

New HDDF retrofit regulation

HDDF - GFV – Brussels, May 23rd 2013



Text structure

The regulation is structured as follow:

Main text (application independent):

- Scope
- Definitions
- Procedures for type approval, extensions, marking etc...
- Link to provisions and test

Annexes include (application dependent):

- Provisions
- Tests
- Format of all required documents.

New UNECE regulation

*Draft new Regulation on uniform provisions concerning the approval of specific LPG (liquefied petroleum gases) or NG (compressed natural gas/bio-methane/liquefied natural gas) dual fuel retrofit systems to be installed in heavy duty **applications** equipped with Compression Ignition engines.*

Scope

This Regulation applies to

- a) specific LPG retrofit systems for use of LPG (liquefied petroleum gases)
- b) specific NG retrofit systems for use of CNG (compressed natural gas or biomethane) or LNG (liquefied natural gas)

to allow dual fuel operation of compression ignition engines.

The first release implements only HDDF retrofit systems for road vehicles, but modular text structure allows to extend the scope to other applications, such as agricultural, non road vehicles etc...

Road vehicles: ANNEX 1 (General requirements)

This Regulation applies to dual fuel retrofit systems intended to be fitted on vehicles of categories M1 with mass exceeding 2610kg, M2, M3 and N with engine approved according to R49.

Euro III and older engines are excluded.

The HDDF retrofit system shall be tested on the parent engine.

The application range is defined by the parent engine family characteristics.

The engine family

An engine belongs to the same engine family if shares the following characteristics with the parent engine before the installation of the HDDF retrofit system:

- (a) The same engine manufacturer
- (b) The same fuel supply type
- (c) The same combustion cycle and cooling medium
- (d) The same engine baseline emission stage
- (e) An approved power output between 0.7 and 1.15 the parent engine
- (f) The same pollution control system

General requirements

The manufacturer shall declare the dual fuel type of the retrofit system, which results from the installation of the retrofit system on the parent engine.

Only dual fuel types 1B, 2B and 3B are allowed.

Operating modes: idle and warm up

Type 1B dual-fuel retrofit systems shall not idle using diesel fuel exclusively in dual-fuel mode.

Types 2B and 3B dual-fuel retrofit systems may idle using diesel fuel exclusively.

In dual fuel mode a Type 1B, Type 2B, or Type 3B dual-fuel retrofit system may warm-up or start using diesel fuel solely. However, in that case, it shall operate in diesel mode.

The strategy shall cease to be active when the coolant temperature has reached a temperature of 343 K (70 °C), or within 15 minutes after it has been activated, whichever occurs first.

Operability Restriction

A HDDF retrofit system when operating in a dual-fuel mode shall be designed so as to perform, in case of unavailability of gaseous fuel, the switch back to diesel mode. The switch back shall occur as soon as possible in all following cases:

- Empty gaseous fuel tank
- Malfunctioning gas supply
- Abnormality of gas consumption (for Euro VI only)

Dual-fuel operating mode indicator

Dual-fuel engines and vehicles shall have a visual indicator indicating to the driver the mode under which the engine operates.

The characteristics and the location of this indicator are left to the decision of the system manufacturer.

The dual-fuel mode indicator shall be set for at least one minute on dual-fuel mode or diesel mode as soon as the engine operating mode is changed from diesel to dual-fuel mode or vice-versa. This indication is also required for at least 1 minute at key-on, or at the request of the manufacturer at engine cranking. The indication shall also be given upon the driver's request.

Empty gaseous fuel tank warning system

A dual-fuel vehicle shall be equipped with a dual-fuel warning system that alerts the driver that the gaseous fuel tank will soon become empty.

The dual-fuel warning system shall remain active until the tank is refuelled to a level above which the warning system is activated.

The dual-fuel warning system shall consist of a visual alert system (icon, pictogram, etc...) left to the choice of the manufacturer. It may include an audible signal.

Time line

	2013								2014	
	GRPE 66°								GRPE 67°	GRPE 68°
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Jun
Road vehicles: general requirements	Yellow	Yellow								
Road vehicles: performances and tests			Red	Red	Red	Red	Red	Red		
Informal document									Blue	
Formal document										Green

Jun 2013: request to GRPE the mandate for new regulation

Jan 2014: informal document for 67° GRPE

Jun 2014: formal document for 68° GRPE

Nov 2014: WP29

HDDF retrofit regulation

Thank You

