

GRPE **008** 24-01-03

GRPE CGH₂ Experts

(A sub-group of the GRPE Ad-hoc Working Group “Hydrogen/Fuel Cell”)

**Updated Proposals For A Removable Storage System
Based On The PSA Idea**

REWORDING OF THE PSA PROPOSAL – Rev. 2

Insert new definitions:

- 2.1.1? *“Removable Storage System”*: A removable system within a vehicle that houses and protects one or more *Containers* or a *Container Assembly* and associated *Hydrogen Components*.
- 2.1.2? *“Removable Storage System Connector”*: The connection device between a *Removable Storage System* and the section of the *Hydrogen System* permanently installed in the vehicle. A *Removable Storage System Connector* shall consist of sections mounted on the *Removable Storage System* and the vehicle.

6.1.8 Add *“Removable Storage System Connector connection system”*

6.3 Renumber existing 6.3 to 6.3.1

Add new paragraph:

- 6.3.2 Unless otherwise stated in this Regulation, the sections of a *Removable Storage System Connector* mounted on the *Removable Storage System* and the vehicle shall be treated as separate components.

Modify the following paragraph:

- 14.2.1 A *Container* or *Container Assembly* shall be permanently installed on-board the vehicle and shall only be removed for maintenance except as permitted in Paragraph 14.2.2. A *Container* or *Container Assembly* shall not be installed in the internal combustion engine compartment.

Insert the following paragraphs:

- 14.2.2 A *Container* or *Container Assembly* may be permanently installed within a *Removable Storage System*.

Insert the following section:

14.3 REMOVABLE STORAGE SYSTEM

- 14.3.1 The section of a *Hydrogen System* within a *Removable Storage System* shall fulfil all the requirements of this Regulation as if it were permanently installed in the vehicle unless otherwise stated in the following paragraphs. ~~In the event of a conflict between this Regulation and any requirements when the *Removable Storage System* is not mounted in the vehicle, the more stringent requirements shall apply unless it can be shown such requirements would compromise safety.~~
- 14.3.2 The *Removable Storage System* shall protect the *Container(s)* or *Container Assembly* and associated *Hydrogen Components* from damage during handling operations necessary for installation, removal and storage.
- 14.3.3 Reasonably practicable measures shall be taken to prevent unauthorised removal of the *Removable Storage System*.

- 14.3.4 A single interface for the flow of hydrogen shall be provided between the *Removable Storage System* and the part of the *Hydrogen System* permanently installed in the vehicle. The ~~maximum~~ Nominal Working Pressure of the *Hydrogen System* at the interface shall be less than or equal to 1.0MPa.
- 14.3.5 When the *Removable Storage System* is installed in the vehicle the connection with the part of the *Hydrogen System* permanently installed in the vehicle shall be made without the use of tools and shall be capable of fulfilling the requirements of Paragraph 14.1.10 of this Regulation.
- 14.3.6 At the time of disconnection of the *Removable Storage System*, the volume of hydrogen released shall not exceed 10Ncm³ on either side of the Removable Storage System Connector and shall not be released near a possible ignition source. The build up of hydrogen due to successive disconnections shall be prevented.
- 14.3.7 The part of the *Removable Storage System Connector* permanently fitted to the vehicle shall not be compatible with standard refilling nozzles for either hydrogen or natural gas.
- 14.3.8 The flow of hydrogen from a Removable Storage System shall be prevented if a Removable Storage System is installed with a higher Maximum Allowable Working Pressure than that of the permanent part of the vehicle's Hydrogen System.
~~The flow of hydrogen from a Removable Storage System shall be prevented if a Removable Storage System is installed in the vehicle with a higher Working Pressure than that of the permanent part of the vehicle's Hydrogen System.~~
- 14.3.9 Opening of the *Automatic Valve* mounted on a *Container* or a *Container Assembly* shall not be possible when the *Removable Storage System* is not correctly connected to the permanently fixed section of the vehicle's *Hydrogen System*.
- 14.3.10 Disconnection or removal of the *Removable Storage System* shall not be possible unless the *Automatic Valve* mounted on a *Container* or a *Container Assembly* is in the closed position.
- 14.3.11 Use of the *Hydrogen System* shall be prevented if a partial or total failure of the *Removable Storage System Connector* or electrical connectors between the *Removable Storage System* and the vehicle occurs, that may affect the safety of the *Hydrogen System*.
- 14.3.12 The installation and removal operations of the *Removable Storage System* shall be illustrated on a label attached to the vehicle close to the mounting point of the *Removable Storage System*. The label shall also state the *Working Pressure* of the vehicle's *Hydrogen System*.
- 14.3.13 A label shall be attached to the *Removable Storage System* stating the *Working Pressure*.

Modify the following table:

Table 8A.1 Add new row "*Removable Storage System Connectors*" and add corresponding ticks under Tests B1& B2, B3, B5, B6, B7 & B8

Insert the following paragraphs:

B5.2.9 Removable Storage System Connector

A *Removable Storage System Connector* shall be submitted to a number of connection/disconnection cycles equal to three times the number of *Filling Cycles* calculated in accordance with Paragraph 2.4.6 of this Regulation. For each cycle the *Removable Storage System Connector* shall be pressurised to 1.25 times the *Working Pressure*. The External Leakage Test (Paragraph B7 of this Annex) is required on the *Removable Storage System* and the vehicle sections of the *Removable Storage System Connector* when separated and when connected together.

Check numbering throughout the document