MEETING MINUTES
13th Meeting
Informal Group on Gaseous Fuelled Vehicles (GFV)
10th May 2011
Diamant Conference & Business Centre, Blvd Reyer, Brussels
10.00-17.30

I. Welcome & Introductions

1. Mr. Rijnders welcomed the group to Brussels.
2. Introductions of the participants

II. Approval of the Minutes of GFV-12

Documentation: Working paper GFV-12-04

3. No comments or changes were made to the minutes of the last meeting.

III. Review of today's agenda items

Documentation: Working paper GFV-13-01

4. Agenda adopted with changes to the order to accommodate participants' travel schedules today.

IV. Review of the item of interest from the last 100th session of the GRSG held at the United Nations, Geneva

Documentation: Working paper GFV-13-06

5. Mr. Duvielguerbigny and Mr. Piccolo presented the working paper GFV-13-06 summarizing what happened with the regulation 67-01 (Equipment for Liquefied Petroleum Gas) in Geneva.
6. Since the October session of the GRSG group, the Dutch delegation has been proposing amendments to R67_01 in order to introduce new requirements for higher pressure equipment/components (current limit is to 30 bar). Those new requirements have been urgently asked by the LPG industry to design and type-approve components for direct injection engines. Following discussions and exchanges of views in the April 2011 session the working paper ECE/TRANS/WP.29/GRSG/2011/14 from the Netherlands and informal paper GRSG-100-02-Rev.1 from Italy were approved.
7. During that same April session the Italian delegation submitted the working paper ECE/TRANS/WP.29/GRSG/2011/15 amending paragraphs 17.11.5 and 17.11.6. related to diesel dual-fuel operation. Following the requests of International Organization of Motor Vehicle Manufacturers (OICA) and Poland for clarification on "LPG running mode" and "bi-fuel vehicles" definitions, the Italian delegation tabled the informal document GRSG 100-28. Both documents were adopted.
8. The Chairman noted that the 'bi-fuel vehicle' definition (paragraph 2.21 in GRSG 100-28), is based on but not the same as Regulation 83 (the 'new' definition introduced distinguishes between OEM and retrofit systems). (The new definition reads: "Bi-fuel vehicle" means a vehicle that originally or after the application of a LPG retrofit system, is equipped with two separate fuel storage systems, can run on petrol and also on LPG and is designed to run only one fuel at a time.")

9. There is a general discussion about the need for a new definition and the differences now existing between R.67 and R.115, R.110 and R.83. Mr. Rijnders remarked that it would have been better to discuss these definitions first with the GFV because the experts are in the GFV group and the creation of definitions generally is very sensitive. The GFV did not have time to discuss these changes that are now adopted in R.67.
10. Mr. Piccolo indicated that the new definition, proposed by the delegate from Poland, was intended to make sure that the definition included both OEM and retrofit vehicles. They intend to propose to align the definitions in R.115 and R.83 since R.67.01 is for LPG only.
11. Mr. Rijnders suggests that aligning definitions should become a new topic of discussion in the next GFV meeting so that the various regulations can be aligned properly. He suggests to create a task to develop a 'side-by-side' of the vehicle definitions in EU and ECE regulations.
12. Mr. Renaudin suggests that we could ask for the creation of a SR (Special Resolution), which is not technically a rule but is useful to help clarify elements in different regulations. This process exists for other issues within WP29. This type of document can be used as a reference document for vehicle definitions in all regulations being created that relate to gaseous fuel technologies (and even other fuels/technologies).
13. Mr. Rijnders suggests that this also could be aligned with efforts by the European Commission to standardize definitions of other types of vehicles such as 'flex fuel'. Mr. Rijnders raises the possibility that the GFV group could make an informal document at the WP29-level to 're-amend' or correct the 'new' R.67 definitions in order to be harmonized with the same definitions in existing regulations.

V. AEGPL Amendments to Regulations 115 & 83: Retrofit systems for direct injection

Documentation: working paper GFV-13-02, GFV-13-03 & GFV-13-04 (PowerPoint presentation) from AEGPL & GFV-13-05 from Poland

14. With GFV-13-04, Mr. Piccolo presented the amendments introduced via the working paper GFV-13-02 & GFV-13-03.
15. After also recalling to the members the history of the discussions, Mr. Piccolo explains to the group the AEGPL proposals aiming at: 1) clarifying the definitions applied to bi-fuel gas vehicles; 2) proposing a clear definition for a new class of direct injection gas system/vehicles to allow petrol/gas use simultaneously; and 3) developing a reliable calculation/measurement method to limit the use of petrol for this new class of gas system/vehicle.
16. Henk Dekker (TNO) questions the need to introduce a new definition for "bimix-fuel vehicle" (vehicle designed to make limited use of petrol also simultaneously with gas) and by doing so to create possible gaps in definition. He suggests that it might be best would be to conform to the current legislative framework (i.e. mono and bi-fuel vehicles) and to add extra requirements for the bi-fuel vehicles operating under a "bimix" mode.
17. Following the discussion between participants AEGPL and Henk Dekker are going to offer new versions of definitions for the amendments.
18. Mr. Piccolo asked the participants to send comments in writing and recalled the urgency of this matter to be taken into consideration. The objective for the LPG industry is to have a formal amendment approved at the January 2012 session of the GRPE.

19. The group did not make any comment on the proposed methodology to measure the LPG consumption and to its associated 80% threshold for the total energy consumed.
20. The comments from Mr. Radzimirski (GFV-13-05) from Poland were not circulated prior to the meeting but were discussed briefly during the meeting as they also referred to the definition.
21. Mr. Del Alamo (NGVAe) contends that the current AEGPL proposal does not deal with other elements affecting gas systems. Mr. Del Alamo offers to work with AEGPL to determine other elements in the proposal that can be linked to both LPG and CNG.
22. Mr. Rijnders indicates that calculations for a CNG variety of this technology, if it is to be used, remains an open issue.

VI. **Heavy Duty Dual-Fuel Task Force report**

Documentation: Working papers GFV-13-07 & GFV-13-08

23. Mr Renaudin, co-chairman with Henk Dekker of the HDDF Task Force, presented a report of the work of the HDDF TF (working paper GFV-13-07). Main highlights are:
    - HDDF terminology has been altered to clarify the different D-F engine types:
        - Old Type 1 becomes HDDF Type 1A; Gas ratio (GR) not lower than 90%
        - Old type 1+ becomes HDDF Type 1B; GR ratio not lower than 90% but engine has also been type approved for diesel
        - Old type 2 becomes HDDF Type 2A: GR varies between 10%-90%
        - Old type 2+ becomes HDDF Type 2B:GR varies between 10%-90% but engine has been approved to operate on diesel
          Note: Types with 'A' are for engines only operating in dual fuel mode. Types for 'B' are for engines capable of operating *either* in dual fuel *or* in diesel mode
        - Old Type 3 mode becomes HDDF Type 3 (whatever the possible operating modes) where GR does not exceed 10%.
    - Torque & Power: HDDF-06 meeting agreed on principles regarding the torque/ power retrievable in the engine control unit (ECU); GFV is requested to validate these principles, No comments are received from the group.
    - NOx control measures shall apply as close as possible to the pure diesel mode.
    - HDDF indicators: basically three; one for DF or diesel mode and another for an empty gas tank; one for level of operability restriction when lack of gas supply is detected.
    - EURO VI HDDF OBD: full EURO VI compression ignition engines OBD. Gas consumption monitoring to be discussed in future. Issue of R.49 and EURO VI ('gas engines' vs 'positive ignition engines' to be resolved)
    - EURO V HDDF OBD: Euro V OBD rules shall apply. Most of the Euro V HDDF are resulting from a modification of a diesel engine without re-design or re-calibration of the original engine ECU and OBD system.
    - EURO VI PEMS (Portable Emissions Measurement System) test at certification; Type 1A & 2A done according to Annex VI but in dual-fuel mode. NOx level should be lower or equal to 1.5 the NOx limit. Other pollutants will be discussed at the next DF TF meeting. Type 1B or Type 2B PEMS done in diesel mode according to Annex VI. Dual fuel mode for Type 1A and 1A engine types.

Repeating the test to average the final emission value per pollutant form each PEMS test would be allowed.

- EURO V and VI – ISC test done in dual fuel mode.
- CH4 correlation factor: Westport presentation will be circulated; ACEA/OICA input to be requested. Clean Air Power to check the correlation for Type 2 engines; issue checked by the Commission and then presented to upcoming GFV meeting
- EURO V specific issues: PEMS test at certification to be addressed;
- Calculation formulae: may have to be changed in Annex 4B and possibly the GTR.

24. Mr. Renaudin then presented the proposed amendments to Regulation 85, in order to type approve engines (working paper GFV-13-08).

VII. LNG equipment standards for on-board vehicles (associated with HDDF TF)

25. Mr. Rijnders explains that the informal paper GRSG-100-19-Rev.1 was presented by the Dutch delegation at the last GRSG session in order to invite GRSG experts for a meeting on LNG equipment standards in Regulation 110. A dedicated meeting will take place on 16 May 2011. Work is needed for amending R110 because while ISO is still developing LNG tank or fuel connector standards, proper requirements/provisions are needed now to have the dual-fuel certification procedures and regulations go into effect in 2012.
26. Mr. Rijnders will chair the above mentioned kick-off meeting on LNG but then a Chairperson will be needed to help guide this group. LNG specialists from Chart (US), Westport and CAP will be attending.

VIII. Information & Update on Dutch Dual-Fuel Test Program

Documentation: Working paper GFV-13-09

27. Mr. Rijnders: Applications for conversion to dual-fuel have been occurring in the Netherlands but there were no legal possibilities for full type approval of these vehicles. RDW started a D-F test program with the Ministry of Transport and Environment, TNO, and various stakeholders. More information can be found by visiting: http://www.rdw.nl/SiteCollectionDocuments/VT/IKS/Handleidingen/ENG%20Dual%20Fuel%20test%20programma%20-%2007%20februari%202011%202.0.pdf
28. Vehicles include classes N2, N3, M2 and M3. The research was, in part, motivated by issues and needs identified at the Clean Fuels Consulting Dual Fuel Workshop in March 2010.
29. Dual-fuel vehicles will be tested and given provisional approval on an individual basis. Participation in the program requires various documentation for safety inspection and emissions testing. Experiences and results can be used for development of test procedures and regulation of conversions (and OEMs).
30. Mr. Dekker (TNO) continues with the working paper GFV-13-09 by explaining that until now 5 CNG & LPG Type 2 D-F engines/vehicles were tested. Those vehicles have high mileages and conformity to Euro standards on straight diesel prior to their conversion. Main results of the testing: NOx emissions on diesel were too high; The CNG HC emissions were above the limit (CH4 emission is problematic); LPG HC emissions were within limits; no CO2 (greenhouse gas equivalent) benefit was observed; there was a difference between the measured diesel substitution claimed and the actual substitution levels.

31. Test program continues in progress; national regulation is under consideration. More vehicles will be tested. The program is no a half year underway and will last for a full two years (to 2013).
32. Mr. Whelan (CAP) comments that the retrofit systems are not fully optimized into the electronic system of the OEM engines being tested. The D-F systems work but may not be significantly different than diesel, although the fuel is cheaper. Expenditure on R&D in the D-F industry has been relatively marginal compared to the OEM engine development R&D funding. Retrofit systems will be limited in number as the OEMs adopt D-F systems, but they must be optimized into the OEM systems. Testing of the current systems will demonstration a lower potential than if the system is designed for a specific heavy duty engine. Therefore, the overall results so far from the RDW/TNO study should be viewed in balance and even positively considering the factors mentioned.

IX. Update on EC proposal for Euro 5/6 on blends of hydrogen and methane

33. Mr. Asman, (DG Enterprise) indicates that he has no information yet. In Geneva at GFV-14 this will not be discussed due to a lack of time. This will be re-visited after Geneva.

X. Update on methane-CO2/greenhouse gas regulation

34. Mr. Asman indicates that the Commission will be studying changing CH4 from a pollutant to be categorized as a greenhouse gas as one of the topics identified in the Commission's work program, which will be dealt with in the Co-Decision process. The Commission is preparing a draft proposal 'fairly soon' to perform the impact assessment needed to support the proposal for CH4 as a greenhouse gas. Co-decisions can take up to three years, so the timeframe is somewhat out of the hands of the Commission.

35. IANGV had done a paper on CH4/NMHC looking at atmospheric chemistry and the total contribution of vehicle methane emissions compared to many other sources of methane (termites, agricultural waste, farm animals, etc.) These factors and others must be considered in the Commission's impact assessment of methane impacts from vehicles.

XI. Other items

36. No other items. Next meeting is in Geneva on 7 June 2011 from 09.00-11.00.

XII. Summary of Actions

37. With regard to the last amendments adopted at the GRSG session, Mr. Rijnders offered to: 1) propose to the GRPE corrections to 'editorial mistakes' in the proposed amendment GRSG/2011/15 and to consider corrections introduced by GRSG 100-28 at WP.29 (after discussing the matter with GRSG Chairman Erario and Mr. Radzimirski); and 2) propose to GRPE to consider a Special Resolution to align vehicle definitions and additionally suggest that the GFV provide input for all definitions concerning gaseous fuel vehicles specifically.
38. Request for members of GFV to work on proposals to improve those two definitions and the GRSG can adopt a new proposal or, if they agree, the GFV or the GRSG can make a proposal directly to WP29 to correct/change the definitions. The longer route is to go again through GRSG with a new amendment.
39. AEGPL and Henk Dekker will work on a definition for bi-fuel vehicles in attempt to incorporate the bimix-fuel vehicle and accordingly amend documents GFV-13-02 and GFV-13-03.

40. Mr. Renaudin will make a proposal for D-F on R.85 (power) for GRPE for a vote.
41. Other HDDF items: CH4 calculation and in search for a new correction proposal in 2012; for Euro V only, D-F TF we will make a GFV proposal to GRPE to delete Type 3A.

XIII. Close of Meeting

The Chair warmly thanks AECC for providing the very good venue, and recalled to the participants that comments in writing are needed to move forward on the many issues discussed during the meeting.

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Participants :
André Rijnders (RDW)
Jean-François Renaudin (Volvo)
Henk Dekker (TNO)
Arnaud Duvielguerbigny (AEGPL)
Jeff Seisler (Clean Fuels Consulting/NGV Global)
John May (AECC)
Jaime D' Alamo (NGVAE)
Francesco Cagnolati (Landi Renzo)
Susanne Leifheit (Volkswagen)
Alberto Castagnini (AEB/Landi Renzo)
Steve Whelan (CAP)
Petter Asman (DG Enterprise), from agenda item VI
Werner Prumm (MAN Truck & Bus)
Salvatore Piccolo (Federchimica/AEGPL)