the installation from the vehicle and the indications for proper disposal.

Annex 8

Statutory plate for the biofuel conversion system (Article 6 (2)).

1. The system manufacturer's statutory plate shall consist of:

   a) a rectangular plate of metal,
      or
   b) a rectangular self-adhesive label.

2. The metal plates must be fixed with rivets or equivalent instruments.
3. The sticker must be able to detect tampering or fraud and self-destroy when trying to remove it.
4. The following information shall be indelibly printed on the statutory plate in the order indicated:

   a) name of the system manufacturer;
   b) conversion system approval number;
   c) the trade name of the conversion system;
   d) any two-dimensional barcode (QR code) containing the installation and/or end user manuals or the manner of downloading them.

5. The height of the characters of the information referred to in paragraph 4(a) and (c) shall be at least 2 mm.

   The height of the characters of the information referred to in paragraph 4(b) shall be at least 4 mm.

6. The manufacturer may affix additional information below or next to the required information, outside the clearly defined rectangle in which only the information required by paragraph 4 is to be contained.

7. The manufacturer's statutory plate must be firmly attached in a conspicuous and easily accessible place, preferably on the vehicle's plate.

8. The location shall be chosen in such a way that the plate is fixed to a part that is not subject to replacement during the use of the vehicle.

Annex 9

Declaration concerning the installation of a conversion system (Article 6 (2))

Declaration concerning the installation in the vehicle of the biofuel conversion system

- ‘mono-fuel’;
- ‘bi-fuel’;
- ‘flex fuel’;
- ‘bi-fuel with dedicated flex fuel tank’ (or ‘bi-flex-fuel’).

The undersigned …… born in …… on …… resident in …… via …… in the capacity of …… of the company …… with headquarters in …… VAT or tax code ……

Registered at the CC.II.A. of ……

Aware of the criminal penalties provided for by Article 76 of Presidential Decree No 445/2000 in the event of false declarations and falsity in documents, within the meaning and for the purposes of Article 47 of the same Presidential Decree No 445/2000

DECLARES

that the following have been installed on the vehicle in a flawless manner and in compliance with the requirements contained in the installation manual:

Brand
Type/Commercial name
registered
chassis no

biofuel conversion system:

Brand:……
Designation: ……
Approval number: ……,

whose main components are:

……

- that the vehicle falls within the family for which the conversion system installed in the vehicle has been approved;

- that it has complied with all the applicable provisions in force;
- having verified that the installation is compatible for the vehicle on which it has been installed.

Attaches hereto:

a) a copy of the identity document [2]

b) copy of the certificate of conformity of the conversion system;

c) a copy of the conversion system scheme;

Place and date signature (in full and legible)

(1) Delete the wording not of interest.

(2) not necessary if signed digitally.