

**COMMISSION DIRECTIVE 2002/80/EC****of 3 October 2002****adapting to technical progress Council Directive 70/220/EEC relating to measures to be taken against air pollution by emissions from motor vehicles****(Text with EEA relevance)**

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Council Directive 70/156/EEC of 6 February 1970 on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers <sup>(1)</sup>, as last amended by Commission Directive 2001/116/EC <sup>(2)</sup>, and in particular Article 13(2) thereof

Having regard to Council Directive 70/220/EEC of 20 March 1970 on the approximation of the laws of the Member States relating to measures to be taken against air pollution by emissions from motor vehicles <sup>(3)</sup>, as last amended by Directive 2001/100/EC of the European Parliament and of the Council <sup>(4)</sup> and in particular Article 5 thereof

Whereas:

- (1) Directive 70/220/EEC is one of the separate directives under the type-approval procedure established by Directive 70/156/EEC.
- (2) Directive 70/220/EEC introduced a method for checking the conformity of vehicles in-service. The type of data a manufacturer should collect and submit as a basis for examination by the type-approval authority of whether a vehicle is in conformity with the requirements of Directive 70/220/EEC over the requisite durability period should be defined. The definition of a vehicle that could be considered to be an outlying emitter, in the case that a representative sample of vehicles of a type are subject to testing and statistical analysis to confirm emissions performance of the said type, should be completed.
- (3) Technical measures for the type-approval, as separate technical units, of replacement catalytic converters to ensure both their emissions performance and, where appropriate, their compatibility with the on-board diagnostic (OBD) system of the vehicle for which they are designed, should be introduced. Measures to aid enforcement in Member States, through the marking

of both replacement catalytic converters and original replacement catalytic converters and their packaging, should be introduced. In addition, a request for additional information to accompany replacement catalytic converters that were manufactured and introduced for sale in the Community prior to the introduction of this Directive should also be introduced.

- (4) Directive 70/220/EEC introduced provisions for OBD systems. To ensure that the development of replacement components which are critical to the correct functioning of the OBD system is not restricted by the unavailability of pertinent OBD-related information, prescriptions requiring the vehicle manufacturer to make available such relevant information to the type-approval authority should be introduced.
- (5) The technical requirements relating to malfunction indication strategies are clarified such that a malfunction is deemed to occur if the OBD thresholds are exceeded or if the OBD system is unable to fulfil the basic OBD monitoring requirements of this Directive.
- (6) It is also necessary to introduce specific modifications to the handling of OBD information to deal independently with vehicle operation on petrol or on gas.
- (7) Due to the short lead-time until 1 January 2003 from which new types of gas-fuelled vehicles should be equipped with an OBD system, it is necessary to allow the type-approval of gas-fuelled vehicles that contain a limited number of minor deficiencies that may arise at, or prior to the time of type-approval. The type-approval authority may also issue an extension to the type-approval certificate for vehicles that have already been type-approved in cases where deficiencies are subsequently found within the OBD system on vehicles in-service. Such extensions may not be issued if there is a complete lack of monitoring capability. A period should be specified within which deficiencies authorised by the type-approval authority must be corrected on future manufactured vehicles.
- (8) Directive 70/220/EEC should be updated to take account of technical progress and in particular the new definitions of the more standard diagnostic fault codes, the more manufacturer-specific diagnostic fault codes, and the new hexadecimal codes as well as ISO standard

<sup>(1)</sup> OJ L 42, 23.2.1970, p. 1.

<sup>(2)</sup> OJ L 18, 21.1.2002, p. 1.

<sup>(3)</sup> OJ L 76, 6.4.1970, p. 1.

<sup>(4)</sup> OJ L 16, 18.1.2002, p. 32.

15031-6 and SAE standard J2012 that have been updated.

- (9) Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC<sup>(5)</sup>, as amended by Commission Directive 2000/71/EC<sup>(6)</sup>, requires that petrol and diesel motor fuels for sale throughout the Community from 1 January 2005 shall have a maximum sulphur content of 50 mg/kg (parts per million). The reference fuels used for the type-approval testing of vehicles against the emission limits applicable from the year 2005 should be redefined in order to better reflect, where applicable, the sulphur, aromatics and oxygen content of the petrol and diesel fuels that should be available on the market from 2005 and used by vehicles having advanced emission control systems or 'gasoline direct-injection' engine technology.
- (10) Directive 70/220/EEC should therefore be amended accordingly.
- (11) The measures provided for in this Directive are in accordance with the opinion of the Committee for Adaptation to Technical Progress established by Directive 70/156/EEC,

HAS ADOPTED THIS DIRECTIVE:

#### Article 1

1. Article 1 of Directive 70/220/EEC is replaced by the following:

'Article 1

For the purposes of this Directive:

- (a) "vehicle" means any vehicle as defined in Annex II Section A to Directive 70/156/EEC;
- (b) "a vehicle fuelled by LPG or NG" means a vehicle fitted with specific equipment for the use of LPG or NG in its propulsion system. Such an LPG or NG vehicle can be designed and constructed as a mono-fuel vehicle or a bi-fuel vehicle;
- (c) "a mono-fuel vehicle" means a vehicle that is designed primarily for permanent running on LPG or NG but may also have a petrol system for emergency purposes or starting only, where the

petrol tank does not contain more than 15 litres of petrol;

- (d) "a bi-fuel vehicle" means a vehicle that can run part-time on petrol and also part-time on either LPG or NG'.

2. Annexes I, II, III, IX, IX(a), X, XI and XIII are amended in accordance with the Annex to this Directive.

#### Article 2

1. With effect from 1 July 2003, if the vehicles comply with the requirements of Directive 70/220/EEC, as amended by this Directive, Member States shall not:

- (a) refuse to grant EC type-approval pursuant to Article 4(1) of Directive 70/156/EEC; or
- (b) refuse to grant national type-approval; or
- (c) prohibit the registration, sale or entry into service of vehicles, pursuant to Article 7 of Directive 70/156/EEC.

2. If a new vehicle type fails to comply with the provisions of Directive 70/220/EEC, as amended by this Directive, with effect from 1 July 2003, Member States shall no longer grant:

- (a) EC type-approval pursuant to Article 4(1) of Directive 70/156/EEC; or
- (b) national type-approval.

However, Member States may continue to grant type-approvals referred to in the first subparagraph where Article 8(2) of Directive 70/156/EEC applies.

3. If the vehicles fail to comply with the provisions of Directive 70/220/EEC, as amended by this Directive, Member States shall:

- (a) consider certificates of conformity which accompany new vehicles pursuant to Directive 70/156/EEC as no longer valid for the purpose of Article 7(1) of that Directive; and,
- (b) refuse the registration, sale or entry into service of new vehicles which are not accompanied by a valid certificate of conformity pursuant to Directive 70/156/EEC, except where the provisions of Article 8(2) of Directive 70/156/EEC are invoked.

4. Paragraph 3 shall apply with effect from 1 January 2006 to:

- (a) vehicles in category M except vehicles the maximum mass of which exceeds 2 500 kg; and
- (b) vehicles in category N<sub>1</sub> class I.

<sup>(5)</sup> OJ L 350, 28.12.1998, p. 58.

<sup>(6)</sup> OJ L 287, 14.11.2000, p. 46.

Paragraph 3 shall apply with effect from 1 January 2007 to:

- (a) vehicles in category N<sub>1</sub> classes II and III, as defined in the table in section 5.3.1.4. of Annex I to Directive 70/220/EEC; and
- (b) vehicles in category M whose maximum mass exceeds 2 500 kg.

#### Article 3

1. With regard to new replacement catalytic converters intended to be fitted on vehicles that have been type-approved in compliance with Directive 70/220/EEC, as amended by this Directive, with effect from 1 July 2003, Member States shall not:

- (a) refuse to grant EC type-approval pursuant to Article 4(1) of Directive 70/156/EEC; or
- (b) prohibit their sale and installation on a vehicle.

2. With effect from 1 July 2003, Member States shall no longer grant EC type-approval pursuant to Article 4(1) of Directive 70/156/EEC or a new replacement catalytic converter if it is not type-approved in compliance with Directive 70/220/EEC, as amended by this Directive.

3. Member States shall continue to permit the sale and installation of new replacement catalytic converters, for which type-approval as a separate technical unit was granted prior to the entry into force of the Directive, for vehicles already in service.

#### Article 4

Before 1 July 2005, manufacturers shall take steps to provide additional information either directly to the point of sale or to any distributor, covering all new replacement catalytic converters that were introduced for sale in the EU before the date of entry into force of this Directive and which do not otherwise comply with the requirements laid down in Commission Directive 98/77/EC (7).

The additional information referred to in the first paragraph shall comply with the conditions laid down in section 7 of Annex XIII to this Directive.

(7) OJ L 286, 23.10.1998, p. 34.

#### Article 5

From the date of entry into force of this Directive, the provisions detailed in section 7 of Annex I to Directive 70/220/EEC, as amended by this Directive, with specific regard to the conformity of in-service vehicles shall apply to all vehicles that have been type-approved according to the requirements of Directive 70/220/EEC, as amended by Directive 98/69/EC of the European Parliament and of the Council (8) or subsequent amending Directives.

#### Article 6

1. Member States shall adopt and publish, before 31 May 2003, the provisions necessary to comply with this Directive. They shall forthwith inform the Commission thereof.

They shall apply those provisions with effect from 1 June 2003.

When Member States adopt these measures, they shall contain a reference to this Directive or shall be accompanied by such reference at the occasion of their official publication. The procedure for such reference shall be adopted by the Member States.

2. Member States shall communicate to the Commission the texts of the main provisions of national law which they adopt in the field governed by this Directive.

#### Article 7

This Directive shall enter into force on the third day following its publication in the *Official Journal of the European Communities*.

#### Article 8

This Directive is addressed to the Member States.

Done at Brussels, 3 October 2002.

For the Commission

Erkki LIIKANEN

Member of the Commission

(8) OJ L 350, 28.12.1998, p. 1.

## ANNEX

## AMENDMENTS TO ANNEXES I, II, III, IX, IXa, X, XI and XIII TO DIRECTIVE 70/220/EEC

## A. Annex I is amended as follows:

1. In section 1, the last paragraph is amended to read as follows:

'This Directive also applies to the EC type-approval procedure for replacement catalytic converters as separate technical units intended to be fitted on vehicles of category M<sub>1</sub> and N<sub>1</sub>.'

2. Sections 2.17 and 2.18 read as follows and section 2.19 is replaced by the following:

'2.17. "original equipment catalytic converter", means a catalytic converter or an assembly of catalytic converters covered by the type-approval delivered for the vehicle and which are indicated in point 1.10 of the Appendix to Annex X to this Directive.

2.18. "replacement catalytic converter" means a catalytic converter or an assembly of catalytic converters intended to replace an original equipment catalytic converter on a vehicle approved according to Directive 70/220/EEC which can be approved as a separate technical unit as defined in Article 4(1)(d) of Directive 70/156/EEC.

2.19. "original replacement catalytic converter" means a catalytic converter or an assembly of catalytic converters whose types are indicated in point 1.10 of the Appendix to Annex X to this Directive but are offered on the market as separate technical units by the holder of the vehicle type-approval.'

3. Section 3.2 is replaced as follows:

'3.2. A model of the information document relating to tailpipe emissions, evaporative emissions, durability and the on-board diagnostic (OBD) system is given in Annex II. The information listed under section 3.2.12.2.8.6 of Annex II is to be included in Appendix 2 "OBD related information" to the EC type-approval certificate given in Annex X.'

4. Section 5.2.2 is replaced as follows:

'5.2.2. Positive-ignition engine powered vehicle fuelled with LPG or NG (mono or bi-fuel) shall be subjected to the following tests:

Type I (verifying the average tailpipe emissions after a cold start),

Type II (carbon monoxide emissions at idling speed),

Type III (emission of crankcase gases),

Type IV (evaporative emissions), where applicable,

Type V (durability of pollution control devices),

Type VI (verifying the average low ambient temperature carbon monoxide and hydrocarbon tailpipe emissions after a cold start), where applicable,

OBD test, where applicable.'

5. Figure I.5.2 is replaced by the following:

Type-approval test	Positive-ignition engined vehicles of categories M and N			Compression-ignition engined vehicles of categories M <sub>1</sub> and N <sub>1</sub>
	Petrol-fuelled vehicle	Bi-fuel vehicle	Mono-fuel vehicle	
Type I	Yes (maximum mass ≤ 3,5 t)	Yes (test with both fuel types) (maximum mass ≤ 3,5 t)	Yes (maximum mass ≤ 3,5 t)	Yes (maximum mass ≤ 3,5 t)
Type II	Yes	Yes (test with both fuel types)	Yes	—
Type III	Yes	Yes (test only with petrol)	Yes	—
Type IV	Yes (maximum mass ≤ 3,5 t)	Yes (test only with petrol) (maximum mass ≤ 3,5 t)	—	—
Type V	Yes (maximum mass ≤ 3,5 t)	Yes (test only with petrol) (maximum mass ≤ 3,5 t)	Yes (maximum mass ≤ 3,5 t)	Yes (maximum mass ≤ 3,5 t)
Type VI	Yes (maximum mass ≤ 3,5 t)	Yes (maximum mass ≤ 3,5 t) (test only with petrol)	—	—
Extension	Section 6	Section 6	Section 6	Section 6; M <sub>2</sub> and N <sub>2</sub> with a reference mass ≤ 2 840 kg <sup>(1)</sup>
On-board diagnostics	Yes, in accordance with section 8.1.1 or 8.4	Yes, in accordance with section 8.1.2 or 8.4	Yes, in accordance with section 8.1.2 or 8.4	Yes, in accordance with sections 8.2, 8.3 or 8.4

(1) The Commission will study further the question of extending the type-approval test to vehicles in categories M<sub>2</sub> and N<sub>2</sub> with a reference mass not exceeding 2 840 kg and put forward proposals no later than 2004 in accordance with the procedure laid down in Article 13 of Directive 70/156/EEC, for measures to be applied in 2005.'

6. In footnote 1 to section 5.3.7.3, the coefficients for Hcv and Ocv are changed to the following:

Hcv = Atomic ratio of hydrogen to carbon [1,73], in the case of LPG [2,53], in the case of NG [4,0]

Ocv = Atomic ratio of oxygen to carbon [0,02], in the case of LPG [zero], in the case of NG [zero].

7. Section 5.3.8 is replaced by the following:

'5.3.8. Replacement catalytic converters and original replacement catalytic converters

5.3.8.1. Replacement catalytic converters intended to be fitted to EC type-approved vehicles must be tested in accordance with Annex XIII.

5.3.8.2. Original replacement catalytic converters, which are of a type covered by point 1.10 of the Appendix to Annex X and are intended for fitment to a vehicle to which the relevant type-approval document refers, do not need to comply with Annex XIII to this Directive provided they fulfil the requirements of sections 5.3.8.2.1 and 5.3.8.2.2.

5.3.8.2.1. Marking

Original replacement catalytic converters shall bear at least the following identifications:

5.3.8.2.1.1. the vehicle manufacturer's name or trade mark;

5.3.8.2.1.2. the make and identifying part number of the original replacement catalytic converter as recorded in the information mentioned in point 5.3.8.3.

5.3.8.2.2. Documentation

Original replacement catalytic converters shall be accompanied by the following information:

5.3.8.2.2.1. the vehicle manufacturer's name or trade mark;

5.3.8.2.2.2. make and identifying part number of the original replacement catalytic converter as recorded in the information mentioned in point 5.3.8.3;

5.3.8.2.2.3. the vehicles for which the original replacement catalytic converter is of a type covered by point 1.10 of the Appendix to Annex X, including, where applicable, a marking to identify if the original replacement catalytic converter is suitable for fitting to a vehicle that is equipped with an on-board diagnostic (OBD) system;

5.3.8.2.2.4. installation instructions, where necessary;

5.3.8.2.2.5. this information shall be provided either:

- as a leaflet accompanying the original replacement catalytic converter, or
- on the packaging in which the original replacement catalytic converter is sold, or
- or by any other applicable means.

In any case, the information must be available in the product catalogue distributed to points of sale by the vehicle manufacturer.

5.3.8.3. The vehicle manufacturer shall provide to the technical service and/or approval authority the necessary information in electronic format which makes the link between the relevant part numbers and the type approval documentation.

This information shall contain:

- make(s) and type(s) of vehicle,
- make(s) and type(s) of original replacement catalytic converter,
- part number(s) of original replacement catalytic converter,
- type-approval number of the relevant vehicle type(s).'

8. Section 7.1.1 is replaced by the following:

'7.1.1. Audit of in-service conformity by the type-approval authority is conducted on the basis of any relevant information that the manufacturer has, under procedures similar to those defined in Article 10(1) and (2) of Directive 70/156/EEC and in points 1 and 2 of Annex X to that Directive.

Figures I.8 and I.9 in Appendix 4 to this Annex illustrate the procedure for in-service conformity checking.

## 7.1.1.1. Parameters defining the in-service family

The in-service family may be defined by basic design parameters which must be common to vehicles within the family. Accordingly, those vehicle types which have in common, or within the stated tolerances, at least the parameters described below, can be considered as belonging to the same in-service family:

- combustion process (2-stroke, 4-stroke, rotary),
- number of cylinders,
- configuration of the cylinder block (in-line, V, radial, horizontally opposed, other). The inclination or orientation of the cylinders is not a criteria,
- method of engine fuelling (e.g. indirect or direct injection),
- type of cooling system (air, water, oil),
- method of aspiration (naturally aspirated, pressure charged),
- fuel for which the engine is designed (petrol, diesel, NG, LPG, etc). Bi-fuelled vehicles may be grouped with dedicated fuel vehicles providing one of the fuels is common,
- type of catalytic converter (three-way catalyst or other(s)),
- type of particulate trap (with or without),
- exhaust gas recirculation (with or without),
- engine cylinder capacity of the largest engine within the family minus 30 %.

7.1.1.2. An audit of in-service conformity will be conducted by the type-approval authority on the basis of information supplied by the manufacturer. Such information must include, but is not limited to, the following:

- 7.1.1.2.1. the name and address of the manufacturer;
- 7.1.1.2.2. the name, address, telephone and fax numbers and e-mail address of his authorised representative within the areas covered by the manufacturer's information;
- 7.1.1.2.3. the model name(s) of the vehicles included in the manufacturer's information;
- 7.1.1.2.4. where appropriate, the list of vehicle types covered within the manufacturer's information, i.e. the in-service family group in accordance with section 7.1.1.1;
- 7.1.1.2.5. the vehicle identification number (VIN) codes applicable to these vehicle types within the in-service family (VIN prefix);
- 7.1.1.2.6. the numbers of the type approvals applicable to these vehicle types within the in-service family, including, where applicable, the numbers of all extensions and field fixes/recalls (re-works);
- 7.1.1.2.7. details of extensions, field fixes/recalls to those type approvals for the vehicles covered within the manufacturer's information (if requested by the type-approval authority);
- 7.1.1.2.8. the period of time over which the manufacturer's information was collected;
- 7.1.1.2.9. the vehicle build period covered within the manufacturer's information (e.g. vehicles manufactured during the 2001 calendar year);

- 7.1.1.2.10. the manufacturer's in-service conformity checking procedure, including:
    - 7.1.1.2.10.1. vehicle location method;
    - 7.1.1.2.10.2. vehicle selection and rejection criteria;
    - 7.1.1.2.10.3. test types and procedures used for the programme;
    - 7.1.1.2.10.4. the manufacturer's acceptance/rejection criteria for the in-service family group;
    - 7.1.1.2.10.5. geographical area(s) within which the manufacturer has collected information;
    - 7.1.1.2.10.6. sample size and sampling plan used;
    - 7.1.1.2.11. the results from the manufacturer's in-service conformity procedure, including:
      - 7.1.1.2.11.1. identification of the vehicles included in the programme (whether tested or not). The identification will include:
        - model name,
        - vehicle identification number (VIN),
        - vehicle registration number,
        - date of manufacture,
        - region of use (where known),
        - tyres fitted;
      - 7.1.1.2.11.2. the reason(s) for rejecting a vehicle from the sample;
      - 7.1.1.2.11.3. service history for each vehicle in the sample (including any re-works);
      - 7.1.1.2.11.4. repair history for each vehicle in the sample (where known);
      - 7.1.1.2.11.5. test data, including:
        - date of test,
        - location of test,
        - distance indicated on vehicle odometer,
        - test fuel specifications (e.g. test reference fuel or market fuel),
        - test conditions (temperature, humidity, dynamometer inertia weight),
        - dynamometer settings (e.g. power setting),
        - test results (from at least three different vehicles per family);
    - 7.1.1.2.12. records of indication from the OBD system.'
9. Section 7.1.2 is replaced by the following:
- '7.1.2. The information gathered by the manufacturer must be sufficiently comprehensive to ensure that in-service performance can be assessed for normal conditions of use as defined in section 7.1 and in a way representative of the manufacturer's geographic penetration.



For the purpose of this Directive, the manufacturer shall not be obliged to carry out an audit of in-service conformity for a vehicle type if he can demonstrate to the satisfaction of the type-approval authority that the annual sales of that vehicle type are less than 5 000 per annum in the Community.'

10. Section 7.1.7 is replaced by the following. Sections 7.1.7.1 to 7.1.7.5 remain unchanged:

- '7.1.7. On the basis of the audit referred to in section 7.1.1, the type-approval authority must either:
- decide that the in-service conformity of a vehicle type or a vehicle in-service family is satisfactory and not take any further action,
  - decide that the data provided by the manufacturer is insufficient to reach a decision and request additional information or test data from the manufacturer, or
  - decide that the in-service conformity of a vehicle type, or vehicle type(s) that is/are part of an in-service family, is unsatisfactory and proceed to have such vehicle type(s) tested in accordance with Appendix 3 to this Annex.

In the case that the manufacturer has been permitted to not carry out an audit for a particular vehicle type in accordance with section 7.1.2, the type-approval authority may proceed to have such vehicle types tested in accordance with Appendix 3 to this Annex.'

11. Section 2.6 of Appendix 3 is replaced by the following:

- '2.6. The lead content and sulphur content of a fuel sample from the vehicle tank must meet the applicable standards laid down in Directive 98/70/EC (\*) and there must be no evidence of mis-fuelling. Checks may be done in the tailpipe etc.

\_\_\_\_\_ (\*) OJ L 350, 28.12.1998, p. 58.'

12. Section 6.1 of Appendix 3 is replaced by the following:

- '6.1. When more than one vehicle is found to be an outlying emitter that either,
- meets the conditions of section 3.2.3 of Appendix 4 and where both the type-approval authority and the manufacturer agree that the excess emission is due to the same cause, or
  - meets the conditions of section 3.2.4 of Appendix 4 where the type-approval authority has determined that the excess emission is due to the same cause,

the type-approval authority must request the manufacturer to submit a plan of remedial measures to remedy the non-compliance.'

13. Appendix 4 to Annex I is amended as follows:

- (a) Section 3 is replaced by the following:

'3. PROCEDURE TO BE FOLLOWED WITH OUTLYING EMITTERS IN THE SAMPLE (\*)

- 3.1. With a minimum sample size of three and a maximum sample size as determined by the procedure of paragraph 4, a vehicle is taken at random from the sample and the emissions of the regulated pollutants are measured to determine if it is an outlying emitter.

- 3.2. A vehicle is said to be an outlying emitter when the conditions given in either section 3.2.1 or section 3.2.2 are met.
- 3.2.1. In the case of a vehicle that has been type-approved according to the limit values given in row A of the table in section 5.3.1.4 of Annex I, an outlying emitter is a vehicle where the applicable limit value for any regulated pollutant is exceeded by a factor of 1,2.
- 3.2.2. In the case of a vehicle that has been type-approved according to the limit values given in row B of the table in section 5.3.1.4 of Annex I, an outlying emitter is a vehicle where the applicable limit value for any regulated pollutant is exceeded by a factor of 1,5.
- 3.2.3. In the specific case of a vehicle with a measured emission for any regulated pollutant within the "intermediate zone" (\*\*).
- 3.2.3.1. If the vehicle meets the conditions of this section, the cause of the excess emission must be determined and another vehicle is then taken at random from the sample.
- 3.2.3.2. Where more than one vehicle meets the condition of this section, the type-approval authority and the manufacturer must determine if the excess emission from both vehicles is due to the same cause or not.
- 3.2.3.2.1. If the type-approval authority and the manufacturer both agree that the excess emission is due to the same cause, the sample is regarded as having failed and the plan of remedial measures outlined in section 6 of Appendix 3 applies.
- 3.2.3.2.2. If the type-approval authority and the manufacturer can not agree on either the cause of the excess emission from an individual vehicle or whether the causes for more than one vehicle are the same, another vehicle is taken at random from the sample, unless the maximum sample size has already been reached.
- 3.2.3.3. When only one vehicle meeting the conditions of this section has been found, or when more than one vehicle has been found and the type-approval authority and the manufacturer agree it is due to different causes, another vehicle is taken at random from the sample, unless the maximum sample size has already been reached.
- 3.2.3.4. If the maximum sample size is reached and not more than one vehicle meeting the requirements of this section has been found where the excess emission is due to the same cause, the sample is regarded as having passed with regard to the requirements of section 3 of this Appendix.
- 3.2.3.5. If, at any time, the initial sample has been exhausted, another vehicle is added to the initial sample and that vehicle is taken.
- 3.2.3.6. Whenever another vehicle is taken from the sample, the statistical procedure of paragraph 4 of this Appendix is applied to the increased sample.
- 3.2.4. In the specific case of a vehicle with a measured emission for any regulated pollutant within the "failure zone" (\*\*\*).
- 3.2.4.1. If the vehicle meets the conditions of this section, the type-approval authority shall determine the cause of the excess emission and another vehicle is then taken at random from the sample.

- 3.2.4.2. Where more than one vehicle meets the condition of this section, and the type-approval authority determines that the excess emission is due to the same cause, the manufacturer shall be informed that the sample is regarded as having failed, together with the reasons for that decision, and the plan of remedial measures outlined in section 6 of Appendix 3 applies.
- 3.2.4.3. When only one vehicle meeting the conditions of this section has been found, or when more than one vehicle has been found and the type-approval authority has determined that it is due to different causes, another vehicle is taken at random from the sample, unless the maximum sample size has already been reached.
- 3.2.4.4. If the maximum sample size is reached and not more than one vehicle meeting the requirements of this section has been found where the excess emission is due to the same cause, the sample is regarded as having passed with regard to the requirements of section 3 of this Appendix.
- 3.2.4.5. If, at any time, the initial sample has been exhausted, another vehicle is added to the initial sample and that vehicle is taken.
- 3.2.4.6. Whenever another vehicle is taken from the sample, the statistical procedure of paragraph 4 of this Appendix is applied to the increased sample.
- 3.2.5. Whenever a vehicle is not found to be an outlying emitter, another vehicle is taken at random from the sample.

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(\*) On the basis of actual in-service data to be supplied before 31 December 2003 by the Member States, the requirements of this section may be reviewed and consider (a) whether the definition of outlying emitter needs to be revised with respect to vehicles that have been type-approved according to the limit values given in row B of the table in section 5.3.1.4 of Annex I, (b) whether the procedure for identifying outlying emitters should be amended and (c) whether the procedures for in-service conformity testing should be replaced at an appropriate time by a new statistical procedure. If appropriate, the Commission will propose the necessary amendments in accordance with the procedure laid down in Article 13 of Directive 70/156/EEC.

(\*\*) For any vehicle, the "intermediate zone" is determined as follows. The vehicle shall meet the conditions given in either section 3.2.1 or section 3.2.2 and in addition, the measured value for the same regulated pollutant shall be below a level that is determined from the product of the limit value for the same regulated pollutant given in row A of the table in section 5.3.1.4 of Annex I multiplied by a factor of 2,5.

(\*\*\*) For any vehicle, the "failure zone" is determined as follows. The measured value for any regulated pollutant exceeds a level that is determined from the product of the limit value for the same regulated pollutant given in row A of the table in section 5.3.1.4. of Annex I multiplied by a factor of 2.5.'

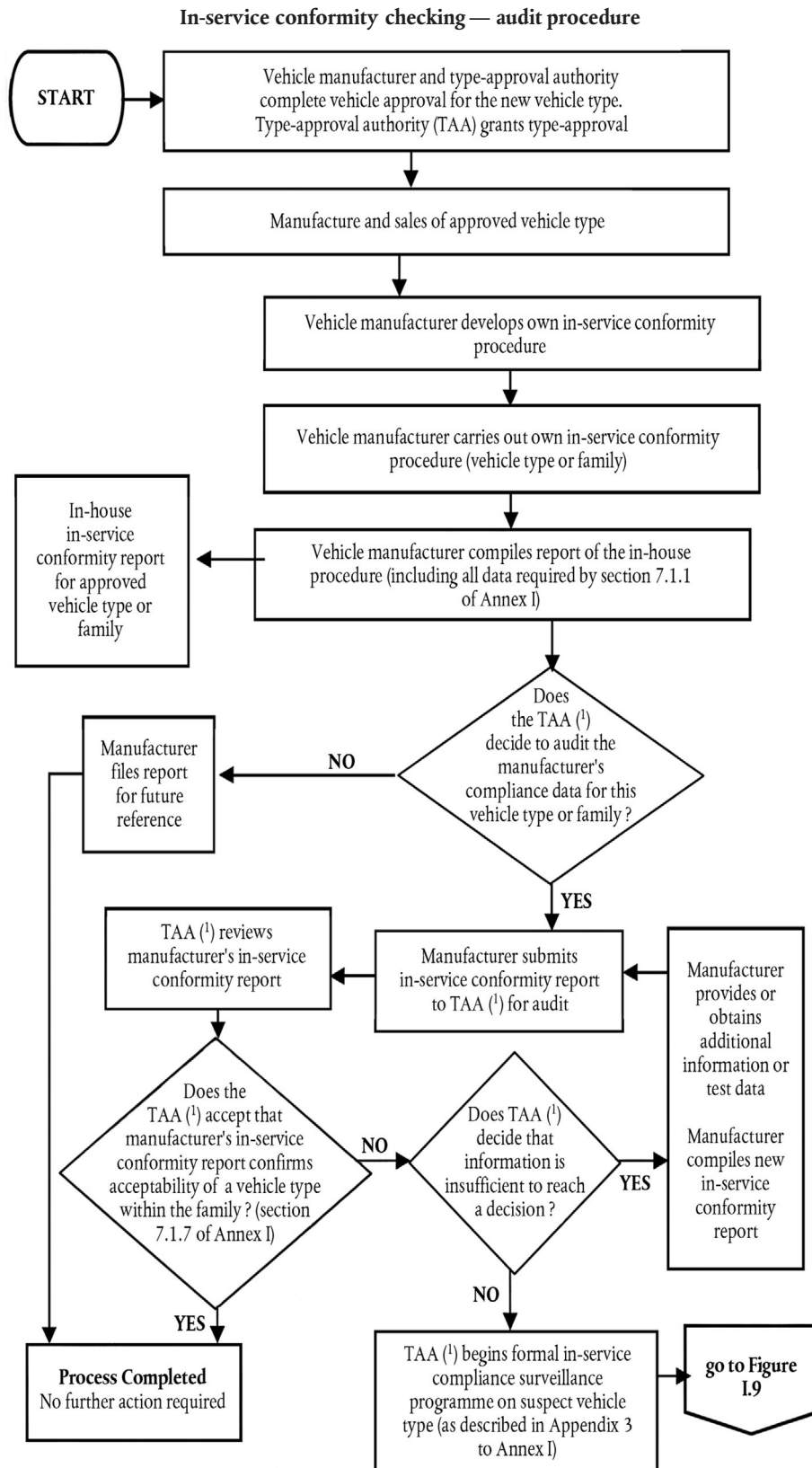
(b) In section 4.2, the phrase '(see Figure I.7)' is replaced by '(see Figure I.9)'.

(c) 'Figure I.7.' becomes 'Figure I.9. In-service conformity testing — selection and test of vehicles'.

In Figure I.9, the word 'yes' immediately above the diamond box at the bottom left of the figure shall be changed to the word 'no'. In Figure I.9, the word 'no' immediately above the diamond box at the bottom right of the figure is replaced by 'no, or uncertain'.

(d) A 'Figure I.8' is inserted as follows:

'Figure I.8



(1) In this case, TAA means the type-approval authority that granted the type-approval according to Directive 70/220/EEC.'

**B. Annex II is amended as follows:**

1. Section 3.2.12.2.8.6 is added, as follows:

- 3.2.12.2.8.6. The following additional information must be provided by the vehicle manufacturer for the purposes of enabling the manufacture of OBD-compatible replacement or service parts and diagnostic tools and test equipment, unless such information is covered by intellectual property rights or constitutes specific know-how of the manufacturer or the OEM supplier(s).

The information given in this section shall be repeated in Appendix 2 to the EC type-approval certificate (Annex X to this Directive):

- 3.2.12.2.8.6.1. A description of the type and number of the pre-conditioning cycles used for the original type approval of the vehicle.
- 3.2.12.2.8.6.2. A description of the type of the OBD demonstration cycle used for the original type-approval of the vehicle for the component monitored by the OBD system.
- 3.2.12.2.8.6.3. A comprehensive document describing all sensed components with the strategy for fault detection and MI activation (fixed number of driving cycles or statistical method), including a list of relevant secondary sensed parameters for each component monitored by the OBD system. A list of all OBD output codes and format used (with an explanation of each) associated with individual emission related power-train components and individual non-emission related components, where monitoring of the component is used to determine MI activation. In particular, a comprehensive explanation for the data given in service \$05 Test ID \$21 to FF and the data given in service \$06 must be provided. In the case of vehicle types that use a communication link in accordance with ISO 15765-4 "Road vehicles, diagnostics on controller area network (CAN) — part 4: requirements for emissions-related systems", a comprehensive explanation for the data given in service \$06 Test ID \$00 to FF, for each OBD monitor ID supported, must be provided.
- 3.2.12.2.8.6.4. The information required by this section may, for example, be defined by completing a table as follows, which shall be attached to this Annex.

Component	Fault code	Monitoring strategy	Fault detection criteria	MI activation criteria	Secondary parameters	Preconditioning	Demonstration test
Catalyst	P0420	Oxygen sensor 1 and 2 signals	Difference between sensor 1 and sensor 2 signals	3rd cycle	Engine speed, engine load, A/F mode, catalyst temperature	Two Type I cycles	Type I'

**C. Annex III is amended as follows:**

1. Section 2.3.5 is added as follows:

- 2.3.5. At the request of the manufacturer, for a vehicle type where the idle speed of the engine is higher than the engine speed that would occur during operations 5, 12 and 24 of the elementary urban cycle (Part One), the clutch may be disengaged during the previous operation.'

2. Section 3.2 is replaced by the following:

‘3.2. Fuel

When testing a vehicle against the emission limit values given in row A of the table in section 5.3.1.4 of Annex I to this Directive, the appropriate reference fuel must comply with the specifications given in section A of Annex IX or, in the case of gaseous reference fuels, either section A.1 or section B of Annex IXa.

When testing a vehicle against the emission limit values given in row B of the table in section 5.3.1.4 of Annex I to this Directive, the appropriate reference fuel must comply with the specifications given in section B of Annex IX or, in the case of gaseous reference fuels, either section A.2 or section B of Annex IXa.’

3. In column 5 of Table III.1.2 (entitled: Speed (km/h)); operation 23 reads as follows: ‘35 — 10’.

D. In Annex VII Section 3.4.1 is replaced by the following:

‘3.4.1. The test fuel must comply with the specifications given in section C of Annex IX.’

E. Annex IX is replaced by the following:

‘ANNEX IX

A. Specifications of reference fuels for testing vehicles to the emission limits given in row A of the table in section 5.3.1.4 of Annex I — Type I test

1. TECHNICAL DATA ON THE REFERENCE FUEL TO BE USED FOR TESTING VEHICLES EQUIPPED WITH POSITIVE-IGNITION ENGINES

Type: Unleaded petrol

Parameter	Unit	Limits <sup>(1)</sup>		Test method
		Minimum	Maximum	
Research octane number, RON		95,0	—	EN 25164
Motor octane number, MON		85,0	—	EN 25163
Density at 15 °C	kg/m <sup>3</sup>	748	762	ISO 3675
Reid vapour pressure	kPa	56,0	60,0	EN 12
Distillation:				
— initial boiling point	°C	24	40	EN-ISO 3405
— evaporated at 100 °C	% v/v	49,0	57,0	EN-ISO 3405
— evaporated at 150 °C	% v/v	81,0	87,0	EN-ISO 3405
— final boiling point	°C	190	215	EN-ISO 3405
Residue	% v/v	—	2	EN-ISO 3405

Parameter	Unit	Limits <sup>(1)</sup>		Test method
		Minimum	Maximum	
Hydrocarbon analysis:				
— olefins	% v/v	—	10	ASTM D 1319
— aromatics	% v/v	28,0	40,0	ASTM D 1319
— benzene	% v/v	—	1,0	Pr. EN 12177
— saturates	% v/v	—	balance	ASTM D 1319
Carbon/hydrogen ratio		report	report	
Induction period <sup>(2)</sup>	minutes	480	—	EN-ISO 7536
Oxygen content	% m/m	—	2,3	EN 1601
Existent gum	mg/ml	—	0,04	EN-ISO 6246
Sulphur content <sup>(3)</sup>	mg/kg	—	100	Pr. EN ISO/DIS 14596
Class I copper corrosion		—	1	EN-ISO 2160
Lead content	mg/l	—	5	EN 237
Phosphorus content	mg/l	—	1,3	ASTM D 3231

(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 should 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 the questions as to whether a fuel meets the requirements of the specifications, the terms of ISO 4259 should be applied.

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

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

## 2. TECHNICAL DATA ON THE REFERENCE FUEL TO BE USED FOR TESTING VEHICLES EQUIPPED WITH DIESEL ENGINE

Type: Diesel fuel

Parameter	Unit	Limits <sup>(1)</sup>		Test method
		Minimum	Maximum	
Cetane number <sup>(2)</sup>		52,0	54,0	EN-ISO 5165
Density at 15 °C	kg/m <sup>3</sup>	833	837	EN-ISO 3675
Distillation:				
— 50 % point	°C	245	—	EN-ISO 3405
— 95 % point	°C	345	350	EN-ISO 3405
— final boiling point	°C	—	370	EN-ISO 3405

Parameter	Unit	Limits <sup>(1)</sup>		Test method
		Minimum	Maximum	
Flash point	°C	55	—	EN 22719
CFPP	°C	—	- 5	EN 116
Viscosity at 40 °C	mm <sup>2</sup> /s	2,5	3,5	EN-ISO 3104
Polycyclic aromatic hydrocarbons	% m/m	3	6,0	IP 391
Sulphur content <sup>(3)</sup>	mg/kg	—	300	Pr. EN-ISO/DIS 14596
Copper corrosion		—	1	EN-ISO 2160
Conradson carbon residue (10 % DR)	% m/m	—	0,2	EN-ISO 10370
Ash content	% m/m	—	0,01	EN-ISO 6245
Water content	% m/m	—	0,02	EN-ISO 12937
Neutralisation (strong acid) number	mg KOH/g	—	0,02	ASTM D 974-95
Oxidation stability <sup>(4)</sup>	mg/ml	—	0,025	EN-ISO 12205
New and better method for polycyclic aromatics under development	% m/m	—	—	EN 12916

<sup>(1)</sup> 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 should 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 the questions as to whether a fuel meets the requirements of the specifications, the terms of ISO 4259 should be applied.

<sup>(2)</sup> 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.

<sup>(3)</sup> The actual sulphur content of the fuel used for the Type I test shall be reported.

<sup>(4)</sup> Even though oxidation stability is controlled, it is likely that shelf life will be limited. Advice should be sought from the supplier as to storage conditions and life.



**B. Specifications of reference fuels for testing vehicles to the emission limits given in row B of the table in section 5.3.1.4 of Annex I — Type I test**

1. TECHNICAL DATA ON THE REFERENCE FUEL TO BE USED FOR TESTING VEHICLES EQUIPPED WITH POSITIVE-IGNITION ENGINES

Type: Unleaded petrol

Parameter	Unit	Limits <sup>(1)</sup>		Test method
		Minimum	Maximum	
Research octane number, RON		95,0	—	EN 25164
Motor octane number, MON		85,0	—	EN 25163
Density at 15 °C	kg/m <sup>3</sup>	740	754	ISO 3675
Reid vapour pressure	kPa	56,0	60,0	PrEN ISO 13016-1 (DVPE)
Distillation:				
— evaporated at 70 °C	% v/v	24,0	40,0	EN-ISO 3405
— evaporated at 100 °C	% v/v	50,0	58,0	EN-ISO 3405
— evaporated at 150 °C	% v/v	83,0	89,0	EN-ISO 3405
— final boiling point	°C	190	210	EN-ISO 3405
Residue	% v/v	—	2,0	EN-ISO 3405
Hydrocarbon analysis:				
— olefins	% v/v	—	10,0	ASTM D 1319
— aromatics	% v/v	29,0	35,0	ASTM D 1319
— benzene	% v/v	—	1,0	ASTM D 1319
— saturates	% v/v	report		Pr. EN 12177
Carbon/hydrogen ratio		report		
Induction period <sup>(2)</sup>	minutes	480	—	EN-ISO 7536
Oxygen content	% m/m	—	1,0	EN 1601
Existent gum	mg/ml	—	0,04	EN-ISO 6246
Sulphur content <sup>(3)</sup>	mg/kg	—	10	ASTM D 5453
Copper corrosion		—	class 1	EN-ISO 2160

Parameter	Unit	Limits <sup>(1)</sup>		Test method
		Minimum	Maximum	
Lead content	mg/l	—	5	EN 237
Phosphorus content	mg/l	—	1,3	ASTM D 3231

<sup>(1)</sup> 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 should 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 the questions as to whether a fuel meets the requirements of the specifications, the terms of ISO 4259 should be applied.

<sup>(2)</sup> The fuel may contain oxidation inhibitors and metal deactivators normally used to stabilise refinery gasoline streams, but detergent/dispersive additives and solvent oils must not be added.

<sup>(3)</sup> The actual sulphur content of the fuel used for the Type I test shall be reported.

## 2. TECHNICAL DATA ON THE REFERENCE FUEL TO BE USED FOR TESTING VEHICLES EQUIPPED WITH DIESEL ENGINE

Type: Diesel fuel

Parameter	Unit	Limits <sup>(1)</sup>		Test method
		Minimum	Maximum	
Cetane number <sup>(2)</sup>		52,0	54,0	EN-ISO 5165
Density at 15 °C	kg/m <sup>3</sup>	833	837	EN-ISO 3675
Distillation:				
— 50 % point	°C	245	—	EN-ISO 3405
— 95 % point	°C	345	350	EN-ISO 3405
— final boiling point	°C	—	370	EN-ISO 3405
Flash point	°C	55	—	EN 22719
CFPP	°C	—	- 5	EN 116
Viscosity at 40 °C	mm <sup>2</sup> /s	2,3	3,3	EN-ISO 3104
Polycyclic aromatic hydrocarbons	% m/m	3,0	6,0	IP 391
Sulphur content <sup>(3)</sup>	mg/kg	—	10	ASTM D 5453
Copper corrosion		—	Class 1	EN-ISO 2160
Conradson carbon residue (10 % DR)	% m/m	—	0,2	EN-ISO 10370
Ash content	% m/m	—	0,01	EN-ISO 6245

Parameter	Unit	Limits <sup>(1)</sup>		Test method
		Minimum	Maximum	
Water content	% m/m	—	0,02	EN-ISO 12937
Neutralisation (strong acid) number	mg KOH/g	—	0,02	ASTM D 974
Oxidation stability <sup>(4)</sup>	mg/ml	—	0,025	EN-ISO 12205
Lubricity (HFRR wear scan diameter at 60 °C)	µm	—	400	CEC F-06-A-96
FAME	Prohibited			

(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 should 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 the questions as to whether a fuel meets the requirements of the specifications, the terms of ISO 4259 should 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) The actual sulphur content of the fuel used for the Type I test shall be reported.

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

### C. Specifications of reference fuel to be used for testing vehicles equipped with positive-ignition engines at low ambient temperature — Type VI test

Type: Unleaded petrol

Parameter	Unit	Limits <sup>(1)</sup>		Test method
		Minimum	Maximum	
Research octane number, RON		95,0	—	EN 25164
Motor octane number, MON		85,0	—	EN 25163
Density at 15 °C	kg/m <sup>3</sup>	740	754	ISO 3675
Reid vapour pressure	kPa	56,0	95,0	Pr. EN ISO 13016-1 (DVPE)
Distillation:				
— evaporated at 70 °C	% v/v	24,0	40,0	EN-ISO 3405
— evaporated at 100 °C	% v/v	50,0	58,0	EN-ISO 3405
— evaporated at 150 °C	% v/v	83,0	89,0	EN-ISO 3405
— final boiling point	°C	190	210	EN-ISO 3405

Parameter	Unit	Limits <sup>(1)</sup>		Test method
		Minimum	Maximum	
Residue	% v/v	—	2,0	EN-ISO 3405
Hydrocarbon analysis:				
— olefins	% v/v	—	10,0	ASTM D 1319
— aromatics	% v/v	29,0	35,0	ASTM D 1319
— benzene	% v/v	—	1,0	ASTM D 1319
— saturates	% v/v	report		Pr. EN 12177
Carbon/hydrogen ratio		report		
Induction period <sup>(2)</sup>	minutes	480	—	EN-ISO 7536
Oxygen content	% m/m	—	1,0	EN 1601
Existent gum	mg/ml	—	0,04	EN-ISO 6246
Sulphur content <sup>(3)</sup>	mg/kg	—	10	ASTM D 5453
Copper corrosion		—	Class 1	EN-ISO 2160
Lead content	mg/l	—	5	EN 237
Phosphorus content	mg/l	—	1,3	ASTM D 3231

(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 should 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 the questions as to whether a fuel meets the requirements of the specifications, the terms of ISO 4259 should be applied.

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

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

F. **Annex IXa is amended as follows:**

'ANNEX IXa

**SPECIFICATIONS OF GASEOUS REFERENCE FUELS**

A. **Technical data of the LPG reference fuels**

1. TECHNICAL DATA OF THE LPG REFERENCE FUELS USED FOR TESTING VEHICLES TO THE EMISSION LIMITS GIVEN IN ROW A OF THE TABLE IN SECTION 5.3.1.4 OF ANNEX I — TYPE I TEST

Parameter	Unit	Fuel A	Fuel B	Test method
<i>Composition:</i>				ISO 7941
C <sub>3</sub> -content	% vol.	30 ± 2	85 ± 2	

Parameter	Unit	Fuel A	Fuel B	Test method
C <sub>4</sub> -content	% vol.	balance	balance	
< C <sub>3</sub> , > C <sub>4</sub>	% vol.	maximum 2	maximum 2	
Olefins	% vol.	maximum 12	maximum 15	
Evaporation residue	mg/kg	maximum 50	maximum 50	ISO 13757
Water at 0 °C		free	free	visual inspection
Total sulphur content	mg/kg	maximum 50	maximum 50	EN 24260
Hydrogen sulphide		none	none	ISO 8819
Copper strip corrosion	rating	class 1	class 1	ISO 6251 <sup>(1)</sup>
Odour		characteristic	characteristic	
Motor octane number		minimum 89	minimum 89	EN 589 Annex B

<sup>(1)</sup> This method may not accurately determine the presence of corrosive materials if the sample contains corrosion inhibitors or other chemicals which diminish the corrosivity of the sample to the copper strip. Therefore, the addition of such compounds for the sole purpose of biasing the test method is prohibited.

## 2. TECHNICAL DATA OF THE LPG REFERENCE FUELS USED FOR TESTING VEHICLES TO THE EMISSION LIMITS GIVEN IN ROW B OF THE TABLE IN SECTION 5.3.1.4 OF ANNEX I — TYPE I TEST

Parameter	Unit	Fuel A	Fuel B	Test method
<i>Composition:</i>				ISO 7941
C <sub>3</sub> -content	% vol	30 ± 2	85 ± 2	
C <sub>4</sub> -content	% vol	balance	balance	
< C <sub>3</sub> , > C <sub>4</sub>	% vol	maximum 2	maximum 2	
Olefins	% vol	maximum 12	maximum 15	
Evaporation residue	mg/kg	maximum 50	maximum 50	ISO 13757
Water at 0 °C		free	free	Visual inspection
Total sulphur content	mg/kg	maximum 10	maximum 10	EN 24260
Hydrogen sulphide		none	none	ISO 8819

Parameter	Unit	Fuel A	Fuel B	Test method
Copper strip corrosion	Rating	class 1	class 1	ISO 6251 <sup>(1)</sup>
Odour		characteristic	characteristic	
Motor octane number		minimum 89	minimum 89	EN 589 Annex B

<sup>(1)</sup> This method may not accurately determine the presence of corrosive materials if the sample contains corrosion inhibitors or other chemicals which diminish the corrosivity of the sample to the copper strip. Therefore, the addition of such compounds for the sole purpose of biasing the test method is prohibited.

#### B. Technical data of the ng reference fuels

Characteristics	Units	Basis	Limits		Test method
			minimum	maximum	

##### Reference fuel G<sub>20</sub>

<i>Composition:</i>					
Methane	% mole	100	99	100	ISO 6974
Balance <sup>(1)</sup>	% mole	—	—	1	ISO 6974
N <sub>2</sub>	% mole				ISO 6974
Sulphur content	mg/m <sup>3</sup> <sup>(2)</sup>	—	—	10	ISO 6326-5
Wobbe Index (net)	MJ/m <sup>3</sup> <sup>(3)</sup>	48,2	47,2	49,2	

##### Reference fuel G<sub>25</sub>

<i>Composition:</i>					
Methane	% mole	86	84	88	ISO 6974
Balance <sup>(1)</sup>	% mole	—	—	1	ISO 6974
N <sub>2</sub>	% mole	14	12	16	ISO 6974
Sulphur content	mg/m <sup>3</sup> <sup>(2)</sup>	—	—	10	ISO 6326-5
Wobbe Index (net)	MJ/m <sup>3</sup> <sup>(3)</sup>	39,4	38,2	40,6	

<sup>(1)</sup> Inerts (different from N<sub>2</sub>) + C<sub>2</sub> + C<sub>2+</sub>.

<sup>(2)</sup> Value to be determined at 293,2 K (20 °C) and 101,3 kPa.

<sup>(3)</sup> Value to be determined at 273,2 K (0 °C) and 101,3 kPa.

**G. Annex X is amended as follows:**

1. The third line in the title is replaced by the following:

'EC TYPE-APPROVAL CERTIFICATE'

2. Section 1.8.1.1 is replaced by the following:

'1.8.1.1. Repeat the table for all reference gases of LPG or NG, showing if the results are measured or calculated and repeat the table for the (one) final result of the vehicle emissions on LPG or NG. In case of a bi-fuel vehicle, show the result for petrol and repeat the table for all reference gases of LPG or NG, showing if the results are measured or calculated and repeat the table for the (one) final result of the vehicle emissions on LPG or NG.'

3. 'Appendix' becomes 'Appendix 1' and the title is replaced by the following 'Addendum to EC type-approval certificate No...':
4. Section 1.10 is added to Appendix 1 as follows:

'1.10. Catalytic converters

1.10.1. Original equipment catalytic converter tested to all relevant requirements of this Directive

1.10.1.1. Make and type of original equipment catalytic converter as listed in item 3.2.12.2.1 of Annex II to this Directive (the information document)

1.10.2. Original replacement catalytic converter tested to all relevant requirements of this Directive

1.10.2.1. Make(s) and types (s) of original replacement catalytic converter as listed in item 3.2.12.2.1 of Annex II to this Directive (the information document)'

5. Appendix 2 is added as follows:

*'Appendix 2*

**OBD-related information**

As noted in section 3.2.12.2.8.6 of the information document, the information in this appendix is provided by the vehicle manufacturer for the purposes of enabling the manufacture of OBD-compatible replacement or service parts and diagnostic tools and test equipment. Such information need not be supplied by the vehicle manufacturer if it is covered by intellectual property rights or constitutes specific know-how of the manufacturer or the OEM supplier(s).

Upon request, this appendix will be made available to any interested component, diagnostic tools or test equipment manufacturer, on a non-discriminatory basis.

1. A description of the type and number of the preconditioning cycles used for the original type-approval of the vehicle.
2. A description of the type of the OBD demonstration cycle used for the original type-approval of the vehicle for the component monitored by the OBD system.
3. A comprehensive document describing all sensed components with the strategy for fault detection and MI activation (fixed number of driving cycles or statistical method), including a list of relevant secondary sensed parameters for each component monitored by the OBD system. A list of all OBD output codes and format used (with an explanation of each) associated with individual emission-related power-train components and individual non-emission related components, where monitoring of the component is used to determine MI activation. In particular, a comprehensive explanation for the data given in service \$ 05 Test ID \$ 21 to FF and the data given in service \$ 06 must be provided. In the case of vehicle types that use a communication link in accordance with ISO 15765-4 "Road vehicles — Diagnostics on Controller Area Network (CAN) — Part 4: Requirements for emissions-related systems", a comprehensive explanation for the data given in service \$ 06 Test ID \$ 00 to FF, for each OBD monitor ID supported, must be provided.

This information may be defined in the form of a table, as follows:

Component	Fault code	Monitoring strategy	Fault detection criteria	MI activation criteria	Secondary parameters	Preconditioning	Demonstration test
Catalyst	P0420	Oxygen sensor 1 and 2 signals	Difference between sensor 1 and sensor 2 signals	3rd cycle	Engine speed, engine load, A/F mode, catalyst temperature	Two Type I cycles	Type I'

H. **Annex XI is amended as follows:**

1. Section 2.6 is replaced by the following:

'2.6. "Malfunction" means the failure of an emission-related component or system that would result in emissions exceeding the limits in section 3.3.2 or if the OBD system is unable to fulfil the basic monitoring requirements of this Annex.'

2. Section 3.5.2 is replaced by the following:

'3.5.2. For strategies requiring more than two preconditioning cycles for MI activation, the manufacturer must provide data and/or an engineering evaluation which adequately demonstrates that the monitoring system is equally effective and timely in detecting component deterioration. Strategies requiring on average more than 10 driving cycles for MI activation are not accepted. The MI must also activate whenever the engine control enters a permanent emission default mode of operation if the emission limits given in 3.3.2 are exceeded or if the OBD system is unable to fulfil the basic monitoring requirements specified in section 3.3.3 or section 3.3.4 of this Annex. The MI must operate in a distinct warning mode, e.g. a flashing light, under any period during which engine misfire occurs at a level likely to cause catalyst damage, as specified by the manufacturer. The MI must also activate when the vehicle's ignition is in the "key-on" position before engine starting or cranking and de-activate after engine starting if no malfunction has previously been detected.'

3. Section 3.6 is replaced by the following:

'3.6. The OBD system must record fault code(s) indicating the status of the emission control system. Separate status codes must be used to identify correctly functioning emission control systems and those emission control systems which need further vehicle operation to be fully evaluated. If the MI is activated due to deterioration or malfunction or permanent emission default modes of operation, a fault code must be stored that identifies the type of malfunction. A fault code must also be stored in the cases referred to in sections 3.3.3.5 and 3.3.4.5 of this Annex.'

4. Section 3.9 is added as follows:

'3.9. Bi-fuelled gas vehicles

3.9.1. For bi-fuelled gas vehicles, the procedures:

- activation of malfunction indicator (MI) (see section 3.5 of this Annex),
- fault code storage (see section 3.6 of this Annex),



- extinguishing the MI (see section 3.7 of this Annex),
- erasing a fault code (see section 3.8 of this Annex),

shall be executed independently of each other when the vehicle is operated on petrol or on gas. When the vehicle is operated on petrol, the result of any of the procedures indicated above shall not be affected when the vehicle is operated on gas. When the vehicle is operated on gas, the result of any of the procedures indicated above shall not be affected when the vehicle is operated on petrol.

Notwithstanding this requirement, the status code (described in section 3.6 of this Annex) shall indicate fully evaluated control systems for both fuel types (petrol and gas) when the control systems are fully evaluated for one of the fuel types.'

5. Section 4.4 and 4.5 are replaced by the following:

'4.4. Prior to or at the time of type-approval, no deficiency shall be granted in respect of the requirements of section 6.5, except section 6.5.3.4 of Appendix 1 to this Annex. This section does not apply to bi-fuelled gas vehicles.

4.5. Bi-fuelled gas vehicles

4.5.1. Notwithstanding the requirements of section 3.9.1, and where requested by the manufacturer, the type-approval authority shall accept the following deficiencies as meeting the requirements of this Annex for the purpose of the type-approval of bi-fuelled gas vehicles:

- erasing of fault codes, distance travelled and freeze-frame information after 40 engine warm-up cycles, independent of the fuel currently in use,
- activation of the MI on both fuel types (petrol and gas) after the detection of a malfunction on one of the fuel types,
- de-activation of the MI after three subsequent sequential driving cycles without malfunction, independent of the fuel currently in use,
- use of two status codes, one for each fuel type.

Further options may be requested by the manufacturer and granted at the discretion of the type-approval authority.

4.5.2. Notwithstanding the requirements of section 6.6.1 of Appendix 1 to this Annex, and where requested by the manufacturer, the type-approval authority shall accept the following deficiencies as meeting the requirements of this Annex for the evaluation and transmission of diagnostic signals:

- transmission of the diagnostic signals for the fuel currently in use on a single source address,
- evaluation of one set of diagnostic signals for both fuel types (corresponding to the evaluation on mono-fuelled gas vehicles, and independent of the fuel currently in use),
- selection of one set of diagnostic signals (associated to one of the two fuel types) by the position of a fuel switch.

Further options may be requested by the manufacturer and granted at the discretion of the type-approval authority.'

6. Section '4.6.' becomes section '4.7.'

7. A new section 4.6. is inserted as follows:

‘4.6. Deficiency period

4.6.1. A deficiency may be carried-over for a period of two years after the date of type-approval of the vehicle type unless it can be adequately demonstrated that substantial vehicle hardware modifications and additional lead-time beyond two years would be necessary to correct the deficiency. In such a case, the deficiency may be carried-over for a period not exceeding three years.

4.6.1.1. In the case of a bi-fuelled gas vehicle, a deficiency granted in accordance with section 4.5 may be carried-over for a period of three years after the date of type-approval of the vehicle type unless it can be adequately demonstrated that substantial vehicle hardware modifications and additional lead-time beyond three years would be necessary to correct the deficiency. In such a case, the deficiency may be carried-over for a period not exceeding four years.

4.6.2. A manufacturer may request that the type-approval authority grant a deficiency retrospectively when such a deficiency is discovered after the original type-approval. In this case, the deficiency may be carried-over for a period of two years after the date of notification to the type-approval authority unless it can be adequately demonstrated that substantial vehicle hardware modifications and additional lead-time beyond two years would be necessary to correct the deficiency. In such a case, the deficiency may be carried-over for a period not exceeding three years.’

8. Section 5 is added as follows:

‘5. ACCESS TO OBD INFORMATION

5.1. Applications for type-approval or amendment of a type-approval according to either Article 3 or Article 5 of Directive 70/156/EEC shall be accompanied by the relevant information concerning the vehicle OBD system. This relevant information shall enable manufacturers of replacement or retrofit components to make the parts they manufacture compatible with the vehicle OBD system with a view to fault-free operation assuring the vehicle user against malfunctions. Similarly, such relevant information shall enable the manufacturers of diagnostic tools and test equipment to make tools and equipment that provide for effective and accurate diagnosis of vehicle emission control systems.

5.2. Upon request, the type-approval authorities shall make Appendix 2 to the EC type-approval certificate containing the relevant information on the OBD system available to any interested components, diagnostic tools or test equipment manufacturer on a non-discriminatory basis.

5.2.1. If a type-approval authority receives a request from any interested components, diagnostic tools or test equipment manufacturer for information on the OBD system of a vehicle that has been type-approved to a previous version of Directive 70/220/EEC,

— the type-approval authority shall, within 30 days, request the manufacturer of the vehicle in question to make available the information required in section 3.2.12.2.8.6 of Annex II. The requirement of the second paragraph of section 3.2.12.2.8.6 is not applicable,

— the manufacturer shall submit this information to the type-approval authority within two months of the request,

— the type-approval authority shall transmit this information to the approval authorities of the Member States and the authority which granted the original type-approval shall attach this information to Annex II to the vehicle type-approval information.

This requirement shall not invalidate any approval previously granted pursuant to Directive 70/220/EEC nor prevent extensions to such approvals under the terms of the Directive under which they were originally granted.

- 5.2.2. Information can only be requested for replacement or service components that are subject to EC type-approval, or for components that form part of a system that is subject to EC type-approval.
- 5.2.3. The request for information must identify the exact specification of the vehicle model for which the information is required. It must confirm that the information is required for the development of replacement or retrofit parts or components or diagnostic tools or test equipment.'

I. **Appendix 1 to Annex XI is amended as follows:**

1. Section 3.2. is replaced by the following:

'3.2. Fuel

The appropriate reference fuel as described in Annex IX for petrol and diesel fuels and in Annex IXa for LPG and NG fuels must be used for testing. The fuel type for each failure mode to be tested (described in section 6.3 of this Appendix) may be selected by the type-approval authority from the reference fuels described in Annex IXa in the case of the testing of a mono-fuelled gas vehicle and from the reference fuels described in Annex IX or Annex IXa in the case of the testing of a bi-fuelled gas vehicle. The selected fuel type must not be changed during any of the test phases (described in sections 2.1 to 2.3 of this Appendix). In the case of the use of LPG or NG as a fuel it is permissible that the engine is started on petrol and switched to LPG or NG after a pre-determined period of time which is controlled automatically and not under the control of the driver.'

2. Sections 6.3.1.4 and 6.3.1.5 are replaced by the following:

'6.3.1.4. Electrical disconnection of any other emission-related component connected to a powertrain management computer (if active on the selected fuel type).

6.3.1.5. Electrical disconnection of the electronic evaporative purge control device (if equipped and if active on the selected fuel type). For this specific failure mode, the Type I test need not be performed.'

3. Sections 6.4.1.5 and 6.4.1.6 are replaced by the following:

'6.4.1.5. Electrical disconnection of the electronic evaporative purge control device (if equipped and if active on the selected fuel type).

6.4.1.6. Electrical disconnection of any other emission-related powertrain component connected to a computer that results in emissions exceeding any of the limits given in section 3.3.2 of this Annex (if active on the selected fuel type).'

4. Section 6.5.3. is replaced by the following:

'6.5.3. The emission control diagnostic system must provide for standardised and unrestricted access and conform with the following ISO standards and/or SAE specification.

6.5.3.1. One of the following standards with the restrictions as described must be used as the on-board to off-board communications link:

ISO 9141 — 2: 1994 (amended 1996) "Road Vehicles — Diagnostic Systems — Part 2: CARB requirements for interchange of digital information";

SAE J1850: March 1998 "Class B Data Communication Network Interface". Emission-related messages must use the cyclic redundancy check and the three-byte header and not use inter-byte separation or checksums;

ISO 14230 — Part 4 "Road Vehicles — Keyword protocol 2000 for diagnostic systems — Part 4: Requirements for emissions-related systems";

ISO DIS 15765-4 "Road vehicles — Diagnostics on Controller Area Network (CAN) — Part 4: Requirements for emissions-related systems", dated 1 November 2001.

6.5.3.2. Test equipment and diagnostic tools needed to communicate with OBD systems must meet or exceed the functional specification given in ISO DIS 15031-4 "Road vehicles — Communication between vehicle and external test equipment for emissions-related diagnostics — Part 4: External test equipment", dated 1 November 2001.

6.5.3.3. Basic diagnostic data, (as specified in 6.5.1) and bi-directional control information must be provided using the format and units described in ISO DIS 15031-5 "Road vehicles — Communication between vehicle and external test equipment for emissions-related diagnostics — Part 5: Emissions-related diagnostic services", dated 1 November 2001, and must be available using a diagnostic tool meeting the requirements of ISO DIS 15031-4.

The vehicle manufacturer shall provide to a national standardisation body the details of any emission-related diagnostic data, e.g. PID's, OBD monitor Id's, Test Id's not specified in ISO DIS 15031-5 but related to this Directive.

6.5.3.4. When a fault is registered, the manufacturer must identify the fault using an appropriate fault code consistent with those given in Section 6.3. of ISO DIS 15031-6 "Road vehicles — Communication between vehicle and external test equipment for emissions-related diagnostics — Part 6: Diagnostic trouble code definitions", relating to "emission related system diagnostic trouble codes". If such identification is not possible, the manufacturer may use diagnostic trouble codes according to Sections 5.3 and 5.6 of ISO DIS 15031-6. The fault codes must be fully accessible by standardised diagnostic equipment complying with the provisions of section 6.5.3.2.

The vehicle manufacturer shall provide to a national standardisation body the details of any emission-related diagnostic data, e.g. PID's, OBD monitor Id's, Test Id's not specified in ISO DIS 15031-5 but related to this Directive.

6.5.3.5. The connection interface between the vehicle and the diagnostic tester must be standardised and must meet all the requirements of ISO DIS 15031-3 "Road vehicles — Communication between vehicle and external test equipment for emissions-related diagnostics — Part 3: Diagnostic connector and related electrical circuits: specification and use", dated 1 November 2001. The installation position must be subject to agreement of the approval authority such that it is readily accessible by service personnel but protected from accidental damage during normal conditions of use.'

5. Section 6.6 is added as follows:

'6.6. Bi-fuelled gas vehicles

6.6.1. For bi-fuelled gas vehicles, the diagnostic signals (as described in section 6.5 of Appendix 1 to this Annex) for the operation on petrol and for the operation on gas shall be evaluated and transmitted independently of each other. On a request from a diagnostic tool, the diagnostic signals for the vehicle operating on petrol shall be transmitted on one source address and the diagnostic signals for the vehicle operating on gas shall be transmitted on another source address. The use of source addresses is described in ISO DIS 15031-5 "Road vehicles — Communication between vehicle and external test equipment for emissions-related diagnostics — Part 5: Emissions-related diagnostic services", dated 1 November 2001.'

J. **Annex XIII is replaced by the following:**

*'ANNEX XIII*

**EC TYPE-APPROVAL OF REPLACEMENT CATALYTIC CONVERTER AS SEPARATE TECHNICAL UNIT**

1. SCOPE

This Annex applies to the EC type-approval, as separate technical units within the meaning of Article 4(1)(d) of Directive 70/156/EEC, of catalytic converters to be fitted on one or more given types of motor vehicles of categories M<sub>1</sub> and N<sub>1</sub> <sup>(1)</sup> as replacement parts.

2. DEFINITIONS

For the purpose of this Annex:

- 2.1. "original equipment catalytic converter" — see section 2.17 of Annex I;
- 2.2. "replacement catalytic converter" — see section 2.18 of Annex I;
- 2.3. "original replacement catalytic converter" — see section 2.19 of Annex I;
- 2.4. "type of catalytic converter" means catalytic converters which do not differ in such essential aspects as:
  - 2.4.1. number of coated substrates, structure and material;
  - 2.4.2. type of catalytic activity (oxidising, three-way, etc.);
  - 2.4.3. volume, ratio of frontal area and substrate length;
  - 2.4.4. catalyst material content;
  - 2.4.5. catalyst material ratio;
  - 2.4.6. cell density;
  - 2.4.7. dimensions and shape;
  - 2.4.8. thermal protection;
- 2.5. "vehicle type", see point 2.1 of Annex I;
- 2.6. "Approval of a replacement catalytic converter" means the approval of a converter intended to be fitted as a replacement part on one or more specific types of vehicles with regard to the limitation of pollutant emissions, noise level and effect on vehicle performance and, where applicable, OBD;
- 2.7. "deteriorated replacement catalytic converter" is a converter that has been aged or artificially deteriorated to such an extent that it fulfils the requirements laid out in section 1 of Appendix 1 to Annex XI to this Directive <sup>(2)</sup>.

<sup>(1)</sup> As defined in Annex II Section A to Directive 70/156/EEC.

<sup>(2)</sup> For the purpose of the demonstration test of vehicles equipped with positive-ignition engines, when the HC value measured under point 6.2.1 of this Annex is higher than the value measured during type approval of the vehicle, the difference has to be added to the threshold values mentioned in point 3.3.2 of Annex XI, to which the exceedance allowed in point 1 of Appendix 1 to Annex XI is applied.

3. APPLICATION FOR EC TYPE-APPROVAL
- 3.1. An application for EC type-approval pursuant to Article 3(4) of Directive 70/156/EEC of a type of replacement catalytic converter shall be submitted by the manufacturer.
- 3.2. A model for the information document is given in Appendix 1 to this Annex.
- 3.3. In the case of an application for approval of a replacement catalytic converter, the following must be submitted to the technical service responsible for the type-approval test:
- 3.3.1. Vehicle(s) of a type approved in accordance with Directive 70/220/EEC equipped with a new original equipment catalytic converter. This (these) vehicle(s) shall be selected by the applicant with the agreement of the technical service. It (they) shall comply with the requirements of Section 3 of Annex III to this Directive.
- The test vehicle(s) shall have no emission control system defects; any excessively worn out or malfunctioning emission-related original part shall be repaired or replaced. The test vehicle(s) shall be tuned properly and set to manufacturer's specification prior to emission testing.
- 3.3.2. One sample of the type of the replacement catalytic converter. This sample shall be clearly and indelibly marked with the applicant's trade name or mark and its commercial designation.
- 3.3.3. An additional sample of the type of the replacement catalytic converter, in the case of a replacement catalytic converter intended to be fitted to a vehicle equipped with an OBD system. This sample shall be clearly and indelibly marked with the applicant's trade name or mark and its commercial designation. It must have been deteriorated as defined in point 2.7.
4. GRANTING OF EC TYPE-APPROVAL
- 4.1. If the relevant requirements are satisfied, EC type-approval pursuant to Article 4(3) of Directive 70/156/EEC shall be granted.
- 4.2. A model for the EC type-approval certificate is given in Appendix 2 to this Annex.
- 4.3. An approval number in accordance with Annex VII to Directive 70/156/EEC shall be assigned to each type of replacement catalytic converter approved. The same Member State shall not assign the same number to another replacement catalytic converter type. The same type-approval number may cover the use of that replacement catalytic converter type on a number of different vehicle types.
5. EC TYPE-APPROVAL MARKING
- 5.1. Every replacement catalytic converter conforming to the type approved under this Directive as a separate technical unit shall bear an EC type-approval mark.
- 5.2. This mark shall consist of a rectangle surrounding the letter "e" followed by the distinguishing number or letters of the Member State which has granted the EC type-approval:
- |                           |                   |
|---------------------------|-------------------|
| 1 for Germany             | 12 for Austria    |
| 2 for France              | 13 for Luxembourg |
| 3 for Italy               | 17 for Finland    |
| 4 for the Netherlands     | 18 for Denmark    |
| 5 for Sweden              | 21 for Portugal   |
| 6 for Belgium             | 23 for Greece     |
| 9 for Spain               | 24 for Ireland    |
| 11 for the United Kingdom |                   |

It must also include in the vicinity of the rectangle the "base approval number" contained in point 4 of the type-approval number referred to in Annex VII to Directive 70/156/EEC, preceded by the two figures indicating the sequence number assigned to the most recent major technical amendment to Directive 70/220/EEC on the date EC component type-approval was granted. In this Directive, the sequence number is 01.

5.3. The EC type-approval approval mark referred to in point 5.2 shall be clearly legible and indelible and must, wherever possible, be visible when the replacement catalytic converter is installed on the vehicle.

5.4. Appendix 3 to this Annex gives examples of arrangements of the approval mark and approval data referred to above.

## 6. REQUIREMENTS

### 6.1. General requirements

6.1.1. The replacement catalytic converter shall be designed, constructed and capable of being mounted so as to enable the vehicle to comply with the provisions of this Directive, against which it originally complied with, and that the pollutant emissions are effectively limited throughout the normal life of the vehicle under normal conditions of use.

6.1.2. The installation of the replacement catalytic converter shall be at the exact position of the original equipment catalytic converter, and the position on the exhaust line of the oxygen probe(s) and other sensors, if applicable, shall not be modified.

6.1.3. If the original equipment catalytic converter includes thermal protection, the replacement catalytic converter shall include equivalent protection.

6.1.4. The replacement catalytic converter shall be durable, i.e. designed, constructed and capable of being mounted so that reasonable resistance to the corrosion and oxidation phenomena to which it is exposed is obtained, having regard to the conditions of use of the vehicle.

### 6.2. Requirements regarding emissions

The vehicle(s) indicated in point 3.3.1 of this Annex, equipped with a replacement converter of the type for which approval is requested, shall be subjected to a Type I test under the conditions described in the corresponding Annex to this Directive in order to compare its performance with the original equipment catalytic converter according to the procedure described below.

#### 6.2.1. *Determination of the basis for comparison*

The vehicle(s) shall be fitted with a new original equipment catalytic converter (see point 3.3.1) which shall be run in with 12 extra urban cycles (type I test part 2).

After this preconditioning, the vehicle(s) shall be kept in a room in which the temperature remains relatively constant between 293 and 303 K (20 °C and 30 °C). This conditioning shall be carried out for at least six hours and continue until the engine oil and coolant temperature are within  $\pm 2$  K of the temperature of the room. Subsequently three type I tests shall be made.

#### 6.2.2. *Exhaust gas test with replacement catalytic converter*

The original equipment catalytic converter of the test vehicle(s) shall be replaced by the replacement catalytic converter (see point 3.3.2) which shall be run in with 12 extra urban cycles (type I test part 2).

After this preconditioning, the vehicle(s) shall be kept in a room in which the temperature remains relatively constant between 293 and 303 K (20 °C and 30 °C). This conditioning shall be carried out for at least six hours and continue until the engine oil and coolant temperature are within  $\pm 2$  K of the temperature of the room. Subsequently three type I tests shall be made.

#### 6.2.3. *Evaluation of the emission of pollutants of vehicles equipped with replacement catalytic converters*

The test vehicle(s) with the original equipment catalytic converter shall comply with the limit values according to the type-approval of the vehicle(s) including, if applicable, the deterioration factors applied during the type-approval of the vehicle(s).

The requirements regarding emissions of the vehicle(s) equipped with the replacement catalytic converter shall be deemed to be fulfilled if the results meet, for each regulated pollutant (CO, HC, NOx and particulates) the following conditions:

$$M \leq 0,85 S + 0,4 G$$

$$M \leq G$$

where:

M is the mean value of the emissions of one pollutant or the sum of two pollutants<sup>(1)</sup> obtained from the three type I tests with the replacement catalytic converter;

S is the mean value of the emissions of one pollutant or the sum of two pollutants<sup>(1)</sup> obtained from the three type I tests with the original catalytic converter;

G is the limit value of the emissions of one pollutant or of the sum of two pollutants<sup>(1)</sup> according to the type-approval of the vehicle(s) divided by, if applicable, the deterioration factors determined in accordance with point 6.4.

Where approval is applied for different types of vehicles from the same car manufacturer, and provided that these different types of vehicle are fitted with the same type of original equipment catalytic converter, the type I test may be limited to at least two vehicles selected after agreement with the technical service responsible for approval.

#### 6.3. **Requirements regarding noise and exhaust back-pressure**

The replacement catalytic converter shall satisfy the technical requirements of Annex II to Directive 70/157/EEC.

#### 6.4. **Requirements regarding durability**

The replacement catalytic converter shall comply with the requirements of point 5.3.5 of Annex I to this Directive, i.e. type V test or deterioration factors from the following table for the results of the type I tests.

<sup>(1)</sup> As appropriate with respect to the limit values defined in point 5.3.1.4 of Annex I to Directive 70/220/EEC in the version against which the vehicle equipped with the original catalytic converter was type-approved.



Table XIII.6.4

Engine category	Deterioration factors				
	CO	HC <sup>(1)</sup>	NO <sub>x</sub> <sup>(1)</sup>	HC + NO <sub>x</sub>	Particulate
Positive-ignition	1,2	1,2	1,2	1,2 <sup>(2)</sup>	—
Compression ignition	1,1	—	1,0	1,0	1,2

<sup>(1)</sup> Applicable only to vehicles approved to Directive 70/220/EEC, as amended by Directive 98/69/EC or subsequent amending Directives.

<sup>(2)</sup> Applicable only to positive-ignition engined vehicles approved to Directive 70/220/EEC, as amended by Directive 96/69/EC or earlier Directives.

**6.5. Requirements regarding OBD compatibility (applicable only to replacement catalytic converters intended to be fitted to vehicles equipped with an OBD system)**

OBD compatibility demonstration is required only when the original catalyst was monitored in the original configuration.

6.5.1. The compatibility of the replacement catalytic converter with the OBD system shall be demonstrated by using the procedures described in Directive 98/69/EC, Annex XI, Appendix 1.

6.5.2. The provisions of Directive 98/69/EC, Annex XI, Appendix 1 applicable to components other than the catalytic converter shall not be applied.

6.5.3. The aftermarket manufacturer may use the same preconditioning and test procedure as used during the original type-approval. In this case, the type-approval authority shall provide, on request and on a non-discriminatory basis, Appendix 2 to the EC type-approval certificate which contains the number and type of preconditioning cycles and the type of test cycle used by the original equipment manufacturer for OBD testing of the catalytic converter.

6.5.4. In order to verify the correct installation and functioning of all other components monitored by the OBD system, the OBD system shall indicate no malfunction and have no stored fault codes prior to the installation of any of the replacement catalytic converters. An evaluation of the status of the OBD system at the end of the tests described in point 6.2.1 of this Annex may be used for this purpose.

6.5.5. The MI (reference section 2.5 of Annex XI to this Directive) must not activate during vehicle operation required by point 6.2.2 of this Annex.

**7. DOCUMENTATION**

7.1. Each new replacement catalytic converter shall be accompanied by the following information:

7.1.1. the catalyst manufacturer's name or trade mark;

7.1.2. the vehicles (including year of manufacture) for which the replacement catalytic converter is approved, including, where applicable, a marking to identify if the replacement catalytic converter is suitable for fitting to a vehicle that is equipped with an on-board diagnostic (OBD) system;

7.1.3. installation instructions, where necessary.

7.2. This information shall be provided either:

as a leaflet accompanying the replacement catalytic converter; or

on the packaging in which the replacement catalytic converter is sold; or

or by any other applicable means.

In any case, the information must be available in the product catalogue distributed to points of sale by the manufacturer of replacement catalytic converters.

8. MODIFICATION OF THE TYPE AND AMENDMENTS TO APPROVALS

In the case of modification of the type approved pursuant to this Directive, the provisions of Article 5 of Directive 70/156/EEC shall apply.

9. CONFORMITY OF PRODUCTION

Measures to ensure the conformity of production shall be taken in accordance with the provisions laid down in Article 10 of Directive 70/156/EEC.

9.2. **Special provisions**

9.2.1. The checks referred to in point 2.2 of Annex X to Directive 70/156/EEC shall include compliance with the characteristics as defined under point 2.4 to this Annex.

9.2.2. For the application of point 3.5 of Annex X to Directive 70/156/EEC, the tests described in point 6.2 of this Annex (requirements regarding emissions) may be carried out. In this case, the holder of the approval may ask, as an alternative, to use as a basis for comparison not the original equipment catalytic converter, but the replacement catalytic converter which was used during the type-approval tests (or another sample that has been proven to conform to the approved type). Emissions values measured with the sample under verification shall then on average not exceed by more than 15 % the mean values measured with the sample used for reference.

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*Appendix 1*

**Information document No ... relating to the EC type-approval of replacement catalytic converters (Directive 70/220/EEC as last amended by Directive ...**

The following information, if applicable, must be supplied in triplicate and include a list of contents. Any drawings must be supplied in appropriate scale and sufficient detail on size A4 or on a folder of A4 format. Photographs, if any, must show sufficient detail.

If the system, components or separate technical units have electronic controls, information concerning their performance must be supplied.

0. GENERAL

0.1. Make (trade name of manufacturer):

0.2. Type:

0.5. Name and address of manufacturer:

0.7. In the case of components and separate technical units, location and method of affixing of the EC approval mark:

0.8. Address(es) of assembly plant(s):

1. DESCRIPTION OF THE DEVICE

1.1. Make and type of the replacement catalytic converter:

1.2. Drawings of the replacement catalytic converter, identifying in particular all the characteristics referred to in Section 2.3 of this Annex:

- 1.3. Description of the vehicle type or types for which the replacement catalytic converter is intended:
- 1.3.1. Number(s) and/or symbol(s) characterising the engine and vehicle type(s):
- 1.3.2. Is the replacement catalytic converter intended to be compatible with OBD requirements (Yes/No) <sup>(1)</sup>:
- 1.4. Description and drawings showing the position of the replacement catalytic converter relative to the engine exhaust manifold(s):

---

Appendix 2

**Model**

(Maximum format: A4 (210 mm × 297 mm))

EC TYPE-APPROVAL CERTIFICATE

**Stamp of administration**

Communication concerning the:

- type-approval <sup>(1)</sup>,
- extension of type-approval <sup>(1)</sup>,
- refusal of type-approval <sup>(1)</sup>,
- withdrawal of type-approval <sup>(1)</sup>,

of a type of vehicle/component/separate technical unit <sup>(1)</sup> with regard to Directive ..., as last amended by Directive ...

Type-approval number:

Reason for extension:

**Section I**

- 0.1. Make (trade name of manufacturer):
- 0.2. Type:
- 0.3. Means of identification of type if marked on the vehicle/component/separate technical unit <sup>(2)</sup>:
- 0.3.1. Location of that marking:
- 0.4. Category of vehicle <sup>(3)</sup>:

---

<sup>(1)</sup> Delete where not applicable.

<sup>(2)</sup> If the means of identification of type contains characters not relevant to describe the vehicle, component or separate technical unit types covered by this type-approval certificate such characters shall be represented in the document by the symbol: "?" (e.g. ABC??123??).

<sup>(3)</sup> As defined in Annex II Section A to Directive 70/156/EEC.

- 0.5. Name and address of manufacturer:
- 0.7. In the case of components and separate technical units, location and method of affixing of the EC approval mark:
- 0.8. Address(es) of assembly plant(s):

## Section II

1. Additional information (where applicable): see addendum
2. Technical service responsible for carrying out the tests:
3. Date of test report:
4. Number of test report:
5. Remarks (if any): see addendum
6. Place:
7. Date:
8. Signature:
9. The index to the information package lodged with the approval authority, which may be obtained on request, is attached.

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### *Addendum*

to EC type-approval certificate No ...

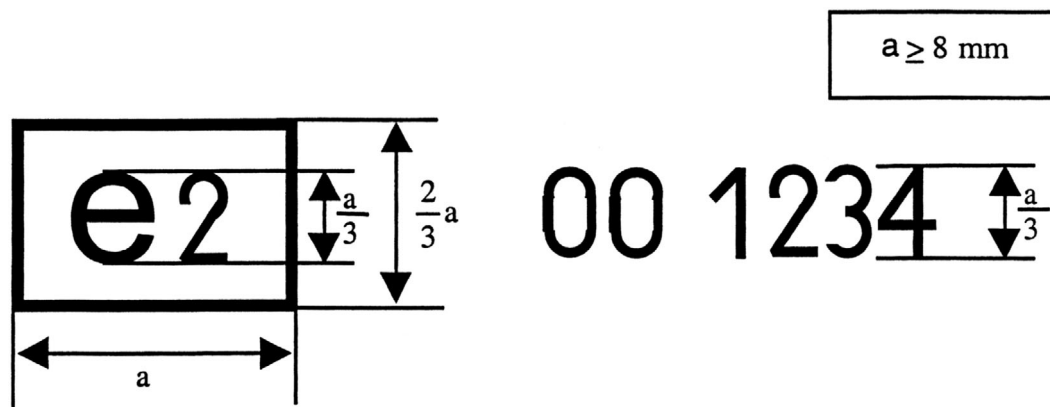
concerning the separate technical unit type-approval of replacement catalytic converters for motor vehicles with regard to Directive 70/220/EEC, as last amended by Directive ...

1. Additional information
  - 1.1. Make and type of the replacement catalytic converter:
  - 1.2. Vehicle type(s) for which the catalytic converter type qualifies as replacement part:
  - 1.3. Type(s) of vehicle(s) on which the replacement catalytic converter has been tested:
    - 1.3.1. Has the replacement catalytic converter demonstrated compatibility with OBD requirements (yes/no) <sup>(1)</sup>:
5. Remarks:

---

<sup>(1)</sup> Delete where not applicable.

## Appendix 3

**Model for the EC type-approval marks***(see point 5.2 of this Annex)*

The above approval mark affixed to a component of a replacement catalytic converter shows that the type concerned has been approved in France (e 2), pursuant to this Directive. The first two digits of the approval number (00) refer to the sequence number assigned to the most recent amendments made to Directive 70/220/EEC. The following four digits (1234) are those allocated by the approval authority to the replacement catalytic converter as the base approval number.'