

# Hot-Fire Test of Liquid Oxygen/Hydrogen Space Launch Mission Injector Applicable to Exploration Upper Stage

## Project Manager(s)/Lead(s)

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## Sponsoring Program(s)

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Human Exploration and Operations Mission Directorate  
Space Launch System Advanced Development

## Project Description

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This task is to hot-fire test an existing Space Launch Mission (SLM) injector that is applicable for all expander cycle engines being considered for the exploration upper stage. The work leverages investment made in FY 2013 that was used to additively manufacture three injectors (fig. 1) all by different vendors.



Figure 1: Manufactured LOX/H<sub>2</sub> injectors.

## Notable Accomplishments

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Accomplishments include selecting two of the injectors to use for hot-fire testing, performing nondestructive evaluation on the original SLM injectors, final machining, welding on the Rigimesh® face plate, water flow testing, fabricating the ablative chambers used to support testing, test facility buildup, writing the Test Requirements Document and successfully completing the Test Readiness Review, performing facility leak checks and blow-down testing, and hot-fire testing injectors (fig. 2).

## References

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Crumbly, C.M.; Bickley, F.P.; and Hueter, U.: “Space Launch System Spacecraft/Payloads Integration and Evolution Office Advanced Development FY 2014 Annual Report,” NASA/TM—2015-218201, NASA Marshall Space Flight Center, Huntsville, AL, January 2015.



Figure 2: Water flow and hot-fire testing of two LOX/H<sub>2</sub> SLM injectors.