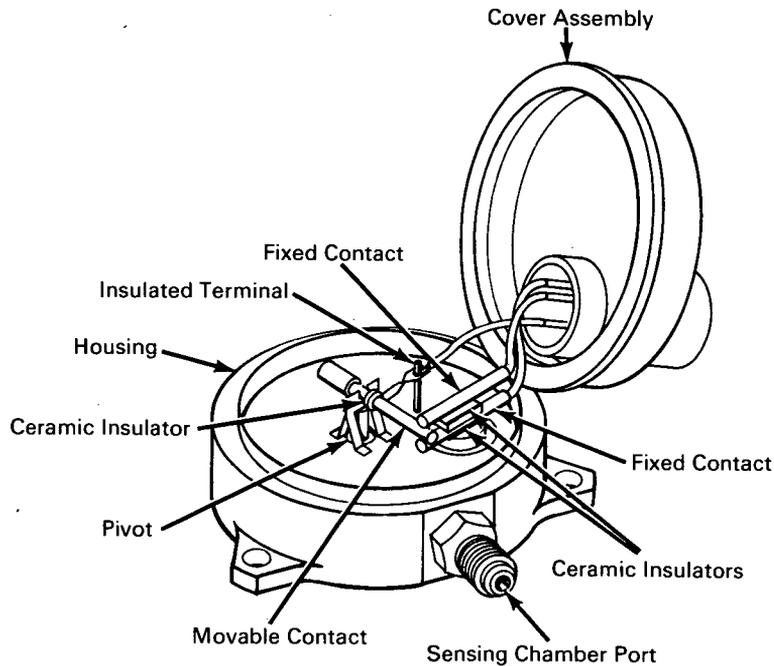


NASA TECH BRIEF



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Rugged Switch Responds to Minute Pressure Differentials



The problem:

To provide a pressure responsive switching device that exhibits high sensitivity but is extremely rugged and resistant to large amplitude shock and velocity loading. The device must meet stringent size and weight requirements and operate over a wide temperature range.

The solution:

A snap-action, single pole-double throw switch having a maximum 2.0 psi bandwidth over a range of -420° to 165°F with presettable actuation pressures from 20 to 45 psia. The switch is immune to vibration to 30 g's peak from 38 to 2,000 cps.

How it's done:

The switch is contained in a housing divided into two chambers, a pressure sensing chamber and a sealed chamber. The sealed chamber contains two fixed contacts mounted on ceramic insulators and a movable contact mounted on a spring steel pivot. The movable contact is in the form of a beam whose inboard end is attached to a link that passes through the sealed chamber floor into the sensing chamber where it is fastened to a sensing diaphragm.

When pressure in the sensing chamber drops below a selected threshold, the sensing diaphragm acts upon the link to pull down the inboard end of the movable

(continued overleaf)

contact and cause its outboard end to rise and engage the upper fixed contact. Conversely, when pressure in the sensing chamber rises above a selected threshold, the diaphragm acts to raise the inboard end of the movable contact and cause its outboard end to engage the lower fixed contact. The fixed contacts are both magnetized to minimize contact bounce during a switching phase.

Note:

Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B67-10389

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: L. C. Friend and K. D. Shaub
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