Mechanical tests proposal

Proposal from France
4th RESS meeting (Mainz-Germany)

Proposal after the acceptance of the Frontal Impact informal group during their 13th meeting

Mechanical tests

Rationale :

RESS regulation will allow to realize mechanical tests (mechanical shock and mechanical integrity) applied on RESS itself as a component or on a vehicle via R12, R94 and R95 impact tests.

The scope of this regulation applies to RESS with a voltage over 60VDC, whatever is the vehicle category on which the RESS will be fitted. However R12, R94 and R95 regulations are not applicable to all vehicle categories:

<table>
<thead>
<tr>
<th>Regulation number</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>R12</td>
<td>M1, N1 &lt; 1,5t</td>
</tr>
<tr>
<td>R94</td>
<td>M1 &lt; 2,5t and others (decided by the manufacturer)</td>
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<tr>
<td>R95</td>
<td>M1, N1 (with exemption depending of R point position)</td>
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</table>

Whatever is the RESS destination, the opportunities to realize these tests with R12, R94 or R95 specifications are offered.
Mechanical shock

If the RESS is not intended for a specific vehicle, tests are realized on component for the vehicle category requested by the component manufacturer. M1/N1 levels could be applied on this entity (for side and frontal impact test) at the request of the component manufacturer to cover all categories of vehicles.

1. **Frontal impact test for M1, N1**

The Proposal validated by the Frontal Impact informal group (GRSP) is to apply the R17 dynamic corridor.

**Justification:** the batteries anchorages shall undergo the same deceleration than the seats fixation points, Therefore they have to undergo the same test level.

The pulse into the corridor is a simulated pulse, H axis: seconds, V axis: acceleration in g.
2. Side impact test for M1, N1

No existence of corridor corresponding to a R95 for component test. We studied a corridor based on our experience of R95 impact tests (average of several tests).

Pulse proposal

The pulse into the corridor is a simulated pulse.
3. **Corridor for M2, N2 and M3, N3 frontal and side impact tests**

We agree with values from RESS 3-3 rev 1 (which are the same values introduced in R110 and R67). Furthermore, we have to define a hold time, and we propose to apply the hold time from R80, which is 50ms, for the M2, N2, M3 and N3 categories.

**Extract of R67:**

« ... The fuel container(s) must be mounted and fixed so that the following accelerations can be absorbed (without damage occurring) when the containers are full:

Vehicles of categories M1 and N1:
(a) 20 g in the direction of travel
(b) 8 g horizontally perpendicular to the direction of travel

Vehicles of categories M2 and N2:
(a) 10 g in the direction of travel
(b) 5 g horizontally perpendicular to the direction of travel

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