



Economic and Social Council

Distr.: General
15 April 2025

Original: English

Economic Commission for Europe

Inland Transport Committee

World Forum for Harmonization of Vehicle Regulations

196th session

Geneva, 24–27 June 2025

Item 4.6.8 of the provisional agenda

1958 Agreement:

Consideration of draft amendments to existing

UN Regulations submitted by GRSP

Proposal for supplement 2 to the 02 series of amendments to UN Regulation No. 134 (Hydrogen and fuel cell vehicles)

Submitted by the Working Party on Passive Safety*

The text reproduced below was adopted by the Working Party on Passive Safety (GRSP) at its seventy-sixth session (ECE/TRANS/WP.29/GRSP/76, paragraph 30). It is based on ECE/TRANS/WP.29/GRSP/2024/27, as amended by annex IX of the report. It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee (AC.1) for consideration at their June 2025 sessions.

* In accordance with the programme of work of the Inland Transport Committee for 2025 as outlined in proposed programme budget for 2025 (A/79/6 (Sect. 20), table 20.6), 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.



Paragraph 5.2., amend to read:

"5.2. Verification tests for performance durability (Hydraulic sequential tests)

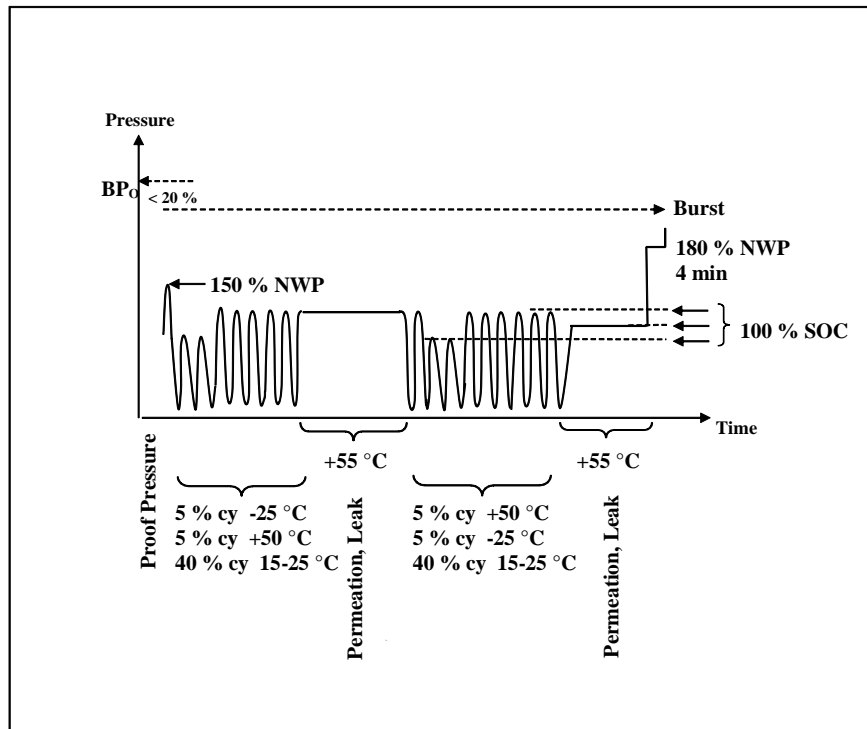
One (1) container is tested in paragraph 5.2.

..."

Paragraph 5.3., figure 2., amend to read:

"Figure 2

Verification test for expected on-road performance (pneumatic)



"

Paragraph 5.3.3., amend to read:

"5.3.3. Extreme temperature static permeation test and localized leak test (pneumatic).

..."

Paragraph 7.1.5., amend to read:

"7.1.5. Fuel system leakage

The hydrogen fuelling line downstream of the main shut-off valve(s) to the fuel cell system, or the engine shall be verified at NWP per Annex 5, paragraph 5. and meet the leakage requirements therein."

Paragraph 9.2.1., amend to read:

"9.2.1. Every container of CHSS shall be pressurized smoothly and continually with a hydraulic fluid or gas to the target pressure of ≥ 125 per cent NWP until the target test pressure level is reached and then held for ≥ 30 seconds. Temperature variation during the test shall be taken into account. The quality variability of the products shall be assessed with a method defined by the manufacturer e.g., variability of elastic expansion, etc. If applicable, upon agreement of the Type Approval Authority and Technical Service, as an alternative, every pressure bearing chamber and every high-pressure fuel line of multiple permanently interconnected chambers may also be subjected to the same test described above individually. When applying this separate testing option, the test article shall be connected to a hydraulic pressure source at one

of its openings by use of appropriate hydraulic mating connections and the remaining openings, if any, shall be closed by use of appropriate means."

Annex 3, paragraph 3.2., amend to read:

"3.2. Drop (impact) test (unpressurized)

The container and its container attachments (if any) is drop tested without internal pressurization or attached valves. The surface onto which the test article is dropped shall be a smooth, horizontal concrete pad or other flooring type with equivalent hardness. No attempt shall be made to prevent the test article from bouncing or falling over during a drop test, but the test article shall be prevented from falling over during the vertical drop test.

The test article shall be dropped in any one of the following four orientations, the orientation chosen for the test shall be determined by the Technical Service in consultation with the manufacturers:

..."

Annex 3, paragraphs 4.2. and 4.3., amend to read:

"4.2. Permeation test (pneumatic)

...

4.3. Localized leak test (pneumatic)

This test is performed after each permeation test conducted in accordance with Table 5a in Annex 3, paragraph 4.

A bubble test may be used to fulfil this requirement. The following procedure is used when conducting the bubble test:

- (a) The exhaust of the shut-off valve (and other internal connections to hydrogen systems) shall be capped for this test (as the test is focused on external leakage).

At the discretion of the Technical Service, the test article may be immersed in the leak-test fluid or leak-test fluid applied to the test article when resting in open air. Bubbles can vary greatly in size, depending on conditions. The tester estimates the gas leakage based on the size and rate of bubble formation.

- (b) For a localized rate of 0.005 mg/sec (3.6 Nml/min), the resultant allowable rate of bubble generation is about 2,030 bubbles per minute for a typical bubble size of 1.5 mm in diameter. Even if much larger bubbles are formed, the leak shall be readily detectable. For an unusually large bubble size of 6 mm in diameter, the allowable bubble rate would be approximately 32 bubbles per minute.

If the measured permeation rate during the permeation test under paragraph 4.2. is less than or equal to 0.005 mg/sec (3.6 Nml/min), the localized leak test is deemed to be fulfilled."

Annex 5, paragraphs 5.2 and 5.3., amend to read:

- "5.2. Hydrogen leakage is evaluated at accessible sections of the fuel lines from the high pressure section to the fuel cell stack (or the engine), using a gas leak detector or a leak detecting liquid, such as soap solution. Any single point of localized external leakage shall not exceed 0.005 mg/sec (3.6 Nml/min).

- 5.3. Hydrogen leak detection is performed primarily at joints."