June 1966

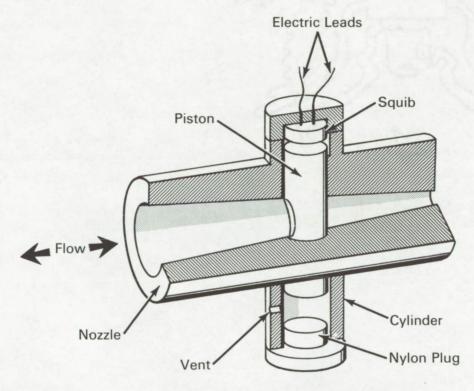
Brief 66-10233

# NASA TECH BRIEF



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# Quick-Closing Valve Is Actuated by Explosive Discharge



# The problem:

To devise a remotely controlled valve that will shut off a high-pressure (4600 psi), high-temperature (10,000°F) gas flow in a few milliseconds.

## The solution:

A plug-type valve that is actuated by a commercially available electrically initiated squib of low explosive power.

#### How it's done:

The valve incorporates a piston that is inserted with a light interference fit in a cylindrical bore extending transversely through the flow nozzle. The piston has a radial hole which is concentrically aligned with the axis of the nozzle to provide unobstructed flow when the valve is in the open position. The squib is mounted at a small standoff in a cap above the top of the piston. When the flow is to be shut off, the squib is initiated from a remote voltage source. The resulting detonation drives the piston down the cylinder until it is stopped by the nylon plug. In this closed position, the piston provides a tight seal against the gas flow. Time for complete closure after initiation of the squib is 6 to 8 milliseconds.

(continued overleaf)

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### Notes:

- This valve has been used for quick shutoff operation only. Valves of this type can also be designed for remote reverse actuation by mechanical, hydraulic, or explosive means.
- 2. More rapid closure is attainable with squibs containing heavier explosive charges.
- 3. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer Ames Research Center Moffett Field, California 94035 Reference: B66-10233

### Patent status:

No patent action is contemplated by NASA.

Source: Stanley J. Majeski

(ARC-55)

Brief B66-10233 Category 05