

Actuator Systems



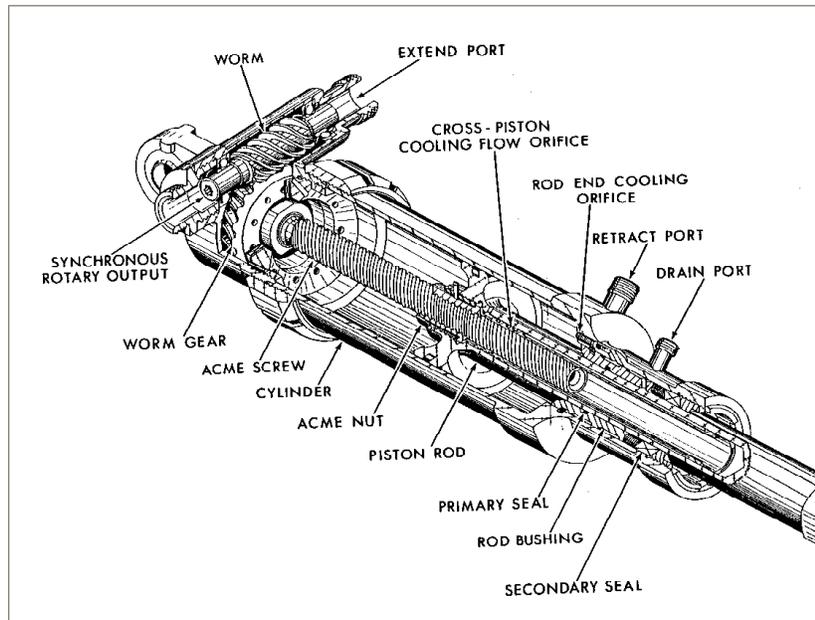
Customer value proposition

The linear actuator and actuation system product lines, designed and manufactured by the Hydraulic Systems Division (HSD), provide motion control for a variety of applications in many of today's leading military and commercial aircraft including:

- Boeing 747, 757, 767, and 777
- C-5
- C-17
- Airbus A330 and A340
- Cessna Bravo and Excel
- Hawker Horizon
- Gulfstream GVI

With both system and individual actuator offerings, Parker HSD has the capability to provide linear actuators and actuation systems for thrust reverser, steering, and door applications.

In addition to our existing units, the Parker product development team has the skill set and engineering tools to custom design an actuation solution that will meet your specific application requirements. The information in this publication will assist you in planning for your specific technical needs. Please contact us to see how we can engineer a solution for your application.



Operation

Linear actuators consist of a piston and rod that move within a cylinder. The cylinder has two hydraulic ports; one for extension of the piston and rod and one for retraction. When hydraulic fluid is directed to the extension port of the actuator, the piston moves to extend the rod out of the cylinder. When hydraulic fluid is directed to the retract port, the piston moves to retract the rod into the cylinder. The cylinder is "pinned" in two places; one fixed point and one translational point. As the piston rod extends and retracts, the translating point moves with it, providing motion control to accomplish tasks such as deploying thrust reversers or opening and closing doors.

Actuators can be outfitted with locking mechanisms designed to hold the actuator in a desired position. This aids functionality and safety of the actuator.

Parker has the capability to design an entire actuation system to meet your project requirements. Actuation systems incorporate all the necessary elements to keep a system clean and controlled, including filters, valving, and hydraulic lines. Multi-actuator systems-such as those required for thrust reverser applications-can also be synchronized using a shaft and worm gear system which ensures the system works together smoothly and safely.

Actuator systems

Applications

Parker HSD linear actuators and actuation systems have been employed in applications such as:

- Thrust-reverser systems
- Main landing gear steering
- Landing gear retraction
- Door operation

Contact Parker Hydraulic Systems Division to determine if our linear actuators are a good solution to your specific application.

Physical characteristics

The following must be determined based on actuator application:

- Pin-to-pin retracted length
 - The total length between the pinned points when the unit is fully retracted
- Stroke length
 - The total distance traveled by the piston rod end
 - Parker can design for stroke lengths up to 30 inches
- Fluid
 - Parker actuators can be designed to operate in phosphate ester-based or hydrocarbon-based (MIL-PRF-87257, 83282, 5606) hydraulic fluids

System components

Parker HSD can provide a system solution for your actuation needs. A system may include:

- Filtration
- Isolation valves
- Check valves
- Directional control valves
- Hydraulic tubes and lines
- Synchronization capability

Performance

Parker HSD linear actuators can meet the following performance limits:

- Extend and retract output force
 - The force needed to move the desired object
 - Parker linear actuators can provide forces up to 35,000 lbs.
- System pressure
 - Parker linear actuators have been designed to operate routinely in both 3,000 psi and 5,000 psi hydraulic systems
- Extreme temperature environments
 - Parker linear actuators can be designed to perform in temperatures as low as -65 °F and as high as 275 °F

Locking options

Parker HSD can provide locks to hold an actuator in a desired position. The following locking mechanisms are available:

- Retracted position only
 - Poker chip lock
 - Finger lock
- Any position
 - Segmented lock

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