

WLTP-E-Lab Sub Group Progress report

WLTP-DTP-E-LabProc-028

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Meeting (after 61th GRPE)

- 5th meeting:

Date: 27.1.2011

Location: Phone conference

Topics: GTR structure/Definition

- 6th meeting:

Date: 23-24.2.2011

Location: Brussels

Topics: GTR structure/Definition/CD&CS
test / Calculation

Meeting (after 61th GRPE)

- 7th meeting:

Date:1.4.2011

Location: Phone conference

Topics:CD&CS test /Calculation

Discussed based on ACEA proposal

- 8th meeting:

Date:12.4.2011

Location: Zurich

Topics: Open issues/Schedule

- 9th meeting will be held 9th May by phone.
- 10th meeting will be held 1st June by phone.

Current Regulation

R	Annex	
101	7	Electric Energy Consumption 1. Test Sequence 2. Test Method 2.1. Principle 2.2. Papa. 2.3. Vehicle 2.4. Operation mode appendix. R/L
101	8	CO2/Fuel Consumption 1. Introduction 2. Cate. of Vehicle 3. OVC w/o mode switch 4. OVC w/ mode switch 5. NOVC w/o mode switch 6. NOVC w/ mode switch appendix 1. SOC profile appendix 2. SOC compensation
101	9	Electric Range 1. Electric Range 2. Para. 3. Test conditions 4. Operation mode
83	14	Emission 1. Introduction 2. Cate. Of Vehicle 3. Type I 3.1. OVC w/o mode switch 3.2. OVC w/ mode switch 3.3. NOVC w/o mode switch 3.4. NOVC w/ mode switch IDLE 4. Type II CRANKCASE 5. Type III EVAPO 6. Type IV DURABILITY 7. Type V COLD 8. Type VI appendix. SOC profile

Proposed gtr Structure

Annex		will be discussed on
X	Type I combine emission/CO2/fuel&energy consumption/electric range test procedure to ONE gtr 1. Introduction new 2. Definitions / Terminologies related electrified vehicles only base document : WLTP-DTP-E-LabProc-011_ACEA proposal bis_Definition_10 3. Categories of Vehicles new and required test matrix -> refer sheet "3. test matrix" 4. Test Equipment and Accurç-> refer sheet "4. test equipment" 5. Preparation of Vehicles 5.1. Vehicle weight : follow the procedure defined in ICE group 5.2. Vehicle running-in : follow the procedure defined in ICE group PEV : 300km ? consider to define unique running-in for multiple power sources 6. Test Sequence 6.1. CD Test applicable to PEV and OVC HEV 6.2. CS Test applicable to OVC HEV and NOVC HEV 6.3. Electric Range test PEV : consider "within 7days requirement" 7. Calculation 7.1. Emissions 7.2. CO2/Fuel Consumption/GHG 7.3. Electric Energy Consumption 7.4 E Range (to add) appendix 1. SOC profile appendix 2. SOC compensation base document : R101/Annex8/Appendix 2 (including the specific test procedure and factor calculation) new appendix 3. Utility Factor	end of May 27 Jan.2011 23/24 Feb 2011 end of April end of April end of March 23/24 Feb.2011 23/24 Feb.2011 23/24 Feb.2011 23/24 Feb.2011 23/24 Feb.2011 27 Jan. 2011 end of May
X+1	Type II delete ?	
X+2	Type III delete ?	
X+3	Type IV TBD	
X+4	Type V	Phase II
X+5	Type VI	Phase II
X+6	Type ? (high altitude)	Phase II

Open issue list1

	tech/polit/overlap	A/P/OI	Item	Issue	Action	Vehicle	Date of discussion
1	tec	OI	Utility factor	The us and jp regulation has methods which include statistical analysis. (EU:25km)	These methods will be considered.	PHEV	September
2	tec	A	Energy consumption test condition	"Battery temperature requirements" : What does it mean ? --> "T°C of the test" ? need to precise this wording	Follow recommendation from ICE group regarding ambient temperature, in phase 1 only normal ambient temperature and in phase 2 consider cold ambient temperature.	EV	agreed
3	tec/Overlap	OI	Road load	* Issue for vehicle with no mechanical neutral gear * consider the charging/recharging electrical energy during deceleration : to guaranty the same behavior on the "road" and on the chassis dyno	Follow recommendations from ICE group except in cases where there are differences for example no mechanical neutral gear. Agreed to consider minimum requirement. This will make flexibility for future technical development and prevent judgment variation by contracting	ALL	9.5.2011
3 bis	tec/Overlap	OI	Road load	Coast Down Mode : there is a need for a coast down mode and where there are special requirement for electrified vehicles this will be addressed by the Elab subgroup.	To be discussed (see T&E proposal)	ALL	9.5.2011
4	tec/Overlap	OI	Weighting factor	The vehicles which have difficulty to follow the prescribed cycle. (like as electrified vehicles for only urban)	follow development in the DHC group. Vehicles that will have problem following the driving cycle will be considered by the DHC group.	ALL	after DHC completed
5	tec	A	Emission worst test : to merge row 5 and row 29	General opinion to avoid to large number of tests. Only Japanese regulation has worst emission test for CD mode.	out of GTR scope Japanese worst emission test is out of gtr scope.. Same with No29	PHEV	agreed
6	tec	OI	Run in mileage	Run in mileage for test	300km or more		1.6.2011
7	tec	OI for EV and for PHEV	Charging condition	to not regulate the possibility to soak outdoor. (proposed by Jp) ; Remark: actually maybe still an OI for PHEV (electric range impact) as well. Please to explain which country(ies) has (have) a problem to perform the charge of the charging method	It could be a safety issue for by some contracting parties if we do not allow charging outdoor.	PHEV/EV	1.6.2011
8	tec	A	Charging method	Soak time:12 hr or more, less than 36hr.Charging time: Stop with full charged. 4.5.	manufacture's recommended	PHEV/EV	agreed
9	tec	A- P	Charging time	The Lab-process group has decided to have 2 alternatives for the soak time: Alt 1: This conditioning shall be carried out for at least six hours and continue until the engine oil temperature and coolant, if any, are within ±2 K of the set point temperature of the room. At the request of the manufacturer, forced cooling down could be used with open bonnet, appropriate use of cooling fan. Alt.2: This conditioning shall be carried out at least 12 hours and maximum 36 hours, with closed bonnet in soak area environment without using a fan. So, before the test CD test for EV and OVC HEV, we propose to keep the choose between both options during the soak time with specific provision for the charge of the battery	Upper limit for charging time is 36 hr. To be discussed	PHEV/EV	1.6.2011

Open issue list2

	tech/polit /overlap	A/P/OI	Item	Issue	Action	Vehicle	Date of discussion
10	tec	OI P	criteria for end of charging	which is the criteria "plug-off" : indication of charging completed from the vehicle and starting within 1 hour from plug off test procedure shall be applied (ACEA proposal)	Still an open issue. See ACEA proposal	EV/PHEV	1.6.2011
10 bis		New OI	criteria for end of charging	see § End of charge criteria : to find a consensus on the "same conditions" before and after the test.	All Charging length : losses issue to deal with as far as energy consumption calculation is concerned. Do we have to take into account such losses in the procedure ? The purpose of such a discussion is to avoid double counting	EV/PHEV	9.5.2011
11	tec	P and OI	Interruption condition	Less than 3 minutes interruption is possible for every one cycle. During interruption, main power may be OFF.	still an open issue. Needs the driving cycle from DHC.	EV/PHEV	end of May
12	tec	OI	test termination condition	Test termination condition for range measurement	ACEA will make a proposal.	EV/PHEV	9.5.2011
13	tec	A	Stop condition	Proposed stop condition :Accel Off ,and press braking pedal when 5 km/h or lower to stop.	agreement	EV	agreed
13 bis	tec/overlap	OI	deceleration condition	ACEA proposal: to enable OEMs to fully take advantage of regenerative braking potentials, it should be allowed to disengage the clutch at deceleration periods. There may also be conventional ICE vehicle concepts with very long axle ratios where such an disengagement of the clutch would avoid problems of stalling	To be discussed	ALL	9.5.2011
14	tec	A	Initial Discharge condition	Initial Discharge condition before test: Discharge until manufacture's recommended level	agreement on the proposal and a wish that this should be optional and not a requirement. And also to add temperature condition for the discharge driving (?? To check this requirement ---> A priori, the T°C should be the same as the	EV	1.6.2011
15	tec	OI	Watt-hour meter measurement accuracy	US and JP: +/-2% EU: +/-0.2%	To be discussed	EV/PHEV	9.5.2011
16	tec	OI	Accuracy of	JP: +/-1% F.S. EU: +/- 0.5%	To be discussed	EV/PHEV	9.5.2011
17	tec	OI	LOD of ammeter	JP:0.0001Ah (<=50A) 0.001Ah(>50A) EU:Regulation 0.3%	To be discussed	EV/PHEV	9.5.2011
18	tec	P	RCB(SOC)	Definition;Rename " SOC" to "RCB". RESS (Rechargeable energy storage system) ECB (RESS Charge Balance)	To be discussed	ALL	agreed

Open issue list3

	tech/polit /overlap	A/P/OI	Item	Issue	Action	Vehicle	Date of discussion
19	tec	A	RCB(SOC)	For CS mode, it could be necessary to compensate the CO2/fuel consumption based on SOC balance RCB to obtain correct value. (for CD mode, no need to compensate).	Need results about the driving cycle from the DHC group to continue the discussion. Same with No26	PHEV	agreed
20	tec	OI	CD test	calculation method for CD test (fuel	To be discussed	PHEV	beginning of July
21	tec	OI	EAER determination : CO2 compensation for range test	Separation point of CD mode and CS mode in one cycle is agreed but the method on how is still an open issue.	To be discussed	PHEV	beginning of July
22	tec	P	Electric range : Shorten the test procedure	Current requirement (full charge to empty) is basic procedure. As an option, need to adapt the shorten procedure to reduce testing burden (i. e. SAE J1634)	To be discussed	EV/PHEV	beginning of July
24	Overlap with ICE	OI	Ambient Air Correction	Open issue from ICE group. Intake air emission should be subtracted from tail	To be considered. Follow ICE group.	ALL	follow ICE
25	Tec	OI	For detection of CS condition : RCB break off criteria	Japan proposal:SAE J1711 : NEC* (as % of Fuel consumption) ACEA proposal : absolute NEC* as a % of cycle energy demand * NEC = Net Energy Change = RCB x nominal voltage of BESS	To be discussed in next phone meeting and F to F meeting in Zurich	PHEV	beginning of July
25 bis	New tec	OI	For detection of CS condition : RCB break off criteria	Wh ----> new O.I. to be discussed with EC / JRC, other experts to find an acceptable way to measure in safety conditions or to pick-up the voltage information from the can ? If the absolute NEC is not measurable for safety reason and the CAN solution not accepted, we will have to finde an alternative proposal	To be discussed	PHEV	beginning of July
26	New tec	A	RCB correction	JAMA and ACEA agree to only correct CO2 and fuel consumption. No relevance for pollutant emissions because no relationship between RCB and pollutant emisison	Tests related to CO2 correction factor elaboration are used to show that pollutant emissions comply with the limit values and no relationship with RCB. So, it means that specific tests should not be required for certification test. The non relationship between RCB and pollutants emission can be showed with manufacturers internal data associated to the	NOVC HEV and PHEV in CS test	beginning of July

These open Issues will be discussed according to E-Lab group schedule.

Open issue list4

	tech/polit /overlap	A/P/OI	Item	Issue	Action	Vehicle	Date of discussion
26 bis	New tec	OI	RCB correction	Need for a clarification regarding statement from ACEA and JAMA. Both agrees that there is no need for pollutants emission correction unless there is evidence for a correction. Remark from ACEA there is the Matador study that could give clarity for the need of a correction. Japan is of the opinion that since there is correction for CO2 there is no extra burden for the manufacturer and that correction for critical emissions could be applied. Comment from Japan, additional pollutants will be regulated in the WLTP process. The Japanese government will require to show to influence of different RCB.	Need of pollutants emisison correction if evidence to be discussed for final clear position. Especially, if there is relationship between RCB and pollutants emissions but in any cases the pollutants emission comply with the limit value : should we need to correct as well ? (Zurich)	NOVC HEV and PHEV in CS test	beginning of July
27	tec	OI	RCB correction criteria (window definition) CO2-related	ACEA proposed a tolerance a window (% of fuel energy) in which there is no RCB correction. Japan does not agree. But JAMA coul agree with ACEA as per a reasonable window definition.	ACEA will make a proposal until 18th March : RCB window without correction needed; in case of exceeding the 1% (of fuelenergy used) a correction calculation is required.	NOV HEV and PHEV in CS test	beginning of July
28	tec	A	CS test achievement : energy efficiency	Only Japanese regulation: If necessary, to confi	Japan will confirm the necessity and reason. Japan agreed to delete this criteria.	PHEV	agreed
30	tec	OI	Calculation of electric consumption of CD range	Japan proposal: to be calculated by EAER ACEA proposal: to be calculated by RCDA (or Rcdc : to be checked)	ACEA/JAPAN will provide the concrete calculation sample, then discuss its advantage/disadvantage	PHEV	beginning of July
31	tec	OI	AER City	There is an interest for EV and OVC HEV with low power engine and even with full capable engine to consider such an electric range like AER city (which means low speed part(s) of the WLTC). As far as NOVC HEV are concerned, we have to consider the interest to get this pure electric driving information with	To discuss with all together and especially along with the european Commission.	EV/OVC HEV	beginning of July
32	tec	P	performance info.	additional performance item(s) may be necessary	EC ask JRC? for study	EV/PHEV	September
33	tec/overla	OI	gear box/multi modes	See ICE group proposal according to the presence or not of a default mode : number of tests to perform for pollutants emissions and CO2/fuel consumption ..	To check if it is transposable to electrified vehicles ? To be discussed	All	1.6.2011
34	tec	A	CD test : pollutants emissions compliance	Discussion about requirement on emissions during CD test. The Japanese legislation require emissions compliance during CD test and the manufacturer is to provide documentation that for different initial SOC there is also compliance with emission standards. ACEA is of the opinion that the GTR requires emissions compliance during all conditions and therefore additional test is not required.	Final decision of the group confirmed on 31/03/2011 : agreement to remove such requirement (additional tests) from the GTR and to let it only at the regional request that is to say at the Japanese government request if needed.	PHEV	September

Proposal for on OVC Hybrids at WLTP / Charge Depleting Test

Overview, methodology for determination of different ranges, fuel and electric energy consumptions and emissions:

Step2 Charge Depleting Mode



