

Post Crash provisions today in GTR13 (1/2)

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- 4.2. Each contracting party under the UN 1998 Agreement shall maintain its existing national crash tests (frontal, side, rear and rollover) and use the limit values of section paragraph 5.2.2. for compliance.

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5.2.2. Post-crash fuel system integrity

5.2.2.1. Fuel leakage limit

The volumetric flow of hydrogen gas leakage shall not exceed an average of 118 NL per minute for 60 minutes after the crash (para. 6.1.1. test procedures).

5.2.2.2. Concentration limit in enclosed spaces

Hydrogen gas leakage shall not result in a hydrogen concentration in the air greater than 3 ± 1.0 per cent} by volume in the passenger, luggage and cargo compartments (para. 6.1.2. test procedures). The requirement is satisfied if it is confirmed that the shut-off valve of the storage system has closed within 5 seconds of the crash and no leakage from the storage system.

5.2.2.3. Container Displacement

The storage container(s) shall remain attached to the vehicle at a minimum of one attachment point.



For heavy trucks and busses: There is no crash test existing on national basis. UN Regulation 66 (tip test for busses) is to test the integrity of the body (tested with BiW)

Post Crash provisions today in GTR13 (2/2)

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6.1. Compliance tests for fuel system integrity

6.1.1. Post-crash compressed hydrogen storage system leak test

The crash tests used to evaluate post-crash hydrogen leakage are those already applied in the jurisdictions of each contracting party.

Prior to conducting the crash test, instrumentation is installed in the hydrogen storage system to perform the required pressure and temperature measurements if the standard vehicle does not already have instrumentation with the required accuracy.

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7.5.1. Post-crash leak test for the liquefied hydrogen storage systems

Prior to the vehicle crash test, the following steps are taken to prepare the liquefied hydrogen storage system (LHSS):

Post Crash provisions in GTR13 – (1/3)

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4.2. Each contracting party under the UN 1998 Agreement shall maintain its existing national crash tests (frontal, side, rear and rollover) and use the limit values of section paragraph 5.2.2. for compliance.

4.3. In case a contracting party under the UN 1998 Agreement requires a crash impact simulation (sled test) the procedure set out in paragraph Z shall apply and the provisions in paragraph 5.2.2.3. shall be used for compliance.

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5.2.2. Post-crash fuel system integrity

5.2.2.1. Fuel leakage limit

The volumetric flow of hydrogen gas leakage shall not exceed an average of 118 NL per minute for 60 minutes after the crash (para. 6.1.1. test procedures).

5.2.2.2. Concentration limit in enclosed spaces

Hydrogen gas leakage shall not result in a hydrogen concentration in the air greater than 3 ± 1.0 per cent} by volume in the passenger, luggage and cargo compartments (para. 6.1.2. test procedures). The requirement is satisfied if it is confirmed that the shut-off valve of the storage system has closed within 5 seconds of the crash and no leakage from the storage system.

5.2.2.3. Container Displacement

The storage container(s) shall remain attached to the vehicle at a minimum of one attachment point.

Post Crash provisions in GTR13 – (2/3)

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6.1. Compliance tests for fuel system integrity

The provisions of paragraph 6.1.1. and paragraph 6.1.2. apply only to show compliance with paragraph 5.2.2.1 and paragraph 5.2.2.2

6.1.1. Post-crash compressed hydrogen storage system leak test

The crash tests used to evaluate post-crash hydrogen leakage are those already applied in the jurisdictions of each contracting party.

Prior to conducting the crash test, instrumentation is installed in the hydrogen storage system to perform the required pressure and temperature measurements if the standard vehicle does not already have instrumentation with the required accuracy.

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7.5.1. Post-crash leak test for the liquefied hydrogen storage systems

The provisions of this paragraph apply only to show compliance with paragraph 5.2.2.1 and paragraph 5.2.2.2

Prior to the vehicle crash test, the following steps are taken to prepare the liquefied hydrogen storage system (LHSS):

Post Crash provisions in GTR13 – (3/3)

Copy from UN Regulation 134

Copy from UN Regulation 110

Copy from UN Regulation 134&110

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Z: Crash simulation test

~~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 specified below and the hydrogen storage system shall be installed in a position satisfying the requirements in paragraph 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 vehicles of categories M₁ and N₁:

- (a) 20 g in the direction of travel (forward and rearward direction);
- (b) 8 g horizontally perpendicular to the direction of travel (to left and right).

Accelerations for vehicles of categories M₂ and N₂:

- (a) 10 g in the direction of travel (forward and rearward direction);
- (b) 5 g horizontally perpendicular to the direction of travel (to left and right).

Accelerations for vehicles of categories M₃ and N₃:

- (a) 6.6 g in the direction of travel (forward and rearward direction);
- (b) 5 g horizontally perpendicular to the direction of travel (to left and right).

A calculation method can be used instead of practical testing if its equivalence can be demonstrated by the applicant for approval to the satisfaction of the Technical Service.