

Alternatives for BEVs

Supporting presentation for GRVA-07-73

Requirements

5.1.2.4.1 and 5.1.2.4.2 ("normal" type-IIA)

- 12 minutes, 30km/h, 7%
- Without using brakes

Technical solutions (examples)

The minimum energy and power guaranteed by the system design is enough to pass Type-IIA.

#1

100%

Add an Endurance Brake
(e.g. a cooled resistor)

#2

<100%

Secure X kWh in the batteries
 X kWh = Type-IIA energy *
 (* minus dissipated energy, i.e. losses)

#3 Hybrid solution: secure "less than X kWh" in the batteries and use a supplementary retardation means (which is only able to provide a "fraction" of a Type-IIA)

5.1.2.4.3 "Account for road topology"

The minimum guaranteed by the design depends on road topology

#3

Flat road ahead Downhill ahead

Secure X kWh in the batteries
 X kWh = required energy for next downhill *
 that can be reached by the vehicle

#4 Hybrid solution: use a supplementary retardation means (which is not able to pass Type-IIA alone)

5.1.2.4.4

Annex 4 - 1.8.2.4 (a) Type-II with brakes Hot-stop 5 m/s² + 1.8.2.4 (a) Type-IIA with endurance brake („power“ test only)

+ 5.2.1.29.7 - Brake estimator
 Warn the driver with yellow signal if performance is below:
 3.3 m/s² (N3),
 3.75m/s² (M3)
 (use "red" signal if performance is below secondary brake perfo)

#5

100%

The vehicle does not secure energy in the batteries.
 Brakes alone passes "type II with hot stop 5 m/s²"

#6

<100%

The vehicle secures X kWh in the batteries (x kWh not enough to pass type-IIA)
 Brakes passes "type II with hot stop 5 m/s²" with the help of regenerative braking (and/or of a supplementary retardation means when available)

Proposed modifications

- Proposal from Czech Republic: "The condition of the vehicle batteries at the start of the test, shall be such that the braking force contribution provided by the electric regenerative braking system does not exceed the minimum guaranteed by the system design."

- Limit the required "X kWh" to type IIA energy

- Increase slope from 6% to **7%**
- Add text from Czech Republic

- Inform driver prior to the time when the braking force of the electric regenerative braking can no longer be provided (e.g. when the battery is fully loaded)