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Technologies applied to Gaseous Fuelled (CNG/LPG) Vehicles

LPG / CNG vehicles for a cleaner tomorrow in Metro Manila

Mr. B. Hollemans, commercial director

Koltec-Necam B.V. The Netherlands

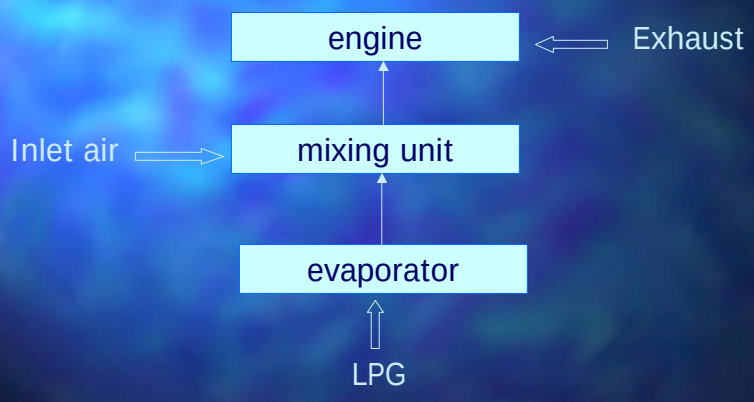
Technologies applied to gaseous fuelled (CNG/LPG) vehicles

- Introduction
- LPG market
- Technological aspects
  - history (the 1st, 2nd and 3rd generation)
  - the 4th generation equipment
  - light duty vehicles
  - heavy duty vehicles
- Conclusions

LPG Market Europe 2001

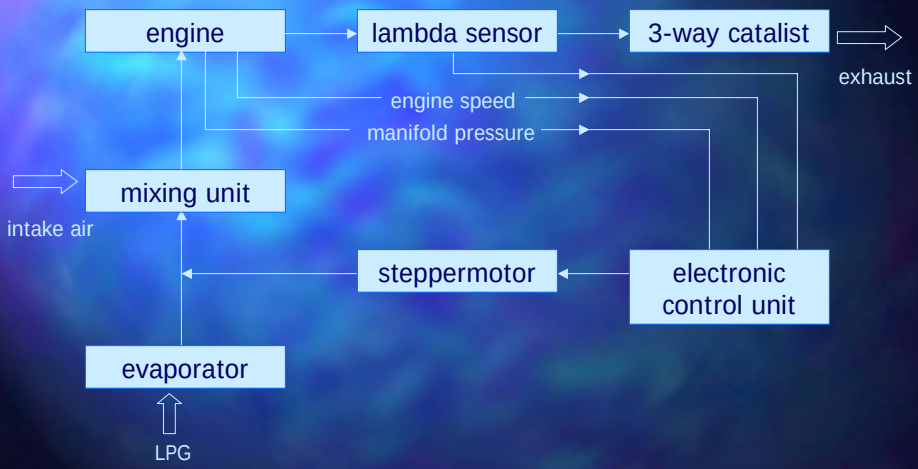
Country	Consumption '000 tonnes	Number of vehicles x 1000	Number of Dispensing Sites
Belgium	97	90	507
France	210	210	1800
Italy	1394	1250	2000
Netherlands	521	315	2400
Poland	800	590	1000
United Kingdom	51	60	1000
Others	207	303	846
Total Europe	**3279**	**2819**	**9553**

First generation



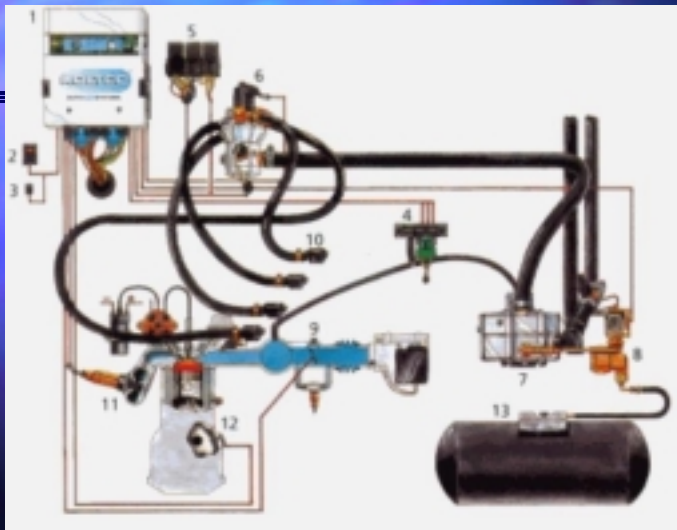
Mechanical carburetted LPG system

Second generation



Electronically controlled carburetted LPG system

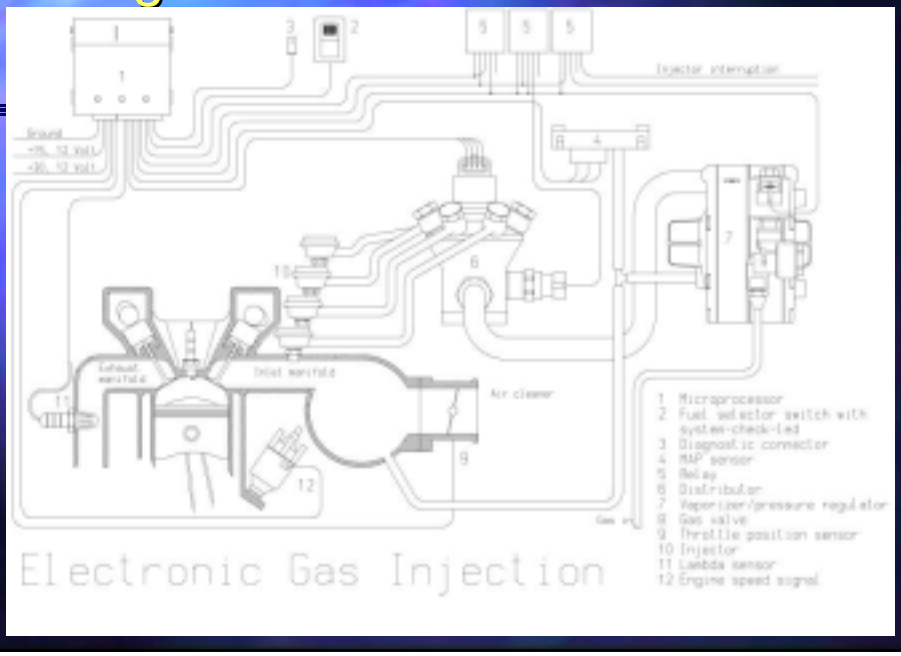
Third generation



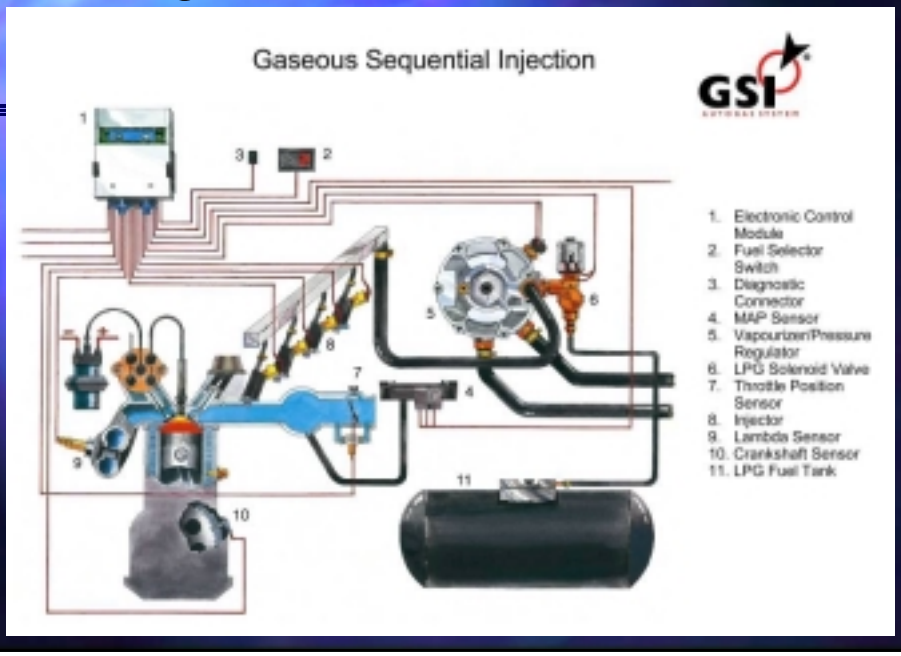
1. Microprocessor
2. Fuel selector switch
3. Diagnostic connector
4. MAP sensor
5. Relay
6. Distributor
7. Pressure regulator
8. Gas valve
9. Throttle position sensor
10. Injector
11. Lambda sensor
12. Engine speed sensor
13. LPG tank

The MEGA multipoint dry gas injection system

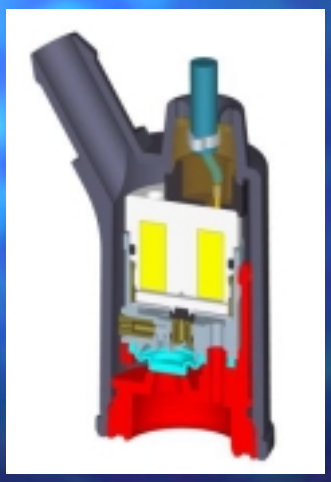
Third generation



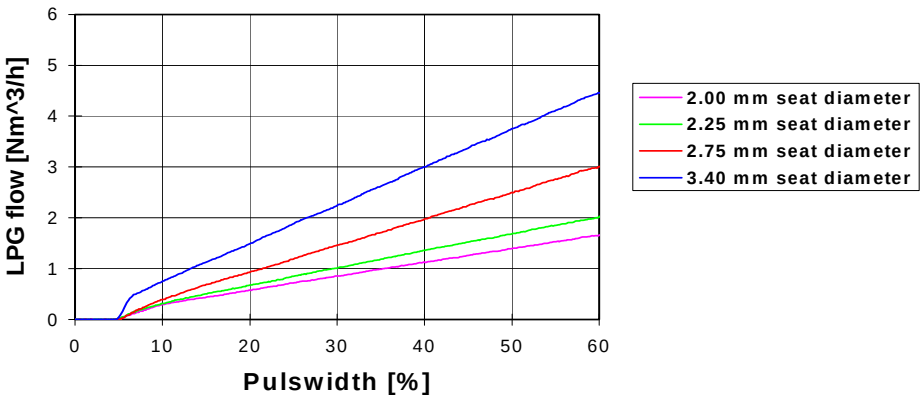
Fourth generation



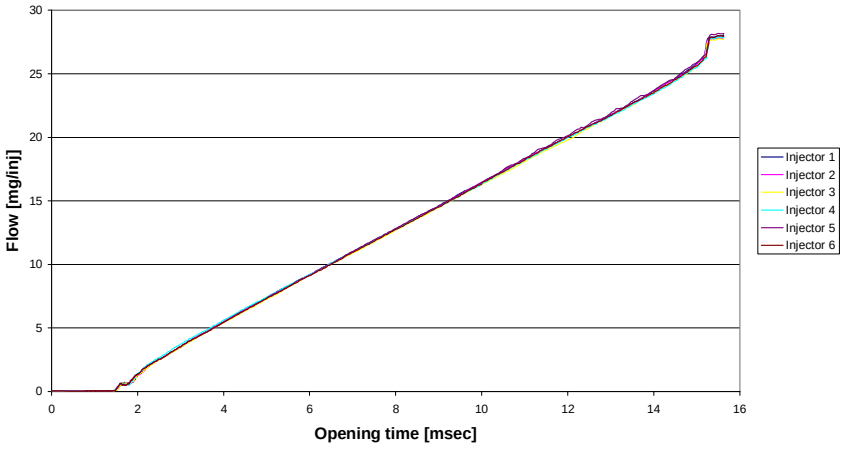
Sequential LPG / CNG Injector



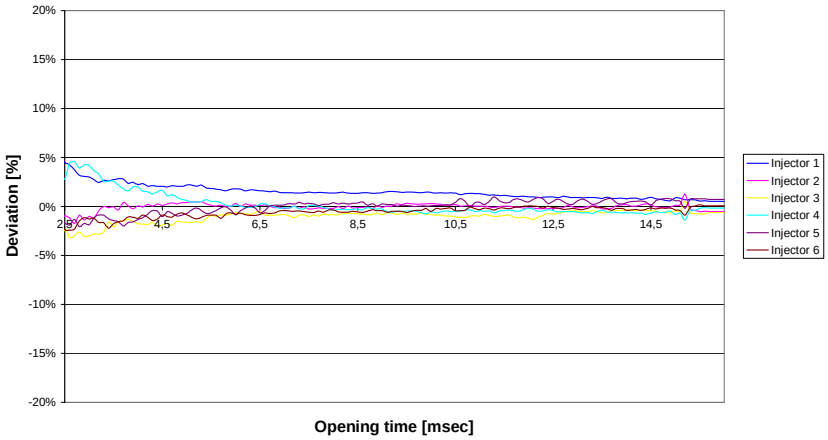
Variation of seat diameter



Injector flow (64 Hz)



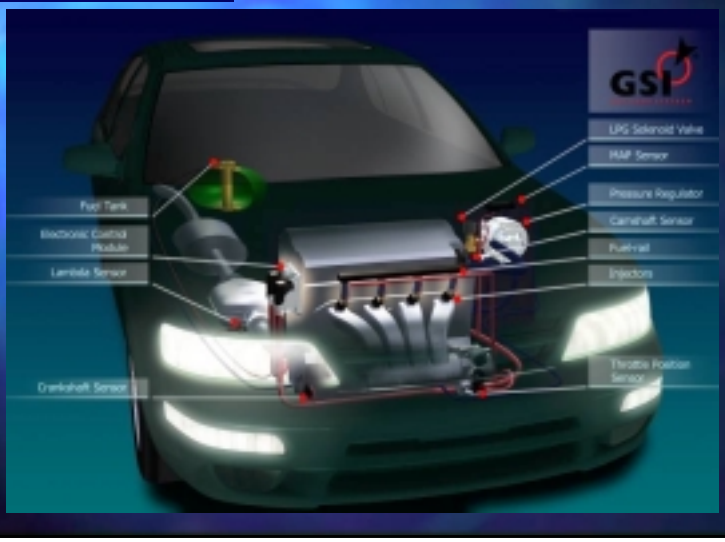
Injector deviation



CNG / LPG pressure regulator

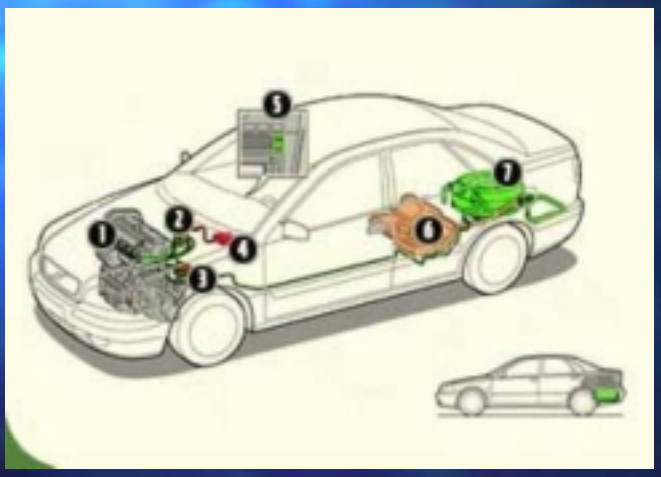
Sequential Hybrid Delphi ECU

Positions of GSI components

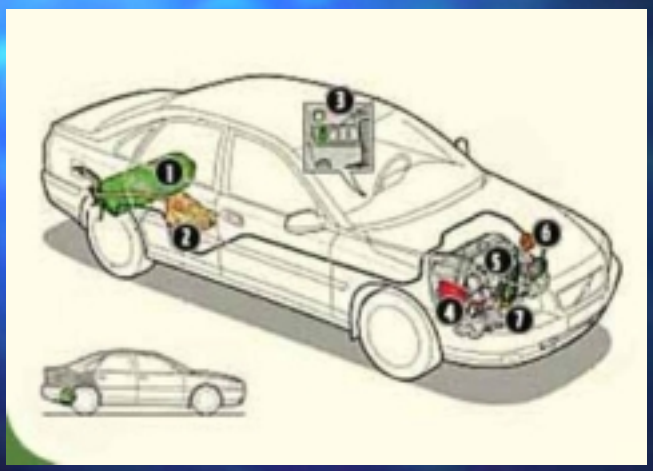


Tank positioning

Ring tank positioning



Cylindrical tank positioning



LPG/CNG system for heavy duty vehicles

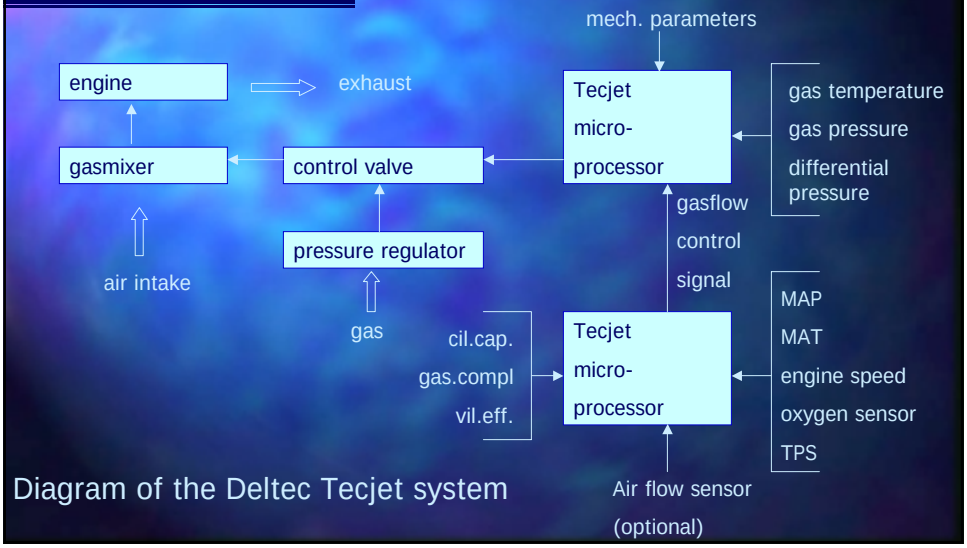


Diagram of the Deltec Tecjet system

Conclusions I

- For every type of vehicle, independent of the technology, an LPG or CNG system is available.
- With the new Gaseous Sequential Injection (GSI) system EURO4 emission standards can easily be met.
- The new GSI system fulfils all OEM requirements.

Conclusions II

- To meet EOBD requirements on LPG the GSI system can be used as a translator system (follow strategy) of the petrol system. In that case all default codes used on petrol are also used on LPG.
- Conversion of vehicles to CNG or LPG contributes to a cleaner environment.