

## **Confirmation of GRSP on draft interpretation "mechanical integrity" UN R100, 02 series of amendments**

### **Submitted by the expert from France**

The text reproduced below was prepared by the expert from France, aiming to seek guidance and consistency on the way the battery should be tested according to annex 8D of UN Regulation N°100 02 series of amendments.

### **Issue**

The purpose of the test of Annex 8D Mechanical integrity is to verify the safety performance of the REESS under contact loads which may occur during vehicle crash situation.

Paragraph 3.2.1 specifies how the tested-device shall be tested:

"The application of the force shall be decided by the manufacturer together with the Technical Service having consideration to the direction of travel of the REESS relative to its installation in the vehicle. The application force being applied horizontally and perpendicular to the direction of travel of the REESS."

Should the REESS be tested in two different directions (one test in the direction of travel of the vehicle and one test perpendicular to the direction of travel of the REESS) or should it be tested in just on direction (perpendicular to the direction of travel of the REESS)?

### **Draft Interpretation France**

The REESS should be tested in two different directions: one test in the direction of travel of the vehicle and one test perpendicular to the direction of travel of the REESS.

## **Background**

In UN Regulation N°100 02 series of amendments, mechanical integrity requirements were introduced for REESS intended for installation in vehicles of categories M1 and N1.

At the manufacturer's choice, the test may be performed as, either vehicle based tests or component based tests.

In case of vehicle based tests, REESS(s) installed in vehicles are subjected to vehicle crash tests in accordance with Regulation No. 12, Annex 3 or Regulation No. 94, Annex 3 for frontal impact, and Regulation No. 95, Annex 4 for side impact. The REESS(s) will therefore be loaded in two directions : frontal and lateral.

In case of vehicle specific component test, the crush force replacing the prescribed force specified in paragraph 3.2.1. of Annex 8D shall be determined by the vehicle manufacturer using the data obtained from either actual crash tests or its simulation as specified in Annex 3 to Regulations No. 12 or No. 94 in the direction of travel and according to Annex 4 to Regulation No. 95 in the direction horizontally perpendicular to the direction of travel. These forces shall be agreed by the Technical Service.

Therefore forces have to be applied in both directions: frontal (in the direction of travel) and lateral (perpendicular to the direction of travel).

As an alternative, a generic component-based integrity test for the REESS is possible to allow REESS manufacturers to achieve a generic vehicle independent component approval for the REESS. The test shall be conducted in accordance with Annex 8D to the UN Regulation N°100 02 series of amendments.

In the working document of UN Regulation N°100 02 series of amendments presented during GRSP 51st session (ECE-TRANS-WP29-GRSP-2012-10e), the justifications of the mechanical integrity test were detailed.

Paragraph 31 of part II explains that the loads used in the integrity tests for component tests were derived from REESS contact loads which have been observed on vehicle crash tests according to UN Regulation Nos. 12, 94 and 95, using electric and hybrid-electric vehicles which were available on the market at that time. Considering this, a REESS charged with the maximum observed contact load in the direction of travel and horizontal perpendicular to this direction can be assumed as save in the event of a vehicle crash (Paragraph 38). As consequence paragraph 38 of part II prescribes explicitly two directions.

Because of this justification, France considered that REESS tested with a generic component-based integrity test should be loaded in two different directions: one test in the direction of travel of the vehicle and one test perpendicular to the direction of travel of the vehicle.

## **Request**

1. Do other Contracting Parties to the 1958 Agreement agree with this draft interpretation?
2. Is there a need to update the current Regulation text?

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