

Prins vs. BRC

Comparative test drive of LPG systems for direct injection engines



THE NEW GENERATION OF LPG SYSTEMS THAT INJECT THE LPG FUEL IN LIQUID FORM DIRECTLY INTO THE COMBUSTION CHAMBER OF THE MODERN DIRECT-INJECTION ENGINES ARE THE FUTURE OF GAS DRIVES. THE LEADERS OF THIS TECHNOLOGY, WHICH TAKE THE BEST POSSIBLE ADVANTAGE OF THE SPECIAL PROPERTIES OF LPG FUEL, ARE CURRENTLY BRC AND A DUTCH MANUFACTURER - PRINS. BOTH OF THEM STRIVE TO GAIN A FOOHOLD IN THE OEM SECTOR WITH THEIR SYSTEMS, WHICH ARE CALLED DLM (DIRECT LIQUIMAX) AT PRINS AND LDI (DIRECT LIQUID INJECTION) AT BRC. WE WANTED TO KNOW HOW GOOD THE NEW GAS SYSTEMS REALLY ARE AND DROVE FOR THEIR READERS TWO ALMOST IDENTICAL HYUNDAI IX 35 WITH THE 1.6-LITER GDI ENGINES. ONE OF THEM WAS EQUIPPED WITH THE PRINS SOLUTION, THE OTHER ONE WITH LDI SYSTEM DEVELOPED BY BRC. TO MAKE IT SHORT, BOTH DESIGNS SURPRISED THE EDITORS.

So far, the direct-injection engines were actually "tortured" during the operation with LPG: the gas systems inject the gas into the intake manifold, and therefore the benefits in terms of fuel consumption and emissions, which are offered by a normal DI engine at least in the lower load range, could be utilized only partially. If you use the engine's components to fill the combustion chamber with LPG instead of gasoline, the alternative fuel can use its advantages in a better way.

This was also evident in **Hyundai iX35 with Prins system**: Despite initial skepticism, the car ran better on LPG than on gasoline. Smoother engine running gave impression of better elasticity and harmony of the LPG operation. Nevertheless, old reservations were not pushed completely aside: The notorious formation of vapor bubbles occurred even in the pre-production DI gas systems from all manufacturers when the vehicle was parked with the hot engine and when one tried to start it again immediately. Then in the fuel lines vapor bubbles were often produced which prevented the restart.

Besides, at high temperature outside Hyundai with the Prins system needed slightly longer startup time, about one to two more turns of the starter to resume engine's work. But it was only noticed when someone pursued every startup carefully with a stopwatch. A revision of the booster pump, however, says Prins should solve this problem. As Prins DI systems are now sold in Turkey, Australia, Korea and America and there are no complaints, one can believe this statement.

It seems that in Italy, maybe due to the summer heat, this deficiency also occurs on the track. The **Hyundai with BRC system** started immediately even at 30 degrees outside and without any delay. Faults were not absolutely provoked even on short distances with constant switching off the engine. At high heat the BRC system acknowledged its stoic calm and serenity. After a turn of the switching key the engine started immediately.

Even on longer distances at full speed the iX 35 with the Prins system revealed no weak points.

Both gas systems have nothing to do at the gasoline station: fuel consumption differences are hardly noticeable.

However, the noise level of the pump unit in the gas tank was problematic: In order to start the engine directly with gas instead of expensive gasoline, the pump is activated early upon opening the doors. The driver hears it with a soft whirring. When the vehicle is stopped, the unit continues to operate a little while to prepare the fuel system for the next startup. The noise was barely noticeable in the vehicle, outside the vehicle a little louder noise could be heard from the Prins pump.

When you examine the cause, it may soon be found, however, that Prins wrapped the tank with a sound-insulating synthetic fiber, while BRC relies on solid, multilayer firm foam, which obviously served better its purpose. Upon request, however, Prins promised to give more attention to the noise reduction in the future.

When driving, both systems had to highlight their advantages in an open way. Both Prins and BRC showed absolutely convincing performance. To begin with, both vehicles were doing what they were supposed to: start immediately on LPG. One who refueled the car with LPG in due time, can theoretically weld the gasoline tank. The expensive fuel will stay then where it belongs: in the tank.

After warming up, both vehicles offer an excellent drive. Even longer distances with the maximum speeds passed without a murmur. The consumption values in gas operation

are from 20% to 30% higher than those in gasoline mode. In terms of design, there were no differences between the systems of the two manufacturers. The increased consumption resulted from the fact that in the cold start phase, in which the engine gets a higher amount of fuel, gas was used instead of gasoline.

When considering the development levels of both manufacturers, the conclusion is more than surprising: the DI systems of Prins as well as those of BRC are absolutely apt for OEM production. Evidently, the developers have done their homework.

And the retrofitters? Of course those who have internalized the principle of the new generation of gas equipment, can perform the conversion easily. This requires, however, scrupulous and accurate work. Then a DLM or LDI can be installed within just six hours by two experienced technicians.

An experienced retrofitter said after installation of Prins DLM system: *"By adhering to the specifications, the system is easier to install than a traditional gas system with manifold injection"*.

However, one thing is clear for manufacturers of LPG systems: DI systems should be held only in the hands of specially trained companies. And what about the choice of end user?

The choice between Prins or BRC, as the Hyundai comparative test showed, is rather a matter of faith.

Wolfgang Kröger



BRC engine:

Perfect installation of the first BRC LDI system in an vehicle approved in Germany. You can see the high pressure pump and the fuel selection unit (FSU).



BRC tank:

Good solution: the tank of the BRC version is insulated with thick foam. As a result, no sounds penetrate to the outside.



Prins engine:

While BRC housed the additional booster pump in the tank, Prins installed the pump in the engine compartment. On the right you can see the high pressure pump.



Prins tank:

The tank version of Prins should accept additional noise insulation.

