

# NASA TECH BRIEF

## *Manned Spacecraft Center*



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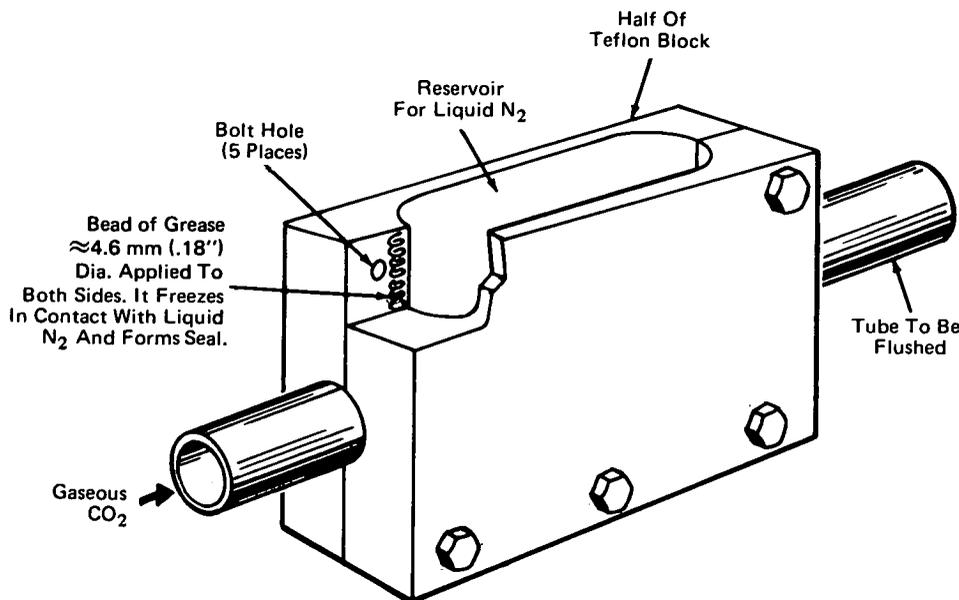
### Dry Ice Plug for Hydraulic and Pneumatic Pipe Flushing

#### The problem:

Blocked hydraulic or pneumatic piping sections or valves are usually removed from the system before they are flushed. Their removal prevents the system from contamination by the flushing fluid and eliminates possible blockage of smaller passages. Such removal and reinstallation is costly and time consuming.

#### How it's done:

A portion of the piping that is to be plugged is enclosed by a Teflon block, as shown in the figure. Gaseous  $\text{CO}_2$  is then pumped into the piping at a very low flow rate. Simultaneously, liquid nitrogen is introduced into the Teflon block to cool the gaseous  $\text{CO}_2$ . Within a short period, the  $\text{CO}_2$  begins to solidify



#### The solution:

A method was developed which utilizes dry ice as a plug that isolates sensitive components from the flushing fluid. Flushing is thus performed without pipe disassembly.

radially inward and forms a solid plug of dry ice. The system can then be flushed up to the solid plug.

Preliminary results show that it takes 10 minutes to form a 12.5-cm (5-in.) dry-ice plug in a 1.9-cm (3/4-in.) diameter tube. This plug was tested successfully to

(continued overleaf)

pressures of  $4.46 \times 10^5 \text{ N/m}^2$  (50 psig) applied to one side; however, no maximum pressure has yet been established.

**Note:**

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer  
Manned Spacecraft Center  
Code JM7  
Houston, Texas 77058  
Reference: B72-10496

**Patent status:**

No patent action is contemplated by NASA.

Source: L. Francino and S. Rauch of  
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