

GTR#21 Re-revised proposal

~ Family Definition ~

prepared by Japan
@EVE59

10th January 2023

- EVE57(held in September 2022)
 - Japan proposed seven parameters as the GTR#21 family definition.
 - Japan's proposal was well recognized for necessity of family building.
 - U.K. suggested to consider the potential harmonization with the GTR#22 family definition.

- EVE58(held in November 2022)
 - No new proposals from Japan, as the EVE57 proposal is still under discussion.
 - IWG understands that full harmonization between GTR#21 and #22 is not appropriate due to the difference of each purpose.
 - On the other hands, it was suggested to take a look at each element of the family definition as a template terminology.

EVE59 JAPAN Proposals

parameters	GTR#22		GTR#21	Reason for judgment
	Part A	Part B		
	SOCE/SOCR determination algorithm	Electric systems affecting battery durability	HEV System Power determination	
1. Algorithm for estimating on-board SOCR and on-board SOCE	✓		NA	SOCR/SOCE estimation algorithm does not affect system output.
2. Sensor configuration (for sensors used in determination of SOCR and SOCE estimates)	✓		NA	Sensors for SOCR/SOCE do not affect system output.
3. Characteristics of battery cell which have a non-negligible influence on accuracy of monitor	✓		NA	SOCR/SOCE monitor accuracy does not affect system output.
4. Type of vehicle (PEVs or OVC-HEVs) System type	✓		PEVs OVC-HEVs NOVC-HEVs	Add NOVC-HEVs considering hybrid vehicle.
5. Type of electric machines Motor Power		-	-	※Not selected for the title
net power		✓	✓	Required for MOT Power consistency check.
construction type (asynchronous/ synchronous, etc.)		✓	✓	Required for MOT Power consistency check.
any other characteristics having a non-negligible influence on battery durability		✓	NA	No correlation between items affecting battery durability and system output.
6. Number of electric machines		✓	NA	HEV system configuration cannot be represented by the number of MOTs.
7. Type of battery Battery Power		-	-	※Not selected for the title
dimensions		✓	NA	Battery dimensions do not affect system output.
type of cell including format and chemistry		✓	✓	Required for Battery Power consistency check
capacity (Ampere-hour)		✓	NA	Battery capacity does not affect system output
nominal voltage		✓	✓	Necessary to check battery output consistency
nominal power		✓	NA	Battery output cannot be defined.

EVE59 JAPAN Proposals

parameters	GTR#22		GTR#21	Reason for judgment
	Part A	Part B		
	SOCE/SOCR determination algorithm	Electric systems affecting battery durability	HEV System Power determination	
8. Battery management system (BMS) (with regards to battery durability monitoring and estimations)		✓	NA	No correlation between BMS and system output affecting battery endurance.
8. Battery management system (BMS) (with regards to.....)			NA	System output is not related to BMS because the potential of each component is exhausted.
9. Passive and active thermal management of the battery		✓	NA	Battery thermal management does not affect system output.
10. Type of electric energy converter		-	-	※Not selected for the title
between the electric machine and battery		✓	✓	Necessary to check consistency fo K1 efficiency
between the recharge-plug-in and battery		✓	NA	Charging system does not affect system output.
any other characteristics having a non-negligible influence on battery durability		✓	NA	No correlation between items affecting battery durability and system output.
11. Operation strategy of all components influencing the battery durability.		✓	NA	No correlation between items affecting battery durability and system output.
12. Declared maximum charging power.		✓	NA	No correlation between charging power and system output.
13. [Adding item] HEV System configuration			✓	No confirmation of HEV system configuration in GTR22.
14. [Adding item] ICE power			✓	No confirmation of Engine output in GTR22.
15. [Adding item] Maximum current			✓	No confirmation of maximum current in GTR22.
notes	At the request of the manufacturer, with the approval of the responsible authority and with appropriate technical justification, the manufacturer may deviate from the above criteria for families.		←	GTR22 concept followed.

Comparison of two family definitions

parameters		GTR#21 family definition proposal			
		①original (@EVE57)	②template terminology		
【GTR#22】 Family definition	Type of vehicle (PEVs or OVC-HEVs)			H	
	Type of electric machine	net power		C	
		construction type (asynchronous/ synchronous, etc.)		C	
	Type of battery	type of cell including format and chemistry			D,E
		nominal voltage			F
	Type of electric energy converter	Between the electric machine and battery			C
New Item	HEV System configuration		A	A	
【UNR85】 Type approval	ICE power		B	B	
	Motor power		C		
【UNR100】 Type approval	The cell chemistry		D		
	Configuration (number of cells, mode of connection, etc.):		E		
	Nominal voltage (V):		F		
	Maximum current (A):		G	G	
Total			7	9	

The two proposals differ only in the source of appropriation, but the family definition items are almost identical

- No significant difference between original proposal and revised proposal which is based on template terminology.
- Thanks to U.K. suggestion, revised GTR#21 family definition has well sense of unity with GTR#22.



Japan proposes GTR#21 family definition based on template terminology

note : the family definition of the heavy-duty battery degradation is under the development based on template terminology