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Ames Research Center



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Proportional Pulsed Pilot Valve

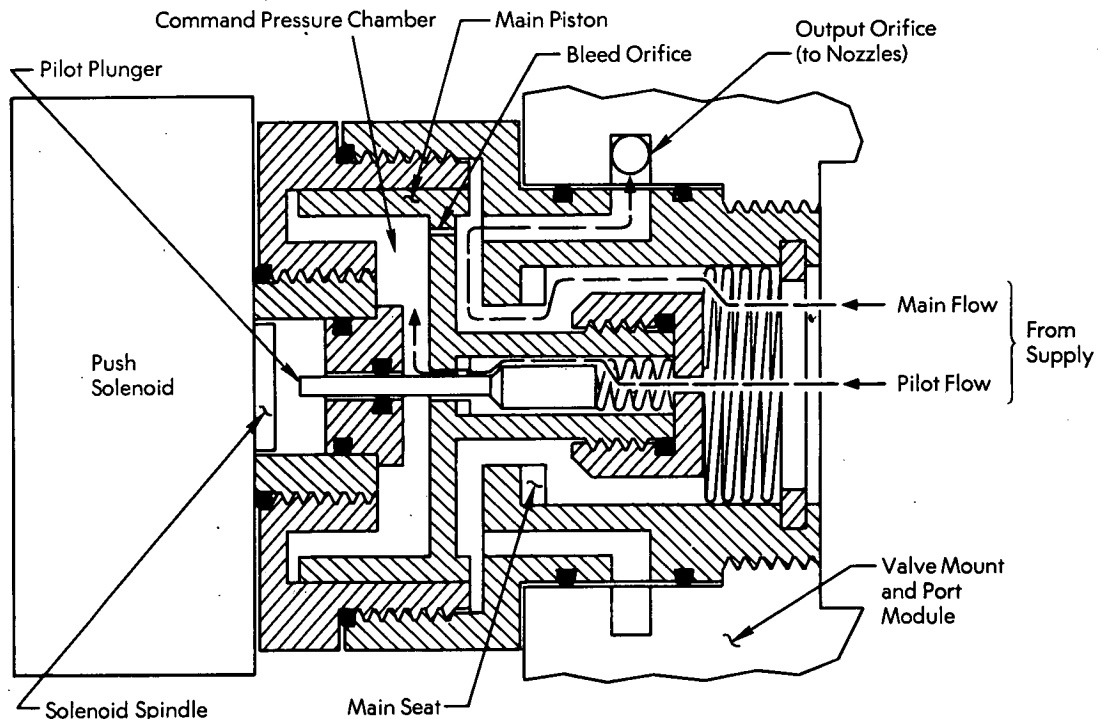
The problem:

To provide proportional thrust control for cold-gas thrusters.

The solution:

A proportional pulsed pilot valve which uses a conventional, efficient solenoid valve for the pilot

opposite the solenoid; the solenoid assembly is not exposed to the pressure. The push action of the solenoid spindle unseats the pilot plunger and allows the pilot flow to enter the command pressure chamber. The pilot flow causes the pressure in the command chamber to rise to a level dictated by the



stage. Proportional control of the main stage, with zero leakage, is accomplished.

How it's done:

The valve is mounted in a block containing appropriate input and output orifices. Pressure is supplied to the chamber on the right, at the end

solenoid duty cycle, supply pressure, and the size of the bleed orifice in the main piston.

The pressure in the command pressure chamber forces the main piston to the right, opening the main orifice and permitting the main flow to proceed from the pressure source to the output orifice. As the

(continued overleaf)

main orifice opens and the main flow is established, pressure is applied to the main piston face on the side opposite the command pressure chamber, which tends to reduce the main flow. Thus, a balance is established between the command pressure and the resultant output pressure and flow, and an output proportional to input is produced.

Notes:

1. A prototype model of the valve has been built and tested.
2. No additional information is available. Specific questions, however, may be directed to:
Technology Utilization Officer
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Moffett Field, California 94035
Reference: B71-10468

Patent status:

No patent action is contemplated by NASA.

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