



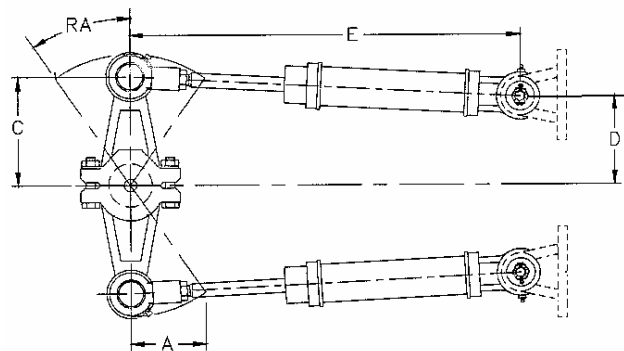
## MODEL 7090 4½” Bore Hydraulic Cylinder

**Specification:**

Cylinder bore: 4.5 inches (114 mm)  
 Stroke: 16 inches (406 mm) to 32 inches (813 mm)  
 Design pressure: 2000 psi (138 bar) Weight: 136 lb (62 kg) approx. for 24” stroke

The cylinder is of the double-acting type with push/pull capability. The cylinder barrel and rod are made of steel with extra fine finish.

For the unbalanced type, the maximum force is obtained at the push stroke. If used for rudder moving purpose, two unbalanced cylinders are required to balance the force for the action. Mounting bracket for this cylinder model is available as an option.



Mounting brackets and tiller are optional items and are used for illustration only

For rudder angle = 35°, working pressure of 2000 p.s.i. on *two unbalanced* cylinders

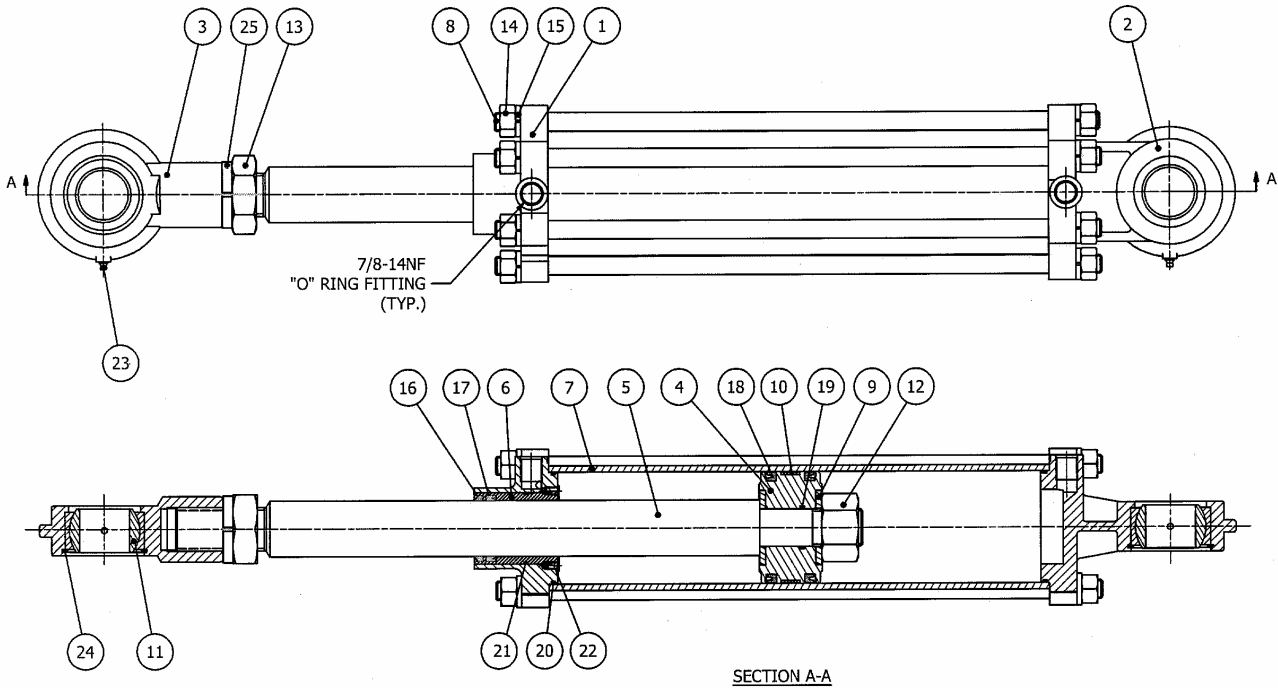
Model	Stroke		Torque		Displacement		A		C		D		E		Port thread
	in.	mm	lb-ft	kg-m	in <sup>3</sup>	cm <sup>3</sup>	in.	mm	in.	mm	in.	mm	in.	mm	
7090	16	406	52960	7322	445	7297	8	203	13.9	353	12.7	322	42.6	1082	7/8”-14 O-ring fitting
	20	508	66290	9165	557	9122	10	254	17.4	442	15.9	403	48.6	1235	
	24	610	79500	10991	668	10946	12	305	20.9	531	19.0	483	54.6	1387	
	28	711	92745	12882	779	12765	14	356	24.4	620	22.2	564	60.6	1540	
	32	813	105990	14654	891	14600	16	406	27.9	708	25.4	644	66.6	1692	

For rudder angle = 45°, working pressure of 2000 p.s.i. on *two unbalanced* cylinders

Model	Stroke		Torque		Displacement		A		C		D		E (mid travel)	
	in.	mm	lb-ft	kg-m	in <sup>3</sup>	cm <sup>3</sup>	in.	mm	in.	mm	in.	mm	in.	mm
7090	16	406	37080	5127	445	7297	8	203	11.3	287	9.7	245	42.6	1082
	20	508	46415	6417	557	9122	10	254	14.1	359	12.1	307	48.6	1235
	24	610	55665	7696	668	10946	12	305	17.0	431	14.5	368	54.6	1387
	28	711	64940	8978	779	12765	14	356	19.8	503	16.9	429	60.6	1540
	32	813	74220	10261	891	14600	16	406	22.6	575	19.3	491	66.6	1692

NOTE: Performance data are for reference only. Changes may be made without notice.

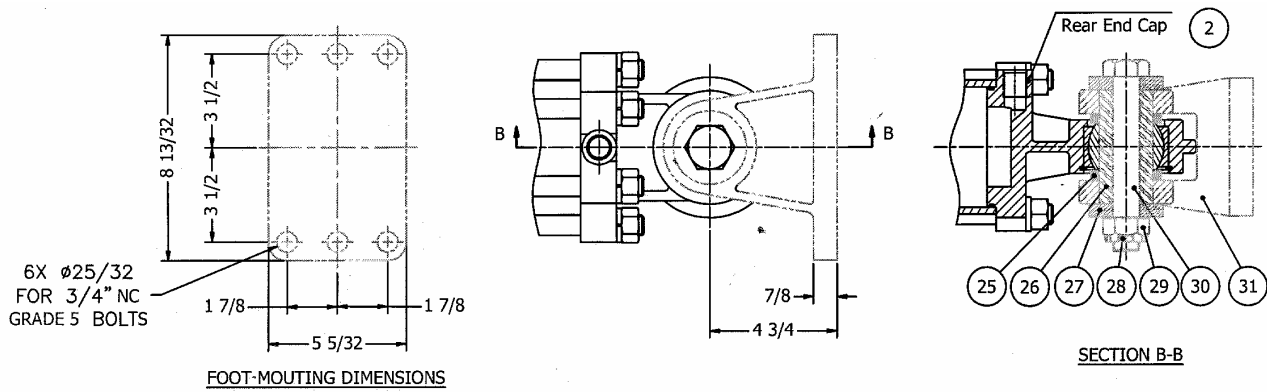
# DIMENSIONS AND PARTS LIST MODEL 7090-U



Item	Qty	Part No.	Description	Item	Qty	Part No.	Description
1	1	7090-0001	Front end cap	13	1	1041-22175	Jam nut
2	1	7090-0002	Rear end cap	14	12	1022-0167	Hex nut
3	1	7094DL-0004	Rod end	15	12	1023-0318	Lock washer
4	1	7090-0003	Piston	16	1	1102-6036	Rod wiper
5	1	7090-0004	Piston rod	17	1	1102-2050	“U” cup
6	1	7090-0005	Front end bushing	18	2	1102-2054	“U” cup
7	1	7090-0006	Tube	19	1	1101-0222	“O” ring
8	6	7090-0007	Tie rod	20	2	1101-0244	“O” ring
9	2	7090-0008	Piston washer	21	1	1101-0231	“O” ring
10	1	7090-0009	Wear ring	22	4	1016-1108	Set screw
11	2	7094D-0036	Spherical bearing	23	2	1501-0301	Grease nipple
12	1	1041-11150	Hex nut	24	2	1029-3315	Retaining ring
				25	1	1023-0330	Lock washer

\* option item not shown

Tube Bore	Piston rod Diameter	Rod end		
		Thickness	Thread	Bearing bore
4 ½ in. (114 mm)	2 ¼ in. (57 mm)	2 in. (51 mm)	1-3/4"-12 UN	2 in. (51 mm)



Pin set (optional)

Item	Qty	Part No.	Description	Item	Qty	Part No.	Description
26	1	7094D-0012	Bearing bushing	30	1	1041-011665	Hex bolt
27	2	7094D-0013	Bearing retainer	31	1	7094D-0002	Foot
28	1	1026-0832	Cotter pin	32	2	7094D-0014	Spacer
29	1	1022-0572	Castle nut				