

LowT 2017- Minutes Face-to-face meeting

Date	December, 12&13 th (2017)
Title	Minutes of the 16 th face to face meeting- Low Temperature Task force
Document	LowT 16-02 - Draft MINUTES

The Chair (C. Astorga) welcomed the TF members, presented the agenda and briefly introduced the meeting: 16th f2f meeting [Zurich Dübendorf EMPA; December 12th (10:30h) to 13th (16:00h)]

Minutes from the latest phone conference were approved after a sort round of comments. (File loaded in CIRCA-BC; [2017_11_17- 15th TelCo meeting Minutes_v4-rev.docx](#))

Auxiliary system “on” was replaced by auxiliary device ‘on’ following the remark from M Bergman referring to the definition in GTR 15: 3.4.2. "Auxiliary devices" means energy consuming, converting, storing or supplying non-peripheral devices or systems which are installed in the vehicle for purposes other than the propulsion of the vehicle and are therefore not considered to be part of the powertrain.

Chair communicated that (with the expected approval from the GRPE) the TF will have 1 year extension. Then, 2018 is expected to be used to progress and developing the GTR and, if needed, validation phases. S. Dubuc together with the Chair (C. Astorga), G. D’Urbano (BAFU) and a short list of TF members will support the drafting process.

LowT TF meeting Tuesday 12th December

Main topics of this meeting was the information attended from Japan in relation to the “scope of how to use the test results” as well as the information from any other CP

Following the agenda, the meeting started with the contracting parties’ presentations Japan, Sweden, Switzerland and EC. Most of the time during the 1st day was dedicated to the test procedure and proposals as well as to discussions for harmonized temperature. Some time was also dedicated to GTR (start-up) and information to consumers (extended discussion on this topic took place during 2nd day).

Meeting started with a presentation of Inuoi-san and Japan clarified the position for the Low Temp TF and as a result of internal discussion, Japan decided to introduce the Low Temp Testing to regulate the emission, fuel consumption and range.

After sharing their position regarding the low temperature test procedure and the purpose of introducing it, Japan confirmed that is open to discuss to reach a harmonized temperature. JPN will also consider PN even if at the moment it isn’t regulated in Japan.

(Presentation available in CIRCA data base)

<https://circabc.europa.eu/faces/jsp/extension/wai/dialog/content/add-content.jsp>

Immediately after this information was released, C. Astorga, communicated to the members of TF that DG CLIMA had addressed to her, as Chair of this TF, the following information:

“From a consumer information perspective, DG CLIMA supports work at UNECE level to develop technical procedures for a low temperature test that covers electric range for electrified powertrains (PHEVs) and pure electric vehicles as well as CO2 emissions.

Specific feedback on type of information that would be necessary will be provided asap and only after more scientific based information on how cold temperature influences these values will be available [Mail CLIMA 8th of December (cc DG GROW)] (Mail from Grow on the 8th of Dec and cc to DG GROW)

DG GROW has also ratified its position, which was sustained during the previous meeting of the TF in September:

DG GROW, in response to the Question of the Chair of the Low and Realistic winter temperature Task Force, has provide inputs regarding a series of elements that should help shape the new procedure for testing vehicles at low temperatures, which in Europe shall replace the existing one still based on NEDC: “In the past months DG GROW has already provided you with several inputs, like the need to include the diesel vehicles in the scope of the Low-T test, the addition of other pollutants (ex. NOx and PN)”.

DG GROW would like now to complete the description of their position on this matter. It is necessary to distinguish the issue of regulated pollutants from the one covering CO2, fuel consumption and electrical range.

Concerning regulated pollutants (THC, NOx, CO, PM-PN), in addition to what DG GROW have already stated in the past months, we clarify here that we don't have any element to modify the test temperature of -7 °C.

Switzerland (represented by G. D'Urbano) supported the position of the EC as well as Sweden (represented by Per Ohlund).

Sweden presentation: (P.Ohlund) It was indicated that 1/3 of the population of Sweden is well below zero degrees during winter and that several areas suffer from pollution episodes. Sweden highlighted that CO₂ emissions and FC are important and must be provided for customer information.

OICA (B. Coleman) requested to send feedback to DG-GROW indicating that GROW's position on temperature could compromise harmonization process.

Once the CP expressed their intention on those principal topics, the TF started the discussions for a low T procedure, without further comment to the temperature harmonization which is being discussed bilaterally among CP (namely Japan and EC). The structure of the meeting was as following:

1st part - Discussion for a proposal for ICE test procedure (introduction of the GTR drafting coordinator and process: star-up)

2nd part - Discussion for a proposal for a test procedure for hybrid vehicles & emissions

3rd part - Discussion for a proposal for a procedure for hybrids and Electric vehicles

4th part – Discussions on new Test procedure: Information to the customers?

1st part - discussions on new Test procedure: Proposal for LD “pure ICE” vehicles test:

Chair presented this first part of the discussion on the test procedure for internal combustion engine as the main topic to be agreed during this meeting in order to allow starting the work of the drafting coordinator on this first part of the new GTR. The proposal presented by Chair to the TF was as follow [*]

[*] Notice that the process and test procedure will be adjusted to the final decision on the harmonized temperature still under discussion (CPs) and also depending of the final T harmonise and agree) the group,

ICE TEST for LDV Type approval at low Temperature (sub-zero).

A Test for LD vehicles under cold weather conditions, meaning temperature below zero (sub-zero). (Hereby: T = **-X °C**).

This test should be done for

- All “pure ICE” (Technology independent and fuel independent)
- Type 1 test of WLTP (see GTR 15) at **-X °C**
- all pollutants need to be referred (same as for Type 1)
- Preconditioning & soaking (force cooling?)
- Cold start
- Auxiliary devices “on” (heating on, others?)
- R/L determination at **-X °C** or 10% (?) reduction of coast-down time
- Gear shift calculations (adaptation)
- Fuels
- Cycle? Need to revise? If only need of harmonization and scientific basis that justify that last part not to be necessary?
- Hardware and instrumentation of the test

OICA suggested if it could be taken into consideration to harmonize cycle using the same approach that JPN (i.e., 3 phases) to reduce the burden.

JRC questioned the burden link to measure the extra-high phase as well. OICA indicated that at least in the case of OVC-HEV it would be helpful.

It was pointed out that the group will need to define which auxiliary devices will need to be taken into consideration as well as to describe the procedure to activate them.

T. Butler (EMPA) presented “Emission behaviour in WLTC at low ambient temperatures of light commercial vehicles”, where he showed how cold ambient temperatures negatively affect emissions from a series of Euro 6b diesel vehicles from this category. While CO and THC were mainly increased at cold temperature during the first and second phases of the WLTC, CO₂ and NO_x were higher at cold temperature during the whole cycle. EMPA pointed out that: i) CO and THC from light commercial vehicle behave similar to Euro 6b passenger cars even though vehicle weight is higher for the former; ii) the studied vehicle resulted in higher NO_x emissions due to higher engine load at 23°C but similar behaviour to Euro 6b passenger cars at -7°C; iii) PM levels measured were slightly higher compared to passenger cars.

EMPA recommended for these vehicles to use: a) the same -7° procedure as passenger cars and b) payload setting like 23°C test (+28%)

R. Suarez- Bertoa (JRC) shared a summary of the information regarding pure ICE and NOVC-HEV emissions presented in previous meetings as well as the request from DG-GROW and DG-ENV for the cold temperature test procedure for these vehicles.

LowT TF agreed on this proposal as a starting point of the discussion of the procedure on 12th December 2017 (16th f2f meeting)

Drafting of new LowT GTR

Once the proposal was accepted by the members of the TF the chair proceeded to introduce the new group for drafting of the LowT GTR: Mr S. Dubuc as drafting coordinator and a short list of members of the TF that will accompanied the work.

G. D'Urbano (Swiss Federal Office for environment) did an introduction on the scope of this drafting process and announce that the Swiss Federal Office for environment will guarantee the presence of the drafting coordination for another year (for more information see presentation in CIRCA)

In preparation this new GTR on Low Temp Mr Dubuc anticipated to the TF a list of 5 files for further discussion: Two are the official low temperature test texts from EPA (CFR-2014...1066.710.pdf) and the UNECE's Annex 8 of Reg. 83 (04.02.2015 R083r5e.pdf).

Two more files are tabular representations of those regulations (Structure of Annex 8 UNECE R 83.docx and Structure of 1066.710.docx). The last file (Items to be taken into consideration.docx) is a general and not all-encompassing list of items which we can use as a working guide in getting started on writing a GTR.

All these documents were discussed and accepted for further work by the drafting group. All documents can be found in CIRCA BC database

Serge Dubuc presented a comprehensive list of items that will need to be discussed and taken into consideration for the new GTR.

OICA suggested that we could try to work at an early stage to produce a document that could then be easily used for the Transposition to 58-agreement.

JPN pointed out that the use of R/L values calculated using the winter tunnel approach needs to be reconsidered.

The question regarding the GTR or Annex came up again.

It was agreed that TF members, led by S. Dubuc, could start working on the elaboration of the GTR section regarding "pure ICE".

Fuels

A short summary regarding winter fuels was provided. It was agreed that reference fuels should include Petrol E10 and Diesel with a cloud point of -10 C.

Japan will provide feedback on which characteristic should be needed.

2nd part / Discussions on new Test procedure: Presentation of a proposal for a valid test for hybrid vehicles (OVC-HEVs) and emissions ALL OVC-HEVs

Chair of the TF introduced the following points for discussion

- Test could follow Type 1 test of WLTP (see GTR 15)
- *CS & CD tests should be necessary to fully address OVC-HEV emissions*
- COLD START
- Preconditioning (same time and method as pure ICE?) of the vehicle, soaking T and time?? *Heating, lights?, defrosting?(Others?)system* or any other auxiliary device necessary under cold T conditions: "ON" (US 1066 - set control max... etc). List of devices that may have an influence on the range of the vehicle and/ safety)

No particular opposition was shown by the members of the TF. The following comments were collected and will be taken into consideration for further discussion and progress.

1. Jama; Request for time & data collection (March?)
2. Different time of soaking for ICE and EV OVC-HEVs?
3. Worst case scenario? Preconditions: reasonable and representative of real world conditions?
4. EV to give input to GTR Drafting coordinator directly and GTR
5. Soaking time? Definitions and time (is charging part of soaking)

3rd part: Discussions on new Test procedure: proposal for a test (or procedure?) for Electric vehicles

Chair stated that this discussion should be focused on a Test at low sub-zero T (**-X °C**) (See GTR 15):

A Type 1 – short procedure- test should be necessary

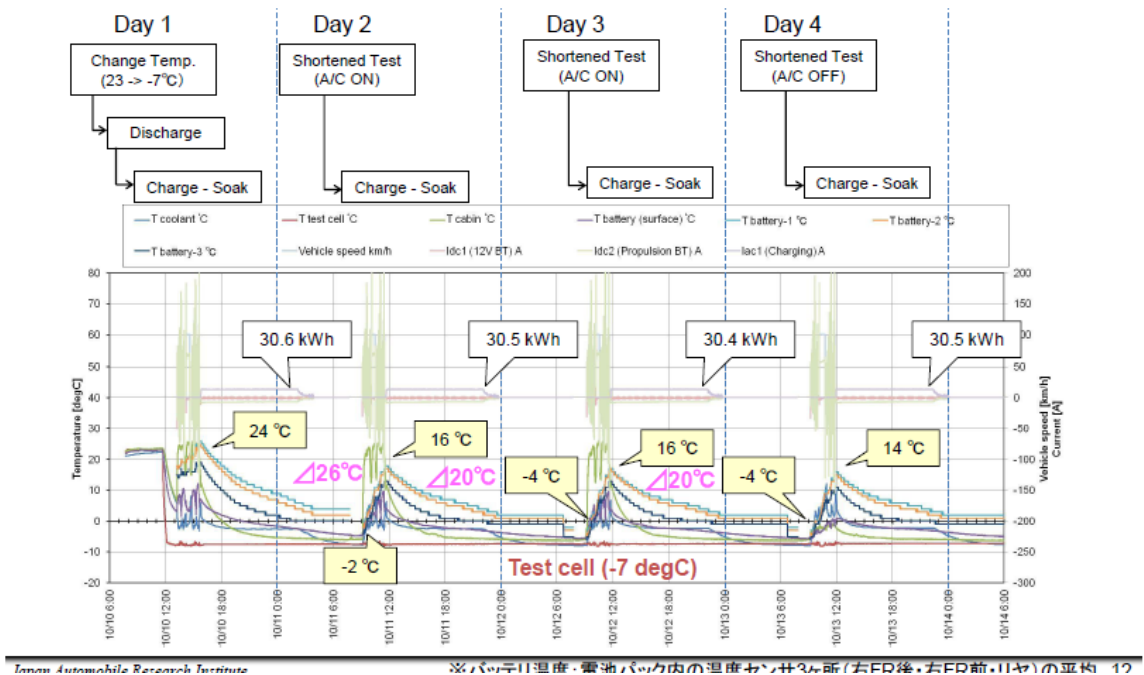
Chair expressed that unless an alternative method could be demonstrated in time and validated before the dead line of delivery of the work of this TF and including the one year of prolongation of the work, if granted by GRPE.

Japan proposal: Shorten cycle but always test needed. Open for discussion

EV Group does not have any alternative proposal for an empiric alternative method at the moment.

GTR 15 and corresponding annexes 8 will be the reference for drafting coordinator.

Haniu-san (JARI) showed the JAMA data from -7°C test for PEV. The vehicle was soaked in -7°C room for 17 hours with charge. This PEV has not REESS heating when charging at -7°C. The REESS temperature started from 24°C and dropped to -2°C. The charge was ended after 11 hours. Japan is planning to do test on another PEV.



T. Butler (EMPA) presented “Effect of fast charging on the efficiency of energy storage system and on-going research” where he described the effects of fast charging on BEV. It was shown: i) charging efficiency related to different technologies used in the vehicles; ii) the energy demand along the WLTC at different ambient temperatures and iii) the influence of the thermal management of the battery on the overall energy consumption. He also shared information regarding energy demand due to auxiliaries (ÖVK, Batterieelektrische Fahrzeuge in der Praxis, 2012). Finally, preliminary results of fuel consumption of a fuel cell vehicle studied at different ambient temperatures at EMPA were presented.

Summary of the Different aspects discussed about the Proposal for a test procedure for hybrid vehicles & emissions:

Japan requires a test for emissions, range and energy consumption. They suggest that a shorten procedure could be used for PEV and that they are open to discuss other approaches for PEV.

It was shared that a Type-1 like procedure will also be needed to address emissions from OVC-HEV (CD+CS). The question on the harmonization of the cycle applies here.

Several questions regarding vehicle precondition and soaking were raised. These questions will need to be addressed by the TF in the upcoming meetings.

Valeo and several other TF members pointed out the need of a procedure that is representative (realistic) and that will not impair the development of new technologies.

At the time being Japan and JAMA are working on measuring the time needed by the battery to cool down to ambient (sub-zero) temperature after being charged. That information will be share with the group during the next f2f meeting. This information will help defining the soaking time needed before the test needs to start.

Energy consumption of a battery (or vehicle) while exposed to sub-zero temperature was asked. No information was shared on this regard. In early march JPN expect to share the slides of the impact of the temperature on the stabilization of the battery temperature and the energy stored in the battery over time at cold temperature.

JPN raised the question of where the discussion regarding the test procedure of electrified vehicles should take place, within the Low T TF or the EV-subgroup. The Chair indicated that, as stated in previous occasions, these issues should be discussed within the TF with input from the EV-SG.

Drafting coordinator, S. Dubuc, will gather the needed information for OVC-HEV and PEV from Annex 8 of GTR-15 to start working in the Low T GTR.

4th part – Discussions on new Test procedure: Information to the customers?

Chair presented the working hypothesis for this last part of the meeting:

Considering that there is variable effect of low temperature in the **electric range, and consequently also in the autonomy of the vehicle running with the electrical engine when temperature is sub-zero**. In that case, and if hypothesis is proven to be valid, it should be quite logical to provide related information to consumer:

For practical purposes and safe use of the car during extreme winter conditions, customer should have information about the performance and autonomy of the vehicle under those conditions

What kind of information should be useful (and necessary?) for the consumers?

Some examples can be seen below:

- Proper information about the autonomy of the car running with battery under low sub-zero $T = -X^{\circ}\text{C}$ (Similar to number of km that a consumer knows to be able to run with the fuel available)
- How long will take the car to have completely depleted battery charge if driving at that the defined sub-zero temperature $T = -X^{\circ}\text{C}$?
- Energy consumption during Soaking at $T = -X^{\circ}\text{C}$?
- Information needed: Soaking time and % of reduction of state of charge of the battery when exposed to low sub-zero $T = -X^{\circ}\text{C}$
- % of reduction of the battery capacity after 8h? 12 h? of soaking at $T = -X^{\circ}\text{C}$ (does this hypothesis eliminates the possibility of force cooling ??)
- How long would need the car to fully recharge the battery at $T = -X^{\circ}\text{C}$; Stabilization time?
- Should be also needed the information on recharging capacity at low temperature? meaning how long would take the battery to be fully charged at $-X^{\circ}\text{C}$

This topic remain open under the light of the information submitted by DG CLIMA and in attendance for further comments coming from the other contracting parties

AoB

Next meeting will be close to the next WLTP meeting in Ispra

Telco will be announced.

All documents and presentations corresponding to this 16th LowT meeting can be found in CIRCA-BC under:

[Library](#) > [WLTP](#) > [UNECE-WLTP](#) > [Low and realistic winter temperature TF](#) > [Icon of the selected element LowT TF 16th meeting Dec 12&13-2017](#)

Low Temp Task force: 16th face-to-face meeting

Low Temp Task force Agenda	
Date	December 2017 Tuesday 12 th & Wednesday 13 th
Informal Document	Agenda doc Low Temp TF 2017-16-01 (Doc TF LowT 16-01)
Room link	https://ecwacs.webex.com/meet/mastorga-llorens

Face-to-face meeting- 12th December; EMPA Zurich

Time	Agenda item	Lead/ contributions	Working Document
10:30	Welcome and introduction Presentation of Agenda Minutes of the last Telco (17 th November). Lecture and approval	Coordinator / All	Agenda TF LowT 16-01 <i>(doc attached mail 6th Dec)</i> Minutes TF LowT 15-02 <i>(doc attached mail 20th Nov)</i>
10:45	Japan presentation Other CP communications EC ; Switzerland; others? Sweden position	Representatives of the CPs P. Öhlund	
11:30	Proposal for ICE test procedure: short introduction followed by discussion	Coordinator / All	
	JRC summary	Suarez Bertoa (JRC)	
	Sort insight in a measurement campaign on Light Commercial Vehicles and cold start measurements at -7°C	Thomas Btler (EMPA)	
	on-going research and activities: an overview	Thomas (EMPA)	
12:30	Lunch break		

14:00	Visit to EMPA labs: Future Mobility Demonstrator „move“ (Hydrogen/Methane-Fuelling-Station)	Thomas (EMPA)	
14:30	GTR 1 st part: ICE LowT drafting: How to start? Structure & proposal	G. D'Urbano BAFU (CH) S. Dubuc	
16:00	Coffee break		
17:00	Fuels: update	Suarez Bertoa (JRC)	
17:30	End of the meeting		
18:00	Social dinner (Air plane museum in Dübendorf)		

Face-to-face meeting- 13th December; EMPA Zurich

Time	Agenda item	Lead/ contributions	Working Document
9:30	Proposal for a test procedure for hybrid vehicles & emissions: short introduction and discussion	Coordinator/ All	
	JRC summary	Suarez Bertoa (JRC)	
10:00	GTR 2nd part: hybrid vehicles & emissions LowT drafting: How to start? Structure discussion	G. D'Urbano BAFU (CH) & S. Dubuc	
11:00	Coffee break		
11:30	Effect of fast charging on the efficiency of energy storage system (on-going research)	Thomas Bütler (EMPA)	
	Proposal for a procedure for hybrids and Electric vehicles: short introduction and discussion GTR 3 rd part: EV procedure at LowT drafting: How to start? Structure discussion	Coordinator / All	
	Information to customers "Hybrids and electrical range: information to customers	Coordinator / All	
	Next meetings and TelCo		
13:00	Lunch break & End of the meeting		