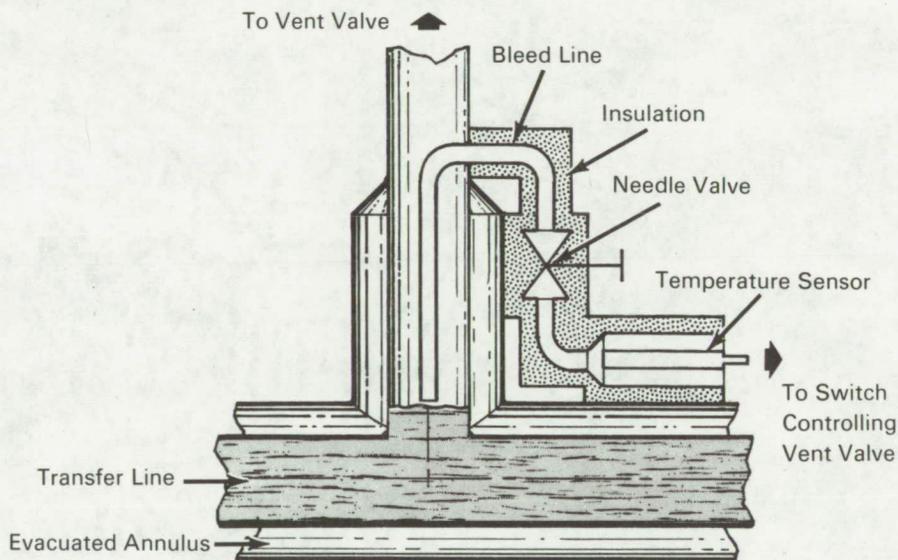


NASA TECH BRIEF



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Temperature-Sensed Cryogenic Bleed Maintains Liquid State in Transfer Line



The problem:

To maintain nitrogen in the liquid state constantly in a cryogenic transfer line.

The solution:

An inverted tee installed at a high point in the transfer line is equipped with an insulated bleed line that constantly passes a fixed amount of the cryogenic fluid at atmospheric pressure, over a sensing device. The sensing device actuates a vent valve in the tee stack whenever gaseous nitrogen is present.

Notes:

1. This system has an advantage over that employing a sensor within the transfer line since the latter would react to differences in line pressure as well as to gaseous versus liquid phases. The temperature of LN₂ varies between -320°F at atmospheric pressure and -274°F at 140 psia.

2. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B67-10424

Patent status:

No patent action is contemplated by NASA.

Source: A. R. Lindgren
of North American Aviation, Inc.
under contract to
Marshall Space Flight Center
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Category 01