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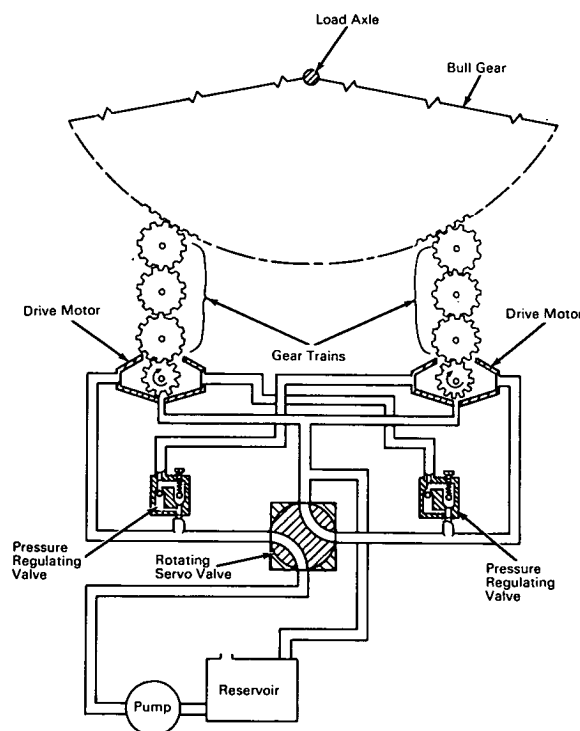
Brief 65-10351

# NASA TECH BRIEF



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## Hydraulic Drive System Prevents Backlash



**The problem:** In driving heavy loads, such as large tracking antennas which require precise starting and stopping, by means of gear trains, normal gear train backlash cannot be tolerated.

**The solution:** A hydraulic drive system that employs a second drive motor operating at reduced torque to exert a relative braking action on the driven load.

**How it's done:** The hydraulic drive system consists of a reservoir, pump, rotating servo valve, two

pressure regulating valves, two drive motors and associated piping. Each drive motor engages a gear train that in turn engages a bull gear mounted on the load axle shaft. The portion of the system connecting the servo valve to the drive motors consists of two closed loops, each containing a dual passage pressure regulating valve. The pressure regulating valves are adjusted to provide a reduced pressure in one or the other of the drive motors, thus reducing the torque exerted by that motor on its associated gear train. This has a braking or restraining effect on the bull

(continued overleaf)

gear and effectively holds it in continuous and positive engagement with the gear train of the drive motor exerting the greater torque. The system drive direction may be reversed by actuating the rotary servo valve. This causes a reduction in torque from the initial primary drive motor and an increase in torque from the initial drag motor, so that each assumes the previous function of the other.

**Notes:**

1. This drive system would be useful wherever a smooth, continuous torque application is required.
2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer  
Jet Propulsion Laboratory  
4800 Oak Grove Drive  
Pasadena, California, 91103  
Reference: B65-10351

**Patent status:** NASA encourages the immediate commercial use of this invention. Inquiries about obtaining rights for its commercial use may be made to NASA, Code AGP, Washington, D.C., 20546.

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