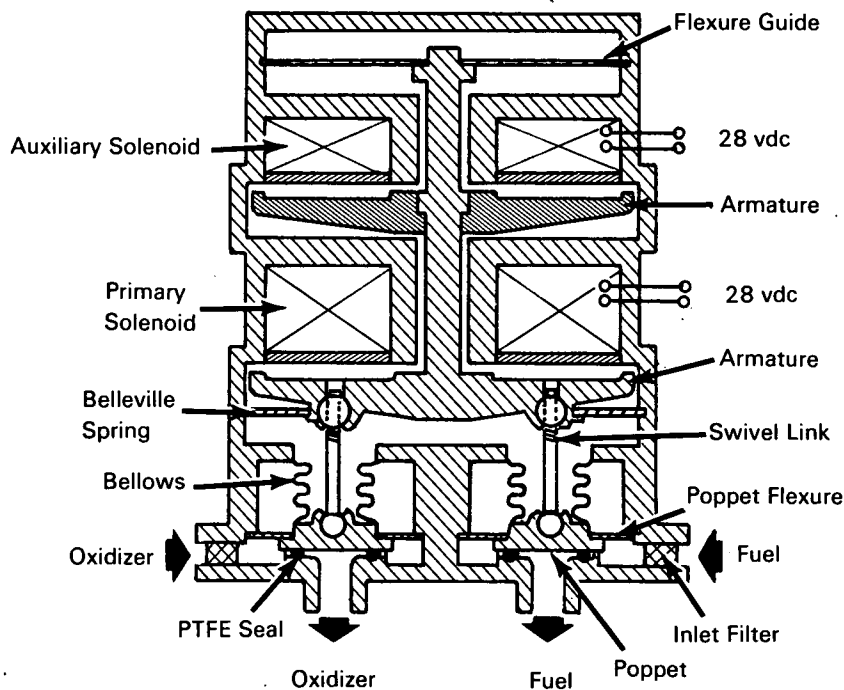


NASA TECH BRIEF



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Fuel and Oxidizer Valve Assembly Employs Single Solenoid Actuator



The problem:

To design a valve system that will simultaneously start or stop the flow of oxidizer and fuel from separate inlet channels to reaction control motors.

The solution:

An assembly combining an oxidizer shutoff valve and a fuel shutoff valve, mechanically linked and operated by a single high-speed solenoid actuator.

How it's done:

The actuator incorporates two independent, hermetically sealed solenoids, either or both of which may

be used to open the valves. The additional (auxiliary) solenoid is provided to increase the operational reliability of the system. Fuel and oxidizer channels are isolated from each other by hermetic (welded) seals.

Each of the two valves in the assembly is balanced to the inlet pressure by a metal bellows. The mechanical linkage allows enough motion for independent hermetic seating of the valve poppets, yet prevents either valve poppet from opening substantially more than the other. The armature is axially guided and prevented from rotating about any axis by means of frictionless flexure guides. The Belleville spring performs

(continued overleaf)

the dual function of serving as the lower flexure guide and providing a closing spring force. The valves are normally opened by energizing the lower (primary) solenoid.

Notes:

1. This valve assembly may find application in a variety of operations requiring simultaneous injection of two fluids into a processing system.
2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Manned Spacecraft Center
Houston, Texas 77058
Reference: B66-10648

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: Parker Aircraft Company
under contract to
Manned Spacecraft Center
(MSC-1046)