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NASA TECH BRIEF

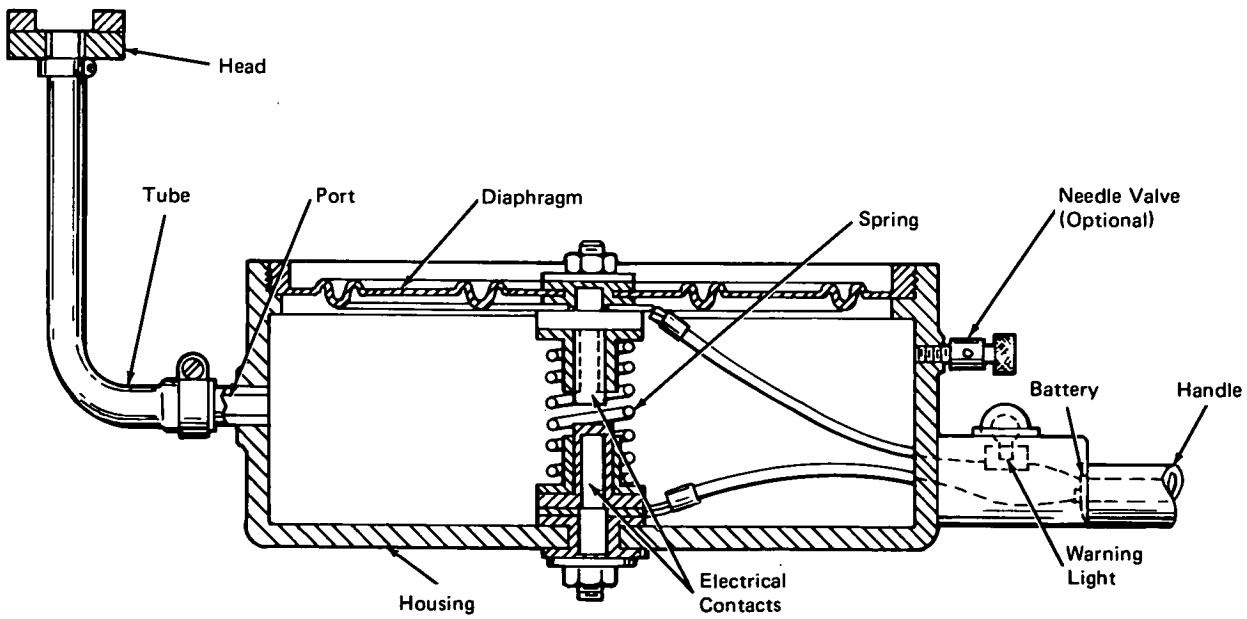
Marshall Space Flight Center

Leak Detector-Measurer

A portable leak detector is commonly used to locate leaks in pressurized vessels. The detector is hand-held and moved over the external surface flush with the vessel. When a leak is present, the gas escaping from the vessel in the area over which the detector is held increases pressure inside the device and automatically activates a warning light, a buzzer, or an electrical meter. Unfortunately, these devices cannot locate leaks from inside the pressurized vessels. Therefore, leaks in pressurized cabins such as in spacecraft and aircraft cannot be effectively located and repaired in flight.

A detector has been developed for locating the leaks from inside the pressurized cabins. The detector (see figure) is essentially a differential pressure sensor. It includes a rigid housing with the top end covered by a flexible diaphragm. The housing has an open port on one side and a handle containing a battery on the other. Inside the housing are two electrical contacts that are kept apart by a spring. One electrical contact is attached to the diaphragm and connected to a warning light and one battery terminal. The second contact is attached to the bottom of the housing and connected to the second battery terminal. The entire housing, with the exception of an open port, is sealed off from the outside environment. A flexible tubing fixed to a cylindrically shaped head on one end is inserted over the port nipple and secured with a clamp.

In use, the detector is held by the handle and the head is placed flush against the area that is being tested. Should a leak be present, most of the air inside the detector housing will escape. The diaphragm will then flex into the chamber and push the electrical contacts together, closing the circuit and turning on the warning light.



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The detector can be made as sensitive as practical by using different combinations of diaphragm diameter, diaphragm flexibility, and springs. Instead of a warning light, a buzzer or a needle valve may be used to indicate a drop in pressure.

Note:

Requests for further information may be directed to:

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Patent status:

This invention is owned by NASA, and a patent application has been filed. Inquiries concerning non-exclusive or exclusive license for its commercial development should be addressed to:

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