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# NASA TECH BRIEF

## *Lewis Research Center*



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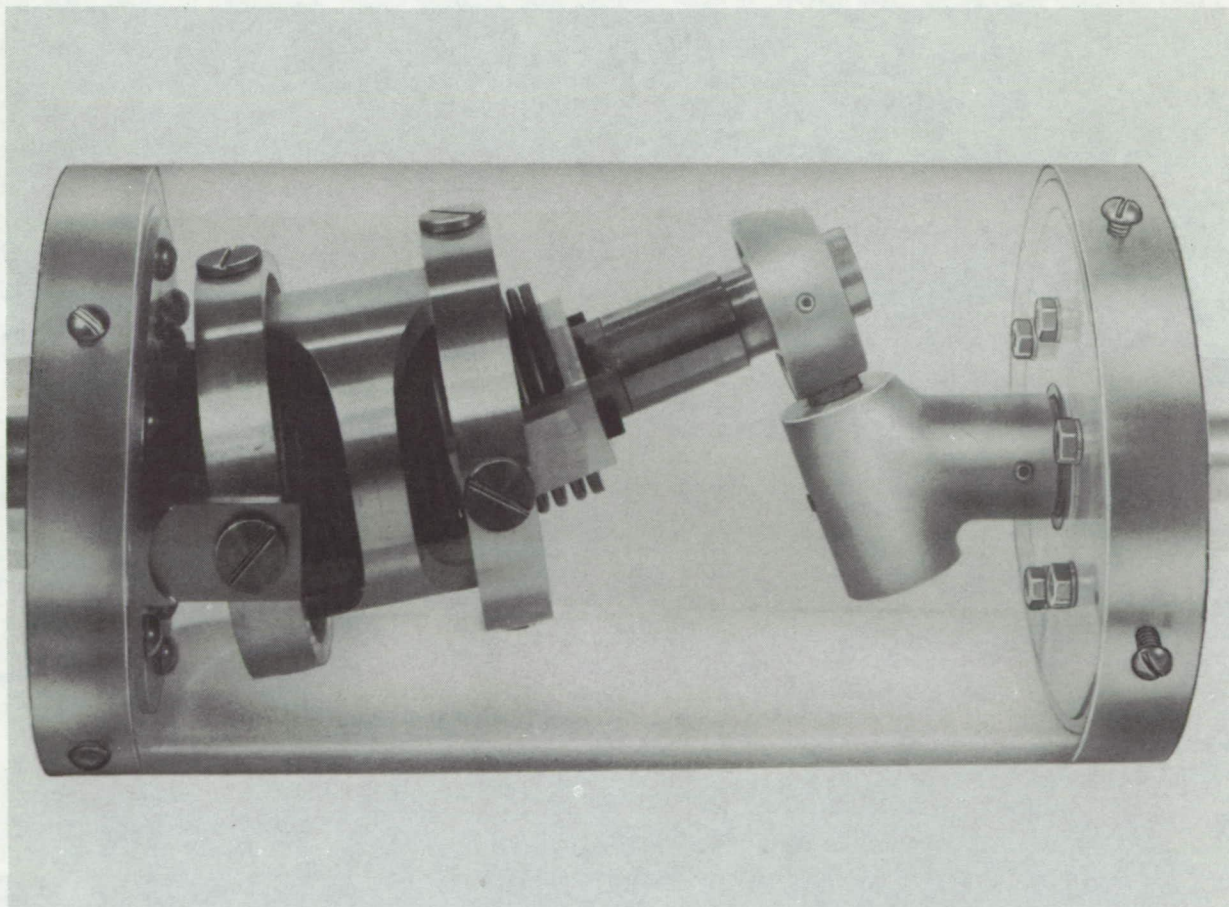
### High Torque Bellows Seal Rotary Drive

A bellows seal rotary drive device has been developed which allows high torque transmission through sealed compartments. Bearing friction which would normally be carried by the sealing bellows in comparable devices is absorbed by a universal-gimbal joint.

This device was developed for activating control drums through the pressure vessel wall of a nuclear reactor where a hermetic seal is required. It can be used to transmit high torque, low speed, rotary motion through hermetically

sealed barriers in other process systems in order to prevent contamination, exposure, or escape of system fluids.

A model of the device is shown in the photograph. Rotary motion is transmitted through the compartment wall by a rotating bent shaft enclosed in a capped bellows sealing arrangement. The motion is transferred to the mating shaft through a crank arm. The unique feature of this device is the addition of a universal-gimbal joint mounted around the bellows. Frictional torque generated



(continued overleaf)

by the interior and exterior bearings on the capped end of the bellows is absorbed by this joint rather than by the bellows which have low torque carrying capacity, especially in a bent position.

**Note:**

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer

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**Patent status:**

NASA has decided not to apply for a patent.

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