

21 November 2019

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## **Agreement**

### **Concerning the Adoption of Harmonized Technical United Nations Regulations 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 United Nations Regulations\***

(Revision 3, including the amendments which entered into force on 14 September 2017)

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#### **Addendum 109 – UN Regulation No. 110**

#### **Revision 5 – Amendment 2**

Supplement 2 to 03 series of amendments – Date of entry into force: 15 October 2019

#### **CNG and LNG vehicles**

This document is meant purely as documentation tool. The authentic and legal binding text is: ECE/TRANS/WP.29/2019/13 as amended by paragraph 104 in document ECE/TRANS/WP.29/1145.



**UNITED NATIONS**

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\* Former titles 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 (original version);  
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, done at Geneva on 5 October 1995 (Revision 2).

## Supplement 2 to the 03 series of amendments to UN Regulation No. 110 (CNG and LNG vehicles)

Paragraphs 4.32. and 4.33., amend to read:

- "4.32.        *"Gas injector"* means a device for introducing gaseous fuel into the engine or associated intake system. A gas injector shall be considered as a gas flow adjuster.
- 4.33.        *"Gas flow adjuster"* means a gas flow restricting device, installed downstream of a pressure regulator, controlling gas flow to the engine. The function of a gas flow adjuster can be performed by another component (e.g. gas injector)."

Paragraph 4.56., amend to read:

- "4.56.        *"Finished cylinders"* means completed cylinders that are ready for use, typical of normal production, complete with identification marks and external coating including integral insulation and/or protection specified by the manufacturer on the design drawing for the cylinder."

Insert a new definition 4.76., to read:

- "4.76.        *"Certified cylinder"* means a finished cylinder that complies with the tests described in this Regulation for finished cylinders and is approved."

### Annex 3A

Paragraphs 4.1.2. to 4.1.4.2., amend to read:

- "4.1.2.        Use of cylinders
- The service conditions ... may safely be used to:
- (a)    Manufacturers of cylinders;
- (b)    Owners of certified cylinders;
- .....
- 4.1.3.        Service life
- The service life for which certified cylinders are safe ... be 20 years.
- 4.1.4.        Periodic requalification
- Recommendations for periodic requalification by visual inspection or testing during the service life shall be provided by the cylinder manufacturer on the basis of use under service conditions specified herein. Each certified cylinder shall be visually inspected at least every 48 months after the date of its entry into service on the vehicle (vehicle registration), and at the time of any reinstallation, for external damage and deterioration. It is suggested to visually inspect under the support straps as well. The visual inspection shall be performed by a competent agency approved or recognized by the Regulatory Authority, in consideration of the manufacturer's specifications: Certified cylinders without label containing mandatory information or with labels containing mandatory information that are illegible in any way shall be removed from service. If the certified cylinder can be positively identified by manufacturer and serial number, a replacement label may be applied, allowing the certified cylinder to remain in service. Contracting Parties requiring a more frequent (than every 48 months) or more stringent periodic requalification of cylinders may do so in accordance with the national or regional requirements."

4.1.4.1. Certified cylinders involved in collisions

Certified cylinders that have been ... having jurisdiction. A certified cylinder that has not experienced ... otherwise the certified cylinder shall be returned to the manufacturer for evaluation.

4.1.4.2. Cylinders involved in fires

Certified cylinders that have been subject to the action of fire shall be reinspected by an agency authorized by the manufacturer, or condemned and removed from service."

*Paragraph 6.12.*, amend to read:

"6.12. Exterior environmental protection

The exterior of .....

(c) A protective coating ..... A.9. (Appendix A to this annex).

Any coatings or protections applied to cylinders shall be such that the application process does not adversely affect the mechanical properties of the cylinder. The coating or protection shall be designed to facilitate subsequent in service inspection and the manufacturer shall provide guidance on coating or protection treatment during such inspection to ensure the continued integrity of the cylinder.

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*Paragraph 6.17., Table 6.7 (Change of design), twelfth row*, in the first column replace "Dome shape" by "Dome design" and in the eighth column insert the figure "X\*\*" including a new note\*\* to read: "\*\* Drop test A.20 only required for CNG-3 and CNG-4 designs".

*Paragraph 10.7.1.*, amend to read:

"10.7.1. General

Cylinder design qualification tests shall be in accordance with the requirements of paragraphs 8.6., 10.7.2., 10.7.3., 10.7.4. and 10.7.5. of this annex, except that the LBB performance in paragraph 8.6.10. above is not required."

*Add a new paragraph 10.7.5.*, to read:

"10.7.5. Impact damage test

One or more finished cylinders shall be subjected to an impact damage test according to Appendix A, paragraph A.20."

*Annex 3A, Appendix A, paragraph A.17.*, amend to read:

"A.17. Composite flaw tolerance tests

For type CNG-2, CNG-3 and CNG-4 designs only, one finished cylinder, complete with protective coating, a flaw tolerance test shall be performed on the cylindrical wall as well as on the minimum composite wall thickness of the weakest part(s) of the container as identified by an appropriate stress analysis as determined in Annex 3A, Appendix F, paragraph F.1. or full scale tests on finished cylinders. The flaws shall be cut in the longitudinal direction into the composite. The flaws shall be greater than the visual inspection limits as specified by the manufacturer.

The flawed cylinder shall then ..... be destroyed."

*Annex 3B, paragraph 2.1.3.*, amend to read:

"2.1.3. Periodic requalification

Recommendations for periodic requalification by visual inspection or testing during the service life shall be provided by the tank manufacturer on the basis of use under service conditions specified herein. Each tank shall be visually inspected at least every 120 months after the date of its entry into service on the vehicle (vehicle registration), and at the time of any reinstallation, for external damage and deterioration. It is suggested to visually inspect under the support straps as well. The visual inspection shall be performed by a Technical Service designated or recognized by the Type Approval Authority, in consideration of the manufacturer's specifications: tanks without label containing mandatory information, or with labels containing mandatory information that are illegible in any way shall be removed from service. If the tank can be positively identified by manufacturer and serial number, a replacement label may be applied, allowing the tank to remain in service. Contracting Parties requiring a more frequent (than every 120 months) or more stringent periodic requalification of tanks may do so in accordance with the national or regional requirements."

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