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## Economic Commission for Europe

### Inland Transport Committee

### World Forum for Harmonization of Vehicle Regulations

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Item 4.9.11 of the provisional agenda

#### 1958 Agreement:

Consideration of draft amendments to existing

UN Regulations submitted by GRSP

## Proposal for the 03 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-seventh session (ECE/TRANS/WP.29/GRSP/77, paragraph 30). It is based on informal document GRSP-77-30-Rev.2 (as reproduced in annex VI 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 November 2025 sessions.

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\* 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 1., footnote 1*, at the end, add a new paragraph to read:

"This Regulation also does not cover supply lines for additional TPRDs made of materials other than metal until specific requirements for such materials have been defined."

*Paragraph 2.1.*, replace the existing paragraph by:

"2.1. 'Appropriate adaptor' means a test component that substitutes for the container valve or end plug and includes an outlet with the proper fitting size and geometry to connect the supply line to the additional TPRD."

*Paragraph 2.3.*, after "(if any)", add ", supply lines for additional TPRDs (if any)".

*Paragraph 2.5.*, at the end, add a new paragraph to read:

"*Note*: The non-pressure bearing parts attached to the container, that provide additional support or protection to additional TPRDs and their supply lines, are also considered as container attachments."

*Paragraph 2.29.*, in (c), after "(T)PRD", add ", supply lines for additional TPRDs".

*Paragraph 5.*, amend (b) and (c) to read:

"(b) The primary closure devices shall be mounted directly on or within each container. If needed, manufacturers may choose to locate additional TPRDs in alternative locations on the container. However, any high-pressure supply lines for such additional TPRDs shall have demonstrated mechanical integrity and durability as part of qualification tests for the container (verification tests for baseline metrics in paragraph 5.1., hydraulic sequential test in paragraph 5.2. excluding the drop test; see Annex 9 — Description of test articles for performance requirements in paragraphs 5.1. to 5.4.).

(c) The CHSS shall meet the performance test requirements specified in paragraphs 5.1. to 5.5. and summarized in Table 2. The corresponding test procedures are specified in Annex 3 and Annex 4;

*Note*: The post-crash fuel system integrity requirements in paragraph 7.2. also apply to supply lines for additional TPRDs."

*Paragraph 5., table 2*, in the first two rows, amend column "Test article" to read "Container or container plus container attachments, and supply lines for additional TPRDs<sup>4</sup>, as applicable".

*Paragraph 5.*, add a new footnote 4 to read:

<sup>4</sup> For detailed requirements on supply lines for additional TPRDs see Annex 9 – Description of test articles for performance requirements in paragraphs 5.1. to 5.4. "

*Paragraphs 5.1.1. and 5.1.2.*, first sentences after the headings, after "Three (3) containers", add "(as well as supply lines for additional TPRDs (if any) through appropriate adaptors)".

*Paragraph 5.2.*, second paragraph, amend to read:

"Unless otherwise specified, the tests in paragraph 5.2. shall be conducted on the container equipped with its container attachments (if any) as well as supply lines for additional TPRDs (if any) through appropriate adaptors that represent the CHSS without the primary closures. At the discretion of the Technical Service and the Type Approval Authority, for such supply lines the worst-case approach may be applied, e.g., longest lines, largest diameter, smallest bend radius and highest number of fittings."

*Paragraph 5.2.1.*, second sentence after the heading, after "if any", add ", as well as supply lines for additional TPRDs (if any) through appropriate adaptors".

*Paragraph 5.2.2.*, amend to read:

"5.2.2. Drop (impact) test

The container with its container attachments (if any) is dropped once in one of the impact orientations specified in Annex 3, paragraph 3.2. This test does not apply to supply lines for additional TPRDs.

*Note:* The manufacturer applying for approval shall provide handling procedures to ensure that the supply lines for additional TPRDs will not suffer damage or contamination during handling. The handling procedure shall require the removal from service of supply lines that have unacceptable damage."

*Paragraphs 5.2.3. to 5.2.8.,* first sentences after the headings, after "(if applicable)", add "as well as supply lines for additional TPRDs (if any) through appropriate adaptors".

*Paragraph 5.3.,* first paragraph, amend to read:

"A single CHSS shall undergo the following sequence of tests, which are illustrated in Figure 2. Specifics of applicable test procedures for the CHSS are provided in Annex 3. At the discretion of the Technical Service and the Type Approval Authority, for supply lines for additional TPRDs, the worst-case approach may be applied, e.g., longest lines, largest diameter, smallest bend radius and highest number of fittings."

*Paragraph 5.3.1.,* first sentence after the heading, after "CHSS", add "as well as supply lines for additional TPRDs (if any) through appropriate adaptors".

*Paragraphs 5.3.4. and 5.3.5.,* first sentences after the headings, after "(if any)", add ", as well as supply lines for additional TPRDs (if any) through appropriate adaptors".

*Paragraph 5.4.,* at the end, add a new paragraph to read:

"During the entire fire test, additional TPRDs shall remain connected to the container by at least one attachment point."

*Paragraph 7.1.1.5.,* amend to read:

"7.1.1.5. The geometry of the fuelling receptacle of compressed hydrogen gas vehicles shall, depending on its nominal working pressure and specific application, be compatible with specification H35, H35MF or H70, and in accordance with international standard ISO 17268:2020 or ISO 17268-1:2025."

*Paragraph 9.2.,* after "system container", add "(and supply lines for additional TPRDs (if any))".

*Paragraph 9.2.1.,* amend to read:

"9.2.1. Every container of CHSS, as well as supply lines for additional TPRDs (if any) through appropriate adaptors, shall be pressurized smoothly and continually with a hydraulic fluid or gas to the target pressure of  $\geq 125$  per cent NWP until the target test pressure level is reached and then held for  $\geq 30$  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 and supply lines for additional TPRDs 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."

*Paragraph 9.2.3.2.,* second sentence after the heading, after "container", add ", as well as supply lines for additional TPRDs (if any) through appropriate adaptors,".

*Paragraph 13.1.,* renumber as paragraph 13.3.1.

*Insert new paragraphs 13.1. to 13.2.1.,* to read:

"13.1. General

13.1.1. Contracting Parties applying this Regulation may grant type approvals according to any of the preceding series of amendments to this Regulation.

13.1.2. Contracting Parties applying this Regulation shall continue to grant extensions of existing approvals to any of the preceding series of amendments to this Regulation.

13.2. Transitional provisions applicable to the 01 series of amendments."

13.2.1. As from the official date of entry into force of the 01 series of amendments, no Contracting Party applying this UN Regulation shall refuse to grant or refuse to accept UN type approvals under this UN Regulation as amended by the 01 series of amendments."

*Paragraphs 13.2. to 13.4. (former), renumber as paragraphs 13.2.2. to 13.2.4.*

*Paragraph 13.5. (former), renumber as paragraph 13.2.5. and replace the references to "13.2." and "13.4" by references to "13.2.2." and "13.2.4.", respectively.*

*Insert new paragraph 13.3., to read:*

"13.3. Transitional provisions applicable to the 02 series of amendments."

*Paragraphs 13.6. to 13.7. (former), renumber as paragraphs 13.3.2. to 13.3.3.*

*Delete paragraphs 13.8 to 13.9.*

*Insert new paragraphs 13.4. to 13.4.4., to read:*

"13.4. Transitional provisions applicable to the 03 series of amendments.

13.4.1. As from the official date of entry into force of the 03 series of amendments, no Contracting Party applying this UN Regulation shall refuse to grant or refuse to accept UN type approvals under this UN Regulation as amended by the 03 series of amendments.

13.4.2. As from 1 September 2028, Contracting Parties applying this UN Regulation shall not be obliged to accept type approvals to any of the preceding series of amendments, first issued after 1 September 2028.

13.4.3. Until 1 September 2029, Contracting Parties applying this UN Regulation shall accept type approvals to any of the preceding series of amendments, first issued before 1 September Date 2028, provided the transitional provisions in these respective preceding series of amendments foresee this possibility.

13.4.4. As from 1 September 2029, Contracting Parties applying this UN Regulation shall not be obliged to accept type approvals issued to any of the preceding series of amendments to this Regulation.

13.4.5. Notwithstanding paragraph 13.4.4., Contracting Parties applying this UN Regulation shall also continue to accept type approvals issued according to any of the preceding series of amendments to this UN Regulation, for the vehicles or vehicle systems which are not affected by the changes introduced by the 03 series of amendments, provided the transitional provisions in these respective preceding series of amendments foresee this possibility."

*Annex 2, Model A, in the figure, replace "02185" by "03185". In the paragraph under the figure, replace "02 series of amendments" by "03 series of amendments".*

*Annex 2, Model B, in the figure, replace "02 1628" by "03 1628". In the paragraph under the figure, replace the last instance of "02 series of amendments" by "03 series of amendments".*

*Annex 3, paragraph 2.1., third sentence after the heading, after "container", add "(as well as supply lines for additional TPRDs (if any) through appropriate adaptors)".*

*Annex 3, paragraph 2.2., in (a), after "The test article", add "(the container as well as supply lines for additional TPRDs (if any) through appropriate adaptors)".*

*Annex 3, paragraph 3.1., after "(if any)", add ", as well as supply lines for additional TPRDs (if any) through appropriate adaptors".*

*Annex 3, paragraph 3.2.*, first sentence under the heading, amend to read "The container and its container attachments (if any) is drop tested without internal pressurization, attached valves or supply lines for additional TPRDs."

*Annex 3, paragraph 3.3.*, amend (a) to read:

- "(a) Surface flaw generation: A saw cut at least 0.75 mm deep and 200 mm long is made on the surface specified above. If the container is to be affixed to the vehicle by compressing its composite surface or if the container attachments for additional TPRDs or supply lines are attached to the composite surface of the container, then a second cut at least 1.25 mm deep and 25 mm long is applied at the end of the container which is opposite to the location of the first cut;"

*Annex 3, paragraph 3.4.*, first paragraph, after "if applicable", add "as well as supply lines for additional TPRDs (if any) through appropriate adaptors".

*Annex 3, paragraph 3.5.*, after "The test article", add "(as described in Annex 9 for Test No. 5.2.5.)".

*Annex 3, paragraph 3.6.*, in (a), after "The test article", add "(as described in Annex 9 for Test No. 5.2.6.)".

*Annex 3, paragraph 5.1.*, first sentence after the heading, at the end, add ", as well as supply lines for additional TPRDs (if any) through appropriate adaptors".

*Annex 7, table 1*, at the end, add the following new rows:

“

Changed Item		Required Tests
Supply lines for additional TPRDs	Changed location of additional TPRD	- Fire test <sup>8</sup>
	Diameter <sup>2</sup> ≤ 20 %	- Initial burst and Initial pressure cycle life <sup>8</sup>
	Diameter <sup>2</sup> > 20 %	- Initial burst, Initial pressure cycle life <sup>8</sup> - Sequential hydraulic test <sup>8</sup> - Fire test <sup>8</sup>
	Bend radius	- Initial burst, Initial pressure cycle life <sup>8</sup> - Sequential hydraulic test <sup>8</sup> - Fire test <sup>8</sup>
	Length	- Initial burst, Initial pressure cycle life <sup>8</sup> - Fire test <sup>8</sup> - Sequential hydraulic test <sup>8</sup>
	Line routing	- Initial burst, Initial pressure cycle life <sup>8</sup> - Fire test <sup>8</sup>
	Number of fittings	- Pneumatic sequential test <sup>8</sup> - Initial burst, Initial pressure cycle life <sup>8</sup> - Fire test <sup>8</sup>

”

*Annex 7, table 1 notes*, at the end, add the following new note:

- "8. Fire test, initial burst, initial pressure cycle life, hydraulic and pneumatic sequential tests are not required if the parameters of the supply lines are covered by the tested worst-case configuration."

Insert new Annex 9:

## "Annex 9

### Description of test articles for performance requirements in paragraphs 5.1. to 5.4.

Test No.	Test title	CHSS			Notes
		Container with attachments (if any)	Primary closure devices	Supply lines	
		Test article			
5.1.	Verifications test for baseline metrics				
5.1.1.	Baseline initial burst pressure	x		x <sup>1</sup>	
5.1.2.	Baseline initial pressure cycle life	x		x <sup>1</sup>	
5.2.	Verification tests for performance durability (Hydraulic sequential tests)				At the discretion of the Technical Service and the Type Approval Authority, for supply lines the worst-case approach may be applied, e.g., longest lines, largest diameter, smallest bend radius and highest number of fittings.
5.2.1.	Proof pressure test	x		x <sup>1</sup>	
5.2.2.	Drop (impact) test	x			The manufacturer applying for approval shall provide handling procedures to ensure that the supply lines for additional TPRDs will not suffer damage or contamination during handling. It shall require the removal from service of supply lines that have unacceptable damage.
5.2.3.	Surface damage test	x <sup>2</sup>			
5.2.4.	Chemical exposure and ambient-temperature pressure cycling test	x <sup>2</sup>		x <sup>1</sup>	
5.2.5.	High temperature static pressure test	x <sup>2</sup>		x <sup>1</sup>	
5.2.6.	Extreme temperature pressure cycling test	x <sup>2</sup>		x <sup>1</sup>	
5.2.7.	Residual proof pressure test	x <sup>2</sup>		x <sup>1</sup>	
5.2.8.	Residual strength burst test	x <sup>2</sup>		x <sup>1</sup>	
5.3.	Verification test for expected on-road performance (Pneumatic sequential tests)				At the discretion of the Technical Service and the Type Approval Authority, for such supply lines the worst-case approach may be applied, e.g., longest lines, largest diameter, smallest bend radius and highest number of fittings.
5.3.1.	Proof pressure test	x		x <sup>1</sup>	
5.3.2.	Ambient and extreme temperature gas pressure cycling test (pneumatic)	x	x	x	
5.3.3.	Extreme temperature static gas pressure permeation, leak test (pneumatic)	x	x	x	
5.3.4.	Residual proof pressure test (hydraulic)	x		x <sup>1</sup>	
5.3.5.	Residual strength burst test (hydraulic)	x		x <sup>1</sup>	
5.4.	Verification test for service terminating performance in fire	x	x	x	

1. Supply lines for additional TPRDs (if any) shall be tested with the container through appropriate adaptors.
2. Container attachments may be removed in accordance with Annex 3, paragraph 3.3."