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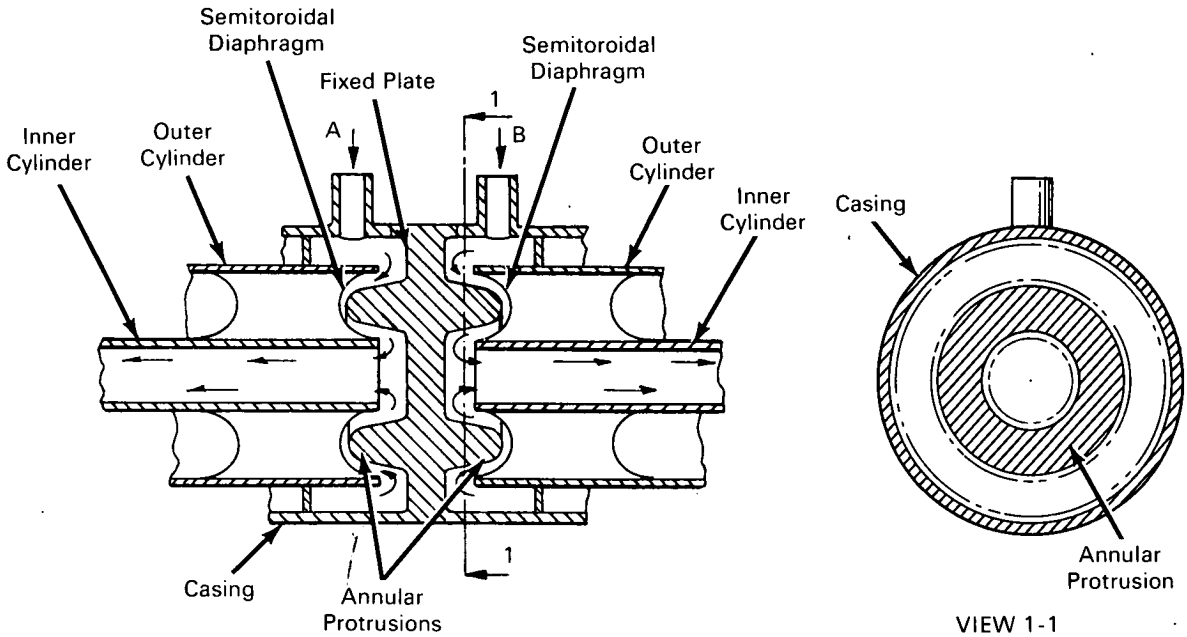
Brief 69-10016

NASA TECH BRIEF

Semitoroidal-Diaphragm Cavitating Valve Designed for Bipropellant Flow Control



This valve is designed to control the flow of bipropellant liquids (A and B) in rocket engines. Throttling and cavitation of the liquids are controlled only by axial deflections of a metal diaphragm. This simple, compact valve may be more highly resistant to corrosion and leakage than many of the dynamically and statically sealed valves currently available. It should be generally useful in the food processing and chemical industries.

The valve includes a casing that encloses a fixed plate with annular protrusions. Each protrusion is partially surrounded by a semitoroidal metal diaphragm to form an annular valve chamber. The gap between the apex of the protrusion and the diaphragm functions as a throat, and the downstream side of the chamber is shaped to cause cavitation of the liquid. The diaphragms are each mounted on a set of cylinders (inner cylinders and outer cylinders), the inner cylinders being flexurally supported for axial movement. Shut-off, controlled throttling, and cavitation are accomplished by selectively moving the inner cylinders to vary the gaps between the diaphragms and protrusions.

Notes:

Documentation is available from:

Clearinghouse for Federal Scientific and Technical Information
Springfield, Virginia 22151
Price $3.00
Reference: B69-10016

(continued overleaf)

Patent status:

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