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Report of the Working Party on Pollution and Energy (GRPE) on its ninetieth session

Contents

	<i>Paragraphs</i>	<i>Page</i>
I. Attendance.....	1	4
II. Adoption of the agenda (agenda item 1)	2-8	4
III. Report on the last session of the World Forum for Harmonization of Vehicle Regulations (WP.29) (agenda item 2)	9-11	4
IV. Light vehicles (agenda item 3)	12-37	5
A. UN Regulations Nos. 68 (Measurement of the maximum speed, including electric vehicles), 83 (Emissions of M ₁ and N ₁ vehicles), 101 (CO ₂ emissions/fuel consumption), 103 (Replacement pollution control devices) and 154 (Worldwide Light duty Test Procedure (WLTP)).....	12-33	5
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)).....	34-36	7
C. Worldwide harmonized Real Driving Emissions test procedure	37	7
V. Heavy duty vehicles (agenda item 4)	38-45	8
A. UN Regulations Nos. 49 (Emissions of compression ignition and positive ignition (LPG and CNG) engines) and 132 (Retrofit Emissions Control devices (REC)).....	38-41	8
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))	42	8
C. Worldwide provisions for Heavy Duty vehicles Fuel Economy.....	43-45	8
VI. N 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).....	46-53	9
VII. Agricultural and forestry tractors, non-road mobile machinery (agenda item 6)	54-62	9

A.	UN Regulations Nos. 96 (Diesel emission (agricultural tractors)) and 120 (Net power of tractors and non-road mobile machinery)	54-61	9
B.	UN Global Technical Regulation No. 11 (Non-road mobile machinery engines).....	62	10
VIII.	Particle Emissions (agenda item 7)	63-77	10
A.	UN Global Technical Regulation No. 24 (Light-duty brake emissions).....	63-66	11
B.	Activities of the IWG on Particle Measurement Programme (PMP).....	67-70	11
C.	Activities of the Task Force on Tyre Abrasion (TFTA)	71-77	12
IX.	Motorcycles and mopeds (agenda item 8)	78-81	12
A.	UN Regulations Nos. 40 (Emission of gaseous pollutants by motorcycles) and 47 (Emission of gaseous pollutants of mopeds)	78	12
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) and [XX] (Durability)	79	12
C.	Environmental and Propulsion Performance Requirements (EPPR) for L-category vehicles.....	80-81	12
X.	Electric Vehicles and the Environment (EVE) (agenda item 9)	82-89	13
A.	UN GTR No. 21 (DEVP) and No. 22 (In-Vehicle Battery Durability).....	82-87	13
B.	Other activities of IWG on EVE	88-89	13
XI.	Mutual Resolution No. 2 (M.R.2) (agenda item 10)	90	13
XII.	International Whole Vehicle Type Approval (IWVTA) (agenda item 11).....	91-94	14
XIII.	Vehicles Interior Air Quality (VIAQ) (agenda item 12)	95-96	14
XIV.	Lifetime compliance (agenda item 13)	97	14
XV.	Automotive Life Cycle Assessment (A-LCA) (agenda item 14)	98-100	14
XVI.	Priority topics for GRPE activities (agenda item 15)	101-104	14
XVII.	Any other business (agenda item 16)	105-108	15
XVIII.	Provisional agenda for the next session.....	109-111	15
A.	Next GRPE session.....	109	15
B.	Provisional agenda for the next proper GRPE session.....	110	15
C.	Informal meetings scheduled to be held in conjunction with the next GRPE session.....	111	17

Annexes

I	List of informal documents (GRPE-90-) distributed without an official symbol before and during the session	18
II	Informal meetings held in conjunction with the GRPE session	20
III	List of GRPE informal working groups, task forces and subgroups	21
IV	Adopted on the basis of ECE/TRANS/WP.29/GRPE/2024/7 as amended by GRPE-90-09-Rev.1 .	22
V	Adopted on the basis of GRPE-90-09-Rev.1	26
VI	Adopted on the basis of GRPE-90-09-Rev.1	28
VII	Adopted on the basis of ECE/TRANS/WP.29/GRPE/2024/8 as amended by GRPE-90-08.....	30
VIII	Adopted on the basis of ECE/TRANS/WP.29/GRPE/2024/9 as amended by GRPE-90-39.....	34
IX	Adopted on the basis of ECE/TRANS/WP.29/GRPE/2024/10 as amended by GRPE-90-21.....	36

X	Adopted on the basis of ECE/TRANS/WP.29/GRPE/2024/11 as amended by GRPE-90-22.....	38
XI	Adopted on the basis of ECE/TRANS/WP.29/GRPE/2024/17 as amended by GRPE-90-13.....	40

I. Attendance

1. The Working Party on Pollution and Energy (GRPE) held its ninetieth session from 10 to 12 January 2024, with André Rijnders (Netherlands) as Chair and Duncan Kay (United Kingdom of Great Britain and Northern Ireland) as Vice-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): Canada, China, France, Germany, Hungary, India, Italy, Japan, Netherlands, Norway, Poland, Republic of Korea, Russian Federation, Spain, Sweden, Switzerland, United Kingdom of Great Britain and Northern Ireland (UK), United States of America. Experts from the European Commission (EC) also participated. Experts from the following non-governmental organizations (NGOs) took part in the session: American Automotive Policy Council (AAPC), Association for Emissions Control by Catalyst (AECC), European Association for Electromobility (AVERE), European Association of Automobile Suppliers (CLEPA/MEMA/JAPIA), European Association of Internal Combustion Engine Manufacturers (EUROMOT), European Natural Gas Vehicle Association (NGVA Europe), International Motorcycle Manufacturers Association (IMMA), International Motor Vehicle Inspection Committee (CITA), and International Organization of Motor Vehicle Manufacturers (OICA).

II. Adoption of the agenda (agenda item 1)

Documentation: ECE/TRANS/WP.29/GRPE/2024/1
Informal documents GRPE-90-01-Rev.2, GRPE-90-02-Rev.3, GRPE-90-03 and GRPE-90-04

2. Mr. Rijnders, Chair of GRPE, opened the meeting and welcomed the participants.
3. GRPE adopted the provisional agenda of the ninetieth session (ECE/TRANS/WP.29/GRPE/2024/1), as updated and consolidated in GRPE-90-01-Rev.2, and GRPE-90-03 as a tentative running order.
4. The secretariat also briefly introduced GRPE-90-02-Rev.3, showing the schedule of meetings held in conjunction with this session of GRPE.
5. 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 active Informal Working Groups (IWGs) of GRPE, task forces and subgroups, giving details on their Chairs, Secretaries and the end of their mandates.
6. The secretariat introduced GRPE-90-04, announcing details for this and next GRPE sessions. Given room constraints in the palais in 2024 and the rescheduling of the 91st session of GRPE in May, with limited time to prepare working documents, the Chair proposed to hold a GRPE session in October 2024.
7. GRPE requested the secretariat to cancel the May 2024 session of GRPE and agreed to host a session in October 2024. GRPE agreed to hold a series of virtual or hybrid events in January, May and October 2024 to support the activities to be achieved during official meetings. The secretariat informed GRPE the corresponding deadline for the submission of official documents to the 91st session of GRPE would therefore be Monday 22 July 2024.
8. For 2025, GRPE agreed to request a change to the schedule of GRPE meetings. GRPE requested the secretariat to schedule the 2025 GRPE sessions to be tentatively held on 25-28 March 2025 and 14-17 October 2025 in order to avoid the early January slot and the challenges faced this year, and the very busy May/June time period.

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

Documentation: ECE/TRANS/WP.29/1173, ECE/TRANS/WP.29/1175
Informal documents GRPE-90-05

9. The secretariat introduced GRPE-90-05 and reported about relevant items discussed during the 190th and 191st sessions of the World Forum for Harmonization of Vehicle Regulations (WP.29). He referred to ECE/TRANS/WP.29/1173 and ECE/TRANS/WP.29/1175 for further details.

10. He also introduced key elements for the forthcoming session of the Inland Transport Committee, where ITC is expected to adopt an inland transport GHG mitigation strategy to 2050.

11. The representative of France asked whether the task detailed in WP.29-191-16 would be tackled by GRPE in the near future. The Chair indicated that GRPE would be looking at initiating this activity following additional guidance from WP.29.

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), 103 (Replacement pollution control devices) and 154 (Worldwide Light duty Test Procedure (WLTP))

Documentation: ECE/TRANS/WP.29/GRPE/2024/2,
ECE/TRANS/WP.29/GRPE/2024/3,
ECE/TRANS/WP.29/GRPE/2024/7,
ECE/TRANS/WP.29/GRPE/2024/8,
ECE/TRANS/WP.29/GRPE/2024/9,
ECE/TRANS/WP.29/GRPE/2024/10,
ECE/TRANS/WP.29/GRPE/2024/11,
Informal documents GRPE-90-08, GRPE-90-09-Rev.1, GRPE-90-10,
GRPE-90-11, GRPE-90-19, GRPE-90-21, GRPE-90-22, GRPE-90-23
and GRPE-90-39

12. The representative of OICA introduced ECE/TRANS/WP.29/GRPE/2024/7. The representative of Germany supported the proposal. The representative of OICA introduced GRPE-90-09-Rev.1, with wording improvements proposed by the representative of France and the Netherlands. The representative of Italy supported both proposals.

13. GRPE adopted ECE/TRANS/WP.29/GRPE/2024/7 and GRPE-90-09-Rev.1, as reflected in Annex IV, and requested the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their June 2024 sessions as draft new supplement to the 05 series of amendments to UN Regulation No. 83 (Emissions of M₁ and N₁ vehicles).

14. GRPE adopted GRPE-90-09-Rev.1, as reflected in Annex V, and requested the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their June 2024 sessions as draft new supplement to the 06 series of amendments to UN Regulation No. 83 (Emissions of M₁ and N₁ vehicles).

15. GRPE adopted GRPE-90-09-Rev.1, as reflected in Annex VI, and requested the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their June 2024 sessions as draft new supplement to the 07 series of amendments to UN Regulation No. 83 (Emissions of M₁ and N₁ vehicles).

16. The representative of OICA introduced ECE/TRANS/WP.29/GRPE/2024/8 as amended by GRPE-90-08. The representative from the EC asked why the vehicle from category N₂ did not have On-Board Fuel Consumption Meter (OBFCM) provisions. The representative of OICA clarified that OBFCM is only present in UN Regulation No. 154 (including for concerned N₂ vehicles) but not in UN Regulation No. 83.

17. The representative of the UK proposed to opt for the option 3 as proposed in GRPE-90-08 and to delete the content in square brackets in footnote 4. The representatives from France, Germany, Italy, Sweden and the EC supported the position of the UK.

18. GRPE adopted ECE/TRANS/WP.29/GRPE/2024/8 and option 3 without footnote 4 of GRPE-90-08, as reflected in Annex VII and requested the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their June 2024 sessions as draft new supplement to the 08 series of amendments to UN Regulation No. 83 (Emissions of M₁ and N₁ vehicles).
19. The representative of OICA introduced ECE/TRANS/WP.29/GRPE/2024/9. The representative of the UK introduced GRPE-90-39 proposing small improvements to ECE/TRANS/WP.29/GRPE/2024/9.
20. GRPE adopted ECE/TRANS/WP.29/GRPE/2024/9 and GRPE-90-39, as reflected in Annex VIII and requested the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their June 2024 sessions as draft new supplement to the 01 series of amendments to UN Regulation No. 101 (CO₂ emission/fuel consumption).
21. The representative of OICA introduced ECE/TRANS/WP.29/GRPE/2024/2 and ECE/TRANS/WP.29/GRPE/2024/3. The representative of the EC acknowledged that the EC is not subject to the original and 01 series of UN regulation No. 154 but requested more time to scrutinize the proposal to ensure robust legislation.
22. GRPE agreed to postpone the consideration of those proposals to forthcoming sessions of GRPE.
23. The representative of Japan introduced ECE/TRANS/WP.29/GRPE/2024/10, amended by GRPE-90-21 and ECE/TRANS/WP.29/GRPE/2024/11, amended by GRPE-90-22. The representative of EC supported the content of the proposal and asked whether this proposal could be submitted with other proposals amending UN Regulation No.154 to lower the number and frequency of revision to existing legislation. The representative of OICA agreed that GRPE should try to bundle amendments proposals as much as possible. The representative of Japan agreed for a later submission to WP.29 as long as GRPE adopted the proposal in this session.
24. GRPE adopted ECE/TRANS/WP.29/GRPE/2024/10 and GRPE-90-21, as reflected in Annex IX and requested the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their March 2025 sessions as draft new supplement to the 02 series of amendments to UN Regulation No. 154 (WLTP).
25. GRPE adopted ECE/TRANS/WP.29/GRPE/2024/11 and GRPE-90-22, as reflected in Annex X and requested the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their March 2025 sessions as draft new supplement to the 03 series of amendments to UN Regulation No. 154 (WLTP).
26. The representative of OICA introduced GRPE-90-10. The representative of Germany acknowledged the necessity to continuously improve UN Regulations, and especially UN Regulation No. 154. The representative of France agreed to include EAER in the information package. She added that, with existing texts, direct reference of EU legislation in UN Regulation information package was not possible, as there was no equivalence. She also requested further information about the expected timeline for the adoption of this proposal.
27. The Chair clarified this proposal would be considered by GRPE during forthcoming sessions. The representative of OICA asked about the preference of GRPE on the format of the forthcoming working document, showing a list of amendments or as a consolidated version. The secretariat indicated, given the size of the document, that a consolidated version might be easier to process.
28. The representative of Japan introduced GRPE-90-23. The Chair supported the intention and thanked Japan for the clarity of their intentions. He suggested to amend UN Regulations only once per year.
29. The representative of OICA introduced GRPE-90-11, highlighting this was still a work in progress. GRPE agreed to re-consider this proposal at a later stage.
30. The representative of Sweden introduced GRPE-90-19, proposing to include the possibility to use driver robots during pure electric vehicle range and electric energy consumption tests in the 02 and 03 series of amendments to UN Regulation No. 154. The representative of the UK supported the concept, and reckoned some refinement would be

needed before a potential adoption. The representative of OICA highlighted the links with the activities of the Task Force on Automated Vehicles Regulations Screening (AVRS) and how to ensure fitness of the test procedure defined by GRPE in the context of automated and autonomous driving. The representative of TÜV Nord thanked the initiative and agreed further investigation would be needed to improve the proposal.

31. The representative of the EC agreed further assessment would be needed, and he invited relevant stakeholders to share more data and information about the use of robot drivers for type approval purposes to better understand the magnitude of the issue.

32. The representative of Spain expressed sympathy for the proposal and agreed some more work might be needed, especially to prove the equivalency between human and robot driving behaviours. The representative of France shared a similar position and also asked whether such authorization might also be given for non-electric vehicle, for instance for the test performed under the Annex B6 of UN regulation No. 154. The representative of Sweden confirmed other powertrain types could also be included in the proposal.

33. The representative of Japan showed interest to further discuss the topic. He highlighted that the main issue lied with the “shortened” test procedure to measure EV range, that was not short for vehicles equipped with batteries of large capacities. He thought a more efficient procedure would be needed. The representative of OICA also wondered if this proposal could be potentially extended to all series of amendments to UN Regulation No. 154 and to UN Regulation No. 101. He informed an updated SAE shortened cycle was already existing, and invited GRPE to consider further in the near future

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/2024/12,
Informal documents GRPE-90-12 and GRPE-90-34

34. The representative of OICA introduced ECE/TRANS/WP.29/GRPE/2024/12 as amended by GRPE-90-12. The Chair welcomed the effort from OICA and acknowledged UN GTR No. 15 was getting outdated and needed an upgrade. He recalled at least one contracting party would be needed to submit the updated proposal to AC.3. The representative of OICA emphasized the activity on Annex 13 on the low temperature test were of particular importance given potential regional adoption of this annex.

35. The representative of the EC highlighted the importance of this activity, and informed GRPE that the lack of involvement of the EC was due to a lack of resources, but would try to have a closer attempt of getting support from the EC to submit an updated amendment to UN GTR No. 15 in the near future at forthcoming sessions of AC.3. He further added that the Euro 7 proposal was indeed considering to adopt Annex 13 in its regulatory package and requested any further substantive insights on the areas of the text that would need to be improved.

36. The representative of AAPC introduced GRPE-90-34. The representative of the Netherlands supported the proposal, indicating that when looking at the reference document (ECE/TRANS/WP.29/202/128), the reference to ISO 14229:2013 seemed to be missing, and he sought further clarifications. The representative of APPC informed that the 2013 version of this ISO standard had been overtaken by the 2020 version, and that this standard was not present in UN Regulation No. 154. He invited GRPE to have an overall revisit of ISO references in both UN Regulation No. 154 and UN GTR No. 15 when possible.

C. Worldwide harmonized Real Driving Emissions test procedure

Documentation: Informal document GRPE-90-07

37. The introduction of GRPE-90-07 by the representative of the Republic of Korea has been withdrawn from the agenda. GRPE agreed to reconsider this topic as soon as possible.

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/2024/13,
ECE/TRANS/WP.29/GRPE/2024/14
Informal document GRPE-90-18

38. The representative of OICA introduced ECE/TRANS/WP.29/GRPE/2024/13 and ECE/TRANS/WP.29/GRPE/2024/14 to amending the 05 and 06 series of amendments to UN Regulation No. 49 to permit the use of hydrogen (H₂) in internal combustion engines as fuel. The representative of the EC had some reservations he wanted to clarify before agreeing to the proposals. The representative of Germany underlined the 06 series of amendments to UN Regulation No.49 had a similar testing approach as the European Euro VI regulation, so he did not see any objections to adopt ECE/TRANS/WP.29/GRPE/2024/14. The representative of Italy seconded this remark.

39. Following further consultations, GRPE adopted ECE/TRANS/WP.29/GRPE/2024/13 and requested the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their June 2024 sessions as draft new supplement to the 05 series of amendments to UN Regulation No. 49 (Emissions of compression ignition and positive ignition (LPG and CNG) engines).

40. GRPE adopted ECE/TRANS/WP.29/GRPE/2024/14 and requested the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their June 2024 sessions as draft new supplement to the 06 series of amendments to UN Regulation No. 49 (Emissions of compression ignition and positive ignition (LPG and CNG) engines).

41. The representative of OICA introduced GRPE-90-18. The representative of the EC welcomed the initiative, and remarked that some validation testing were still necessary, for example to measure water content. He praised the clear position of OICA regarding the scope and the engines that would be covered by this proposal and was looking forward to considering a proposal at 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))

42. 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-90-38

43. The representative of OICA introduced GRPE-90-38. The representative of the UK asked whether the potential workshop would be considering energy consumption and range determination, especially for electrified heavy-duty vehicles. The representative of OICA agreed e-HDV should be considered given their growing importance.

44. The representative of EC took note and agreed to consult internally if/how the EC could contribute.

45. GRPE agreed to hold a half-day hybrid workshop on the global harmonization of Heavy Duty fuel economy, energy consumption and range determination, to take place on 23 May 2024 in Geneva and virtually.

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/2024/15
Informal document GRPE-90-37

46. The representative from OICA introduced ECE/TRANS/WP.29/GRPE/2024/15.
47. GRPE adopted ECE/TRANS/WP.29/GRPE/2024/15 to amend UN Regulation No. 85 to clarify and bring up to date the requirements for fitment of auxiliaries when testing the net power or 30 minutes power of electric drive trains and requested the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their June 2024 sessions as draft new supplement to UN Regulation No. 85 (Measurement of the net power and the 30 min. power).
48. The representative of France informed GRPE that France had noticed recent numerous request for retrofit of light-duty vehicles engines similar to the ones defined in UN Regulation No. 143 for heavy-duty vehicles. She requested GRPE for guidance and if an harmonized approach to enlarge the scope of UN regulation No. 143 would be of interest to GRPE.
49. The representative of Sweden noted his country had similar requests and agreed an harmonized approach would be desirable. The representative of Italy and Spain showed interested to exchange on this topic.
50. GRPE agreed to host a hybrid workshop, under the leadership of France, in conjunction with the 91st session of GRPE in October 2024 on the topic of a potential enlargement of the scope of UN regulation No. 143.
51. The representative of OICA introduced GRPE-90-37. The representative of the EC agreed this would be a good topic to be considered promptly by GRPE. The representative of Japan informed his country was conducting an investigation on the correlation between UN Regulation No. 85 and UN GTR No. 21. He added that might be too soon to provide conclusive outcomes of this study.
52. The representative of the EC noted Japan concerns, and proposed the workshop to focus on brainstorming, insisting that no concrete regulatory proposals would be expected at a later stage. The representative of Germany thanks OICA for the proposal and supported the idea of a brainstorming workshop in May 2024.
53. GRPE agreed to hold a half-day Hybrid workshop on the future of power determination regulations, to take place on 23 May 2024 in Geneva and virtually.

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)

Documentation: ECE/TRANS/WP.29/GRPE/2024/16
ECE/TRANS/WP.29/GRPE/2024/17
Informal documents GRPE-90-13, GRPE-90-14 and GRPE-90-24

54. The representative of EUROMOT introduced ECE/TRANS/WP.29/GRPE/2024/16, ECE/TRANS/WP.29/GRPE/2024/17, GRPE-90-13 and GRPE-90-14 to propose amending the 05 series of amendments to UN Regulation No. 96 and amending the 02 series of amendments to UN Regulation No. 120 to permit the use of hydrogen (H₂) in internal combustion engines to be installed in agricultural and forestry tractors and in non-road mobile machinery. The representatives of France, Germany, Italy, the Netherlands, Spain, Sweden,

the UK and of the EC supported the proposals. The representative of the Netherlands also encouraged to develop similar proposals for dual-fuel engines.

55. GRPE adopted ECE/TRANS/WP.29/GRPE/2024/16 and requested the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their June 2024 sessions as draft new supplement to the 05 series of amendments to UN Regulation No. 96 (Uniform provisions concerning the approval of engines to be installed in agricultural and forestry tractors and in nonroad mobile machinery with regard to the emissions of pollutants by the engine).

56. GRPE adopted ECE/TRANS/WP.29/GRPE/2024/17, as amended by GRPE-90-13 as reflected in Annex XI and requested the secretariat to submit it to WP.29 and AC.1 for consideration and vote at their June 2024 sessions as draft new supplement to the 02 series of amendments to UN Regulation No. 120 (Uniform provisions concerning the approval of internal combustion engines to be installed in agricultural and forestry tractors and in non-road mobile machinery, with regard to the measurement of the net power, net torque and specific fuel consumption).

57. The representative of the Netherlands introduced GRPE-90-24. The representative of the EC praised the high value and timeliness of the analysis. He informed GRPE that the EC will perform a review of the European Stage V legislation in 2025, using the data collected during the In-Service Monitoring (ISM) program. He added that was expected to be a basis for the next Non-Road Mobile Machinery (NRMM) legislation. He further added that the JRC of the EU had access to the ISM collected raw data, highlighting the longer-term potential to shift from ISM to In-Service Conformity (ISC), while keeping type approval in mind.

58. The representative of the UK reiterated the testing activities were on-going in the country that were mentioned during the last session of GRPE.

59. The Chair emphasized the importance of controlling the existing and improve the limits where necessary.

60. The representative of EUROMOT said that the association was getting ready for the next stage of NRMM emission legislation discussions. He added that ISM program implied high resources and was a an extensive, expensive activity and that it would be important to take the output of this program to discuss the next legislative steps. Reacting to GRPE-90-24, he recalled that all the data reported as part of the ISM are provided with and without the exclusions referred to in GRPE-90-24. He also reacted to the power-bin hopping mentioned in GRPE-90-24, highlighting other factors than emission limits can also partly explain the situation described; he provided the example of 56-130 kW versus 130-560 kW engine power bins, where emission limits are the same but engine configuration and architecture are different (4- versus 6-cylinder engines in this case) that could partly explain why 129 kW engines are popular, given their higher power density and higher operating load (which also benefited an efficient operation of SCR systems).

61. The representative of Italy wondered if other non-EU parties were also planning for NRMM legislation revisions in the future to set technical conditions that could be recognized worldwide. He also added that indeed limits could be decided here in Geneva, but recalled that usual practice that limits are set nationally/regionally before being agreed upon globally as part of the activity of WP.29 and its subsidiary bodies.

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

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

VIII. Particle Emissions (agenda item 7)

A. UN Global Technical Regulation No. 24 (Light-duty brake emissions)

Documentation: ECE/TRANS/WP.29/GRPE/2024/4
Informal documents GRPE-90-06, GRPE-90-25-Rev.3, GRPE-90-26,
and GRPE-90-27

63. The representative of the European Commission, introduced ECE/TRANS/WP.29/GRPE/2024/4, as amended by GRPE-90-25-Rev.3 (issued as a post-session document) to include a vehicle-specific non-friction braking measurement procedure, definition of brake emission families and other changes with the aim of improving the overall protocol. He also briefly introduced GRPE-90-06 and GRPE-90-26 providing further background and justifications for the proposed amendments to UN GTR No. 24

64. The representative of the Netherlands sought further clarifications about the relaxation of ceramic disc operating temperature range. The representative of the EC informed that such discs are operating better at lower temperature, hence the needs for a specific lower temperature range compared with other disc materials. The representative of the Netherlands agreed with the technical and proposed a text improvement to make the provisions clearer, as reflected in GRPE-90-25-Rev.1.

65. GRPE adopted ECE/TRANS/WP.29/GRPE/2024/4, as amended by GRPE-90-25-Rev.3, as reflected in Addendum 1 and requested the secretariat to submit it to WP.29 and AC.3 for consideration and vote at their June 2024 sessions as draft new Amendment 1 to UN GTR No. 24 (Laboratory Measurement of Brake Emissions for Light-Duty Vehicles).

66. GRPE adopted GRPE-90-27, as reflected in Addendum 2 and requested the secretariat to submit it to WP.29 and AC.3 for consideration and vote at their June 2024 sessions as draft final status report to a new Amendment 1 to UN GTR No. 24 (Laboratory Measurement of Brake Emissions for Light-Duty Vehicles).

B. Activities of the IWG on Particle Measurement Programme (PMP)

Documentation: Informal documents GRPE-90-28 and GRPE-90-30

67. The representative of the European Commission, Chair of the IWG on PMP, introduced GRPE-90-28, giving a status report of the activities of the IWG on PMP. The representative of France requested further information about the inclusion of ultrafine particles (PN10) into exhaust particle measurement procedures.

68. The Chair of the IWG on PMP clarified the technical work is finalized, and inserting provision to include PN10 in UN Regulations Nos. 49, 154, 168 or others was mostly administrative and needed agreement with contracting parties involved. The representative of the EC indicated the latest Euro 7 proposal required PN10, and the preamble of the legal act gave a mandate to the EC to align concerned UN Regulations with EU legislation. He showed willingness to address such issue in a timely manner to be aligned with the Euro 7 implementation timeline.

69. The representative of the Netherlands introduced GRPE-90-30. The Chair of PMP clarified that the group did not have any health-effect experts participating at the moment. To date, particular mass and particle number had been recognized as important proxies to health effect of particle emissions. He added that additional expertise would be needed in PMP to tackle health effect. He further clarified that total particle mass and wear are included in UN GTR No. 24. The representative of the EC informed that the latest draft of Euro 7 legislation included a placeholder for a particle number limit for brake emission for 2030. He said the EC is required to prepare a report on the topic by the end of 2027.

70. The representative of the UK acknowledged the importance for GRPE to have a platform to discuss these topics early in prepare further legislative requirements. He added that there is mixed evidence today and so a dedicated platform where updated knowledge would be shared and discussed could play an important role to be able to act in a timely manner. The Chair proposed to keep the topic in the emissions list of GRPE (GRPE-87-55-Rev.1) to discuss regularly discuss the topic in GRPE.

C. Activities of the Task Force on Tyre Abrasion (TFTA)

Documentation: Informal documents GRPE-90-29-Rev.1 and GRPE-90-40

71. The Co-Chair from TFTA introduced GRPE-40-29-Rev.1, indicating that GRPE-90-40 was a copy of the working document that had been submitted to the February 2024 session of GRBP. She invited GRPE to provide comments to the TFTA leadership by the end of January.

72. The representative of the Netherlands asked about the ambient temperature effect in the drum method, which did not seem to be covered in the method as presented. The Co-Chair of TFTA agreed the methods would need to be improved. She added that a market assessment expected to take place shortly was expected to contribute to improving the draft methods.

73. The representative of OICA reckoned the latest draft text has improved significantly in the last iterations and was happy that some issues raised by the automotive industry were taken into account, such as the driving mode selection provisions. Given candidate tyres were expected to be assessed against reference tyre, he asked how the reference tyre would be assessed in the first place. He also enquired more information about the need for news series of amendment for this activity.

74. The Co-Chair of TFTA informed the Joint Research Center (JRC) of the European Union (EU) was expected to perform a large-scale study in 2024 to try and answer some of those questions.

75. The representative of Germany asked about the potential difficulty to correlate between the vehicle and drum methods. The Co-Chair confirmed this was work in progress and was expected to be tackled once the results of the market assessment were ready.

76. The Chair proposed to have a virtual informal GRPE session closer to the date of the GRBP session to get more in-depth insights to the proposal and to give GRPE more time to get familiar with the latest proposals from TFTA.

77. GRPE agreed to host a virtual informal session of GRPE on 29 January 2024 from 12.30 to 15.00 CET to provide further feedback to TFTA on the tyre abrasion proposals.

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)

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

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) and [XX] (Durability)

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

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

Documentation: Informal document GRPE-90-41

80. The Co-Chair of IWG on EPPR, representative of the Netherlands, presented a status report (GRPE-90-41). He sought guidance from GRPE on the potential engagement of countries to initiate the transposition of the latest improvements to UN GTR No. 2 into UN Regulations.

81. The Chair acknowledged the latest progress that had been included in UN GTR No. 2 and invited any contracting party to the 1958 Agreement to manifest its interest to transpose UN GTR No. 2 in UN Regulations under the 1958 Agreement. GRPE noted the request and agreed to raise any further interest at forthcoming sessions.

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

A. UN GTR No. 21 (DEVP) and No. 22 (In-Vehicle Battery Durability)

Documentation: ECE/TRANS/WP.29/GRPE/2024/5
ECE/TRANS/WP.29/GRPE/2024/6
Informal documents GRPE-90-16-Rev.1, GRPE-90-17, GRPE-90-32-Rev.1 and GRPE-90-33

82. The representative of the US introduced ECE/TRANS/WP.29/GRPE/2024/5, as amended by GRPE-90-16-Rev.1, as a new amendment to UN GTR No. 21. He also introduced GRPE-90-17 as the accompanying final status report.

83. GRPE adopted ECE/TRANS/WP.29/GRPE/2024/5, as amended by GRPE-90-16-Rev.1, as reflected in Addendum 3 and requested the secretariat to submit it to WP.29 and AC.3 for consideration and vote at their June 2024 sessions as draft new Amendment 1 to UN GTR No. 21 (Determination of Electrified Vehicle Power (DEVP)).

84. GRPE adopted GRPE-90-17, as reflected in Addendum 4 and requested the secretariat to submit it to WP.29 and AC.3 for consideration and vote at their June 2024 sessions as draft final status report on the development of Amendment 1 to UN GTR No. 21 (Determination of Electrified Vehicle Power (DEVP)).

85. The Co-chairs of the IWG on EVE introduced ECE/TRANS/WP.29/GRPE/2024/6, as amended by GRPE-90-32, as a new amendment to UN GTR No. 22. He also introduced GRPE-90-33 as the accompanying final status report.

86. GRPE adopted ECE/TRANS/WP.29/GRPE/2024/6, as amended by GRPE-90-32-Rev.1, as reflected in Addendum 5 and requested the secretariat to submit it to WP.29 and AC.3 for consideration and vote at their June 2024 sessions as draft new Amendment 1 to UN GTR No. 22 (In-vehicle Battery Durability for Electrified Light-Duty Vehicles).

87. GRPE adopted GRPE-90-33, as reflected in Addendum 6 and requested the secretariat to submit it to WP.29 and AC.3 for consideration and vote at their June 2024 sessions as draft final status report on the development of Amendment 1 to UN GTR No. 22 (In-vehicle Battery Durability for Electrified Light-Duty Vehicles).

B. Other activities of IWG on EVE

Documentation: Informal documents GRPE-90-36 and GRPE-90-42

88. The representative of the US, Co-Chair of the IWG on EVE presented the status report introducing the latest activities of the group (GRPE-90-36). The representative of Korea informed GRPE that the next in-person meeting to take place in Korea in April 2024 would be hosted as a hybrid event, with the exact venue to be confirmed. The representative of Japan informed GRPE that Japan would be hosted an IWG on EVE meeting in the fall of 2024. He added the meeting would be hosted as a hybrid event, with the exact venue to be confirmed.

89. The representative of the US, Co-Chair of the IWG on EVE, also introduced GRPE-90-42, as updated Terms or Reference for the IWG on EVE. GRPE adopted the revised Terms of Reference and requested the secretariat to upload them in the relevant wiki page.

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

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

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

91. The GRPE ambassador to the IWG on IWVTA and DETA informed GRPE all GRs except one had stated that they will not accept Universal Identifier (UI) in their UN Regulations at the moment. Ha added the remaining GR appeared to be close to the same opinion.

92. He reminded GRPE that, as the 1958 Agreement currently permitted UI in all Regulations unless they were specifically amended to forbid its usage, it was being considered whether an amendment to the 1958 Agreement would be more efficient, highlighting this is not a simple task.

93. He also said as the DETA system was necessary to issue a UI, and the system for doing so had not yet been developed, further time to reflect could be envisaged. He added that regarding UN Regulation No. 0, the number of approvals which had been issued worldwide appeared to have stagnated at three.

94. He concluded the IWG on DETA continued to discuss possibilities to increase the attractiveness of the IWVTA concept, but was now also assessing whether there was a long-term interest to maintain UN Regulation No. 0.

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

Documentation: Informal document GRPE-90-35

95. The Chair of IWG on Vehicles Interior Air Quality (VIAQ), representative from the Russian Federation, presented a status report on the ongoing activities of the group (GRPE-90-35).

96. GRPE noted the update and acknowledged the latest progress realized by the IWG on VIAQ.

XIV. Lifetime compliance (agenda item 13)

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

XV. Automotive Life Cycle Assessment (A-LCA) (agenda item 14)

Documentation: Informal document GRPE-90-31

98. The Chair of the IWG on A-LCA introduced GRPE-90-31. The representative of the US emphasized the importance that the progress of each subgroup is monitored and that all subgroup make similar progress and are given similar attention.

99. He further added that the levelling concept would need to be harmonized across subgroups to ensure consistency and that common sets of assumptions, in particular with respect to the representative vehicle.

100. The representative of the Republic of Korea informed GRPE that the IWG on A-LCA meeting planned in April in his country was expected to be hosted as a hybrid meeting.

XVI. Priority topics for GRPE activities (agenda item 15)

Documentation: Informal document GRPE-90-43-Rev.1

101. The Chair introduced GRPE-90-43-Rev.1. The representative of the Netherlands supported the new priority on NRMM. Another representative of the Netherlands suggested to add the activity of the Task Force on Automated Vehicles Regulations Screening (AVRS) to the list of priority, as reflected in GRPE-90-43-Rev.1.

102. The representative of OICA suggested to maybe wait to have a full package of Euro 7 legislation before updating the UN Regulations and UN GTRs with respect to the PN10, in order to avoid having to update them in case there would be small differences between UN and EU legislation on this matter. He also reflected on the potential impact of the forthcoming On-Board Monitoring (OBM) on UN legislation.

103. The representative of IMMA suggested to remove UN GTR No.2 from the list of UN legislation potentially concerned by the inclusion of PN10, given there is no particle number limits in UN GTR No.2 at the moment. GRPE agreed with this suggestion, as reflected in GRPE-90-43-Rev.1.

104. GRPE endorsed GRPE-90-43-Rev.1, as amended during the session.

XVII. Any other business (agenda item 16)

Documentation: Informal document GRPE-90-15

105. The interim Chair of the GRPE's Task Force on Automated Vehicles Regulations Screening (AVRS), representative of the Netherlands, introduced GRPE-90-15. The Chair highlighted the importance of this activity and hoped more parties would be in a position to join and contribute as the activities developed.

106. The Chair of GRVA's Task Force on fitness for ADS of GRVA Regulations and GTRs (TF on FADS) commended GRPE's TF on AVRS for the progress achieved so far (as reflected for all GRs in ECE/TRANS/WP.29/2023/86). He announced some GRs have started to amend relevant UN Regulations, and that several meeting of the various TFs in GRs took place to exchange and to make TFs were progressing at a similar pace. He encouraged TF AVRS to try and get more workforce to deliver on the regulation screening by March 2024.

107. The representative of OICA congratulated the Netherlands for the coordination of the TF AVRS, and shared his positive view on the benefits of looking at regulations under a different angle.

108. The Chair encouraged all interested parties to reach out to the Netherlands to get involved and was looking forward to the expected reporting at WP.29.

XVIII. Provisional agenda for the next session

A. Next GRPE session

109. The next GRPE session, including IWG meetings, is scheduled to be held from Monday 14 October 2024 starting at 10.30 a.m. to Wednesday 16 October 2024 12.30 p.m. (see paras. 7 and 8 for more information about GRPE sessions). Interpretation services would be provided.

B. Provisional agenda for the next proper GRPE session

110. 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), 103 (Replacement pollution control devices) and 154 (Worldwide harmonized Light vehicles Test Procedures (WLTP));

- (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 Emissions.
 - (a) UN Global Technical Regulation No. 24 (Light-duty brake emissions);
 - (b) Activities of the IWG on Particle Measurement Programme (PMP);
 - (c) Activities of the Task Force on Tyre Abrasion (TFTA).
- 8. Motorcycles and mopeds:
 - (a) UN Regulations Nos. 40 (Emission of gaseous pollutants by motorcycles) 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), 18 (On-Board Diagnostic (OBD) systems for L-category vehicles) and 23 (Durability);
 - (c) Environmental and Propulsion Performance Requirements (EPPR) for L-category vehicles.
- 9. Electric Vehicles and the Environment (EVE);
 - (a) UN GTR No. 21 (DEVP) and 22 on (In-Vehicle Battery Durability);
 - (b) Other activities of IWG on EVE.
- 10. Mutual Resolution No. 2 (M.R.2).
- 11. International Whole Vehicle Type Approval (IWVTA).
- 12. Vehicle Interior Air Quality (VIAQ).
- 13. Lifetime compliance.
- 14. Automotive Life Cycle Assessment (A-LCA)
- 15. Priority topics for GRPE activities.
- 16. Election of Officers

17. Any other business.

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

111. GRPE agreed to hold workshops in conjunction with the next GRPE session (para. 0).

Annex I

List of informal documents (GRPE-90-) distributed without an official symbol before and during the session

<i>No.</i>	<i>(Author) Title</i>	<i>Follow-up</i>
1r2	(Secretariat) Provisional annotated agenda	A
2r3	(Secretariat) Informal meetings in conjunction with the GRPE (proper) session: schedule and rooms reservation	A
3	(Chair) Draft running order	A
4	(Secretariat) General Information, 90th, 91st and 92nd sessions of GRPE	A
5	(Secretariat) Highlights of the recent WP.29 and ITC sessions	A
6	(PMP) Main modifications and justifications for ECE/TRANS/WP.29/GRPE/2024/4	A
7	(Republic of Korea) Real Driving Emissions for in-use compliance test using Indoor Test Cycle in Korea - withdrawn	C
8	(OICA) Proposal to amend ECE/TRANS/WP.29/GRPE/2024/8	B
9r1	(OICA) Alignment of UN Regulation No. 83 with UN Regulation No. 154	A
10	(OICA) List of issues related to all series of amendments to UN Regulation No. 154	A
11r1	(OICA) Proposal for Transitional Provisions to Supplement 2 for the original and 01 series of amendments to UN Regulation No. 154	A
12	(OICA) Proposal to amend ECE/TRANS/WP.29/GRPE/2024/12	D
13	(EUROMOT) Proposal to amend ECE/TRANS/WP.29/GRPE/2024/17	B
14	(EUROMOT) Introduction to ECE/TRANS/WP.29/GRPE/2024/16 and ECE/TRANS/WP.29/GRPE/2024/17	A
15	(Netherlands) Report of the Task Force Automated Vehicles Regulation Screening (TF-AVRS)	A
16r1	(EVE) Proposal to amend ECE/TRANS/WP.29/GRPE/2024/5	B
17	(EVE) Proposal for a final status report for Amendment 1 to UN GTR No. 21	B
18	(OICA) Activities on Hydrogen Dual Fuel engines	A
19	(Sweden) Proposal for a new supplement to the 02 and 03 series of amendments to UN Regulation No. 154	A
20r1	(OICA) Tyre Abrasion Study for ACEA/OICA	A
21	(Japan) Proposal to amend ECE/TRANS/WP.29/GRPE/2024/10	B
22	(Japan) Proposal to amend ECE/TRANS/WP.29/GRPE/2024/11	B
23	(Japan) Future amendment plan of UN Regulation No. 154	A
24	(Netherlands) Reducing emissions from non-road mobile machinery	A
25r2	(PMP) Proposal to amend ECE/TRANS/WP.29/GRPE/2024/4	B
26	(PMP) Additions to GRPE-90-06	A
27	(PMP) Proposal for a final status report for Amendment 1 to UN GTR No. 24	B
28	(PMP) Status report of the IWG on PMP	A
29r2	(TFTA) Status report of the Task Force on Tyre Abrasion	A
30	(Netherlands) Health effects of brake wear particle emissions	A
31	(A-LCA) Status report of the IWG on A-LCA	A
32	(EVE) Proposal to amend ECE/TRANS/WP.29/GRPE/2024/6	B
33	(EVE) Proposal for a final status report for Amendment 1 to UN GTR No. 22	B
34r1	(AAPC) Proposal to amend ECE/TRANS/WP.29/GRPE/2024/12	D
35	(VIAQ) Status report of the IWG on VIAQ	A
36	(EVE) Status report of the IWG on EVE	A
37	(OICA) Request for workshop on future of engine system power determination	A

<i>No.</i>	<i>(Author) Title</i>	<i>Follow-up</i>
38	(OICA) OICA activity on HD FE Harmonization	A
39	(UK) Proposal to amend ECE/TRANS/WP.29/GRPE/2024/9	B
40	(TFTA) Working document to be considered by GRBP: ECE/TRANS/WP.29/GRBP/2024/10	A
41	(EPPR) Status report of the IWG on EPPR	A
42	(EVE) draft updated Terms of References	B
43r1	(Secretariat) Draft updated GRPE list of priority	A

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 October 2024 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>
8 January 2024	1.30 p.m. – 5.00 p.m.	Automotive Life Cycle Assessment	A-LCA
	9.30 a.m. – 12.30 p.m.	Automotive Life Cycle Assessment	A-LCA
9 January 2024	2.30 p.m. – 5.30 p.m.	Particle Measurement Programme	PMP
	2.30 p.m. – 5.30 p.m.	Environmental and Propulsion Performance Requirements of L-category vehicles	EPPR
	2.30 p.m. – 5.30 p.m.	Electric Vehicles and the Environment	EVE

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)	Niels den Ouden Joseph Mashele	Edwin Bastiaensen	January 2025
Electric Vehicles and the Environment (EVE) (group)	Michael Olechiw Pangiota Dilara Chen Chunmei (Vice-Chair) Hisakazu Suzuki (Vice-Chair)	Kendelle Anstey	June 2027
Particle Measurement Programme (PMP) (group)	Barouch Giechaskiel	Rainer Vogt	June 2025
Vehicle Interior Air Quality (VIAQ) (group)	Andrey Kozlov Inji Park	Andreas Wehrmeier	November 2025
Automotive Life Cycle Assessment (A-LCA) (group)	Tetsuya Niikuni Charyung Kim	Noriyuki Ichikawa Erik Potsma Romain Denayer	June 2025

Annex IV

[English only]

Adopted on the basis of ECE/TRANS/WP.29/GRPE/2024/7 as amended by GRPE-90-09-Rev.1 (see para. 0)

A new Supplement to the 05 series of amendments to UN Regulation No. 83

I. Proposal

Annex 4

paragraph 4.1.5.2., amend to read:

"4.1.5.2. Dynamometer with adjustable load curve: the load simulator shall be adjusted in order to absorb the power exerted on the driving wheels at steady speeds of 120, 100, 80, 60 and 40 and 20 km/h. The means by which these loads are determined and set are described in Appendix 3a to this annex. **In the case where the vehicle road load has already been determined according to WLTP procedures as defined in UN GTR No. 15, the methodology, described in Appendix 3b may alternatively be used.**"

rename Appendix 3 to Appendix 3a.

insert a new Appendix 3b, to read:

"Annex 4 - Appendix 3b

Alternative procedure for determination of the total road load power of a vehicle

1. Introduction

The purpose of this appendix is to provide the road load power calculation method that may be used, at the choice of manufacturer, when the vehicle road load has been determined according to WLTP procedures as defined in UN GTR No. 15.

2. Method

2.1. WLTP Road Load calculation of the vehicle

The WLTP Road Load of the vehicle shall be determined according to UN GTR No. 15 Annex 4 or in case the vehicle is part of an interpolation family, according to Annex 7 point 3.2.3.2.2. "Road Load calculation for an individual vehicle" considering as input parameters of the individual vehicle:

- (a) The Test Mass of the vehicle¹, fitted with its standard equipment¹;
- (b) The RRC value of the applicable tyre energy class according to Table A4/2 of UN GTR No. 15 Annex 4 or, if the tyres on the front and rear axles belong to different energy efficiency classes, the weighted mean using the equation in paragraph 3.2.3.2.2.3. of UN GTR No. 15 Annex 7;
- (c) The aerodynamic drag of the vehicle fitted with its standard equipment¹.

¹ As defined in UN GTR No.15

2.2. Calculation of the applicable (NEDC) road load of the vehicle

2.2.1. Effect of different tyre pressure prescriptions

The tyre pressure to be taken into account for the purpose of calculating the NEDC road load shall be the average between the two axles of the average between the minimum and maximum tyre pressure permitted for the selected tyres on each axle for the NEDC reference mass of the vehicle. The calculation shall be carried out with the following formula:

$$P_{avg} = \left(\frac{P_{max} + P_{min}}{2} \right)$$

Where,

P_{max} , is the average of the maximum tyre pressures of the selected tyres for the two axles;

P_{min} , is the average of the minimum tyre pressures of the selected tyres for the two axles.

The corresponding effect in terms of resistance applied to the vehicle shall be calculated using the following formula:

$$TP = \left(\frac{P_{avg}}{P_{min}} \right)^{-0.4}$$

2.2.2. Effect of tyre tread depth

The effect in terms of the resistance applied to the vehicle shall be determined in accordance with the following formula:

$$TTD = \left(2 \cdot \frac{0.1 \cdot RM_n^{0.81}}{1000} \right)$$

Where, RM_n is the reference mass of the vehicle according to this Regulation

2.2.3. Effect of different consideration of rotating parts

During the WLTP coastdown setting, coastdown times are to be transferred to forces and vice versa by taking into account the applicable test mass plus the effect of rotational mass (3 % of the sum of the MRO and 25 kg). For the NEDC coastdown setting, coastdown times are to be transferred to forces and vice versa by neglecting the effect of rotational mass.

2.2.4. Determination of the NEDC road load coefficients

(a) The road load coefficient $F_{0,n}$ expressed in Newton (N) for vehicle shall be determined as follows:

(i) Effect of different inertia:

$$F_{0n}^1 = F_{0w} \cdot \left(\frac{RM_n}{TM_w} \right)$$

Where:

RM_n is the Reference Mass of the vehicle according to this Regulation

F_{0w} is the road load coefficient F_0 determined for the WLTP test of the vehicle;

TM_w is the WLTP test mass of the vehicle fitted with its standard equipment.

(ii) Effect of different tyre pressure:

$$F_{0n}^2 = F_{0n}^1 \cdot TP$$

Where the factors TP in the formula are as defined in point 2.2.1.

(iii) Effect of the inertia of rotating parts:

$$F_{0n}^3 = F_{0n}^2 \cdot \left(\frac{1}{1.03} \right)$$

(iv) Effect of different tyre tread depth:

$$F_{0n} = F_{0n}^3 - TTD$$

Where the factors TTD in the formula are as defined in point 2.2.2.

(b) The road load coefficient F_{1n} for the vehicle shall be determined as follows:

$$F_{1n} = F_{1w} \cdot \left(\frac{1}{1.03} \right)$$

(c) The road load coefficient F_{2n} for the vehicle shall be determined as follows:

$$F_{2n} = F_{2w} \cdot \left(\frac{1}{1.03} \right)$$

Where the factor F_{2w} is the WLTP road load coefficient F_2 determined of the vehicle fitted with its standard equipment."

Delete Annex 4a

Annex 7

Paragraph 7.1. of Annex 7, amend to read:

"7.1. For routine end-of-production-line testing, **as an alternative to conducting the Type 4 test as described in this Annex**, the holder of the approval may demonstrate compliance by sampling vehicles which shall meet the following requirements."

Add paragraphs 7.1.1. and 7.1.2., to read:

7.1.1. In case of vehicles with a sealed fuel tank system, at the request of the manufacturer and in agreement with the responsible authority, alternative procedures to paragraphs 7.2. to 7.4. of this Annex can be applied.

7.1.2. When the manufacturer chooses to use any alternative procedure, all the details of the conformity test procedure shall be recorded in the type approval documentation."

Paragraph 7.2.2., amend to read:

"7.2.2. A pressure of ~~370 ± 10 mm of H₂O~~ **3.70 kPa ± 0.10 kPa** shall be applied to the fuel system. **At the request of the manufacturer and with approval of the responsible authority, an alternative pressure can also be applied, taking into account the pressure range in use of the fuel system."**

Paragraph 7.2.4., amend to read:

"7.2.4. Following isolation of the fuel system, the pressure shall not drop by more than **0.50 kPa** ~~50 mm of H₂O~~ in five minutes."

Add paragraph 7.2.5., to read:

"7.2.5. **At the request of the manufacturer and in agreement with the responsible authority the function for leakage can be demonstrated by an equivalent alternative procedure.**"

Paragraph 7.3.2., amend to read:

"7.3.2. A pressure of ~~370 ± 10 mm of H₂O~~ **3.70 kPa ± 0.10 kPa** shall be applied to the fuel system. **At the request of the manufacturer and with approval of the responsible authority, an alternative pressure can also be applied, taking into account the pressure range in use of the fuel system.**"

Paragraph 7.3.5., amend to read:

"7.3.5. The pressure of the fuel system shall drop to ~~below a pressure less than 100 mm of H₂O in not less than 30 seconds~~ but **2.5 kPa above ambient pressure** within ~~two~~ **one** minutes."

Paragraph 7.3.6., amend to read:

"7.3.6. At the request of the manufacturer **and in agreement with the responsible authority** the functional capacity for venting can be demonstrated by equivalent alternative procedure. ~~The specific procedure should be demonstrated by the manufacturer to the Technical Service during the type approval procedure.~~"

Paragraph 7.4.4.3., amend to read:

"7.4.4.3. At the request of the manufacturer **and in agreement with the Type Approval Authority responsible authority**, 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.~~"

Delete paragraphs 7.5., 7.5.1., 7.5.2. and 7.6.

II. Justification

1. UN GTR No. 15 (WLTP) has introduced changes to some of the parameters in the process of road load determination.
2. EU have defined in its correlation Regulation, the methodology to derive an NEDC Road Load from a WLTP Road Load.
3. This amendment avoids the burden of a new road load determination when a WLTP road load has been performed.
4. This concept has been adopted in the 06 and 07 series of amendments at 82nd GRPE and it is proposed to also include it in the 05 series which is also commonly used in some world markets.

Annex V

[English only]

Adopted on the basis of GRPE-90-09-Rev.1 (see para. 0)

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

I. Proposal

Annex 7

Paragraph 7.1., amend to read:

"7.1. For routine end-of-production-line testing, **as an alternative to conducting the Type 4 test as described in this Annex**, the holder of the approval may demonstrate compliance by sampling vehicles which shall meet the following requirements."

Add paragraphs 7.1.1. and 7.1.2., to read:

"7.1.1. **In case of vehicles with a sealed fuel tank system, at the request of the manufacturer and in agreement with the responsible authority, alternative procedures to paragraphs 7.2. to 7.4. of this Annex can be applied.**

7.1.2. **When the manufacturer chooses to use any alternative procedure, all the details of the conformity test procedure shall be recorded in the type approval documentation."**

Paragraph 7.2.2., amend to read:

"7.2.2. A pressure of ~~370 ± 10 mm of H₂O~~ **3.70 kPa ± 0.10 kPa** shall be applied to the fuel system. **At the request of the manufacturer and with approval of the responsible authority, an alternative pressure can also be applied, taking into account the pressure range in use of the fuel system."**

Paragraph 7.2.4., amend to read:

"7.2.4. Following isolation of the fuel system, the pressure shall not drop by more than **0.50 kPa** ~~50 mm of H₂O~~ in five minutes."

Add paragraph 7.2.5., to read:

"7.2.5. **At the request of the manufacturer and in agreement with the responsible authority the function for leakage can be demonstrated by an equivalent alternative procedure."**

Paragraph 7.3.2., amend to read:

"7.3.2. A pressure of ~~370 ± 10 mm of H₂O~~ **3.70 kPa ± 0.10 kPa** shall be applied to the fuel system. **At the request of the manufacturer and with approval of the responsible authority, an alternative pressure can also be applied, taking into account the pressure range in use of the fuel system."**

Paragraph 7.3.5., amend to read:

"7.3.5. The pressure of the fuel system shall drop to ~~below a pressure less than 100 mm of H₂O in not less than 30 seconds~~ but **2.5 kPa above ambient pressure** within ~~two~~ **one** minutes."

Paragraph 7.3.6., amend to read:

"7.3.6. At the request of the manufacturer **and in agreement with the responsible authority** the functional capacity for venting can be demonstrated by

equivalent alternative procedure. ~~The specific procedure should be demonstrated by the manufacturer to the Technical Service during the type approval procedure.~~"

Paragraph 7.4.4.3., amend to read:

"7.4.4.3. At the request of the manufacturer **and in agreement with the Type Approval Authority responsible authority**, 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.~~"

Delete paragraphs 7.5., 7.5.1., 7.5.2. and 7.6.

II. Justification

1. Alignment with UN Regulation No. 154.

Annex VI

[English only]

Adopted on the basis of GRPE-90-09-Rev.1 (see para. 00)

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

I. Proposal

Annex 7

Paragraph 7.1., amend to read:

"7.1. For routine end-of-production-line testing, **as an alternative to conducting the Type 4 test as described in this Annex**, the holder of the approval may demonstrate compliance by sampling vehicles which shall meet the following requirements."

Add paragraphs 7.1.1. and 7.1.2., to read:

"7.1.1. **In case of vehicles with a sealed fuel tank system, at the request of the manufacturer and in agreement with the responsible authority, alternative procedures to paragraphs 7.2. to 7.4. of this Annex can be applied.**

7.1.2. **When the manufacturer chooses to use any alternative procedure, all the details of the conformity test procedure shall be recorded in the type approval documentation."**

Paragraph 7.2.2., amend to read:

"7.2.2. A pressure of ~~370 mm ± 10 mm of H₂O~~ **3.70 kPa ± 0.10 kPa** shall be applied to the fuel system. **At the request of the manufacturer and with approval of the responsible authority, an alternative pressure can also be applied, taking into account the pressure range in use of the fuel system."**

Paragraph 7.2.4., amend to read:

"7.2.4. Following isolation of the fuel system, the pressure shall not drop by more than **0.50 kPa** ~~50 mm of H₂O~~ in five minutes."

Add paragraph 7.2.5., to read:

"7.2.5. **At the request of the manufacturer and in agreement with the responsible authority the function for leakage can be demonstrated by an equivalent alternative procedure."**

Paragraph 7.3.2., amend to read:

"7.3.2. A pressure of ~~370 mm ± 10 mm of H₂O~~ **3.70 kPa ± 0.10 kPa** shall be applied to the fuel system. **At the request of the manufacturer and with approval of the responsible authority, an alternative pressure can also be applied, taking into account the pressure range in use of the fuel system."**

Paragraph 7.3.5., amend to read:

"7.3.5. The pressure of the fuel system shall drop to ~~below a pressure less than 100 mm of H₂O in not less than 30 seconds~~ but **2.5 kPa above ambient pressure** within ~~two~~ **one** minutes."

Paragraph 7.3.6., amend to read:

"7.3.6. At the request of the manufacturer **and in agreement with the responsible authority** the functional capacity for venting can be demonstrated by

equivalent alternative procedure. ~~The specific procedure should be demonstrated by the manufacturer to the Technical Service during the type approval procedure.~~"

Paragraph 7.4.4.3., amend to read:

"7.4.4.3. At the request of the manufacturer **and in agreement with the Type Approval Authority responsible authority**, 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.~~"

Delete paragraphs 7.5., 7.5.1., 7.5.2. and 7.6.

II. Justification

2. Alignment with UN Regulation No. 154.

Annex VII

[English only]

Adopted on the basis of ECE/TRANS/WP.29/GRPE/2024/8 as amended by GRPE-90-08 and during the session (see para.0)

A new Supplement to the 08 series of amendments to UN Regulation No. 83

I. Proposal

Paragraph 2.1., amend to read:

"2.1. "Vehicle type" means a group of vehicles that ~~do not differ in the following respects:~~ **fulfil the requirements for a vehicle type with regard to emissions in accordance with paragraph 3.0.1. of UN Regulation No. 154.**

~~2.1.1. The equivalent inertia determined in relation to the reference mass as prescribed in Table A4a/3 of Annex 4a of the 07 series of amendments to this Regulation; and~~

~~2.1.2. The engine and vehicle characteristics as defined in Annex 1 to this Regulation."~~

paragraph 2.37., amend to read:

"2.37. "Portable emissions measurement system" (PEMS) means a portable emissions measurement system meeting the requirements specified in ~~Appendix 1 to Annex IIIA~~ **Annex 4 of UN Regulation No. [168].**"

Paragraph 3.4.10., amend to read:

"3.4.10. Vehicles of category M₁ or N₁ shall be approved with emission characters EA, EB or EC as specified in Table A3/1, Annex 3, taking into account the utility factors determined in accordance with the values specified in Table A8.App5/1 ~~of paragraph 3.2. of~~ **Appendix 5 to Annex B8 to UN Regulation No. 154.** "

Paragraph 7.1., amend to read:

"7.1. Extensions for ~~tailpipe~~ **idling** emissions (Type 2 test)"

Paragraph 7.2.2.2., amend to read:

"7.2.2.2. To determine whether type approval can be extended, for each of the transmission ratios used in the Type 6 test, the proportion,

$$(E) = \frac{(V_2 - V_1)(V_2 - V_1)}{V_1}$$

shall be determined where, at an engine speed of 1,000 min⁻¹, V₁ is the speed of the vehicle-type approved and V₂ is the speed of the vehicle type for which extension of the approval is requested."

Paragraph 12., amend to read:

"12. Transitional provisions

12.1. General provisions

12.1.1. As from the official date of entry into force of the 08 series of amendments, no Contracting Party applying this Regulation shall refuse to grant approval under this Regulation as amended by the 08 series of amendments.

- 12.2. Type approvals
- 12.2.1. As from 1 September 2023, Contracting Parties applying this Regulation shall grant an approval to new types of vehicle only if they comply with: **the requirements for vehicles approved under the character EA as defined in Table A3/1, Annex 3 of this Regulation, as amended by the 08 series of amendments.**
- ~~(a) The requirements for vehicles approved under the character EA as defined in Table A3/1, Annex 3 of this Regulation, as amended by the 08 series of amendments.~~
- ~~(b) The requirements stated in Part III of UN Regulation No. 24 (if applicable).~~
- ~~(c) The requirements of UN Regulation No. 85.~~
- ~~(d) The Level 1A requirements of the 02 series of amendment to UN Regulation No. 154 or the requirements of the 03 series of amendment to UN Regulation No. 154.~~
- ~~(e) The requirements of UN Regulation No. [xxx] on RDE.~~
- 12.2.2. As from 1 January 2025, Contracting Parties applying this Regulation shall grant an approval to new types of vehicle only if they comply with: **the requirements for vehicles approved under the character EB as defined in Table A3/1, Annex 3 of this Regulation, as amended by the 08 series of amendments.**
- ~~(a) The requirements for vehicles approved under the character EB as defined in Table A3/1, Annex 3 of this Regulation, as amended by the 08 series of amendments.~~
- ~~(b) The requirements stated in Part III of UN Regulation No. 24 (if applicable).~~
- ~~(c) The requirements of UN Regulation No. 85.~~
- ~~(d) The Level 1A requirements of Supplement 1, or later version, to the 02 series of amendment to UN Regulation No. 154 or the requirements of Supplement 1, or later version, to the 03 series of amendment to UN Regulation No. 154.~~
- ~~(e) The requirements of UN Regulation No. [xxx] on RDE.~~
- 12.2.3. As from 1 January 2027, Contracting Parties applying this Regulation shall grant an approval to new types of vehicle only if they comply with: **the requirements for vehicles approved under the character EC as defined in Table A3/1, Annex 3 of this Regulation, as amended by the 08 series of amendments.**
- ~~(a) The requirements for vehicles approved under the character EC as defined in Table A3/1, Annex 3 of this Regulation, as amended by the 08 series of amendments.~~
- ~~(b) The requirements stated in Part III of UN Regulation No. 24 (if applicable).~~
- ~~(c) The requirements of UN Regulation No. 85.~~
- ~~(d) The Level 1A requirements of Supplement 1, or later version, to the 02 series of amendment to UN Regulation No. 154 or the requirements of Supplement 1, or later version, to the 03 series of amendment to UN Regulation No. 154.~~
- ~~(e) The requirements of UN Regulation No. [xxx] on RDE.~~

"

Annex 1, paragraph (a) to Appendix 3a, amend to read:

"(a) a declaration of the manufacturer that the vehicle does not contain any defeat device not covered by one of the exceptions in paragraph ~~5.1.3~~ **5.1.7** of this Regulation;"

Annex 1, item (i) to paragraph (d) to Appendix 3a, amend to read:

"(i) why any of the exception clauses from the defeat device prohibition in paragraph ~~5.1.3~~ **5.1.7** of this Regulation apply;"

Annex 1, paragraph (f) to Appendix 3a, amend to read:

"(f) a description of the hierarchical relations among the AES (i.e., when more than one AES can be active concurrently, an indication of which AES is primary in responding, the method by which strategies interact, including data flow diagrams and decision logic and how does the hierarchy assure emissions from all AES are controlled to the lowest practical level);"

Annex 1, item "Versioning table" of Table A1/1 to Appendix 3a, amend to read:

"...

Versioning table	Content of each version modifications: and with and which part is modified
------------------	--

..."

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

"Table A3/1

Letters with reference to emission standard, vehicle category and engine type

Character	Emission standard	Vehicle category	Engine type	AES Flag ⁽¹⁾	OBD	Comply with...	
						UN Regulation No. 154:	Others:
EA	Euro 6e	M ₁ , M ₂ N ₁ , N ₂ ⁽³⁾	PI, CI	No	OBD thresholds ⁽²⁾	Level 1A requirements of the 02 series of amendments or 03 series of amendments taking into account the utility factor based on d_{nea} determined in accordance with the values specified in Table A8.App5/1 of Appendix 5 to Annex B8 to UN Regulation No. 154	(a) The requirements stated in Part III of UN Regulation No. 24 (if applicable) (b) The requirements of UN Regulation No. 85 (c) The requirements of UN Regulation No. 168 on RDE
EB	Euro 6e-bis			Yes		Level 1A requirements of the 02 series of amendments or 03 series of amendments taking into account the utility factor based on d_{neb} determined in accordance with the values specified in Table A8.App5/1 of Appendix 5 to Annex B8 to UN Regulation No. 154	
EC	Euro 6e-bis-FCM			Yes		Level 1A requirements of the 02 series of amendments or 03 series of amendments taking into account the utility factor based on d_{nec} determined in accordance with the values specified in Table A8.App5/1 of Appendix 5 to Annex B8 to UN Regulation No. 154⁽⁴⁾	

Key:

(1): AES Flag: See paragraph 3.4.2. of this Regulation, as amended by the 08 series of amendments.

(2): See Table 4A in paragraph 6.8. of UN Regulation No. 154.

(3): UN Regulation No. 168 on RDE is not applicable for vehicles of category N₂.

"

Annex VIII

[English only]

Adopted on the basis of ECE/TRANS/WP.29/GRPE/2024/9 as amended by GRPE-90-39 (see para.0 0)

A new supplement to the 01 series of amendments to UN Regulation No. 101

I. Proposal

Paragraph 9.4.3.1., amend to read:

"9.4.3.1. **The vehicle shall be prepared according to the procedure in paragraph 5.2.2. of Annex 7 to this Regulation.**

During the conformity of production procedure, the break-off criterion for the Type 1 test procedure according to paragraph 5.2.3.1. to Annex 7 to this Regulation (consecutive cycle procedure) and paragraph 5.2.3.2. to Annex 7 to this Regulation (Shortened Test Procedure) shall be replaced with the following:

The break-off criterion for the conformity of production procedure shall be reached with having finished the first two NEDC test cycles according to paragraph 2. to Annex 7 to this Regulation."

Annex 8,

Paragraph 3.2.2.5. and paragraph 3.2.2.5.1., amend to read:

"3.2.2.5. **Application of a normal charge**

Normal charging is the transfer of electricity to an electrified vehicle with a power of less than or equal to 22 kW.

Where there are several possible methods to perform a normal AC charge (e.g. cable, induction, etc.), the charging procedure via cable shall be used.

Where there are several AC charging power levels available, the highest normal charging power shall be used. An AC charging power lower than the highest normal AC charging power may be selected if recommended by the manufacturer and by approval of the responsible authority.

3.2.2.5.1. **Charging procedure**

The REESS shall be charged at an ambient temperature compromised between 20°C and 30°C with the on-board charger if fitted.

In the following cases, a charger recommended by the manufacturer and using the charging pattern prescribed for normal charging shall be used if:

(a) **No on-board charger is fitted, or**

(b) **Charging time exceeds maximum time defined in paragraph 3.2.2.5.2.**

The procedures in this paragraph exclude all types of special charges that could be automatically or manually initiated, e.g. equalization charges or servicing charges.

The car manufacturer shall declare that during the test, a special charge procedure has not occurred."

Appendix 2, insert new paragraph 2., to read:

"2. External REESS current measurement"

Paragraph 2., renumber to 2.1.

Paragraph 2.1., renumber to 2.1.1.

Paragraphs 2.1.1. to 2.1.3., renumber to 2.1.1.1. to 2.1.1.3.

Paragraph 2.2. renumber to 2.1.2.

Paragraph 3. renumber to 2.2.

Insert new paragraph 3., to read:

"3. Vehicle on-board REESS current data

As an alternative to paragraph 2. of this appendix, the manufacturer may use the on-board current measurement data. The accuracy of these data shall be demonstrated to the approval authority."

II. Justification

1. The proposal to amend ECE/TRANS/WP.29/GRPE/2024/9 is shown in red text.
2. It improves consistency of the proposal.

Annex IX

[English only]

Adopted on the basis of ECE/TRANS/WP.29/GRPE/2024/10 as amended by GRPE-90-21 (see para.0 0)

A new supplement to the 02 series of amendments to UN Regulation No. 154

I. Proposal

Paragraph 6.7.2., Table 3b, amend to read:

"6.7.2. Notwithstanding the requirement of paragraph 6.7.1., a manufacturer may choose to have the deterioration factors from Tables 3a or 3b (as applicable) used as an alternative to testing to paragraph 6.7.1.

Table 3b
This table is only applicable for Level 1B
Additive Deterioration factors

Category		Class	Technically Permissible Maximum Laden Mass (GVW) (kg)	Assigned additive deterioration factors														
				Mass of carbon monoxide (CO)			Mass of non-methane hydrocarbons (NMHC)			Mass of oxides of nitrogen (NO _x)			Mass of particulate matter (PM)			Particle Number (PN)		
				L ₁ (mg/km)			L ₃ (mg/km)			L ₄ (mg/km)			L ₅ (mg/km)			L ₆ (#/km)		
			G	D	O	G	D	O	G	D	O	G*1	D	O	G*1	D	O	
M	—	All	127	76		12	3.1		11	11	*4	0	0		0	0		
N ₁	—*2	GVW ≤ 1,700	127	76	*4	12	3.1	*4	11	11		0	0	*4	0	0	*4	
	—	1,700 < GVW ≤ 3,500	281	76		18	3.1		15	17		0	0		0	0		
	—*3	All	327	—	—	9	—	—	8	—		0	—	—	0	—	—	

G Petrol, LPG

D Diesel

O Other fuel

*1 For petrol or LPG, particulate mass and particle number limits shall apply only to vehicles with direct injection engines.

*2 Except vehicles having engine displacement less than or equal to 0.660 litre, vehicle length less than or equal to 3.40m, vehicle width less than or equal to 1.48m, and vehicle height less than or equal to 2.00m, seats less than or equal to 3 in addition to a driver, and payload less than or equal to 350kg.

*3 Vehicles having engine displacement less than or equal to 0.660 litre, vehicle length less than or equal to 3.40m, vehicle width less than or equal to 1.48m, and vehicle height less than or equal to 2.00m, seats less than or equal to 3 in addition to a driver, and payload less than or equal to 350kg.

*4 As there are no assigned deterioration factors for compression ignition vehicles **using other fuels**, manufacturers shall use the whole vehicle ageing durability test procedures to establish deterioration factors.

"

II. Justification

1. Japan intends to introduce the additive deterioration factors for diesel from October 2024 in our regional regulation.
2. Necessity of this amendment is to eliminate the potential manipulation which was recently observed in our region and this action needs to be implemented as one of the urgent solutions.
3. For the purpose of our domestic legal procedure, it is desirable that this amendment is also reflected into UNR154.
4. Considering the time constraints, Japan requests GRPE approval during the 90th session, January 2024.
5. On the other hand, Japan understands that the frequent amendments of this Regulation is not efficient from the viewpoint of UNECE amendment process and homologation process in each region. Therefore, Japan follows GRPE decision if this amendment would be voted at WP.29 as a consolidated document including the other amendments yet to come in the near future.

Annex X

[English only]

Adopted on the basis of ECE/TRANS/WP.29/GRPE/2024/11 as amended by GRPE-90-22 (see para.0 0)

A new supplement to the 03 series of amendments to UN Regulation No. 154

I. Proposal

Paragraph 6.7.2., Table 3b, amend to read:

"6.7.2. Notwithstanding the requirement of paragraph 6.7.1., a manufacturer may choose to have the deterioration factors from Tables 3a or 3b used as an alternative to testing to paragraph 6.7.1.

Table 3b

Additive Deterioration factors (for emissions measurements to be compared against the limits in Table 1B)

Category		Class	Technically Permissible Maximum Laden Mass (GVW) (kg)	Assigned additive deterioration factors														
				Mass of carbon monoxide (CO)			Mass of non-methane hydrocarbons (NMHC)			Mass of oxides of nitrogen (NO _x)			Mass of particulate matter (PM)			Particle Number (PN)		
				L ₁ (mg/km)	L ₃ (mg/km)		L ₄ (mg/km)		L ₅ (mg/km)			L ₆ (#/km)						
G	D	O	G	D	O	G	D	O	G*1	D	O	G*1	D	O				
M	—	All	127	76		12	3.1		11	11	*4	0	0		0	0		
N ₁	—*2	GVW ≤ 1,700	127	76	*4	12	3.1	*4	11	11		0	0	*4	0	0	*4	
	—	1,700 < GVW ≤ 3,500	281	76		18	3.1		15	17		0	0		0	0		
	—*3	All	327	—	—	9	—	—	8	—		0	—	—	0	—	—	

G Petrol, LPG

D Diesel

O Other fuel

*1 For petrol or LPG, particulate mass and particle number limits shall apply only to vehicles with direct injection engines.

*2 Except vehicles having engine displacement less than or equal to 0.660 litre, vehicle length less than or equal to 3.40m, vehicle width less than or equal to 1.48m, and vehicle height less than or equal to 2.00m, seats less than or equal to 3 in addition to a driver, and payload less than or equal to 350kg.

*3 Vehicles having engine displacement less than or equal to 0.660 litre, vehicle length less than or equal to 3.40m, vehicle width less than or equal to 1.48m, and vehicle height less than or equal to 2.00m, seats less than or equal to 3 in addition to a driver, and payload less than or equal to 350kg.

*4 As there are no assigned deterioration factors for compression ignition vehicles **using other fuels**, manufacturers shall use the whole vehicle ageing durability test procedures to establish deterioration factors.

"

II. Justification

1. Japan intends to introduce the additive deterioration factors for diesel from October 2024 in our regional regulation.
2. Necessity of this amendment is to eliminate the potential manipulation which was recently observed in our region and this action needs to be implemented as one of the urgent solutions.
3. For the purpose of our domestic legal procedure, it is desirable that this amendment is also reflected into UNR154.
4. Considering the time constraints, Japan requests GRPE approval during the 90th session, January 2024.
5. On the other hand, Japan understands that the frequent amendments of this Regulation is not efficient from the viewpoint of UNECE amendment process and homologation process in each region. Therefore, Japan follows GRPE decision if this amendment would be voted at WP.29 as a consolidated document including the other amendments yet to come in the near future.

Annex XI

[English only]

Adopted on the basis of ECE/TRANS/WP.29/GRPE/2024/17 as amended by GRPE-90-13 (see para.0 0)

A new supplement to the 02 series of amendments to UN Regulation No. 120

I. Proposal

Paragraph 5.2.1., amend to read:

- “5.2.1. The net power test shall consist of either:
- (a) A run at full throttle for mechanically controlled positive ignition engines;
 - (b) **A run at** fixed full load fuel-injection-pump setting for mechanically controlled compression ignition engines; or
 - (c) A run at the required fuel system settings to produce the manufacturer specified power for electronically controlled engines.

The engine shall be equipped as specified in Table 1 of Annex 4 to this Regulation.”

Paragraph 5.2.3., amend to read:

- “5.2.3. The testing of an engine type or engine family shall be carried out by using the following reference fuels or fuel combinations described in Annex 7, as appropriate:
- (a) Diesel;
 - (b) Petrol;
 - (c) Petrol/oil mixture, for two stroke SI engines;
 - (d) Natural gas/bio methane;
 - (e) Liquid petroleum gas (LPG);
 - (f) Ethanol;
 - (g) **Hydrogen.**

The engine type or engine family shall, in addition, meet the requirements set out in paragraph 5.1.1. in respect of any other specified fuels, fuel mixtures or fuel emulsions included by a manufacturer in an application for type- approval and described in Annex 1 to this Regulation.”

Insert new Paragraph 5.4.2.1.3., to read:

- “5.4.2.1.3. When a turbocharged engine is fitted with a system which allows compensating the ambient conditions temperature and altitude, at the request of the manufacturer, the correction factor α_a or α_d shall be set to the value of 1.”***Annex 1 - Appendix A1, paragraph 2.8.1.*, amend to read:

- “2.8.1. Fuel Type ¹: Diesel (non-road gas-oil)/Ethanol for dedicated compression ignition engines (ED95)/Petrol (E10)/ Ethanol (E85)/(Natural gas/Biomethane)/Liquid Petroleum Gas (LPG) / **Hydrogen**”

Annex 1 - Appendix A1, paragraph 3.14.1., amend to read:

“3.14.1.	Fuel: LPG /NG-H/NG-L /NG-HL/LNG/Fuel specific LNG/ Hydrogen ”							
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Annex 2, paragraph 2.8.1., amend to read:

“2.8.1. Fuel Type(s): Diesel (non-road gas-oil)/Ethanol for dedicated compression ignition engines (ED95)/Petrol (E10)/ Ethanol (E85)/(Natural gas/Biomethane)/Liquid Petroleum Gas (LPG) ² / **Hydrogen**”

Annex 2 - Appendix A.1 - Template for Test Report A.1.3, insert new paragraph to read:

“4.5. Gaseous Fuel - Hydrogen

4.5.1. Make.....

4.5.2. Type.....

4.5.3. Grade.....

4.5.6. Dual-fuel engine (in addition to relevant sections above)

4.5.6.1. Gas energy ratio on test cycle:

Annex 4, paragraph 3.10., amend to read:

“3.10. For C.I. engines, the fuel temperature shall be measured at the inlet of the fuel injection pump and maintained within 306 - 316 K (33-43 °C) for positive-ignition engines the fuel temperature shall be measured as near as possible to the inlet of the carburettor or **assembly** of fuel injectors and maintained within 293–303 K (20-30 °C).”

Annex 5, paragraph 2.3.6., amend to read:

“2.3.6. Fuel type

- (a) Diesel (non-road gas-oil);
- (b) Ethanol for dedicated compression ignition engines (ED95);
- (c) Petrol (E10);
- (d) Ethanol (E85);
- (e) Natural gas/Biomethane:
 - (i) Universal fuel — high calorific fuel (H-gas) and low calorific fuel (L-gas);
 - (ii) Restricted fuel — high calorific fuel (H-gas);
 - (iii) Restricted fuel — low calorific fuel (L-gas);
 - (iv) Fuel specific (LNG);
- (f) Liquid Petroleum Gas (LPG);
- (g) **Hydrogen**”

Annex 7, insert new paragraph 3.3., to read:

3.3. Type: Hydrogen

<i>Parameter</i>	<i>Unit</i>	<i>Limits</i>		<i>Test method</i>
		<i>Minimum</i>	<i>Maximum</i>	
Hydrogen fuel index	%	99.97		1
Total non-hydrogen gases	µmol/mol		300	

Lists of non-hydrogen gases and the specification of each contaminant ⁶ :				
Water (H ₂ O)	µmol/mol		5	5
Total hydrocarbons except methane (C1 equivalent) ²	µmol/mol		2	5
Methane (CH ₄)	µmol/mol		100	5
Oxygen (O ₂)	µmol/mol		5	5
Helium (He)	µmol/mol		300	5
Nitrogen (N ₂)	µmol/mol		300	5
Argon (Ar)	µmol/mol		300	5
Carbon dioxide (CO ₂)	µmol/mol		2	5
Carbon monoxide (CO) ³	µmol/mol		0.2	5
Total sulphur compounds (H ₂ S basis) ⁴	µmol/mol		0.004	5
Formaldehyde (HCHO)	µmol/mol		0.2	5
Formic acid (HCOOH)	µmol/mol		0.2	5
Ammonia (NH ₃)	µmol/mol		0.1	5
Total halogenated compounds (Halogenate ion basis)	µmol/mol		0.05	5

Notes

- ¹ The hydrogen fuel index is determined by subtracting the “total non-hydrogen gases” in this table, expressed in mole per cent, from 100 mole per cent.
- ² Total hydrocarbons except methane include oxygenated organic species.
- ³ The sum of measured CO, HCHO and HCOOH shall not exceed 0.2 µmol/mol
- ⁴ As a minimum, total sulphur compounds include H₂S, COS, CS₂ and mercaptans, which are typically found in natural gas.
- ⁵ Test method shall be documented. Test methods defined in ISO21087 are preferable.
- ⁶ The analysis of specific contaminants depending on the production process shall be exempted. The manufacturer shall provide the approval authority reasons for exempting specific contaminants.”