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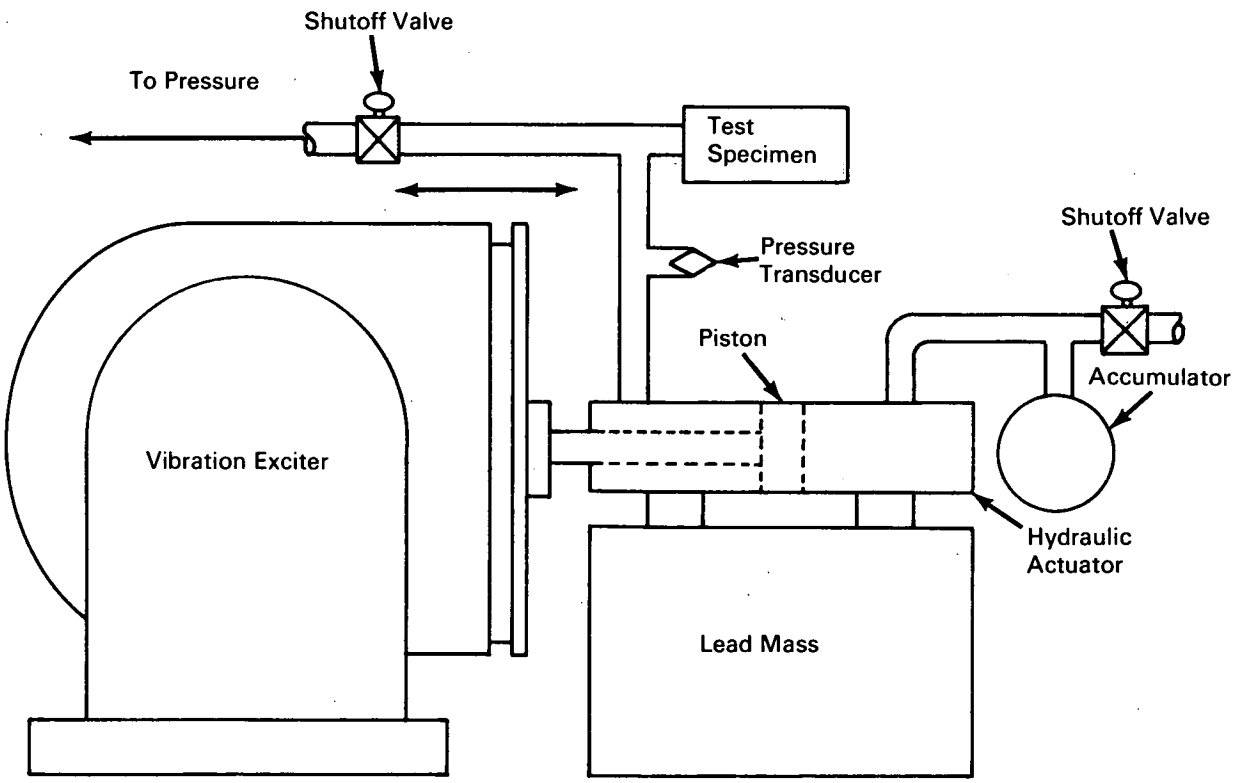
# NASA TECH BRIEF



## Pressure Levels and Pulsation Frequencies Can Be Varied on High Pressure/Frequency Testing Device




**The problem:**

To develop a device to test hydraulic system components to high pressure/frequency cycle requirements. It was necessary to pressure cycle a 1000 psi precharged hydraulic accumulator from 2950 psi to 3050 psi at a frequency of 400 cps. Due to the soft nature of the system, a significant flow was required to produce the pressure cycles.

**The solution:**

Obtain a pulsating pressure from a hydraulic actuator that is being driven by a vibration exciter of sufficient force and displacement. Input to the exciter controls the frequency of pressure variation.

**How it's done:**

The rod of a hydraulic actuator is attached to the exciter head. The rod end port of the actuator cylinder

(continued overleaf)

is connected to the test specimen and pressurized to 3000 psig. A pressure balance to maintain the shaker head and hydraulic actuator in the center of their strokes is obtained by trapping the appropriate pressure on the back side of the hydraulic actuator. For stability the actuator is bolted to a lead mass. A pressure transducer and direct writing oscillographic recorder are used to indicate the pulsating pressure level and the input to the exciter is adjusted accordingly. The motion of the actuator piston provides the compressing force necessary to vary the pressure.

**Notes:**

1. This method can also be used to test pressure transducers, pressure switches, and other hydraulic components. The pressure levels and frequencies of pulsation can be varied as test requirements dictate. This system can also be used to test pneumatic components.
2. Inquiries concerning this innovation may be directed to:

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   or to

   New Technology Representative
   General Dynamics/Convair Division
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**Patent status:**

No patent action contemplated by NASA.

Source: J. W. Routson
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under contract to
Lewis Research Center
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