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Seventy-eighth session

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

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I. Attendance

1. The Working Party on Pollution and Energy (GRPE) held its seventy-eighth session from 8 to 11 January 2019, 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): Australia, Austria, Canada, China, Czech Republic, France, Germany, Hungary, India, Italy, Japan, Netherlands, Norway, Poland, Republic of Korea, Russian Federation, Spain, Sweden, Switzerland and United Kingdom of Great Britain and Northern Ireland (UK). Experts from the European Commission (EC) also participated. Experts from the following non-governmental organizations (NGOs) took part in the session: Association for Emissions Control by Catalyst (AECC), International Motor Vehicle Inspection Committee (CITA), European Association of Automobile Suppliers (CLEPA/MEMA/JAPIA), European Garage Equipment Association (EGEA), European Association of Internal Combustion Engine Manufacturers (EUROMOT), International Motorcycle Manufacturers Association (IMMA), International Organization of Motor Vehicle Manufacturers (OICA) and Liquid Gas Europe.

II. Adoption of the agenda (agenda item 1)

Documentation: ECE/TRANS/WP.29/GRPE/2019/1
Informal documents GRPE-78-01-Rev.1, GRPE-78-02 and
GRPE-78-11-Rev.3

2. Mr. Rijnders, Chair of GRPE, opened the meeting, welcomed the participants and expressed the best wishes for the New Year. GRPE adopted the provisional agenda of the seventy-eighth session (ECE/TRANS/WP.29/GRPE/2019/1), as updated and consolidated in GRPE-78-11-Rev.3. GRPE took note of GRPE-78-01-Rev.1 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 this GRPE session. Annex III lists IWGs of GRPE, task forces and subgroups, giving details on their Chairs, Secretaries and the end of their mandates.

4. The secretariat introduced GRPE-78-02, announcing that the next GRPE session would take place on from 21 to 24 May 2019 and recalling the corresponding deadline (25 February 2019) 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 May 2019 GRPE session.

5. The Chair recalled the importance of emissions regulations and that, together with the emergence of automated, autonomous and connected vehicles, the work of GRPE remained a high priority of the parties involved in WP.29. He highlighted the need to deliver on the regulatory provisions under the responsibility of GRPE.

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

Documentation: ECE/TRANS/WP.29/1138 and ECE/TRANS/WP.29/1139
Informal document GRPE-78-08

6. The Secretary introduced GRPE-78-08 and reported on relevant items discussed during the 175th and 176th sessions of the World Forum for Harmonization of Vehicle Regulations (WP.29). He referred to ECE/TRANS/WP.29/1138 and ECE/TRANS/WP.29/1139 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/2019/8
Informal documents GRPE-78-10, GRPE-78-16, GRPE-78-20, GRPE-78-22 and GRPE-78-27

7. The expert from OICA introduced ECE/TRANS/WP.29/GRPE/2019/8 and GRPE-78-27 clarifying the relationship between approval levels, reference fuels and particulate number limits for positive ignition engines and to modify the calculation formulae for determining evaporative emissions in accordance with changes already agreed in UN GTR No. 19. He stated that GRPE-78-27 superseded GRPE-78-16 and GRPE-78-16 has therefore not been introduced. He stated that some amendments were about harmonizing national legislation and SAE standards. The Chair insisted that ISO or SAE standards should fit the needs of UN Regulations and not that UN Regulations should align with ISO/SAE standards. The representative from the EC opposed to the change on SCR provisions and accepted the other amendments proposed. The representative from the UK and EC sought clarifications on the use of characters to reflect emission levels. The experts from EC and UK proposed minor corrections to ECE/TRANS/WP.29/GRPE/2019/8 and GRPE-78-27 that GRPE adopted as reproduced in Annex IV.

8. The secretariat introduced GRPE-78-10 correcting omissions in ECE/TRANS/WP.29/2018/148 adopted in the November 2018 session of WP.29. GRPE adopted GRPE-78-10 as reproduced in Annex V.

9. The expert from EC introduced GRPE-78-22 introducing minor changes to the 06 and 07 series of amendments to UN Regulation No. 83. The representative from OICA agreed to the changes and expressed his wish to have the changes included as soon as possible in UN Regulation No. 83. The experts from EC, UK proposed minor corrections to GRPE-78-22 that GRPE adopted as reproduced in Annex VI.

10. GRPE requested the secretariat to submit Annexes IV and VI of the report to WP.29 and Administrative Committee of the 1958 Agreement (AC.1) for consideration and vote at their June 2019 sessions as draft Supplement 13 and 9 to the 06 and 07 series of amendments to UN Regulation No. 83 respectively. GRPE also requested to submit Annex V of the report to WP.29 and AC.1 for consideration and vote at their June 2019 sessions as draft Corrigendum 1 to Supplement 8 to the 07 series of amendments to UN Regulation No. 83.

11. The expert from OICA introduced GRPE-78-20 proposing to amend UN Regulation No.101 to permit the measurement of fuel and energy consumption and CO₂ emissions using road loads which are calculated according to the method used in EU correlation. The representative from EC sought clarifications on the use of CO2MPAS for this proposal. The representative from OICA explained that CO2MPAS formula are expected to be used for the calculation of road load coefficients, without using the CO2MPAS software itself. The representative from EC backed the proposal and requested that the EU JRC be involved in developing the working document. The Chair thanked the representative from OICA for initiating this effort and for making the latest legislative provisions available to all Contracting Parties.

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/GRPE/2019/2
ECE/TRANS/WP.29/GRPE/2019/4
Informal documents GRPE-78-03-Rev.1, GRPE-78-09, GRPE-78-13, GRPE-78-14-Rev.1, GRPE-78-21-Rev.1, GRPE-78-25-Rev.1 and GRPE-78-28

12. The Chair of IWG on the Worldwide harmonized Light vehicles Test Procedures (WLTP) reported on the ongoing activities (GRPE-78-13). He reported on the progress of the different task forces under this IWG and stated that a delay is to be expected in the development of the low temperature test provisions for WLTP.

13. The expert from EC, leading the drafting coordination of IWG on WLTP, introduced ECE/TRANS/WP.29/GRPE/2019/2, GRPE-78-21-Rev.1 and GRPE-78-25-Rev.1 proposing the draft Amendment 5 to UN GTR No. 15. as well as the corresponding report GRPE-78-03-Rev.1 on the development of this amendment.

14. GRPE adopted ECE/TRANS/WP.29/GRPE/2019/2 and GRPE-78-21-Rev.1 as amended by Addendum 1 to this report and requested the secretariat to submit it to WP.29 and the Executive Committee of the 1998 Agreement (AC.3) for consideration and vote at their June 2019 sessions as draft Amendment 5 to UN GTR No. 15. GRPE also adopted the technical report (GRPE-78-03-Rev.1) as reproduced in Annex VII. GRPE requested the secretariat to submit Addendum 1 and Annex VII to WP.29 and AC.3 for consideration and vote at their June 2019 sessions.

15. As introduced by the secretary of the task force on evaporative emissions, GRPE also adopted ECE/TRANS/WP.29/GRPE/2019/4 (amended by GRPE-78-28) as reproduced in Addendum 2 to this report, proposing draft Amendment 2 to the UN GTR No. 19 (WLTP EVAP) as well as the corresponding report on the development of this amendment (GRPE-78-09) as reproduced in Annex VIII. GRPE requested the secretariat to submit Addendum 2 and Annex VIII to WP.29 and AC.3 for consideration and vote at their June 2019 sessions as draft Amendment 2 to UN GTR No. 19.

16. The expert from EC, leading the task force on the transposition of WLTP into a UN Regulation annexed to the 1958 Agreement, introduced GRPE-78-14-Rev.1 on the activities of his group. He reported on an alternative concept to transpose UN GTR No.15 into a UN Regulation to avoid disharmonization by including Level 1a (Europe) in the 08 series of amendment to UN Regulation No. 83. He detailed why the representatives from Japan objected to the proposal during a recent meeting of the task force.

17. He highlighted a request for the work on the transposition to be delayed by six months, with a draft working document to be proposed for the January 2020 session of GRPE. EC and Japan backed this request for a delay.

18. He also underlined the urgency of the task force to work on the definition of the most stringent, harmonized level (so called Level 2). The Chair recalled the need for harmonization of the legal provisions for mutual recognition at the most stringent level. He emphasized that harmonization should not force Contracting Parties to reduce their national level of stringency in emission performance.

19. The representative from EC agreed with the Chair on the need for harmonization and committed the EC to arrange meetings to solve the remaining issues. She also reminded the need to include Real Driving Emissions (RDE) provision within the 58 Agreement to be in line with the latest legislative developments in Europe.

20. The representative from Japan also agreed with the objective of harmonization.

21. The representative from OICA thanked the positive feedback from the chair, EC and Japan on reaching harmonization and reminded GRPE that harmonization had to be technically and economically feasible and insisted industry stakeholders remain available to be involved in any forthcoming discussions.

22. GRPE noted the request for a meeting room for one and half day during the GRPE week in May 2019.

C. Worldwide harmonized Real Driving Emissions test procedure

Documentation: Informal documents GRPE-78-23 and GRPE-78-24

23. The representative from EC introduced GRPE-78-23 detailing the latest activities from IWG on RDE. The Chair congratulated the members of IWG for their dedication and for the fast start of the activities within IWG. GRPE approved the approach to include all Contracting Parties into the work from the start and was looking forward to receiving the next update from IWG during the next GRPE session in May 2019.

24. The representative from EC also presented the draft terms of references for IWG on RDE (GRP-78-24). The timeline has been revised following comments received from WP.29 (ECE/TRANS/WP.29/1139, para. 60), with the updated mandate expiring in January 2021.

25. GRPE endorsed the terms of references for IWG on RDE.

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: Informal document GRPE-78-04

26. The expert from CITA introduced GRPE-78-04 detailing some methods to manipulate emission control devices in light and heavy-duty vehicles. He called for further actions within GRPE to prevent manipulations of emission control systems. The Chair highlighted that GRPE would be the appropriate body to tackle those issues but also recognized the important role that IWG on Periodic Technical Inspection (PTI) had to make proposals to address the issues highlighted by the representative from CITA.

27. The expert from Austria supported the findings and the position from the expert from CITA. He shared the view that Type Approval (TA) and PTI are strongly connected and that activities to better link those two should start as soon as possible. The expert from Poland agreed that most air pollution was from older vehicles, and that fleet renewal must be

accelerated. He acknowledged that PTI cannot capture all tampering as it stood, and that a more systematic use of Mini Portable Emission Measurement System (PEMS) might have helped solve the issue. The expert from OICA called for a holistic approach, that includes individual behavioural aspects to tampering.

28. The representative from EC stated that she was well aware of the issue and highlighted the fact that PTI tests had historically been developed elsewhere and included in TA legislation as Type II tests, as it required a simple and cheap test procedure. The secretariat reminded that all parties, including NGOs were allowed to submit proposals under the 1958 Agreement.

29. The Chair recalled that the mandate of GRPE also include legal provisions for the whole life of the vehicle and called for discussions on improvements to the PTI test to take place in the forthcoming sessions of GRPE.

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))

30. GRPE had not received any new proposals for discussion under this agenda item.

C. Worldwide provisions for Heavy Duty vehicles Fuel Economy

Documentation: Informal document GRPE-78-15

31. The expert from OICA introduced GRPE-78-15 and summarized the workshop on the harmonization of heavy duty fuel economy measurements held by OICA earlier during the GRPE week. He thanked the secretariat for the assistance in organizing the event. He highlighted the high level of interest shown by all parties involved in the workshop.

32. The Chair encouraged GRPE to start activities in this topic. He suggested a follow-up workshop in January 2020 to gauge progress. The expert from OICA confirmed activities on this topic is of high priority to them, and he confirmed his willingness to organize such a workshop prior to the January 2020 session of GRPE.

VI. UN Regulations Nos. 24 (Visible pollutants, measurement of power of C.I. engines (Diesel smoke)), 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/2019/3
ECE/TRANS/WP.29/GRPE/2019/6
ECE/TRANS/WP.29/GRPE/2019/7
Informal document GRPE-78-07

33. The expert from Italy presented ECE/TRANS/WP.29/GRPE/2019/3 which introduced a reference to WLTP as an alternative for emission tests stated in UN Regulation No. 115. GRPE adopted ECE/TRANS/WP.29/GRPE/2019/3.

34. GRPE requested the secretariat to submit ECE/TRANS/WP.29/GRPE/2019/3 to WP.29 and AC.1 for consideration and vote at their June 2019 sessions as draft Supplement 8 to UN Regulation No. 115.

35. The expert from OICA introduced ECE/TRANS/WP.29/GRPE/2019/6 that aligns the provisions of the 03 series of amendments to UN Regulation No. 24 with UN Regulation No. 85 on engine power measurement. GRPE adopted ECE/TRANS/WP.29/GRPE/2019/6.

36. The expert from the Russian Federation introduced GRPE-78-07 on a proposal to extend the scope of UN Regulation No. 24 to agricultural vehicles of Category T. The expert from EC stated that vehicles of Category T were covered by UN Regulations No. 96 and 120 instead of UN Regulation No. 24. The representatives from Italy, UK, EC and EUROMOT expressed positions against the proposal. GRPE rejected the adoption of GRPE-78-07.

37. GRPE requested the secretariat to submit ECE/TRANS/WP.29/GRPE/2019/6 to WP.29 and the AC.1 for consideration and vote at their June 2019 sessions as draft Supplement 5 to the 03 series of amendments to UN Regulation No. 24.

38. The expert from OICA presented ECE/TRANS/WP.29/GRPE/2019/7 proposing to amend, in UN Regulation No. 85, the wording of the description of auxiliaries to be fitted for testing to reduce potential testing burden. The experts from Netherlands, France, UK and EC did not see the benefit in some part of the proposal and would only support the proposed amendments contained in the first paragraph of the proposal. GRPE adopted ECE/TRANS/WP.29/GRPE/2019/7 as amended by Annex IX.

39. GRPE requested the secretariat to submit Annex IX of the report to WP.29 and the AC.1 for consideration and vote at their June 2019 sessions as draft Supplement 9 to UN Regulation No. 85.

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)

40. GRPE had not received any new proposals for discussion under this agenda item.

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

41. GRPE did not receive any new proposal to amend UN GTR No. 11.

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

Documentation: Informal document GRPE-78-12-Rev.1

42. The Chair of IWG on Particle Measurement Programme (PMP) presented a status report on activities on exhaust and non-exhaust particle emissions (GRPE-78-12-Rev.1). He informed GRPE about a change of secretary of IWG and informed GRPE about a change in timeline to deliver more rapidly a methodology to measure sub-23 nm exhaust particles. He noted that the timeline for the other activities of the group were not impacted by this anticipated delivery for sub-23 nm particles measurement provisions.

43. The representative from EC welcomed the decision to prioritize the work on the sub-23 nm exhaust particles measurement. She emphasized that EC would do their best to provide a drafting coordinator to assist the activities of IWGs on PMP, RDE and WLTP.

44. GRPE acknowledged the progress made by IWG on PMP and noted that the group had not requested a meeting room for the GRPE week in May 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)

45. 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 document GRPE-78-26

46. The Chair of IWG on Environmental and Propulsion Performance Requirements for L-category vehicles (EPPR) presented a status report (GRPE-78-26). He updated GRPE on the progress in IWG on OBD2 and introduced two topics that IWG might be willing to tackle in the future, dealing with durability and propulsion performance of L-category vehicles.

47. GRPE acknowledged the progress made by IWG on EPPR and noted the request for a meeting room for one-and-half days during the GRPE week in May 2019.

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)

Documentation: Informal document GRPE-78-31

48. The Chair of IWG on EPPR briefly introduced the latest draft amendment to UN GTR No. 2 that is expected to be submitted as a working document for the next session of GRPE in May 2019.

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

Documentation: Informal document GRPE-78-30-Rev.1

49. The Secretary of IWG on Electric Vehicles and the Environment (EVE) presented a status report on the on-going activities of IWG (GRPE-78-30-Rev.1).

50. She explained that the ongoing work on UN GTR on Determination of Electrified Vehicle Power (DEVP) had been delayed due to unexpected and inconsistent results obtained during the validation testing of the power measurement approaches, mainly regarding its reproducibility and repeatability. The delay in developing the UN GTR was expected to be at least half a year, and IWG had still not agreed on a new timeline for developing the draft proposal.

51. She reported on the activity on battery durability, where the activities had progressed well. She added that a consensus on the next steps for this research activities was still to be found.

52. She informed GRPE that IWG on EVE had made a presentation to the Cleaner Electricity Production (CEP) expert group of the Energy Division of ECE to seek their partnership on the project to assess upstream emissions from electric vehicles. The Secretary of GRPE agreed to follow-up with colleagues from ECE Energy Division.

53. GRPE reviewed and endorsed the request for authorization to develop the provisions on DEVP as a new UN GTR (ECE/TRANS/WP.29/2019/33), to be adopted during the March 2019 session of WP.29.

54. The representative from EC highlighted that the work done by IWG was very important, and that the activities should be undertaken at GRPE. She insisted on further efforts to finish the activities on time or risk that activities would have to be held at the national / regional level.

55. GRPE acknowledged the progress of IWG on EVE and encouraged the group to deliver on the important activities that are needed in many Contracting Parties. GRPE noted the request for a meeting room for half a day during the GRPE week in May 2019.

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

Documentation: ECE/TRANS/WP.29/GRPE/2019/5
Informal documents GRPE-78-17, GRPE-78-18 and GRPE-78-19

56. The expert from EC with the support of the expert from UK introduced ECE/TRANS/WP.29/GRPE/2019/5 clarifying the definition of peripheral devices. GRPE adopted ECE/TRANS/WP.29/GRPE/2019/5 and requested the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their June 2019 sessions as draft Amendment 1 to Mutual Resolution No. 2 (M.R.2).

57. The representative from OICA introduced GRPE-78-17, GRPE-78-18 and GRPE-78-19 proposing a scheme to maintain M.R.2. The Chair acknowledged the potential benefits of maintaining M.R.2 but required more time to find the best way forward. He invited each Contracting Party to consult internally on how to best perform this activity in the future. The representative from EC supported the future work on such activity.

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

Documentation: Informal documents GRPE-78-05-Rev.1 and GRPE-78-06

58. The GRPE Ambassador to IWG on International Whole Vehicle Type Approval (IWVTA) introduced GRPE-78-05-Rev.1 which lists the GRPE-related UN Regulations and their status for a potential inclusion in UN Regulation No. 0. The secretariat informed GRPE that GRPE, as a formal body under WP.29, can decide on which UN Regulations to include, taking the opinion of IWG on IWVTA into account.

59. The representatives from Switzerland, UK and EC supported the inclusion of UN Regulation No. 133 into UN Regulation No. 0. The Chair also indicated that UN Regulation is part of the European Union Whole Vehicle Type Approval (EUWVTA), and therefore there should not weaken national legislations because of IWVTA.

60. The representative from Japan did not support the introduction of UN Regulations Nos. 24, 49 and 133 into UN Regulation No. 0.
61. The secretariat and Chair informed GRPE that candidate UN Regulations to UN Regulation No. 0 are reviewed annually and that the possibility of Limited IWVTA (L-IWVTA) existed for Contracting Parties not willing to accept Uniform IWVTA (U-IWVTA).
62. GRPE requested Contracting Parties to raise their interest at the next IWVTA meeting in March 2019 to work on UN Regulations, such as UN Regulations Nos. 24 and 49 that need to be split to be included into UN Regulation No. 0.
63. The GRPE Ambassador to IWG on IWVTA introduced GRPE-78-06 which reviews the provisions about approval numbering in UN Regulations developed and maintained by GRPE. He highlighted, for example, the impossibility for certain characters to be used in approval numbering such as “*” that were used in UN Regulations Nos. 115 and 143 to specify fuel type.
64. The Chair asked each Contracting Party to request their Type Approval Authorities if the approval numbering was in compliance with Schedule 4 of the 58 Agreement.
65. The representatives from France, the Netherlands and UK committed themselves to internally verify this compliance.

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

Documentation: Informal document GRPE-78-29

66. The Chair of IWG on Vehicles Interior Air Quality (VIAQ) presented a status report on the ongoing activities of the group (GRPE-78-29). He informed GRPE about the latest progress and the items agreed during the last IWG meetings, highlighting that the amendments to Mutual Resolution No. 3 were being developed according to schedule.
67. GRPE acknowledged the progress made by IWG on VIAQ and noted the request for no meeting room during the GRPE week in May 2019.

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

68. The representative of EC informed GRPE that the EU had started the post-EURO 6 / VI legislative process, that was expected to last for about two years. She highlighted that the work undertaken at GRPE on, among other important activities, low temperature test, particulates measurement and electric-vehicle related activities were of paramount importance to the process and she encouraged the work to be performed by GRPE and finalized by 2020.
69. GRPE agreed to further discuss the issue during the next session in May 2019 to learn more about the potential impact of the EU process on post EURO 6 / VI on GRPE activities.

XV. Election of Officers (agenda item 14)

70. As agreed during the last session of GRPE in June 2018 (ECE/TRANS/WP.29/GRPE/77, para. 61), the election for Vice-Chair was at the beginning of the session. The secretariat recalled an email sent in December 2018 reminding Contracting Parties about the vote during the January 2019 session of GRPE and that applications had not been received. The secretariat consequently proposed to GRPE to hold the election of officers for Chair and Vice-Chair(s), in compliance with Rule 37 of the Rules

of Procedures (TRANS/WP.29/690, as amended), during the next session of GRPE in May 2019. GRPE agreed to this proposal.

XVI. Any other business (agenda item 15)

71. GRPE noted that Ms. C. Hosier would no longer attend GRPE as secretary of IWG on PMP, GRPE thanked her for her excellent contributions and expertise in the work of GRPE during the last years and wished her all the best in her future endeavours.

72. GRPE thanks Mr. F. Guichard for performing the interim secretariat duties until the successor of Mr. M. Gangonells had been appointed.

XVII. Provisional agenda for the next session

A. Next GRPE session

73. The next GRPE session, including IWG meetings, is scheduled to be held in Geneva, Palais des Nations, starting on Monday, 20 May 2019, from 9.30 a.m. until Friday, 24 May 2019, at 5.30 p.m., subject to confirmation by the secretariat (see GRPE-79-01). Interpretation services would be provided from 21 May (2.30 p.m.) to 24 May (12.30 p.m.) 2019.

B. Provisional agenda for the next proper GRPE session

74. 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. 24 (Visible pollutants, measurement of power of C.I. engines (Diesel smoke)), 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) 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);
 - (c) Environmental and Propulsion Performance Requirements (EPPR) for L-category vehicles.
- 9. Electric Vehicles and the Environment (EVE);
 - (a) UN GTR on the Determination of Electrified Vehicle Power (DEVPP);
 - (b) other activities of IWG on 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

- 75. 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, 20 May 2019	Worldwide harmonized Light vehicles Test Procedure	WLTP	9.30 a.m. – 12.30 p.m. 2.30 p.m. – 5.30 p.m.
	WLTP Sub Group EV	SG EV	9.30 a.m. – 12.30 p.m.
Tuesday, 21 May 2019	Electric Vehicles and the Environment	EVE	2.30 p.m. – 5.30 p.m.
	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.
Wednesday, 22 May 2019	Environmental and Propulsion Performance Requirements of L-category vehicles	EPPR	9.30 a.m. – 12.30 p.m.
	Global Real Driving Emissions	RDE	9.30 a.m. – 12.30 p.m.

76. 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>
1r1	(Secretariat) Informal meetings in conjunction with the GRPE (proper) session: schedule and rooms reservation	A
2	(Secretariat) General information	A
3r1	(WLTP) Technical report on the development of Amendment 5 to UN GTR No. 15	B
4	(CITA) Tampering of Emission Control Systems	A
5	(IWVTA Ambassador) Candidate Regulations for IWVTA	C
6	(IWVTA Ambassador) Compliance of GRPE Regulations with Schedule 4	C
7	(Russia) Proposal amendments to UN Regulation No. 24	A
8	(Secretariat) Highlights of the WP.29 Sessions of June and November 2018	A
9	(WLTP) Technical report on the development of Amendment 2 to UN GTR No. 19	B
10	(Secretariat) Proposal for Corrigendum 1 to Revision 5 – Amendment 8 to UN Regulation No. 83	B
11r3	(Secretariat) Provisional Annotated Agenda	A
12r1	(PMP) IWG on PMP status report	A
13	(WLTP) IWG on WLTP status report	A
14	(WLTP) Transposition Task Force status report	A
15	(OICA) HDV FE workshop highlights	A
16	(OICA) Amendments to ECE/TRANS/WP.29/GRPE/2019/8 and to UN Regulation No.83	A
17	(OICA) Request for a Task Force to Maintain M.R.2	A
18	(OICA) Appendix 1 for MR2 - Hybrid definitions	A
19	(OICA) Appendix 2 for MR2 - Definitions	A
20	(OICA) Proposal for Amendment of UN R101-NEDC2	A
21r1	(WLTP) Proposal for Amendments to Amendment 5 to UN GTR No.15	B
22	(EC) Proposal for amendments to the 06 and 07 Series of Amendments to UN Regulation No. 83	B
23	(RDE) IWG on RDE status report	A
24	(RDE) Proposal for the Terms of Reference and rules of procedure for the informal group on Real Driving Emissions (RDE-IWG)	A
25r1	(WLTP) Consolidated Proposal for Amendment 5 to UN GTR No.15	B
26	(EPPR) IWG on EPPR status report	A
27	(OICA) Amendments to ECE/TRANS/WP.29/GRPE/2019/8 and to UN Regulation No.83	B
28	(WLTP) Proposal for editorial corrections to ECE/TRANS/WP29/GRPE/2019/4	B
29	(VIAQ) IWG on VIAQ status report	A
30r1	(EVE) IWG on EVE status report	A
31	(EPPR) Draft proposal for Amendments to UN GTR No. 2	C
32	(EC) Towards post-EURO 6/VI	A

Notes:

- A Consideration by GRPE completed or to be superseded;
- B Adopted;
- C Further consideration on the basis of a revised proposal.

Annex II

Informal meetings held in conjunction with the GRPE session

<i>Date</i>	<i>Time</i>	<i>Group</i>	<i>Acronym</i>
7 January 2019	9:30 a.m. - 12:30 p.m.	Worldwide harmonized Light vehicles Test Procedure	WLTP
	2:30 p.m. - 5:30 p.m.		
	9:30 a.m. - 12:30 p.m.	Heavy Duty Fuel Economy measurement Workshop *	HDFE
	2:30 p.m. - 5:30 p.m.		
8 January 2019	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
	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
9 January 2019	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.		
	9:30 a.m. - 12:30 p.m.	Global Real Driving Emissions	RDE
	2:30 p.m. - 5:30 p.m.		
	9:30 a.m. - 12:30 p.m.	EVE Sub-Group on System Power	SG SP
	2:30 p.m. - 5:30 p.m.	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	Rainer Vogt rvogt@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
Global Real Driving Emissions (RDE) (group)	Panagiota Dilara, Panagiota.DILARA@ec.europa.eu Yoshiaki Kono (vice-Chair), kohno-y2jc@mlit.go.jp Junhong Park (vice-Chair) pjhy98@korea.kr	Noriyuki Ichikawa (co-Technical Secretary), noriyuki_ichikawa@mail.toyota.co.jp Pablo Mendoza Villafuerte (co-Technical Secretary), pablo.mendoza-villafuerte@cnhind.com	January 2021

Annex IV

Adopted amendments to ECE/TRANS/WP.29/GRPE/2019/8

Adopted on the basis of GRPE-78-27, as amended (see para. 7)

A new Supplement to the 07 series of amendments to UN Regulation No. 83

Paragraph 5.2., Table A, footnote 7, amend to read:

"⁷ Upon the choice of the manufacturer vehicles with positive and compression ignition engines may be tested with either E5 or E10 and either B5 or B7 fuels, respectively. **This decision shall be reflected where applicable in the approval character as described in Table A3/1**~~However: – not later than sixteen months after the dates set out in point 12.2.1., new type approvals shall only be performed with E10 and B7 fuels; – not later than as from dates set out in point 12.2.4., all new vehicles shall be approved with E10 and B7 fuels.~~ "

Paragraph 5.3.1.4., Table 1, footnote 2, amend to read:

"² ~~Until three years after the dates specified in paragraphs 12.2.1. and 12.2.2. of this Regulation for new type approvals and new vehicles respectively, a~~ A particulate number emission limit of 6.0×10^{12} #/km shall apply to PI direct injection vehicles upon the choice of the manufacturer. **This decision shall be reflected where applicable in the approval character as described in Table A3/1**"

Insert a new paragraph 12.2.5., to read:

"**12.2.5. From the entry into force of this supplement [number to be inserted] the type approvals according to the characters ZD, ZE and ZF shall be considered to be the latest level for the purposes of mutual recognition for their respective vehicle categories.** "

Paragraph 12.3.1., amend to read:

"12.3.1. Contracting Parties applying this Regulation may ~~continue to~~ grant approvals to those vehicles which comply with any previous series of amendments, or to any level of this Regulation, provided that the vehicles are intended for sale or for export to countries that apply the relating requirements in their national legislations. **'Any level of this regulation' shall also be understood to mean any approval character in Table A3/1.** "

Annex 3, footnote to Table A3/1, amend to read:

"Emissions standard key

- A Emission requirements according to the limits in Table 1 of paragraph 5.3.1.4. of this Regulation, but allowing **complying with** the preliminary values for particulate numbers for PI vehicles as detailed in footnote 2 to that table **and using any applicable reference fuel**;
- B Emission requirements according to the limits in Table 1 of paragraph 5.3.1.4. of this Regulation, including **complying with** the final particulate number standards for PI vehicles **in the table without reference to footnote 2** and use of E10 and B7 reference fuel (where applicable). "

A new Supplement to the 06 and 07 series of amendments to UN Regulation No. 83

Annex 7, paragraph 4.2.1., amend to read:

"4.2.1. Variable-volume enclosure

The variable-volume enclosure expands and contracts in response to the temperature change of the air mass in the enclosure. Two potential means of accommodating the internal volume changes are movable panel(s), or a bellows design, in which an impermeable bag or bags inside the enclosure expand(s) and contract(s) in response to internal pressure changes by exchanging air from outside the enclosure. Any design for volume accommodation shall maintain the integrity of the enclosure as specified in Appendix 1 to this annex over the specified temperature range.

Any method of volume accommodation shall limit the differential between the enclosure internal pressure and the barometric pressure to a maximum value of ± 5 ~~kPa~~ **hPa**.

The enclosure shall be capable of latching to a fixed volume. A variable volume enclosure shall be capable of accommodating a +7 per cent change from its "nominal volume" (see paragraph 2.1.1. of Appendix 1 to this annex), taking into account temperature and barometric pressure variation during testing. "

Annex 7, paragraph 4.6.2., amend to read:

"4.6.2. The accuracy of the pressure recording system shall be within ± 2 ~~0.3~~ **0.3** kPa and the pressure shall ~~be capable of being resolved to ± 0.2~~ **have resolution of 0.025** kPa. "

Delete Annex 7, paragraphs 4.9. and 4.9.1.:

~~"4.9. Additional equipment~~

~~4.9.1. The absolute humidity in the test area shall be measurable to within ± 5 per cent. "~~

Annex 7, paragraph 6.1., amend to read:

"6.1. **Calculation of evaporative test results**

6.1.1. The evaporative emission tests described in paragraph 5. of this annex allow the hydrocarbon emissions from the diurnal and hot soak phases to be calculated. Evaporative losses from each of these phases is calculated using the initial and final hydrocarbon concentrations, temperatures and pressures in the enclosure, together with the net enclosure volume. The formula below is used:

$$M_{HC} = k \cdot V \cdot 10^{-4} \left(\frac{C_{HC,f} \cdot P_f}{T_f} - \frac{C_{HC,i} \cdot P_i}{T_i} \right) + M_{HC,out} - M_{HC,i}$$

Where:

M_{HC} = hydrocarbon mass in grams,

$M_{HC,out}$ = mass of hydrocarbon exiting the enclosure, in the case of fixed volume enclosures for diurnal emission testing (grams),

$M_{HC,i}$ = mass of hydrocarbon entering the enclosure, in the case of fixed volume enclosures for diurnal emission testing (grams),

- C_{HC} = measured hydrocarbon concentration in the enclosure (ppm volume in C1 equivalent),
- V = net enclosure volume in cubic metres corrected for the volume of the vehicle, with the windows and the luggage compartment open. If the volume of the vehicle is not determined a volume of 1.42 m³ is subtracted,
- T = ambient chamber temperature, in K,
- P = barometric pressure in kPa,
- H/C = hydrogen to carbon ratio,
- k = $1.2 \cdot (12 + H/C)$;

Where:

- i = is the initial reading,
- f = is the final reading,
- H/C = is taken to be 2.33 for diurnal test losses,
- H/C = is taken to be 2.20 for hot soak losses.

6.1.2. As an alternative to the equation in paragraph 6.1.1. of this Annex, for variable volume enclosures the following equation may be used at the choice of the manufacturer:

$$M_{HC} = k \times V \times \frac{P_i}{T_i} (C_{HCf} - C_{HCi})$$

where:

- M_{HC} = hydrocarbon mass in grams,
- C_{HC} = measured hydrocarbon concentration in the enclosure (ppm volume in C1 equivalent),
- V = net enclosure volume in cubic metres corrected for the volume of the vehicle, with the windows and the luggage compartment open. If the volume of the vehicle is not determined a volume of 1.42 m³ is subtracted;
- T_i = initial ambient chamber temperature, in K,
- P_i = initial barometric pressure in kPa,
- H/C = hydrogen to carbon ratio,
- H/C = is taken to be 2.33 for diurnal test losses;
- H/C = is taken to be 2.20 for hot soak losses;
- k = is $1.2 \times 10^{-4} \times (12 + H/C)$, in (g × K)/(m³ × kPa);"

Annex 7, Appendix 1, paragraph 2.4., amend to read:

"2.4. **Calculations of evaporative test results**

2.4.1. The calculation of net hydrocarbon mass change within the enclosure is used to determine the chamber's hydrocarbon background and leak rate. Initial and final readings of hydrocarbon concentration, temperature and barometric pressure are used in the following formula to calculate the mass change.

$$M_{HC} = k \cdot V \cdot 10^{-4} \left(\frac{C_{HC,f} \cdot P_f}{T_f} - \frac{C_{HC,i} \cdot P_i}{T_i} \right) + M_{HC,out} - M_{HC,i}$$

Where:

- M_{HC} = hydrocarbon mass in grams,
 $M_{HC,out}$ = mass of hydrocarbon exiting the enclosure, in the case of fixed volume enclosures for diurnal emission testing (grams),
 $M_{HC,i}$ = mass of hydrocarbon entering the enclosure when a fixed volume enclosure is used for diurnal emissions (grams),
 C_{HC} = hydrocarbon concentration in the enclosure (ppm carbon (Note : ppm carbon = ppm propane x 3)),
 V = enclosure volume in cubic metres,
 T = ambient temperature in the enclosure, (K),
 P = barometric pressure, (kPa),
 k = 17.6

Where:

- i = is the initial reading,
 f = is the final reading,

2.4.2. As an alternative to the equation in paragraph 2.4.1. of this Annex, for variable volume enclosures the following equation may be used at the choice of the manufacturer:

$$M_{HC} = k \times V \times \frac{P_i}{T_i} (C_{HCf} - C_{HCi})$$

where:

- M_{HC} = hydrocarbon mass in grams,
 C_{HC} = measured hydrocarbon concentration in the enclosure (ppm volume in C_1 equivalent),
 V = net enclosure volume in cubic metres,
 T_i = initial ambient chamber temperature, in K,
 P_i = initial barometric pressure in kPa,
 k = is 17.6"

Annex V

Adopted proposal for Corrigendum 1 to the Supplement 08 to the 07 series of Amendment to UN Regulation No. 83

Adopted on the basis of GRPE-78-10 (see para. 8)

Annex 7, paragraph 7.4.4.3., correct to read:

"7.4.4.3. At the request of the manufacturer an alternative purge ~~test~~ **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., correct 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 4~~ **Table A4a/1** and Figure A4a/1 in Annex 4a to this Regulation."

Appendix 1 to Annex 11, paragraph 6.5.3.5., correct 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 standardisation 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., correct 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., correct 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’²;
- 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>	–Pure electric –Hybrid Switch-in position	–Pure fuel consuming –Hybrid Switch-in position	–Pure electric –Pure fuel consuming –Hybrid Switch-in position	–Hybrid mode n¹ ... –Hybrid mode m¹ Switch-in position
	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 mode ³	

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 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 VI

Adopted amendments to GRPE-78-22

Adopted on the basis of para. 9

A. A new Supplement to the 06 series of amendments to UN Regulation No. 83

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

"6.5.3.5. The connection interface between the vehicle and the diagnostic tester must be standardised and must meet all the requirements of ISO DIS 15031-3 "Road vehicles – Communication between vehicle and external test equipment for emissions-related diagnostics – Part 3: Diagnostic connector and related electrical circuits: specification and use", dated 1 November 2001. The installation position must be subject to agreement of the ~~administrative department~~ **Type Approval Authority** such that it is readily accessible by service personnel but protected from tampering by non-qualified personnel."

B. A new Supplement to the 07 series of amendments to UN Regulation No. 83

Paragraph 5.2.1., amend to read:

"5.2.1. Positive ignition engine-powered vehicles and hybrid electric vehicles equipped with a positive ignition engine shall be subject to the following tests:

- Type I (verifying the average exhaust emissions after a cold start);
- Type II (carbon monoxide emission at idling speed);
- Type III (emission of crankcase gases);
- Type IV (evaporation emissions);
- Type V (durability of anti-pollution devices);
- Type VI (verifying the average low ambient temperature carbon monoxide and hydrocarbon exhaust emissions after a cold start;
- OBD-test;
- ~~Engine power test."~~

Paragraph 5.2.2., amend to read:

"5.2.2. Positive ignition engine-powered vehicle and hybrid electric vehicles equipped with positive ignition engine fuelled with LPG or NG/biomethane (mono or bi-fuel) shall be subjected to the following tests (according to Table A):

- Type I (verifying the average exhaust emissions after a cold start);
- Type II (carbon monoxide emissions at idling speed);
- Type III (emission of crankcase gases);
- Type IV (evaporative emissions), where applicable;
- Type V (durability of anti-pollution devices);
- Type VI (verifying the average low ambient temperature carbon monoxide and hydrocarbon exhaust emissions after a cold start), where applicable,

OBD test;

~~Engine power test."~~

Paragraph 13., amend to read:

- "13. The Contracting Parties to the 1958 Agreement which apply this Regulation shall communicate to the United Nations Secretariat the names and addresses of the Technical Services responsible for conducting approval tests and of the Type Approval Authorities which grant approval and to which forms certifying approval or extension, or refusal or withdrawal of approval, ~~or extension or refusal or withdrawal of approval~~, issued in other countries, are to be sent."

Appendix 3, paragraph 6., amend to read:

- "6. Plan of remedial measures
- 6.1. The Type Approval Authority shall request the manufacturer to submit a plan of remedial measures to remedy the non-compliance when:
- 6.1.1. For tailpipe emissions more than one vehicle is found to be an outlying emitter that meets either of the following conditions:
- (a) The conditions of paragraph 3.2.2. of Appendix 4 to this Regulation and where both the Type Approval Authority and the manufacturer agree that the excess emission is due to the same cause; or
- (b) The conditions of paragraph 3.2.3. of Appendix 4 to this Regulation where the Type Approval Authority has determined that the excess emission is due to the same cause.
- ~~The Type Approval Authority shall request the manufacturer to submit a plan of remedial measures to remedy the non-compliance.~~
- ..."

Annex 10a, paragraph 1.3. footnote 3, amend to read:

"³ The hydrogen shall not contain dust, sand, dirt, gums, oils, or other substances in an amount sufficient to damage the fuelling station equipment ~~of~~ **or** the vehicle (engine) being fuelled."

Annex 11 Appendix 1, paragraph 6.5.3.4., amend to read:

- "6.5.3.4. Basic diagnostic data, (as specified in paragraph 6.5.1.) and bi-directional control information shall be provided using the format and units described in the standard listed in paragraph 6.5.3.2.(a) of this appendix and must be available using a diagnostic tool meeting the requirements of the standard listed in paragraph 6.5.3.2.(b) of this appendix.
- The vehicle manufacturer shall provide to a national standardisation 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 ~~Regulation~~ **appendix** but related to this Regulation."

Annex 11 Appendix 1, paragraph 6.5.3.6., amend to read:

- "6.5.3.6. The connection interface between the vehicle and the diagnostic tester shall be standardised and shall meet all the requirements of the standard listed in paragraph 6.5.3.2.(c) of this appendix. The installation position shall be subject to agreement of the ~~administrative department~~ **Type Approval Authority** such

that it is readily accessible by service personnel but protected from tampering by non-qualified personnel."

C. A new Supplement to the 06 and 07 series of amendments

Appendix 5, paragraph 2., amend to read:

"2. The manufacturer shall compile all the information needed to comply with the requirements of ~~this annex~~ **paragraph 9 and Appendices 3, 4 and 5 of this Regulation**. The Type Approval Authority may also take information from surveillance programmes into consideration."

Appendix 6, paragraph 9.4., amend to read:

"9.4. The instructions shall specify that use of, and refilling of, a required reagent of the correct specifications is mandatory for the vehicle to comply with ~~the~~ **its** certificate of conformity ~~issued for that type of vehicle type~~."

Annex 1, paragraph 3.2.12.2.6.2., amend to read:

"3.2.12.2.6.2. Type and design of particulate trap ~~and design~~:"

Annex 5, paragraph 3.1., amend to read:

"3.1. The sampling probe shall be inserted **into the exhaust pipe** to a depth of at least 300 mm **or** into the pipe connecting the exhaust with the sampling bag and as close as possible to the exhaust."

Annex 7, paragraph 5.1.3.3., amend to read:

"5.1.3.3. The canister is connected to a fuel tank, possibly an external one, filled with reference fuel, to 40 per cent ~~volume~~ **capacity** of the fuel tank(s)."

Annex 11, paragraph 2.2., amend to read:

"2.2. "Vehicle type" means a category of power-driven vehicles which do not differ in ~~such~~ essential engine and OBD system characteristics."

Annex VII

Technical report on the development of Amendment 5 to UN GTR No. 15 on WLTP

Adopted on the basis of GRPE-78-03-Rev.1 (See para. 14)

Technical report on the development of Amendment 5 to UN GTR No. 15 on Worldwide harmonized Light vehicles Test Procedures (WLTP)

I. Mandate

1. Amendment 5 to global technical regulation (GTR) No. 15 was developed by the Informal Working Group (IWG) on Worldwide harmonized Light vehicles Test Procedures (WLTP) in the framework of Phase 2 of the development of GTR No. 15. The Executive Committee (AC.3) of the 1998 Agreement adopted the authorization to develop Phase 2 of GTR No. 15 at its June 2016 session (ECE/TRANS/WP.29/AC.3/44).

II. Objectives

2. The definition of a *category 1-1 vehicle* was modified to align with that in Special Resolution No. 1.
3. The definition of an *on-board charger* was introduced.
4. The method of rounding figures was standardised. The GTR also specifies when and how intermediate results may be rounded.
5. The annexes concerning the WLTC, and gear selection and shift point determination for vehicles equipped with manual transmissions were modified to have consistent terminology and for improvement of the text.

Tables were introduced making examples of shifting procedures more understandable.

Lessons learned from the Round Robin Tournament were incorporated into GTR 15. Downshift sequences were modified to improve driveability, and the engine speed range of the power curve was changed in order to make it compatible to the measurement method of the power curve. These improvements were incorporated into the ACCESS tool. The ACCESS gearshift calculation tool was developed by the gearshift and cycle issues task force leader on behalf of the informal working group as an aid for users during the development phase of the GTR. It may also be used as a reference for other calculation tools.

6. The text on permissible wind conditions when using stationary and on-board anemometry for coastdown purposes was rewritten for reasons of clarity.

A manufacturer may, at its option, perform coastdowns at a low temperature.

Coastdowns terminology was improved by introducing terms such as run pairs and referring specifically to vehicle coastdown runs.

The use of split runs was clearly defined.

Due to uncertainty associated with data validation and for practical reasons, the total number of run pairs during coastdown testing shall be limited to 30 including rejected run pairs.

7. In order to reduce the testing burden, the wind tunnel method may be used to test the representative vehicle in case of a road load matrix family if the facilities are approved by a responsible authority.

8. When using the wind tunnel method, every combination of wind speeds used for the determination of road load values shall be validated separately. The aerodynamic force shall be measured at two different wind speeds. These wind speeds depend on the class of test vehicle.

The equations for the calculation of aerodynamic force were modified to take the two wind speeds into consideration. The aerodynamic force shall also be calculated for velocity-dependent movable aerodynamic body parts at the reference speed point concerned.

9. The amount of hydrogen in grams not consumed during testing of fuel cell hybrid vehicles may or may not be taken into consideration. The analysis of specific contaminants depending on the production process were exempted. A vehicle manufacturer will be required to provide the responsible authority reasons for exempting specific contaminants.

10. The frequency at which response factors are to be determined has been defined. The test gases methane and purified air to be used and the recommended response factors have also been reintroduced into the UN GTR.

11. Dilution flow of a CVS must not be calibrated. This requirement was removed from the table listing CVS calibration intervals as the contribution of the pollutants in the dilution air to the diluted exhaust mass emissions are corrected by the appropriate equation the UN GTR.

12. The time measurement system of a dynamometer was defined as a certain percentage after a minimum operation time.

13. The response time of a CVS temperature sensor was increased to 1 second or less as 0.1 seconds are not considered to be practical.

14. The equation to correct the weights of the sample and reference filters for their buoyancy in air was corrected.

15. The calibration intervals of measuring instruments was brought up to date to reflect current practice.

16. The extension of the CO₂ interpolation range of vehicles L and H using a mid-vehicle M as applied to EVs and pure ICEs was clarified.

During the development phases of WLTP, testing showed that a range of 30 g/km, and possibly to 40 g/km, was linear and allowed for proper interpolation.

Initially it was established that there were a significant number of families in the range of 30 to 40 g/km CO₂ which had to be separated into two families. The first engineering estimates on the maximum range of interpolation families were too conservative. This led to a high testing burden and to a lack of transparency in the approval process.

Using the concept for EVs as a basis, a proposal was developed for pure ICEs to use a mid-vehicle M to check for linearity and to extend the maximum range of the interpolation.

The restriction will not apply for road load matrix families when the calculation of the road load is based on the default road load.

17. After numerous discussions, the requirement to measure engine oil and coolant temperatures at the start of the Type 1 test remains unchanged from Amendment 4.

18. A manufacturer may utilise an alternative interpolation calculation procedure in the case that the interpolation method creates unrealistic phase-specific CO₂ results or an unrealistic road load curve.

19. New text was introduced regarding the application and calculation of vehicle-specific drive trace indices. The indices for pure ICE vehicles, NOVC-HEVs, NOVC-FCHVs shall be calculated for the applicable test cycle and shall meet specified limits. The indices for OVC-HEVs must also be calculated for the applicable test cycle and shall meet specified limits for the charge-sustaining test. In the case of the charge-depleting test, the indices for OVC-HEVs shall be calculated according to the number of test cycles driven.

For the city cycle test for OVC-HEVs, the drive trace indices shall be calculated depending on the number of cycles driven before the combustion engine starts.

For PEVs, the indices shall be calculated differently depending on whether a consecutive cycle test, a shortened Type 1 test or a city cycle test procedure is being driven. The break-off criteria determines the number of cycles to be taken into consideration for calculation purposes.

20. The post-test processing calculations were extensively modified to improve clarity, to define when intermediate rounding is to be performed, to define when certain results are to be rounded to the nearest whole number, and to highlight when certain steps in the post-processing are not required if the interpolation method is not applicable.

21. The application of REESS charging for electrified vehicles has been more clearly defined.

22. Conditions under which the application of instantaneous voltage may be used were introduced.

III. Meetings held by Task Forces

23. The proposed changes in Amendment 5 to GTR No. 15 listed in section II above were discussed at length and agreed upon by all participants during the following Informal Working Group (IWG) meetings:

- (a) 21st IWG, January 2018 (Geneva);
- (b) 22nd IWG, April 2018 (Ispra);
- (c) 23rd IWG, June 2018 (Geneva);
- (d) 24th IWG, September 2018 (Tokyo).

Numerous face-to-face or audio/web meetings of the following task forces were held: New Issues, EV (electric vehicle), Gearshift, CFD (Computational Fluid Dynamics), Drive Trace Indices, Dual Axes, Power Determination, Drafting Subgroup, Reference Gases, and Coastdown Definitions.

Annex VIII

[English only]

Technical report on the development of Amendment 2 to UN GTR No. 19 on WLTP EVAP

Adopted on the basis of GRPE-78-09 (See para. 15)

Technical report on the development of Amendment 2 to UN GTR No. 19 on the Evaporative emission test procedure for the Worldwide harmonized Light vehicles Test Procedure (WLTP EVAP)

I. Introduction

1. During the seventy-fourth session of the Working Party on Pollution and Energy (GRPE) in January 2017, the Evaporative emission test procedure for the Worldwide harmonized Light vehicles Test Procedures (WLTP EVAP) Task Force (TF) submitted a working document and an informal document for the consideration of GRPE.
2. The working document ECE/TRANS/WP.29/GRPE/2017/3 (Proposal for a new UN Global Technical Regulation on Evaporative emission test procedure for the Worldwide harmonized Light vehicles Test Procedures), UN GTR No. 19, contained the new proposed test procedure to measure evaporative emission from non-sealed fuel tank systems.
3. Non-sealed fuel tank systems are mostly used in conventional vehicles with an internal combustion engine. Since these vehicles have a high chance of purging the fuel vapours inside the fuel tank systems and the canister(s) into the internal combustion engines, the pressure inside the fuel tank generated by fuel vapours is well maintained at low level.
4. From late 2016 to September 2017, thirteen meetings (including three face-to-face meetings and two drafting meetings) were held and the WLTP EVAP task force worked to include a test procedure covering the sealed fuel tank systems in UN GTR No. 19. These systems are expected to be used in the hybrid electric vehicles driven mainly by electric engines and in the future conventional vehicles.
5. Amendment 1 to UN GTR No. 19 complements the text of the UN GTR not only by adding descriptions of the test procedure for sealed fuel tank systems but also by adding other provisions related to non-sealed fuel tank systems which were raised along the discussions on sealed fuel tank systems.
6. From April to September 2018, four meetings (including one drafting meeting) were held and the WLTP EVAP Task Force worked to include the calibration requirements and intervals for test equipment, and the equation for the variable-volume enclosures in UN GTR No. 19. Also, improvements to clarify the requirements were made.
7. The discussions of Amendment 2 were led by experts from Japan (Ms. Mayumi "Sophie" Morimoto) and the European Commission's Joint Research Centre (Giorgio Martini). The drafting of the text was led by the experts from the European Commission (Serge Dubuc and Rob Gardner).

II. Text improvements

A. Objectives

8. After the issuance of the original UN GTR No. 19 and Amendment 1 to it, certification tests started in Europe. During those certification tests using this new GTR-based procedures, several issues which needed improvements of the GTR text were identified. These issues were mostly caused by misinterpretation from missing equation and explanations in the text.

9. Therefore, WLTP IWG decided to keep EVAP task force active to solve those issues.

B. Topics discussed

10. The following points were discussed during WLTP EVAP task force meetings:

- (a) Calibration requirements and intervals for test equipment;
- (b) Equation for the variable-volume enclosures;
- (c) Improvements of the texts:
 - (i) Clarification of aged carbon canister and when to install;
 - (ii) Clarification and review of test equipment;
 - (iii) Clarification and review of requirements of an evaporative emission family;
 - (iv) Clarification of "carbon canister";
 - (v) Change the term "carbon canister" used to catch depressurisation puff loss overflow.

C. Amendments introduced in UN GTR No. 19

1. Calibration requirements and intervals for test equipment

11. During the 22nd WLTP IWG, one of the manufacturers mentioned that the calibration requirement is missing from UN GTR No. 19. The task force members confirmed that the requirement should be included in GTR.

12. Japan made a text proposal to include the calibration requirements and its intervals into the paragraph on test equipment. In that proposal, the texts mostly referred to the requirements written in UN Regulation No. 83, the same as the requirements for test equipment. Some members proposed to change the reference to UN GTR No. 15 instead. After discussion within members, they decided to keep references to UN Regulation No. 83 because some equipment does not require the same severity as required for the Type 1 test.

13. For equipment not written in both UN Regulation No. 83 or UN GTR No. 19, the task force members decided to calibrate the equipment before its initial use and at the appropriate service intervals thereafter.

2. Equation for the variable-volume enclosures

14. During the 22nd WLTP IWG, one of the manufacturers requested to add the alternative equation for the variable-volume enclosures. This equation is already used in US EPA and CARB regulations.

15. The variable volume enclosure is the enclosure which adjusts the volume by moving the roof or internal/external bags during temperature changes. With this feature, the pressure and the number of molecules inside the enclosure remains the same even during temperature changes. The alternative equation reflects this feature, assuming no gas is removed during the diurnal test.

16. The task force members discussed if this alternative equation should be added to UN GTR No. 19. After extensive discussions on understanding the feature of the variable volume enclosure, the task force decided to add the equation as an alternative option.

17. During the 23rd WLTP IWG, India asked to clarify where the fixed value of 1.42 m³, which is subtracted from enclosure volume in the equation, comes from, and review the value. It is the assumed volume of the vehicle exteriors, the volume of the vehicle with the windows and the luggage compartment open. The manufacturer may choose to use this fixed value or the actual measured volume. This fixed value originally came from US EPA/CARB regulation and existed from original text of UN GTR No.19. EPA tracked down where this number came from and clarified this value was decided a few decades ago with good engineer judgement when evaporative emission tests were introduced. EPA also mentioned that no manufacturer requested to use measured value. Therefore, task force members decided to keep it as it is.

3. Improvements of the texts

3.1. Clarification of aged carbon canister and when to install

18. During the 23rd WLTP IWG, Japan requested to clarify what is an aged carbon canister and when it should be installed. Japan said Paragraph 3 of Annex 1 to UN GTR No. 19 might lead to misunderstanding that the measurement of Butane Working Capacity (BWC) 300 is considered to be part of the process to age the carbon canister. This paragraph is also unclear if the aged carbon canister should be installed during the run-in.

19. The task force members confirmed that the aged carbon canister shall not be installed to vehicle during the run-in period in order to keep the condition of aged carbon canister the same as before every test. Therefore, task force members decided to add the text to avoid the aged carbon canister to be installed during the run-in period. For more clarification, members decided to add another text that the aged carbon canister shall not be installed until the start of the first fuel drain and refill procedure.

20. The task force members also confirmed that the measurement of BWC300 is not part of process to age the carbon canister. Therefore, members decided to add paragraph numbers to clarify what is the process of ageing the carbon canister.

3.2. Clarification and review of test equipment

21. During the 23rd WLTP IWG, Japan mentioned that there is a corrigendum to the requirement of a variable volume enclosure, which is the limit of the difference between the enclosure internal and the barometric pressures.

22. UN GTR No. 19 refers to UN Regulation No. 83 for the requirement of variable volume enclosure and this requirement was originally based on US EPA regulation. In the EPA regulation, the limit is a maximum value of ± 2.0 inches of water, which equals to around ± 0.5 kPa. However, in UN Regulation No. 83, the limit is ± 5 hPa.

23. At first, the task force members decided to correct the value in UN GTR No. 19. However, to avoid separate requirements to test equipment among UN GTR No. 19 and UN Regulation No. 83, OICA (Organisation Internationale des Constructeurs d'Automobiles) requested to change UN Regulation No. 83. Other requirements of test equipment in the latest UN GTR No. 19, correcting UN Regulation No. 83 requirements, were deleted from UN GTR No. 19 and will be expected to be reflected in UN Regulation No. 83 in the 78th GRPE.

24. During the review of test equipment, one of the members mentioned that the requirements in former paragraph 4.8. in Annex 1 to Amendment 1, additional equipment and former paragraph 4.9. in Annex 1 to Amendment 1 (new paragraph 4.8. in Amendment 2) carbon canister weighing scales in Annex 1 is unclear.

25. In former paragraph 4.8. in Annex 1 to Amendment 1, additional equipment, the accuracy of absolute humidity is required. Since the humidity is not measured during the evaporative emission test, the task force members decided to delete the whole paragraph.

26. In former paragraph 4.9. in Annex 1 to Amendment 1, (new paragraph 4.8. in Amendment 2), carbon canister weighing scale, it was unclear what this scale is used for. This requirement was added in Amendment 1 to clarify the requirement for scale weighing the carbon canister with depressurization puff loss overflow. Since this carbon canister weight shall be no change in the weight within the tolerance of ± 0.5 gram, the accuracy of the weighing scale was clarified. However, the text can be interpreted that this accuracy applies to all weighing scale, such as a scale used to a measure 2-gram breakthrough. The task force members decided to clarify the text.

3.3. *Clarification and review of requirements of evaporative emission family*

27. During the 23rd WLTP IWG, Japan mentioned that it is difficult to understand the requirement in paragraph 5.5.1. (b). It said "vapour hose material, fuel line material and connection technique" should be identical to categorize different vehicles in same evaporative emission family. However, it was difficult to differentiate if the connection techniques of both the vapour hose and fuel line should be identical or only if the connection technique of fuel line should be identical.

28. The task force members discussed and because of high pressure in fuel line but not with vapour hose, they confirmed that the connection technique only refers to the fuel line. To clarify the text, the bullet point on "vapour hose material, fuel line material and connection technique" was expanded to 2 bullet points.

29. Along with this discussion, one of the members mentioned that the evaporative emission family was slightly modified in EU-WLTP and this would cause disharmonisation. In the EU-WLTP discussion, it was confirmed that the vapour hose material among the family and the fuel line material among the family can be different but technically equivalent. This was also discussed with the task force members and as a result, members decided to reflect EU-WLTP requirement in UN GTR No. 19.

30. During the 24th WLTP IWG, India requested to clarify that the technical equivalency shall be demonstrated by the manufacturer to the responsible authority. Therefore, during the drafting meeting, text to clarify it is added to reflect this.

3.4. *Clarification of "carbon canister"*

31. During the review of UN GTR No. 19, it was found that the words "carbon canister", "canister", and "vapour storage unit" were used for describing the same component. Therefore, the task force members decided to harmonise on using "carbon canister".

3.5. *Change the term "carbon canister" used to catch depressurisation puff loss overflow*

32. In Amendment 1 to UN GTR No. 19, the carbon canister used to catch depressurization puff loss overflow was referred to as an "auxiliary canister." The explanation of this carbon canister was included in paragraph 4. Test equipment to Annex 1 of this GTR. Along with the discussion, this wording might mislead to understand as a different canister and therefore this term was deleted from that paragraph. The explanation of this carbon canister was moved to paragraph 6.6.1.8.1. to Annex 1, which describes the procedure to measure the depressurization puff loss overflow.

Annex IX

Adopted amendments to ECE/TRANS/WP.29/GRPE/2019/7

Adopted on the basis of para. 38

I. Proposal

Annex 5, Table 1, Footnote 1b, amend to read:

"^{1b} **In the following cases**, ~~the~~ complete exhaust system shall be fitted as provided for the intended application:

Where there is a risk of an appreciable effect on the engine power;

In the case of two-stroke ~~and positive ignition~~ engines;

When the manufacturer requests that this should be done.

In other cases, an equivalent system may be installed provided the pressure measured at the exit of the engine exhaust system does not differ by more than 1,000 Pa from that specified by the manufacturer.

The exit from the engine exhaust system is defined as a point 150 mm downstream from the termination of the part of the exhaust system mounted on the engine."
