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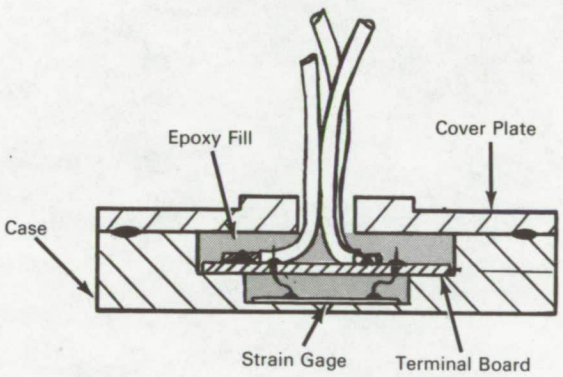
Brief 68-10246

NASA TECH BRIEF

Miniature Pressure Transducer for Stressed Member Application

Strain Gage Pattern



A miniature pressure transducer has been designed and fabricated in such a way that it responds to static or dynamic pressures acting against a structural surface without introducing errors caused by stresses in the structural surface. This is accomplished by a thin stainless steel pressure sensing diaphragm with an attached foil strain gage. The strain gage is bonded to the stressed surface and has a very thin profile and low mass.

A metal film strain gage is installed on the inner surface of the housing diaphragm by conventional strain gage application procedures, using hard epoxy adhesive. Gold-plated wires 0.001 inch in diameter are soldered to the three tabs of the strain gage element. These wires are passed through holes in a miniature terminal board that is bonded to a land at the center of the transducer housing. The 0.001-inch diameter wires are each soldered to one end of the terminal element. Larger (0.019) lead-in wires are soldered to the other end of each terminal element and passed out through the access hole in the transducer cover plate. The cover plate is then joined to the transducer housing by an overlapping spot-weld process using a capacitor discharge welder. The void between the cover plate and terminal board is filled with epoxy to afford maximum protection for lead wire ends and to provide a seal for the back side of the transducer.

Notes:

1. Zero balance of 4 transducers tested did not deviate more than 0.03% of full scale per °F over a temperature range of 32° to 120°F. Sensitivity of the 4 transducers remained within 0.47% of their respective full scale room temperature outputs over the same temperature range.
2. Inquiries concerning this innovation may be directed to:

   Technology Utilization Officer
   Manned Spacecraft Center
   Houston, Texas 77058
   Reference: B68-10246

(continued overleaf)

Patent status:

No patent action is contemplated by NASA.

Source: R. R. Walker and C. G. Wickham
of North American Aviation, Inc.
under contract to
Manned Spacecraft Center
(MSC-11869)