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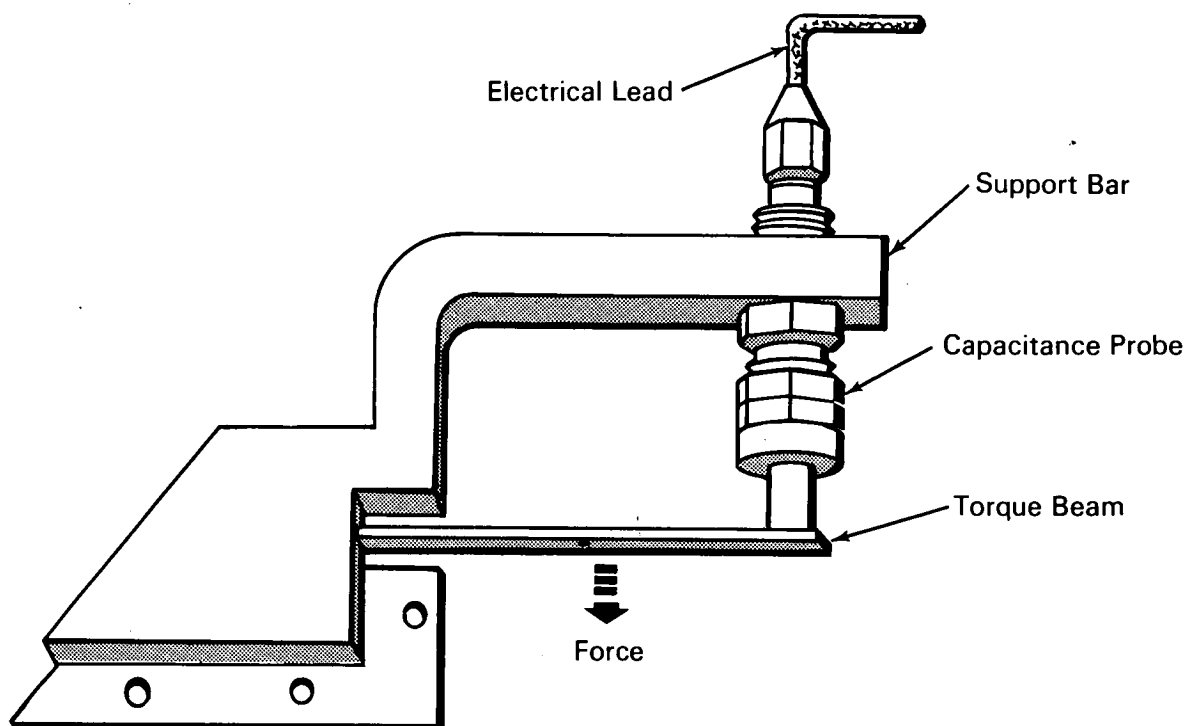
Brief 66-10161

NASA TECH BRIEF



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Transducer Measures Force in Vacuum Environment



The problem:

To measure force in a vacuum environment (down to 10^{-9} mm Hg). Since radiation is the only mode of heat transfer in a vacuum, any transducer, such as a bonded or unbonded strain gage, that requires a sustained current for operation may overheat and fail in this environment. Bonded strain gages present the additional problem of outgassing at low pressures.

The solution:

A force transducer assembly consisting of a standard capacitance probe and a torque beam.

How it's done:

The capacitance probe is mounted between a support bar and a torque beam. The deflection at the end of the torque beam is directly proportional to the applied force. The resulting change in probe capac-

(continued overleaf)

itance is measured with a circuit employing a high-gain amplifier in a feedback loop with the probe. This circuit provides a voltage output that is directly proportional to the capacitor plate separation and hence to the applied force.

Notes:

1. This transducer can be used in high-pressure as well as in low-pressure environments for static and dynamic force measurements.

2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Lewis Research Center
21000 Brookpark Road
Cleveland, Ohio, 44135
Reference: B66-10161

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C., 20546.

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(Lewis-218)