Voulis®

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LPG movement assistance

HANDBOOK

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- LPG movement in diesel engines
- CNG... movement

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LPG as a fuel in internal combustion engines is increasing rapidly. However, it should also develop technology to aid in the safe and proper operation of the engine, from the fact that **the gas in the combustion chamber behaves differently than gasoline or diesel**.

During the injection and ignition is created at the top of the cylinder sufficiently **high temperature**, while **stress** during opening and closing of valves is strong.

The molecular structure of benzene as well as the additives which have includes:

- good heat dissipation ability,
- special additives which create film between valves and seats, absorbing vibrations.

The **LPG liquefied petroleum gas** (propane - butane) is **highly calorific** (*94MJ/m³ or 26.1KWh/m³*) while it has **dry burning** and has **low potential of heat dissipation**, also **does not provide the necessary anti-vibrating film in the seats and valves**.

VOULIS chemicals in association with some reputable companies that deal with fuel additives, developed a family of products that cover all these needs a proper LPG engines assistance by various methods.

Spray of the additive in the combustion chamber (*with the special kit*)

With this method, spray in the combustion chamber the special liquid additive **valver** in a specific ratio (*0,001%*) that regulate the skilled artisans, using the special placed kit. The additive has oil texture and contains prosthetics:

- provides effectively heat dissipation,
- cleans the supply and infusion system of deposits,
- provides the required protection film and absorbing knocks of the valves on seats (*some call it "freezing-oil", a name that only describes the ability of heat dissipation rather than the other two meaning, the cleaning and the creation of a protective film*).

Note 1: The product is fully compatible when mixed with gasoline (a*vailable with a special nozzle*) to raise high levels of both properties - (*heat dissipation and film formation on the valves*).

Note 2: Available in 2 qualities: a) **valver super quality** (*high specification*) and b) **valver premium**.

Ratio: in both cases 0.001% or 100 ml / 100 lit is satisfactory.

Mixture of additive with LPG (*with a special spray*)

Many technicians put straight LPG, without some protection prediction, except perhaps start with petrol. At this point it should be pointed out that the disadvantages of LPG combustion that were mentioned above remain, but because the effects of corruption are not direct, at some point they will surely occur. For these cases the method developed by the product **progas** spray, where a special nozzle that adjusts the rim of the tank filling LPG (*liquefied petroleum gas when it contains a bit before filling*) is injected into the material. This material provides the following properties:

• cleans the whole circuit gas storage and supply of moisture and deposits,

• it carries the additive into the combustion chamber that creates additional protective film on the valves and seats,

• it cannot offer though sufficient heat dissipation.

Ratio: 100 - 120 ml / 50 - 60 lit gas is satisfactory.

Regularity: every 10,000 km for cleaning. The more often the better protective film it creates.

Mixed System (*LPG/petrol*)

Many engineers develop a mixed system, where the appropriate settings, at regular intervals, along with the amount of gasoline there is injected LPG simultaneously. Or in other cases pure gasoline is injected for certain time, so that the additives it contains dissipate the heat created but also create an anti-vibrating film.

However in these cases where the proportion of gasoline is very limited, there is a special developed technology where with the addition of **probenz** to the gasoline tank we ensure the following properties:

• clean the entire fuel supply system in order to achieve the best performance and

• enrich the fuel with extra additive, which serves as an anti-vibrating film. So we can remove the risk of rattling valve and the kickback of the engine.

Ratio: 0.0025% or 250 ml / 100 lit is satisfactory.

Note: Of course, in this case it would be useful at regular intervals to use simultaneously the special spray gas **progas** for its good cleaning properties against moisture and deposits.

LPG in Diesel Engines

Diesel engines have different installation and operation. In this case, diesel is not replaced with LPG in gasoline engines, but in essence, we have simultaneous spraying in approximately 85-90% oil and 10-15% LPG. However this mix offers dramatically better and cleaner combustion with a very high performance, the results are spectacular. For instance:

- economy 20-25%,
- drastic reduction of particles and nitrogen oxides in cars of old technology,
- dramatically reduced deposits with everything this implies (*decrease maintenance costs - best performance - long term functioning*).

In this case, we developed the additive **prodiesel** that enters into the diesel tank in order to:

- clean the entire storage system, power supply and spray to protect it from deposits and to achieve optimal performance while
- any notice of dryness during burning that may create rattling valves, improves effectively.

Ratio: 0.0025% or 250 ml / 100 lit is satisfactory.

Note: Of course, in this case it would be useful at regular intervals to simultaneously use the special spray **progas** for its good cleansing properties from moisture and deposits.

CNG – Natural Gas

In several countries there are stations of CNG refueling. While gas (***LPG - Liquefied Petroleum Gas***) is predominantly propane and butane gas (***CNG - Compressed Natural Gas***) is predominantly methane and ethane.

The main advantages are that it is basically cheaper and cleaner enough. The main drawback is that it has a lower heating value ratio (38MJ/m^3 or 10.6KWh/m^3). We also need more storage space than LPG.

Note: The above **VOULIS** products are fully compatible with natural gas (*CNG*) in the same proportions.