

## Meeting Minutes

**27<sup>th</sup> Meeting of the Informal Group on Gaseous Fuelled Vehicles (GFV)  
4 June 2013  
Palais Nations, Geneva Room XXVI  
14.30-17.30**

**I. Welcome and introductions**

1. Mr Rijnders welcomed the group, including one call-in from the Federal Ministry of Transport (Germany)

**II. Agenda for today (changes/additions)**

2. There are no remarks, additions or changes in the agenda.

**III. Adoption of minutes of the 26<sup>th</sup> GFV on 23rd May 2013 (GFV-26-09)**

3. The 23 May 2013 minutes have been put on the website but due to the short notice since the last meeting we can adopt the minutes at the next meeting. Alternatively, with no comments or objections, the minutes are adopted. If anyone has comments changes can be noted at the next GFV meeting.

**IV. Annex 4A of Euro V provisions for Dual-Fuel Engines** (Amendment proposals to document ECE/TRANS/WP.29/GRPE/2013/7 further to the 23 May 2013 GFV meeting). Jean-François Renaudin (Volvo), chairman of HDDF-TF

4. In the last meeting, GFV-26, some modifications to the amendments to Annex 4A were made, many of which were editorial. Type 3B engines in the D-F mode and the ETC cycle was discussed but needs further discussion.
5. Mr. Renaudin reviewed the amendments that were discussed at GFV-26 to Annex 4A sections. (These can be seen in GFV 26-09 or, in the document format, in the GRPE document ECE/TRANS/WP.29/GRPE/2013/7.) Also, as in the Euro VI, R.49 amendments the formulae 'decimal separator' (comma or period) were changed.
6. Mr. Dekker (TNO) has made some changes Annex 11 Appendix 4 but 4B is in better form than the current Annex 4A. Reference to Annex 4A was added with reference in Annex 4B. The changes are complicated by the fact that one has to look at both Annex 4A and 4B. If people have time to look at this to identify any mistakes Mr. Dekker would be interested in getting comments.
7. G-20 is not referenced in Annex 5 but now is amended to include it. Testing in ESC the same limits will be applied as a diesel engine but due to the discrepancy between gas and diesel on ETC takes into consideration a non-methane hydrocarbon (NMHC). Mr. Renaudin explained that the diesel principle is kept intact and the proportionality is indicated. The Figure 1 chart showing THC, CH<sub>4</sub> and NMHC is corrected from the last meeting. (Illustration of the HC limits in the case of a HDDF Type2 engine operating in dual-fuel mode during the WHTC cycle (natural gas dual-fuel engines))
8. Mr. Stein (Daimler/OICA) indicated that text must be changed in Annex 4B for type approval purposes and the change may have to be confirmed by the GRPE.
9. Mr. Rijnders indicated that the documents (Euro V) were sent to GRPE but now we realize there are some small corrections needed. He asked if the original document can remain as a formal document or if, due to corrections needed does this change the document, to become an informal document?

10. Mr. Stein suggested that if Annex 4B needs to be changed then the document could not be a final. This is a type approval document and without some of the suggested changes it would be difficult to be useful.
11. Annex is used only for calculations. Annex 4B is usable only based upon the use of Annex 4A, for dual-fuel engines.
12. Mr. Rijnders asked if the GFV agrees to explain to the GRPE the document with the small corrections made today (the graph and improved flexibility). There are no objections so the document will be brought to the GRPE for adoption.

**V. Dual-fuel retrofits** (follow-up of document to GFV 27-04)

13. In earlier discussions it was decided that the heavy duty D-F retrofit regulation would be created as an entirely new regulation and not part of an existing one (for example, R.115). Also discussed was the idea to expand the regulation to apply to off-road and agricultural vehicles.
14. Alberto Castagnini (AEB) made a revised PowerPoint presentation on behalf of AEGPL, based on the originally circulated presentation from GFV 26, which was not made due to lack of time (based on GFV 26-07, retrofit heavy duty dual-fuel systems). The revised version now includes agricultural and forestry tractors as well as non-road mobile machinery in the title.
15. Mr. Rijnders commented that we will have to take into consideration at first only the HD road vehicles, with other non-road vehicles in the regulation's title to be considered at a later time. Other regulations covering these vehicles (or their engines) must be reviewed to see if they are impacted. Also we have to bring forth a suggested change that R.115 applies only to light duty vehicles.
16. Mr. Renaudin agreed with this approach. He indicated that the new regulation should address the type approval of retrofitted engines rather than of retrofit systems because a gas retrofit system introduces several modifications to the original engine system, for instance, in comparison with Retrofit Emissions Control (REC) systems. Furthermore, there must be details and solid principals that apply to the other non-road vehicles and these may originate from the first round of retrofit regulations that will be created.
17. Mr Piccolo noted that also RECs - other than very simple passive filters - introduce relevant modifications to the engine system. Just for this reason, REC regulation provides proper requirements on that aspect as well as R 115 does in the case of gas retrofits. Retrofit-system-type-approval approach is applied in both regulations, and modifications to the original vehicle/engine are taken into account and properly validated. Mr. Piccolo added that a retrofitted engine would be considered as a new engine, i.e. a "new type". Hence, at least in EU, the "new engine type" will have to comply with the latest emission stage, even if the base diesel engine conforms to previous stages, which he indicated could impede de facto the retrofitting.
18. As for the inclusion of non-road vehicles, Mr. Cagnoloti proposed to include them in the first instance due to the fact that the engines and operational principles are the same.
19. Mr. Stein suggested that the time table for the HDDF retrofit regulation is not realistic. He noted that the REC regulation took three years to create. He referred to the non-road vehicles and asked if it is desirable for the industry to bring this forward.

20. Mr. Rijnders acknowledged that the retrofit system certification was requested at the very beginning of the work undertaken by the HDDF TF. He said it is important to take some precautions about enlarging the scope to include non-road vehicles at the beginning of the effort to create dual-fuel retrofit regulations.
21. Pierre Laurent (CLEPA) asked why the word 'retrofit' is being used. He suggested it would be better from an editorial perspective to use the word 'replacement.' In response, Mr. Rijnders suggested that these two principals are different: A 'replacement' takes the place of the same type of system that has failed. But 'retrofit' indicates a new system is put onto an existing engine/vehicle. Maybe this will be clarified when we work on the document, and provide a good definition of 'retrofit'. (Mr. Stein agreed with Mr. Rijnders's interpretation.)
22. Mr. Renaudin asked if we can create a definition of 'retrofit' as part of the work at the VPSD, which is working on harmonization of vehicle definitions.
23. There is further general discussion on the principal of defining a 'retrofit' versus 'replacement' engine as well as including non-road vehicles into the scope of work.
24. Mr. Rijnders summarized what he believes should be presented to the GRPE on this issue. We will ask to work on the new regulation that has modules and we are taking into consideration the retrofit of engines and vehicles as well. We also have to take into consideration the expanded use of LNG as a vehicle fuel. This GFV group facilitates the market introduction through the regulations that are written. But the principals of retrofit engines also can be taken on board for non-road and agricultural vehicles. He summarized that we have a consensus about HDDF engines; to work on retrofit but also work on a 'module' basis to include agricultural tractors and non-road vehicles if the industry supports this additional work. The only point we need to ask GRPE is about working on a model regulation and to inform them at what stages we might work to include other engine types.

**VI. Amendment R.115 Fuel Consumption** (informal document for the GRPE on formulae in Annex 6A and 6B) (GFV 27-03e). (GRPE Informal Documents 66-19)

25. Mr. Rijnders described the origin of this issue from previous GFV meetings and that the relatively simple definitional change that everyone has agreed to can be brought to the GRPE as a corrigendum to WP29 approved documents rather than as a supplement to the original regulation. However, the GRPE secretariat indicated that it must be made as a supplement, which is procedurally more correct.
26. Mr. Piccolo further described that using the word 'mean' in the definition must be changed to 'norm' because each parent vehicle must be checked that it is using no more than 20% gasoline.
27. Mr. Rijnders will ask to make this document an informal document and then made into a Formal Document so it can be adopted at the next GRPE (January 2014).

**VII. Alternative Fuel Vehicle Propulsion System Definitions** (VPSD) (see ECE/TRANS/WP.29/GRPE-65-12 and GRPE-65-13).

28. Mr. Rijnders explained that the GFV has responsibility to provide input to the new group involved with Vehicle Propulsion System Definitions. Previously the GFV has agreed that each stakeholder has its responsibility to provide input to the VPSD. The GFV will not be the intermediary group to make the changes in the VPSD. Therefore, the topic will not be discussed further and

any and all stakeholders who wish to provide input to the VPSD should do so independently of GFV and go directly to the VPSD informal group.

**VIII. Updating Regulation 115**

29. Mr. Rijnders will evaluate the regulation to update it to the highest possible level reflecting the newest changes and new levels of stringency in other various regulations (i.e. the various Euro levels).
30. Oliver Eberhardt (German Federal Ministry of Environment) suggested that R.115 is outdated and more attuned to Euro 3. Consideration of in-use conformity and OBD are important and also should be evaluated. Germany suggested that identifying the possible improvements and issues could be done in a general brainstorming exercise.
31. Mr. Rijnders expressed his agreement and suggested other items such as a revision of family definitions and possible introduction of SEMs can be added to the type approval for retrofit systems . As such the 'brain-storming' process could be important and very useful.
32. Mr. Renaudin fully supported this effort on behalf of OICA.

**IX. Other Items**

33. There are two more informal documents from the GFV to the GRPE. One relates to LNG coming from the GRSG for venting and holding time. This was a request from Germany to bring the issue as an 'environment concern' to GRPE, but not to have an impact on the adoption of the LNG amendments to R.110. (66-06 and 66-20) The second document is a PowerPoint presentation of this same issue. Mr. Rijnders suggested that Mr. Seisler may be asked to make the presentation to GRPE since he was involved in the LNG TF and participated at the GRSG meeting in April where this issue came up.

**X. Planning upcoming Meetings of GFV & Task Forces**

34. Normally the GFV has a meeting between the Summer GRPE and the New Year. We will bring some proposed dates for the GFV in late October possibly in Zoetermeer at the office of RDW. For the HDDF TF a meeting would be preferred sometime late in September. But this has to be discussed first with the HDDF TF since we had not considered this previously.

**XI. Closing**

Mr. Rijnders thanked all the participants for their attendance and remarks throughout the meeting. Progress is being made on different items and there is much left to do.

**Attendees**

Andre Rijnders, Chairman (RDW-NL)  
Jeff Seisler, Co-secretariat, (NGV Global/Clean Fuels Consulting)  
Salvatore Piccolo, Co-secretariat, (Federchimica/AEGPL)  
Henk Dekker, (TNO)  
Jean-François Renaudin (Volvo/OICA)  
Hans-Juergen Stein (Daimler/OICA)  
Walter Bleuler (German Federal Ministry of Transport) (phone link)  
Matthias Tappe (Bosch)  
Francesco Cagnolati (Landi Renzo)  
Alberto Castagnini (AEB)  
Leif-Erik Schulte (TUV)  
Vispute Suresh (VANAZ Engineers Ltd, India)  
Shrikant Raghunath Marathe (ARAI)

R.M.Petkar (Tata Motors, Ltd)  
Wojciech Gis (Motor Transport Institute, Poland)  
Andrej Zoltowski (Motor Transport Institute, Poland)  
Peter Cullingham (UK Department of Transport)  
Simon Davies (UK Department of Transport)  
Pierre Laurent (CLEPA/Bosch)  
Nilesh Bhana (VW/OICA)  
Dries van Tonder (National Regulator for Compulsory Specifications, South Africa)  
Alexey Terenchenko (NAMI, Russia)  
Vadim Kutenev (NAMI, Russia)  
Mariz Vaysblyum, (NAMI, Russia)  
Takatoshi Sakai (OICA/JAMA)  
Georges Dimitri (Michelin/ETRTO)  
Jeongmin In (KATRI, Korea)  
Jongsoon Lim (KATRI, Korea)  
Hyunwoo Lee ((KATRI, Korea)  
Kyung Wan RHO (KEMCO, Korea)  
John May (AECC)  
Giovanni Margaria (OICA/IVECO)  
Kristof Schockaert (Belgium)  
Ian Bacon (OICA)  
Ivan Pollak (Hungary)  
Helmut Kraft (Germany)  
Yuki Toba (JASIC/Japan)  
Shingo Morita (MLIT/Japan)  
Kazuyuki Narusawa (NTSEL/Japan)  
Masahiko Sakai (JASIC/Japan)  
Masahito Yamashita (JASIC/Japan)