

5 February 2016

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## Agreement

### **Concerning the Adoption of Uniform Technical Prescriptions for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these Prescriptions\***

(Revision 2, including the amendments which entered into force on 16 October 1995)

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#### **Addendum 82 – Regulation No. 83**

#### **Revision 5 - Amendment 1**

Supplement 1 to the 07 series of amendments – Date of entry into force: 29 January 2016

#### **Uniform provisions concerning the approval of vehicles with regard to the emission of pollutants according to engine fuel requirements**

This document is meant purely as documentation tool. The authentic and legal binding text is: ECE/TRANS/WP.29/2015/57 (as amended by paragraphs 63 and 64 of the report ECE/TRANS/WP.29/1116).



**UNITED NATIONS**

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\* Former title of the Agreement: Agreement Concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts, done at Geneva on 20 March 1958.



*Paragraph 2.26.*, shall be deleted.

*Paragraphs 2.27. to 2.35. (former)*, renumber as paragraphs 2.26. to 2.34.

*Text of footnote 3*, shall be deleted.

*Paragraph 9.3.5.2.*, amend to read:

"9.3.5.2. For IUPR, the number of sample lots to be taken is described in Table 4 and is based on the number of vehicles of an OBD family that are approved with IUPR (subject to sampling).

For the first sampling period of an OBD family, all of the vehicle types in the family that are approved with IUPR shall be considered to be subject to sampling. For subsequent sampling periods, only vehicle types which have not been previously tested or are covered by emissions approvals that have been extended since the previous sampling period shall be considered to be subject to sampling.

For families consisting of fewer than 5,000 registrations that are subject to sampling within the sampling period, the minimum number of vehicles in a sample lot is six. For all other families, the minimum number of vehicles in a sample lot to be sampled is fifteen.

Each sample lot shall adequately represent the sales pattern, i.e. at least the high volume vehicle types ( $\geq 20$  per cent of the family total) shall be represented.

Vehicles of small series productions with less than 1000 vehicles per OBD family are exempted from minimum IUPR requirements as well as the requirement to demonstrate these to the Type Approval Authority."

*Paragraph 12.1.2.*, shall be deleted.

*Paragraph 12.2.*, amend to read:

"12.2. Type approvals"

*Paragraph 12.2.1.*, amend to read:

"12.2.1. As from the official date of entry into force of the 07 series of amendments for vehicles of category M or N<sub>1</sub> (Class I) and 1 September 2015 for vehicles of category N<sub>1</sub> (Classes II or III) and category N<sub>2</sub>, Contracting Parties applying this Regulation shall grant an approval to new vehicle types only if they comply with:

- (a) The applicable limits for the Type I test in Table 1 specified in paragraph 5.3.1.4. of this Regulation; and
- (b) The Preliminary OBD threshold limits in Table A11/2 specified in paragraph 3.3.2.2. of Annex 11 to this Regulation."

*Paragraph 12.2.2.*, amend to read:

"12.2.2. As from 1 September 2015 for vehicles of category M or N<sub>1</sub> (Class I), and from 1 September 2016 for vehicles of category N<sub>1</sub> (Classes II or III) and category N<sub>2</sub>, Contracting Parties applying this Regulation shall not be obliged to accept a type-approval which has not been granted in accordance with the 07 series of amendments to this Regulation which does not comply with:

- (a) The applicable limits for the Type I test in Table 1 specified in paragraph 5.3.1.4. of this Regulation; and
- (b) The Preliminary OBD threshold limits in Table A11/2 specified in paragraph 3.3.2.2. of Annex 11 to this Regulation."

*Paragraph 12.2.3.*, amend to read:

"12.2.3. As from 1 September 2017 for vehicles of category M or N<sub>1</sub> (Class I) and 1 September 2018 for vehicles of category N<sub>1</sub> (Classes II or III) and category N<sub>2</sub>, Contracting Parties applying this Regulation as amended by the 07 series of amendments shall grant an approval to new vehicle types only if they comply with:

- (a) The applicable limits for the Type I test in Table 1 specified in paragraph 5.3.1.4.; and
- (b) The Final OBD threshold limits in Table A11/1 specified in paragraph 3.3.2.1. of Annex 11 to this Regulation."

*Paragraph 12.2.4.*, amend to read:

"12.2.4. As from 1 September 2018 for vehicles of category M or N<sub>1</sub> (Class I), and from 1 September 2019 for vehicles of category N<sub>1</sub> (Classes II or III) and category N<sub>2</sub>, Contracting Parties applying this Regulation shall not be obliged to accept a type-approval which has not been granted in accordance with the 07 series of amendments to this Regulation which does not comply with:

- (a) The applicable limits for the Type I test in Table 1 specified in paragraph 5.3.1.4. of this Regulation; and
- (b) The Final OBD threshold limits in Table A11/1 specified in paragraph 3.3.2.1. of Annex 11 to this Regulation."

*Annex 1,*

*Paragraph 3.2.12.2.7.6.3.*, amend to read:

"3.2.12.2.7.6.3. 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 shall be provided. In the case of vehicle types that use a communication link in accordance with the standard listed in paragraph 6.5.3.1.(a) of Annex 11, Appendix 1 of this Regulation, a comprehensive explanation for the data given in service \$06 Test ID \$00 to FF, for each OBD monitor ID supported, shall be provided."

*Annex 2,*

*Appendix 1,*

*Paragraph 3.,* amend to read:

- "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 and 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 shall be provided. In the case of vehicle types that use a communication link in accordance with the standard listed in paragraph 6.5.3.1.(a) of Annex 11, Appendix 1 of this Regulation, a comprehensive explanation for the data given in service \$06 Test ID \$00 to FF, for each OBD monitor ID supported, shall be provided."

*Annex 11,*

*Paragraph 2.,* amend to read:

- "2. ...  
For the purposes of this annex only:"

*Paragraph 2.10.,* amend to read:

- "2.10. A "driving cycle" consists of engine key-on, a driving mode where a malfunction would be detected if present, and engine key-off."

*Insert a new paragraph 3.2.3.,* to read:

- "3.2.3. Identification of deterioration or malfunctions may be also be done outside a driving cycle (e.g. after engine shutdown)."

*Delete paragraphs 3.3.4.9. and 3.3.4.10.*

*Insert new paragraphs 3.3.5.1. and 3.3.5.2.,* to read:

- "3.3.5.1. The following devices should however be monitored for total failure or removal (if removal would cause the applicable emission limits to be exceeded):
- (a) A particulate trap fitted to compression ignition engines as a separate unit or integrated into a combined emission control device;
  - (b) A NO<sub>x</sub> after-treatment system fitted to compression ignition engines as a separate unit or integrated into a combined emission control device;
  - (c) A Diesel Oxidation Catalyst (DOC) fitted to compression ignition engines as a separate unit or integrated into a combined emission control device.
- 3.3.5.2. The devices referred to in paragraph 3.3.5.1. shall also be monitored for any failure that would result in exceeding the applicable OBD threshold limits."

*Paragraph 3.8.1., amend to read:*

"3.8.1. The OBD system may erase a fault code and the distance travelled and freeze-frame information if the same fault is not re-registered in at least 40 engine warm-up cycles or forty driving cycles with vehicle operation in which the criteria specified in sections 7.5.1.(a)–(c) of Annex 11, Appendix 1 are met."

*Paragraph 3.9.3.1., amend to read:*

"3.9.3.1. On a request from a diagnostic scan tool, the diagnostic signals shall be transmitted on one or more source addresses. The use of source addresses is described in the standard listed in paragraph 6.5.3.2.(a) of Annex 11, Appendix 1 of this Regulation."

*Insert a new paragraph 3.10., to read:*

- "3.10. Additional provisions for vehicles employing engine shut - off strategies.
- 3.10.1. Driving cycle
- 3.10.1.1. Autonomous engine restarts commanded by the engine control system following an engine stall may be considered a new driving cycle or a continuation of the existing driving cycle."

*Appendix 1,*

*Paragraph 1., amend to read:*

"1. Introduction

This appendix describes the procedure of the test according to paragraph 3. of this annex. The procedure describes a method for checking the function of the On-Board Diagnostic (OBD) system installed on the vehicle by failure simulation of relevant systems in the engine management or emission control system. It also sets procedures for determining the durability of OBD systems.

The manufacturer shall make available the defective components and/or electrical devices which would be used to simulate failures. When measured over the Type I Test cycle, such defective components or devices shall not cause the vehicle emissions to exceed the limits of paragraph 3.3.2 by more than 20 per cent. For electrical failures (short/open circuit), the emissions may exceed the limits of paragraph 3.3.2. by more than twenty per cent.

When the vehicle is tested with the defective component or device fitted, the OBD system is approved if the MI is activated. The OBD system is also approved if the MI is activated below the OBD threshold limits."

*Insert a new paragraphs 6.1.1., to read:*

"6.1.1. The Type I test need not be performed for the demonstration of electrical failures (short/open circuit). The manufacturer may demonstrate these failure modes using driving conditions in which the component is used and the monitoring conditions are encountered. These conditions shall be documented in the type approval documentation. "

*Insert a new paragraph 6.2.3., to read:*

"6.2.3. The use of additional preconditioning cycles or alternative preconditioning methods shall be documented in the type approval documentation."

*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).

*Paragraphs 6.4.1.1.*, amend to read:

- "6.4.1.1. After vehicle preconditioning according to paragraph 6.2. of this appendix, the test vehicle is driven over a Type I test (Parts One and Two).

The MI shall be activated at the latest before the end of this test under any of the conditions given in paragraphs 6.4.1.2. to 6.4.1.5. of this appendix. The MI may also be activated during preconditioning. The Technical Service may substitute those conditions with others in accordance with paragraph 6.4.1.6. of this appendix

In the case of testing a bi-fuel gas vehicle, both fuel types shall be used within the maximum of four (4) simulated failures at the discretion of the Type Approval Authority."

*Paragraphs 6.4.2.1.*, amend to read:

- "6.4.2.1. After vehicle preconditioning according to paragraph 6.2. of this appendix, the test vehicle is driven over a Type I test (Parts One and Two).

The MI shall be activated at the latest before the end of this test under any of the conditions given in paragraphs 6.4.2.2. to 6.4.2.5 of this appendix. The MI may also be activated during preconditioning. The technical service may substitute those conditions by others in accordance with paragraph 6.4.2.5. of this appendix. However, the total number of failures simulated shall not exceed four (4) for the purposes of type approval."

*Paragraphs 6.5.3. to 6.5.3.6.*, amend to read:

- "6.5.3. The emission control diagnostic system shall provide for standardised and unrestricted access and conform to the following ISO standards and/or SAE specification. Later versions may be used at the manufacturers' discretion.

- 6.5.3.1. The following standard shall be used as the on-board to off-board communications link:

(a) ISO 15765-4:2011 "Road vehicles – Diagnostics on Controller Area Network (CAN) – Part 4: Requirements for emissions-related systems", dated 1 February 2011.

- 6.5.3.2. Standards used for the transmission of OBD relevant information:

(a) ISO 15031-5 "Road vehicles - communication between vehicles and external test equipment for emissions-related diagnostics – Part 5: Emissions-related diagnostic services", dated 1 April 2011 or SAE J1979 dated 23 February 2012;

(b) ISO 15031-4 "Road vehicles – Communication between vehicle and external test equipment for emissions related diagnostics – Part 4: External test equipment", dated 1 June 2005 or SAE J1978 dated 30 April 2002;

- (c) ISO 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 July 2004 or SAE J 1962 dated 26 July 2012;
- (d) ISO 15031-6 "Road vehicles – Communication between vehicle and external test equipment for emissions related diagnostics – Part 6: Diagnostic trouble code definitions", dated 13 August 2010 or SAE J2012 dated 07 March 2013;
- (e) ISO 27145 "Road vehicles – Implementation of World-Wide Harmonized On-Board Diagnostics (WWH-OBD)" dated 2012-08-15 with the restriction, that only 6.5.3.1.(a) may be used as a data link;
- (f) ISO 14229:2013 "Road vehicles – Unified diagnostic services (UDS) with the restriction, that only 6.5.3.1.(a) may be used as a data link".

The standards (e) and (f) may be used as an option instead of (a) not earlier than 1 January 2019.

6.5.3.3. Test equipment and diagnostic tools needed to communicate with OBD systems shall meet or exceed the functional specification given in the standard listed in paragraph 6.5.3.2.(b) of this appendix.

6.5.3.4. Basic diagnostic data, (as specified in paragraph 6.5.1.) and bi-directional control information shall be provided using the format and units described in the standard listed in paragraph 6.5.3.2.(a) of this appendix and must be available using a diagnostic tool meeting the requirements of the standard listed in paragraph 6.5.3.2.(b) of this appendix.

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 the standard listed in paragraph 6.5.3.2.(a) of this Regulation but related to this Regulation.

6.5.3.5. When a fault is registered, the manufacturer shall identify the fault using an appropriate ISO/SAE controlled fault code specified in one of the standards listed in paragraph 6.5.3.2.(d) of this appendix relating to "emission related system diagnostic trouble codes". If such identification is not possible, the manufacturer may use manufacturer controlled diagnostic trouble codes according to the same standard. The fault codes shall 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 the standard listed in paragraph 6.5.3.2.(a) of this appendix but related to this Regulation.

6.5.3.6. The connection interface between the vehicle and the diagnostic tester shall be standardised and shall meet all the requirements of the standard listed in paragraph 6.5.3.2.(c) of this appendix. The installation position shall 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 a new paragraph 6.5.3.7., to read:*

"6.5.3.7. The manufacturer shall also make accessible, where appropriate on payment, the technical information required for the repair or maintenance of motor vehicles unless that information is covered by an intellectual property right or constitutes essential, secret know-how which is identified in an appropriate form; in such case, the necessary technical information shall not be withheld improperly.

Entitled to such information is any person engaged in commercially servicing or repairing, road-side rescuing, inspecting or testing of vehicles or in the manufacturing or selling replacement or retro-fit components, diagnostic tools and test equipment. "

*Paragraphs 7.6.1. to 7.6.2.1., amend to read:*

"7.6.1. The OBD system shall report, in accordance with the ISO 15031-5 specifications of the standard listed in paragraph 6.5.3.2.(a) of this appendix, the ignition cycle counter and general denominator as well as separate numerators and denominators for the following monitors, if their presence on the vehicle is required by this annex:

- (a) Catalysts (each bank to be reported separately);
- (b) Oxygen/exhaust gas sensors, including secondary oxygen sensors (each sensor to be reported separately);
- (c) Evaporative system;
- (d) EGR system;
- (e) VVT system;
- (f) Secondary air system;
- (g) Particulate filter;
- (h) NO<sub>x</sub> after-treatment system (e.g. NO<sub>x</sub> adsorber, NO<sub>x</sub> reagent/catalyst system);
- (i) Boost pressure control system.

*Paragraph 7.6.2., amend to read:*

7.6.2. For specific components or systems that have multiple monitors, which are required to be reported by this point (e.g. oxygen sensor bank 1 may have multiple monitors for sensor response or other sensor characteristics), the OBD system shall separately track numerators and denominators for each of the specific monitors and report only the corresponding numerator and denominator for the specific monitor that has the lowest numerical ratio. If two or more specific monitors have identical ratios, the corresponding numerator and denominator for the specific monitor that has the highest denominator shall be reported for the specific component.

*Insert a new paragraph 7.6.2.1., to read:*

7.6.2.1. Numerators and denominators for specific monitors of components or systems, that are monitoring continuously for short circuit or open circuit failures are exempted from reporting.



"Continuously," if used in this context means monitoring is always enabled and sampling of the signal used for monitoring occurs at a rate no less than two samples per second and the presence or the absence of the failure relevant to that monitor has to be concluded within 15 seconds.

If for control purposes, a computer input component is sampled less frequently, the signal of the component may instead be evaluated each time sampling occurs.

It is not required to activate an output component/system for the sole purpose of monitoring that output component/system."

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