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THE RESEARCH OF PRESSURE BOOST AND DEPRESSION IN THE EXHAUST SYSTEM IMPACT ON THE PETROL ENGINE PERFORMANCE

It is known that 12 percent of engine power is lost to overcome the resistance in the engine exhaust system. So, changing the parameters of the exhaust process we can significantly improve the engine efficiency. Nowadays this problem is solved by changing the design of the exhaust system and the gas exchange processes characteristics. In the first case, the exhaust system resistance is changing as well as the pressure at the end of the exhaust process. That leads to the increase of engine noisiness, and so the change of the exhaust system resistance is possible only in a specific, narrow range causing the necessity to provide normative noisiness. The usage of boost systems changes the characteristics of gas exchange processes. The boost system improves the engine efficiency changing the parameters of the inlet process. But this system does not reduce the losses in the exhaust system, so it doesn't cut the losses in the exhaust system. Taking into account the above mentioned information it is possible to underline that that the problem of reducing the pressure in the exhaust system to improve the engine efficiency is relevant.

Using the features designed to improve the exhaust system functions decreasing the pressure in the exhaust manifold would facilitate more complete combustion chambers clean from residual gases and filling the cylinder with fresh charge.

It is obvious that under such conditions the number of gases that remain in the combustion chamber from the previous cycle will be the lowest. It will positively result in further filling the cylinder with fresh ions as well as the power efficiency and the environment.

The research aim is to study the influence of the main parameters of gas exchange on the performance characteristics of the internal combustion engine.

The M10 carburetor engine was tested measuring and recording the following parameters:

- the depression in the exhaust system;
- the pressure in the intake manifold;
- the frequency of the crankshaft rotation;
- the fuel consumption at different frequencies of the engine crankshaft rotation.

The analytical studies of the working process were carried out using the “Diesel RK” program.

As the result of researching the engine operations and its parameters while changing the pressure values in the exhaust system, the improvement of gas exchange parameters (the coefficient of residual gases and the admission coefficient) was defined. That led to the 6-8 percent increase of average indicated pressure as well as the engine power.

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