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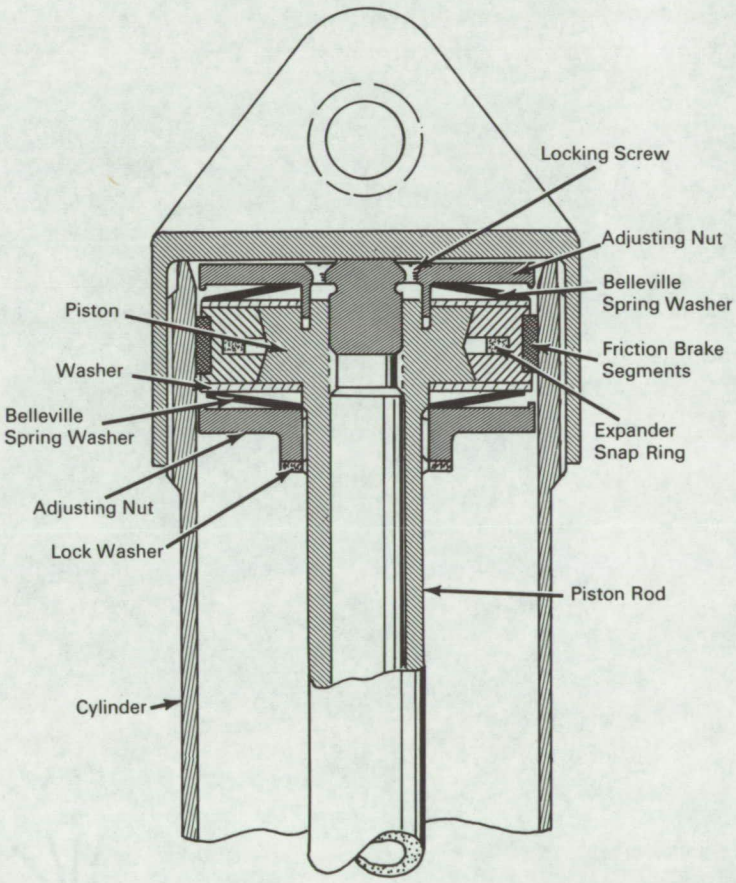
Brief 66-10608

NASA TECH BRIEF

Friction Brake Cushions Acceleration and Vibration Loads



The problem:

To design a brake that will cushion an object, such as a seat, in a vehicle from axially applied vibration and steady-state acceleration forces. The brake must be effective in damping the motion of the object against axial forces which tend to accelerate or decelerate the vehicle.

The solution:

A friction brake incorporating a doubly tapered piston that applies a controlled radial force to friction brake segments bearing against the walls of a cylinder. The braking friction varies as a function of the impulsive or steady-state axial forces acting on the vehicle.

(continued overleaf)

How it's done:

The brake segments are maintained in contact with the cylinder bore by the Belleville spring and force distribution washers. Adjustment nuts are used to limit the stroke of the piston between two extreme positions within the cylinder. When the piston moves axially relative to the cylinder as the result of an external force on the vehicle, the tapered surfaces on the piston transmit a radial force to the friction brake segment. The force of friction thus produced between the brake segments and the cylinder bore is of sufficient magnitude to resist the applied impact or acceleration force on the vehicle.

Notes:

1. This design configuration minimizes the difference between static and dynamic friction loads.
2. Inquiries concerning this invention may be directed to:

   Technology Utilization Officer
   Manned Spacecraft Center
   Houston, Texas 77058
   Reference: B66-10608

Patent status:

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

Source: G. Z. Zawadski and G. F. Fraser
of North American Aviation, Inc.
under contract to
Manned Spacecraft Center
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