

# **Post-crash REESS safety assessment and stabilization procedures**

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# Necessity of research

- The necessity of research** post-crash REESS safety assessment and stabilization procedures:
- REESS after crash accident still has a big amount of energy, which depends on the SOC before accident;
  - The battery pack and other protection devices may be damaged, coolant may leak from REESS liquid cooling system, causing short circuit and fire right after or several days after the accident;
  - Because the fire and dangerous situation was difficult to be predicted, it is necessary to assess and stabilize the safety status of the battery pack.



Chevrolet Volt after being subjected to the NCAP pole test on May 12, 2011 at the MGA test facility.



Pole tested Chevrolet Volt after the fire at MGA reported on June 6, 2011.

Source: National Highway Traffic Safety Administration (2011-11-25). "Defect Investigations Results - NHTSA Action Number : PE11037". Safercar.com. Retrieved 2011-11-27.

# Key Points

**For battery safety after collision, there are two situations:**

1. A serious collision, the severity is similar to the regulatory test (GTR20, 5.2 & 5.5). In this case, GTR 20 already has the safety requirement both at vehicle and REESS level.

ECE/TRANS/180/Add.20

This requirement shall be demonstrated by using the vehicle connector specified by the vehicle manufacturer.

## 5.2. Requirements of a vehicle with regard to its electrical safety - post-crash

### 5.2.1. General principle

The requirements of paragraph 5.2.2. shall be checked in accordance with the methods set out in paragraph 6.1.6.

These requirements can be met by a separate crash test from that for the evaluation of occupant protection performance under the relevant crash regulations. This is only possible, if the electrical components do not influence the occupant protection performance.

## 5.5. Requirements with regard to the safety of REESS – post-crash.

If any vehicle crash test under this regulation is conducted, the requirements of paragraphs 5.5.1.1. to 5.5.1.3. shall be satisfied.

These requirements can be met by a separate crash test from that for the evaluation of occupant protection performance under the relevant crash regulations. This is only possible, if the electrical components do not influence the occupant protection performance.

However, if the REESS satisfies the requirements of paragraph 5.5.2., the requirements of this paragraph are considered as satisfied for the respective direction of the crash test.

Vehicle based test

Electrolyte leakage

REESS retention

Fire hazard.

# Key Points

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**For battery safety after collision, there are two situations:**

2. A slight collision occurred and the battery or high voltage system may not be damaged directly. Although the battery system seems not be damaged and the parameters maybe still at normal status, the battery may have some potential damage, which may result in chronic failure of the battery and eventually cause a fire.

- Is this a problem that should be considered by regulations?
- If yes, what should be the criterial to assess whether a REESS is safe, and what should be done to stabilize the REESS if it is at an “dangerous” condition?



**Thanks for your attention!**