

Proposal for revision of ECE/TRANS/WP.29/GRSP/2013/22

Note: The text reproduced below was prepared by the expert from JAPAN. The modifications to the current text of the Regulation are marked in bold for new or strikethrough for deleted characters.

I. Proposal

Paragraph 3.1., amend to read:

"**3.1.** ~~The application for approval of a vehicle or component type with regard to the safety related performance of hydrogen fuelled vehicles shall be submitted by the manufacturer or by his authorized representative.~~

Part I : Application for approval of a type of hydrogen storage system."

Insert new paragraphs 3.1.1 to 3.1., to read:

"**3.1.1.** **The application for approval of a type of hydrogen storage system shall be submitted by the hydrogen storage system manufacturer or his duly accredited representative.**

3.1.2. **A model of information document is shown in Annex 1, Part 1-I**

3.1.3. **A sufficient number of hydrogen storage systems representatives of the type to be approved shall be submitted to the Technical Service conducting the approval tests."**

Paragraph 3.2. and 3.2.1., amend to read:

"**3.2.** ~~It shall be accompanied by the documents mentioned below and include the following particulars:~~

Part II : Application for approval of a specific component of hydrogen storage system type

3.2.1. ~~Detailed description of the vehicle or component type on the safety-related performance of hydrogen fuelled vehicles.~~

The application for approval of a type of specific component shall be submitted by the specific component manufacturer or his duly accredited representative."

Insert new paragraphs 3.2.2. to 3.2.3., to read:

"**3.2.2.** **A model of information document is shown in Annex 1, Part 1-II**

3.2.3. **A sufficient number of specific component of hydrogen storage system representatives of the type to be approved shall be submitted to the Technical Service conducting the approval tests."**

Paragraph 3.3., amend to read:

"**3.3.** ~~A sufficient number of vehicles and/or components representatives of the type to be approved shall be submitted to the Technical Service conducting the approval tests.~~

Part III : Application for approval of a vehicle type."

Insert new paragraphs 3.3.1. to 3.3.3., to read:

- 3.3.1. The application for approval of a vehicle type**
- 3.3.2. A model of information document is shown in Annex 1, Part 1- III**
- 3.3.3. A sufficient number of vehicles representatives of the type to be approved shall be submitted to the Technical Service conducting the approval tests."**

Paragraph 4.1., amend to read:

- "4.1. If the vehicle or component type submitted for approval pursuant to this Regulation meets the requirements of the relevant part of this Regulation, approval of that vehicle, system or component shall be granted.**

Granting of type approval"

Insert new paragraphs 4.1.1. to 4.1.3.1., to read:

- "4.1.1. Approval of a type of hydrogen storage system**
- 4.1.1.1. If the hydrogen storage system submitted for approval pursuant to this Regulation meets the requirements of Part I below, approval of that type of hydrogen storage system shall be granted.**
- 4.1.2. Approval of a type of specific component**
- 4.1.2.1. If the specific component submitted for approval pursuant to this Regulation meets the requirements of Part II below, approval of that type of specific component shall be granted.**
- 4.1.3. Approval of a vehicle type**
- 4.1.3.1. If the vehicle submitted for approval pursuant to this Regulation meets the requirements of Part III below, approval of that vehicle type shall be granted."**

Paragraph 4.4., amend to read:

- "4.4 ... on the approval form, to every vehicle, hydrogen storage system or specific component conforming to a type approved ..."**

Paragraph 4.6.2., amend to read:

- "4.6.2. In the case of a hydrogen storage system, the approval mark shall be placed close to or on the container."**

Insert a new paragraph 4.6.3., to read:

- "4.6.3. In the case of a specific component, the approval mark shall be placed on the specific component."**

Paragraph 5.3.5., amend to read:

- "5.3.5. Residual strength burst test (hydraulic)**
- The storage container undergoes a hydraulic burst to verify that the burst pressure is ~~within 20~~ **at least 80** per cent of the baseline burst pressure determined in paragraph 5.1.1. (Annex 3, paragraph 2.1. test procedure)."

Paragraph 5.5., amend to read:

- "5.5. Requirements for primary closure devices**
- The primary closure devices that isolate the high pressure hydrogen storage system, namely TPRD, check valve and shut-off valve, as described in Figure 1, shall ~~comply with one of the following requirements:~~
- (a) The closing devices shall be tested and type-approved in accordance with Part II of this Regulation and produced in**

conformity with the approved type, [or—

~~(b) —The manufacturer of the compressed hydrogen storage system shall demonstrate that the primary closure devices comply with the requirements of Part II of this Regulation.]—"~~

Paragraph 5.6., amend to read:

"5.6. Labelling

A label shall be permanently affixed on each container with at least the following information: name of the manufacturer, serial number, date of manufacture, **MFP**, **NWP**, type of fuel (i.e. "CHG" for gaseous hydrogen or "LH2" for liquid hydrogen),"

Insert new paragraph 5.6.1., to read:

"5.6.1 A label shall be permanently affixed on each valve unit with at least the following information: name of the manufacturer, serial number, date of manufacture, MFP, NWP, and type of fuel."

Paragraph 7., amend to read:

"7. . . .

This part . . . in which hydrogen is present. **The hydrogen storage system included in the vehicle fuel system shall be tested and type-approved in accordance with Part I of this Regulation and produced in conformity with the approved type."**

Paragraph 7.2., amend to read:

"7.2. Post-crash fuel system integrity

The fuel system of the vehicle shall comply with the following requirements after the vehicle crash tests in accordance with the following Regulations by also applying the test procedures prescribed in Annex 5 of this Regulation.

- (a) Frontal impact test in accordance with either Regulation No. 12, or Regulation No. 94; and
- (b) Lateral impact test in accordance with Regulation No. 95.
- (c) **Rear impact test with Annex [XX]**

In case that one or both of the vehicle crash tests specified above are not applicable to the vehicle, the vehicle fuel system shall, instead, be subject to the relevant alternative accelerations **and the hydrogen storage system installation requirements** specified below. **The accelerations shall be measured at the location where the hydrogen storage system is installed.** The vehicle fuel system shall be mounted and fixed on the representative part of the vehicle. The mass used shall be representative for a fully equipped and filled container or container assembly.

Accelerations for \forall vehicles of categories M₁ and N₁:

- (a) 20 g in the direction of travel;
- (b) 8 g horizontally perpendicular to the direction of travel.

Accelerations for \forall vehicles of categories M₂ and N₂:

- (a) 10 g in the direction of travel;
- (b) 5 g horizontally perpendicular to the direction of travel.

Accelerations for \forall vehicles of categories M₃ and N₃:

- (a) 6.6 g in the direction of travel;

(b) 5 g horizontally perpendicular to the direction of travel.

Requirements on installation of the hydrogen storage system not subject to the frontal impact test:

The horizontal distance between the hydrogen storage system's front most edge and the vehicle's front edge, which is parallel to the vehicle's center line, shall be 420 mm or more.

Requirements on installation of the hydrogen storage system not subject to the lateral impact test:

The distance between the hydrogen storage system and the vehicle's outermost side (except at the rear) in its proximity shall be 200 mm or more. On the side where the test is performed, the hydrogen storage system does not have to be installed 200 mm or more away from the vehicle's outermost side (except at the rear) in the proximity of its components.

Requirements on installation of the hydrogen storage system not subject to the rear impact test:

The horizontal distance between the hydrogen storage system's rearmost edge and the vehicle's rear edge, which is parallel to the vehicle's center line, shall be 300 mm or more.

Paragraph 11.1.1., amend to read:

"11.1.1. Revision

When particulars recorded ...and that in any case the ~~vehicle/component~~
vehicle/ hydrogen storage system/specific component still meets..."

14. The information document annexed to this communication:
15. Any remarks:

Annex 1 - Part 2

Model II

Communication

(Maximum format: A4 (210 x 297 mm))



issued by: Name of administration:
.....
.....
.....

- concerning ²: Approval granted
Approval extended
Approval refused
Approval withdrawn
Production definitively discontinued

of a type of specific component (TPRD / Check valve / Automatic shut-off valve ²)
with regard to the safety-related performance of hydrogen-fuelled vehicles
pursuant to Regulation No. XYZ

Approval No.: Extension
No.:

1. Trademark:
2. Type and trade names:
3. Name and address of manufacturer:
4. If applicable, name and address of manufacturer's representative:
5. Brief description of specific component:
6. Date of submission of specific component for approval:
7. Technical Service performing the approval tests:
8. Date of report issued by that Service:
9. Number of report issued by that Service:
10. Approval with regard to the safety-related performance of hydrogen-fuelled vehicles is granted/refused: ²
11. Place:
12. Date:
13. Signature:
14. The information document annexed to this communication:
15. Any remarks:

¹ Distinguishing number of the country which has granted/extended/refused/withdrawn an approval (see approval provisions in the Regulation).

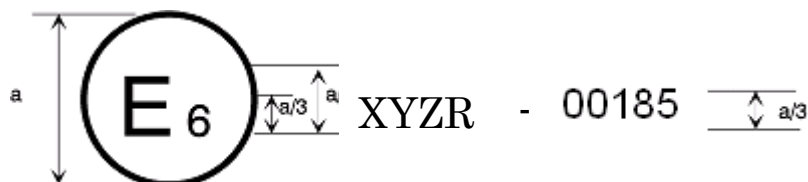
² Delete what does not apply.

Annex 2, amend to read:

"Annex 2

Arrangements of the approval marks

Model A (See paragraphs 4.4. to 4.4.2. of this Regulation)



$a = 8 \text{ mm min}$

The above approval mark affixed to a vehicle/**storage system/specific component** shows that the vehicle/**storage system/specific component** type concerned has been approved in Belgium (E6) for its the safety-related..."

"Annex3, paragraph 3.3., amend to read:

"3.3. Surface damage test (unpressurized)

.....

- (b) Pendulum impacts: The upper section of the horizontal storage container is divided into five distinct (not overlapping) areas 100 mm in diameter each (see Figure 2). After 12 hours preconditioning at ≤ -40 (~~+2/-0~~) °C in an environmental chamber,"

II. Justification

This regulation includes three steps as hydrogen storage system, specific component and vehicle. Therefore, applicable requirements for each steps and relation between each step should be clarified. This document is proposing to clarify this applicability of each step and relationship between them.

- 1) Paragraph 3.1., 3.2., 3.2.1. and 3.3: amendment proposed to clarify applicant, model of information document and test samples for each step. For information document, each models described in Annex 1, Part 1 are referred by these paragraphs.
- 2) Paragraph 4.1.: amendment proposed to specify the applicable requirement for each step.
- 3) Paragraph 4.4.: amendment proposed to correct the word 'component' to 'hydrogen storage system' and 'specific components.'
- 4) Paragraph 4.6.2.: amendment proposed to limit the place where the approval mark for the hydrogen storage system because the hydrogen storage system is important for safety and the approval mark shall be placed directly on the container.
- 5) Paragraph 4.6.3.: amendment proposed to clarify that approval marking is necessary for specific component in addition to vehicle and hydrogen storage system.
- 6) Paragraph 5.5.: amendment proposed to oblige the approval for specific components in order to clarify the responsibility of products for specific components.

- 7) Paragraph 7.: amendment to clarify that the approval of hydrogen storage system is necessary for the approval of vehicle.
- 8) Paragraph 11.1.1.: amendment proposed to correct the word ‘component’ to ‘hydrogen storage system’ and ‘specific components.’
- 9) Annex 1 – Part 2: amendment proposed to specify the models of communication for each step.
- 10) Annex 2: amendment proposed to correct the word ‘component’ to “hydrogen storage system” and “specific components”.

The experts from JAPAN are prepared the justification for technical issues as below.

- 1) Paragraph 5.3.5 : Correction of an editorial error.
- 2) Paragraph 5.6.:

The concept of labelling under GTR No. 13 is based on our agreement to allow each Contracting Party to specify additional labelling requirements as necessary (see the relevant provision of GTR No. 13 quoted below). Japan considers it necessary to include the maximum pressure that the container reaches in its normal use, i.e., MFP, in the high-pressure system’s label.

Excerpt from GTR No. 13:

I. Statement of technical rationale and justification

E. Rationale for paragraph 5. (Performance requirements)

(f) Rationale for paragraph 5.1.6. labelling

75. The purpose of minimum labelling on the hydrogen storage containers is three-fold: (i) to document the date when the system should be removed from service, (ii) to record information needed to trace manufacturing conditions in event of on-road failure, and (iii) to document NWP to ensure installation is consistent with the vehicle fuel system and fuelling interface. Contracting Parties may specify additional labelling requirements. Since the number of pressure cycles used in qualification under para. 5.1.1.2. may vary between Contracting Parties, that number shall be marked on each container.

- 3) New paragraph 5.6.1:

Labelling is important for the management of not only the high-pressure container but also its components, and the above items, at minimum, are necessary in the label.

- 4) Paragraph 7.2

In the crash tests, two effects on the high-pressure hydrogen storage system are evaluated; namely, the effect of deceleration and the effect of vehicle deformation. These two effects also need to be verified in the alternative requirements to the crash tests.

In the draft regulation, while the accelerations are specified, the location of their measurement is not clearly defined. Thus, it is necessary to clarify such location.

As regards the effect of vehicle deformation, it needs to be required to install the hydrogen storage system at a location where the effect of vehicle deformation is small.

- 5) Annex3 paragraph 3.3. (b) :

For the purpose of harmonization with the similar tests in paragraphs 5.2.6. and 5.3.2.