

INTRODUCTION OF HYDRAULIC AND PNEUMATIC SYSTEM ON PROPULSION SYSTEM TEST COMPLEX FOR KSLV- II

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Abstract: The Korea Space Launch Vehicle- II (KSLV-II) is being developed in Korea with the first launch on October 21, 2021 and second in 2022. Before launch, Propulsion system needs to verify the integrated tests for assembled system. Propulsion System Test Complex (PSTC) was established as verification tests of each stage's propulsion system at the Naro space center, Republic of Korea.

Each stage's cold flow test and hot fire test are performed for the qualification and evaluation of propulsion system in the PSTC. For the tests, Hydraulic and pneumatic system has to supply propellants and various gases to propulsion system according to required condition. The KSLV-II uses propellants to liquid oxygen/kerosene and needs gases for pressuring and purging gas. Therefore, Hydraulic and pneumatic system includes liquid oxygen filling system, kerosene filling system, nitrogen supply system, compressed gas supply system, thermo-stating system, electro-pneumatic panel system and helium heating system.

The system summary is below:

- Liquid oxygen and kerosene filling systems use two centrifugal pumps in parallel for hazard and fault.
- Liquid oxygen filling and Nitrogen supply systems use vacuum jacket pipe for cryogenic fluid.
- Nitrogen supply and thermo-stating systems supply protecting purge to launch vehicle.
- Compressed gas supply and electro-pneumatic panel systems deliver nitrogen and helium to launch vehicle for each purpose to pressure, flow rate and temperature.