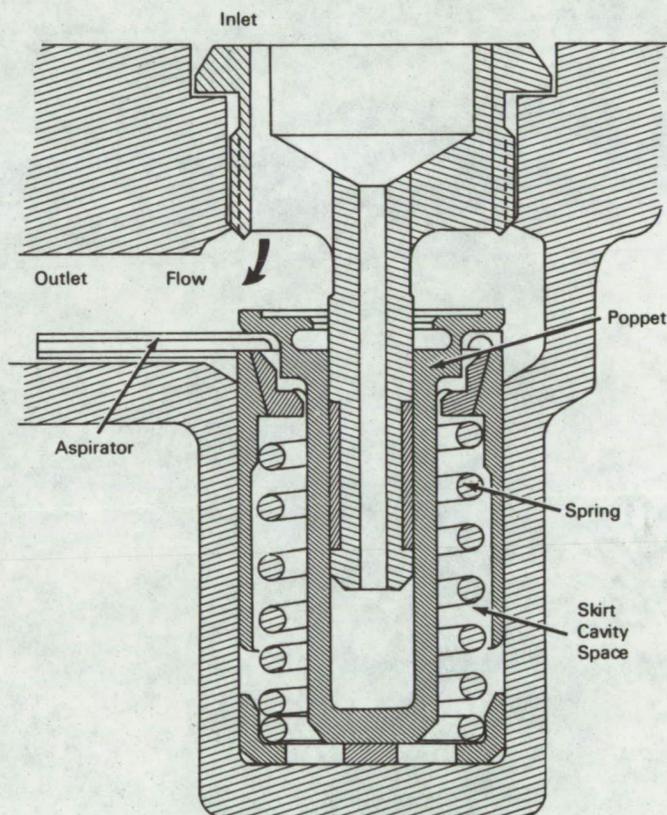


NASA TECH BRIEF



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Aspirator Increases Relief Valve Poppet Stroke



The problem:

Under dynamic flow conditions, the poppet of a relief valve would travel only 42% of its full stroke. This limited the valve flow rate well below system design requirements.

The solution:

The addition of an aspirator to the relief valve design. The aspirator allows poppet inlet dynamic

forces to overcome relief valve spring force in such a manner that poppet travel reaches full stroke.

How it's done:

In a relief valve designed as an integral part of a prevalue, water flow tests proved the design to be inadequate. A flow rate of only 96 gpm was obtained with 80 psi inlet pressure, while design requirement was for 110 gpm at this inlet pressure. Analysis

(continued overleaf)

established that poppet travel was only 42% of full stroke. The condition was corrected by the addition of an aspirator that provides a relatively low pressure sense probe for the poppet skirt cavity, thereby reducing the fluid pressure in the skirt cavity and allowing the poppet inlet dynamic forces to overcome the relief valve spring force.

Notes:

1. Tests with the aspirator showed a flow rate increase to 145 gpm with 80 psi inlet pressure, indicating a 100% stroked poppet.

2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Headquarters
National Aeronautics and Space
Administration
Washington, D.C. 20546
Reference: B67-10154

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: M. E. Biddle
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