GFV-10-07

MINUTES OF THE MEETING
INFORMAL GROUP ON GASEOUS FUELLED VEHICLES
(GFV-10)
8 June 2010
United Nations
Palais Nations
Geneva
09.30-12.30

I. Welcome

1. Chairman Rijnders welcomes the group of participants.

II. Review of Agenda & Adoption of the Agenda

2. No changes to the agenda are requested and the agenda is approved.

III. Adoption of the minutes GFV, 28 April 2010 (GFV 09-02)

3. Four small changes in the minutes were requested. The revised agenda will be posted as GFV-09-02 (REV).

IV. Non-Methane Hydrocarbon (NMHC)

4. Mr. Rijnders (Chair) reviews the GFV-9 meeting comments on the NMHC discussion.
5. Mr. Dekker (TNO) provides a brief overview with GFV-09-07 of his presentation from GFV-9. Measurements at TNO and JRC were done, comparing vehicles with optimized methane catalysts over the normal test cycle with the cold start. The retrofit vehicles were not done with optimized catalysts, so it is not a 'clean' comparison, causing some confusion. Data from JRC and TNO have been recalculated and are included in document (GFV-09-07).
6. Mr. Rijnders mentioned the earlier remarks from the European Commission on their concerns about a relaxed new limit value for CH4 only for retrofit. This will create a distinction of stringency between retrofit and OEM factory built NGVs and create legal inequality. The idea of developing "CO2 equivalents" (as discussed recently in the U.S.) was considered as an alternative to CH4 / NMHC.
7. Mr. Asman (European Commission). The minutes of the GFV-09 describes the discussion very well. The limits for Euro regulations cannot be changed. But we discussed if type approval can be done for older vehicles under the Euro 5/6 but the Commission still has no resolution from its counsel on the issue. We will have a clearer picture for the next meeting of GFV.
8. NMHC will be put on the agenda for the next GFV meeting to see if the Commission has additional input. A determination then can be made to see if the topic requires further discussion.

V. Dual fuel regulatory work;

V.1 Report GFV-9

9. The topic is now raised as a new item due to the potential economic and environmental beneficial contributions of dual-fuel engines. But there are no certification requirements to test these engines so the GFV will determine how to amend or change existing regulations. There are two clear issues: 1) heavy duty diesel versus light duty diesel vehicle technologies and regulations; and 2) it is possible that a technology using a mixture of petrol and gaseous fuels will be introduced, and this might require further regulatory action.
10. Mr. Rijnders requests Mr. Seisler (IANGV) to provide a brief review of the Dual Fuel Workshop sponsored by Clean Fuel Consulting, looking at dual-fuel systems for natural gas and LPG in operation with HDV diesel engines. Mr. Seisler outlined some of the key findings and conclusions from the workshop, where there were 75 participants that included commercial suppliers, governments, the European Commission, etc. (See document GFV-09-03). Mr. Rijnders further emphasizes the need to satisfy both the OEM suppliers and retrofit suppliers of dual fuel systems.

V.2 Issues to Address in HD-Dual-Fuel Discussion GFV-10-04 (Volvo-TNO)

11. Mr. Renaudin (Volvo) discusses GFV-10-04, introduced as a new document by Volvo-TNO.
    - There are major differences between light duty and heavy duty dual-fuel systems. Maybe there should be two different subgroups within GFV to do separate work on these two vehicle classes since there may be different experts dealing with heavy duty and light duty who don't necessarily cross-over. It is suggested that two new subgroups would be more efficient.
    - Amending Regulation 49 for OEMs is needed first in order to draft an amendment for Regulation 115.
    - The work can be done on R.49 and R115 simultaneously in order to save time.
    - R49 rules should be harmonized to the best extent possible with other country regulations that have been developed by other experts around the world, especially when some of these experts are also involved in the European work.
12. It is suggested that heavy-duty diesel/gas dual-fuel engines can be categorized into three types.
    - Type 1 Dual-fuel engines capable of running with pure diesel-fuel that should comply with diesel fuel engine requirements.
    - Type 2 DF that have a 'balance' of diesel vs. gaseous fuel use across the drive cycle.
    - Type 3 DF types using less than 10% gas.
13. In the development of draft recommendations on DF, some basic principles should be agreed upon and respected. The suggestions are:
    - DF capable of running on pure diesel should be tested as diesel but some 'limp-home' capability with diesel fuel should be considered (possibly with a limitation on vehicle speed).
    - Consider the work done in the US on diesel pilot injection, and DF Type 1 should be considered as PI mono-fuel gas engines, noting PM and NH3 emissions are to be addressed.
    - DF type 3 (less than 10% gas) should be considered as a diesel-fuel engine.
    - DF type 2 should be required to comply with diesel fuelled engines applicable to a mono-fuelled gas engine that is proportionate to the actual usage of the fuels.

('Proportionate' must be clearly defined to be consistent with other requirements, such as OBD).

Mr. Rijnders asks for comments from the larger group. First, are the three categories clear and consistent?

14. Mr.Asman (European Commission). The categories make sense but he does not fully understand how the categories can be dealt with in the regulations.
15. Mr. Dekker (TNO). Most of the engines are Type 2 and might be in regulations as 'A', 'B', and 'C'. These categories may have to be clarified or refined, subject to further consideration.
16. Mr. Per Öhlund (Swedish Transport Administration) agrees with comments by the Commission. But these same categories and engines should be considered for off-road vehicles, such as tractors, which can play an important role. Mr. Rijnders recognizes the importance of non-road vehicles and suggests that the working group can deal with this at a later stage, but the main focus would be on Regulation 49 and then could be expanded into the non-road machinery regulations.
17. Mr. Stein (OICA/Daimler). It is not necessary to differentiate all the engines types as long they are certified on diesel, gaseous fuels, and combined. There is one other point that Auxilliary Emission Control (AEC) systems must be considered in the regulations.
18. Mr. Rijnders. Creating a separate informal Task Force for HDVs (distinct from LDVs) that meet separately in a smaller drafting group can be a productive way to proceed. But the group should be transparent and should be responsible to the GFV, which can help schedule the meetings and announce to the larger GFV (and on the UN website) that meetings are occurring. We will ask the GRPE Secretariat if a separate website reference can be made to keep the documents distinct
19. The GFV group agreed that certification requirements within R.49 should be done first. Mr. Renaudin suggests that language also can be drafted for R.115. Mr. Rijnders agrees that R.49 amendments must come first, since R.115 references R.49. R.115 provisions cannot be made on their own, but must come first in R.49.
20. Mr. Seisler asks if the principals will deal first with the issues in a generic way and then craft language to both R.49 and R.115. Mr. Renaudin clarifies that type approval of new vehicles (R.49) must be dealt with and then R.115 would follow. The Commission also agrees. The group moved to the LDV gasoline Direct Injection engine topic, and heard from system designers that dual fuel operation is today the unique solution to convert those cars to gas. This point is clear from this discussion and will be further discussed next with the LandiRenzo/AEGPL document.
21. Harmonization and having a worldwide vision of DF is important. Looking at any other existing regulations (or standards) will prevent us from re-inventing the wheel. We can take advantage in the rule-making process if we can have, for example, 20% of the language on Type 1 engines already; other language might exist for the Type 2 DF.
22. Mr. Rijnders suggests that the DF task force work can be done in concert with the GFV meetings. But if more meetings are required, separate DF meetings would be possible, depending on the consensus of the DF group.
23. Mr. Duvielguerbigny explains briefly how the GFV documents attribution were changed (OICA is Volvo-TNO); LandiRenzo submittal was changed to AEGPL.

V.3. Presentation document GFV-10-02, for bi-fuelled Gas Direct Injection for Light Duty Vehicles (LandiRenzo/AEGPL)

25. Mr. Cagnoloti (LandiRenzo): Proposed method for THC and fuel consumption calculation for vehicles using two fuels simultaneously should be considered in Regulations 83 and 101 respectively. GFV-10-06? supporting document to GFV-10-02 THC and consumption calculation

26. Mr. Piccolo (Assogasliquidi). Clarifies that the discussion is about LDVs running on petrol. R.83 will set a period of time that a bi-fuel vehicle can run on petrol before switching to gaseous fuel. Considering the gas cycle (disregarding 20-30% on petrol) and using a "mono-fuel" gas calculation, THC emissions and fuel consumption are higher than in real life operation. Therefore, the proposal is conservative. For a better calculation, it is needed to know what percentage of petrol is consumed but that's a challenge. LandiRenzo is suggesting a calculation method to understand the actual petrol consumption, resulting in a better understanding of the true THC emissions. The current regulations addressing THC and fuel consumption are not adequate. Assuming a more detailed engine classification system (for example, as outlined by Mr. Renaudin earlier), one has to calculate the percentage of gaseous versus diesel fuels used during the test cycle.
27. Mr. Radzimirski (Poland) welcomed the proposal. HC emissions, fuel consumption and dilution factor must be considered, although the impact on dilution factor is negligible. Mr. Cagnoloti's amendment is based on the assumption that emissions are a function of the fuel percentages used. Calculations were made on a classical bi-fuel vehicle operating on petrol for 90 seconds on petrol. The calculation is made on the basis of a mono-fuel LPG vehicle. The calculation is about 4% higher than the actual emissions. However, with the method proposed by Mr. Cagnolati the test results are .5% lower on emissions; regarding fuel consumption the difference is much higher; 3-4%. For the classical bi-fuel concept the advantages are not high but are higher for the DF concept, when there is a rough relationship between the emissions and fuel consumption.
28. Mr. Crawford (Westport) asks what the definition is of a dual-fuel vehicle in the document, when the vehicle can run only on one fuel. Mr. Rijnders indicates that we have not settled on a definition of a 'dual-fuel' vehicle. Westport's technology must be reflected correctly in the definition. Defining DF is a principle task of the new task force.
29. AEGPL displayed a matrix (GFV-10-05) that defines DF vehicles. AEGPL agrees that a suitable definition of DF must be proposed for R.49.
30. Mr. Rijnders suggests that a Task Force be created to address LDV dual fuel/mixed fuel with petrol. And, since the document from LandiRenzo may not have been seen by everyone, more time is needed to review it. If there is interest in creating a separate LDV-DF task force the GFV secretariat should be informed.

VI. Amendments to Regulation 115 for LPG (and related CNG) submitted by the representative from Poland & AEGPL.

Presentation of document GFV-10-03 (Revision 1) (AEGPL)

31 Mr. Duvielguerbigny (AEGPL). Proposes new footnotes/amendments to encourage type approval of Euro 5-compliant conversion systems. A number of minor mistakes in the current regulation were noted (for example, engine power, etc.). Some of these issues, if not corrected, could hamper conversion of new Euro-5 vehicles.
32. Mr. Rijnders suggests that these amendments must be done quickly. But this is possible only if there are no objections to the approach. The new document revisions, working closely with Mr. Radzimirski, will be proposed to the GRPE.
33. Mr. Redmann (Germany) asks if we should expect emissions benefits from converting Euro 5 vehicles. We might lose advantages of certain benefits, such as durability, OBD compliance, in-service conformity, etc. Mr. Redmann is worried about a possible loophole in the EU-type approval (TA) allowing car makers, using R115, to offer bi-fuelled cars not fulfilling the EU-TA provisions for bi-fuelled cars.
34. Mr. Duvielguerbigny. These corrected regulations are for 'pure' retrofits (in the original spirit of R115). The documents have been presented in December 2009 and again in

April 2010. There is a market demand for retrofitting these vehicles, thus the regulations must be amended.

35. Mr. Rijnders reminds Germany that we have R.115, and it is logical that when a new stage of emissions regulations comes into force, then retrofits need to be addressed in this context. Fundamentally, if there are changes in R.83 then changes must occur for R.115, which reference R.83. He asks if we should start the discussion for restricting retrofit with Euro 6.
36. Mr. Asman. The intention of the proposal is to make it possible to do retrofits on Euro 5 similar to retrofits of vehicles on other stages of Euro regulations. This is different than the discussion on NMHC, which involve actual changes in the regulations. In principle, it appears that currently proposed changes follows precedents in the past dealing with the various Euro regulations.
37. Mr. Piccolo. The approach as a corrigendum should have been done originally when the Euro regulations were proposed. There are national type approval regulations in force for Euro 5 vehicles so it is appropriate to harmonize the European regulations in accordance with the current direction of some countries. This is important not to jeopardize the retrofit industry for gaseous fuels.
38. Mr. Rijnders agrees in principle and that the proposed amendments are in the spirit of implementing Euro 5.
39. Mr. Redmann. The question is more of a fundamental political question. Germany would like to wait until the full GRPE can consider this. If other contracting parties don't share the question about environmental benefits and closing loopholes, then they would like to see some changes in R.115.
40. Mr. Rijnders confirms that the document will be launched as an informal document to the full GRPE to see how the contracting parties react.

VII. Other Items

VII.1 LNG venting to the atmosphere

41. Mr. Ohlund (Sweden). Sweden has some concerns about LNG vehicles (L-NGVs), especially with the effects of 'boil-off' in LNG vehicles that are not driven for a certain period. It is not so much of a concern at the moment since there are not that many LNG vehicles, but they are increasing in Sweden and this might be a problem in the future.
42. Mr. Rijnders indicates that this could be an LNG tank issue and would be dealt with in GRSG, R.110. But dealing with LNG boil-off as an 'evaporative emission' could be within the scope of the GRPE.
43. Mr. Seisler indicates that ISO is now developing standards for LNG fuelling connectors, LNG fuel tanks, and LNG fuelling stations. He suggests that Sweden's important question about boil-off from LNG systems should be raised first within the ISO task forces since work there would eventually affect changes in R.110 at a future time.

VIII.2 New documents drafted to clarify minor changes (editorial mistakes and definitions) in R.115.

44. The LPG industry, along with Mr. Radzimirski, has been working on important clarifications of details in R.115. They may be ready to propose a supplemental amendment on a new possible structure for these regulations.
45. Mr. Duvielguerbigny encourages the group to look at the new documents when they are ready.
46. Mr. Rijnders suggests to Mr. Piccolo, in reaction to a question of timing, that it is up to the authors to determine when they are prepared to bring the new framework document to either the GFV and/or the GRPE.

IX. Next Meeting

47. Mr. Rijnders proposes a meeting in October 2010 and we will determine an exact date shortly. GFV members are encouraged to inform the GFV secretary (or him) if there are specific dates that active GFV members cannot be present (or that they can be present).

X. Closing of the Session

48. Mr. Rijnders thanks the participants for their attention and closes the meeting.

GFV Documents for the previous session (GFV-9) are available at:
http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/gfv09.html
GFV Documents for GFV-10 are available at:
http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/gfv10.html

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