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Agenda Item 6 (b) of the provisional agenda

Amendments to Gas-Fuelled Vehicle Regulation:**UN Regulation No. 110 (Compressed Natural Gas and Liquefied Natural Gas vehicles)****Proposal for Supplement 1 to the 05 of Amendments to UN Regulation No. 110 (Compressed Natural Gas and Liquefied Natural Gas vehicles)****Submitted by the expert from the Netherlands ***

The text reproduced below was prepared by the Task Force on UN Regulation No. 110, aiming to update the existing requirements for compressed natural gas/liquefied natural gas (CNG/LNG) fuelled components. It is based upon GRSG-123-28 distributed at the 123rd session of the Working Party on General Safety (GRSG) (see ECE/TRANS/WP.29/GRSG/102, paragraph 38). The modifications to the current text of the UN Regulation are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2022 as outlined in the proposed programme budget for 2022 (A/76/6, part V, sect. 20, para. 20.76), 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

Paragraphs 8.4. to 8.11., amend to read:

"8.4.-8.11. Provisions on other CNG components

The components shown shall be type approved pursuant to the provisions laid down in the annexes which can be determined from the table below:

<i>Paragraph</i>	<i>Component</i>	<i>Annex</i>
8.4.	Automatic valve Check valve or non-return valve Pressure relief valve Pressure relief device (temperature triggered) Manual valve Excess flow valve Pressure relief device (pressure triggered)	4A
8.5.	Flexible fuel line-hose	4B
8.6.	CNG filter	4C
8.7.	CNG Pressure regulator CNG Compressor	4D
8.8.	Pressure and temperature sensors	4E
8.9.	Filling unit or receptacle	4F
8.10.	Gas flow adjuster and gas/air mixer, injector or fuel rail	4G
8.11.	Electronic control unit	4H

Annex 4A, paragraph 3.2.3., amend to read:

"3.2.3. The non-return valve, being in the normal position of use specified by the manufacturer, is submitted to 20,000 operations; then it is deactivated. **Following 20,000 cycles of operation, subject the check valve to 240 h of chatter flow at a flow rate that causes the most chatter. Failure in any sense during the procedure shall constitute a failure of the check valve. All parts shall remain in position and function properly after this test.** The non-return valve shall remain leak-proof (external) at a pressure of 1.5 times the working pressure (MPa) (see Annex 5B)."

Annex 5L, amend to read:

"Annex 5L

Durability Test (Continued Operation)

1. Test method for CNG components
 - 1.1. The component shall be connected to a source of pressurized dry air or nitrogen by means of a suitable fitting and subjected to the number of cycles specified for that specific component. A cycle shall consist of one opening and one closing of the component within a period of not less than 10 ± 2 seconds.
 - (a) Room temperature cycling

The component shall be operated through 96 per cent of the total cycles at room temperature and at rated service pressure. During the off cycle the downstream pressure of the test fixture should be allowed to decay to 50 per cent of the test pressure. After that, the components shall comply with the leakage test of Annex 5B at room temperature. It is allowed to interrupt this part of the test at 20 per cent intervals for leakage testing.

(b) High temperature cycling

The component shall be operated through 2 per cent of the total cycles at the appropriate maximum temperature specified at rated service pressure. The component shall comply with the leakage test of Annex 5B at the appropriate maximum temperature at the completion of the high temperature cycles.

(c) Low temperature cycling

The component shall be operated through 2 per cent of the total cycles at the appropriate minimum temperature specified at rated service pressure. The component shall comply with the leakage test of Annex 5B at the appropriate minimum temperature specified at the completion of the low temperature cycles.

Following cycling and leakage re-test, the component shall be capable of completely opening and closing when a torque not greater than that specified in Table 5.3 below is applied to the component handle in a direction to open it completely and then in the reverse direction. **For a lever operated valve, the appropriate maximum torque is to be determined by applying a pull force up to 150 N to the end of the handle operating mechanism.**

Table 5.3

<i>Component inlet size [mm]</i>	<i>Maximum torque [Nm]</i>
6	1.7
8 or 10	2.3
12	2.8

- 1.2. This test shall be conducted at the appropriate maximum temperature specified, and shall be repeated at a temperature of -40 °C.
- 1.3. Durability test for LNG products are mentioned in their specific Annex 4I up to Annex 4O, where applicable."

II. Justification

1. The above proposal is intended to:
 - (a) Correct errors/mistakes in the current UN Regulation No. 110;
 - (b) Update paragraphs to be in line with the requirements of ISO15500 and NGV3.1 (industry standards for CNG):
 - (i) Annex 4A: after the duration test on a check valve, it is common to perform a chatter flow. This chatter flow can occur in practice at a filling station. To determine the closing function, this test is added after the duration test. (This is in line with ISO15500 and NGV3.1);
 - (ii) Annex 5L: the durability test on a manual valve is updated with a distinction between a wheel-style valve and lever-operated valve. In the current text, a distinction is not made in the requirements between the two versions. The new proposed wording will give a more specific requirement.
2. By introducing the above requirements, the expert from the Netherlands aims to make this UN Regulation up to date and at the same time ensure an adequate safety level.