



## BEARING TEST FACILITY

### Purpose:

**To test and validate the performance of bearings used in Space Shuttle Main Engine Program.**

Bearings are a major component of high speed, cryogenic, main engine turbopumps. The bearings need to be designed to carry the loads and speeds during launch without wear or degradation. The LH2 Bearing Test Program utilizes a cryogenic test rig running in liquid hydrogen or nitrogen that duplicates as closely as possible, the operating conditions in a Space Shuttle main engine turbopump. Flight type bearings are installed in the rig, and then the shaft is rotated at speeds up to 40,000 RPM. The test rig is capable of 2000-psi internal pressures and has instrumentation to monitor pressure, temperature, speed, and loads. Test duration is typically 1000 to 1200 seconds per run. When using liquid hydrogen, inlet temperatures are -400 degrees Fahrenheit. This tester has been used to validate the use of hybrid bearings with silicon nitride balls in steel races for the Main Engine program. Hardware is also available to modify the test rig to run all hydrostatic bearings.



### POINT-OF-CONTACT:

Robert Thom / ED32  
(256) 544-2517  
robert.thom@msfc.nasa.gov