

Doc file Low T04-04

**ToR of the task force
Low and Realistic Winter temperature
(Meeting 9th January 2017 – Geneva)**

WLTP Phase 2

Reference Document WLTP-14-14e - Low & Realistic Winter Temperature Task Force

Mandate and Terms of Reference

The purpose of the low temperature test is to check the level of specific pollutant emissions, CO₂, and range of vehicles in conditions that may easily be encountered during the winter season.

Having asked the CP about the “the need to improve the current regulation” they have expressed a number of needs to be considered,

- GTR 15 could be used, as a basis for the work of this task force. However, items for discussion should be the low / realistic winter temperature, Cycle, vehicle category, measured parameters, limits.

- Concerns are the effects on air quality, the environment, health and customer information and customer protection. Some of them are considered critical whereas others should be referred for information.

- Harmonization is considered important. However, it is necessary for the task force to take advice on the operation of IWVTA.

1. BACKGROUND

Europe introduced in 1998 a type-approval test that allows to measure emissions at low temperatures from vehicles with positive-ignition engines. The Directive 98/69/EC of the European Parliament and of the Council¹ was a measure against air pollution by emissions from motor vehicles.

This test was carried out on vehicles with positive ignition engines (M1 and N1 Class I) on a chassis dynamometer at -7 ± 3 °C only over the Urban Driving Cycle (first part of the New European Driving Cycle, NEDC). The diluted exhaust gases are analysed for CO and HC. Road-load can be either determined at -7 C or adjusting the driving resistance for a 10% decrease of the coast-down time at 20°C.

Regulation (EC) 715/2007² and its amendment EC 692/2008³ brought some modifications, including the eligibility of vehicles with positive ignition engines (namely petrol hybrids, bi-fuel and flex-fuel), for the test, which is known as the Type 6 test from that moment.

Most of the content found in this last regulation (EC 692/2008) regarding Type 6 test is identical to what is present in the UNECE Regulation 83 / 2007.⁴

EC 692/2008³ includes the obligation of the manufactures to present the type-approval authority with information showing that the NO_x after-treatment device on diesel vehicles reaches a sufficiently high temperature for efficient operation within 400 seconds after a cold start at -7 °C and strategy of EGR systems used in diesel vehicles at low temperature.

Similar procedures to the Type 6 test are applied in the USA (CFR 1066 Subpart H)⁵ where the test is also performed at -7 ± 1.7 °C) and the determination of the road-load is done in the same way determined at -7 C or adjusting the driving resistance for a 10% decrease of the coast-down time), there are important differences as well.

In the USA the entire FTP testing procedure is used, while only the UDC is used in EU. The CFR 1066 procedure foresees the use of the vehicle's heater and defroster during the test, while the Type 6 test specifies that these auxiliaries should not be used. Moreover, in the USA otto-cycle and diesel vehicles must be tested at low temperature.

In 2016 a new piece of Legislation has also been drafted in China which will also come with some regulation regarding low Temperature.

Introduction

As far as conventional vehicles are concerned, **the test procedure should assess the impact of low temperature on emissions.**

In order to properly reflect the conditions that are encountered in real world winter conditions, the road load should be representative of the increased resistance to progress at low temperatures due to the higher air density and other factors (viscosity of transmission lubricant,...). A **proper procedure to define the road load and consequently the dyno settings should be developed if the approach currently used is demonstrated to be inadequate.**

Another element to be addressed is **whether the emissions should be measured during the whole WLTC cycle or on a reduced part of it.**

Moreover, low temperatures largely affect the range of electrified vehicles as a consequence of a reduced efficiency of the battery and also due to the additional energy consumption from auxiliaries (i.e. heating system). This aspect does not fall within the typical scope of the low temperature tests, especially due to the absence of exhaust emissions in the case of battery electric vehicles. However this is an important element for the **information to customers** whose choice at the moment of the purchase of an electrified vehicle can be heavily influenced by the available range.

[1] Directive 98/69/EC of the European Parliament and of the Council of 13 October 1998, “Relating to measures to be taken against air pollution by emissions from motor vehicles and amending Council Directive 70/220/EEC”. Off. J. Eur. Un., L0069, pp1-65.

[2] Regulation(EC) No 715/2007 of the European Parliament and of the Council on type-approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information. Off. J. Eur. Communities L171/1; 2007.

[3] Commission regulation (EC) No 692/2008 of 18 July 2008 implementing and amending regulation (EC) No 715/2007 of the European Parliament and of the Council on type-approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information. Off. J. Eur. Communities L199/1; 2008.

[4] US. EPA; <http://www.ecfr.gov/cgi-bin/text-idx?SID=ba447754d6f766672ab21e5aa4146283&mc=true&node=pt40.33.1066&rgn=div5#sp40.37.1066.h>

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2. MANDATE OF THE LOW and REALISTIC WINTER TEMPERATURE TASK FORCE

The low and realistic winter temperature Task Force shall:

- be open to all experts, stakeholders and CP representatives that have an interest in WLTP;
- be chaired by the European Commission;
- develop a harmonised low and realistic winter temperature test procedure (Type 6 test) for the assessment of the emissions (including CO₂), vehicle fuel consumption and electric range, at low and/or realistic winter temperature
- propose a harmonised procedure to assess the impact of low temperatures on the range of electric vehicles for proper information of the consumers;
- act as a platform for the exchange of information and contributions of stakeholders, to be discussed and agreed during the development process;
- report to the WLTP-IWG on the progress;
- Deliver technical advice and make recommendations to the WLTP-IWG on the document strategy, i.e. a new GTR or an annex of the GTR 15. Task Force will provide a draft text and will contribute to the drafting process.
- focus only on the technical issues regarding the procedure to be developed, while decisions are made at the WLTP-IWG level
- develop a proposal for the handling of families for low temperature requirements
- Low and realistic winter temperature task force will promote interaction and exchange of information with other IWG Groups, sub-group and task forces, in particular with WLTP-EV Sub-Group and PMP- IWG.

3. TERMS OF REFERENCE

The Task Force will work to define the temperature for the procedure in order to be representative of low and/or realistic winter temperatures.

- Define the driving cycle to be used for the procedure at low and/or realistic winter temperature and more specifically whether the whole WLTC cycle should be used or a reduced part of it.
- Define the procedure for the adjustment of the road load and consequently of the dyno settings.

The work may need specific studies or requests from the experts in the task force, specifically regarding a/ the procedure for assessing the pollutant emissions in conventional and electrified vehicles (LowTemp-Emis); b/ the procedure for assessing the impact of the low temperature test on the range of electrified vehicles (LowTemp-Range):

LowTemp-Emis

The scope is to develop a procedure to check specific emissions including CO₂. The specific objectives are the following:

- Define the procedure to measure the distance specific emissions of the following compounds: total HC, CH₄ and NMHC, CO, NO_x, CO₂ as well as PM and Particle Number, paying attention to the measurement procedures for those compounds not currently regulated at low temperatures.
- Define specific provisions for the low temperature procedure for diesel and hybrid vehicles where necessary.

LowTemp-Range

The scope is to develop a procedure to determine the impact on the range of electrified vehicles at low temperature. The specific objectives are the following:

- Assess whether the shortened procedure for PEV and OVC-HEV range measurement is appropriate at low temperatures or otherwise agree on a new procedure for range determination
- Develop a procedure to assess the impact of auxiliary systems (e.g. heating device,...) on the energy consumption and the range of electrified vehicles

To reach the scope of the task force the following is proposed which can be adapted to the specific purpose of each deliverable.

- Start with an analysis of the existing normative and literature on the method;
- Prepare a comparative analysis amongst the different regional procedures;
- Propose a way forward for the development of a harmonized procedure, including considerations on whether there is need for experimental activities and to what extent;
- Develop the harmonized method;
- Validate the method

4. TIMING

LowTemp-Emis & LowTemp-Range deliverables (to be agreed)