Moog designs a range of products that complement the performance of those featured in this catalog. Visit our website for more information or contact the Moog facility nearest you.

WHAT MOVES YOUR WORLD

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WHAT MOVES YOUR WORLD
Whenever the highest levels of motion control performance and design flexibility are required, you’ll find Moog expertise at work. Through collaboration, creativity and world-class technological solutions, we help you overcome your toughest engineering obstacles. Enhance your machine’s performance, achieve greater efficiencies and help take your thinking further than you ever thought possible.

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Actuators are at the heart of high performance test systems such as those used for aerospace structural testing. For years, test engineers have been looking for actuators that deliver dependability, less maintenance and high performance, yet are available at an affordable price. Their expectation has been to expedite tests to obtain accurate test results more efficiently. Test safety and protection have been the primary criteria when selecting Actuators for large scale tests.

With deep roots in electro-hydraulic servo control expertise and global test experience, Moog has designed servo actuators for some of the world’s most demanding applications—from Primary Flight Control System Actuators to AGC Control Actuators used in a steel mill product line.

Today, Moog engineers have further developed a new series of Actuators, the C086-5 Double-Ended Hydraulic Test Actuator to meet the critical test needs of aerospace test engineers around the world.

OVERVIEW

Features

- 7 force sizes: Frame size from 10kN (2.2kip) to 250kN (56.2kip)
- 3 stroke lengths: 200mm (8in), 300mm (12in), 500mm (20in)
- Multiple combinations: Building-block design and other options to create different actuator configurations to suit your unique application needs
- Safety-Abort Manifold as an option for large scale, multiple channel and synchronized aerospace testing
- “Building Block” concept and Commercial-Off-The-Shelf (COTS) components
- High performance seals and bearings
- Robust and rigid servovalves, contact-less linear position sensors and loadcells
- High-load-capacity wear rings are selected to increase side load rating
- Rod bearings and seals can be easily replaced without dismantling the whole actuator
- Industry-leading Moog G761 and 72 servo valves are selected to provide high dynamic, accurate and robust actuator control

Benefits

- Wide array of sizes and flexibility
- Ultimate safety and protection for specimen and test
- Economical solution to customers
- Longer life and low friction, High Performance
- Higher side load rating
- Simple maintenance
- High performance servo control

Solutions Built Around You

Moog Double-Ended Hydraulic Test Actuator delivers higher reliability, less maintenance and cost-effective performance for test labs seeking the competitive edge.

To ensure high performance from design to delivery, Moog engineers use the latest tools such as Matlab® and Simulink® system modeling. A rigorous physical testing program assures that our customers receive components that they can rely on for a trouble-free test process. The combination of innovative design, world-class manufacturing and responsive worldwide customer support makes Moog components the ideal solution for test labs that offer more reliability and the highest performance.

Typical Applications:
- Aerospace structural static and fatigue testing
- Civil engineering testing
- General industrial servo control applications

Iron Bird Test

Landing Gear Structural Test
### SPECIFICATIONS

#### Basic Actuator Specifications

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Construction Style</th>
<th>Rated Force @ 21 MPa</th>
<th>Rod Diameter</th>
<th>Bore Diameter</th>
<th>Stroke</th>
<th>Buckling Force Capacity (*)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>kN (kip)</td>
<td>mm (in)</td>
<td>mm (in)</td>
<td>kN (kip)</td>
<td></td>
</tr>
<tr>
<td>C086-51</td>
<td>Tie Rod Type</td>
<td>10 (2.2)</td>
<td>40 (1.6)</td>
<td>48 (1.9)</td>
<td>200 [8] 350 [12] 500 [20] 10 [2.2] 10 [2.2] 10 [2.2]</td>
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</tr>
<tr>
<td>C086-54</td>
<td>Flange Type</td>
<td>100 (22.5)</td>
<td>63 (2.5)</td>
<td>100 (3.9)</td>
<td>200 [8] 300 [12] 500 [20] -100 [22.5] -100 [22.5] 71.0</td>
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<tr>
<td>C086-55</td>
<td>Flange Type</td>
<td>150 (33.7)</td>
<td>80 (3.1)</td>
<td>125 (4.9)</td>
<td>200 [8] 300 [12] 500 [20] -150 (33.7) -150 (33.7) 71.0</td>
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<tr>
<td>C086-56</td>
<td>Flange Type</td>
<td>250 (56.2)</td>
<td>90 (3.5)</td>
<td>160 (6.3)</td>
<td>200 [8] 300 [12] 500 [20] +250 (56.2) +250 (56.2) +250 (56.2)</td>
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</table>

(*) Notes:
1. Clevis base installation
2. Safety factor = 3.5

#### Additional Actuator Specifications

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Operating Pressure: 21 MPa</th>
<th>Maximum Return Pressure: 1.4 MPa</th>
<th>Maximum Drain Pressure: 0.35 MPa</th>
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<tbody>
<tr>
<td>Seal</td>
<td>Material NBR as standard</td>
<td>Hydraulic interface SAE O-Ring Face Seal 'Seal-Lok' (ISO 8434-3) - 12</td>
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<tr>
<td>Oil</td>
<td>Temperature Range 24°C (75°F) to 57°C (134°F)</td>
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<tr>
<td>System</td>
<td>Fluid Mobil DTE-24, 25, Shell Tellus 32, 46, or equivalent</td>
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<td></td>
</tr>
<tr>
<td>Cleanliness level ISO 4406 (SAE J1165) 15/14/11 (NAS 5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard electrical connector mates with following, or equivalent (waterproof, IP55)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>G761 Servovalve MS3106F14S-2S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72 Servovalve MS3106F14S-2S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position transducer &amp; load cell PT06A-10-6S (MOOG # CA64645-001)</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Moog Hydraulic Test Actuator – Double-Ended
DIMENSIONS

Tie-Rod Style Actuators (Figure 1)

Flange Style Actuators (Figure 2)

---

Moog Hydraulic Test Actuator – Double-Ended
**CONFIGURATION ACTUATOR TO MEET YOUR NEEDS**

A variety of building blocks are available to configure the exact actuator per test rig design or application requirements (see illustrative drawing at right).

Various Moog high performance servo valves and loadcells are provided to help application engineer to pick up the right one for a specific actuator to avoid over-sizing or undersizing. Mounting joints and bases are also provided to adapt to the installation requirements.

**OPTIONS**

**Safety-Abort Manifold**

Safety-Abort Manifold can be selected rather than a simple valve block. Controlled by a solenoid (and other signals), the Safety-Abort Manifold provides a mechanism to unload the hydraulic pressure in the actuator thus to remove loading force onto the specimen with a controlled speed. This provides an ultimate protection to specimen in case of an emergency especially for large scale, multiple-axis and synchronized testing such as aerospace structural testing.

**Valve blocks**

Standard valve block is designed for 1x MOOG G761 servo valve, flow rated from 4LPM (1GPM) to 63 LPM (16GPM). Other valve blocks are also available to adapt to 2x G761 servo valves or 1x 72 servo valve.

**Position Sensor**

- Internal, co-axial installed position sensor as standard configuration.
- Signal type: Analog signal output as standard. SSI signal output is also available.
- Accuracy ≤ 0.5% F.S.

**Load Cell**

High performance loadcell can be adapted to the actuators to provide a force feedback to a closed loop force control. Spiral washer can be provided as well.

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**ORDER INFORMATION**

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**Key for configurations**

- Joints and Bases
- Servovalves
- Manifolds/Valve Blocks
- Load Cells
A HIGHER LEVEL OF SUPPORT

Five point inspection process

Our number one goal is to eliminate downtime and make repairs that will deliver reliability and cost savings for years to come. When you send in your repair, it must work like new when you get it back. This is the Moog Global Support™ promise.

- Incoming inspection will provide the customer details on the performance of the actuator assembly such as leakage and response. The inspection will also provide details to our technicians in regards to critical performance specs that need to be addressed.
- Technicians will then review engineering notes for any design improvements that may have been initiated since inception.
- Actuator assembly will get completely disassembled to piece parts. Aqueous Ultrasonic cleaners are used to thoroughly clean each component before inspection and dimensional checks. Any components found to wear will be replaced with OEM parts. Critical components such as fitted rod and bearings will be dimensionally checked to ensure the component meets the print criteria. A complete seal kit replacement will be installed to ensure integrity of the structure.
- The servovalve will be removed and sent through the same rigorous evaluation, disassembly and test.
- Finally, the assembly will be tested to original specs to ensure the overhaul unit meets all design and performance criteria as new.

Moog engineering on call for you

Delivering world-class motion control products and solutions means taking customer support far beyond the initial sale. It requires a dedicated approach to solving your problems, addressing your machine challenges and helping you achieve maximum productivity on a daily basis. In today’s competitive manufacturing environment, machine performance plays a significant role in determining your bottom line. Moog Global Support™ is key to achieving cost-effective machine operation, day in and day out.

Actuator repair capabilities

Moog Global Support™ is designed to keep your critical machines up and running at peak performance with only 100% genuine Moog replacement parts. Only Moog replacement parts can deliver the reliability, versatility and long life that you would expect from a world leader in motion control solutions. Each Moog part delivers essential components with precise dimensions, close tolerances and specific materials specifications. Because we understand the key role our parts play in the overall operation of your machine, we carefully inspect and test each repair to identify only those components that need replacement.

Take the next step

Isn’t it time you worked with a partner who can offer both the world-class products and collaborative expertise you need to reach the next level of performance? Contact us today and see for yourself the difference the right partner can make.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Seal Kit</th>
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<tbody>
<tr>
<td>C086-51</td>
<td>CB39500-901</td>
</tr>
<tr>
<td>C086-52</td>
<td>CB39501-901</td>
</tr>
<tr>
<td>C086-53</td>
<td>CB39502-901</td>
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<tr>
<td>C086-54</td>
<td>CB39503-901</td>
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<td>C086-55</td>
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<tr>
<td>C086-57</td>
<td>CB39506-901</td>
</tr>
<tr>
<td>C086-58</td>
<td>CB39507-901</td>
</tr>
</tbody>
</table>

PRODUCTS FOR EVERY NEED

Solutions designed around you

Moog engineers are always ready to meet your unique application needs with complete turnkey systems that include servovalves, servovalves, software and more. Our Portable Test Controller, for example, is the only stand-alone unit on the market that can be extended up to four channels within the same housing.

Test Controllers

This servocontroller product incorporates Moog’s unique force loop technology to handle general purpose tests. With or without a PC, our Test Controllers are flexible with high-performance capabilities to handle complex testing formulas. This makes it an indispensable tool for testing labs. The units offer plug-and-play with industry standard connectors for cost effective and easy integration. The larger Test Controller is ideal for complex systems up to 32 servo channels.

Moog Servovalves

Because we designed our renowned Moog Servovalves - the world standard in performance and durability - you’re assured of a system tailored to your exacting requirements.