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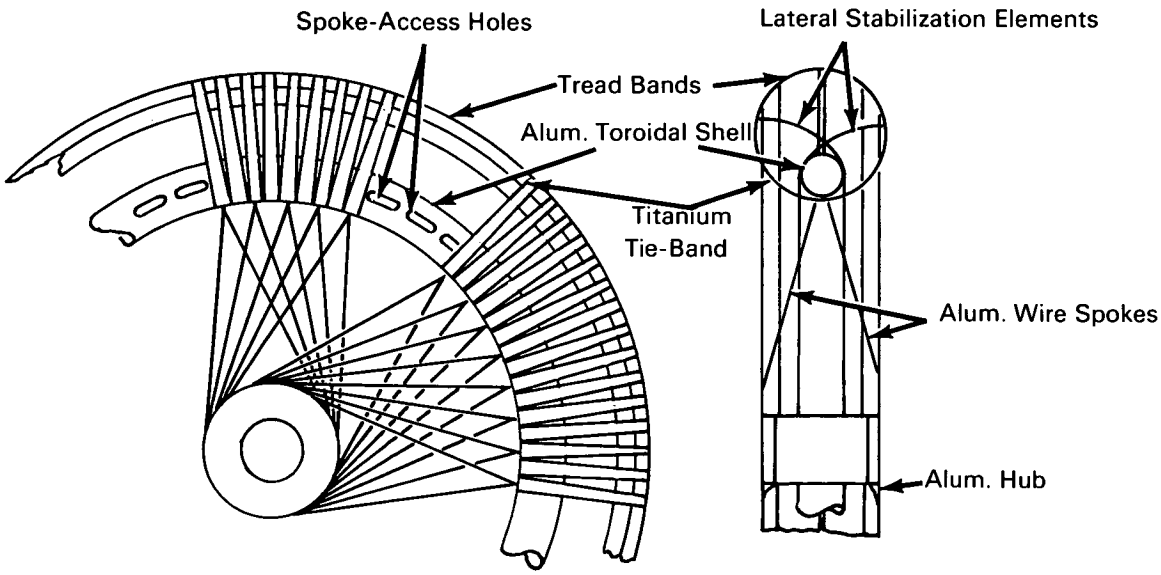
# NASA TECH BRIEF



## Lateral Ring Metal Elastic Wheel Absorbs Shock Loading




**The problem:**

In the operation of vehicles over rough and irregular surfaces, conventional wheels deliver shock loads directly to suspension components such as springs, shock absorbers, and axles. In extremely rough terrain, these members frequently fail and costly down time results.

**The solution:**

A lateral ring metal elastic wheel that absorbs practically all shock loading when operated over extremely rough terrain and delivers only a negligible shock residue to associated suspension components.

**How it's done:**

The lateral ring metal elastic wheel consists of a rigid aluminum assembly to which are attached lateral titanium ring flexible elements with treads. The rigid assembly has an aluminum hub, aluminum spokes, either wire or column type, and a rigid aluminum toroidal outer shell of either circular or elliptic cross section. The flexible element assembly consists of a discrete number of titanium rings or tie bands evenly spaced around the circumference of the rigid toroidal shell and riveted to the inner face of the toroidal surface. A discrete number of stainless steel stabilization elements are riveted at one end to the side face of the toroidal surface in alternate sequence and at the other end to the adjacent titanium ring in order to increase stability against lateral loading. Four continuous circumferential tread bands are riveted to the outer surfaces of the titanium rings to form a continuous tread surface for traction and rigidity.

(continued overleaf)

These tread bands provide a high friction coefficient combined with high radial flexibility.

**Notes:**

1. The number of flexible element titanium rings and lateral bands, along with the width and diameter of the overall assembly may be selected to meet various requirements of design loads and surface contact area under static loading.
2. Inquiries concerning this innovation may be directed to:

   Technology Utilization Officer
   Marshall Space Flight Center
   Huntsville, Alabama 35812
   Reference: B66-10663

**Patent status:**

No patent action is contemplated by NASA.

Source: L. Galán
of The Bendix Corporation
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