µHoubolt Combustion Chamber Test Protocol

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TEST BY
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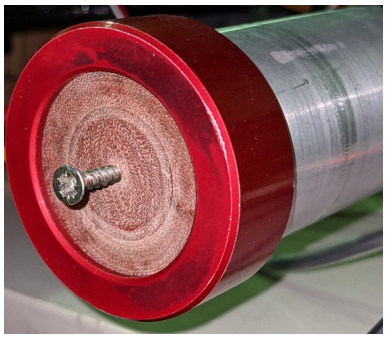
TESTTYPE	Proof Pressure Test
TESTGOAL	Testing the combustion chamber with a maximum static pressure
FAILS AND LEARNINGS	Test passed
ADDITIONAL INFO	Over 28bar for 2.5min

Test summary

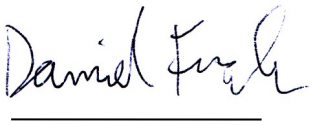
General Description:
To ensure that the combustion chamber pressure can withstand the pressures it is exposed to during engine operation, it was statically pressure proofed. The maximum expected chamber pressure is 16bar, so a proof pressure of at least 24bar is needed to satisfy the safety factor of 1.5. The engine nominally operates for 8s, and the pressure test needs to last at least twice as long, so 2.5 min were chosen as testing duration.

Test Setup:
The test was conducted as part of a leak check of the whole propulsion system. The main propellant valves were opened, and the system was pressurized using nitrogen. The pressure was measured using three independent pressure sensors, two of them connected to the two propellant tanks and one connected to the combustion chamber. Instead of a liner (which is not pressure bearing), a sealed endcap was installed in the combustion chamber casing and held in place by the usual retainer cap.



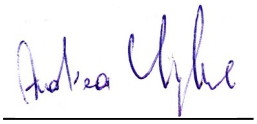
Test Outcome:
A pressure of over 28bar was maintained in the system for about 2.5min, before the system was depressurized again. The pressures of the three sensors confirmed the value within a range of 1bar. No leaks could be detected, and the combustion chamber withstood the pressure without any problems and damages.

Signature 1



Daniel Frank

Signature 2



Andreas Ungersböck

Signature 3

Luis Büchi