



**Economic and Social
Council**

Distr.
GENERAL

TRANS/WP.29/2003/73
28 July 2003

Original: ENGLISH

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

World Forum for Harmonization of Vehicle Regulations (WP.29)

(One-hundred-and-thirty-first session,
11-14 November 2003, agenda item 4.2.29.)

**PROPOSAL FOR DRAFT SUPPLEMENT 4 TO THE 05 SERIES
OF AMENDMENTS TO REGULATION No. 83**

(Emissions of M₁ and N₁ categories of vehicles)

Transmitted by the Working Party on Pollution and Energy (GRPE)

Note: The text reproduced below was adopted by GRPE at its forty-sixth session, and is transmitted for consideration to WP.29 and to AC.1. It is based on documents TRANS/WP.29/GRPE/2003/17, as amended by annex 2 to the report, and TRANS/WP.29/GRPE/2003/6/Rev.1, as corrected in para. 47 of the report (TRANS/WP.29/GRPE/46, paras. 25 and 48).

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Insert new paragraphs 2.22. and 2.23., to read:

- "2.22. "Mono-fuel vehicles" means a vehicle that is designed primarily for permanent running on LPG or NG, but may also have a petrol system for emergency purposes for starting only, where the petrol tank does not contain more than 15 litres of petrol;
- "2.23. "Bi-fuel vehicle" means a vehicle that can run part-time on petrol and also part-time on either LPG or NG."

Paragraph 3.2., amend to read:

- "3.2. A model of the information document relating to exhaust emissions, evaporative emissions, durability and the on-board diagnostic (OBD) system is given in annex 1. The information mentioned under paragraph 4.2.11.2.7.6. of annex 1 is to be included in appendix 1 "OBD - RELATED INFORMATION" to the type-approval communication given in annex 2."

Paragraph 5.2.2., amend to read:

- "5.2.2. Positive-ignition engine powered vehicle and hybrid electric vehicles equipped with positive-ignition engine fuelled with LPG or NG (mono or bi-fuel) shall be subjected to the following tests:
- Type I (verifying the average exhaust 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 anti-pollution devices),
- Type VI (verifying the average low ambient temperature carbon monoxide and hydrocarbon exhaust emissions after a cold start), where applicable,
- OBD test, where applicable."

Table 1, amend to read:

"Table 1

Different routes for type approval and extensions

| Type-approval test | Positive-ignition engined vehicles of categories M and N | | | Compression-ignition engined vehicles of categories M ₁ and N ₁ |
|----------------------|--|--|--|--|
| | 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 | Paragraph 7. | Paragraph 7. | Paragraph 7. | Paragraph 7.; M ₂ and N ₂ with a reference mass ≤ 2,840 kg . |
| On-board diagnostics | Yes, in accordance with paragraph 11.1.5.1.1. or 11.1.5.3. | Yes, in accordance with paragraph 11.1.5.1.2. or 11.1.5.3. | Yes, in accordance with paragraph 11.1.5.1.2. or 11.1.5.3. | Yes, in accordance with paragraph 11.1.5.2.1 or 11.1.5.2.2. or 11.1.5.2.3. or 11.1.5.3 |

"

- 8.2.1.2.2. The name, address, telephone and fax numbers and e-mail address of his authorised representative within the areas covered by the manufacturer's information.
- 8.2.1.2.3. The model name(s) of the vehicles included in the manufacturer's information.
- 8.2.1.2.4. Where appropriate, the list of vehicle types covered within the manufacturer's information, i.e. the in-service family group in accordance with paragraph 8.2.1.1.
- 8.2.1.2.5. The vehicle identification number (VIN) codes applicable to these vehicle types within the in-service family (VIN prefix).
- 8.2.1.2.6. 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);
- 8.2.1.2.7. Details of extensions, field fixes/recalls to those type approvals for the vehicles covered within the manufacturer's information (if requested by the administrative department).
- 8.2.1.2.8. The period of time over which the manufacturer's information was collected.
- 8.2.1.2.9. The vehicle build period covered within the manufacturer's information (e.g. 'vehicles manufactured during the 2001 calendar year').
- 8.2.1.2.10. The manufacturer's in-service conformity checking procedure, including:
- 8.2.1.2.10.1. Vehicle location method;
- 8.2.1.2.10.2. Vehicle selection and rejection criteria;
- 8.2.1.2.10.3. Test types and procedures used for the programme;
- 8.2.1.2.10.4. The manufacturer's acceptance/rejection criteria for the in-service family group;
- 8.2.1.2.10.5. Geographical area(s) within which the manufacturer has collected information.
- 8.2.1.2.10.6. Sample size and sampling plan used.
- 8.2.1.2.11. The results from the manufacturer's in-service conformity procedure, including:
- 8.2.1.2.11.1. 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.
- 8.2.1.2.11.2. The reason(s) for rejecting a vehicle from the sample.

- 8.2.1.2.11.3. Service history for each vehicle in the sample (including any re-works).
- 8.2.1.2.11.4. Repair history for each vehicle in the sample (where known).
- 8.2.1.2.11.5. 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).
- 8.2.1.2.12. Records of indication from the OBD system."

Paragraph 8.2.2., amend to read:

"8.2.2. 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 paragraph 8.2. and in a way representative of the manufacturer's geographic penetration.

For the purpose of this Regulation, 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 worldwide sales of that vehicle type in less than 10,000 per annum.

In the case of vehicles to be sold within the European Union, the manufacturer shall not be obliged to carry out an audit 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 is less than 5,000 per annum within the European Union."

Paragraph 8.2.7., amend to read:

"8.2.7. On the basis of the audit referred to in paragraph 8.2.1., the administrative department 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.

In the case that the manufacturer has been permitted to not carry out an audit for a particular vehicle type in accordance with paragraph 8.2.2., the administrative department may proceed to have such vehicle types tested in accordance with appendix 3."

Insert a new paragraph 8.2.7.3.1., to read:

- "8.2.7.3.1. The test results shall also be excluded from the conformity check of vehicles within the sample:
- (i) that been issued an approval certificate indicating compliance with the emission limits of category A in paragraph 5.3.1.4. of the 05 series of amendments to Regulation provided that those vehicles have been regularly operated on fuel having a sulphur level exceeding 150 mg/kg (petrol fuel) or 350 mg/kg (diesel fuel), or
 - (ii) that have been issued with an approval certificate indicating compliance with the emission limits of category B in paragraph 5.3.1.4. of the 05 series of amendments to Regulation provided that those vehicles have been regularly operated on petrol or diesel fuel having a sulphur level exceeding 50 mg/kg."

Paragraphs 11.1.2.2., amend to read:

- "11.1.2.2. Subject to the provisions of paragraphs 11.1.4., 11.1.5., 11.1.6. and 11.1.7., Contracting Parties applying this Regulation shall grant..."

Paragraphs 11.1.3.2., amend to read:

- "11.1.3.2. Subject to the provisions of paragraphs 11.1.4., 11.1.5., 11.1.6. and 11.1.7., approvals granted...
- ... the vehicle type approved meets the requirements of this Regulation as required by paragraph 11.1.2.2. above."

Paragraphs 11.1.5. to 11.1.5.2., replace by paragraphs 11.1.5. to 11.1.5.3. to read:

"11.1.5. On-board diagnostic (OBD) system

11.1.5.1. Vehicles equipped with positive ignition engines

11.1.5.1.1. Vehicles of category M₁ and N₁ fuelled with petrol shall be equipped with on-board diagnostic systems, as specified in paragraph 3.1. to annex 11 of this Regulation, on the dates shown in paragraph 11.1.2.

11.1.5.1.2. Vehicles of category M₁, other than vehicles whose maximum mass exceeds 2,500 kg, and N₁ class I, running permanently or part-time on either LPG or NG fuel shall be equipped with on-board diagnostic system from 1 October 2004 for new types and from 1 July 2005 for all types.
Vehicles of category M₁ whose maximum mass exceeds 2,500 kg and N₁ classes II and III, running permanently or part-time on either LPG or NG fuel shall be equipped with on-board diagnostic system from 1 January 2006 for new types and from 1 January 2007 for all types.

- 11.1.5.2. Vehicles equipped with compression-ignition engines
- 11.1.5.2.1. Vehicles of category M₁, other than vehicles designed to carry more than six occupants (including the driver) or vehicles whose maximum mass exceeds 2,500 kg, shall be equipped with on-board diagnostic system from 1 October 2004 for new types and from 1 July 2005 for all types.
- 11.1.5.2.2. Vehicles of category M₁ not covered by paragraph 11.1.5.2.1., except vehicles whose maximum mass exceeds 2,500 kg, and vehicles of category N₁ class I, shall be equipped with on-board diagnostic system from 1 January 2005 for new types and from 1 January 2006 for all types.
- 11.1.5.2.3. Vehicles of category N₁, classes II and III, and vehicles of category M₁ whose maximum mass exceeds 2,500 kg, shall be equipped with on-board diagnostic system from 1 January 2006 for new types and from 1 January 2007 for all vehicles.
- 11.1.5.2.4. Where compression-ignition engined vehicles entering into service prior to the dates given in the paragraphs above are fitted with on-board diagnostic systems the provisions of paragraphs 6.5.3. to 6.5.3.6. of annex 11, appendix 1, are applicable.
- 11.1.5.3. Vehicles of other categories or vehicles of category M₁ or N₁ not cover by the above may be equipped with an on-board diagnostic system. In this case, they shall comply with the OBD provisions laid down in paragraphs 6.5.3. to 6.5.3.6. of annex 11, appendix 1."

Paragraph 11.6.1., amend to read

- "11.1.6.1. By exception to the requirements of paragraphs 11.1.2. and 11.1.3. Contracting Parties may continue to approve vehicles and may continue to recognise the validity of existing approvals that indicate compliance with:
- (i) the requirements of paragraph 5.3.1.4.1. of the 04 series of amendments to this Regulation provided that the vehicles are intended for export to, or for first use in, countries where the use of unleaded petrol is not widely available, and
 - (ii) the requirements of paragraph 5.3.1.4.2 of the 04 series of amendments to this Regulation provided that the vehicles are intended for export to, or for first use in, countries where unleaded petrol having a maximum sulphur level of 50mg/kg or less is not widely available, and
 - (iii) the requirements of paragraph 5.3.1.4.3. of the 04 series of amendments to this Regulation provided that the vehicles are intended for export to, or for first use in, countries where diesel fuel having a maximum sulphur level of 350 mg/kg or less is not widely available."

Paragraph 11.1.6.2., should be deleted.

Paragraph 11.1.6.3., renumber as paragraph 11.1.6.2.

Insert new paragraphs 11.1.7., 11.1.7.1. and 11.1.7.2., to read:

"11.1.7. Approvals to Regulation as amended by 05 series of amendments

11.1.7.1 By exception to the requirements of paragraph 11.1.2.2. and 11.1.3.2. Contracting Parties may continue to approve vehicles and may continue to recognize the validity of approvals granted to vehicles to the requirements of paragraph 5.3.1.4. (concerning category A emissions) of the 05 series of amendments to this Regulation provided that the vehicles are intended for export to, or for first use in, countries where unleaded petrol or diesel fuels having maximum sulphur levels of 50 mg/kg or less are not widely available.

11.1.7.2 By way of derogation to the obligations of Contracting Parties to this Regulation, approvals granted indicating compliance with the emission limits of category A in paragraph 5.3.1.4. of the 05 series of amendments to this Regulation, shall cease to be valid in the European Community from:

- (i) 1 January 2006 for vehicles of category M having a maximum mass less than or equal to 2,500 kg or vehicles of category N₁ (Class I), and on
- (ii) 1 January 2007 for vehicles of category M having a maximum mass greater than 2,500 kg or vehicles of category N₁ (Class II or III),

unless the Contracting Party which has granted the approval notifies other Contracting Parties applying this Regulation that the vehicle type approved meets the requirements of this Regulation as required by paragraph 11.1.2.2. above."

Appendix 3, paragraph 6.1., amend to read:

"6.1. When more than one vehicle is found to be an outlying emitter that either,
– meets the conditions of paragraph 3.2.3. of appendix 4 and where both the administrative department and the manufacturer agree that the excess emission is due to the same cause, or
– meets the conditions of paragraph 3.2.4. of appendix 4 where the administrative department has determined that the excess emission is due to the same cause,

the administrative department must request the manufacturer to submit a plan of remedial measures to remedy the non-compliance."

Appendix 4,

Paragraphs 3. to 3.2., amend to read (inserting new footnotes 1/ to 3/):

- "3. PROCEDURE TO BE FOLLOWED WITH OUTLYING EMITTERS IN THE SAMPLE 1/
- 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 paragraph 3.2.1. or paragraph 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 paragraph 5.3.1.4., 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 paragraph 5.3.1.4., 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' 2/.
- 3.2.3.1. If the vehicle meets the conditions of this paragraph, 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 paragraph, the administrative department 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 administrative department 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 paragraph 6. of appendix 3 applies.
- 3.2.3.2.2. If the administrative department 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 paragraph has been found, or when more than one vehicle has been found and the administrative department 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 paragraph 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 paragraph 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/.
- 3.2.4.1. If the vehicle meets the conditions of this paragraph, the administrative department 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 paragraph, and the administrative department 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 paragraph 6. of appendix 3 applies.
- 3.2.4.3. When only one vehicle meeting the conditions of this paragraph has been found, or when more than one vehicle has been found and the administrative department 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 paragraph 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 paragraph 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.

1/ On the basis of actual in-service data to be supplied before 31 December 2003, the requirements of this paragraph 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 paragraph 5.3.1.4., (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 it will be proposed the necessary amendments.

- 2/ For any vehicle, the “intermediate zone” is determined as follows. The vehicle shall meet the conditions given in either paragraph 3.2.1. or paragraph 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 paragraph 5.3.1.4. multiplied by a factor of 2.5.
- 3/ 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 paragraph 5.3.1.4. multiplied by a factor of 2.5."

Paragraph 4.2., amend to read:

"4.2. ..., the following procedure is used (see Figure 4/2 below).

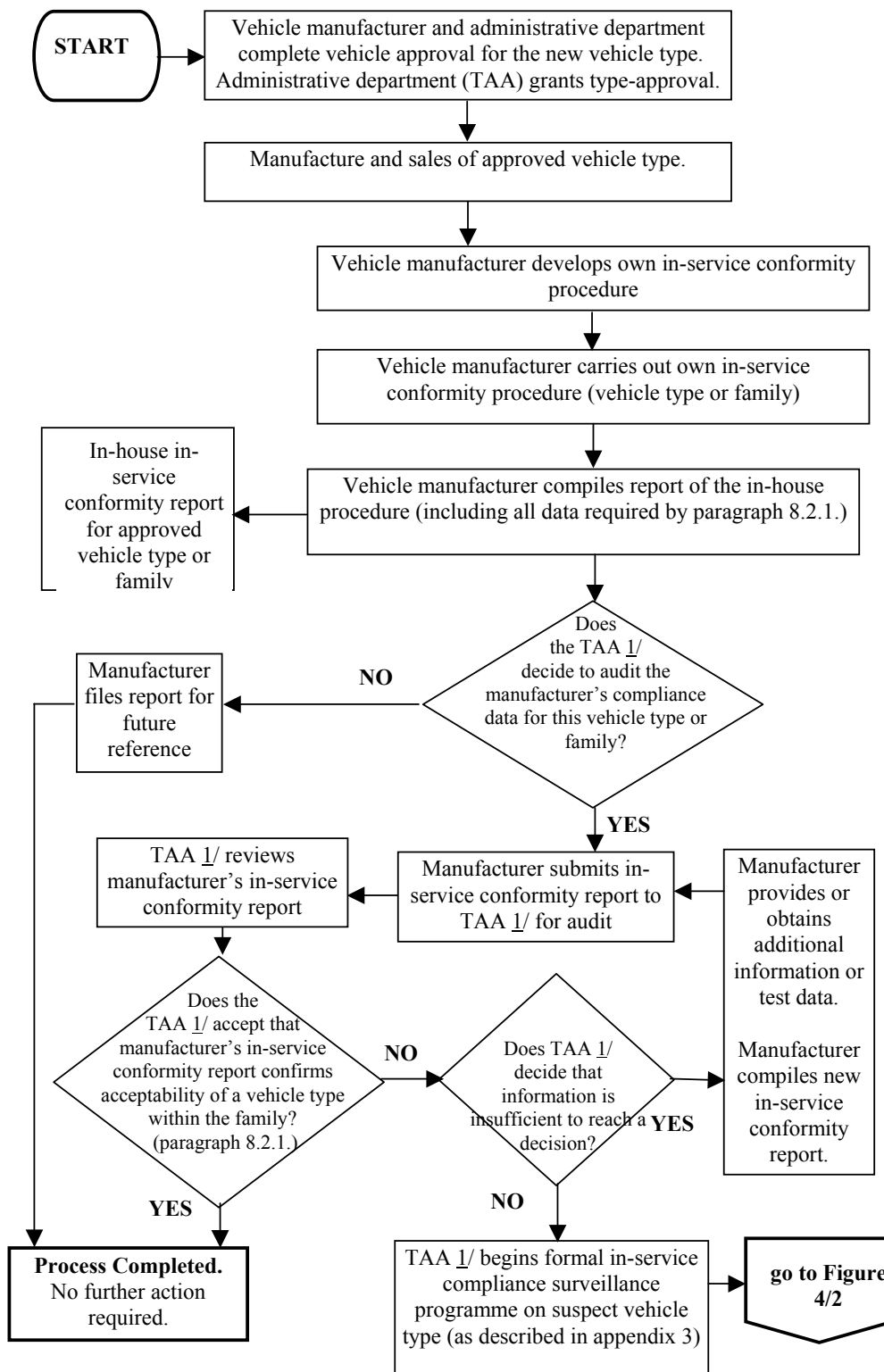
where:

..."

Insert a new Figure 4/1, to read (see next page).

"Figure 4/1:

In-service conformity checking – audit procedure

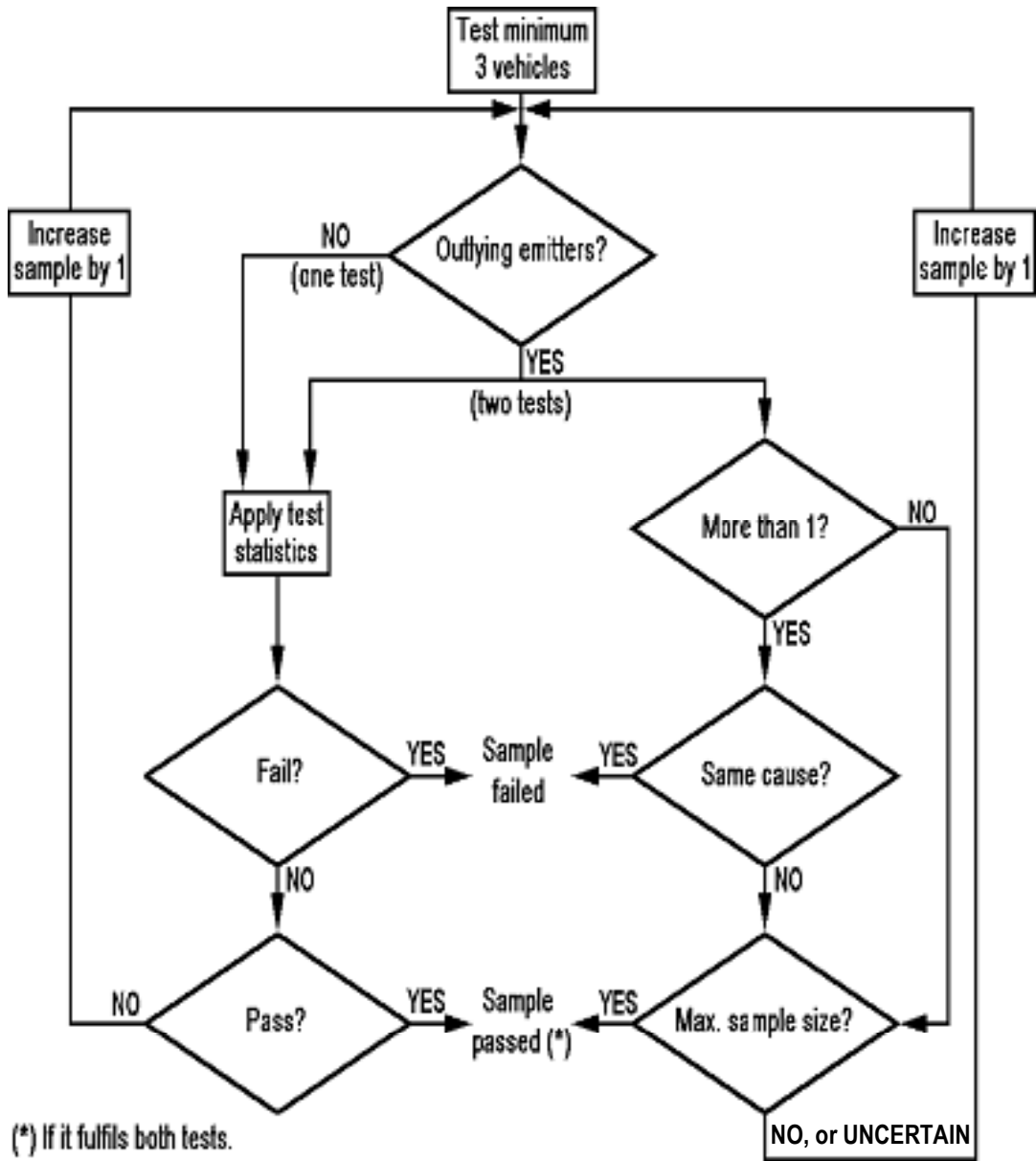


1/ In this case, TAA means the administrative department that granted the type-approval."

Figure 4/1 (former), rename as Figure 4/2 and amend to read:

"Figure 4/2:

In-service conformity testing – selection and test of vehicles



..

Annex 1, insert new items 4.2.11.2.7.6. to 4.2.11.2.7.6.4., to read:

- "4.2.11.2.7.6. 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).
- 4.2.11.2.7.6.1. A description of the type and number of the pre-conditioning cycles used for the original type approval of the vehicle.
- 4.2.11.2.7.6.2. 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.
- 4.2.11.2.7.6.3. 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.
- 4.2.11.2.7.6.4. The information required by this paragraph 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 | 3 rd cycle | Engine speed, engine load, A/F mode, catalyst temperature | Two Type I cycles | Type I |

"

Annex 2,

Insert a new item 18., to read:

"18. Make and type of catalytic converters (s) as listed in item 4.2.11.2.1. of annex 1 to this Regulation."

Items 18. to 21. (former), renumber as items 19. to 22.

Insert a new appendix 1, to read:

"Annex 2 – Appendix 1
OBD – RELATED INFORMATION

As noted in item 4.2.11.2.7.6. of the information document in annex 1 of this Regulation, 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 pre-conditioning 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 and 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 |

"

Annex 4,

Insert a new paragraph 2.3.5., to read:

"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."

Paragraph 3.2., amend to read:

"3.2. Fuel

When testing a vehicle against the emission limit values given in row A of the table in paragraph 5.3.1.4. of this Regulation, the appropriate reference fuel must comply with the specifications given in paragraph 1. of annex 10 or, in the case of gaseous reference fuels, either paragraph 1.1.1. or paragraph 1.2. of annex 10a.

When testing a vehicle against the emission limit values given in row B of the table in paragraph 5.3.1.4. of this Regulation, the appropriate reference fuel must comply with the specifications given in paragraph 2. of annex 10 or, in the case of gaseous reference fuels, either paragraph 1.1.2. or paragraph 1.2. of annex 10a."

In table 1.2 of appendix 1, in the column entitled "Acceleration (m/s²)", correct operation 23 to read "-0.99" instead of "-0,86" and in the column entitled "Speed (km/h)", correct operation 23 to read "35-10" instead of "32-10".

Annex 8, paragraph 3.4.1., amend to read:

"3.4.1. The test fuel must comply with the specifications given in paragraph 3. of annex 10."

Annex 10, amend to read (see next pages):

"1. SPECIFICATIONS OF REFERENCE FUELS FOR TESTING VEHICLES TO THE EMISSION LIMITS GIVEN IN ROW A OF THE TABLE IN PARAGRAPH 5.3.1.4. – TYPE I TEST

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

Type: unleaded petrol

| Parameter | Unit | Limits ^{1/} | | 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 ³ | 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 | per cent v/v | 49.0 | 57.0 | EN-ISO 3405 |
| - evaporated at 150 °C | per cent v/v | 81.0 | 87.0 | EN-ISO 3405 |
| - final boiling point | °C | 190 | 215 | EN-ISO 3405 |
| Residue | per cent v/v | - | 2 | EN-ISO 3405 |
| Hydrocarbon analysis: - olefins | per cent v/v | - | 10 | ASTM D 1319 |
| - aromatics | per cent v/v | 28.0 | 40.0 | ASTM D 1319 |
| - benzene | per cent v/v | - | 1.0 | pr. EN 12177 |
| - saturates | per cent v/v | - | balance | ASTM D 1319 |
| Carbon/hydrogen ratio | | report | report | |
| Induction period ^{2/} | min. | 480 | - | EN-ISO 7536 |
| Oxygen content | per cent m/m | - | 2.3 | EN 1601 |
| Existent gum | mg/ml | - | 0.04 | EN-ISO 6246 |
| Sulphur content ^{3/} | 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.

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

Type: Diesel fuel

| Parameter | Unit | Limits 1/ | | Test Method |
|--|--------------------|-----------|---------|----------------------|
| | | minimum | maximum | |
| Cetane number 2/ | | 52.0 | 54.0 | EN-ISO 5165 |
| Density at 15 °C | kg/m ³ | 833 | 837 | EN-ISO 3675 |
| Distillation: | | | | |
| 50 per cent point | °C | 245 | - | EN-ISO 3405 |
| 95 per cent 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 ² /s | 2.5 | 3.5 | EN-ISO 3104 |
| Polycyclic aromatic hydrocarbons | per cent m/m | 3 | 6.0 | IP 391 |
| Sulphur content 3/ | mg/kg | - | 300 | Pr. EN-ISO/DIS 14596 |
| Copper corrosion | | - | 1 | EN-ISO 2160 |
| Conradson carbon residue (10 per cent DR) | per cent m/m | - | 0.2 | EN-ISO 10370 |
| Ash content | per cent m/m | - | 0.01 | EN-ISO 6245 |
| Water content | per cent m/m | - | 0.02 | EN-ISO 12937 |
| Neutralisation (strong acid) number | mg KOH/g | - | 0.02 | ASTM D 974-95 |
| Oxidation stability 4/ | mg/ml | - | 0.025 | EN-ISO 12205 |
| New and better method for polycyclic aromatics under development | per cent m/m | - | - | EN 12916 |

- 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.

2. SPECIFICATIONS OF REFERENCE FUELS FOR TESTING VEHICLES TO THE EMISSION LIMITS GIVEN IN ROW B OF THE TABLE IN PARAGRAPH 5.3.1.4. - TYPE I TEST

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

Type: Unleaded petrol

| Parameter | Unit | Limits <u>1/</u> | | 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 ³ | 740 | 754 | ISO 3675 |
| Reid vapour pressure | kPa | 56.0 | 60.0 | PrEN ISO 13016-1 (DVPE) |
| Distillation: - Evaporated at 70 °C | per cent v/v | 24.0 | 40.0 | EN-ISO 3405 |
| - Evaporated at 100 °C | per cent v/v | 50.0 | 58.0 | EN-ISO 3405 |
| - Evaporated at 150 °C | per cent v/v | 83.0 | 89.0 | EN-ISO 3405 |
| - final boiling point | °C | 190 | 210 | EN-ISO 3405 |
| Residue | per cent v/v | - | 2.0 | EN-ISO 3405 |
| Hydrocarbon analysis: | | | | |
| Olefins | per cent v/v | - | 10.0 | ASTM D 1319 |
| Aromatics | per cent v/v | 29.0 | 35.0 | ASTM D 1319 |
| Saturates | per cent v/v | Report | | ASTM D 1319 |
| Benzene | per cent v/v | - | 1.0 | pr. EN 12177 |
| Carbon/hydrogen ratio | | Report | | |
| Induction period <u>2/</u> | minutes | 480 | - | EN-ISO 7536 |
| Oxygen content | per cent m/m | - | 1.0 | EN 1601 |
| Existent gum | mg/ml | - | 0.04 | EN-ISO 6246 |
| Sulphur content <u>3/</u> | 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 I test shall be reported.

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

Type: Diesel fuel

| Parameter | Unit | Limits 1/ | | Test Method |
|--|--------------------|-----------|---------|---------------|
| | | minimum | maximum | |
| Cetane number 2/ | | 52.0 | 54.0 | EN-ISO 5165 |
| Density at 15°C | kg/m ³ | 833 | 837 | EN-ISO 3675 |
| Distillation: | | | | |
| 50 per cent point | °C | 245 | - | EN-ISO 3405 |
| 95 per cent 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 ² /s | 2.3 | 3.3 | EN-ISO 3104 |
| Polycyclic aromatic hydrocarbons | per cent m/m | 3.0 | 6,0 | IP 391 |
| Sulphur content 3/ | mg/kg | - | 10 | ASTM D 5453 |
| Copper corrosion | | - | Class 1 | EN-ISO 2160 |
| Conradson carbon residue (10 per cent DR) | per cent m/m | - | 0.2 | EN-ISO 10370 |
| Ash content | per cent m/m | - | 0.01 | EN-ISO 6245 |
| Water content | per cent m/m | - | 0.02 | EN-ISO 12937 |
| Neutralisation (strong acid) number | mg KOH/g | - | 0.02 | ASTM D 974 |
| Oxidation stability 4/ | 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.

3. 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 ^{1/} | | 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 ³ | 740 | 754 | ISO 3675 |
| Reid vapour pressure | kPa | 56.0 | 95.0 | prEN ISO 13016-1 (DVPE) |
| Distillation: | | | | |
| - Evaporated at 70 °C | per cent v/v | 24.0 | 40.0 | EN-ISO 3405 |
| - Evaporated at 100 °C | per cent v/v | 50.0 | 58.0 | EN-ISO 3405 |
| - Evaporated at 150 °C | per cent v/v | 83.0 | 89.0 | EN-ISO 3405 |
| - final boiling point | °C | 190 | 210 | EN-ISO 3405 |
| Residue | per cent v/v | - | 2.0 | EN-ISO 3405 |
| Hydrocarbon analysis: | | | | |
| Olefins | per cent v/v | - | 10.0 | ASTM D 1319 |
| Aromatics | per cent v/v | 29.0 | 35.0 | ASTM D 1319 |
| Saturates | per cent v/v | Report | | ASTM D 1319 |
| Benzene | per cent v/v | - | 1.0 | pr. EN 12177 |
| Carbon/hydrogen ratio | | Report | | |
| Induction period ^{2/} | minutes | 480 | - | EN-ISO 7536 |
| Oxygen content | per cent m/m | - | 1,0 | EN 1601 |
| Existent gum | mg/ml | - | 0.04 | EN-ISO 6246 |
| Sulphur content ^{3/} | 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."

Annex 10a, amend to read:

"1. SPECIFICATIONS OF GASEOUS REFERENCE FUELS

1.1. TECHNICAL DATA OF THE LPG REFERENCE FUELS

1.1.1. TECHNICAL DATA OF THE LPG REFERENCE FUELS USED FOR TESTING VEHICLES TO THE EMISSION LIMITS GIVEN IN ROW A OF THE TABLE IN PARAGRAPH 5.3.1.4. - TYPE I TEST

| Parameter | Unit | Fuel A | Fuel B | Test method |
|------------------------------------|--------------|----------------|----------------|--------------------|
| <i>Composition:</i> | | | | ISO 7941 |
| C ₃ -content | per cent vol | 30 ± 2 | 85 ± 2 | |
| C ₄ -content | per cent vol | balance | balance | |
| < C ₃ , >C ₄ | per cent vol | max. 2 | max. 2 | |
| Olefins | per cent vol | max. 12 | max. 15 | |
| Evaporation residue | mg/kg | max. 50 | max. 50 | ISO 13757 |
| Water at 0°C | | free | free | visual inspection |
| Total sulphur content | mg/kg | max. 50 | max. 50 | EN 24260 |
| Hydrogen sulphide | | none | none | ISO 8819 |
| Copper strip corrosion | rating | Class 1 | class 1 | ISO 6251 <u>1/</u> |
| Odour | | characteristic | characteristic | |
| Motor octane number | | min. 89 | min. 89 | EN 589 Annex B |

1/ 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.

1.1.2. TECHNICAL DATA OF THE LPG REFERENCE FUELS USED FOR TESTING VEHICLES TO THE EMISSION LIMITS GIVEN IN ROW B OF THE TABLE IN PARAGRAPH 5.3.1.4. OF ANNEX I - TYPE I TEST

| Parameter | Unit | Fuel A | Fuel B | Test method |
|------------------------------------|--------------|----------------|----------------|-------------------|
| <i>Composition:</i> | | | | ISO 7941 |
| C ₃ -content | per cent vol | 30 ± 2 | 85 ± 2 | |
| C ₄ -content | per cent vol | balance | balance | |
| < C ₃ , >C ₄ | per cent vol | max. 2 | max. 2 | |
| Olefins | per cent vol | max. 12 | max. 15 | |
| Evaporation residue | mg/kg | max. 50 | max. 50 | ISO 13757 |
| Water at 0 °C | | free | free | Visual inspection |
| Total sulphur content | mg/kg | max. 10 | max. 10 | EN 24260 |
| Hydrogen sulphide | | none | none | ISO 8819 |
| Copper strip corrosion | Rating | class 1 | class 1 | ISO 6251 1/ |
| Odour | | characteristic | characteristic | |
| Motor octane number | | min. 89 | min. 89 | EN 589 Annex B |

1/ 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.

1.2. TECHNICAL DATA OF THE NG REFERENCE FUELS

| Characteristics | Units | Basis | Limits | | Test Method |
|--------------------------------------|----------------------|-------|--------|------|-------------|
| | | | min. | max. | |
| Reference fuel G₂₀ | | | | | |
| <i>Composition:</i> | | | | | |
| Methane | per cent mole | 100 | 99 | 100 | ISO 6974 |
| Balance 1/ | per cent mole | - | - | 1 | ISO 6974 |
| N ₂ | per cent mole | | | | ISO 6974 |
| Sulphur content | mg/m ³ 2/ | - | - | 10 | ISO 6326-5 |
| Wobbe Index (net) | MJ/m ³ 3/ | 48.2 | 47.2 | 49.2 | |
| Reference fuel G₂₅ | | | | | |
| <i>Composition:</i> | | | | | |
| Methane | per cent mole | 86 | 84 | 88 | ISO 6974 |
| Balance 1/ | per cent mole | - | - | 1 | ISO 6974 |
| N ₂ | per cent mole | 14 | 12 | 16 | ISO 6974 |
| Sulphur content | mg/m ³ 2/ | - | - | 10 | ISO 6326-5 |
| Wobbe Index (net) | MJ/m ³ 3/ | 39.4 | 38.2 | 40.6 | |

1/ Inerts (different from N₂) + C₂ + C₂₊

2/ Value to be determined at 293.2 K (20 °C) and 101.3 kPa

3/ Value to be determined at 273.2 K (0 °C) and 101.3 kPa"

Annex 11,

Paragraph 2.6., amend to read:

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

Paragraph 3.3.3.4., amend to read:

"3.3.3.4. if active on the selected fuel, other emission control system components or systems, or emission related powertrain components or systems which are connected to a computer, the failure of which may result in tailpipe emissions exceeding the limits given in paragraph 3.3.2."

Paragraph 3.5.2., amend to read:

"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 ten 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 paragraph 3.3.2. are exceeded or if the OBD system is unable to fulfil the basic monitoring requirements specified in paragraph 3.3.3. or 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."

Paragraph 3.6., amend to read:

"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 paragraphs 3.3.3.5. and 3.3.4.5. of this annex."

Insert new paragraphs 3.9. to 3.9.1., to read:

"3.9. Bi-fuelled gas vehicles

3.9.1. For bi-fuelled gas vehicles, the procedures:
– activation of malfunction indicator (MI) (see paragraph 3.5. of this annex);

- fault code storage (see paragraph 3.6. of this annex);
 - extinguishing the MI (see paragraph 3.7. of this annex);
 - erasing a fault code (see paragraph 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 paragraph 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."

Paragraph 4.4., amend to read:

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

Paragraphs 4.5. to 4.5.2., amend to read:

"4.5. Bi-fuelled gas vehicles

4.5.1. Notwithstanding the requirements of paragraph 3.9.1., and where requested by the manufacturer, the administrative department 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 administrative department.

4.5.2. Notwithstanding the requirements of paragraph 6.6. of appendix 1 to this annex, and where requested by the manufacturer, the type-approval 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.
- evaluation and transmission of one set of diagnostic signals for both fuels in the petrol computer independent of the fuel use. The as supply system computer will evaluate and transmit the gaseous fuel system related diagnostic signals and store status history.

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

Insert new paragraphs 4.6. to 4.6.2., to read:

"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 paragraph 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 administrative department 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 administrative department 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."

Paragraph 4.6. (former), renumber as paragraph 4.7.

Insert new paragraphs 5. to 5.2.3., to read:

"5. ACCESS TO OBD INFORMATION

5.1. Applications for type-approval or amendment of a type-approval 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 administrative departments shall make appendix 1 of annex 2 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 administrative department 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 Regulation,
- the administrative department shall, within 30 days, request the manufacturer of the vehicle in question the type to make available the information required in paragraph 4.2.11.2.7.6. of annex 1. The requirement of the second section of paragraph 4.2.11.2.7.6. is not applicable;
 - the manufacturer shall submit this information to the administrative department within two months of the request;
 - the administrative department shall transmit this information to the administrative departments of the Contracting Parties and the administrative department which granted the original type-approval shall attach this information to annex 1 of the vehicle type-approval information;
- This requirement shall not invalidate any approval previously granted pursuant to Regulation No. 83 nor prevent extensions to such approvals under the terms of the Regulation under which they were originally granted.
- 5.2.2. Information can only be requested for replacement or service components that are subject to UNECE type-approval, or for components that form part of a system that is subject to UNECE 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."

Appendix 1,

Paragraph 3.2., amend to read:

"3.2. Fuel

The appropriate reference fuel as described in annex 10 for petrol and diesel fuels and in annex 10a for LPG and NG fuels must be used for testing. The fuel type for each failure mode to be tested (described in paragraph 6.3. of this appendix) may be selected by the administrative department from the reference fuels described in annex 10a in the case of the testing of a mono-fuelled gas vehicle and from the reference fuels described in annex 10 or annex 10a 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 paragraphs 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."

Paragraph 6.3.1.4., amend to read:

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

Paragraph 6.3.1.5., amend to read:

"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."

Paragraph 6.4.1.5., amend to read:

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

Paragraph 6.4.1.6., amend to read:

"6.4.1.6. Electrical disconnection of any other emission-related power-train component connected to a computer that results in emissions exceeding any of the limits given in paragraph 3.3.2. of this annex (if active on the selected fuel type)."

Paragraphs 6.5.3. to 6.5.3.5., amend to read:

"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 emission-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 paragraph 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 Regulation.

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 paragraph 6.5.3.2. of this annex.

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 Regulation.

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 administrative department such that it is readily accessible by service personnel but protected from tampering by non-qualified personnel."

Insert new paragraphs 6.6. to 6.6.3., to read:

"6.6. Specific requirements regarding the transmission of diagnostic signals from bi-fuelled gas vehicles

- 6.6.1. For bi-fuelled gas vehicles, where the diagnostic signals of the different fuel systems are stored in the same computer, the diagnostic signals for the operation on petrol and for the operation on gas shall be evaluated and transmitted independently of each other.
 - 6.6.2. For bi-fuelled gas vehicles, where the diagnostic signals of the different fuel systems are stored in the separate computers, the diagnostic signals for the operation on petrol and for the operation on gas shall be evaluated and transmitted from the computer specific to the fuel.
 - 6.6.3. 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 vehicles and external test equipment for emissions-related diagnostics – Part 5: Emissions-related diagnostic services", dated 1 November 2001."
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