

Electric Vehicles and the Environment (EVE IWG)

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REPORT TO GRPE 87TH SESSION

Recent EVE Meetings

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- **Virtual meetings**

- 54th EVE IWG February 16th, 2022
- 55th EVE IWG April 26-27, 2022
- 58th EVE IWG November 21-22, 2022

- **In –person meetings**

- 56th EVE IWG - May 30, 2022 in Geneva and virtually (Past)
- 57th EVE IWG – September 21-22, 2022, Brussels
- 59th EVE IWG – January 2023, concurrent with GRPE week

Current Work

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- Hybrid power determination (GTR-21)
 - EVE continuing to develop the GTR based on the experiences of stakeholders
- In-vehicle battery durability (GTR-22) – Light-duty
 - Consider further development and refinement of GTR 22
- New GTR for In-vehicle battery durability – Heavy-duty

GTR-21 Development: Hybrid Power Determination

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- Efforts on GTR-21 are focused refining the text and test procedures
 - Consideration of CAN signals in place of direct measurement
 - ✦ Data analysis required
 - Rational accuracy requirements
 - ✦ Review the source of current values
 - Measurement alternatives for highly integrated systems
 - ✦ Data analysis required
 - Add alternative for system bench testing
 - Develop family concept
 - ✦ Proposal from Japan reflected in the current draft update
 - Need for Candidate Method – on hold, may not be required
 - Timing: Informal document for review at June GRPE

GTR-22 Development: LDV Battery Durability

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- GTR-22 was finalized in 2022
- Limited experience with the GTR to-date
 - Included in the implementation of Euro 7
- EVE is focused on several issues
 - Accounting for energy consumption not related to mobility, with focus on Category 2 vehicles that may have ancillary, non-propulsion electrical loads
 - Category 2 Minimum Performance Requirements
 - Temperature data requirements and consideration of CARB requirements

Heavy-duty Durability GTR

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- Heavy-duty in-vehicle battery durability is now the most significant work being performed by the EVE IWG
- While the overall framework of the light-duty GTR is helpful, there is limited technical similarity
 - Light-duty test procedures with respect to electrified vehicles are more mature
 - Light-duty vehicle activity is relatively homogenous
 - Heavy-duty vehicle activity and energy demands can vary significantly between applications
- Additional technical experts on HD vehicles have joined the IWG

Heavy-duty Durability GTR

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EVE-57-10-Rev1a

@ Different possibilities for certification and in-service testing of HDV and LCV

Options Testing	Charge/Discharge test	Chassis-Dynamometer LCV segment ¹⁾ only	Battery System testbench	Any other...
Reference test	<ul style="list-style-type: none"> + Simple/low effort - Limited power level <p>Total vehicle coverage to be evaluated</p>	<ul style="list-style-type: none"> + No limitation of discharge power level + Chassis dyno already established for light duty (in GTR 22) - Additional test procedure for determination of reference value (during type approval) 	<ul style="list-style-type: none"> • Due to complexity and lack of accuracy when disassembling single packs or whole systems and reassemble with virtual vehicle control, OICA came to the conclusion to not consider it as a technical feasible procedure 	<p>However, industry continues to develop a universally valid test procedure.</p>
In-Service test	<ul style="list-style-type: none"> + Simple/low effort - Limited power level 	<ul style="list-style-type: none"> + No fundamental impact on customer vehicles + Vehicle/ Battery operated as customer experience - Need of chassis dyno for ISC testing 		<p>Our target is to present results during next IWG EVE.</p>

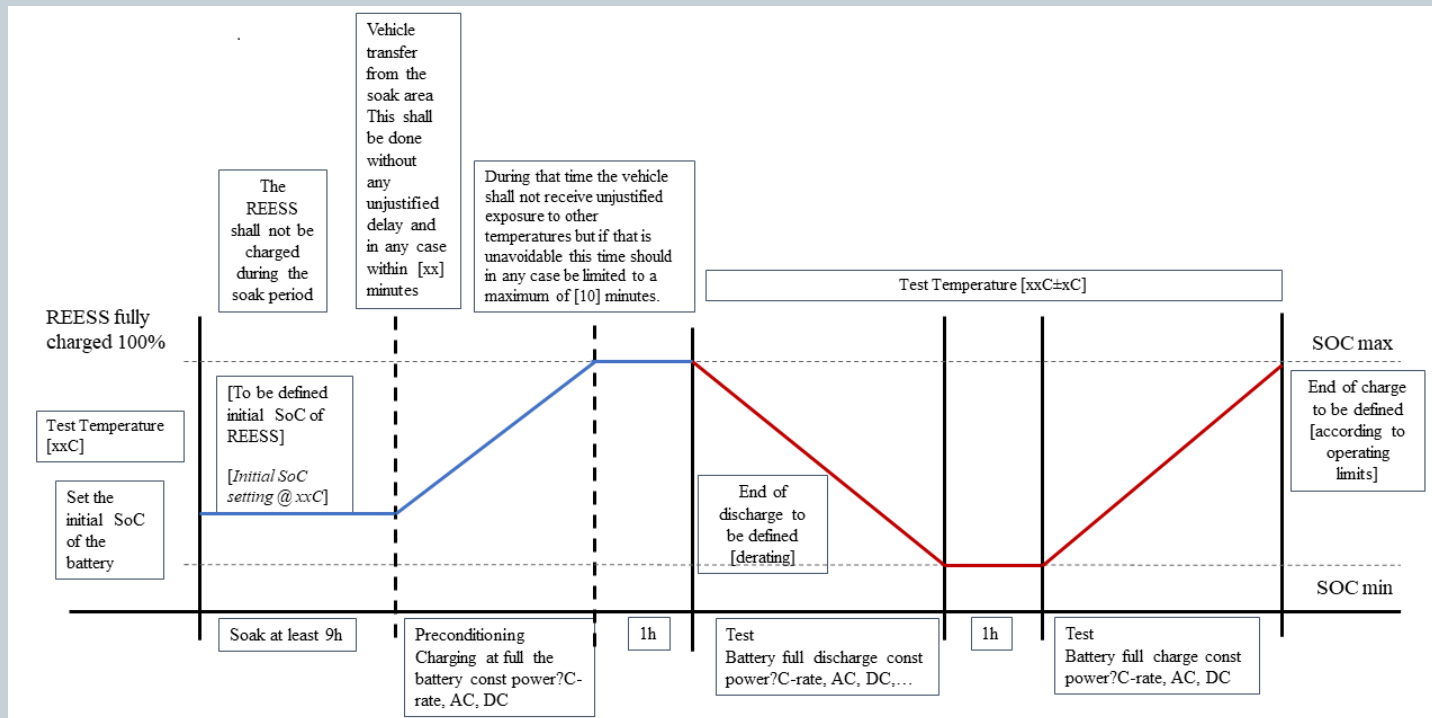
1) No option for heavy duty due to feasibility and availability

- Summary of alternatives presented by OICA
- Each alternative has pluses and minuses
- Goals
 - Identical procedure for Reference Test and In-service Test
 - Leverage experience and existing capabilities of manufacturers and regulatory authorities

Heavy-duty Durability GTR

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EVE-57-07



- JRC presented a battery cycling concept
- Many details to be resolved over the coming months, including the development of appropriate Minimum Performance Requirements
- Cycle test provides a simpler solution that can be adapted to a variety of vehicle applications

Current Timeline

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- **January 2023:**
 - EVE proposes to GRPE the development of a new GTR on in-vehicle battery durability for heavy duty vehicles
- **January 2024:**
 - IWG on EVE provides a status update and draft copy of the development of the durability UN GTR on heavy-duty vehicles as an informal document for further discussion and recommendation. The IWG on EVE provides updates on the future framework for heavy-duty vehicle related durability UN GTR decisions.
- **June 2024:**
 - IWG on EVE provides a draft UN GTR to the June 2024 meeting of GRPE as a working document.
- **June 2021-January 2024:**
 - IWG on EVE continues information gathering on possible modifications to the in-vehicle battery durability UN GTR No 22 and develops amendments to the UN GTR No 22 for consideration by WP.29 and AC.3, as deemed appropriate.
- **May 2021 - June 2023:**
 - EVE IWG supports the Group of Experts on Energy Efficiency on the method for stating energy consumption from upstream emissions of electrified vehicles.
- **November 2021 – June 2023:**
 - Consideration of a candidate test method and further validation testing for UN GTR No. 21
 - Consideration of family concept
 - Consideration of other GTR amendments as necessary

Proposed Future EVE Meetings

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- 60th: March 2023: Virtual meeting
- 61st: April 25~26, 2023 – Ann Arbor, MI – USEPA
- 62nd: June GRPE week – In person and virtual
- 63rd: Early fall 2023: Virtual meeting
- 64th: Mid-fall 2023: Ottawa, Canada – ECCCC
- 65th: Late fall 2023: Virtual meeting

Thank you!

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