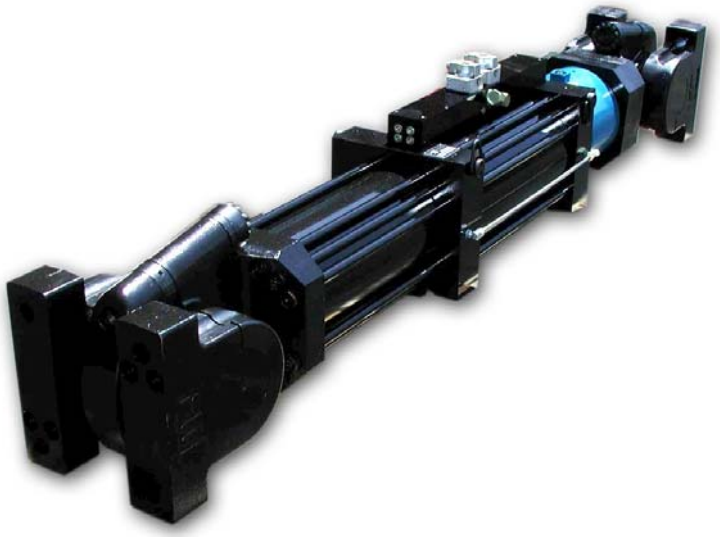
91 Series Dynamic Actuators



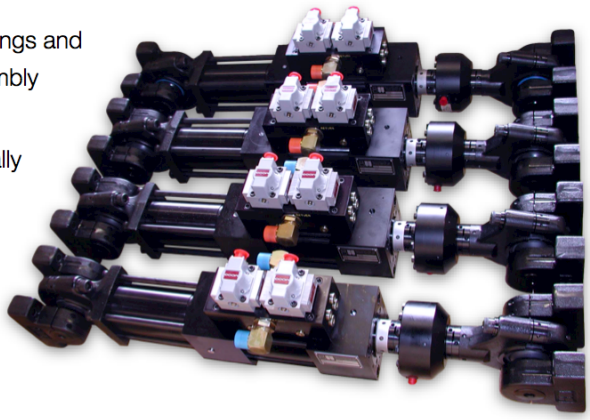
Double acting, double ended fatigue rated linear actuators for fatigue testing of structures and components.

Shore Western's 91 Series actuators are our most popular; with their **proven design and performance** they are the choice of thousands of engineers worldwide. Shore Western 91 Series actuators feature a **single piece chrome plated alloy piston rod** and high integrity **polymer bearings.** They are also designed for ease of maintenance. Our actuators are the only ones in the industry with a **removable seal and bearing system**. Seals and bearings can easily be **replaced in the field**, with your own technicians, using our reasonably priced repair kit, **reducing the cost of maintenance, and minimizing downtime**.

91 series actuators can be sized to meet your specific needs, typically 6 inch (150 mm) or 10 inch (250 mm) stroke lengths and force ratings from 1.1 KIP (5 kN) to 330 KIP (1500 kN). Other sizes are available on request.

Features

- Non metallic bearings. Shore Western utilizes non metallic bearing surfaces for all bearings to provide long life and resist bearing-to-rod galling failures.
- Ease of service. Innovative design permits the piston rod bearings and cylinder seals to be replaced easily. The bearing retainer assembly acts as a bearing puller when removing the gland assembly.
- Integral displacement transducer. All actuators have an internally mounted LVDT that provides repeatable and accurate displacement measurements.
- Hydraulic cushions. The end caps and piston of the actuator are protected from runaway conditions that can cause the actuator to rapidly extend or retract. To prevent



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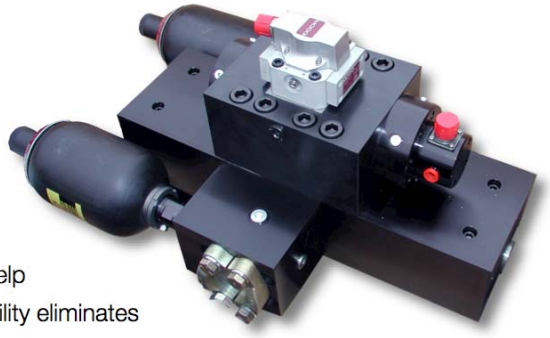
- the piston from striking the end caps, a cushion of oil is ported through an orifice to slow the it down as it approaches the end of its stroke.
- Large diameter rod. 91 Series Actuators use hollow, large diameter, one piece alloy piston rods made of 100,000 psi (700 MPa) yield material for infinite fatigue life, providing strength and maximum lateral stiffness. The chrome plated piston rod is micro ground and super-polished to minimize friction and extend seal and bearing life.
- Seals. 91 Series actuators feature high-pressure seals designed for low friction, long life, and outstanding performance in high-frequency/low-displacement applications. A low-pressure wiper/seal provides for both a hydraulic seal and a rod scraper to help eliminate external contamination of the bearings and internal seals.

Manifolds

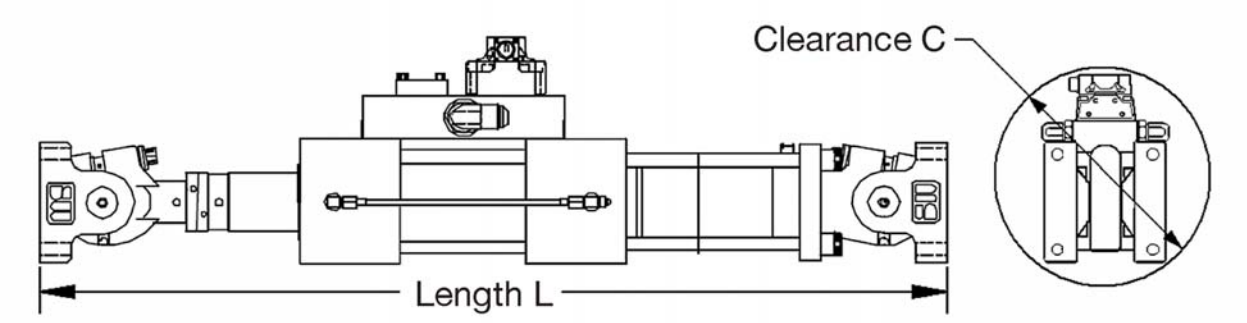
Servo valve manifolds with oversize ports for a variety of servo valves are available with the following options:

- Single, dual, or three-stage servo valve configurations
- Switchable high and low flow servo valves
- delta-P transducer
- Close coupled accumulation
- Fluid conditioning and low/high pressure control



Options

- Swivels. The 98 Series Rod End Swivels and 99 Series Base Ends can help reduce side loads and force alignment problems and their preload capability eliminates backlash.
- Load washers. Load washers preload the connections in the force train to avoid backlash and fatigue failure between attached components. Load washers let you quickly preload attached components.
- 91 Series Actuators may be adapted to test requirements not served by the standard strokes of 6 and10 inches (100 and 250 mm).Custom stroke lengths are available upon request.
- Fatigue rated load cells and differential pressure sensors are available for every force rating



Model	Rating (KIP)	Rod Dia (in)	Area (in2)	Force at 3000psi (LbF)	Length L for 6in Stroke (in)	Length L for 10in Stroke (in)	Clearance C (in)
910	1.1	1.12	0.37	1111	34.9	44.9	7.3
910	2.2	1.12	0.77	2310	34.9	44.9	7.3
910	3.2	1.12	1.08	3240	34.9	44.9	7.3
911	3.3	1.75	1.14	3424	38.6	48.6	9.3
911	5.5	1.75	2.02	6075	38.6	48.6	9.3
911	7.5	1.75	2.5	7510	43.1	53.1	12.1
912	11	2.75	3.68	11045	43.1	53.1	12.1
912	15	2.75	5.11	15315	43.1	53.1	12.1
912	22	2.75	7.42	22273	47.9	57.9	13.1
912	35	2.75	11.78	35343	47.9	57.9	13.1
913	55	3.75	19.63	58905	55.8	65.8	15.5
913	75	3.75	24.74	74220	55.8	65.8	15.5
914	110	5.25	38.48	115454	64.7	74.7	20.8
914	165	5.25	56.89	170677	68.5	78.5	23
915	220	6	75.59	226784	78.1	88.1	26
916	330	8	114.86	344593	85	95	28

Model	Rating (kN)	Rod Dia (mm)	Area (mm2)	Force at 207 Bar (kN)	Length L for 150mm Stroke (mm)	Length L for 250mm Stroke (mm)	Clearance C (mm)
910	5	28.6	239	4.94	886	1140	185
910	10	28.6	497	10.28	886	1140	185
910	14	28.6	697	14.41	886	1140	185
911	15	44.5	735	15.23	980	1234	236
911	27	44.5	1303	27.02	980	1234	236
911	33	44.6	1613	33.41	1095	1349	307
912	50	69.9	2374	49.13	1095	1349	307
912	65	69.9	3297	68.13	1095	1349	307
912	100	69.9	4790	99.08	1217	1471	333
912	150	69.9	7600	157.22	1217	1471	333
913	250	95.3	12664	262.03	1417	1671	394
913	330	95.3	15961	330.15	1417	1671	394
914	500	133.4	24826	513.59	1643	1897	528
914	750	133.4	36703	759.21	1740	1994	584
915	1000	152.4	48768	1008.83	1984	2238	660
916	1500	203.2	74103	1532.89	2159	2413	711