

Liquid propellant loading and offloading test

[TEST NUMBER]

15:46

16:23

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LEAD	MISSION CONTROL	PAD	RANGE SAFETY	FIREFIGHTER
GEORG MIKULA	Markus Pinter	Johann Breyner	Daniel Frank	Andreas Ungersböck

TESTTYPE	Cold flow
TESTGOAL	Demonstrate that the rocket can be fueled and defueled in a controlled manner using the prepared systems and procedures.
CHANGES	-
FAILS AND LEARNINGS	Coupling of fuel pump difficult -> reengineered connection
ADDITIONAL INFO	Test successfull

Test summary

For this test the liquid propellants were loaded into the rocket as they would be before launch. First the fuel tank was filled with ethanol using a custom made handheld pump. Connecting the pump directly to the rocket via a short section of pipe with a threaded adapter at the end turned out to be possible but impractical. The pipe has since been replaced by a piece of flexible hose with a union nut at the end.

After fuel loading the fuel pump was removed and the oxidiser and pressurant loading equipment connected to the rocket via the strongback. Propellant and pressurant loading was conducted according to the checklist without difficulties.

For the offloading test, the propellant tanks were brought to nominal pressure. First the oxidiser main valve was opened, allowing the nitrous oxide to vent through the engine out of the rocket. After waiting five minutes, in order to give the oxidiser time to completely evaporate and the fumes to clear, the fuel main valve was opened, also emptying the fuel tank through the engine. After making sure that the system was completely depressurised the "firefighter" applied a generous amount of water to the launch pad directly below the engine, in order to dilute the ethanol to a non-flammable concentration.

This test proved that the system can be completely vented from a ready to launch condition without causing any damage to the engine or other systems and without causing the nitrous oxide to decompose or react with the combustion chamber liner.