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2007

CATALOG.

Driving into the future.

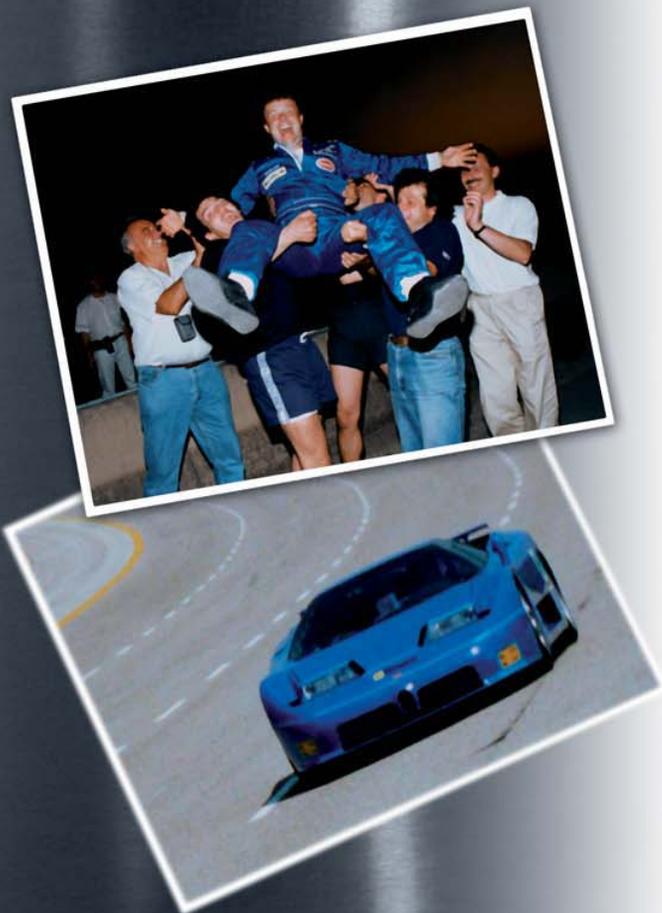
COMPANY PROFILE

- E-GAS S.R.L., ESTABLISHED IN 2001, IS THE PRODUCT OF THE EXPERIENCE ACQUIRED IN AROUND FORTY YEARS IN THE ALTERNATIVE FUELS SECTOR AND OFFERS THE MARKET A COMPLETE RANGE OF INNOVATIVE PRODUCTS.

- The technology developed in the construction of new generations of engines, the evolution of materials, restrictions on limits imposed by pollution emission regulations have lead, over the last few years, to a significant revolution in the LPG and CNG sector.

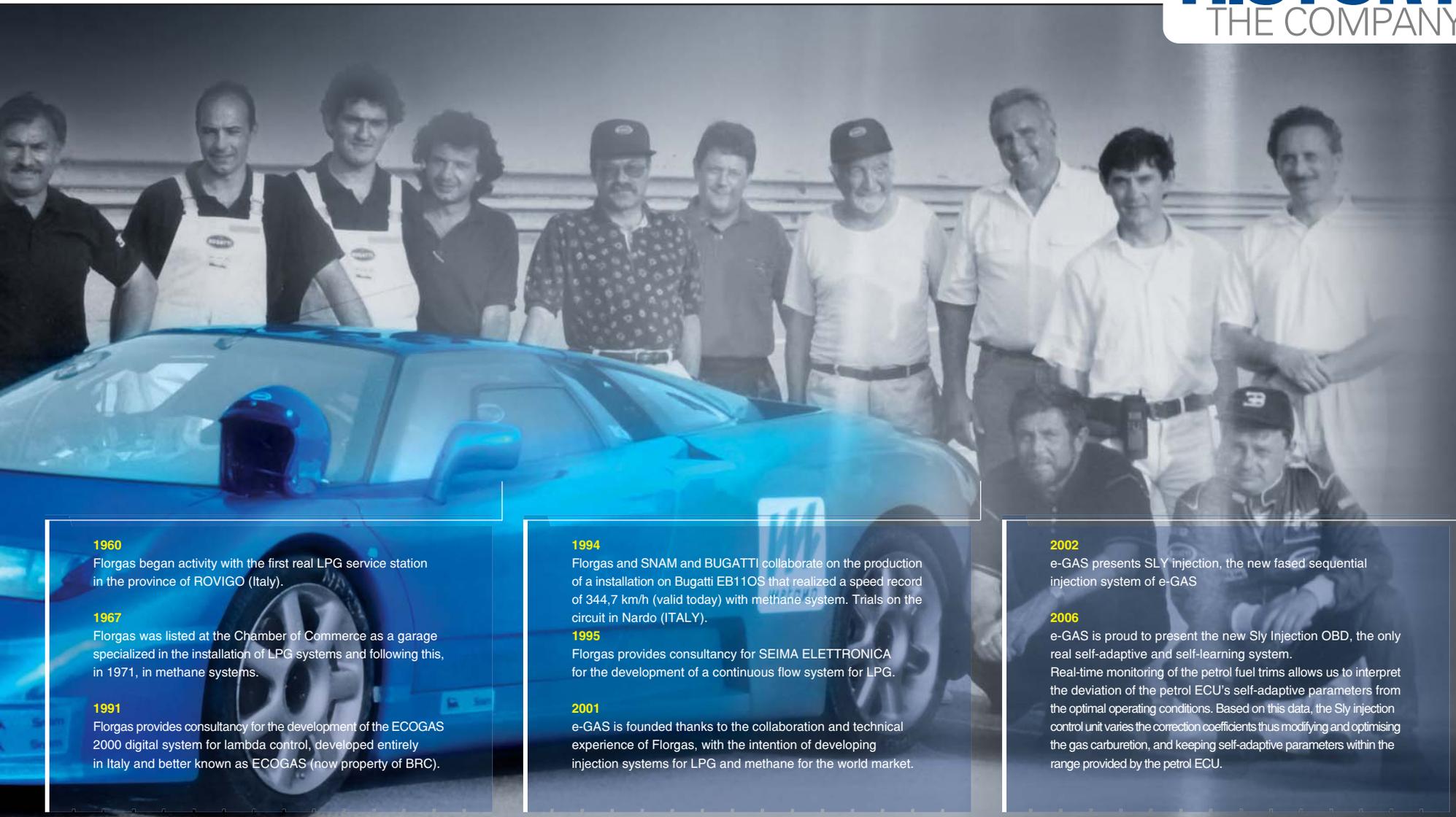
The use of microprocessors in the development of control units has lead to the birth of injection systems that allow us to install systems even for these new generation engines.

Our target is to be on the cutting edge in the design and construction of technologically advanced systems; for this reason we have created an internal research and development division specialized in designing software and hardware destined to satisfy current and future requirements.



HISTORY

THE COMPANY



1960

Florgas began activity with the first real LPG service station in the province of ROVIGO (Italy).

1967

Florgas was listed at the Chamber of Commerce as a garage specialized in the installation of LPG systems and following this, in 1971, in methane systems.

1991

Florgas provides consultancy for the development of the ECOGAS 2000 digital system for lambda control, developed entirely in Italy and better known as ECOGAS (now property of BRC).

1994

Florgas and SNAM and BUGATTI collaborate on the production of an installation on Bugatti EB110S that realized a speed record of 344,7 km/h (valid today) with methane system. Trials on the circuit in Nardo (ITALY).

1995

Florgas provides consultancy for SEIMA ELETTRONICA for the development of a continuous flow system for LPG.

2001

e-GAS is founded thanks to the collaboration and technical experience of Florgas, with the intention of developing injection systems for LPG and methane for the world market.

2002

e-GAS presents SLY injection, the new phased sequential injection system of e-GAS

2006

e-GAS is proud to present the new Sly Injection OBD, the only real self-adaptive and self-learning system. Real-time monitoring of the petrol fuel trims allows us to interpret the deviation of the petrol ECU's self-adaptive parameters from the optimal operating conditions. Based on this data, the Sly injection control unit varies the correction coefficients thus modifying and optimising the gas carburetion, and keeping self-adaptive parameters within the range provided by the petrol ECU.



THE SYSTEM:

- THE TECHNOLOGY DEVELOPED IN THE CONSTRUCTION OF NEW GENERATIONS OF ENGINES, THE EVOLUTION OF MATERIALS USED BY CONSTRUCTERS, RESTRICTIONS ON LIMITS IMPOSED BY POLLUTION EMISSION REGULATIONS HAVE LEAD OVER THE LAST FEW YEARS TO A SIGNIFICANT REVOLUTION IN THE LPG AND CNG SECTOR.

- The use of microprocessors in the development of control units has led to the birth of injection system that allow us to install system even for these new generation engines. Our objective is to be on the cutting edge in the design and construction of a technologically advanced system for this reason we have created an internal research and development division specialized in designing software and hardware destined to satisfy current and future requirements. The electronic system acquires the engine data of the vehicle in any operation condition, guaranteeing emission control and maintaining, in the meantime, unaltered drivability and performances. The presence of innovative and functional electronics in the control unit of the injection system Kit means reducing to a minimum the time for calibration of the vehicle, thanks also

to fewer electrical connections to be performed in the installation phase of the kit.

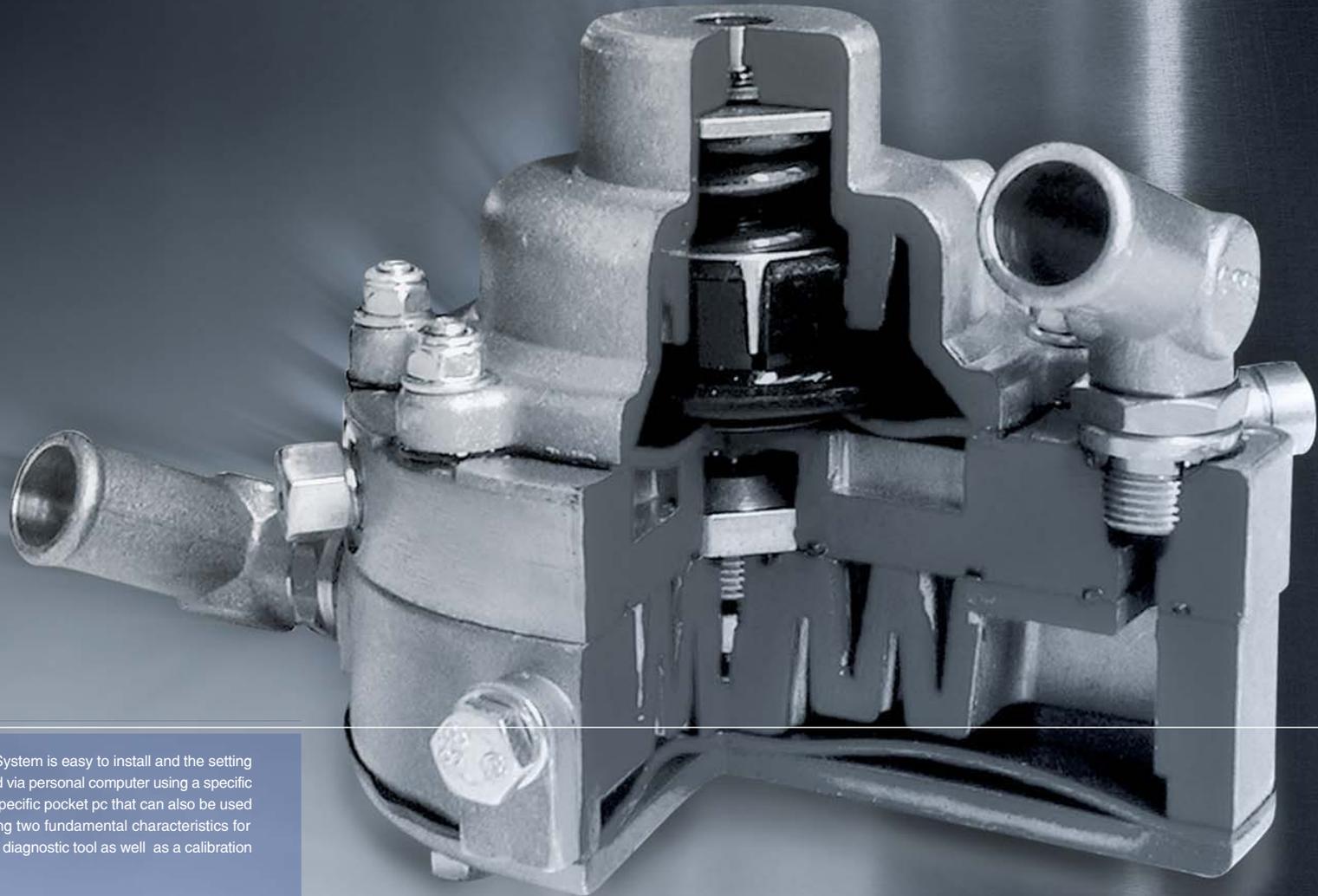
It is in fact absolutely unnecessary to take any signal from the ECU of the cars, thus putting an end to difficulties that usually arise in this phase of installation with other systems currently on the market.

The injection Kit is a unique product and requires only two electrical connections: positive and negative battery.

Thanks to the innovative wiring in the kit (LPG/CNG) the connections with other components are performed via specific "foolproof" automotive connectors, allowing even the least experienced operator to perform the electrical installation on any vehicle.

THE SYSTEM

SLY INJECTION SYSTEM



- Our Sequential Injection System is easy to install and the setting of the vehicle can be performed via personal computer using a specific calibration program or with a specific pocket pc that can also be used as an EOBD tester, combining two fundamental characteristics for the installer: that of a universal diagnostic tool as well as a calibration tool for the system.



New bi-Powered reducer, for engines with up to **450 HP**

CNG REDUCER:

- THE PRESSURE REDUCER FOR CNG WAS DESIGNED FOR USE IN THE INJECTION SYSTEM.

- The working pressure is adjustable and may vary 0.6bar to 1.8 bar (9.7 to 26.1psi) ensuring, in all operating conditions of the engine the correct supply pressure constant and reliable operation is obtained through a sophisticated piston balancing system with a single reduction stage for the whole range of variability of entry pressure, from about 200 bar (2900psi) (with gas cylinder full) to 0bar (0psi) (with gas cylinder empty).

The advantages that derive are important reduction of load

losses, consequent increase in CNG capacity and related improvement in engine power supply at high rpm.

Engine cooling system water circulates inside the pressure reducer to allow the correct operating temperature in all working conditions.

The small dimensions and the compact form facilitate installation in engine bays where space is limited.

The RM10 pressure reducer is able to fuel engines up to 130 kw (about 170hp).

LPG REDUCER:

- THE RG10 VAPORIZER/REDUCER WAS DESIGNED FOR USE IN THE SLY INJECTION SYSTEMS.

- The particular forms and the geometry of the internal canalizations allow effective thermal exchange, permitting it to fuel high power engines and guaranteeing outlet gas temperature stability.

The LPG, which moves along a coil encased directly in the body of the vaporizer, changes from liquid state to gaseous state before pressure reduction, thus guaranteeing a continuous and

stable exit flow.

The viton seals of the vaporizer, working with gas entirely in

the gaseous state and at temperature superior to 0°C (32°F), allow a notable reduction in maintenance costs and are subject, over time, to less deterioration.

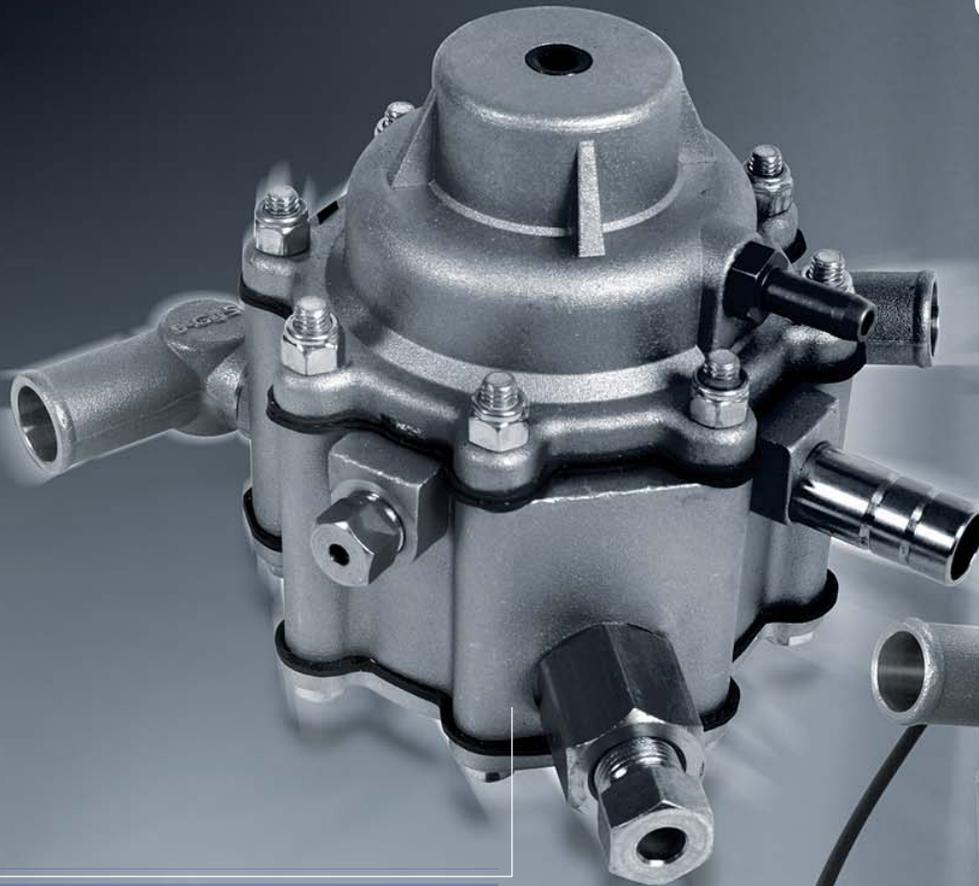
The working pressure may vary from 0.6 to 1.8 bar (8.7 to 26.1 psi) ensuring, in all operating conditions of the engine, the correct supply pressure.

The small dimensions and the compact form facilitate installation in engine bays where space is limited.

The RG10 reducer is able to fuel engines up to 150 Kw (about 200 hp).

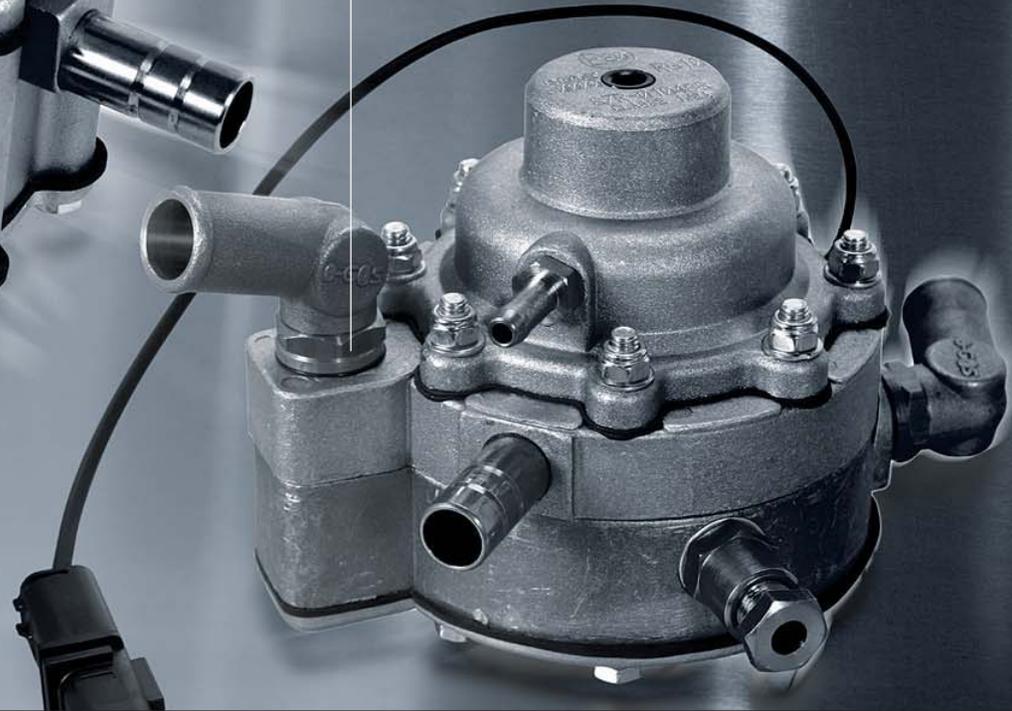
THE COMPONENTS

SUMMARY OF CHARACTERISTICS



- Reduction gear with one membrane stage for pressure reduction
- Piston balancing on the H.P. lever
- Exit pressure of methane is adjustable from 0.6 to 1.8 bar
- Temperature sensor incorporated
- Suitable for fuel engines with power up to 130 Kw

- Reduction gear with only one membrane stage for pressure reduction
- Exit pressure of the LPG is adjustable from 0.6 to 1.8 bar
- Internal circulation of the cooling liquid of the engine to allow thermal exchange with the gas
- Temperature sensor incorporated
- Can fuel engines with power up to 150 Kw





THE ELECTRONIC CONTROL UNIT [ECU]:

- THE ELECTRONIC SYSTEM ACQUIRES THE ENGINE DATA OF THE VEHICLE IN ANY OPERATING CONDITION, GUARANTEEING EMISSION CONTROL AND MAINTAINING, IN THE MEANTIME UNALTERED DRIVEABILITY AND PERFORMANCE.

- The presence of innovative and functional electro-nics in the control unit of the Sly Injection Kit means reducing to a minimum the time for calibration of the vehicle, thanks also to fewer electrical connections to be performed in the installation phase of the kit.

It is, in fact, absolutely unnecessary to take any signal from the ECU of the car, thus putting an end to difficulties that usually arise in this phase of installation with the other systems currently on the market.

Sly Injection is a unique product and requires only two electrical connections: positive and negative battery.

Thanks to innovative wiring in the kit (CNG and LPG) the connections with other components are performed via specific "foolproof" automotive connectors, allowing even the least experienced operator to perform the electrical installation on any vehicle.

MATRIX INJECTORS:

- MATRIX INJECTORS DELIVER TOP PERFORMANCE, RELIABILITY AND SMOOTH DRIVEABILITY BOTH WITH LPG AND CNG.

- Matrix injectors come in a range of models, flow rates and number of outlet ports, in order to cover the widest possible range of engine capacities, today on the market.

PRESSURE SENSOR:

- e-GAS SLY INJECTION SYSTEM USES A MOTOROLA PRESSURE SENSOR OF DIFFERENTIAL TYPE

- The sensor is found inside an appropriate aluminium container, the container has two cylindrical extremities of small size on one side and an electrical connector on the other. The two cylindrical extremities 'Acquisition Conducts', that come out of the aluminium container are used for the connection of tubes used to detect pressure, while the electrical wiring with a special 3 wires connector will be inserted in the appropriate connector found in the central unit side wiring.

THE COMPONENTS

SUMMARY OF CHARACTERISTICS



THE PRESSURE SENSOR
SPO1

ECU
CDC01



- No lambda emulation
- Excellent for Euro 3 and Euro 4 engines
- Vast range of engines from 2 to 8 cylinders, sequential, semi-sequential, full group and monopoint engines.



MATRIX INJECTOR
HD344

- Frequency Range: 0 - 160 Hz
- Operating Pressure: 0.5 - 2.5 bar
- Pneumatic Opening Time: < 0.6 ms
- Pneumatic Closing Time: < 0.6 ms
- Electronic Drive Pulse Mode: Pick&Hold (12/2.5 V DC)
- One Whole Cycle Time: 3 ms
- Environment Operating Temp.: -40° / +120°C
- Fuel Temp. Operating Range: -10° / +95°C
- Gaseous Fuel Grade of Filtration: 10 microns max.

SLY INJECTION EOBD: WELCOME TO THE NEW GENERATION

- EOBD STANDS FOR “EUROPEAN ON BOARD DIAGNOSIS” AND IS A DIAGNOSTIC SYSTEM INTRODUCED IN EUROPE IN 2001 BY THE EUROPEAN DIRECTIVE 98/69 EC STAGE A AND STAGE B FOR MOTOR VEHICLES IN COMPLIANCE WITH EURO III, EURO IV AND ANY FOLLOWING STANDARDS.

- Diagnosis is performed by the engine electronic control unit itself, referred to as the ECU (Electronic Control Unit), it constantly keeps under control any component and system which may affect emissions. Since direct measurement of the exhaust emission level is technically impossible while the engine is running, EOBD is based on indirect evaluations.

EOBD needs to develop specific algorithms for each vehicle model and to take into account the complex interactions among the different subsystems under the different operating conditions, in order to allow sufficient reliability and sensitivity.

The petrol ECU can vary, within the limits determined by the manufacturer, the opening and closing times of the injectors in order to keep the vehicle emissions and drivability within the limit values. The manufacturer determines the range of variation, which is named system self-adaptivity or self-adaptive parameters. If the ECU self-adaptive parameters exceed the limit values, the EOBD illuminates a malfunction indicator light on the vehicle's dashboard to alert the user of the malfunction (this amber yellow indicator light is also named “check engine lamp”).

In the majority of timed sequential systems, running on LPG or methane is only based on reading the petrol ECU injection time and exploits the ECU variations in order to stay within the correction range provided by the self-adaptive parameters. Since LPG is a mixture of gases (propane and butane) with different heating powers and present in different quantities, the carburation variation determined by gas variability may not allow the petrol ECU to stay

within the self-adaptive parameters, thus illuminating the check-engine lamp and also causing malfunctions while the vehicle is running on petrol.

This problem is not due to the gas system (unless the wrong parameters have been used to calibrate it); it is instead only caused by mixtures' diversity or by other variables due to the wearing of some components through time.

On 2006 e-GAS was the first in the world to introduce a monitoring system which is based on the interpretation of the signals provided by the EOBD system. Real-time monitoring of this data allows us to interpret the deviation of the petrol ECU's self-adaptive parameters from the optimal operating conditions. Based on this data, the Sly injection control unit varies the correction coefficients thus modifying and optimising the gas carburetion, and keeping self-adaptive parameters within the range provided by the petrol ECU.

In practise, while the engine is running on lpg or cng, the Sly injection system makes all the corrections, which were earlier only made by the petrol ECU.

We can therefore state, supported by the excellent results we are obtaining, that the EOBD Sly injection system, at the moment, is the only real self-adaptive and self-learning system.

It is also very important to clarify that this is not an EOBD emulator, but a system which really interacts with the petrol ECU by varying carburation properly and in real-time, while the vehicle is running on GAS, exactly the same as provided by the petrol ECU's software.



THE EOBD SYSTEM

ON BOARD DIAGNOSIS SYSTEM





PRODUZIONE E VENDITA
SISTEMI DI ALIMENTAZIONE METANO E GPL

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