UN 38.3.3 (g)
Definition of Battery Management System

JARI Battery Transport Working Group

Japan Automobile Research Institute

2014.09.29-10.2

38.3.3 (f)

38.3.3 (f) Amend to read as follows:

"(f) When testing a battery in which the aggregate lithium content of all anodes, when fully charged, is not more than 500 g, or in the case of a lithium ion battery, with a Watt-hour rating of not more than 6 200 Wh, that is assembled from batteries or single cell batteries that have passed all applicable tests, one assembled battery in a fully charged state shall be tested under tests T.3, T.4 and T.5, and, in addition, test T.7 in the case of a rechargeable battery. A rechargeable battery shall have been cycled at least 25 cycles.".

See ST/SG/AC.10/C.3/90/Add.1 Annex III

38.3.3 (g)

38.3.3 (g) Amend to read as follows:

"(g) When batteries or single cell batteries that have passed all applicable tests are electrically connected to form a battery in which the aggregate lithium content of all anodes, when fully charged, is more than 500 g, or in the case of a lithium ion battery, with a Watt-hour rating of more than 6 200 Wh, the assembled battery does not need to be tested if:

(i) It is designed with a battery management system that has been demonstrated to ensure that the battery will never be subject to overcharge; and

(ii) The assembled battery is equipped with a system capable of preventing short circuits or over discharge between the batteries.".

See ST/SG/AC.10/C.3/90/Add.1 Annex III

Typical Battery System Design in EVs

- A battery system is generally comprised of a battery monitoring unit and a battery pack.
- A battery pack is comprised of battery cells, detection/monitoring system and automatic disconnection (relay or equivalent disconnection device) and manual disconnection (service plug).
- **Battery control unit (BCU) or battery management system (BMS)** is an electronic device that controls or manages or detects or calculates electric and thermal functions of the battery system and that provides communication between the battery system and other vehicle controllers.
- There are commonly two types of allocation of battery systems:
  - **Battery system with integrated battery management system or battery control unit**
  - **Battery system with external battery management system or battery control unit**

Terminologies in Battery Standard

Battery system is an energy storage device that includes cells or cell assemblies or battery pack(s) as well as electrical circuits including service disconnect, contactor and fuse and electronics (e.g. BCU, contactors).

Battery control unit (BCU) is **an electronic device that controls or manages or detects or calculates electric and thermal functions** of the battery system and that provides communication between the battery system and other vehicle controllers.

Battery pack is disconnected by contactor and service disconnect to avoid an external short-circuit, overcharge and over-discharge **during service operation and transport.**

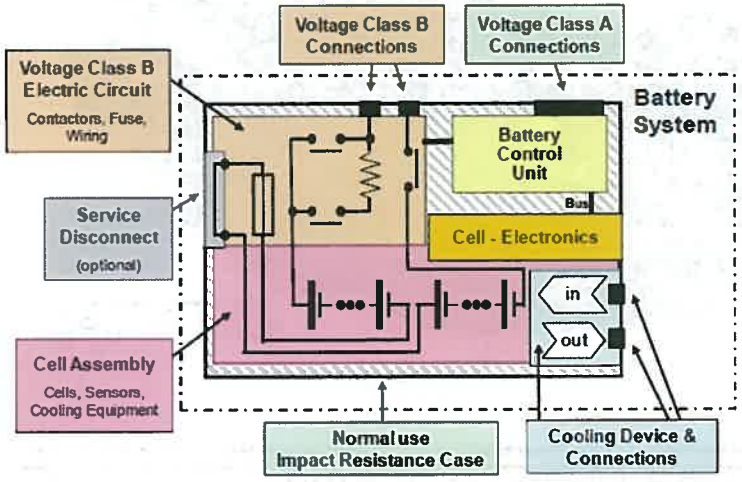


Figure 3 — Typical configuration of battery system with integrated BCU

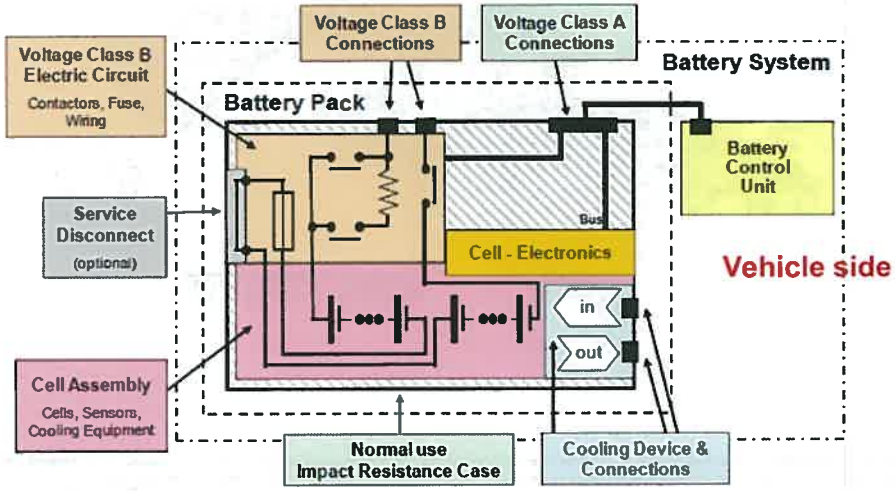
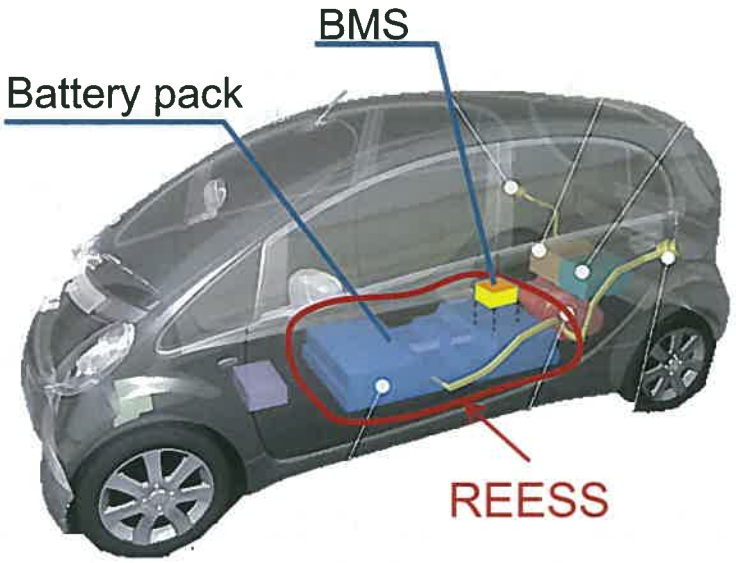


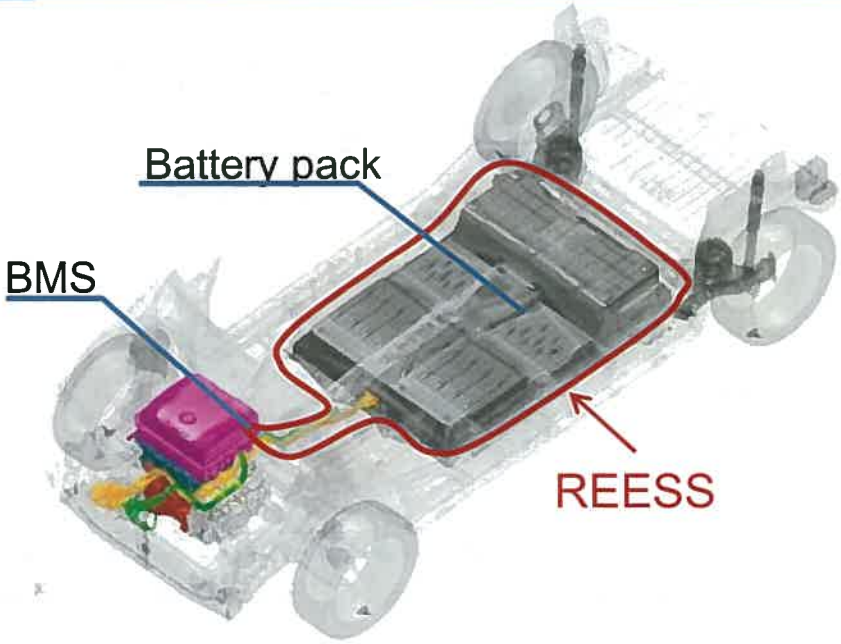
Figure 4 — Typical configuration of battery system with external BCU

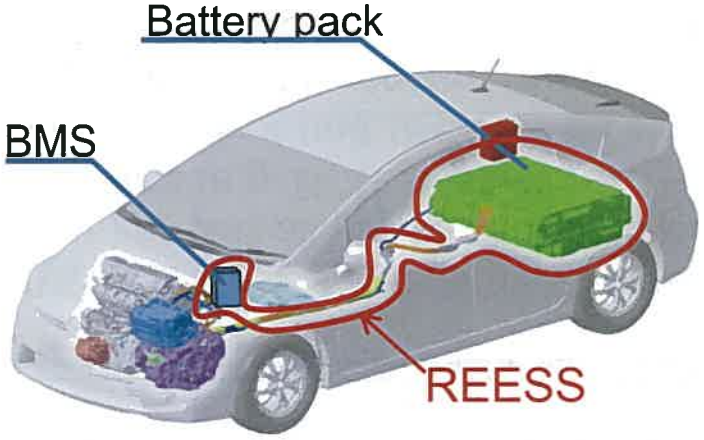
Referred to ISO 12405 : Electrically propelled road vehicles – Test specification for lithium-ion traction battery packs and systems –

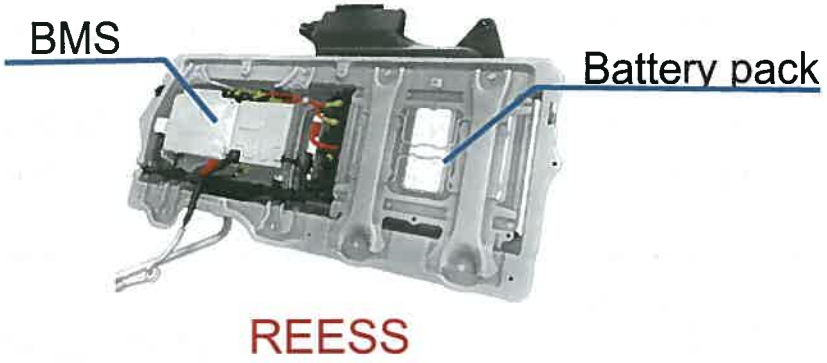
Terminology related to REESS

REESS : Rechargeable Energy Storage System









* Components of REESS may be distributed in different part of the vehicles.

Proposal of Amendment of 38.3.3 (g)

Proposal 1: replace "system" by "function".

(i) It is designed with a battery management ~~system~~ **function** that has been demonstrated to ensure that the battery will never be subject to overcharge, and

(ii) The assembled battery is be equipped with a system capable of monitoring the battery assembly and preventing short circuits or over discharge between the batteries and any overheat or overcharge in the battery assembly."

Proposal of Amendment of 38.3.3 (g)

Or proposal 2: add a Note.

- (i) **It is designed with a battery management system that has been demonstrated to ensure that the battery will never be subject to overcharge, and**
- (ii) The assembled battery is be equipped with …
- **Note: Battery management system means a function to prevent overcharge, over-discharge during transportation or in use.**