

OICA comments on GTR22 Annex 2
EVE-IWG #63
18.-19.07.2023

Annex 2

Values to be read from vehicles:

Mandatory values

1. On board SOCE value
2. On board SOCR value
3. Odometer (in km)
4. Date of manufacture of the vehicle
5. Elapsed time since last charged by more than 50 per cent SOC swing [Days]
6. Average battery temperature while propulsion system is active, during charging and (if equipped) during non-usage of the vehicles (i.e. non-propulsion system active, non-charging)

Values required if manufacturer applies virtual mileage option:

7. Total distance (sum of the distance driven and the virtual distance) [km], if applicable
8. Percentage of virtual distance [in per cent], if applicable
9. Worst case certified energy consumption of PART B family [Wh/km], if applicable
10. Total discharge energy in V2X [Wh], if applicable
11. Total discharge energy for non-traction purposes [Wh], only applicable for Category 2 vehicles and if requested by manufacturer

Optional values:

12. Energy throughput

Annex 2 – proposed Annex 2 restructuring

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10. Total discharge energy in V2X [Wh], if applicable
11. Total discharge energy for non-traction purposes [Wh], if only applicable for category 2 vehicles and if requested by manufacturer

Optional values:

12. Total Energy throughput

 **OICA**
To make clear which values are always required

 **OICA**
To make clear which values are required in case virtual mileage is applied. Values just required then.

 **OICA**
Suggestion to delete due to headline in new structure

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 **OICA**
To make clear that value only required for Cat. 2

 **OICA**
Added as it should be up to OEM to select this option.

 **OICA**
To be clarified for who it is optional.
-For OEM?
-For legislator?

 **OICA**
Wording harmonization with definition

Table 1

Battery Energy based (SOCE) MPR

<i>Vehicle age/km for categories 1-1 and 1-2 in the scope of this GTR</i>	<i>OVC-HEV</i>	<i>PEV</i>
From start of life to 5 years or 100,000 km, whichever comes first	80 per cent	80 per cent
Vehicles more than 5 years or 100,000 km, and up to whichever comes first of 8 years or 160,000 km	70 per cent	70 per cent
<u>Vehicles more than 8 years or 160,000 km, and up to whichever comes first of 10 years or 200,000 km</u>	<u>(Reserved)</u>	<u>(Reserved)</u>

<i>Vehicle age/km for category 2 in the scope of this GTR</i>	<i>OVC-HEV</i>	<i>PEV</i>
From start of life to 5 years or 100,000 km, whichever comes first	<u>75 per cent</u> (Reserved)	<u>75 per cent</u> (Reserved)
Vehicles more than 5 years or 100,000 km, and up to whichever comes first of 8 years or 160,000 km	<u>65 per cent</u> (Reserved)	<u>65 per cent</u> (Reserved)
<u>Vehicles more than 8 years or 160,000 km, and up to whichever comes first of 10 years or 200,000 km</u>	<u>(Reserved)</u>	<u>(Reserved)</u>

 **DILARA Panagiota (GROW)**
From Euro 7 proposal. Still to be discussed.

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From Euro 7 proposal. Still to be discussed.

 **DILARA Panagiota (GROW)**
CN: to extend to 300.000 km

Vehicle age/km for category 2 in the scope of this GTR	OVC-HEV	PEV
From start of life to 5 years or 100,000 km, whichever comes first	(Reserved)	(Reserved)
Vehicles more than 5 years or 100,000 km, and up to whichever comes first of 8 years or 160,000 km	(Reserved)	(Reserved)
Vehicles more than 8 years or 160,000 km, and up to whichever comes first of 10 years or 200,000 km	(Reserved)	(Reserved)

~~SOCR and SOCE monitors of vehicles of category 2 and SOCR monitors of category 1-1 and 1-2 vehicles shall be installed and their values monitored in view of setting the values in the tables for part B as well as accuracy requirements in paragraph 6.3 of Part A in a future amendment of this GTR.~~

~~SOCE monitor values of vehicles shall be monitored after 8 years/160,000 km up to 10 years/200,000 km in view of setting values in tables for Part B in a future amendment of this GTR.~~

~~SOCR monitors of vehicles shall be installed and their values monitored in view of setting the values in the tables for Part B in a future amendment of this GTR.~~



OICA

Replace old text by new text which fits to the tables above. Furthermore suggestion to move “SOCR monitoring in Part A towards paragraph 6.3.3. and 6.3.4.



OICA

Part A monitoring covered by additions in paragraph 6.3.3. and 6.3.4. below.

- 6.3.3. Statistical Method for Pass/Fail decision for a sample of vehicles
Separate statistics shall be calculated for the SOCR monitor and the SOCE monitor.

(...)

As at the current stage no accuracy requirements are set for the SOCR monitor, separate statistics for the SOCR monitors shall not be calculated. Separate statistics for the SOCR monitor shall be calculated once accuracy requirements are being set for Part A in a future amendment of this GTR.



OICA

Suggestion to put Part A monitoring for SOCR here

- 6.3.4. Corrective measures for the SOCR and SOCE monitors

A fail decision for the sample means that the monitors fail to report accurately the durability of the system and appropriate action shall be taken by the manufacturer with the agreement of the responsible authority. This may lead to the requirement that the manufacturer repairs or replaces the faulty monitor including the relevant sensors or by applying software measures in all affected vehicles in the monitor family.

A pass decision or correction of the non-compliance is required for proceeding with Part B.

SOCR monitors shall not lead to a fail decision but shall be monitored in view of setting the accuracy requirements for Part A in a future amendment of this GTR.



OICA

Suggestion to put Part A monitoring for SOCR here

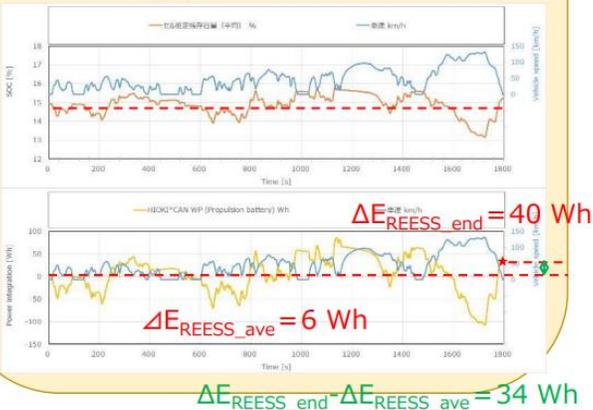
coming from EVE-46-03e

Correction by ΔE_{REESS} profile

$$UBE_{corr} = UBE_{meas} + (\Delta E_{REESS_end} - \Delta E_{REESS_ave})$$

ΔE_{REESS} : Electric energy change of propulsion battery
 ΔE_{REESS_end} : ΔE_{REESS} of Confirmation cycle
 ΔE_{REESS_ave} : Average ΔE_{REESS} during Confirmation cycle

[Confirmation cycle]



correction of UBE via average energy from conformation cycle

to calculate the **average energy**, an average of the **energy curve** is needed

currently version of GTR22 annex 3 3.1.1. shows this formula:

$$\Delta E_{REESS,avg,i,CC} = \frac{1}{3600} \times \frac{1}{t_{end,CC} - t_{start,CC}} \times \int_{t_{start,CC}}^{t_{end,CC}} \int_{t_{start,CC}}^{t_{end,CC}} U_{REESS,i}(t) \times I_{REESS,i}(t) dt dt$$

outer integral is calculating the **average** of inner integral

but **inner integral does not calculate** an **energy curve** $E(t)$, it calculates the energy change between start and end of Confirmation cycle, which is a constant.

This is **due to upper bound** of the **inner integral** $t_{end,CC}$

to get the **energy curve** and be able to calculate $\Delta E_{REESS,avg}$ as intended a possible solution could be to change the upper bound:

$$\Delta E_{REESS,avg,i,cc} = \frac{1}{3600} \times \frac{1}{t_{end,cc} - t_{start,cc}} \times \int_{t_{start,cc}}^{t_{end,cc}} \int_{t_{start,cc}}^t U_{REESS,i}(t) \times I_{REESS,i}(t) dt dt$$



2.1.2. Certified UBE values for PEVs

In the case the interpolation method is applied, $UBE_{certified}$ shall be determined by selecting

- The maximum $UBE_{measured}$ amongst vehicle H and vehicle L;
- The AF which is closest to 1.

Proposal:

In the case the interpolation method is applied, $UBE_{certified}$ shall be determined by selecting the maximum ($UBE_{measured} \times AF$) amongst vehicle H and vehicle L

3.1.2. Certified UBE values for OVC-HEVs

In the case the interpolation method is applied, $UBE_{certified}$ shall be determined by selecting:

- The maximum $UBE_{measured}$ amongst vehicle H and vehicle L and (if applicable) vehicle M;
- The AF which is closest to 1.

Proposal:

In the case the interpolation method is applied, $UBE_{certified}$ shall be determined by selecting the maximum ($UBE_{measured} \times AF$) amongst vehicle H and vehicle L and (if applicable) vehicle M

Justification: Avoid unjustified disadvantage just from mathematics
Example:

Vehicle	UBE [kWh]	UBE max	AF	AFmax	UBE Certified
VL	99,2	99,2	0,98	0,99	98,2
VH	99,0		0,99		

Vehicle	UBE [kWh]	AF	UBE Certified	UBE Certified
VL	99,2	0,98	97,2	98,0
VH	99,0	0,99	98,0	

Existing rules:

- The maximum UBE_{measured} amongst vehicle H and vehicle L
- The AF which is closest to 1.

Proposed rule:

- Selecting the maximum ($UBE_{\text{measured}} \times AF$) amongst vehicle H and vehicle L