N2-O-031502

ANALYSIS OF COMBUSTION, PERFORMANCE AND EMISSIONS OF SYNGAS-FUELED ROTARY ENGINE WITH DUAL INJECTION*

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Synthesis gas (syngas) can be considered as a potential replacement of fossil fuels in transportation and energy production sector [1]. Reciprocating internal combustion engines represent well-known technology of syngas application. The promising technology for efficient utilization of syngas is dual injection that comprise advantages of port fuel injection and direct injection [2]. In this study syngas of 50% H_2: 50% CO_2 by volume is considered as a main fuel for rotary engine. The three-dimensional simulation of the air-fuel mixture formation and combustion processes in the rotary engine was based on the finite volume method.

The engine configuration with proposed fuel injection system was shown in Fig. 1. The location of the injector was adapted from research works devoted to investigation of the port fuel injections and direct injections in rotary engines [3,4]

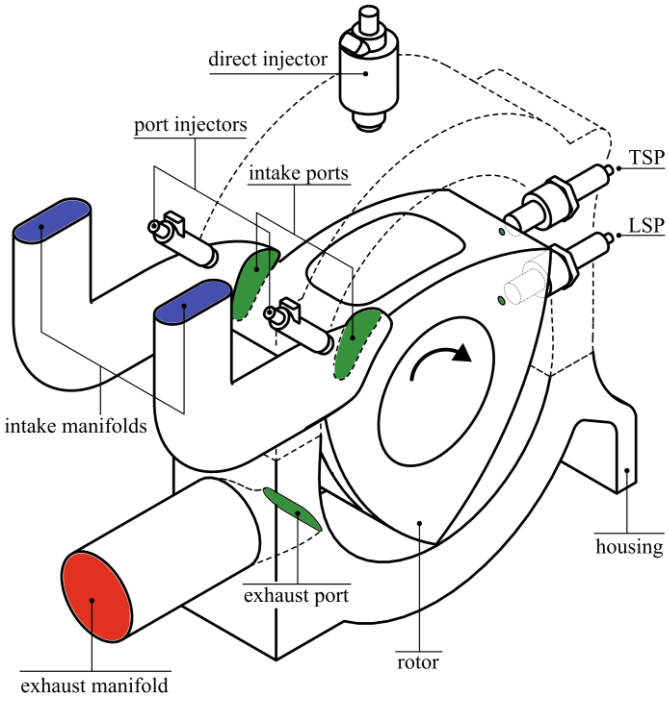

Fig.1. Rotary engine with dual injection system.

The use of dual injection system in a rotary engine can be considered as an effective and efficient method to use syngas in rotary engine with spark ignition. The dual injection technology provide flexibility in the control of air-fuel mixture formation process. The results of this work can be useful for further optimization of the rotary engine.

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* The work was supported by Russian Science Foundation according to the research project №21-79-00170, https://rscf.ru/en/project/21-79-00170/.