

Proposal for amendments to Regulations No. 13 and 13-H (Braking)

The modifications to the existing text of the Regulation are marked in bold for new or strikethrough for deleted characters.

I. Proposal

A. Regulation No. 13

Annex 4, paragraph 1.4.1.2.2., amend to read:

"1.4. Type-0 test (ordinary performance test with brakes cold)

...

1.4.1.2.2. Every test shall be repeated ...

In the case of a vehicle equipped with an electric regenerative braking system...

This requirement is deemed to be satisfied if the batteries are at one of the following state of charge conditions where state of charge 3/ is determined by the method set out in Appendix 1 to this annex:

- (a) At the maximum charge level as recommended by the manufacturer in the vehicle specification; or
- (b) At a level not less than 95 per cent of the full charge level, where the manufacturer has made no specific recommendation; or
- (c) at the maximum level which results from automatic charge control on the vehicle, **or**
- (d) **when the tests are conducted without** a regenerative braking component regardless of the state of charge of the batteries."

Annex 4, paragraph 1.5.3.1.3., amend to read:

"1.5.3.1.3. In the case of vehicles ...

... against the criteria of paragraphs 1.5.3.1.1. and 1.5.3.2. of this annex.

The tests may be conducted without a regenerative braking component. In this case, the requirement on the state of charge of the batteries is not applicable."

Annex 4, Appendix, introductory paragraph, second sentence, amend to read:

"The procedure requires the use of a bi-directional DC Watt-hour **meter or a bi-directional DC Ampere-hour meter.**"

B. Regulation No. 13-H

Annex 3, Paragraph 1.4.1.2.3., amend to read:

"1.4.1.2.3. In the case of a vehicle ...

Category A. ...

Category B. The contribution of the electric regenerative braking system to the braking force generated shall not exceed that minimum level guaranteed by the system design.

This condition is deemed to be satisfied if the state of charge of the batteries is in one of the following conditions:

- (a) At the maximum charge level recommended by the manufacturer, as listed in the vehicle specification,
- (b) At a level not less than 95 per cent of the full charge level, where the manufacturer has made no specific recommendation,
- (c) at a maximum level resulting from automatic charge control on the vehicle, **or**
- (d) **when the tests are conducted without a regenerative braking component regardless of the state of charge of the batteries."**

Annex 3, Paragraph 1.5.2.4., amend to read:

"1.5.2.4. In the case of vehicles ...
... of this annex.
The tests may be conducted without a regenerative braking component. In this case, the requirement on the state of charge of the batteries is not applicable."

Annex 3, Paragraph 1.5.3.1., amend to read:

"1.5.3.1. Vehicles equipped with an electrical regenerative braking system of category B may have their batteries re-charged or replaced by a charged set, in order to complete the recovery procedure.
The procedures may be conducted without a regenerative braking component."

Annex 3, Appendix, introductory paragraph, second sentence, amend to read:

"The procedure requires the use of a bi-directional DC Watt-hour meter **or a bi-directional DC Ampere-hour meter."**

II. Justification

1. At the forty-sixth session of GRRF in September of 1999, the expert from the United States of America proposed in informal document GRRF-46-03 to harmonize UN Regulation No. 13-H and FMVSS 135 on electric vehicle requirements. After several sessions, GRRF agreed to introduce some amendments into UN Regulations Nos. 13 and 13-H. For reference, in FMVSS 135, SAE J227a-1976 is quoted for measurement of the state of charge (SOC).

2. The purpose of the requirements in paragraph 1.4.1.2.3. of Annex 3 to UN Regulation No. 13-H is to perform the type-0 test with the minimum possible assistance from the regenerative braking system (RBS). This worst case condition is realized when the battery is at the maximum charge level. An even worse case would be to simply disconnect the RBS and let the friction brakes alone perform the type-0 test. This is precisely what is being proposed here. The interest for vehicle manufacturers is to simplify the test procedure, since it appears very uneasy to accurately adjust the SOC of the battery in order to fulfil this provision. Therefore, it looks reasonable to allow performing the test with disabled RBS as an alternative to current test conditions.

3. OICA also proposes to add the possibility to measure the SOC of the battery with the help of a DC Ampere-hour meter, in addition to the currently mandatory DC Watt-hour meter. The Ampere-hour meter is indeed a more convenient and more accurate tool for such measurement.

4. At GRRF-73, Germany requested that the reference to an agreement between the manufacturer and the Technical Service be deleted. Both test methods indeed provide satisfactory results and simple information from the manufacturer about the chosen test method is sufficient. This was agreed by GRRF and the present proposal takes this last decision on board.
