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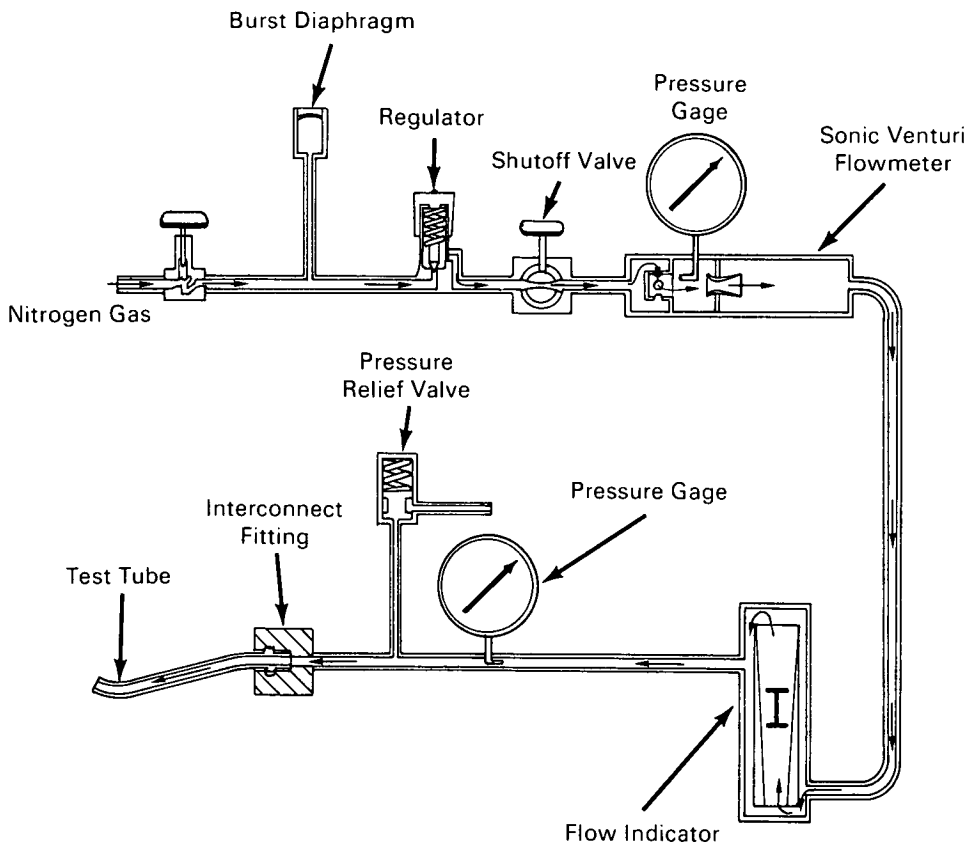
Brief 69-10400

NASA TECH BRIEF

Pneumatic Flow Comparator



The problem:

Flow characteristics of tubes used to form the walls of regeneratively cooled combustors must be identical within very close tolerances to ensure equally distributed coolant flow throughout the combustor wall. In complex assemblies there are hundreds or even thousands of such tubes with identical flow requirements. These tubes are individually fabricated and must be individually checked (100 percent inspection) for conformance to flow tolerances.

The solution:

A pneumatic flow comparator was designed and constructed to provide simple go, no-go evaluation of individual tubes. Nitrogen flow through the system,

(continued overleaf)

before connecting a tube to be tested, is adjusted by means of the regulator to give a constant reading on the lower pressure gage. The reading on the upper gage is then recorded as a reference. With a test tube connected to the fitting at the left end of the system, a reading is taken on the upper pressure gage. This reading is a direct function of the flow rate through the tube under test. Tolerance limits may be marked on the gage face or the protective glass to expedite checking and reduce possibility of operator error. A water-immersion bath may be provided to ensure leak tight connection at the interconnect fitting between the system and the tube being tested.

Notes:

1. This technique can be advantageously applied to quality assurance testing of matched flow passages in large numbers of tubes.
2. No further documentation is available. Inquiries may be directed to:

   Technology Utilization Officer
   Marshall Space Flight Center
   Huntsville, Alabama 35812
   Reference: B69-10400

Patent status:

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

Source: A. J. Wilson of
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