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Item 9 of the provisional agenda

Regulation No. 110 (Specific equipment for CNG)

Proposal for amendments to Regulation No. 110

Submitted by the expert from the Czech Republic *

The text reproduced below was prepared by the expert from the Czech Republic to clarify the general test provisions in the Regulation, mainly those on fuel rail. The modifications to the current text of the Regulation are marked in bold for new characters.

*In accordance with the programme of work of the Inland Transport Committee for 2010–2014 (ECE/TRANS/208, para. 106 and ECE/TRANS/2010/8, programme activity 02.4), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

I. Proposal

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

"2.2. ...

(v) pressure relief device (PRD) (pressure triggered),

(w) **fuel rail.**"

Insert a new paragraph 2.28., to read:

"2.28. "**Fuel rail**" means the pipe or duct that connects the fuel injection devices."

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

"

Paragraph	Component	Annex
...
6.9.	Filling unit or receptacle	4F
6.10.	Gas flow adjuster and gas/air mixer, injector or fuel rail	4G
6.11.	Electronic control unit	4H

"

Insert a new paragraph 17.3.2.7., to read:

"17.3.2.7. **Fuel rail.**"

Annex 1A, insert new items 1.2.4.5.17. to 1.2.4.5.17.6., to read:

"1.2.4.5.17. **Fuel rail: yes/no 1**

1.2.4.5.17.1. **Make(s):**

1.2.4.5.17.2. **Type(s):**

1.2.4.5.17.3. **Description:**

1.2.4.5.17.4. **Working pressure: 2/..... kPa**

1.2.4.5.17.5. **Material:**

1.2.4.5.17.6. **Operating temperatures: 2/..... °C"**

Annex 1B

Insert new items 1.2.4.5.17. to 1.2.4.5.17.5., to read:

"1.2.4.5.17. **Fuel rail: yes/no 1**

1.2.4.5.17.1. **Make(s):**

1.2.4.5.17.2. **Type(s):**

1.2.4.5.17.3. **Working pressure: 2/..... kPa**

1.2.4.5.17.4. **Material:**

1.2.4.5.17.5. **Operating temperatures: 2/..... °C"**

Items 1.2.4.5.17. to 1.2.4.5.17.5. (former), renumber as items 1.2.4.5.18. to 1.2.4.5.18.5.

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

- "1. CNG component considered:

 PRD (pressure triggered) 2/
Fuel rail 2"

Annex 2B, Addendum, insert new items 1.20. to 1.20.2., to read:

- "1.20. **Fuel rail(s)**
 1.20.1. Working pressure(s): 2/ MPa
 1.20.2. Material: "

Annex 3, Appendix A, paragraph A.15.5., amend to read:

- "A.15.5. General test requirements
 Cylinders shall be position at both:
 (a) working pressure;
 (b) 25 per cent of the working pressure, **if a PRD temperature triggered is not used.**
 Immediately following ignition, the fire shall produce..."

Annex 4G, amend to read:

"PROVISIONS REGARDING THE APPROVAL OF GAS FLOW ADJUSTER AND GAS/AIR MIXER, GAS INJECTOR OR FUEL RAIL

1. The purpose of this annex is to determine the provisions regarding the approval of the gas flow adjuster and gas/air mixer, gas injector **or fuel rail**.
2. Gas/air mixer, gas injector **or fuel rail**.
 - 2.1. The material constituting the gas/air mixer, gas injector **or fuel rail** which is in contact with CNG shall be compatible with the CNG. In order to verify this compatibility, the procedure specified in Annex 5D shall be used.
 - 2.2. The gas/air mixer, gas injector **or fuel rail** shall conform to the requirements of Class 1 or 2 components, according to their Classification.
 - 2.3. Test pressures
 - 2.3.1. The gas/air mixer, gas injector **or fuel rail** of Class 2 shall withstand a pressure twice the working pressure.
 - 2.3.1.1. The gas/air mixer, gas injector **or fuel rail** of Class 2 shall be free from leakage at a pressure twice the working pressure.
 - 2.3.2. The gas/air mixer, gas injector **or fuel rail** of Class 1 and Class 2 shall be so designed to operate at temperatures as specified in Annex 5O.
 - 2.4."

II. Justification

1. Fuel rail is one of the most used gas components of Liquefied Petroleum Gas (LPG) and Compressed Natural Gas (CNG) systems with gas injection. UN Regulation No. 67, 01 series of amendments, considers the fuel rail as specific component which is subject to type approval. However, UN Regulation No. 110 does not include the term "fuel rail", even though this single component (regardless of fuel injectors) is being approved and inaccurately formally marked (e.g. as "injector" etc.). This proposal intends to align the above cited disproportion.
 2. Regarding the amendments to paragraph A.15.5. of Annex 3, Appendix A, the heating-up time at the pressure triggered Pressure Relief Device (PRD), essential for opening pressure, is longer at cylinder filled partially than at cylinder filled to maximum pressure. In this case, it is necessary to conduct two bonfire tests with two cylinders pressurized differently. However, the heating-up time at temperature triggered PRD, essential for opening of thermal fuse (at 110 ± 10 °C), is approximately the same (at different pressurizing). In this case, it is sufficient to conduct only one bonfire test with cylinder pressurized to maximum working pressure (which is the worst case) as required by EN ISO 11439:2000. The above stated proposal is therefore harmonized with EN ISO 11439:2000 (Annex A, Paragraph A.15.5. of this EN ISO Standard).
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