

SPACE PROPULSION SYMPOSIUM (C4)  
Poster Session (P)

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## LOX-KEROSENE LIQUID ROCKET ENGINE WITH A THRUST OF 9.8 MN

**Abstract**

In a modern engine using liquid fuel components, including the engine RD171M production JSC “NPO Energomash” reached a certain maximum parameters: the specific impulse in vacuum=3273.2m/s, the pressure in the combustion chamber=25.9MPa, the thrust in vacuum= 7.8MN. To solve the problem of increasing the energy performance of a rocket engine in JSC “NPO Energomash” designed circuitry, which will increase the engine thrust in vacuum of 9.8MN while maintain in dimensions RD171M engine. To implement the increased thrust requires an increase in pressure in the combustion chamber of the engine. In the proposed scheme, the engine is a four-chamber LRE. It is made under the scheme with afterburning of oxidizer-gas. Submission of propellants into the combustion chamber is provided with two turbopump units (TPU), where pumps are connected in series and parallel to the turbine. Each TPU is driven by its turbine operating on generator gas, is produced in one of two gas generators. The main advantage of using two TPU in the proposed scheme is the distribution of power requirements between the two turbines. The data show that the use of two TPU in engine allows increased thrust by 25

Conclusion: 1. The proposed modernization RD171M engine can increase the thrust to 9.8MN, and use in the construction of two series-connected TPUs equal power to reduce power demand created by the pressure, the circumferential velocity, momentum and, as a consequence, the dynamic forces that determine the resource efficiency engine in general. 2. Constructive solutions adopted for engine units approved on RD170 engine family, which reduces the volume of working out terms with a minimum of risk. 3. It is proposed to use the engine as developed for the first stage rocket engine on heavy launch vehicle as part of SLS program or other developed super heavy launch vehicles.