

Precision of total inertia simulation by chassis dynamometers as per in Regulations Nos. 40, 47 and 83

Dear Sirs,

Our state enterprise, as Designated Administrative Department and Technical Service of Ukraine (46/A(b), 46/B) under the Agreement concerning the Adoption of Uniform Technical Prescriptions for Wheeled Vehicles, would like to request you, as a competent organisation, to kindly comment on us the requirements of the UN/ECE Regulations No 83, No 40, No 47 (with their most recent amendments) regarding precision of total inertia simulation by chassis dynamometers.

1. All above-mentioned UN/ECE regulations contain metrological requirements for precision of total inertia simulation.

While the UN/ECE Regulation No 83 (please see Annex 4 – Appendix 4) contains the procedure on verification of precision of total inertia simulation, the UN/ECE Regulations No 40 and No 47 contain the requirements for precision of inertia simulation, but without indication of a specific procedure of verification.

The procedure of verification of precision of total inertia simulation, given in the UN/ECE Regulation No 83, is clear (obvious) and is feasible at a chassis dynamometer in the course of vehicle testing under a standard driving cycle, on the basis of measured values of force and acceleration, as well as values of base (fixed mechanic) inertia, obtained for acceleration and deceleration regimes.

This procedure, based on existing capabilities of chassis dynamometers with electronic simulation of inertia, does not require any additional equipment, it is universally acknowledged; and its successful passage is a guarantee of the execution of the UN/ECE regulations' requirements for precision of inertia simulation by chassis dynamometer.

In our understanding, this procedure of verification not only may be applied, but arises preferable for confirmation of the equipment's (chassis dynamometer's) conformity for the UN/ECE Regulations No 40 and No 47 for precision of inertia simulation, and, possibly, it is the only legitimate procedure, namely the procedure of verification which guarantees fulfilment of the requirements.

Our first question: Please confirm (or disprove) the correctness of our interpretation of the above-mentioned UN/ECE regulations.

2. In our understanding, precision of simulation of inertia is a fundamental metrological requirement of the above-mentioned UN/ECE regulations. Simulated inertia is directly connected with emission values obtained in the course of vehicle tests. Fulfilment of requirement on precision of inertia simulation is mandatory for official (certification) tests of products and the following vehicle type approval.

The second question: Please confirm (or disprove) the correctness of our interpretation of the mentioned UN/ECE regulations regarding the requirements for precision of inertia simulation by chassis dynamometers.

3. Again, we would like to emphasize that given in the UN/ECE Regulation No 83 procedure of verification of simulated inertia may simply comprise of driving of automobile (or motorcycle, or moped) in standard driving cycle, with registration of measured values of acceleration and force, which is a very demonstrative and natural confirmation.

The third question: May, in the case of vehicle official approval, the results of tests of a vehicle (automobile or motorcycle, or moped) be recognized, if the tests are conducted at a chassis dynamometer which shows satisfactory precision of inertia simulation, in accordance with some alternative procedure of verification (for instance, proposed by the producer of the equipment and based on analysis of data on time of deceleration under free coast-down of the rollers, when a vehicle is not put there), but, at the same time, shows unsatisfactory results when passing the above-mentioned standard (and obvious) procedure of verification?

Please note that above mentioned and proposed by the one producer of the equipment «verification method», which based on analysis of data on time of deceleration under free coast-down of the rollers, when a vehicle is not put there, is not related to simulated inertia accuracy issue at all, as we can clear and unambiguously see from the last official explanation competent experts from respected TÜV-NORD organization dated of 20.04.2009.

4. The fourth question, please: what kind of legal and recognized by all parties of Geneva Agreement 1958 year verification procedure for precision of inertia simulation of UN/ECE Regulations No 40 and No 47 we must use on practice?

We will appreciate your answer and assistance in determination of the truth.