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NASA TECH BRIEF

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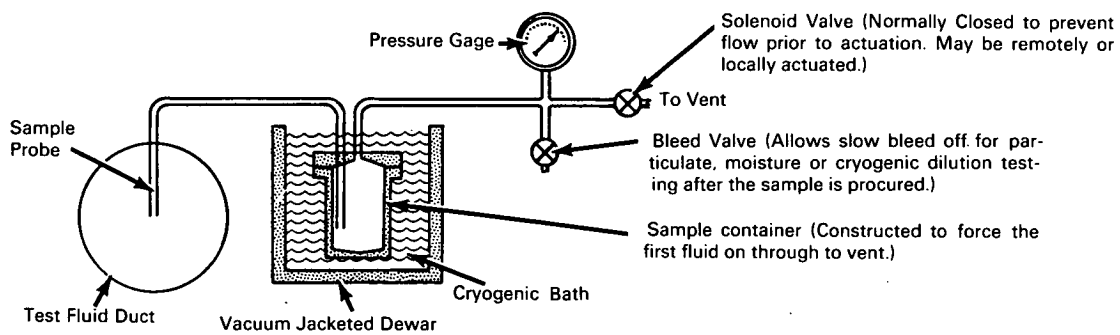
Cryogenic Fluid Sampling Device Permits Testing Under Hazardous Conditions



The problem:

To obtain a representative, timed sample of flowing cryogenic liquid propellants in remote or hazardous testing conditions. This capability permits the determination of the properties of the fluid, which is helpful in the analysis of rocket engine performance.

The solution:

A remotely controlled sampling device consisting of a calibrated container, a dewar, a solenoid valve, a pressure gage, and a manual bleed valve. The device takes timed samples of cryogenic fluid at a specific instance of engine run time.

How it's done:

Prior to sampling, the sampling container is submerged in a dewar that contains a liquid with a boiling point the same as, or lower than, the fluid to be sampled. When the boiling in the chilling bath ceases, the container is ready for sampling. Samples are obtained by activating the solenoid valve to initiate flow from the duct into the sample probe pipe. The fluid enters the sample container, near the bottom, forcing out any purging contents in the container through the vent.

The pressure gage indicates the presence of sample fluid in the sample container and serves as a warning indicator if boil-off begins. The bleed valve permits slow bleed-off for particulate, moisture, or cryogenic dilution testing after the sample is procured. To prevent spurious contamination of the sample there is no valving between the test duct and the sample container. When a satisfactory sample is obtained, the solenoid valve is closed and the container is removed when the hazard no longer exists.

Note:

Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B66-10654

(continued overleaf)

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Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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