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Report of the Working Party on Pollution and Energy (GRPE) on its seventy-seventh session

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I. Attendance

1. The Working Party on Pollution and Energy (GRPE) held its seventy-seventh session from 6 to 8 June 2018, with Mr. A. Rijnders (Netherlands) as Chair. Experts from the following countries participated in the work following Rule 1(a) of the Rules of Procedure of the World Forum for Harmonization of Vehicle Regulations (WP.29) (TRANS/WP.29/690, as amended): Austria, Canada, China, Czech Republic, France, Germany, Hungary, India, Italy, Japan, Netherlands, Norway, Poland, Republic of Korea (Korea), Romania, Russian Federation, San Marino, Spain, Sweden, Switzerland, United Kingdom of Great Britain and Northern Ireland (UK) and the United States of America (USA). Experts from the European Commission (EC) also participated. Experts from the following non-governmental organizations took part in the session: Association for Emissions Control by Catalyst (AECC), European Liquefied Petroleum Gas Association (AEGPL), International Motor Vehicle Inspection Committee (CITA), European Association of Automobile Suppliers (CLEPA/MEMA/JAPIA), European Garage Equipment Association (EGEA), European Tyre & Rubber Manufacturers Association (ETRMA), European Association of Internal Combustion Engine Manufacturers (EUROMOT), International Automobile Federation International Automobile Federation (FIA), International Association for Natural Gas Vehicles (IANGV/NGV Global), International Council on Clean Transportation (ICCT), International Motorcycle Manufacturers Association (IMMA) and International Organization of Motor Vehicle Manufacturers (OICA).

II. Adoption of the agenda (agenda item 1)

Documentation: ECE/TRANS/WP.29/GRPE/2018/11
Informal documents GRPE-77-01, GRPE-77-04 and
GRPE-77-13-Rev.2

2. GRPE adopted the provisional agenda prepared for the seventy-seventh session (ECE/TRANS/WP.29/GRPE/2018/11), as updated and consolidated in GRPE-77-13-Rev.2, including the informal documents tabled for the session that were submitted by 7 June 2018. GRPE took note of GRPE-77-01 on the organization of GRPE Informal Working Group (IWG) meetings held during the week.

3. The informal documents distributed before and during the GRPE session are listed in Annex I. Annex II lists the informal meetings held in conjunction with the GRPE session. Annex III lists the IWGs of GRPE, task forces and subgroups, giving details on their Chairs, Secretaries and the end of mandates.

4. The secretariat introduced GRPE-77-04, announcing that the next GRPE session would take place on 8-11 January 2019 and recalling the corresponding deadline (16 October 2018) for the submission of official documents. The Chairs and Secretaries of IWGs were invited to approach the secretariat to define the calendar of IWGs meetings for the January 2019 GRPE session.

5. The Chair of GRPE introduced the new GRPE secretary, M. F. Cuenot. He thanked Mr. F. Guichard for having temporarily assumed the role of Secretary of GRPE and for the assistance he would still be providing during this session of GRPE and the next of January 2019.

III. Report on the last session of the World Forum for Harmonization of Vehicle Regulations (WP.29) (agenda item 2)

Documentation: ECE/TRANS/WP.29/1137
Informal document GRPE-77-10

6. The secretariat introduced GRPE-77-10 and reported on relevant items discussed during the 174th sessions of the World Forum for Harmonization of Vehicle Regulations (WP.29). The Secretary referred to ECE/TRANS/WP.29/1137 for further details.

IV. Light vehicles (agenda item 3)

A. UN Regulations Nos. 68 (Measurement of the maximum speed, including electric vehicles), 83 (Emissions of M₁ and N₁ vehicles), 101 (CO₂ emissions/fuel consumption) and 103 (Replacement pollution control devices)

Documentation: ECE/TRANS/WP.29/GRPE/2018/13
ECE/TRANS/WP.29/GRPE/2018/14
ECE/TRANS/WP.29/GRPE/2018/15
ECE/TRANS/WP.29/GRPE/2018/16
ECE/TRANS/WP.29/GRPE/2018/17
ECE/TRANS/WP.29/GRPE/2018/18
ECE/TRANS/WP.29/GRPE/76 Annex IV
ECE/TRANS/WP.29/2018/48/Add.1
ECE/TRANS/WP.29/2018/49/Add.1
Informal documents GRPE-77-02, GRPE-77-03, GRPE-77-05,
GRPE-77-11, GRPE-77-31

7. The expert from OICA introduced ECE/TRANS/WP.29/GRPE/2018/13 clarifying the basis of the petrol tank capacity restriction for mono fuel gas vehicles. GRPE adopted the proposal.

8. The expert from OICA introduced ECE/TRANS/WP.29/GRPE/2018/14 and ECE/TRANS/WP.29/GRPE/2018/16 aimed at clarifying provisions on mode selection when measuring emissions from OVC-HEV and bi-fuel gas vehicles. The expert from the Netherlands proposed amendments (GRPE-77-02 and GRPE-77-03) to ECE/TRANS/WP.29/GRPE/2018/14 and ECE/TRANS/WP.29/GRPE/2018/16 respectively. The experts from France and Sweden supported the proposals from the expert from The Netherlands. GRPE adopted the proposals as reproduced in Annexes IV and V respectively.

9. The expert from OICA introduced ECE/TRANS/WP.29/GRPE/2018/15 and ECE/TRANS/WP.29/GRPE/2018/17 aimed at adapting the provisions in UN Regulation No. 83 and UN Regulation No. 101 to allow the usage of WLTP-based Ki and Deterioration Factor (DF) factors as well as On-Board Diagnostics (OBD) demos. The experts from EC and UK proposed minor corrections to ECE/TRANS/WP.29/GRPE/2018/15 that GRPE adopted as reproduced in Annex VI. GRPE also adopted ECE/TRANS/WP.29/GRPE/2018/17.

10. The expert from OICA introduced ECE/TRANS/WP.29/GRPE/2018/18 aimed at modifying the Constant Volume Sampling system temperature sensor time response requirement in UN Regulation No. 83. The Chair of GRPE requested clearer provisions to

align with the work performed under the IWG on WLTP. The Expert from OICA presented informal document GRPE-77-31 amending ECE/TRANS/WP.29/GRPE/2018/18. GRPE adopted the proposal as reproduced in Annex VII.

11. The expert from EC presented informal document GRPE-77-11, superseding documents ECE/TRANS/WP.29/GRPE/76 (Annex IV), ECE/TRANS/WP.29/2018/48/Add.1 and ECE/TRANS/WP.29/2018/49/Add.1, aimed at clarifying Selective Catalytic Reduction (SCR) level warning provisions. GRPE adopted GRPE-77-11 as reproduced in Addendum 1.

12. GRPE requested the secretariat to submit ECE/TRANS/WP.29/GRPE/2018/13, Annexes IV, VI and VII and Addendum 1 to the report to WP.29 and the Administrative Committee of the 1958 Agreement (AC.1) for consideration and vote at their November 2018 sessions as draft Supplements 2, 1, 12, 12 and 18 to the 03, the 04, the 05, the 06 and the 07 series of amendments to UN Regulation No. 83 respectively.

13. GRPE requested the secretariat to submit ECE/TRANS/WP.29/GRPE/2018/17 and Annex V to the report to WP.29 and AC.1 for consideration and vote at their November 2018 sessions as draft Supplements 10 and 8 to the 00 and the 01 series of amendments to UN Regulation No. 101 respectively.

14. The expert from OICA presented GRPE-77-05, proposing to provisions regarding reference fuels and Particulate Number (PN) levels in UN Regulation No. 83. The expert from France supported the intent of the document and would contact the expert from OICA if further explanations would be needed.

B. UN Global Technical Regulations Nos. 15 on Worldwide harmonized Light vehicles Test Procedures (WLTP) and 19 (Evaporative emission test procedure for the Worldwide harmonized Light vehicle Test Procedures (WLTP EVAP))

Documentation: ECE/TRANS/WP.29/2018/73/Add.1
Informal documents GRPE-77-17, GRPE-77-18, GRPE-77-21,
GRPE-77-22

15. The Chair of the IWG on the Worldwide harmonized Light vehicles Test Procedures (WLTP) reported on the ongoing activities (GRPE-77-22). He briefly introduced the draft Amendment 5 to UN GTR No. 15 (GRPE-77-17) and the draft Amendment 2 to UN GTR No. 19 (GRPE-77-18).

16. The expert from EC, leading the task force on the transposition of WLTP into the 1958 Agreement, presented GRPE-77-21 on the activities of his group.

17. He introduced the implications that the forthcoming UN Regulation on WLTP would have on UN Regulations No. 83 and No. 101. Four options are now under consideration to assist Contracting Parties (CPs) once the UN Regulation on WLTP has been created. He stated that further analysis would be undertaken in the coming months. The secretariat mentioned some practices from GRE on the procedure to freeze unused UN Regulations, that could be explored to properly manage UN Regulations Nos. 83, 101 and on WLTP.

18. He reported on the progress done on durability and Conformity of Production (CoP) provisions, where three approaches are considered. The provision on durability and CoP could either be developed as new UN GTRs, as annexes to UN GTR No. 15 or directly into the forthcoming UN Regulation on WLTP. The expert from EC expressed her preference to have them included directly into the forthcoming UN Regulation on WLTP. India reminded GRPE that such issue had already been raised previously (ECE/TRANS/WP.29/GRPE/75, para. 8.), when India expressed its preference for separate UN GTRs. India also mentioned the possibility to have that as part of a Mutual Resolution. The chair of IWG on WLTP

stated that a UN GTR for CoP would only include technical requirements, not administrative ones. GRPE agreed to develop durability and CoP as annexes to UN GTR No. 15.

19. GRPE discussed the possible alternatives to structure the future UN Regulation on WLTP to address regional specificities. Following the consultation of the Office of Legal Affairs (OLA) by the secretariat, GRPE agreed to tentatively adopt approach 2 as noted in GRPE-77-21.

20. GRPE endorsed ECE/TRANS/WP.29/2018/73/Add.1 submitted for formal adoption at the June 2018 session of the Executive Committee of the 1998 Agreement (AC.3).

21. GRPE acknowledged the progress made by the IWG on WLTP and noted the request for a meeting room for one and a half days during the GRPE week in January 2019.

C. Worldwide harmonized Real Driving Emissions test procedure

Documentation: ECE/WP.29/2018/79, ECE/WP.29/2018/80 and ECE/WP.29/2018/81
Informal documents GRPE-77-15, GRPE-77-27 and GRPE-77-30

22. The expert from the European Commission advocated for a UN GTR on Real Driving Emissions (RDE) (GRPE-77-30). She briefly introduced draft Terms of References (ToR) that would guide the work of the forthcoming IWG on RDE (GRPE-77-15).

23. The expert from the United States of America showed interest and tentatively supported this nascent activity. He expressed the need to gain expertise, he showed understanding to the EC position but highlighted the need to accommodate regional specificities. He recognized the timeline detailed in the draft ToR to be very ambitious and requested time to study the draft ToRs presented for the first time at this session.

24. The expert of Canada also declared an interest in the work on RDE. He highlighted potential difficulties that the group could face trying to determine a globally harmonized stringency level for RDE.

25. The expert from India also supported this work and vowed to determine a list of parameters to be harmonized. He also stated that the timeline should allow enough flexibility for all CPs to contribute.

26. The expert from China informed that China includes RDE in the latest China 6 standard since the end of 2016. He stated China performed continuous improvements to the RDE regulatory texts and would therefore be interested to participate in the activities of the IWG on RDE.

27. The expert of EC heard the concerns about the timeline that could be adapted at the first meeting of the IWG on RDE. She invited all interested parties that would be interested to participate to the IWG on RDE, subject to AC.3 consent, to send an email to EC-RDE@ec.europa.eu.

28. GRPE supported the idea of activities on RDE and the draft ToRs.

29. The expert from OICA informed on the support to this work and would identify the best candidate to act as secretary to the IWG on RDE. He also expressed concerns about the ambitious timeline (GRPE-77-27).

30. The experts from Japan and the Republic of Korea reiterated their support and interest to be Vice-Chairs to the activity.

31. The Chair of GRPE stated that RDE activities were an important step towards more consistent approaches to ensure low levels of tailpipe emissions under a wide range of operating conditions and congratulated the large number of CPs that showed interest in the topic.

V. Heavy duty vehicles (agenda item 4)

A. UN Regulations Nos. 49 (Emissions of compression ignition and positive ignition (LPG and CNG) engines) and 132 (Retrofit Emissions Control devices (REC))

Documentation: ECE/TRANS/WP.29/GRPE/2018/12
Informal documents GRPE-77-16 and GRPE-77-26

32. The expert from EC presented GRPE-77-26 that introduces ECE/TRANS/WP.29/GRPE/2018/12 on a proposal to harmonize the latest requirements of UN regulation No. 96 with UN Regulation No. 132. GRPE adopted the proposal and requested the secretariat to submit the proposal to WP.29 and AC.1 for consideration and vote at their November 2018 sessions as draft Supplement 1 to 01 series of amendments to UN Regulation No. 132.

33. The secretariat introduced GRPE-77-16 on behalf of EGEA, introducing a request for guidance on the standardization and access to sensors signal from emission control systems. The secretariat agreed to liaise with the SAE and ISO secretariats to follow-up on the presentation of EGEA. The expert from the United Kingdom highlighted its interest into the topic. GRPE agreed to keep that topic in the agenda for the next session of GRPE in January 2019.

B. UN Global Technical Regulations Nos. 4 (World-wide harmonized Heavy Duty Certification procedure (WHDC)), 5 (World-Wide harmonized Heavy duty On-Board Diagnostic systems (WWH-OBD)) and 10 (Off-Cycle Emissions (OCE))

34. GRPE did not receive any new proposals.

C. Worldwide provisions for Heavy Duty vehicles Fuel Economy

Documentation: Informal document GRPE-77-08

35. The expert from OICA introduced GRPE-77-08 on the harmonization of Heavy Duty Fuel Economy measurements. He proposed to organize a one-day workshop during the next session of GRPE in January 2019 to exchange information on the different approaches used by the CPs to measure fuel economy from heavy duty vehicles.

36. The expert from EC supported the idea to have a workshop organized as part of the January 2019 session of GRPE.

37. The secretariat agreed to assist in the organization of the workshop and help manage the coordination with other meetings from IWGs.

VI. UN Regulations Nos. 85 (Measurement of the net power), 115 (LPG and CNG retrofit systems), 133 (Recyclability of motor vehicles) and 143 (Heavy Duty Dual-Fuel Engine Retrofit Systems (HDDF-ERS)) (agenda item 5)

Documentation: ECE/TRANS/WP.29/GRPE/2018/19
Informal documents GRPE-77-06, GRPE-77-09, GRPE-77-20 and GRPE-77-23

38. The expert from OICA presented GRPE-77-20 that improves the justification of ECE/TRANS/WP.29/GRPE/2018/19 by proposing a solution to align the provisions of the 03 series of amendments to UN Regulation No. 24 with UN Regulation No. 85. GRPE adopted the proposal and requested the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their June 2018 sessions as draft Supplement 4 to the 03 series of amendments to UN Regulation No. 24.

39. The expert from Italy introduced GRPE-77-09 on the need to update UN Regulation No. 115 and the need to introduce a reference to WLTP instead of emission tests performed on the basis of the former test cycle (New European Driving Cycle (NEDC)). He proposed to host a meeting with all interested parties in order to develop a working document that would be presented at the January 2019 session of GRPE. He mentioned the letter from the expert of AEGPL showed support to the idea and interest to participate in the activities (GRPE-77-23). He stated that the difficulty for this work was that WLTC was not yet included in a UN Regulation but in a UN GTR.

40. The expert from OICA presented GRPE-77-06 proposing a new Supplement to UN Regulation No. 85 (Measurement of the net power) amending provisions on power measurement of air-cooled high-power engines. The expert from the Netherlands needed more clarifications on the actual proposal. The expert from OICA stated all questions would be answered before the next session of GRPE in January 2019.

VII. Agricultural and forestry tractors, non-road mobile machinery (agenda item 6)

A. UN Regulations Nos. 96 (Diesel emission (agricultural tractors)) and 120 (Net power of tractors and non-road mobile machinery)

41. GRPE did not receive any new proposals.

B. UN Global Technical Regulation No. 11 (Non-road mobile machinery engines)

42. GRPE did not receive any new proposal to amend UN GTR No. 11. The secretariat mentioned the recent achievements under agenda item 6(a) and their submission to AC.1 at the June 2018 session of WP.29 and highlighted the potential need to harmonize UN Regulation No. 96 and UN GTR No. 11 in the near future.

VIII. Particle Measurement Programme (PMP) (agenda item 7)

Documentation: Informal document GRPE-77-14

43. The Secretary of the IWG on Particle Measurement Programme (PMP), on behalf of the Chair of the IWG on PMP, presented a status report on the activities of the group on exhaust and non-exhaust particle emissions (GRPE-77-14). She reported on the ongoing activities for exhaust and non-exhaust works streams.

44. She requested guidance from GRPE on exhaust emissions in the new activities on the impact of fuel quality on PN emissions and especially on the scope of the literature review: which emissions (engine out or tailpipe), what vehicle types (light-duty, powered 2-wheelers and/or heavy duty) and what engine type (positive ignition or compression ignition) should be considered in the research. The expert from EC expressed a preference for tailpipe emissions for all vehicle and engine types. GRPE agreed with the preference from the expert of EC.

45. The expert from Japan requested more information on non-exhaust emissions and how the braking schedule had been developed. The expert from OICA detailed that WLTP data had been used to develop a specific, new test cycle for brake tests. GRPE showed interest to validate the newly developed cycle and compare it with real driving conditions.

46. GRPE acknowledged the progress made by the IWG on PMP and noted that the group requested a meeting room for half a day during the GRPE week in January 2019.

IX. Motorcycles and mopeds (agenda item 8)

A. UN Regulations Nos. 40 (Emission of gaseous pollutants by motorcycles) and 47 (Emission of gaseous pollutants of mopeds)

47. GRPE did not receive any new proposal to amend UN Regulations Nos. 40 and 47.

B. Environmental and Propulsion Performance Requirements (EPPR) for L-category vehicles

Documentation: Informal documents GRPE-77-25 and GRPE-77-29

48. The Chair of the IWG on Environmental and Propulsion Performance Requirements for L-category vehicles (EPPR) presented a status report (GRPE-77-25) on the activities. He mentioned the current work on the development of amendments to UN GTR No. 2 as reflected in GRPE-77-29. He underlined that the work on On-Board Diagnostic systems phase 2 (OBD2) that begun in 2018 was expected to be completed in 2019.

49. GRPE acknowledged the progress made by the IWG on EPPR and noted the request for a meeting room for two days during the GRPE week in January 2019.

C. UN Global Technical Regulation No. 2 (World-wide Motorcycle emissions Test Cycle (WMTC))

50. GRPE did not receive any new proposal to amend UN GTR No. 2.

X. Electric Vehicles and the Environment (EVE) (agenda item 9)

Documentation: Informal documents GRPE-77-07 and GRPE-77-28

51. The Chair of the IWG on Electric Vehicles and the Environment (EVE) presented a status report on the ongoing activities of the group (GRPE-77-28) under the three areas of

work. First, he explained the ongoing work on GTR development for the test procedure to determine power of electrified vehicles. He requested input from GRPE on whether this work should be done as an annex to the UN GTR No. 15, as a standalone UN GTR or as a new part to UN Regulation No. 85. The experts from Sweden, UK and EC supported to have a standalone UN GTR, with the expert from the Netherlands further added that such standalone UN GTR could be then serve as a basis for an amendment to UN Regulation No. 85. The expert of Japan stated their preference to keep the existing mandate to have power system determination as an annex to UN GTR No. 15. The expert from OICA introduced GRPE-77-07 highlighting the strong connection between system power determination and UN GTR No. 15. The Chair of the IWG on WLTP informed GRPE that all options would be manageable without a need for substantially more resources. GRPE decided to consult AC.3 and the best way forward.

52. Second, he reported on the continuous research on battery durability and referred to activities from the Joint Research Centre (JRC) on a battery life parameterized simulation model validated by on-road testing (led by Canada). He highlighted that the final recommendations, likely to be prepared until 2019, would include a recommendation to seek authorization for relevant additional activities such as UN GTR development or may recommend concluding the topic. The expert from EC supported the development of a UN GTR on durability as this is a priority for EU legislation and as it is not covered by European legislation for the moment.

53. Third, he informed GRPE that the IWG on EVE had made a presentation to the Group of Experts on Energy Efficiency (GEEE) to seek their partnership on the project to assess upstream emissions from electric vehicles, that GEEE had been receptive to the idea and endorsed the proposal for the Group of Expert on Cleaner Electricity Production (CEP) to consider this work, with the support of the IWG on EVE. The Secretary agreed to follow-up with colleagues from ECE Energy Division on the matter.

54. GRPE acknowledged the progress of the IWG on EVE and agreed to have all three areas of work presented in one single package at the next session of GRPE in January 2019. GRPE noted the request for a meeting room for half a day during the GRPE week in January 2019.

XI. Mutual Resolution No. 2 (M.R.2) (agenda item 10)

Documentation: Informal documents GRPE-77-12

55. The expert from EC introduced GRPE-77-12 on a clarification of definitions of peripheral devices. The expert from the United Kingdom further explained the proposal and required guidance from GRPE. GRPE requested the secretariat to distribute the document with an official symbol at the next session of GRPE in January 2019 and agreed that the Chair would request guidance from WP.29/AC.3 on modifications to Mutual Resolutions and if other working parties would like to provide an input to this proposal.

XII. International Whole Vehicle Type Approval (IWVTA) (agenda item 11)

Documentation: Informal document GRPE-77-19

56. The GRPE Ambassador to the IWG on International Whole Vehicle Type Approval (IWVTA) presented a status report (GRPE-77-19) of the IWG on IWVTA. He informed GRPE that UN Regulation No. 0 was expected to enter into force on 19 July 2018, with an introductory provision of nine months.

57. The secretariat recalled to GRPE that the new provisions adopted under the Revision 3 to the 1958 Agreement might require action from GRPE at a later stage, e.g. related to CoP, Transitional Provisions and marking.

XIII. Vehicles Interior Air Quality (VIAQ) (agenda item 12)

Documentation: Informal document GRPE-77-24

58. The Chair of the IWG on Vehicles Interior Air Quality (VIAQ) presented a status report on the ongoing activities of the group (GRPE-77-24). He recalled that the mandate of the group had been extended until November 2020. He informed GRPE on the latest progress and the items agreed during the last meetings of the IWG. Vehicle categories to be measured, vehicle mileage and substances to be measured as well as the sampling points have all been agreed by the IWG.

59. GRPE acknowledged the progress made by the IWG on VIAQ and noted the request for a meeting room for half a day during the GRPE week in January 2019.

XIV. Exchange of information on emission requirements (agenda item 13)

60. GRPE did not receive any new proposals.

XV. Election of Officers (agenda item 14)

61. In compliance with Rule 37 of the Rules of Procedures (TRANS/WP.29/690, as amended) GRPE unanimously elected Mr. A. Rijnders (Netherlands) as Chair of GRPE for the sessions in the year 2018. Due to the lack of time, a vice-chair was not elected. GRPE agreed with the secretariat request that this election would be one of the first agenda item of the next GRPE session.

XVI. Any other business (agenda item 15)

62. GRPE did not receive any new proposals.

XVII. Provisional agenda for the next session

A. Next GRPE session

63. The next GRPE session, including the IWG meetings, is scheduled to be held in Geneva, Palais des Nations, starting on Monday, 7 January 2019, from 9.30 a.m. until Friday, 11 January 2019, at 5.30 p.m., subject to confirmation by the secretariat (see GRPE-78-01). Interpretation services would be provided from 8 January (2.30 p.m.) to 11 January (12.30 p.m.) 2019.

B. Provisional agenda for the next proper GRPE session

64. GRPE agreed on the following provisional agenda for its next session:

1. Adoption of the agenda.

2. Report on the last sessions of the World Forum for Harmonization of Vehicle Regulations (WP.29).
3. Light vehicles:
 - (a) UN Regulations Nos. 68 (Measurement of the maximum speed, including electric vehicles), 83 (Emissions of M₁ and N₁ vehicles), 101 (CO₂ emissions/fuel consumption) and 103 (Replacement pollution control devices);
 - (b) UN Global Technical Regulations Nos. 15 (Worldwide harmonized Light vehicles Test Procedures (WLTP)) and 19 (Evaporative emission test procedure for the Worldwide harmonized Light vehicle Test Procedure (WLTP EVAP));
 - (c) Worldwide harmonized Real Driving Emissions test procedure.
4. Heavy duty vehicles:
 - (a) UN Regulations Nos. 49 (Emissions of compression ignition and positive ignition (LPG and CNG) engines) and 132 (Retrofit Emissions Control devices (REC));
 - (b) UN Global Technical Regulations Nos. 4 (World-wide harmonized Heavy Duty Certification procedure (WHDC)), 5 (World-Wide harmonized Heavy Duty On-Board Diagnostic systems (WWH-OBD)) and 10 (Off-Cycle Emissions (OCE));
 - (c) Worldwide provisions for Heavy Duty vehicles Fuel Economy.
5. UN Regulations Nos. 85 (Measurement of the net power), 115 (LPG and CNG retrofit systems), 133 (Recyclability of motor vehicles) and 143 (Heavy Duty Dual-Fuel Engine Retrofit Systems (HDDF-ERS)).
6. Agricultural and forestry tractors, non-road mobile machinery:
 - (a) UN Regulations Nos. 96 (Diesel emission (agricultural tractors)) and 120 (Net power of tractors and non-road mobile machinery);
 - (b) UN Global Technical Regulation No. 11 (Non-road mobile machinery engines).
7. Particle Measurement Programme (PMP).
8. Motorcycles and mopeds:
 - (a) UN Regulations Nos. 40 (Emission of gaseous pollutants by motor cycles) and 47 (Emission of gaseous pollutants of mopeds);
 - (b) Environmental and Propulsion Performance Requirements (EPPR) for L-category vehicles;
 - (c) UN Global Technical Regulations Nos. 2 (World-wide Motorcycle emissions Test Cycle (WMTC)), 17 (Crankcase and evaporative emissions of L-category vehicles) and 18 (On-Board Diagnostic (OBD) systems for L-category vehicles).
9. Electric Vehicles and the Environment (EVE).
10. Mutual Resolution No. 2 (M.R.2).
11. International Whole Vehicle Type Approval (IWVTA).
12. Vehicles Interior Air Quality (VIAQ).

13. Exchange of information on emission requirements.
14. Election of Officers.
15. Any other business.

C. Informal meetings scheduled to be held in conjunction with the next GRPE session

65. The following informal meetings were scheduled to be held, subject to confirmation:

<i>Date</i>	<i>Group</i>	<i>Acronym</i>	<i>Time</i>
Monday, 7 January 2019	Worldwide harmonized Light vehicles Test Procedure	WLTP	9.30 a.m. – 12.30 p.m. 2.30 p.m. – 5.30 p.m.
	Heavy Duty Fuel Economy measurement Workshop	-	9.30 a.m. – 12.30 p.m. 2.30 p.m. – 5.30 p.m.
Tuesday, 8 January 2019	Worldwide harmonized Light vehicles Test Procedure	WLTP	9.30 a.m. – 12.30 p.m.
	Electric Vehicles and the Environment	EVE	2.30 p.m. – 5.30 p.m.
	Environmental and Propulsion Performance Requirements of L-category vehicles – OBD2	EPPR-OBD2	2.30 p.m. – 5.30 p.m.
	Particle Measurement Programme	PMP	2.30 p.m. – 5.30 p.m.
Wednesday, 9 January 2019	Environmental and Propulsion Performance Requirements of L-category vehicles	EPPR	9.30 a.m. – 12.30 p.m. 2.30 p.m. – 5.30 p.m.
	Global Real Driving Emissions	RDE	9.30 a.m. – 12.30 p.m. 2.30 p.m. – 5.30 p.m.
	Vehicle Interior Air Quality	VIAQ	2.30 p.m. – 5.30 p.m.

66. The agendas of these meetings will be prepared by the respective Technical Secretaries and distributed to the members of each group prior to each meeting.

Annex I

List of informal documents (GRPE-76-) distributed without an official symbol before and during the session

<i>No.</i>	<i>(Author) Title</i>	<i>Follow-up</i>
1	(Secretariat) Informal meetings in conjunction with the GRPE (proper) session: schedule and rooms reservation	A
2	(The Netherlands) Proposal for amendments to ECE/TRANS/WP.29/GRPE/2018/14	B
3	(The Netherlands) Proposal for amendments to ECE/TRANS/WP.29/GRPE/2018/16	B
4	(Secretariat) General information	A
5	(OICA) PN and reference fuels in UN Regulation No.83.07	C
6	(OICA) Amendment Proposal of UN Regulation No. 85	C
7	(OICA) EVE-HEV Systempower-OICA position	A
8	(OICA) HDV-Fuel Efficiency Harmonization	A
9	(Italy) Proposal for amendments to UN Regulation No. 115	A
10	(Secretariat) Report on the March 2018 session of WP.29	A
11	(EC) Updates to GRPE-76-34e to latest EU status	B
12	(EC) Amendments to M.R.2	D
13r2	(Secretariat) Updated and consolidated provisional agenda	A
14	(PMP) Status report	A
15	(EC, Japan and Korea) Draft ToRs for IWG on RDE	A
16	(EGEA) Request for guidance on standardisation of eOBD data related to the urea system sensors	A
17	(WLTP) UN GTR 15 amendment 5 draft proposal	C
18	(WLTP) UN GTR 19 amendment 2 draft proposal	C
19	(IWVTA) Ambassador report	A
20	(OICA) Clarification of GRPE-2018-19 justification	A
21	(WLTP) Transposition Task Force Update	A
22	(WLTP) Status Report	A
23	(AEGPL) Position on GRPE 77-09	A
24	(VIAQ) Status Report	A
25	(EPPR) Status Report	A
26	(EC) Adaptation process of UN Regulation No. 132	A
27	(OICA) Position on GRPE-77-15	A
28	(EVE) Status Report	A
29	(EPPR) Draft GTR 2	C
30	(EC) The need for an RDE GTR	A
31	(OICA) proposal to amend GRPE/2018/18	B

Notes:

- A Consideration by GRPE completed or to be superseded;
 B Adopted;
 C Further consideration on the basis of a revised proposal;
 D Distribute at the January 2019 session with an official symbol.

Annex II

Informal meetings held in conjunction with the GRPE session

<i>Date</i>	<i>Time</i>	<i>Group</i>	<i>Acronym</i>
4 June 2018	9:30 a.m. - 12:30 p.m.	Worldwide harmonized Light vehicles Test Procedure	WLTP
	2:30 p.m. - 5:30 p.m.	Worldwide harmonized Light vehicles Test Procedure	WLTP
5 June 2018	9:30 a.m. - 12:30 p.m.	Worldwide harmonized Light vehicles Test Procedure	WLTP
	2:30 p.m. - 5:30 p.m.	EVE	EVE
6 June 2018	9:30 a.m. - 12:30 p.m.	Environmental and Propulsion Performance Requirements of L-category vehicles	EPPR
	2:30 p.m. - 5:30 p.m.	Environmental and Propulsion Performance Requirements of L-category vehicles	EPPR
		Vehicle Interior Air Quality	VIAQ

Annex III

List of GRPE informal working groups, task forces and subgroups

<i>Name (Acronym) (Status)</i>	<i>Chair or Co-chairs</i>	<i>Secretaries</i>	<i>End of mandate</i>
Environmental and Propulsion Performance Requirements of L-category vehicles (EPPR) (group)	Adolfo Perujo, Adolfo.PERUJO@ec.europa.eu	Daniela Leveratto, d.leveratto@immamotorcycles.org Hardik Makhija, hardik@siam.in	December 2020
Electric Vehicles and the Environment (EVE) (group)	Michael Olechiw, Olechiw.Michael@epamail.epa.gov Chen Chunmei (vice-Chair), chencm@miit.gov.cn Kazuyuki Narusawa (vice-Chair), narusawa@ntsel.go.jp	Andrew Giallonardo, Andrew.Giallonardo@ec.gc.ca	November 2019
Particle Measurement Programme (PMP) (group)	Giorgio Martini, giorgio.martini@ec.europa.eu	Caroline Hosier, chosier@ford.com	June 2019
Vehicle Interior Air Quality (VIAQ) (group)	Andrey Kozlov, a.kozlov@nami.ru Jong Soon Lim (vice-Chair), jongsoon@ts2020.kr	Mark Polster mpolster@ford.com	November 2020
Worldwide harmonized Light vehicles Test Procedure (WLTP) – Phase 2 (group)	Robertus Cuelenaere, rob.cuelenaere@tno.nl Daisuke Kawano (vice-Chair), kawano@ntsel.go.jp	Noriyuki Ichikawa (co-Technical Secretary), noriyuki_ichikawa@mail.toyota.co.jp Markus Bergmann (co-Technical Secretary), markus.bergmann@audi.de	December 2019

Annex IV

Adopted amendments to ECE/TRANS/WP.29/GRPE/2018/14

Adopted on the basis of GRPE-77-02 (see para. 8)

A. A new Supplement to the 06 series of amendments

Paragraphs 2.23. and 2.23.1., amend to read:

~~2.23.~~ "Bi fuel vehicle" means a vehicle with two separate fuel storage systems that is designed to run on only one fuel at a time. The simultaneous use of both fuels is limited in amount and duration.

~~2.23.1.~~ "Bi fuel gas vehicle" means a bi fuel vehicle that can run on petrol (petrol mode) and also on either LPG, NG/biomethane, or hydrogen (gas mode).

2.23. "Bi-fuel vehicle" means a vehicle with two separate fuel storage systems that is designed to run primarily on only one fuel at a time; however the simultaneous use of both fuels is permitted in limited amount and duration.

2.23.1. "Bi-fuel gas vehicle" means a bi-fuel vehicle where the two fuels are petrol (petrol mode) and either LPG, NG/biomethane, or hydrogen."

Paragraph 5.3.1.2.4., amend to read:

5.3.1.2.4. During the test the exhaust gases are diluted and a proportional sample collected in one or more bags. The exhaust gases of the vehicle tested are diluted, sampled and analysed, following the procedure described below, and the total volume of the diluted exhaust is measured. Not only are the carbon monoxide, hydrocarbon and nitrogen oxide emissions recorded, but also the particulate pollutant emissions from vehicles equipped with compression-ignition engines and direct injection petrol engines."

Annex 7, paragraph 7.4.4.3., amend to read:

7.4.4.3. At the request of the manufacturer an alternative purge ~~test~~ procedure can be used, if the procedure has been presented to and has been accepted by the Technical Service during the type approval procedure."

Annex 8, paragraph 3.2.1., amend to read:

3.2.1. Start of engine, start of the sampling and the operation of the first cycle shall be in accordance with ~~Table 1~~ Table A4a/1 and Figure A4a/1 in Annex 4a to this Regulation."

Annex 14, paragraph 3.1.1., amend to read:

3.1.1. Two tests shall be performed under the following conditions:

Condition A: Test shall be ~~carried out~~ started with a fully charged electrical energy/power storage device.

Condition B: Test shall be ~~carried out~~ started with an electrical energy/power storage device in minimum state of charge (maximum discharge of capacity).

The profile of the State of Charge (SOC) of the electrical energy/power storage device during different stages of the Type I test is given in Appendix 1."

Annex 14, paragraph 3.2.1., amend to read:

- "3.2.1. Two tests shall be performed under the following conditions:
- 3.2.1.1. Condition A: Test shall be ~~carried out~~ **started** with a fully charged electrical energy/power storage device.
- 3.2.1.2. Condition B: Test shall be ~~carried out~~ **started** with an electrical energy/power storage device in minimum state of charge (maximum discharge of capacity) **and carried out with an operating mode keeping the vehicle in charge-sustaining operating condition, that being an operating condition in which the energy/power stored in the energy/power storage device may fluctuate but, on average, is maintained at a neutral charging balance level while the vehicle is driven.**
- 3.2.1.3. **In agreement with the responsible type approval authority and justified by the manufacturer, the following operation modes shall not be considered for the purpose of testing:**
- **Operating modes, such as ‘charge mode’, which are not limited to vehicle propulsion but which, in addition to vehicle propulsion, are charging the energy power/storage device in order to facilitate locally emission-free driving (e.g. under urban conditions), ~~such as ‘charge mode’;~~**
 - **Operating modes for vehicle maintenance, such as ‘maintenance mode’;**
 - **Operating modes for special limited purposes and not intended for daily operation, such as ‘mountain mode’.**

On the basis of information provided by the manufacturer, the Technical Service shall make sure that the emission limits specified in Table 1 in paragraph 5.3.1.4. of this Regulation are not exceeded in all hybrid modes, with the exception of the ‘maintenance mode’.

The operating mode switch shall be positioned according to Table A14/1.

Table A14/1

<i>Battery state of charge</i>	<i>Hybrid modes</i>	<i>–Pure electric</i> <i>–Hybrid</i>	<i>–Pure fuel</i> <i>–consuming</i> <i>–Hybrid</i>	<i>–Pure electric</i> <i>–Pure fuel</i> <i>–consuming</i> <i>–Hybrid</i>	<i>–Hybrid mode n¹</i> <i>...</i> <i>–Hybrid mode m¹</i>
		<i>Switch in position</i>	<i>Switch in position</i>	<i>Switch in position</i>	<i>Switch in position</i>
Condition A Fully charged	Hybrid	Hybrid	Hybrid	² Most electric hybrid mode	
Condition B Min. state of charge	Hybrid	Fuel consuming	Fuel consuming	Most fuel consuming mode³	

Notes:

¹ For instance: sport, economic, urban, extra-urban position...

² *Most electric hybrid mode:* The hybrid mode which can be proven to have the highest electricity consumption of all selectable hybrid modes when tested in accordance with condition A of paragraph 4. of Annex 10 to Regulation No. 101, to be established based on information provided by the manufacturer and in agreement with the technical service.

³ *Most fuel consuming hybrid mode:* The hybrid mode which can be proven to have the highest fuel consumption of all selectable hybrid modes when tested in accordance with condition B of paragraph 4. of Annex 10 to Regulation No. 101, to be established based on information provided by the manufacturer and in agreement with the technical service.

3.2.1.4. The operating mode shall be selected as described in paragraphs 3.2.1.4.1. to 3.2.1.4.2.2. inclusive.

3.2.1.4.1. Operating mode selection for Condition A

3.2.1.4.1.1. If there is a single operating mode under condition A that is always selected when the vehicle is switched on regardless of the operating mode selected when the vehicle was previously shut down, and which cannot be switched to another mode without an intentional action of the driver or be redefined, this single operating mode shall be selected.

3.2.1.4.1.2. If there is no single operating mode under condition A that is always selected when the vehicle is switched on, the most electric energy consuming mode shall be selected.

3.2.1.4.2. Operating mode selection for Condition B

3.2.1.4.2.1. If there is a single operating mode under condition B that is always selected when the vehicle is switched on regardless of the operating mode selected when the vehicle was previously shut down, and which cannot be switched to another mode without an intentional action of the driver or be redefined, this single operating mode shall be selected.

3.2.1.4.2.2. If there is no single operating mode under condition B that is always selected when the vehicle is switched on, the most fuel consuming mode shall be selected."

B. A new Supplement to the 07 series of amendments

Paragraphs 2.23. and 2.23.1., amend to read:

~~2.23. "Bi fuel vehicle" means a vehicle with two separate fuel storage systems that is designed to run on only one fuel at a time. The simultaneous use of both fuels is limited in amount and duration.~~

~~2.23.1. "Bi fuel gas vehicle" means a bi fuel vehicle that can run on petrol (petrol mode) and also on either LPG, NG/biomethane, or hydrogen (gas mode).~~

2.23. "Bi-fuel vehicle" means a vehicle with two separate fuel storage systems that is designed to run primarily on only one fuel at a time; however the simultaneous use of both fuels is permitted in limited amount and duration.

2.23.1. "Bi-fuel gas vehicle" means a bi-fuel vehicle where the two fuels are petrol (petrol mode) and either LPG, NG/biomethane, or hydrogen."

Paragraph 5.3.1.2.4., amend to read:

"5.3.1.2.4. During the test the exhaust gases are diluted and a proportional sample collected in one or more bags. The exhaust gases of the vehicle tested are diluted, sampled and analysed, following the procedure described below, and the total volume of the diluted exhaust is measured. Not only are the carbon monoxide, hydrocarbon and nitrogen oxide emissions recorded, but also the particulate pollutant emissions from vehicles equipped with compression-ignition engines **and direct injection petrol engines.**"

Annex 7, paragraph 7.4.4.3., amend to read:

"7.4.4.3. At the request of the manufacturer an alternative purge ~~test~~ procedure can be used, if the procedure has been presented to and has been accepted by the Technical Service during the type approval procedure."

Annex 8, paragraph 3.2.1., amend to read:

"3.2.1. Start of engine, start of the sampling and the operation of the first cycle shall be in accordance with ~~Table 1~~ **Table A4a/1** and Figure A4a/1 in Annex 4a to this Regulation."

Appendix 1 to Annex 11, paragraph 6.5.3.5., amend to read:

"6.5.3.5. When a fault is registered, the manufacturer shall identify the fault using an appropriate ISO/SAE controlled fault code specified in one of the standards listed in paragraph 6.5.3.2.(d) of this appendix relating to "emission related system diagnostic trouble codes". If such identification is not possible, the manufacturer may use manufacturer controlled diagnostic trouble codes according to the same standard. The fault codes shall be fully accessible by standardised diagnostic equipment complying with the provisions of ~~paragraph 6.5.3.2.~~ **paragraph 6.5.3.3.** of this ~~annex~~ **appendix.**

The vehicle manufacturer shall provide to a national standardization body the details of any emission-related diagnostic data, e.g. PID's, OBD monitor Id's, Test Id's not specified in the standard listed in paragraph 6.5.3.2.(a) of this appendix but related to this Regulation."

Annex 14, paragraph 3.1.1., amend to read:

"3.1.1. Two tests shall be performed under the following conditions:

Condition A: Test shall be ~~carried out~~ **started** with a fully charged electrical energy/power storage device.

Condition B: Test shall be ~~carried out~~ **started** with an electrical energy/power storage device in minimum state of charge (maximum discharge of capacity).

The profile of the State of Charge (SOC) of the electrical energy/power storage device during different stages of the Type I test is given in Appendix 1 to this annex."

Annex 14, paragraph 3.2.1., amend to read:

- "3.2.1. Two tests shall be performed under the following conditions:
- 3.2.1.1. Condition A: Test shall be ~~carried out~~ **started** with a fully charged electrical energy/power storage device.
- 3.2.1.2. Condition B: Test shall be ~~carried out~~ **started** with an electrical energy/power storage device in minimum state of charge (maximum discharge of capacity); **and carried out with an operating mode keeping the vehicle in charge-sustaining operating condition, that being an operating condition in which the energy/power stored in the energy/power storage device may fluctuate but, on average, is maintained at a neutral charging balance level while the vehicle is driven.**
- 3.2.1.3. **In agreement with the responsible type approval authority and justified by the manufacturer, the following operation modes shall not be considered for the purpose of testing:**
- Operating modes, **such as 'charge mode'**, which are not limited to vehicle propulsion but which, in addition to vehicle propulsion, are charging the energy power/storage device **in order to facilitate locally emission-free driving (e.g. under urban conditions);** ~~such as 'charge mode'~~;
 - Operating modes for vehicle maintenance, such as 'maintenance mode';
 - Operating modes for special limited purposes and not intended for daily operation, such as 'mountain mode'.

On the basis of information provided by the manufacturer, the Technical Service shall make sure that the emission limits specified in Table 1 in paragraph 5.3.1.4. of this Regulation are not exceeded in all hybrid modes, with the exception of the ‘maintenance mode’.

The operating mode switch shall be positioned according to Table A14/1.

Table A14/1

<i>Battery state of charge</i>	<i>Hybrid modes</i>	<i>–Pure electric</i> <i>–Hybrid</i>	<i>–Pure fuel</i> <i>–consuming</i> <i>–Hybrid</i>	<i>–Pure electric</i> <i>–Pure fuel</i> <i>–consuming</i> <i>–Hybrid</i>	<i>–Hybrid mode-n[†]</i> <i>...</i> <i>–Hybrid mode-m[†]</i>
		<i>Switch in position</i>	<i>Switch in position</i>	<i>Switch in position</i>	<i>Switch in position</i>
Condition A Fully charged	Hybrid	Hybrid	Hybrid	Hybrid	² Most electric hybrid mode
Condition B Min. state of charge	Hybrid	Fuel consuming	Fuel consuming	Fuel consuming	Most fuel consuming mode ³

Notes:

[†] For instance: sport, economic, urban, extra-urban position...

² *Most electric hybrid mode:* The hybrid mode which can be proven to have the highest electricity consumption of all selectable hybrid modes when tested in accordance with condition A of paragraph 4. of Annex 8 to Regulation No. 101, to be established based on information provided by the manufacturer and in agreement with the technical service.

³ *Most fuel consuming hybrid mode:* The hybrid mode which can be proven to have the highest fuel consumption of all selectable hybrid modes when tested in accordance with condition B of paragraph 4. of Annex 8 to Regulation No. 101, to be established based on information provided by the manufacturer and in agreement with the technical service.

3.2.1.4. The operating mode shall be selected as described in paragraphs 3.2.1.4.1. to 3.2.1.4.2.2. inclusive.

3.2.1.4.1. Operating mode selection for Condition A

3.2.1.4.1.1. If there is a single operating mode under condition A that is always selected when the vehicle is switched on regardless of the operating mode selected when the vehicle was previously shut down, and which cannot be switched to another mode without an intentional action of the driver or be redefined, this single operating mode shall be selected.

3.2.1.4.1.2. If there is no single operating mode under condition A that is always selected when the vehicle is switched on, the most electric energy consuming mode shall be selected.

3.2.1.4.2. Operating mode selection for Condition B

3.2.1.4.2.1. If there is a single operating mode under condition B that is always selected when the vehicle is switched on regardless of the operating mode selected when the vehicle was previously shut down, and which cannot be switched to another mode without an intentional action of the driver or be redefined, this single operating mode shall be selected.

3.2.1.4.2.2. If there is no single operating mode under condition B that is always selected when the vehicle is switched on, the most fuel consuming mode shall be selected."

Annex V

Adopted amendments to ECE/TRANS/WP.29/GRPE/2018/16

Adopted on the basis of GRPE-77-03 (see para. 8)

Annex 8, paragraph 3.1., amend to read:

- "3.1. Two tests shall be performed under the following conditions:
- Condition A: Test shall be ~~carried out~~ **started** with a fully charged electrical energy/power storage device.
- Condition B: Test shall be ~~carried out~~ **started** with an electrical energy/power storage device in minimum state of charge (maximum discharge of capacity).
- The profile of the State of Charge (SOC) of the electrical energy/power storage device during different stages of the Type I test is given in Appendix 1 to this annex."

Annex 8, paragraph 4.1., amend to read:

- "4.1. Two tests shall be performed under the following conditions:
- 4.1.1. Condition A: Test shall be ~~carried out~~ **started** with a fully charged electrical energy/power storage device.
- 4.1.2. Condition B: Test shall be ~~carried out~~ **started** with an electrical energy/power storage device in minimum state of charge (maximum discharge of capacity)- **and carried out with an operating mode keeping the vehicle in charge-sustaining operating condition, that being an operating condition in which the energy/power stored in the energy/power storage device may fluctuate but, on average, is maintained at a neutral charging balance level while the vehicle is driven.**
- 4.1.3. **In agreement with the responsible type approval authority and justified by the manufacturer, the following operation modes shall not be considered for the purpose of testing:**
- **Operating modes, such as ‘charge mode’, which are not limited to vehicle propulsion but which, in addition to vehicle propulsion, are charging the energy power/storage device in order to facilitate locally emission-free driving (e.g. under urban conditions), such as ‘charge mode’;**
 - **Operating modes for vehicle maintenance, such as ‘maintenance mode’;**
 - **Operating modes for special limited purposes and not intended for daily operation, such as ‘mountain mode’.**

The operating mode switch shall be positioned according to the table below:

<i>Hybrid modes</i>	↺ <i>Pure electric</i> ↺ <i>Hybrid</i>	↺ <i>Pure fuel consuming</i> ↺ <i>Hybrid</i>	↺ <i>Pure electric</i> ↺ <i>Pure fuel consuming</i> ↺ <i>Hybrid</i>	↺ <i>Hybrid mode n*</i> ↺ ... ↺ <i>Hybrid mode m*</i>
<i>Battery state-of-charge</i>	<i>Switch-in position</i>	<i>Switch-in position</i>	<i>Switch-in position</i>	<i>Switch-in position</i>

* Condition A Fully charged E	Hybrid	Hybrid	Hybrid	Most electric hybrid mode**
Condition B Min. State of charge E	Hybrid	Fuel consuming	Fuel Consuming	Most fuel consuming mode***

stance: sport, economic, urban, extra-urban position...

** Most electric hybrid mode:

The hybrid mode which can be proven to have the highest electricity consumption of all selectable hybrid modes when tested in accordance with condition A, to be established based on information provided by the manufacturer and in agreement with the technical service.

*** Most fuel consuming mode:

The hybrid mode which can be proven to have the highest fuel consumption of all selectable hybrid modes when tested in accordance with condition B, to be established based on information provided by the manufacturer and in agreement with the technical service.

4.1.4. The operating mode shall be selected as described in paragraphs 4.1.4.1. to 4.1.4.2.2. inclusive.

4.1.4.1. Operating mode selection for Condition A

4.1.4.1.1. If there is a single operating mode under condition A that is always selected when the vehicle is switched on regardless of the operating mode selected when the vehicle was previously shut down, and which cannot be switched to another mode without an intentional action of the driver or be redefined, this single operating mode shall be selected.

4.1.4.1.2. If there is no single operating mode under condition A that is always selected when the vehicle is switched on, the most electric energy consuming mode shall be selected.

4.1.4.2. Operating mode selection for Condition B

4.1.4.2.1. If there is a single operating mode under condition B that is always selected when the vehicle is switched on regardless of the operating mode selected when the vehicle was previously shut down, and which cannot be switched to another mode without an intentional action of the driver or be redefined, this single operating mode shall be selected.

4.1.4.2.2. If there is no single operating mode under condition B that is always selected when the vehicle is switched on, the most fuel consuming mode shall be selected. "

Annex VI

Adopted amendments to ECE/TRANS/WP.29/GRPE/2018/15

Adopted on the basis of para. 9

Add a new paragraph 14:

"14. Alternative procedures

14.1. Alternative procedure for periodical regenerating systems

As an alternative to the procedure set out in Annex 13 of this Regulation, the manufacturer may use the results determined by the WLTP procedure, described in Appendix 1 to Annex 6 of Amendment 4 of the UN GTR No. 15.

In this case, the following additional provisions apply:

(a) At the request of the manufacturer and with the agreement of the responsible authority the Extra High phase may be excluded for determining the regenerative factor K_i for Class 2 and Class 3 vehicles.

(b) Instead of the criterion described in paragraph 7.1.4.2. of this Regulation the criterion shall be based on the WLTP test mass: The test mass of each vehicle in the family must be less than or equal to the test mass of the vehicle used for the K_i demonstration test plus 250 kg.

(c) Additive and multiplicative K_i are valid and are to be applied accordingly.

14.2. Alternative procedure for the Type V test

As an alternative to the road load, inertia weight class and Type I test cycle of this Regulation those from the WLTP, described in Amendment 4 of the UN GTR No. 15, may be used for the durability test.

In this case, the following additional provisions apply:

(a) The references to the Type I test in paragraph 2.3.1.7. of Annex 9 of this Regulation shall be understood as reference to the Type 1 test in Amendment 4 of the UN GTR No. 15.

(b) The references to the Type I test in paragraph 2.3.2.6. of Annex 9 of this Regulation shall be understood as reference to the Type 1 test in Amendment 4 of the UN GTR No. 15.

(c) The references to the Type I test in paragraph 3.1. of Annex 9 of this Regulation shall be understood as reference to the Type 1 test in Amendment 4 of the UN GTR No. 15.

(d) The reference in paragraph 6.3.1.2. of Annex 9 of this Regulation to the methods in Appendix 7 to Annex 4a shall be understood as being a reference to Annex 4 of Amendment 4 of the UN GTR No. 15.

(e) The reference in paragraph 6.3.1.4. of Annex 9 of this Regulation to Annex 4a shall be understood as being a reference to Annex 4 of Amendment 4 of the UN GTR No. 15.

(f) The road load coefficients to be used shall be those for vehicle low (VL). If VL ~~low~~ does not exist or the total load of vehicle high (VH) at 80 km/h is higher than the total load of VL at 80 km/h + 5 %, then the VH

road load shall be used. VL and VH are defined in point 4.2.1.1.2. of Annex 4 of Amendment 4 of the UN GTR No. 15.

(g) For Class 2 and Class 3 vehicles, all four phases of the WLTC shall be used.

(h) Additive and multiplicative DF factors are valid and are to be applied accordingly.

14.3. Alternative procedure for the Type VI test

As an alternative to the road load coefficients and inertia weight class according to Appendix 7 of Annex 4a of this Regulation the road load coefficients and test mass of WLTP, described in Annex 4 of Amendment 4 of the UN GTR No. 15, may be used.

In this case, the following additional provision apply:

The road load coefficients to be used shall be those for vehicle low (VL). If VL does not exist then the VH road load shall be used. VL and VH are defined in point 4.2.1.1.2. of Sub-Annex 4 to Annex XXI. The dynamometer shall be adjusted to simulate the operation of a vehicle on the road at -7 °C. Such adjustment may be based on a determination of the road load force profile at -7 °C. Alternatively, the driving resistance determined may be adjusted for a 10% decrease of the coast-down time. The technical service may approve the use of other methods for determining the driving resistance.

14.4. Alternative procedure for the OBD test

As an alternative to the Type I test cycle of this Regulation, Type I test cycle described in Annex 6 of Amendment 4 of the UN GTR No. 15 may be used.

In this case, the following additional provision apply:

The reference to the Type I test cycle in section 2.1.3. of Appendix 1 to Annex 11 of this Regulation shall be understood as a reference to the Type I test of Amendment 4 of the UN GTR No. 15 for each individual malfunction to be demonstrated.

For Class 2 and Class 3 vehicles, all four phases of the WLTC shall be used.

The use of additional preconditioning cycles or alternative preconditioning methods shall be documented in the type approval documentation.

14.4.1. The Type I test cycle referred to in paragraph 3.3.3.2. of Annex 11 shall be understood as being the same as the Type 1 test cycle that was used for at least two consecutive cycles after introduction of the misfire faults according to paragraph 6.3.1.2. of Appendix 1 to Annex 11.

14.4.2. Paragraph 6.2.2. of Appendix 1 to Annex 11 shall be understood to read as follows:

‘At the request of the manufacturer, alternative and/or additional preconditioning methods may be used.’”

Annex VII

Adopted amendments to ECE/TRANS/WP.29/GRPE/2018/18

Adopted on the basis of GRPE-77-31 (See para. 10)

A. A new Supplement to the 03, 04 and 05 series of Amendments

Appendix 5 of Annex 4, paragraph 2.3.3.2., amend to read:

"2.3.3.2. A temperature sensor shall be installed immediately before the volume measuring device. This temperature sensor shall have an accuracy and a precision of ± 1 °C and a response time of ~~0,1 less than 1.0~~ seconds **or less** at 62 per cent of a given temperature variation (value measured in **water or** silicone oil)."

B. A new Supplement to the 06 and 07 series of Amendments

Appendix 2 of Annex 4A, paragraph 1.3.5., amend to read:

"1.3.5. Volume Measurement in the Primary Dilution System

The method of measuring total dilute exhaust volume incorporated in the constant volume sampler shall be such that measurement is accurate to $\pm 2\%$ under all operating conditions. If the device cannot compensate for variations in the temperature of the mixture of exhaust gases and dilution air at the measuring point, a heat exchanger shall be used to maintain the temperature to within $\pm 6\text{K}$ of the specified operating temperature.

If necessary, some form of protection for the volume measuring device may be used e.g. a cyclone separator, bulk stream filter, etc.

A temperature sensor shall be installed immediately before the volume measuring device. This temperature sensor shall have an accuracy and a precision of ± 1 °C and a response time of ~~0,1 less than 1.0~~ seconds **or less** at 62 per cent of a given temperature variation (value measured in **water or** silicone oil).

The measurement of the pressure difference from atmospheric pressure shall be taken upstream from and, if necessary, downstream from the volume measuring device.

The pressure measurements shall have a precision and an accuracy of $\pm 0.4\text{kPa}$ during the test."
