

Submitted by the experts from
CLEPA

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Agenda item 9(a)

Explanation to GRRF-78-27

ECE-R 13H

ANNEX 4

PROVISIONS RELATING TO ENERGY SOURCES AND ENERGY STORAGE DEVICES (ENERGY ACCUMULATORS)

HYDRAULIC BRAKING SYSTEMS WITH STORED ENERGY

1. *Capacity of energy storage devices (energy accumulators)*
 - 1.1. General
 - 1.1.1. Vehicles on which the braking equipment requires the use of stored energy provided by hydraulic fluid under pressure shall be equipped with energy storage devices (energy accumulators) of a capacity meeting the requirements of paragraphs 1.2. or 1.3. of this annex;
 - 1.1.2. However, the energy storage devices shall not be required to be of a prescribed capacity if the braking system is such that in the absence of any energy reserve it is possible with the service brake control to achieve a braking performance at least equal to that prescribed for the secondary braking system;

ECE-R 79 – Annex 3 (Excerpt only!)

E/ECE/324/Rev.1/Add.78/Rev.2/Amend.1 – E/ECE/TRANS/505/Rev.1/Add.78/Rev.2/Amend.1

- "2. If an energy source failure occurs, service braking performance on the first brake application shall achieve the values given in the table below.

| <i>Category</i> | <i>V (km/h)</i> | <i>Service braking (m/s²)</i> | <i>F (daN)</i> |
|----------------------|-----------------|--|----------------|
| <i>M₁</i> | 100 | 6.43 | 50 |

3. After any failure in the steering equipment, or the energy supply, it shall be possible after eight full stroke actuations of the service brake control, to achieve at the ninth application, at least the performance prescribed for the secondary (emergency) braking system (see table below).

In the case where secondary performance requiring the use of stored energy is achieved by a separate control, it shall still be possible after eight full stroke actuations of the service brake control to achieve at the ninth application, the residual performance (see table below).

Secondary and residual efficiency

| <i>Category</i> | <i>V (km/h)</i> | <i>Secondary braking (m/s²)</i> | <i>Residual braking (m/s²)</i> |
|----------------------|-----------------|--|---|
| <i>M₁</i> | 100 | 2.44 | - |

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- 5.3.1.4. In the case where the braking system of the vehicle shares the same energy source as the steering system and this energy source fails, the steering system shall have priority and shall be capable of meeting the requirements of paragraphs 5.3.2. and 5.3.3. as applicable. **In addition the braking performance** on the first subsequent application, shall not drop below the prescribed service brake performance, as given in paragraph 2. of Annex 3 of this Regulation.
- 5.3.1.5. In the case where the braking system of the vehicle shares the same energy supply as the steering system and there is a failure in the energy supply, the steering system shall have priority and shall be capable of meeting the requirements of paragraphs 5.3.2. and 5.3.3. as applicable. **In addition the braking performance** on the first subsequent application shall comply with the prescriptions of paragraph 3. of Annex 3 of this Regulation.
- "5.3.1.6. The requirements for the braking performance in paragraphs 5.3.1.4. and 5.3.1.5. above shall not apply when the prescribed secondary braking performance defined in paragraph 3 of Annex 3 of this Regulation can be achieved by the use of muscular energy alone."**