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INFLUENCE OF THE GEOMETRIC CHARACTERISTICS OF THE TRANSVERSE PROFILING OF THE CHANNEL ON THE PROCESS OF EXHAUST GASES IN THE INTERNAL COMBUSTION ENGINE

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Abstract: *In this paper analyzed the results pilot study factors internal combustion engines on processes gas exchange. Considered addiction changes instantaneous speed and pressure flow in the engine from the angle turn cranked shaft. Data received at various coefficients resistance intake and graduation systems and different frequencies rotation cranked shaft. According to the results experimental and calculated data were made conclusions the dynamic features processes gas exchange V engine at various conditions.*

Key words: engine, crankshaft, piston, pressure, exhaust port, cylinder, combustion chamber

In the modern automotive industry, an urgent topic is the increase in energy and economic indicators piston ICE, whose task is to improve the processes of heat release, gas exchange, mixture formation. On this basis, there is still significant reserve raise technical and economic indicators engines behind check raise thermogasdynamic characteristics gas-air tracts [1-4].

There are two main tasks for the intake systems of internal combustion engines, from successful the solution of which depends on obtaining an efficient workflow: the creation of an inlet systems with given aerodynamic characteristics; choice gas dynamic parameters channels and working charge in cylinder and camera combustion.

The main body of exploratory observation was carried out in graduation channel in the different sections at different speed crankshaft at various variations excess pressure on release without use noise suppression. The average air temperature when entering the main line was 20 - 22 ^{o} C. The average excess pressure *fi* in the camera before graduation valve regulated of range 0.6 - 2.2 bar.

As a result of the study, it was found that the pulsations of the air flow velocity are most pronounced at low speeds. rotation cranked shaft at all values elevated pressure, which in turn, corresponds to the results numerical modeling. Accordingly, the opposite the effect could be seen in the intake process in the engine, where the dynamics of the process are opposite becoming more complicated by measure increasing the number of rotations of the crankshaft shaft.

Based on the experimental and theoretical calculated data of the flow rate

for a single cycle, the dependence of the volume flow was obtained *P* through the exhaust channel differing in geometric shape from the number of revolutions of the crankshaft *q*. shown in Figure 1.

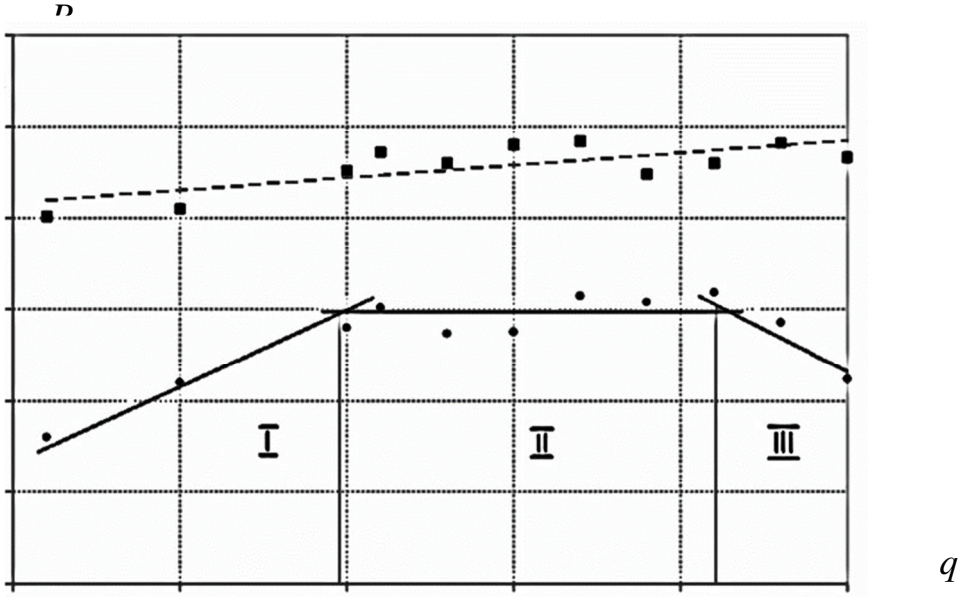

Fig. 1. Volumetric air flow *P* through the outlet channel of various cross-sectional shapes
section depending on the frequency of rotation of the crankshaft *q*

In the course of experimental studies, significant pulsations in the change in the speed of the air flow during the exhaust process were revealed when the configuration of the geometric parameters of the exhaust channel changed, which, in turn, was clearly manifested at low rotational speeds of the crankshaft. It was also determined that with increasing pressure in the system, the mass flow of air through the exhaust channel increases. When using a rectangular exhaust channel, a linear increase in air volume flow was observed with an increase in the number of revolutions of the crankshaft of the internal combustion engine, on average, up to 25% compared to a channel with a circular cross section, which in turn leads to an increase in efficiency.

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