

Japan would like to confirm;

Comments and/or Proposals
regarding to
The Revision of GTR22

prepared by JAPAN

64th EVE IWG
19th & 20th September 2023

Regarding “EVE-61-13er1-GTR22 working draft v3 with meeting revisions.doc” , Japan follows EVE IWG decision but has comment and proposal

1.Added Definition

3.24.“Energy throughput” means the total amount of energy in Wh discharged **(and charged)** from the battery.

3.25.“Total discharge energy for non-traction purposes” means the total amount of energy in Wh discharged from the battery for purposes other than traction to support the particular use case of a Category 2 vehicle and do not include air conditioning/heating for the cabin or other uses already present in categories 1-1 and 1-2.

2. Additions to ANNEX 2

11.Total discharge energy for non-traction purposes [Wh], if applicable

Optional values:

12.**Total** energy throughput

<JAPAN Comment>

1. Regarding the definition of "Energy throughput“, We would like to confirm the intent of (and charged).
In the European Battery Regulation (see Appendix p20-22), it is described as "discharged". Therefore, we propose;
“Energy throughput” means the total amount of energy in Wh discharged ~~(and charged)~~ from the battery.
 - Considering the harmonization with CARB_ACC2 which was already published.
The sum of the energy for on-board and off-board is appropriate, (see p.3 and 4 and Appendix p9-19)
- 2 .Regarding the intention of Optional values; Is it up to the OEM whether or not to output them?
3. #12 should be Energy Throughput, along with the definition of the term. The definition (above) includes total..

< JAPAN Proposal >

Is it appropriate that Japan will submit the application of #11&12 of Annex2 to SAE?

EVE-61-14e - GTR 22 SAE J1979DA update can be used to avoid hard work.

SAE Definition

| | | Definition | specific example | propulsion system non-active operation | propulsion system active operation | GTR22__Annex2 |
|-------|--------------|---|---|---|---------------------------------------|--|
| usage | off-board | Battery energy consumed by external loads (outside the vehicle) | V2X, | 0xF88B | 0XXXXX | V2X |
| | on-board | Battery energy consumed by Traction and internal loads (on the vehicle) | Motor , HVAC, Aux. devices(PS , Safety...) PTO(Refrigerator, elevating cranes, mixers etc.) | N/A | 0xF886 | Energy throughput |
| | non-traction | Battery energy consumed by non-Traction purposes. | HVAC, Aux. devices(PS , Safety...) PTO(Refrigerator, elevating cranes, mixers etc.) | | | |
| | | Battery energy consumed other than Traction and power applications that already exist in Category 1 | PTO(Refrigerator, elevating cranes, mixers etc.) | 0xYYYY For Category 2, this energy is subject to virtual distance. | | Total battery energy supplied to a non-traction usage (lifetime) |
| | traction | N/A | Motor | N/A | N/A | |

Comments and/or Counter-proposals on

latest GTR#22 text

<EVE-63-15e - GTR22 working draft with EVE 63 meeting revisions.docx>



<EVE-64-ZXe – JPN comments on EVE-63-15e>

Thanks for reflecting JPN proposals

3.23. "Maximum charging power" means the highest available charging power for the considered Part B family.↵

3.24. "Energy throughput" means the total amount of energy in Wh discharged from the battery.↵

3.25. "Total discharge energy for non-traction purposes" means the total amount of energy in Wh discharged from the battery for purposes other than traction to support the particular use case of a Category 2 vehicle and do not include air conditioning/heating for the cabin or other uses already present in categories 1-1 and 1-2.↵

JRC Elena Paffumi
削除: (and charged
削除:)

7. Worst case certified energy consumption of PART B family [Wh/km], if applicable↵

8. Total discharge energy in V2X [Wh], if applicable↵

9. Elapsed time since last charged by more than 50 per cent SOC swing [Days]↵

10. 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)↵

11. Total discharge energy for non-traction purposes [Wh], if applicable↵

Optional values:↵

12. Energy throughput↵

DILARA Panagiot... 削除: Last
 DILARA Panagiot... 削除: on
 DILARA Panagiot... 削除: te
 DILARA Panagiot... 削除: 10.→ Maximum, ▼
 JRC Elena Paffumi Japan EVE 63 Is it up to the OEM?
 DILARA Panagiot... 削除: 1
 JRC Elena Paffumi 削除: Total
 JRC Elena Paffumi 削除: e

5.2. Battery Performance Requirements

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.[←]

A manufacturer may elect to declare a Declared Performance Requirement (DPR_i) having an SOCE and/or SOCR value that is higher than that of the corresponding MPR. The DPR_i shall then replace the MPR_i for the purposes of determining compliance by that manufacturer.[←]

The manufacturer shall ensure that batteries installed in vehicles comply with the rules specified in paragraph 6.4.2. for the MPR_i (or DPR_i if applicable).[←]

At the request of the manufacturer and for vehicles designed with V2X, the equivalent virtual distance calculated following the equation below will be reported by each vehicle.[←]

$$\text{Virtual distance (km)} = \left(\frac{\text{total discharge energy during V2X and for non - traction purposes} [Wh]}{\text{worst case certified energy consumption of PART B family [Wh/km]} } \right)^{\leftarrow}$$

Where:[←]

"*worst case certified energy consumption of Part B family*" means the worst case certified energy consumption of a Part B family which needs to be provided according to Annex 2.[←]

JE

JRC Elena Paffumi

←

OICA EVE 63-11[←]

Proposal to replace the paragraph[←]

-Part A monitoring covered by additions in paragraph 6.3.3. and 6.3.4. below.[←]

-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."[←]

←

Proposed text:[←]

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.[←]

←

JPN_230905

OK with OICA proposals[←]

Separate statistics shall be calculated for the SOCR monitor and the SOCE monitor.⁴

As at the current stage no accuracy requirements are set for the SOCR monitor, SOCR statistics shall not lead to a Pass/Fail decision but shall be monitored in view of setting the accuracy requirements for Part A in a future amendment of this GTR.⁴

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.⁴

An adequate number of vehicles (at least 3 and not more than 16) shall be selected from the same monitor family for testing following a vehicle survey (see Annex 1) which contains information designed to ensure that the vehicle has been properly used and maintained according to the specifications of the manufacturer. The following statistics shall be used to take a decision on the accuracy of the monitor.⁴

For evaluating the SOCR/SOCE monitors normalised values shall be calculated:⁴

$$x_i = SOC_{read,i} - SOC_{measured,i} \quad 4$$

Where⁴

$SOC_{read,i}$ is the on-board SOCR/SOCE read from the vehicle i ; and⁴

$SOC_{measured,i}$ is the measured SOCR/SOCE of the vehicle i .⁴

For the total number of N tests and the normalised values of the tested vehicles, x_1, x_2, \dots, x_N the average X_{tests} and the standard deviation s shall be determined:⁴

$$X_{tests} = \frac{(x_1 + x_2 + x_3 + \dots + x_N)}{N} \quad 4$$

and⁴

$$s = \sqrt{\frac{(x_1 - X_{tests})^2 + (x_2 - X_{tests})^2 + \dots + (x_N - X_{tests})^2}{N - 1}} \quad 4$$

For each N tests $3 \leq N \leq 16$, one of the three following decisions can be reached, where the factor A shall be set at 5:⁴

(a) Pass the family if $X_{tests} \leq A - (t_{P1,N} + t_{P2,N}) \cdot s$ ⁴

(b) Fail the family if $X_{tests} > A + (t_{F1,N} - t_{F2}) \cdot s$ ⁴

(c) Take another measurement if:⁴

$$A - (t_{P1,N} + t_{P2,N}) \cdot s < X_{tests} \leq A + (t_{F1,N} - t_{F2}) \cdot s \quad 4$$

where the parameters $t_{P1,N}$, $t_{P2,N}$, $t_{F1,N}$ and t_{F2} are taken from Table 3.⁴

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.⁴

Counter-proposals on OICA proposals

6.3.4. Corrective measures for the SOCR(and SOCE monitors)⁴

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. ⁴

A pass decision or correction of the non-compliance is required for proceeding with Part B. ⁴

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.⁴

JE JRC Elena Paffumi
OICA EVE 63-11 proposed text to add here below⁴

OICA
Suggestion to put Part A monitoring for SOCR here⁴

JPN_230905
Better to move to para. 6.3.3.⁴

OICA
Suggestion to put Part A monitoring for SOCR here⁴

JPN_230905
better to move to top portion of this paragraph with slight modification⁴

Updated JPN original proposals per OICA comments

6.4.2. Pass/Fail Criteria for the battery durability family⁶⁴

6.4.2.1 Step 1 : against vehicle odometer⁶⁴

A battery durability family shall pass if equal to or more than 90 per cent of monitor values read from the vehicle sample are above the ~~MPR_i~~ or ~~DPR_i~~ over only the travelled distance threshold.⁶⁴

If not the case, pass/fail check shall be done according to the paragraph 6.4.2.2. of this GTR.⁶⁴

6.4.2.2. Step 2 : against vehicle odometer with virtual distance⁶⁴

A battery durability family shall fail if less than 90 per cent of monitor values read from the vehicle sample are above the ~~MPR_i~~ or ~~DPR_i~~ over the total distance threshold.⁶⁴

-If not the case, the verification of virtual distance shall be performed according to paragraph 6.4.3.⁶⁴

6.4.3. Verification of virtual distance⁶⁴

6.4.3.1. Timing of verification tests⁶⁴

Verification of virtual distance shall be completed within one year after the decision according to paragraph 6.4.2.2.⁶⁴

6.4.3.2. Verification procedure⁶⁴

In order to verify the virtual distance, the values of on-board total discharge energy (~~TDE_{read,i}~~) for the V2X or non-traction purposes on-board total discharge energy (~~TDE_{read,i}~~) and the energy measured by the external measurement equipment (~~TDE_{measured,i}~~) shall be analysed according to paragraph 6.4.3.3. Verification test procedure shall be determined by the manufacture with the agreement of the responsible authority measured at the

time of the verification during the test and the related values from the monitors shall be collected before the verification test procedure.⁶⁴

6.4.3.3. Statistical Method for Pass/Fail decision for a sample of vehicles⁶⁴

Statistical method shall be followed according to paragraph 6.3.3. with the following modification⁶⁴

$$k_i = (TDE_{read,i} - TDE_{measured,i}) / (k_i * TDE_{measured,i})$$

k_i = 100 / (Percentage of virtual distance [in per cent]) but maximum 2⁶⁴

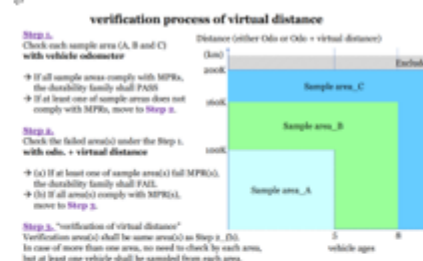
6.4.3.4. If 6.4.3.3. is OK a battery durability family shall pass⁶⁴

If 6.4.3.3. is not OK, move on to 6.4.3.4.⁶⁴

6.4.3.4. Corrective Measures for the Virtual Distance⁶⁴

The corrective measures for virtual distance shall be taken with the agreement of the responsible authority, then repeat paragraph 6.4.2.2. ~ 6.4.3.3.⁶⁴

JE **RC Elena Paffoni**
EVE-63-10 Japan proposal on virtual distance verification⁶⁴
See below in track changes⁶⁴



Shall we add in the text also the proposal here in the picture on the selection criteria for the vehicles for the step3?⁶⁴

JE **RC Elena Paffoni**
As defined above⁶⁴
Odometer with virtual distance is defined as⁶⁴
total distance⁶⁴

JE **RC Elena Paffoni**
A sentence might be added to explain the test procedure, i.e., during the verification test, switching on the V2X/ non-traction purposes systems reading the counter?⁶⁴
How long for?⁶⁴

JE **RC Elena Paffoni**
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How long for?⁶⁴

J **JM**
As a way of thinking, an error of 5% of Total Distance is acceptable. However, since the accuracy is not very good, an upper limit is set. See graph on next page⁶⁴

JE **RC Elena Paffoni**
Rephrasing⁶⁴
If 6.4.3.3 is passing the statistical method check ...⁶⁴

JM 230905
appreciate the sophisticated text proposals⁶⁴

6.4.3.3. Statistical Method for Pass/Fail decision for a sample of vehicles

Statistical method shall be followed according to paragraph 6.3.3. with the following modification

$$x_i = (TDE_{read,i} - TDE_{measured,i}) / (k_i * TDE_{measured,i})$$

$k_i = 100 / (\text{Percentage of virtual distance [in per cent]})$ but maximum 2

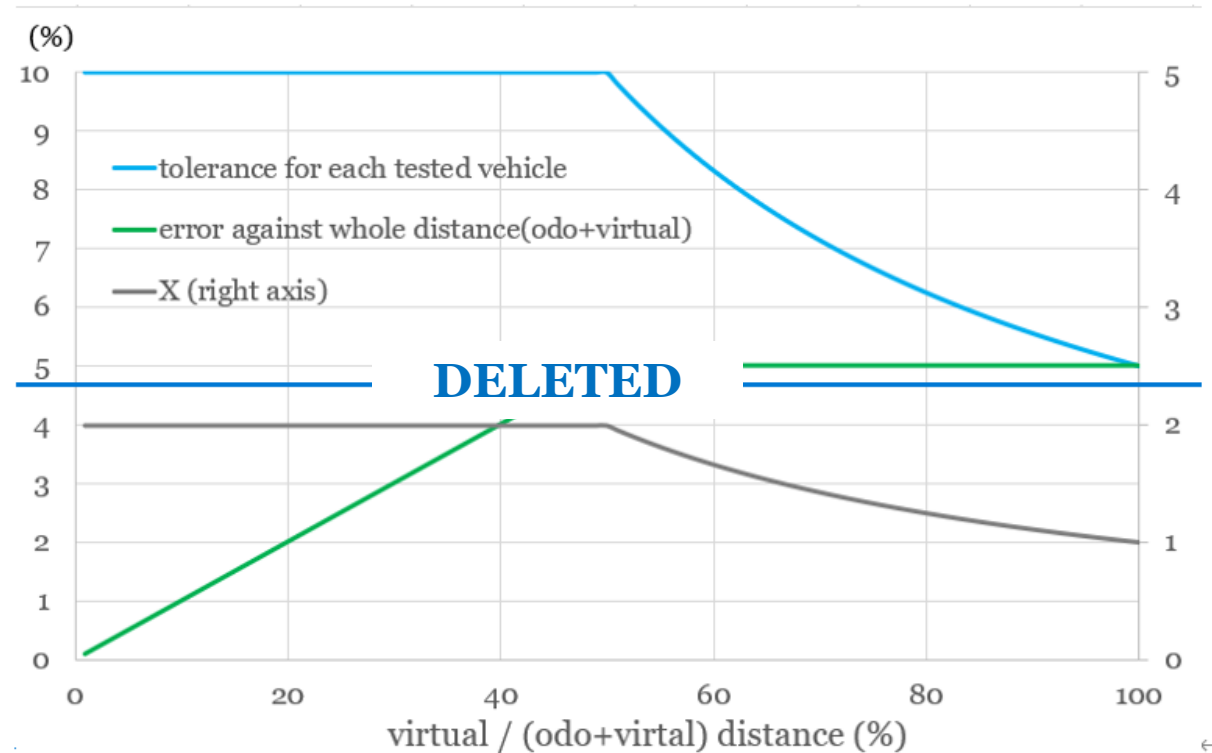
6.4.3.4. If 6.4.3.3. is OK, a battery durability family shall pass

If 6.4.3.3. is not OK, move on to 6.4.3.4.

6.4.3.4. Corrective Measures for the Virtual Distance

The corrective measures for virtual distance shall be taken with the agreement of the responsible authority, then repeat paragraph 6.4.2.2. ~ 6.4.3.3.

←



J

JPN

As a way of thinking, an error of 5% of Total Distance is acceptable. However, since the accuracy is not very good, an upper limit is set. See graph on next page

JE

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Rephrasing

If 6.4.3.3 is passing the statistical method check ...

←

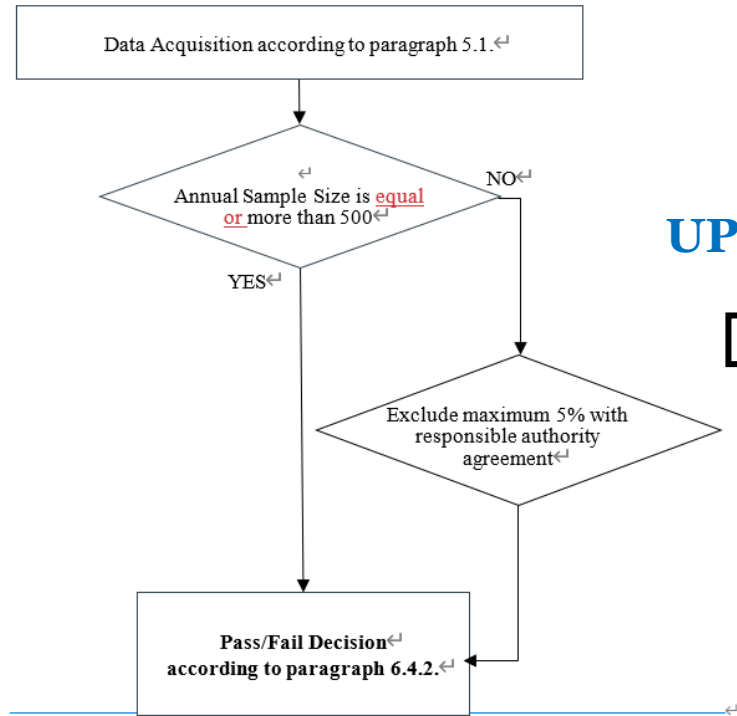
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appreciate the sophisticated text proposals

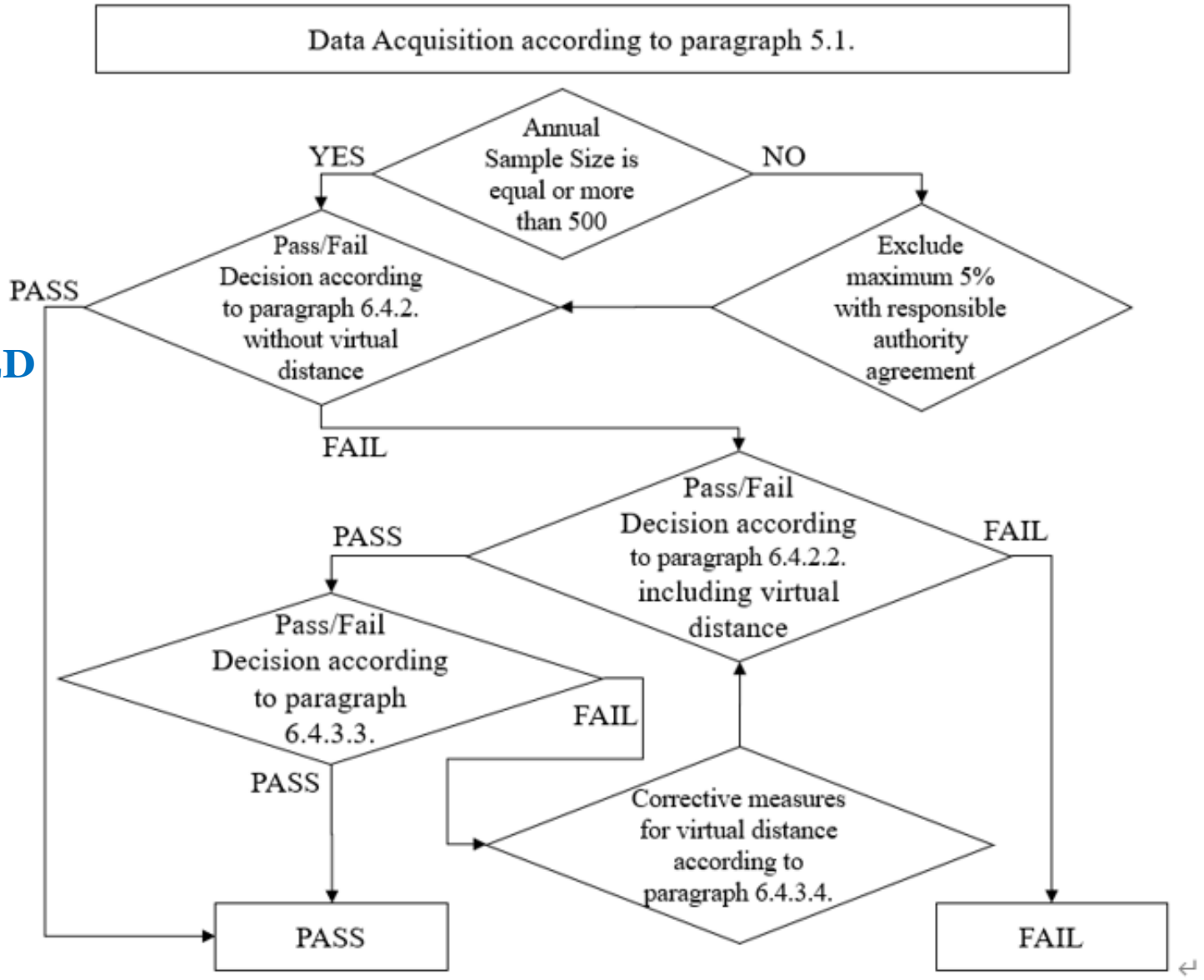
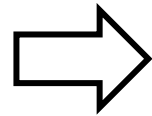
Figure 2

Flow chart for Part B : Verification of Battery Durability and Virtual Distance

Part B : Verification of Battery Durability and Virtual Distance



UPDATED



Annex 2

Values to be read from vehicles:

1. On board SOCE value
2. On board SOCR value
3. Odometer (in km)
4. Date of manufacture of the vehicle
5. Total distance (sum of the distance driven and the virtual distance) [km], if applicable
6. Percentage of virtual distance [in per cent], if applicable
7. Worst case certified energy consumption of PART B family [Wh/km], if applicable
8. Total discharge energy in V2X [Wh], if applicable
9. Elapsed time since Last-last charged by more than 50 per cent SOC swing on [Dayste]
- ~~10. Maximum, minimum, average ambient battery pack temperature* the vehicle battery was exposed experienced to during its lifetime~~
~~10. 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)~~
- ~~11. Total discharge energy for non-traction purposes [Wh], if applicable~~

Optional values:

~~12. Total eEnergy throughput~~

~~12. Capacity throughput~~

~~13. Total time of use of the battery~~

~~Note: * ambient temperature to be read as daily averages~~

JE

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OICA EVE 63 – 11

Proposal to reorganise the values accordingly

1. **Mandatory values** To make clear which values are always required

and

2. **Values required if manufacturer applies virtual mileage option** To make clear which values are required in case virtual mileage is applied. Values just required then.

3. Suggestion to delete *if applicable* due to headline in new structure

4. To make clear that value only required for Cat. 2 vehicles and if requested by manufacturer: *only applicable for Category 2 vehicles and if requested by manufacturer*

Text proposal:

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. Total energy throughput

JPN_230905

Supports OICA proposals

supports OICA proposals

Annex 3

| Parameters↵ | Explanation↵ |
|-------------|--|
| | <p>UBE_{certified} shall be rounded according to paragraph 7 of this GTR:↵</p> <ul style="list-style-type: none"> - To the nearest whole number in case unit is Wh↵ - To three significant numbers in case unit is kWh↵ <p>In the case the interpolation method is applied, UBE_{certified} shall be determined by selecting↵</p> <ul style="list-style-type: none"> - The maximum UBE_{measured} amongst vehicle H and vehicle L;↵ - The AF which is closest to 1.↵ |

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OICA EVE-63-11↵

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

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No strong position. Follow IWG decision↵

| | |
|--|--|
| | <p>In the case the interpolation method is applied, UBE_{certified} shall be determined by selecting↵</p> <ul style="list-style-type: none"> - The maximum UBE_{measured} amongst vehicle H and vehicle L and (if applicable) vehicle M;↵ - The AF which is closest to 1.↵ |
|--|--|

JE

JRC Elena Paffumi

OICA EVE 63-11↵

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

JPN_230905

No strong position. Follow IWG decision↵