



UNECE EVE-IWG

OICA Updates on GTR 21  
EVE-IWG #59  
10.01.2023

## Background of requested updates

- Tolerances to be adjusted to practical and reasonable levels
- Deletion of accuracy requirements from paragraph 5.2.1. and shift to list of operation metrics in 6.8.1. as signals required to be accurate to run vehicle
  - High efforts to prove accuracy w/o benefit (would add unnecessary complexity)
  - Accuracy requirements, as on intake manifold pressure or pedal command, hard to meet
  - Target: focus/limit to values which are really required
- Use of On-Board signals instead of external measurements
  - On-board signals need to be accurate to properly run the vehicle

Para	Item	Challenge	OICA comment
5.2.1.	Accuracy Fuel Flow Rate	Fuel flow rate g/s $\pm 3 \%$	OICA suggests to delete this point from 5.2.1. A comparison of fuel flow rate for a validation check between values of GTR21 and R85 shall be made with the ECU calculated value for fuel flow. For new WLTP project this value is also subject to type approval (OBFCM). But also for non-WLTP projects the usage of the internal fuel flow signal permissible. Record and measurement of ECU calculated fuel flow could be listed in 6.8.1 under operational metrics.
5.2.1.	Accuracy Intake Manifold Pressure	Intake manifold pressure Pa $\pm 50$ Pa	Still under discussion
5.2.1.	Accuracy Engine Speed	Engine speed $\pm 10 \text{ min}^{-1}$ or $\pm 0.5\%$ of measured value Whichever is greater	Measurement application for Engine in the homologation vehicle is only possible with higher efforts. ECU and all control functions for system power work with internal engine speed signal. As the engine speed is only necessary in GTR21 to estimate the relevant power output from R85 in case of using TP1, OICA suggests to use for this comparison the ECU engine speed signal. OICA recommends to delete the point accuracy requirement for engine speed from 5.2.1. It could be listed in 6.8.1 under operational metrics.

Para	Item	Challenge	OICA comment
5.2.1.	Accuracy Accelerator pedal command	Percent ± 1 %	<p>OICA suggests to delete this point from 5.2.1.</p> <p>During R85 tests we usually supply the technical service measurement values based on ECU data for pedal command and throttle value to proof the validity of the wot-Test (wide open throttle). In R85 it is not stipulated to measure pedal or throttle value/angle at all; of course, it is stipulated to perform the R85 at full throttle (gasoline) respectively full load (diesel).</p> <p>Therefore OICA suggests to record those data during GTR21 from ECU data stream without any stipulations to accuracy.</p> <p>Record and measurement of ECU pedal command and throttle value could be listed in 6.8.1 under operational metrics.</p>
5.2.1.	Accuracy Time	Time s ± 10 ms min. precision	<p>OICA needs clarification why this high precision and resolution is required. In R85 no requirement on measurement time is stipulated.</p>
6.1.2..	Alternative measurement device	Instrumentation with measurement device and on-Board measurement devices	<p>OICA recommends to reduce to effort to applicate additional measurement devices to the vehicle to a minimum.</p> <p>The stipulation in case of alternative usage of on-board measurement devices to demonstrate the minimum requirements acc. to 5.2 can not be fulfilled reasonably. This would mean calibration certificate for ECU sensor and calibration certificate for ECU sensor input similar to calibration process for R85 test bed measurement.</p> <p>OICA suggests to modify the text in 6.1.2 as follows:</p> <p>„If TP1 shall be applicated for the system power measurement and on-board measurement data shall be used for the confirmation of intake manifold pressure and fuel flow rate, the manufacturer has to ensure that values of those on-board measurement data has been recorded during R85 or ISO1585 certification measurement.“</p>

Para	Item	Challenge	OICA comment
6.8.1.	Operational Metrics	List of parameters for measurement and recording	<p>OICA is still discussing which parameters should be measure and recorded in the Operational metric list</p> <p>OICA sees the following benefits when deleting parameters from 5.2.1. + add to list of operational metrics in paragraph 6.8.1. + allow onboard data:</p> <ul style="list-style-type: none"> <li>▪ TP1 can be measured independently – just CAN read-out file required</li> <li>▪ GTR-21 can be also applied on highly integrated system where external measurements not possible to be mounted; only possible alternative would be application of standard factors (e.g. K-factors)</li> </ul> <p>Parameters from both GTR-21 and UN-R85 are not w/o requirements → See next line</p>
6.2.9.1.	Comparison of R85 to GTR21 data	To confirm intake manifold pressure and fuel flow rate, compare the measured values to those reported in the certification results of the applicable standard at the measured engine speed.	<p>OICA is still discussing about appropriate measurement and tolerance details</p> <p>For ECU-parameters in 6.8.1. – used to compare between GTR-21 and UN-R-85 – a reasonable tolerance need to be defined and applied.</p>