UNECE EVE-IWG

Determination of Electrified Vehicle Power

OICA comments on GTR21
EVE-IWG #63
18.-19.07.2023

GTR 21 Test Conditions

GTR21 text	Validity of applying C/D test	Validity of system bench application
5. Test conditions	-	-
5.1. Test instrumentation	-	-
5.1.1. Dynamometer **The power absorption capacity of the dynamometer in fixed speed control mode shall be sufficient for the maximum power of the vehicle.** Due to the short duration of maximum power under the test procedure (approximately 10 seconds), a short duration power rating of the dynamometer may be applicable to this requirement with approval of the responsible authority.	OK	OK
5.1.2. Test room **The test cell shall have a temperature set point of 25 ºC. The tolerance of the actual value shall be within ±10 ºC.** Atmospheric pressure in the test cell shall be between 80kPA and 110 kPa.	OK	OK
5.1.3. Cooling fan A current of air of variable speed shall be blown towards the vehicle sufficient to maintain the proper system operating temperatures (see 6.8.1). The set point of the linear velocity of the air at the blower outlet shall be equal to the corresponding dynamometer speed above measurement speeds of 5 km/h. **The deviation of the linear velocity of the air at the blower outlet shall remain within ±10 % of the corresponding measurement speed, up to the maximum speed of the blower. Excessive cooling is prohibited.**	OK It may not be satisfactory in the high vehicle speed range, but since it says "up to the maximum speed of the blower", it can be set arbitrarily by the manufacturer as long as it does not overcool (air volume is insufficient).	Need revision Proposed that the cooling system on the equipment side can be used. The challenge is how to prove that supercooling is not occurring. IPM motors tend to produce more torque when cold, so there is an effect depending on the measurement method. TP1: Even if the MOT torque increases, the battery output remains the same, so there is no effect on the system output. TP2: As the MOT torque increases, the foot axis output increases, which affects the system output.
5.1.4. Soak area The temperature of the soak area shall be **maintained at 25 ºC ±10 ºC.**	OK	OK
5.2. Measurement		
5.2.1. Measurement items and accuracy Measurement devices shall be of certified accuracy as shown in Table 2 traceable to an approved regional or international standard.	OK	OK
Table 2 Measurement items and required accuracy ※Described on a separate sheet	-	-
5.2.2. Measurement frequency All the items in Table 2 of 5.2.1, unless specified otherwise in the table, **shall be measured and recorded at a frequency equal to or greater than 10 Hz.** The items atmospheric pressure and room temperature shall be at least recorded as single measurement activity at start of vehicle operation (see 6.8.5) and after end of vehicle running (see 6.8.8).	OK	OK

GTR 21 Table 5

Item	Units	Accuracy	Validity of applying C/D test	Validity of system bench application
Engine speed	min -1	± 10 min -1 or ± 0.5% of measured value		
Intake manifold pressure	Pa	± 50 Pa		
Atmospheric pressure	Pa	±0.1 kPa, with a measurement frequency of at least 0.1 Hz	OK	OK
Specific humidity	g H2O/kg dry air	± 1 g H2O/kg dry air	OK	OK
Fuel flow rate	g/s	± 3 %		
Electrical voltage	V	±0.3 % FSD or ±1 % of reading		
Electrical current	A	±0.3 % FSD or ±1 % of reading		
Room temperature	K	±1 °C, with a measurement frequency of at least 0.1 Hz	OK	OK
Dynamometer speed	km/h	The dynamometer speeds shall be controlled with an accuracy of ±0.2 km/h.	unnecessary	unnecessary
Dynamometer force	N	The accuracy of the force transducer shall be at least ±10 N for all measured increments. This shall be verified upon initial installation, after major maintenance and within 370 days before testing.	OK	OK
Time	s	± 10 ms; min. precision and resolution: 10 ms	under consideration Is it possible to relax the sample rate?	under consideration Is it possible to relax the sample rate?
Axle/wheel rotational speed	rev/s	± 0.05 s-1 or ± 1 %, whichever is greater	Item for TP2, not required for TP1	Item for TP2, not required for TP1
Axle/wheel torque	Nm	± 6 Nm or ± 0.5 % of the maximum measured total torque, whichever is greater, for the whole vehicle.	Item for TP2, not required for TP1	Item for TP2, not required for TP1
Accelerator pedal command	percent	± 1 %		