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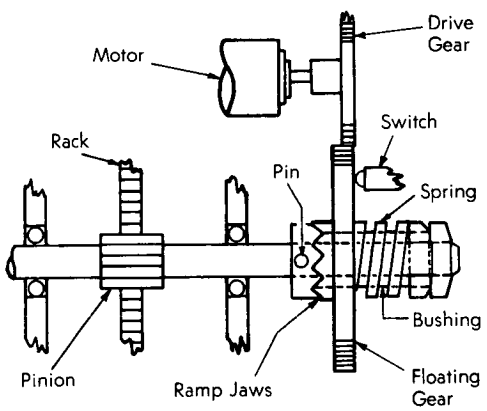
NASA TECH BRIEF

Ames Research Center

Motor-Driven Rack-Positioning Device

The problem:

To switch off power to an electric motor reliably when a rack that is geared to the motor is driven against a stop.



The solution:

Employ a ramped clutch plate to prevent damage to the gear train and to provide ample linear motion for actuation of a microswitch.

How it's done:

As shown in the diagram, a ramped interface is incorporated between a disc pinned to the pinion shaft and spring-loaded spur gear bushed to the same shaft. When a hard stop is reached, the motor continues to drive; this causes pins in the disc to move up the ramps in the spur gear so that the pinned disc and the gear are separated. The motion along the shaft is more than adequate to cause positive action of the microswitch, which may otherwise be insensitive because of temperature effects, spring characteristics, etc. The torque at which ramp action begins can be set by adjusting the spring load against the face of the floating spur gear.

Operation of the device is not affected by the number of revolutions which the pinion shaft must make to produce the required translations. Since the ramps in the spur gear are conical, the device will actuate identically at each mechanical stop.

Note:

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

Technology Utilization Officer
Ames Research Center
Moffett Field, California 94035
Reference: B 75-10058

Patent status:

NASA has decided not to apply for a patent.

Source: Merrill E. Crissey of
Martin Marietta Corporation
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Category 06