

Annex IV

Terms of Reference for the Special Interest Group on Electromechanical Braking (EMB)

I. Introduction

The automotive sector has indicated that new braking technology, employing both electric control transmission and electric energy transmission, is under development. This technology is seen as an important element in the transition from vehicles employing internal combustion engines to alternatives powered by electrical energy.

Industry have been working extensively on an amendment for UN Regulation No. 13 to permit the use of this technology on vehicles of categories M₂, M₃, N₂ and N₃. Separately, interest is growing in the use of such technology on vehicles of categories M₁ and N₁; this will require amendments to both UN Regulations Nos. 13 and 13-H.

Under the 1958 Agreement, the braking requirements for road vehicles are detailed in UN Regulations Nos. 13 (heavy vehicles) and 13-H (light-duty vehicles). As vehicles of category N₁ may be approved to either R.13 or R.13H, these regulations should remain aligned.

To ensure a uniform understanding of this new technology by both the industry sector and the contracting parties, it is desirable that the detailed discussion to develop final proposals be conducted within the auspices of GRVA. This will assist the progress of proposals through GRVA for consideration by WP.29.

II. Objective of the Group

The Brussels EMB Workshop (29-30 March 2023) considered different design strategies for the electric supply and the transmission. These differences bridged across light-duty, heavy-duty, internal combustion engine powered and electrically powered vehicle types. Ensuring that this diversity of design can satisfy the essential safety requirements expected of today's braking systems, and that the regulations are adapted without imposing unwarranted technology limitations, is essential.

Scope of work for the SIG shall include the following items. Should additional items be proposed, the SIG will decide by consensus on their inclusion.

A. Energy supply and brake transmission architectures.

- (a) Identify design principles for the energy supply.
- (b) Identify the brake transmission arrangements that may be recognised by UN Regulations Nos. 13 and 13-H.
- (c) Develop recommendations for the methodology of measuring/monitoring the value of energy available in a reserve of energy suitable for use in identifying critical energy thresholds.
- (d) Identify the safety critical elements of electromechanical braking systems that will require monitoring for fault/failure and the generation of warning signals.

B. Based upon understanding from the above, and building upon the content of the GRVA Informal Document GRVA-15-17:

- (a) Develop proposals to amend UN Regulation No. 13,
- (b) Develop proposals to amend UN Regulation No. 13-H, and
- (c) Make recommendations regarding the application of the electrical system safety principles with respect to other UN Regulations, esp. UN Regulation No. 79.

Objectives A and B will be developed concurrently.

II. Rules of Procedure

1. The SIG is a sub-group of WP29/GRVA and is open to all participants of WP29/GRVA including contracting parties to the 1958 and 1998 Agreements and non-governmental organizations.
2. The SIG will report to GRVA and to WP.29.
3. The SIG may task expert sub-groups to support advancement of the objectives.
4. The Chair of the SIG will be a representative of a Contracting Party. The Secretary of the SIG will be provided by OICA/CLEPA.
5. The Chair may invite experts to the meetings, including non-participants of WP.29, on demand.
6. The working language of the SIG will be English.
7. An agenda and related documents will be circulated to all members of the SIG in advance of all scheduled meetings.
8. All documents of the SIG, or its subgroups, must be submitted to the Secretary of the group at least 5 working days before the meeting. The group may refuse to discuss any item or proposal which has not been circulated as required.
9. All documents shall be provided in digital format. The Secretary shall publish the documents on the dedicated website provided by the UNECE.
10. Decisions of the group shall be reached by consensus based upon written proposals and technical rationale. When consensus cannot be reached, the chair of the group may present the different points of view and seek guidance from GRVA, as appropriate.
11. Meetings of the SIG shall be held at least on a monthly basis but may be more frequent subject to agreement by the majority of the participants. Meetings will be hybrid using web-based technology.
12. A provisional agenda shall be drawn up by the SIG leadership. The first item of the provisional agenda for each session shall be the adoption of the agenda. The second item shall be the minutes of the previous session followed by technical discussions and miscellaneous items.

III. Timeline and deliverables

The SIG shall:

Present an informal paper to the 18th session of GRVA (January 2024) setting out:

- (a) The safety rationale for different arrangements of energy supply and brake transmission to support electromechanical braking systems, and
- (b) A methodology to determine the value of an electrical energy reserve, suitable for application with an electromechanical braking system.

Deliver formal proposals to the 19th session of GRVA (May 2024):

- (a) For an amendment to both UN Regulation No. 13 and UN Regulation No. 13-H to accommodate electromechanical braking systems, and
- (b) Report on recommendations for compatible changes to, for example, UN Regulation No. 79 in respect to the electrical supply, storage, and monitoring.