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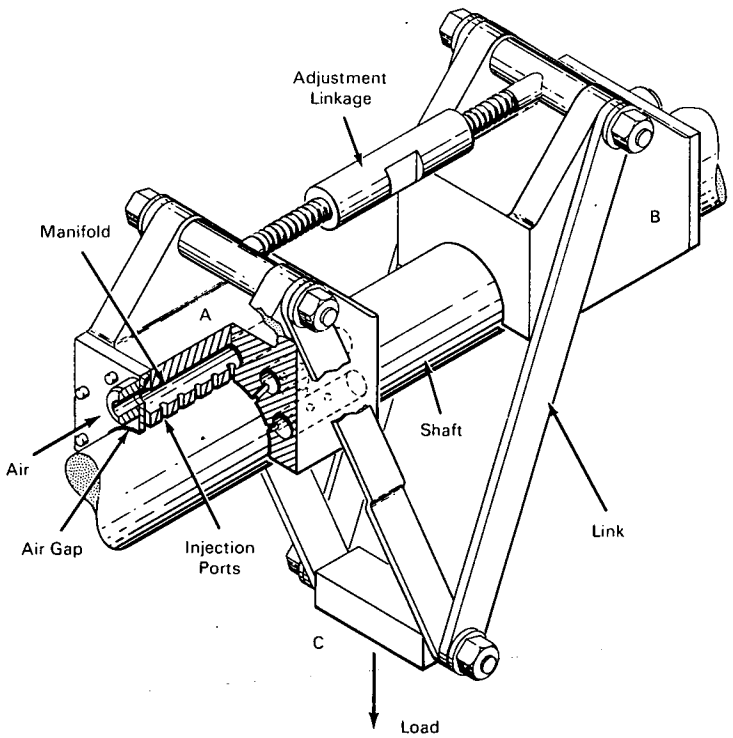
NASA TECH BRIEF

Journal Gas Bearing for Curved Surfaces



Journal Gas Bearing

The problem:

Large deployable arrays require extensive support structures in a one "G" environment which incorporate externally pressurized gas-lubricated journal bearings in the deployment mechanism. Curvature of the load carrying member during deployment causes the film gap of the gas lubricated bearing to become unsymmetrical and may even be eliminated so that binding occurs. This binding can be minimized by optimizing bearing length and permissible axis curvature.

The solution:

The required bearing length has been divided into two shorter bearings which are movably interconnected by links and which allow satisfactory conformity with the bent, load-carrying member. The advantage of this construction is that the bearing can slide on the load-carrying member as long as the shaft curvature under each bearing half does not exceed that permitted by the air gap between the bearing half and the shaft. Thus, a solid bearing having a bearing surface equal to that of the two bearing surfaces would

(continued overleaf)

have to accommodate considerably more shaft curvature than would the split bearing.

How it's done:

The air bearing assembly shown in the schematic has two halves, A and B, connected by the adjustment mechanism. Air is admitted through inlets into the manifolds within the air bearing halves; the manifold is coupled with the air gap via the injection ports.

The load is applied at Point "C" and is transmitted to the bearing/pin assembly by the linkage mechanism. Rotational capability exists at Point "C" in addition to the entire assembly rotation about the shaft axis.

Notes:

1. This bearing assembly has been manufactured and tested with an efficiency of 60%.
2. Inquiries concerning this split bearing assembly may be directed to:

   Clearinghouse for Federal Scientific and Technical Information
   Springfield, Virginia 22151
   Price $3.00
   Reference: TSP69-10182

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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