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Is it possible in a Classic Car?

- Reduce emissions?
- Increase power?
- Reduce fuel consumption?

In Germany, a classic car is subject to technical inspection every two years. CO content, that needs to stay within 2,5%, is the most important verified parameter. Sooner or later such strict requirements will be introduced in Poland as well. Currently authorities in several larger cities are working on introducing of “zones free from emissions” and we do not really know how classics will be treated in those regulations.

While installing electronic fuel injection NotroniG in classic cars, for our own knowledge, but also for our foreign partners, we decided to run several comparative tests of classic cars with their original fuel systems and then the same car with installed modern NotroniG system. The most important parameters measured are emissions, power output and fuel consumption.

NotroniG electronic fuel injection system is a low interference, reversible conversion from old fuel system to modern electronic one described in “Automobilista” 2/2023 and on www.notronig.pl.

We have four items in the NotroniG offer:

- **NotroniG type “M”** – conversion from MFI (Mechanical Fuel Injection) based on Bosch mechanical fuel injection pumps (Mercedes-Benz: W111, W112, W109, W108, W113, W189 and others equipped with Bosch mechanical injection system)
- **NotroniG type “D”** – conversion from D-Jet Bosch (Mercedes-Benz: W107, W116, W114, BMW: E9 3,0CSI and others equipped with D-Jet Bosch)
- **NotroniG type “K”** – conversion from K-Jet (Mercedes-Benz: W107, W116, W126, W124, R129 and others equipped with K-Jet)
- **NotroniG type “C”** – conversion to fuel injection from carburetor fuel supply.

We picked Mercedes W111 Coupe 250SE equipped with mechanical Bosch fuel injection pump (Stage 1). The choice was not an easy one as most of the cars fitted with this system are suffering from more or less serious issues while we were keen on having a fair comparison of performance of factory fitted fuel supply system with our NotroniG.

The car we picked with factory M129 engine was one of solid performance where FIP was sent to a workshop in Germany to have top professional (and very costly) inspection, repair and/or tuning.

In Stage 2 we fitted the same car with NotroniG type “M”. In Stage 3 we installed catalyzer and a Lambda probe to our NotroniG equipped car.

- Emissions measurements were conducted in the newly opened and fully commissioned diagnostic station DUL in Mielec with the use of new certified Bosch equipment, BEA060; 12 measurements were conducted.
- Power output measurements were conducted on a professional dyno stand; 6 measurements were conducted.
- Fuel consumption measurements were conducted on two identical routes, 2x200km in mixed conditions.

	Fabryczne parametry nowego samochodu	ETAP 1 Fabryczna pompa wtryskowa Bosch	ETAP 2 Układ NotroniG	ETAP 3 Układ NotroniG + katalizator
Emisja CO (%)	do 4,5	4,38	1,05	0,01
Moc (PS)	150	136	149	Brak pomiaru
Moment (Nm)	216	198	208	Brak pomiaru
Spalanie (l/100km)	11,7	13,6	10,7	Brak pomiaru

	Factory parameters	Stage 1 Bosch MFI	Stage 2 NotroniG	Stage 3 NotroniG+catalyzer
CO emission (%)	Up to 4,5	4,38	1,05	0,01
Power output (PS)	150	136	149	Not measured
Torque (Nm)	216	198	208	Not measured
Fuel consumption (l/100km)	11,7	13,6	10,7	Not measured

RESULTS

▪ Stage 1.

Car with factory Bosch MFI system.

Measurement of emissions (4 measurements) showed that results are within the factory norm of 4,5% CO. Achieved 4,38% was anyway far from currently required 2,5%.

3 measurements on dyno resulted in achieved power output of 136PS and 189Nm, which is a fairly decent result as for 60-year-old car in original condition, where engine was only after overhaul and cylinder head work carried 6 years ago. Factory parameters were 150PS and 216Nm.

Fuel consumption was quite far away from factory declared 11,7l/100km (as often happens today as well). We achieved 13,6l/100km.

▪ **Stage 2.**

Car fitted with NotroniG fuel injection system.

We performed 4 measurements of emissions with regular road settings of engine management computer. Achieved result of 1,05% was very satisfactory and well below 2,5% norm. Our expert Jakub changed some of the computer settings and we managed to achieve 0,32% CO, but this could be compared with what Volkswagen engineers did and what ended with “dieselgate”. We did one measurement, and we came back to previous settings.

What we achieved on a dyno was beyond our expectations – achieved power output of 149PS and 208Nm meant 12% increase vs. Bosch FIP and come back to sales brochure result from 57 years ago.

Fuel consumption was not a surprise for me as I drive classic cars with NotroniG a lot. The result was 10,7l/100km. A result 23% better than one of a factory MFI system

▪ **Stage 3.**

Car equipped with NotroniG electronic fuel injection system, catalyzer and Lambda probe in exhaust system.

Results achieved in Stage 2 were 100% satisfactory for us, but for our own knowledge and curiosity we conducted 3 measurements with catalyzer – achieved CO results at 0,01% and HC at 55ppm are bringing our car close to Euro 5 requirements level.

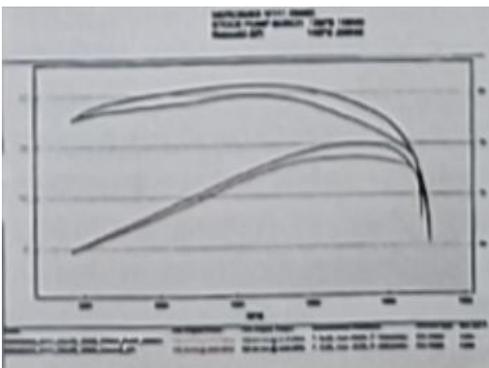
Due to respect to classic motoring and our earlier experience related to work on dyno, we skipped power measurement here as it would relate to huge load on the old car and condition of her engine. Previous 6 measurements, just a week away, were enough to draw conclusions.

While measuring of fuel consumption, winter weather came back and destroyed our plans, but we are 100% confident we can say that installed catalyzer did not increase fuel consumption.

Achieved results across the stages confirm that we are able to “improve factory work” without permanent changes, with possibility of returning to original while adjusting to future trends. Everything indicates that environment related aspects will be increasingly important part of our lives. Correctness of application of modern solutions in classic motoring is evident, if we want to use our vehicles and enjoy them trouble free.

NotroniG reduces emissions, improves performance and saves expensive fuel, giving at the same time opportunity to return to original.

Having listened to opinions of my customers, I can say that it would be very difficult to talk them into coming back to the original fuel supply system, even though they can do it any time.



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Dyno graphs

- These curves are for installed NotroniG. To note: fantastic curve of torque.

