Status of the IWG on gaseous fuelled vehicles (GFV)

and specific concerning the status of the HDDF retrofit regulation

GRPE June 9th 2016
Geneva
Overview

A new regulation is developed which includes the requirements for the type approval of retrofit systems intended to be fitted on a heavy duty diesel vehicle to enable its operation either in diesel mode or in dual-fuel mode.

Only Euro V and EEV vehicles were included.
Issues to be considered

- Regulation for type approval of systems for retrofitting diesel vehicles to dual fuel operation, but it references to R49: type approval of engines
- Tension between retrofit conversion effort/costs and environmental impact/benefit
- Level playing field for both retrofit system manufacturers and engine/vehicle manufacturers
- Euro IV, V and EEV diesel engines have limited diagnostic functionality and no NO\textsubscript{x} closed loop control (difference with R115 for LDV’s)
Progress since Jan 2016 GRPE

• Concerns raised by the German delegation and the legal department of DG-GROWTH of the European Commission were discussed and solved

• Draft was finalised
• Discussions about CO/NMHC derogations

• 5 tele/web meetings
• 1 face to face meeting (2 days)

• Working document submitted to GRPE
Changes since Jan 2016 GRPE

• Concerns from the German delegation and from the legal department of DG-GROWTH of the European Commission;
  – Removed possibility to perform retrofit system type approval on a non compliant demonstration engine (even when the retrofitted engine would be compliant on DF operation)
  – Removed simplified engine test bench and chassis dyno tests and provisions for increased CO emissions
  – Improvements in other parts of the document
Changes since Jan 2016 GRPE

• Retrofit system parts information system introduced for the retrofit system plate
• Administrative provisions were finalised
• Installation- and user manual requirements were finalised
• Fuel related requirements introduced
  – reference fuels vs market fuels
  – composed representative fuels (if market fuel cannot be acquired)
  – universal fuel approval vs fuel range restricted approval
Proposal for a new Regulation of Heavy Duty Dual-Fuel Engine Retrofit Systems (HDDF-ERS)
ECE/TRANS/WP.29/GRPE/2016/12

Structure:

I - Preamble and guidance

II - Requirements and specifications
  • Annex 1 - Information documents
    Appendix 1 - Essential characteristics of the (parent) retrofit system and of the demonstration engine
    Appendix 2 - Essential characteristics of the engine retrofit system family and of the application range
  • Annex 2 - (Reserved)
  • Annex 3 - Information document regarding the actual applications
    Appendix 1 - List of actual applications
HDDF Engine Retrofit Systems (HDDF-ERS) regulation

• Annex 4 - Arrangement of the dual-fuel engine retrofit system type approval mark
• Annex 5 - Communication concerning the approval or extension or refusal or withdrawal of approval or production definitively discontinued of a type of an engine retrofit system (HDDF-ERS) pursuant to Regulation No. XXX
• Annex 6 - Dual-fuel engine retrofit systems intended to be fitted on road vehicles – requirements and tests
Emission tests

*Type-approval extension*

For a type approval extension, the emissions may be measured with a (retrofit specific) test procedure using a Portable Emission Measurement System mounted on a vehicle equipped with the retrofit system.

Back-to-back comparison between a test in diesel mode and a test in dual-fuel mode (measurement of BSFC emissions is not feasible)

Measurement in accordance with the type approval test procedure (against the emission limits on an engine test bench) or back-to-back on the road at the choice of the manufacturer.
Emission tests

*Type-approval extension*

- The working principle has always been that the pollutant emissions of a retrofitted dual-fuel engine shall be lower than or equal to those of the original diesel engine

- A derogation for CH4 emissions is already implemented (GHG neutral)

- Diesel engines may show NMHC and/or CO emissions far below the emission limits

- System manufacturers raised concerns not to be able to meet those emission levels in dual-fuel mode

- Manufacturers desire derogations for CO and NMHC emissions
Vehicle certification / Vehicle approval after the retrofit conversion

The (re-)certification of a retrofitted vehicle including all the quality requirements should be handled in national and/or CP legislation

- The check that the Vehicle Retrofit System is approved for the engine/vehicle combination and is installed in line with the installation manual
- Safety check of the conversion in line with R67 and R110 (including check of the used components)
- Specific attention for the installation of the cylinders and the safety devices.