

HYDRA-DYNAMICS



**3000/5000 psi HYDRAULIC CYLINDERS
SEVERE SERVICE - CONSTRUCTION GRADE**

**Oilfield, Marine, Rail, Mining, Construction, Steel, Foundry, Nuclear, Material
Handling, Machine Tool, Automotive**

HYDRA-DYNAMICS, INC.

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AVAILABLE DESIGN CRITERIA

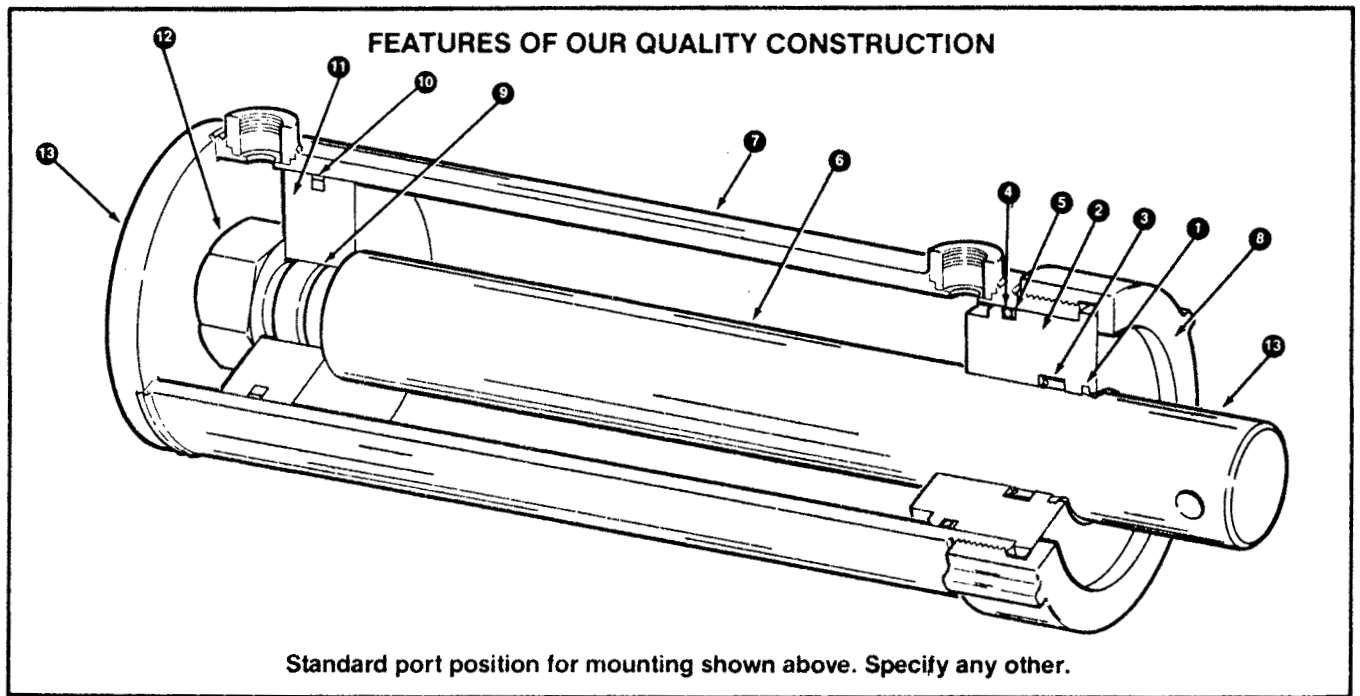
(partial list)

NFPA (NAT'L FLUID POWER ASSN)
ASME, SECTION VIII
ABS (AMER BUREAU OF SHIPS)
USCG (US COAST GUARD)
API (AMER. PETROLEUM INSTITUTE)
UK-DEn (UK DEPT OF ENERGY)
NPD (NORWEGIAN PETROLEUM DIR)

HYDRA-DYNAMICS

SERIES W

3000 PSI WELDED HYDRAULIC CYLINDER
AVAILABLE TO 10,000 PSI



EACH CYLINDER IS CAREFULLY ENGINEERED AND CONSTRUCTED FROM THE FINEST QUALITY MATERIALS. WE MEET ALL NATIONAL FLUID POWER ASSOCIATION (NFPA) SPECIFICATIONS. IN ADDITION, WE CAN SUPPLY CYLINDERS TO ASME, SECTION VIII, DIV I., AMERICAN BUREAU OF SHIPS (ABS), DET NORSK VERITAS (DNV), U.S. COAST GUARD, MIL 9858-A, U.K. DEPARTMENT OF ENERGY (UK-DEn), NORWEGIAN PETROLEUM DIRECTORATE (NPD), AND OTHER STRINGENT STANDARDS. WE HAVE SUPPLIED STANDARD AND CUSTOM CYLINDERS TO ALL MAJOR INDUSTRIES FOR OVER 25 YEARS.

CONSTRUCTION FEATURES

- | | |
|-----------------------|---|
| 1. ROD WIPER | HYTREL DUAL LIP ROD WIPER PREVENTS FOREIGN PARTICLES FROM ENTERING CYLINDER. OPTIONAL METALLIC, WEAR-COMPENSATING, SCRAPER AVAILABLE |
| 2. ROD GLAND | AIRCRAFT GRADE 6061 T-6 ALUMINUM. EXTRA LENGTH FOR MAXIMUM BEARING AREA |
| 3. ROD GLAND SEAL | HIGH DENSITY, O-RING LOADED, URETHANE CUPS FOR ZERO LEAKAGE, LOAD-HOLDING APPLICATIONS. MAXIMUM STRENGTH TO STAND UP TO MISALIGNMENT AND DIRT. OPTIONAL MATERIALS FOR WATER SERVICE, HIGH/LOW TEMPERATURES, OR NUCLEAR SERVICE. |
| 4. GLAND STATIC SEAL | O-RING ASSURES POSITIVE SEAL BETWEEN GLAND AND BARREL. OPTIONAL MATERIALS FOR WATER SERVICE, HIGH/LOW TEMPERATURES, OR NUCLEAR SERVICE. |
| 5. BACK-UP SEAL | STANDARD WITH ALL STATIC SEALS. |
| 6. PISTON ROD | STANDARD CHROMED 1045/1050 STEEL FOR HIGH STRENGTH. OPTIONAL 4130, 4140, 17-4, H-1150 STAINLESS, AND OTHER MATERIALS AVAILABLE |
| 7. BARREL | 1026 D.O.M. TUBING FOR HIGH STRENGTH - HONED TO 10/12 MICROINCH FINISH FOR MAXIMUM SEAL LIFE. OPTIONAL 4130, STAINLESS, AND OTHER MATERIALS AVAILABLE |
| 8. STEEL GLAND CAP | THREADED TO TUBE O.D. FOR MAXIMUM STRENGTH AND EASE OF FIELD REMOVAL |
| 9. PISTON STATIC SEAL | O-RING ASSURES POSITIVE SEAL |
| 10. PISTON SEALS | STANDARD O-RING LOADED URETHANE CUPS. OPTIONAL MATERIALS AVAILABLE |
| 11. PISTON | ONE PIECE, AIRCRAFT GRADE ALUMINUM STANDARD. OPTIONAL MATERIALS AVAILABLE |
| 12. PISTON NUT | SELF-LOCKING NUT STANDARD |
| 13. REAR PLATE | EXTRA THICK STEEL FOR MAXIMUM STRENGTH |

AS PRODUCT IMPROVEMENT IS A CONTINUING PROCESS AT HYDRA-DYNAMICS,
ENGINEERING SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

HYDRA-DYNAMICS, INC.

CYLINDER SIZING CHART

FIGURES IN **BOLD TYPE** ARE MAJOR FORCES—FIGURES IN LIGHT TYPE ARE MINOR FORCES

Bore Size	Rod Dia.	Port Size (N.P.T.)	Major Area (In. ²)	Minor Area (In. ²)	Gallons Per Inch Stroke	Pressure—P.S.I.								
						250	500	1000	1250	1500	1750	2000	2500	3000
1½	¾ 1	½	1.767		.00765	442	884	1767	2209	2651	3092	3534	4418	5301
				1.460	.00632	365	730	1460	1825	2190	2555	2920	3650	4380
				.982	.00420	246	491	982	1228	1473	1719	1964	2455	2946
2	1 1½	½	3.142		.0136	785	1571	3142	3928	4713	5499	6284	7855	9426
				2.357	.0102	589	1179	2357	2946	3536	4126	4714	5893	7071
				1.657	.0071	414	828	1657	2071	2485	2900	3314	4143	4971
2½	1 1½ 1¾	½	4.909		.0212	1227	2454	4909	6137	7363	8591	9818	12273	14727
				4.124	.0178	1034	2061	4124	5155	6185	7217	8248	10310	12372
				3.424	.0148	855	1710	3420	4275	5130	5985	6840	8550	10260
			2.504	.0108	625	1251	2504	3130	3755	4382	5008	6260	7512	
3¾	1¾ 1¾ 2	¾	8.296		.0359	2074	4148	8296	10370	12443	14518	16592	20740	24888
				6.811	.0294	1702	3405	6811	8514	10216	11919	13622	17028	20433
				5.891	.0255	1473	2945	5890	7363	8835	10308	11780	14725	17670
			5.154	.0223	1288	2577	5154	6443	7731	9020	10308	12885	15462	
4	1¾ 2 2½	¾	12.57		.0544	3141	6283	12570	15708	18849	21991	25140	31416	37698
				10.17	.0440	2540	5080	10170	12713	15241	17781	20321	25425	30482
				9.43	.0408	2358	4715	9430	11788	14145	16503	18860	23575	28290
			7.66	.0331	1914	3828	7660	9575	11486	13405	15320	19150	22980	
5	2 2½ 3 3½	¾	19.64		.0850	4908	9817	19640	24544	29452	34361	39270	49088	58905
				16.50	.0714	4123	8246	16500	20625	24740	28875	32986	41232	49480
				14.73	.0638	3683	7365	14730	18413	22095	25778	29460	36825	44190
				12.57	.0544	3143	6285	12570	15713	18855	21998	25140	31425	37710
			10.02	.0433	2503	5006	10020	12525	15020	17535	20027	25033	30040	
6	2½ 3 3½ 4	1	28.27		.1224	7068	14137	28270	35342	42411	49473	56548	70675	84822
				23.37	.1011	5841	11682	23370	29213	35047	40898	46730	58425	70110
				21.20	.0918	5300	10600	21200	26500	31800	37100	42400	53000	63600
				18.65	.0807	4663	9325	18650	23313	27975	32638	37300	46625	55950
			15.70	.0680	3927	7854	15700	19625	23562	27475	31416	39270	47124	
7	3 3½ 4 4½ 5	1¼	38.49		.1666	9621	19242	38490	48106	57727	67358	76970	96225	115455
				31.42	.1360	7854	15708	31420	39270	47124	54978	62832	78540	94248
				28.87	.1247	7218	14435	28870	36088	43305	50523	57740	72175	86610
				25.92	.1122	6480	12960	25920	32400	38880	45360	51840	64800	77760
				22.58	.0977	5645	11290	22580	28225	33870	39515	45160	56450	67740
			18.85	.0816	4712	9425	18850	23562	28275	32988	37700	47125	56550	
8	3½ 4 4½ 5 5½	1½	50.27		.2176	12566	25132	50270	62832	75397	87964	100530	125663	150795
				40.65	.1759	10161	20322	40650	50812	60966	71138	81288	101610	121932
				37.70	.1632	9375	18750	37500	46875	56250	65625	75000	93750	112500
				34.36	.1487	8590	17180	34360	42950	51540	60130	68720	85900	103080
				30.63	.1326	7658	15315	30630	38287	45945	53603	61260	76575	91890
			26.51	.1148	6626	13253	26510	33138	39760	46393	53014	66275	79530	
10	4½ 5 5½	2	78.54		.3400	19635	39270	78540	98175	117810	137445	157080	196270	235620
				62.64	.2712	15660	31320	62640	78300	93960	109620	125280	156600	187920
				58.90	.2550	14725	29445	58900	73625	88350	103075	117800	147250	176700
			54.78	.2371	13695	27390	54780	68475	82170	95865	109560	136950	164340	
12	5½	2½	113.10	89.34	.4896	28275	56550	113100	114375	169650	197925	226200	282750	339300
					.3868	22335	44670	89340	111675	134010	156345	178680	223350	268020



“MAJOR AREA”
FULL PISTON AREA



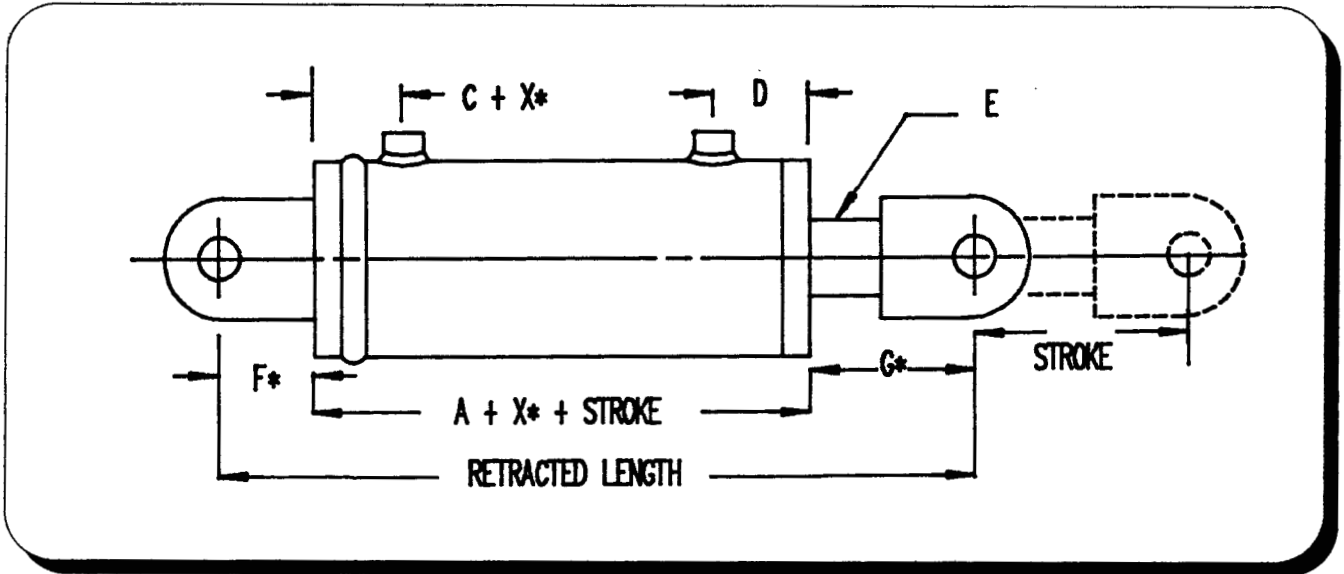
“MINOR AREA”
PISTON AREA LESS ROD AREA

TO CALCULATE FOR FORCES NOT LISTED USE THE FORMULA:
INPUT LINE PRESSURE × EFFECTIVE PISTON AREA = THEORETICAL OUTPUT FORCE IN POUNDS.

The forces shown on this page are theoretical, based on 100% efficiency. It is recommended, that cylinders should have 20% to 40% reserve capacity to compensate for power losses due to variance in line pressure, work friction, etc.

HYDRA-DYNAMICS, INC.

BASIC MOUNTING DIMENSIONS



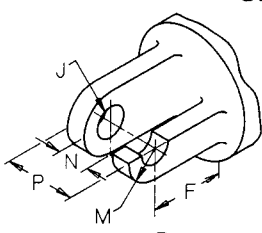
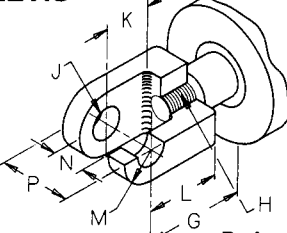
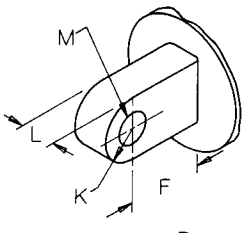
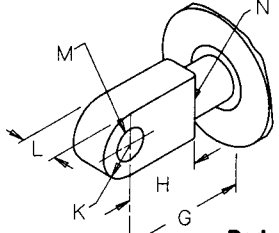
DIMENSIONS MARKED WITH AN ASTERISK ARE DEPENDENT ON MOUNT SELECTION

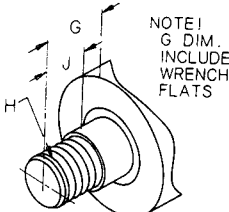
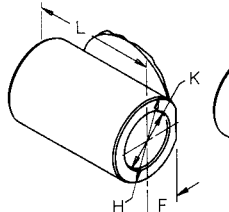
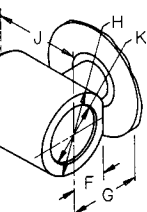
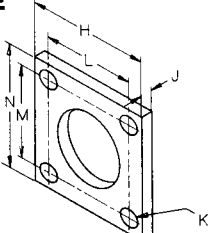
STANDARD DIMENSIONS

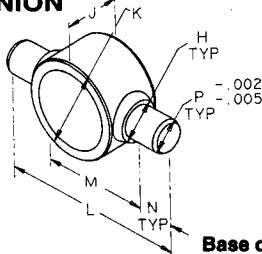
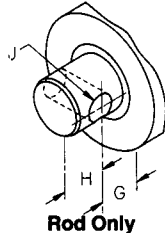
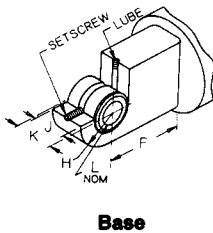
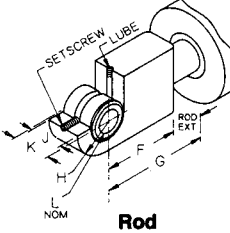
BORE SIZE	BASIC LENGTH A	B	C	D	ROD SIZES E	SAE PORTS				NPTF PORTS				HEAD CAP O.D.
						sm	md	lg	xlg	sm	md	lg	xlg	
2	5.50	2.38	1.13	2.06	.75, 1.00, 1.25	04	06	08	—	.25	.375	.5	—	3.00
2.5	6.00	2.88	1.13	2.31	1.00, 1.375, 1.5, 1.75	04	06	08	—	.25	.375	.5	—	3.50
3	6.13	3.50	1.25	2.31	1.00, 1.375, 1.5, 1.75	06	08	12	—	.375	.5	.75	—	4.00
3.5	7.00	4.00	1.50	2.75	1.375, 1.5, 1.75, 2, 2.5	06	08	12	—	.375	.5	.75	—	4.50
4	7.25	4.50	1.50	2.75	1.5, 1.75, 2, 2.5, 3	06	08	12	16	.375	.5	.75	1.00	5.00
4.5	7.38	5.00	1.63	2.75	1.5, 1.75, 2, 2.5, 3, 3.5	06	08	12	16	.375	.5	.75	1.00	5.50
5	8.13	5.63	1.63	3.13	1.75, 2, 2.5, 3, 3.5	08	12	16	—	.5	.75	1.00	—	6.25
5.5	9.50	6.25	1.63	3.13	2, 2.5, 3, 3.5	08	12	16	20	.5	.75	1.00	1.25	6.75
6	9.63	6.75	1.88	3.13	2, 2.5, 3, 3.5, 4	08	12	16	20	.5	.75	1.00	1.25	7.50
7	11.63	8.00	2.38	3.56	2, 2.5, 3, 3.5, 4, 4.5	12	16	20	—	.75	1.00	1.25	—	9.00
8	12.13	9.00	2.38	4.00	2.5, 3, 3.5, 4, 4.5, 5	12	16	20	24	.75	1.00	1.25	1.50	10.00
10	12.88	11.50	2.75	4.00	4.5, 5, 5.5, 6	16	20	24	—	1.00	1.25	1.5	—	—

HYDRA-DYNAMICS, INC.

MOUNTING OPTIONS

CLEVIS											LUG										
																					
Base					Rod						Base					Rod					
BORE	K	L	M	N	P	J	G	H	F	X	BORE	H	K	L	M	N	F	G	X		
1.50	1.13	1.88	0.75	0.81	1.75	0.76	2.13	5/8-18	1.13	0.00	1.50	1.13	0.75	0.75	0.76	1.13	1.13	1.50	0.00		
2.00	1.63	2.50	1.00	1.13	2.13	1.01	2.75	3/4-16	2.13	0.25	2.00	2.13	1.00	0.75	1.01	WELD	2.13	2.63	0.00		
2.50	1.63	2.50	1.00	1.13	2.13	1.01	2.75	3/4-16	2.13	0.25	2.50	2.13	1.00	0.75	1.01	WELD	2.13	2.63	0.00		
3.00	2.13	3.25	1.00	1.13	2.13	1.01	3.50	1-14	2.13	0.13	3.00	3.25	1.25	1.13	1.01	1-14	2.00	3.50	0.25		
3.50	2.13	3.25	1.00	1.13	2.13	1.01	3.50	1-14	2.13	0.13	3.50	3.25	1.25	1.13	1.01	1-14	2.00	3.50	0.13		
4.00	2.13	3.25	1.00	1.13	2.13	1.01	3.50	1-14	2.00	0.13	4.00	3.25	1.25	1.13	1.01	1-14	2.00	3.50	0.13		
4.50	2.38	3.63	1.38	1.63	3.00	1.26	3.88	1.25-12	2.25	0.13	4.50	2.38	1.50	1.50	1.26	WELD	2.38	3.13	0.00		
5.00	2.38	3.63	1.38	1.63	3.00	1.26	3.88	1.25-12	2.25	0.13	5.00	2.38	1.50	1.50	1.26	WELD	2.38	3.13	0.00		
5.50	2.38	3.63	1.38	1.63	3.00	1.26	3.88	1.25-12	2.25	0.13	5.50	2.38	1.50	1.50	1.26	WELD	2.38	3.25	0.00		
6.00	2.38	3.63	1.38	1.63	3.00	1.26	3.88	1.25-12	2.25	0.00	6.00	2.38	1.50	1.50	1.26	WELD	2.38	3.38	0.00		
7.00	3.00	4.50	2.00	2.00	4.50	2.03	5.25	WELD	3.00	0.00	7.00	4.50	2.00	2.00	2.01	WELD	3.00	5.63	0.00		
8.00	3.00	4.50	2.00	2.00	4.50	2.03	5.25	WELD	3.00	0.00	8.00	4.50	2.00	2.00	2.01	WELD	3.00	5.63	0.00		
9.00	5.00	6.50	3.00	4.00	8.00	3.03	7.63	WELD	5.00	0.00	9.00	5.00	4.00	4.00	3.01	WELD	5.00	6.13	0.00		
10.00	5.00	6.50	3.00	4.00	8.00	3.03	7.75	WELD	5.00	0.00	10.00	5.00	4.00	4.00	3.01	WELD	5.00	6.25	0.00		

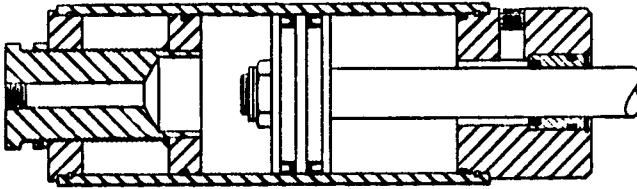
THREADED					PINEYE					FLANGE									
																			
Rod Only					Base					Rod					Base or Tube Only				
ROD DIA	J	H	G	NOTE: G DIM. INCLUDE WRENCH FLATS	BORE	F	H	J	K	L	G	BORE	J	K	L	M	N	H	X
0.63	0.75	1/2-20	7/16-20	1.38	1.50	0.63	1.50	1.75	0.76	2.00	1.00	1.50	0.38	0.44	2.50	2.50	3.50	3.50	0.00
0.75	0.88	5/8-18	1/2-20	1.50	2.00	0.88	2.00	2.25	1.01	3.00	1.38	2.00	0.38	0.56	3.00	3.00	4.00	4.00	0.00
1.00	1.13	7/8-14	3/4-16	1.75	2.50	0.88	2.00	2.25	1.01	3.25	1.38	2.50	0.38	0.56	3.50	3.50	4.50	4.50	0.13
1.13	1.25	1.00-14	7/8-14	2.00	3.00	0.88	2.00	2.75	1.01	4.00	1.50	3.00	0.50	0.69	4.00	4.00	5.50	5.50	0.13
1.25	1.38	1.13-12	1.00-14	2.13	3.50	0.88	2.00	2.75	1.01	4.50	1.50	3.50	0.50	0.69	4.50	4.50	6.00	6.00	0.13
1.38	1.63	1.25-12	1.00-14	2.38	4.00	0.88	2.00	2.75	1.01	5.00	1.63	4.00	0.75	0.81	5.00	5.00	6.50	6.50	0.25
1.50	1.75	1.38-12	1.13-12	2.50	4.50	1.13	2.50	3.25	1.26	5.50	1.88	4.50	0.75	0.81	5.50	5.50	7.00	7.00	0.25
1.75	2.00	1.50-12	1.25-12	2.75	5.00	1.13	2.50	3.25	1.26	6.00	1.88	5.00	1.00	0.94	6.00	6.00	8.00	8.00	0.38
2.00	2.25	1.75-12	1.50-12	3.00	5.50	1.13	2.50	3.25	1.26	6.50	2.00	5.50	1.00	0.94	6.50	6.50	8.50	8.50	0.50
2.25	2.50	2.00-12	1.75-12	3.50	6.00	1.13	2.50	3.25	1.26	7.00	2.13	6.00	1.00	0.94	7.00	7.00	9.00	9.00	0.50
2.50	3.00	2.25-12	1.88-12	4.00	7.00	1.75	4.00	5.00	2.01	9.00	2.88	7.00	1.25	1.06	8.00	8.00	10.00	10.00	0.75
2.75	3.25	2.50-12	2.13-12	4.25	8.00	1.75	4.00	5.00	2.01	10.00	2.88	8.00	1.25	1.31	9.00	9.00	11.50	11.50	1.00
3.00	3.50	2.75-12	2.25-12	4.50	9.00	2.25	5.00	6.00	3.01	11.00	3.38	9.00	1.50	1.56	10.25	10.25	13.00	13.00	1.00
3.50	3.50	3.25-12	2.50-12	4.50	10.00	2.25	5.00	6.00	3.01	12.00	3.50	10.00	2.00	1.81	11.50	11.50	14.50	14.50	1.25
4.00	4.00	3.75-12	3.00-12	5.25															
4.50	4.50	4.25-12	3.25-12	5.75															
5.00	5.00	4.75-12	3.50-12	6.25															
6.00	6.00	5.75-12	4.00-12	7.50															

TRUNNION										DRILLED				SPHERICAL													
																											
Base or Tube Only										Rod Only				Base							Rod						
BORE	K	L	M	N	P	H	J	X	ROD DIA	J	H	G	BORE	L	F	H	J	K	G								
1.50	2.50	4.63	2.88	0.88	0.75	1.00	1.50	0.00	0.63	0.25	0.38	0.63	1.50	0.75	1.25	1.25	0.63	0.66	1.63								
2.00	3.00	5.63	3.38	1.13	1.00	1.25	1.75	0.00	0.75	0.38	0.38	0.75	2.00	1.00	1.50	1.75	0.88	0.88	2.00								
2.50	3.50	6.13	3.88	1.13	1.00	1.25	1.75	0.13	1.00	0.50	0.50	1.00	2.50	1.00	1.50	1.75	0.88	0.88	2.00								
3.00	4.25	7.00	4.75	1.13	1.00	1.25	1.75	0.13	1.13	0.50	0.63	1.13	3.00	1.00	1.50	1.75	0.88	0.88	2.25								
3.50	4.75	7.50	5.25	1.13	1.00	1.25	1.75	0.13	1.25	0.63	0.63	1.25	3.50	1.00	1.50	1.75	0.88	0.88	2.25								
4.00	5.50	8.75	6.00	1.38	1.25	1.75	2.25	0.25	1.38	0.63	0.75	1.38	4.00	1.00	1.50	1.75	0.88	0.88	2.25								
4.50	6.00	9.75	6.50	1.63	1.50	2.00	2.50	0.25	1.50	0.75	0.75	1.50	4.50	1.25	2.00	2.00	1.00	1.09	2.75								
5.00	6.50	10.75	7.00	1.88	1.50	2.00	2.50	0.38	1.75	0.88	0.88	1.75	5.00	1.25	2.00	2.00	1.00	1.09	2.75								
5.50	7.00	11.75	7.75	2.00	1.50	2.00	2.50	0.50	2.00	1.00	1.00	2.00	5.50	1.25	2.00	2.00	1.00	1.09	3.00								
6.00	8.00	12.75	8.50	2.13	1.75	2.50	3.00	0.50	2.25	1.00	1.13	2.25	6.00	1.25	2.00	2.00	1.00	1.09	3.00								
7.00	9.50	14.50	10.00	2.25	2.50	3.50	4.50	0.75	2.50	1.25	1.25	2.50	7.00	2.00	3.00	2.75	1.75	1.75	4.25								
8.00	10.50	15.50	11.00	2.25	2.50	3.50	4.50	1.00	2.75	1.25	1.38	2.75	8.00	2.00	3.00	2.75	1.75	1.75	4.25								
9.00	11.50	16.50	12.00	2.25	2.50	3.50	4.50	1.00	3.00	1.25	1.50	3.00	9.00	2.00	3.00	2.75	1.75	1.75	4.25								
10.00	12.50	18.50	13.50	2.50	3.00	4.00	5.00	1.25	3.50	1.50	1.75	3.50	10.00	2.00	3.00	2.75	1.75	1.75	4.25								
									4.00	1.75	2.00	4.00															
									4.50	2.00	2.25	4.50															
									5.00	2.25	2.50	5.00															

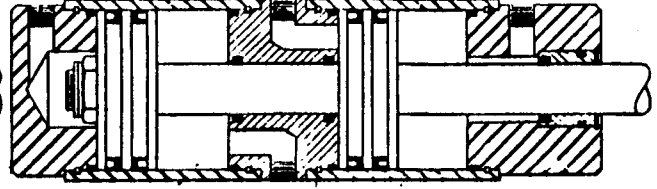
HYDRA-DYNAMICS, INC.

OPTIONAL DESIGN CONFIGURATIONS

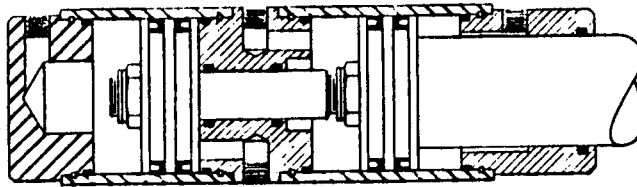
FUNCTION



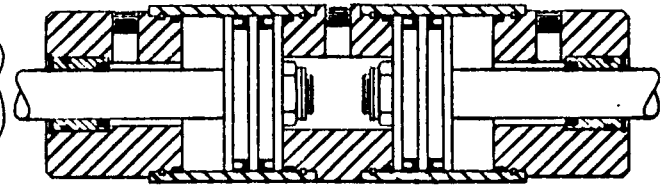
ADJUSTABLE STROKE - EXTERNAL ADJUSTMENT WITH NO DISTURBANCE OF ANY PIPING OR MOUNTING HARDWARE



TANDEM CYLINDERS - TO INTENSIFY THE LOAD ON A ROD WHERE SPACE IS RESTRICTED

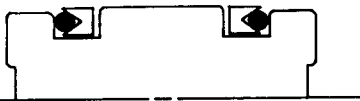


THREE POSITION CYLINDER - USE OF SIMPLE VALVING ALLOWS 3 POSITIONS OF THE LARGE PISTON ROD.



TANDEM CYLINDERS BACK-TO BACK ALLOWS MOVEMENT IN OPPOSITE DIRECTIONS

PISTON/ROD GLAND



STYLE #1

ZERO LEAKAGE, LOAD HOLDING, SEVERE SERVICE HYDRAULIC PISTON/ROD GLAND

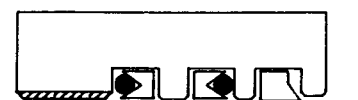
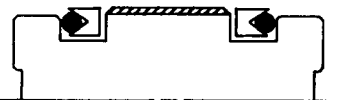
STANDARD MATERIAL IS 6061-T6 ALUMINUM. OPTIONAL 660 BRONZE OR DUCTILE IRON. ALL MATERIALS ARE NON-SCORING FOR LONG LIFE



STYLE #2

HIGH SIDE LOAD, LOW BREAKAWAY, LOW FRICTION PISTON AND ROD GLAND, ALL NON-SCORING MATERIALS

6061 T-6 ALUMINUM WITH BRONZE FILLED TEFLON SEALS FOR SMOOTH SERVICE



STYLE #3

ZERO LEAK, LOAD HOLDING, SUBSEA WATER HYDRAULIC BRONZE PISTON AND ROD GLAND OR STEEL WITH BRONZE OVERLAY, ALL NON-SCORING MATERIALS

HYDRA-DYNAMICS, INC.

MODEL NOMENCLATURE

Type Construction

- A - Aluminum NFPA/JIC
- T - Telescopic
- W - Welded
- M - Mill Type
- H - Hydraulic NFPA/JIC

Mounting Style

- A - Rectangular Rear Flange
- B - Rectangular Front Flange
- C - Side Foot Mount
- D - Rear Trunnion
- E - Front Trunnion
- F - Bottom Flush Mount
- G - Rear Pivot Mount
- L - End Foot Mount
- M - Intermediate Trunnion
- N - End Lug Mount
- W - Square Front Flange
- V - Square Rear Flange
- TF - Tie Rod Extended Front
- TR - Tie Rod Extended Rear
- TB - Tie Rod Extended Both

Cushion Information:

- "F" - Cushioned Front
- "R" - Cushioned Rear
- "B" - Cushioned Both Ends (shown)
- "N" - Non-cushioned

W G B A - SL - 4 x 24 x 2
Stroke Rod Diameter

Pressure Code: A - 250 psi air
 J - 1500/2500 psi Hyd
 S - 3000 psi Hyd

Special Features - SL Self Lubricated (shown)
 SS Super Smooth Low Friction
 HR High Radiation (nuclear)
 HWCF Water Based Fluids
 SUB Marine Subsea
 X Viton Seals
 HT High Temperature Air Cylinder (+500F)

HYDRA-DYNAMICS, INC.

ADDITIONAL POPULAR OPTIONS

INTEGRAL VALVING	Load holding, counterbalance, sequence, and other application sensitive valves are available either internally or externally mounted integral to the cylinder
CUSHIONS	Tapered cushions, stepped cushions, needle valve adjustment, extra long cushions, internal sleeve with orifice metering are all available
SEALS	A wide range of seals is available to the application. Materials range from nitrile, fluorocarbon, urethane, carboxylated nitrile, ethylene-propylene, neoprene, thermoplastic, and PTFE compounds
CYLINDER TUBES	1026 D.O.M. honed tubing is standard. Stainless steel, 4130, 4140, Hastelloy, and low temperature alloys are available upon request
CYLINDER RODS	1045/1050 chromed steel is standard. 316, 303, 17-4 H-1150 stainless steel, 4130, 4140, and other alloys are available
COATINGS	A wide range of internal and external coatings is available to suit particular applications. Internally, extra heavy chrome, chrome and PTFE, ceramics and PTFE, nitrides and other coatings can be selected. Externally, a heavy duty enamel is the standard topcoat. 3 part SSPC compliant epoxies, urethanes, and thermoplastics are also available

PRODUCT WARRANTY

Seller warrants that the items sold hereunder shall be free from defects in material or workmanship for a period of 18 months from date of shipment from the Company. **THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED.**

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