



CAR GAS

Multipoint Sequential Injection System

 **BULGARIAN
BSM SOUND MACHINES**

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Main Features

Dear customers,
Let me introduce an exceptionally live product - CAR GAS sequential injection system.
The system has been developed and designed exclusively for cars with sequential injection systems.

Furthermore, the CAR GAS system can also work successfully with older engines - parallel injection system. In the design and construction of this product we have laid particular stress on the high quality materials and hubs, and on the simplicity of installation and service.

This system has all of the attributes and benefits of the earlier multi point system. In addition, it is super intelligent and It has the ability to inject gas in a truly sequential manner, just like the latest petrol vehicles. It achieves the latest European exhaust emission requirements with ease. This has a double meaning to the LPG motorist - A car that pollutes the least can be the most fuel efficient as little fuel is wasted.

The CAR GAS system requires even more information from the engine but uses a lot of data from the vehicle's existing engine management instead of picking it up raw at source as the earlier system did. Additional information required is:

Gas temperature

Gas pressure

Petrol injector pulse length

Oxygen (Lambda) sensor signal(s)

The system also has its own ECU (Electronic Control Unit) but this works in conjunction with the Petrol ECU, instead of working alongside it like the earlier non sequential system. All these signals are picked up raw at source and then used by the ECU to arrive at the correct mixture for the conditions

Even more benefit of performance and economy are delivered by the new BSM system, along one or two useful bonuses:

1. The new system will 'sense' that gas pressure is low and switch back to petrol before the gas tank runs dry - A very useful trick. It will even give you an audible warning to tell you it has done this. A 'self check' protocol has been added to the changeover procedure so that the system will not move on to gas if a problem exists.

2. The system now handles engines up to 190 PS with a single reducer which makes life easier for us and more reliable for you. We can offer to you more powerful version with other reducer - for engines up to 240 PS

Last but not least, the latest 'FAST' type injectors can be stripped and cleaned using only basic tools.

We installed these new kits on our test cars, a Honda Logo (low power) , Honda Shuttle (high power) and Skoda Oktavia (middle power) was the lucky recipients. We were not disappointed. The car was road tested for 15 000 km. Performance on LPG is just the same as with petrol and one can not even tell when the system has switched over to gas.

We would like to draw your attention to the attractive price of the system which is over 50% lower then its equivalents produced by Italian companies. In addition to the system, we have developed a special software program for Windows through which all the necessary adjustments from the system to the car are done easily and lightly. We offer this software to all mechanics (technicians) of our systems for free. If needed, we are able to conduct a training for the settlement and maintenance of this software for the team that will be installing the system.



Main Components

1- Injector rail

It is controlled by ECU and is used to feed a right quantity fuel to each of cylinders individually.

2- Filter

It is installed between the reducer and the injector rail. Working pressure - max 2,5 bar.

3- ECU (Electronic Control Unit)

Using information from the original petrol Electronic Control Unit, the LPG ECU execute some mathematical operations to correct the petrol injectors pulse length and adapt them to LPG working process. The ECU automatically change over petrol - LPG, showing the moment condition by LED.

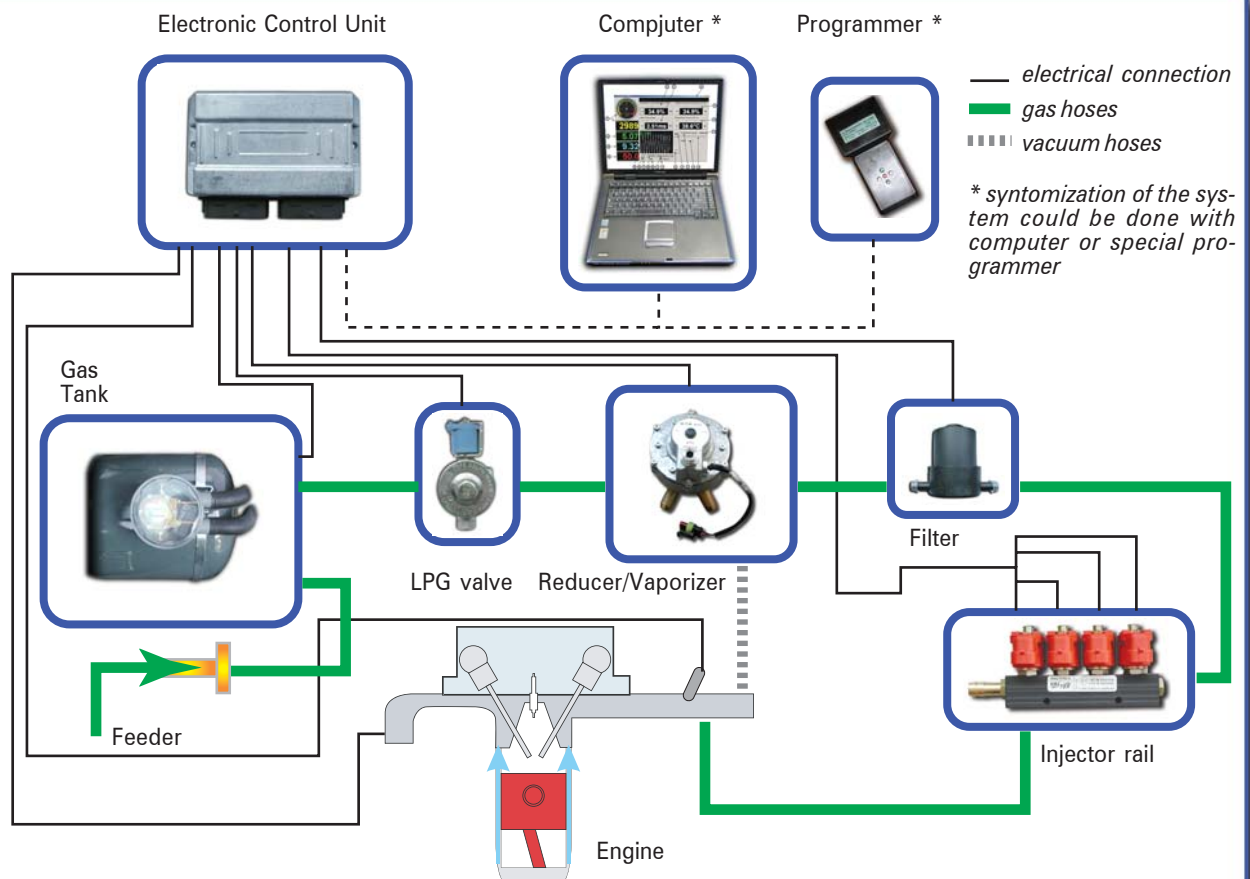
4- LPG valve

It is installed between the LPG tank and the reducer and cuts off the LPG supplying. There is build in filter for the liquid gas.

5- Reducer

The reducer is one stage type which holds up constant outgoing pressure (1,5 atm), compared to the air-intake manifold.

Principle Diagram



Technical Characteristics

Recomendation data for nozzle choice, according to the power of the engine, with injectors:

VALTEK

4 cylinders		Nozzle diameter							
		1,4	1,6	1,8	2,0	2,2	2,5	2,8	3,0
standard rail up to 150 PS	0-67								
	68-82								
	83-101								
	102-120								
	121-137								
"super" rail from 151 PS	138-182								
	183-200								
	201-204								

MATRIX

4 cylinders		Nozzle diameter							
		1,6	1,8	2,0	2,2	2,5	2,8	3,0	3,5
standard rail up to 150 PS	0-67								
	68-82								
	83-101								
	102-120								
	121-137								
"super" rail from 151 PS	138-182								
	183-200								
	201-204								

Some important parameters of the system

Cylinder number 3,4,5,6,8

Maximum power of the engine with 1 reducer до 140 kW / 190 PS

Working pressure of the reducer 1,5 – 1,6 bar

Operating temperature -40 - + 125° C

Operating voltage 6,5 – 18 V

Impedance of the injector coil 3 ohm

Size of the calibration nozzles 1,5; 1,75; 2,0; 2,25; 2,5; 2,75; 3,0; 3,25; 3,5 mm

Working pressure of the injectors 1,0 - 2,0 bar

Guarantee number cycle of the injectors for VALTEK 150 000 000 for MATRIX 500 000 000

Microcontroller 8 bit, 20 MHz; communication protocol BSM-G

Adjustment of the system parameters



According to the engine power, the number of cylinders and some construction features for the intake manifold you can tune the system up with specialized software a few parameters: durations, temperatures, motions and other. There are opportunities with build in data in the software to enter automatically in the ECU all wanted coefficients. For some car models we foresee to give software, which allows to be loaded the adjustment data by pressing a single button.

In order to decrease the book-keeping for the fitter and the checking for the guarantee and post guarantee service we envisage provide for some additional information by dates, system software and adjustment for each client.

Comparison curves for petrol engine with both of fuels

