

30 October 2009

## **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 that entered into force on 16 October 1995)

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**Addendum 109: Regulation No. 110**

**Revision 1 - Amendment 1**

Supplement 8 to the original version of the Regulation: Date of entry into force: 22 July 2009

**UNIFORM PROVISIONS CONCERNING THE APPROVAL OF:**

- I. SPECIFIC COMPONENTS OF MOTOR VEHICLES USING COMPRESSED NATURAL GAS (CNG) IN THEIR PROPULSION SYSTEM;**
- II. VEHICLES WITH REGARD TO THE INSTALLATION OF SPECIFIC COMPONENTS OF AN APPROVED TYPE FOR THE USE OF COMPRESSED NATURAL GAS (CNG) IN THEIR PROPULSION SYSTEM**



**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.

GE.09-

Paragraph 2.2., insert new item (v), to read:

- "2.2. ...  
 (u) ventilation hose,  
 (v) pressure relief device (PRD) (pressure triggered)."

Paragraph 2.22., amend to read:

"2.22. "Pressure relief device (PRD) (temperature triggered)" means a one time use device triggered by excessive temperature which vents gas to protect the cylinder from rupture."

Insert a new paragraph 2.27., to read:

"2.27. "Pressure relief device (PRD) (pressure triggered) (this device sometimes is referred to as "burst disc")" means a one time use device triggered by excessive pressure which prevents a pre-determined upstream pressure being exceeded."

Paragraphs 6.4. to 6.11., amend the table to read:

"

| Paragraph | Component   | Annex |
|-----------|---|-------|
| 6.4.      | Automatic valve<br>Check valve or non-return valve<br>Pressure relief valve<br>Pressure relief device (temperature triggered)<br>Excess flow valve<br>Pressure relief device (pressure triggered) | 4A    |
| 6.5.      | Flexible fuel ...   | ...   |
| ...       | ...   | ...   |

"

Insert a new paragraph 17.3.2.6., to read:

"17.3.2.6. PRD (pressure triggered)."

Insert new paragraphs 17.5.6. to 17.5.6.2., to read:

"17.5.6. PRD (pressure triggered)

17.5.6.1. The PRD (pressure triggered) shall be activated and shall vent the gas independently from the PRD (temperature triggered).

17.5.6.2. The PRD (pressure triggered) shall be fitted to the fuel container(s) in such a manner that it can discharge into the gas-tight housing if that gas-tight housing fulfils the requirements of paragraph 17.5.5."

Annex 1A, insert new items 1.2.4.5.16. to 1.2.4.5.16.6., to read:

- "1.2.4.5.16. PRD (pressure triggered): yes/no 1/
- 1.2.4.5.16.1. Make(s): .....
- 1.2.4.5.16.2. Type(s): .....
- 1.2.4.5.16.3. Description and drawings:.....
- 1.2.4.5.16.4. Activation pressure: 2/ ..... MPa
- 1.2.4.5.16.5. Material: .....
- 1.2.4.5.16.6. Operating temperatures: 2/ ..... °C"

Annex 1B,

Insert new items 1.2.4.5.16. to 1.2.4.5.16.5., to read:

- "1.2.4.5.16. PRD (pressure triggered): yes/no 1/
- 1.2.4.5.16.1. Make(s): .....
- 1.2.4.5.16.2. Type(s): .....
- 1.2.4.5.16.3. Activation pressure: 2/ ..... MPa
- 1.2.4.5.16.4. Material: .....
- 1.2.4.5.16.5. Operating temperatures: 2/ ..... °C"

Items 1.2.4.5.16. to 1.2.4.5.16.5. (former), renumber as items 1.2.4.5.17. to 1.2.4.5.17.5.

Annex 2B, item 1., amend to read:

- "1. CNG component considered:  
.....  
Pressure relief device (PRD) (temperature triggered) 2/  
.....  
CNG filter(s) 2/  
PRD (pressure triggered) 2/"

Annex 2B, Addendum,

Insert new items 1.19. to 1.19.2., to read:

- "1.19. PRD (pressure triggered)
- 1.19.1. Working pressure(s): 2/ ..... MPa
- 1.19.2. Material:..... "

Annex 3, Appendix A

Paragraph A.15.4., amend to read:

"A.15.4. Temperature and pressure measurements

Surface temperatures shall be ... less than 25 square mm.

The pressure inside the cylinder shall be measured by a pressure sensor without modify the configuration of the system under test.

Thermocouple temperatures and ..."

Paragraph A.28., should be deleted.

Annex 4A

The title, amend to read:

"PROVISIONS REGARDING THE APPROVAL OF THE AUTOMATIC VALVE,  
NON RETURN VALVE, PRESSURE RELIEF VALVE, PRESSURE RELIEF DEVICE  
(TEMPERATURE TRIGGERED), EXCESS FLOW VALVE, MANUAL VALVE AND  
THE PRESSURE RELIEF DEVICE (PRESSURE TRIGGERED)"

Add a new paragraph 6.3., to read: (content of former Annex 3, Appendix A, paragraph A.28.)

"6.3. Manual valve device requirements

One specimen shall be submitted to a fatigue test at a pressure cycling rate not to exceed 4 cycles per minute as follows:

(i) held at 20 °C while pressured for 2,000 cycles between 2 MPa and 26 MPa."

Add new paragraphs 7. to 7.4.2.2.2., to read:

"7. Pressure relief device (pressure triggered)

7.1. The materials constituting the PRD (pressure triggered) which are in contact with the CNG when operating, shall be compatible with the test CNG. In order to verify this compatibility, the procedure described in Annex 5D shall be used.

7.2. Operating specifications

7.2.1. The PRD (pressure triggered) of Class 0, shall be so designed to operate at temperatures as specified in the Annex 5O.

7.2.2. The burst pressure shall be 34 MPa ± 10 per cent at ambient temperature and at the maximum operating temperature as indicated in Annex 5O.

7.3. The device has to comply with the test procedures for the Class components, specified in the scheme in Figure 1-1 of paragraph 2. of this Regulation, except overpressure, internal leakage and external leakage.

7.4. PRD (pressure triggered) requirements.

7.4.1. Continued operation

7.4.1.1. Test procedure

Cycle the PRD (pressure triggered) according to Table 3, with water between 10 per cent and 100 per cent of the working pressure, at a maximum cyclic rate of 10 cycles per minute and a temperature of  $82\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$  or  $57\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ .

Table 3 — Test temperatures and cycles

| Temperature [ $^{\circ}\text{C}$ ] | Cycles |
|------------------------------------|--------|
| 82                                 | 2,000  |
| 57                                 | 18,000 |

7.4.1.2. Requirements

7.4.1.2.1. At the completion of the test, the component shall not leak more than  $15\text{ cm}^3/\text{hour}$  when submitted to a gas pressure equal to the maximum working pressure at ambient temperature and at the maximum operating temperature as indicated in Annex 5O.

7.4.1.2.2. At the completion of the test, the PRD (pressure triggered) burst pressure shall be  $34\text{ MPa} \pm 10$  per cent at ambient temperature and at the maximum operating temperature as indicated in Annex 5O.

7.4.2. Corrosion resistance test

7.4.2.1. Test procedure

The PRD (pressure triggered) shall be subjected to the test procedure described in Annex 5E, except the leakage test.

7.4.2.2. Requirements

7.4.2.2.1. At the completion of the test, the component shall not leak more than  $15\text{ cm}^3/\text{hour}$  when submitted to a gas pressure equal to the maximum working pressure at ambient temperature and at the maximum operating temperature as indicated in Annex 5O.

7.4.2.2.2. At the completion of the test, the PRD (pressure triggered) burst pressure shall be  $34\text{ MPa} \pm 10$  per cent at ambient temperature and at the maximum operating temperature as indicated in Annex 5O."