

MEETING MINUTES

**26th Informal Group on Gaseous Fuelled Vehicles (GFV)
23rd May 2013
DG Enterprise Brey Building, Brussels
10.00-17.30**

I. Welcome and introductions

1. Chairman Rijnders welcomed the participants

II. Agenda for today (changes/additions)

2. No changes or additions to the agenda were made.

III. Adoption of minutes of the 25th GFV on 13th-14th March 2013 (GFV-25-07e)

3. No changes were made to the minutes of the past meeting, which were adopted.

**IV. Heavy Duty Dual-Fuel Task Force (Jean-François Renaudin (Volvo)
(ECE/TRANS/WP.29/GRPE/2013/7)**

Editorial changes are suggested for various parts of the text.

4. G-20 Reference fuel has not been introduced into R.49 and this needs to be done in the Working document GRPE 2013-07e)
5. Editorial change in 5.1 to remove redundancy of *operating in diesel fuel mode*. Same remark for 5.2.
6. Section 5.2.2.1 (section on ETC test cycle) 'diesel mode' also needs to be added. Subsections of this section are altered slightly.
7. NMHC is added in (new renumbered) section 5.2.2.2.4
8. Section 5.3, 'operating in diesel fuel mode' is removed and new section 5.3.1 is added. Emission limits applicable to Type 3B dual-fuel engine operating in dual-fuel mode is amended.
9. Question is raised about the NMHC limit value in Figure 1, which illustrates the HC limits in the case of a Type B dual-fuel engine operating in dual-fuel mode during the ETC cycle (natural gas dual-fuel engine). Mr. Castagnini suggests that this is not the correct value and that the formula is not appropriate for Euro V. Mr. Renaudin refers to the calculation procedure formula in section 5.2.3. The chart in Figure 1, therefore, can be amended so that the NMHC line begins at the break point between THC and CH₄ limit (and not begin at the 10% gas energy ratio as THC). The graph will be amended so it is aligned with the formula in the text indicating either HC on its own or the combination of CH₄ and NMHC.
10. Section 5.3.1.1 text amended that over the ESC test-cycle the same exhaust limits will be used as for diesel.
11. Table 1 (Laboratory tests to be performed by a dual-fuel engine) Types 1B and 2B changes made to ETC THC limit to NMHC; in ESC mode THC changed to HC; Type 3B 'dual-fuel mode' added and distinctions are made for emissions in dual-fuel mode and diesel mode. There have been previous discussions about having two separate emissions (HC/NMHC) for diesel with specific limit values for the gas engines. But the sum of both were not discussed. (This is consistent with section 5.2.2.1 to measure the mass of hydrocarbons.) Methane limits were applicable only in gas engines.
12. There is a general discussion on the measurement of methane and NMHC for diesel and gas (dual-fuel) engines for Euro V and VI, and the approach to retrofit versus OEM applications in the ETC cycle, in particular. Potential changes on the HC limit values for Euro V (to better accommodate retrofit systems) would

lead to a lengthy political discussion and likely would not be supported by the European Commission at this time. The concern by the retrofit stakeholders is that if the Euro VI methods and limit values for methane emissions are applied to Euro V then retrofit would not be economically possible, mainly because a methane catalyst would be required.

13. The GFV cannot do much more to make a different proposal to GRPE to change the CH₄ limit value. A relaxed limit might be possible once Euro V is no longer in force (which happens 31 December 2013). One possible 'relaxation' could be if the treatment of dual fuel would not include Type 2 engines in the ESC test cycle. If the ESC test requirement is eliminated for dual fuel engines except for the GER test (gas energy ratio) as it is currently for Type 1B dual-fuel engines then this could be a reasonable approach that provides more latitude for dual-fuel retrofits. The group agrees that this solution is acceptable.
14. Annex 4A of Euro V provisions would be required. These will be included in the final GFV document going to GRPE. But the changes discussed today would be sent no later than 24th May to the HDDF TF. The document will be considered as a GFV-26 document as a result of this meeting and will be prepared as an informal document for the next GFV and GRPE meeting.

New regulations for dual-fuel retrofit (follow-up of document GFV-25-4e; and new GFV 26-07e; GFV 26-08e) (Alberto Castagnini, AEB)

15. This contribution is an initial draft of a new heavy duty dual-fuel retrofit regulation, done at the suggestion of Jean-François Renaudin, to apply to LPG and natural gas for category M1 vehicles exceeding 2610kg, M2, M3 and N vehicles with engines approved according to R.49. Euro III and older engines are excluded. HDDF retrofit systems shall be tested on a parent engine. The proposed regulation would apply to dual-fuel systems of the 1B, 2B and 3B types. Please refer to document GFV 26-07e for the entire presentation.
16. The proposed timing to develop the new regulation would hope to be completed by the end of December 2013 with an informal document submitted to GRPE-67 in January 2014. A formal document would be prepared for GRPE-68 in June 2014 and, subject to approval, going to WP29 by November 2014 for final adoption. But there will be a challenge moving from an informal document in January to create the Formal Document on the GRPE schedule (documents required 12 weeks prior to meeting).
17. Discussion: The concept and plan are good. Also associated with the outcome of this new regulation some changes in R.115 might be required (possibly). The focus on dual-fuel would tend to be on Type 2B dual-fuel systems.
18. Suggestion by Mr. Schulte to conform the title of this new regulation and the scope to the other HDDF regulations (i.e. ensuring this does not apply to non-road vehicles). Ultimately the intention is to widen the scope of this regulation to include non-road and agricultural engines. There is discussion whether or not to include the non-road vehicle specifications as well. This would complicate the process. Such an approach also would involve dealing with regulations about which the GFV is not completely familiar. The question is whether the title of this new regulation should include non-road/agricultural engines as well.
19. Mr. Seisler asks whether we can serve the needs of the non-road/agricultural engine regulations by including language in the scope of work of the new regulation. This would not sacrifice the schedule for the HDDF retrofit applications, particularly if the regulations applying to non-road/agricultural regulations also need modification based on this new retrofit regulation. Countries such as Sweden and Finland that are interested in agricultural

applications could use this regulation as a guidance document to get HDDF engines into these market segments, even in advance of a specific regulation for non-road/agricultural machinery.

20. Decision is made tentatively that the regulation title, scope and time-frame can be changed so it specifies its applicability to road vehicles only. But a final decision will be made at the next GFV to agree with the changes. Primary drafting will be done by the GFV stakeholders and then continued development can be done with the HDDF TF.
21. There is further discussion about the process of the development of the retrofit regulation within the scope of the HDDF TF. AEGPL/AEB/Landi Renzo are taking primary responsibility to develop the regulation. Mr. Piccolo requests that the stakeholders please read the draft document carefully and provide input to him/AEB. Mr. Rijnders suggests that the work be done in coordination with the HDDF TF.

V. Report on results of meeting of 104th GRSG (LNG-TF; R.110 amendments; informal document on boil-off for GRPE June 2013) (Mr. Seisler)

22. Mr. Seisler reported that the 104th GRSG adopted the proposed amendments of the LNG Task Force to include provisions for LNG on-road vehicles within Regulation 110. The LNG TF was instructed by the GRSG, however, to bring the venting/holding time issue to the GRPE because this had an environmental impact that should be noted by the GRPE. Mr. Seisler reminded the group that the GRSG Chairman, Mr. Erario indicated that the adoption of the LNG amendments would continue on its route to adoption by WP29 regardless of the results of the presentation to GRPE. Mr. Del Alamo supported the description of the LNG holding time document. He reminded the group that additional regulations related to venting in enclosed spaces is up to individual countries.
23. The LNG TF principals will prepare a set of PowerPoint slides for Mr. Rijnders so he can bring the issue to the GRPE for their information in accordance with the direction provided by the GRSG. The fact that the requirements are aligned with the US SAE J2343 will be highlighted, also in the name of harmonization as well as safety.

VI. Discussion of CLEPA amendments for R.110 (carry over from GRSG meeting 15-19 April 2013, Geneva) (Matthias Tappe, Bosch and presentation by Gianbeppe Cravero (BRC/AEGPL)

ECE-TRANS-WP.29-GRSG-2013-11e (CLEPA stop fuel flow back R67 & R110) (Also 'new' GFV 26-02e and GFV 26-06)

24. Presentation by Gianbeppe Cravero (BRC), LPG Direct Injection R67-01 Amendment as to why petrol in the tank is not an issue; plus an Amendment proposal. (Please refer to document GFV 26-06)
25. LPG in the petrol tank has a safety impact – and redundant devices shall be introduced to prevent it. The system shall be capable to avoid the fuel level becoming filled beyond 80%. The system shall be capable to limit the quantity of petrol, blended in LPG at a maximum value of 20% in energy units.
26. Discussion: In the emission regulation there should be no possible loophole. Mr. Dekker suggests the amendment apply to petrol only and not diesel. Mr. Rijnders indicates that from an emissions point of view there are very few big concerns.
27. Outcome: Bosch/CLEPA/AEPL will present new data for the next GFV meeting in Geneva.

ECE-TRANS-WP.29-GRSG-2013-12e (CLEPA stop-start R67 & R110) (Also 'new GFV-26-03e) (Matthias Tappe, Bosch)

28. With new vehicle systems being introduced whereby the engines stop when the vehicle is not in motion new requirements and definitions of the systems would be required. The introduction of the hybrid systems within the definitions may not be appropriate in this proposed amendment (not included in R.110).
 29. In the normal system the tank valve remains open. But there would be an option to open or close the valve.
 30. Mr. Dekker indicates that all electric valves close when not energized. This language indicates that the option to keep it open is there, but in normal operation with no power the valve closes.
 31. There won't be an official remark from GFV to GRSG on this topic. Comments would go back to CLEPA to comment on any emissions concerns.
- VII. Chairman's Intervening Remarks on continuation of today's meeting.**
32. Mr. Rijnders asked if, due to the time constraint now at 17.00, the presentation on natural gas composition can be put the agenda of the upcoming 4th June GFV meeting in Geneva.
 33. Mr. Del Alamo has no problem to make his presentation at another GFV meeting. He intends to inform the group of the active work on fuel composition and the possible impacts on regulatory aspects of gas quality. But unfortunately, Mr. Del Alamo will be involved in the NGVAE annual conference and will not be present in Geneva. Members can bring concerns about gas composition to GFV or to NGVAE directly because Mr. Del Alamo is involved deeply in the issues associated with gas composition. Mr. Del Alamo will circulate a draft document to the GFV via the Chairman and secretariat. He will make a presentation at an upcoming meeting of the GFV. Mr. Rijnders recognizes the importance of this issue to many stakeholders and supports receiving more information from NGVAE.
 34. GFV Report on AEGPL Amendment R.115 Fuel Consumption (carry-over issue from GFV-25) This is a correction in the formula in Annex 6A and 6B (see Document ECE/TRANS/WP.29/2012/109), respectively for the calculation of G_{lpg} and G_{cng} refer to fuel consumption (FC) mean as defined in paragraphs 6.1.2.4.3.2 (LPG) and 6.2.2.4.3.2 (CNG). Mr. Rijnders suggests that this correcting amendment be made into an informal document for discussion at the next GFV meeting.
 35. Regarding the Updating of Regulation of 115: There have been no comments at this moment and the discussion can be carried over to the next meeting of the GFV.
 36. Alternative Fuel Vehicle Propulsion System Definitions (VPSD) (see ECE/TRANS/WP.29/GRPE-65-12 and GRPE-65-13). The GFV generally is not as a group in the VPSD deliberations, although there has been a request from GRPE Chairman Mr. Albers that input be provided for gaseous fuel vehicle definitions. Mr. Rijnders indicates that each participating organization can provide input to the VPSD. GFV becomes an intermediate group to receive expressions of interest and comments on the differences with definitions proposed at the VPSD. Every representing organization can participate in this and the concepts can be shared with GFV. Mr. Rijnders suggests that each organization can approach the VPSD and that GFV would want to share information as much as possible but not be an intervening group preventing other opinions to go to VPSD. Mr. Piccolo will make an attempt to prepare comments on the gaseous fuel definitions.

VIII. Planning upcoming Meetings of GFV & Task Forces. There is no need to schedule a new meeting at this time because the Geneva GFV-27 meeting is scheduled for 4 June 2013 from 14.30-17.30.

IX. Closing

37. Mr. Rijnders thanked the participants for attending. Future meetings of the GFV will be scheduled at the end of the meeting in Geneva.

ATTENDEES

André Rijnders, Chairman (RDW)
Jeff Seisler, Co-secretariat (NGV Global/Clean Fuels Consulting)
Salvatore Piccolo Co-secretariat (Federchimica/AEGPL)
Jaime Del Alamo (NGVAeurope)
Henk Dekker (TNO)
Jean-François Renaudin (Volvo)
Bernardo Martinez (DG Enterprise)
John Crawford (Westport Innovations) (by telephone)
Steve Whelan (CAP)
Francesco Cagnolati (Landi Renzo)
Alberto Castagnini (AEB)
Walter Bleuler (German Federal Ministry of Transport)
Gianbeppe Cravero (BRC)
Cecile Favre (AECC)
Matthias Tappe (Bosch)
Alex Stoehr (AEGPL)
Susanne Leifheit (VW)
Leif-Erik Schulte (TUV)