

FORCE CHART FOR EXTEND AND RETRACT (POUNDS OF FORCE)															
BORE	ROD DIA.	AREA	NET AREA	OPERATING PRESSURE (P.S.I.)											
				40	50	60	80	90	100	125	150	200	250	300	400
1½		1.767	1.767	<b>71</b>	<b>88</b>	<b>106</b>	<b>141</b>	<b>159</b>	<b>177</b>	<b>221</b>	<b>265</b>	<b>353</b>	<b>442</b>	<b>530</b>	<b>706</b>
	5/8	0.307	1.460	58	73	88	117	131	146	183	219	292	365	438	584
	1	0.785	0.982	39	49	59	79	88	98	123	147	196	245	294	392
2		3.142	3.142	<b>126</b>	<b>157</b>	<b>188</b>	<b>251</b>	<b>282</b>	<b>314</b>	<b>393</b>	<b>471</b>	<b>628</b>	<b>785</b>	<b>942</b>	<b>1256</b>
	5/8	0.307	2.835	113	142	170	227	255	283	354	425	567	709	850	1134
	1	0.785	2.356	94	118	141	188	212	236	295	353	471	589	706	942
2½		4.909	4.909	<b>196</b>	<b>245</b>	<b>295</b>	<b>393</b>	<b>441</b>	<b>491</b>	<b>614</b>	<b>736</b>	<b>982</b>	<b>1227</b>	<b>1472</b>	<b>1963</b>
	5/8	0.307	4.602	184	230	276	368	414	460	575	690	920	1150	1380	1840
	1	0.785	4.123	165	206	247	330	371	412	515	619	825	1031	1236	1649
3¼		8.296	8.296	<b>332</b>	<b>415</b>	<b>498</b>	<b>664</b>	<b>746</b>	<b>830</b>	<b>1037</b>	<b>1244</b>	<b>1657</b>	<b>2074</b>	<b>2488</b>	<b>3318</b>
	1	0.785	7.510	300	376	451	601	675	751	939	1127	1502	1878	2253	3004
	1 3/8	1.485	6.811	272	341	409	545	612	681	851	1022	1362	1703	2043	2724
4		12.566	12.566	<b>503</b>	<b>628</b>	<b>754</b>	<b>1005</b>	<b>1130</b>	<b>1257</b>	<b>1571</b>	<b>1855</b>	<b>2513</b>	<b>3142</b>	<b>3769</b>	<b>5026</b>
	1	0.785	11.781	471	589	707	942	1060	1178	1473	1767	2356	2945	3534	4712
	1 3/8	1.485	11.082	443	554	665	887	997	1108	1385	1662	2216	2770	3324	4432
5		19.635	19.635	<b>785</b>	<b>982</b>	<b>1178</b>	<b>1571</b>	<b>1767</b>	<b>1964</b>	<b>2454</b>	<b>2945</b>	<b>3927</b>	<b>4909</b>	<b>5890</b>	<b>7854</b>
	1	0.785	18.850	754	942	1131	1508	1696	1885	2356	2827	3770	4712	5655	7540
	1 3/8	1.485	18.150	726	908	1089	1452	1633	1815	2269	2723	3630	4538	5445	7260
6		28.274	28.274	<b>1131</b>	<b>1414</b>	<b>1696</b>	<b>2262</b>	<b>2544</b>	<b>2827</b>	<b>3534</b>	<b>4241</b>	<b>5655</b>	<b>7069</b>	<b>8482</b>	<b>11309</b>
	1 3/8	1.485	26.790	1072	1339	1607	2143	2411	2679	3349	4018	5358	6697	8037	10716
	1 3/4	2.405	25.869	1035	1293	1552	2070	2328	2587	3234	3880	5174	6467	7760	10347
8		50.266	50.266	<b>2011</b>	<b>2513</b>	<b>3016</b>	<b>4021</b>	<b>4523</b>	<b>5027</b>	<b>6283</b>	<b>7540</b>	<b>10053</b>	<b>12566</b>	<b>15079</b>	<b>20106</b>
	1 3/8	1.485	48.781	1951	2439	2927	3902	4390	4878	6098	7317	9756	12195	14634	19512
	1 3/4	2.405	47.860	1914	2393	2872	3829	4307	4786	5983	7179	9572	11965	14358	19144

Figures in bold type indicate pounds of force generated when cylinder extends (push). Figures not in bold type indicate pounds of force generated when cylinder retracts (pull) with various rod diameters.

FORMULA FOR:	WORD FORMULA	LETTER FORMULA
<b>AIR PRESSURE</b> <i>In Pounds/Square Inch</i>	PRESSURE = $\frac{\text{FORCE (Pounds)}}{\text{UNIT AREA (Square Inches)}}$	$P = \frac{F}{A}$ or $\text{psi} = \frac{F}{A}$
<b>CYLINDER PISTON AREA</b> <i>In Square Inches</i>	AREA = $\pi \times \text{RADIUS}^2 \text{ (Inches)}$	$A = \pi r^2$
<b>CYLINDER OUTPUT FORCE</b> <i>In Pounds, Push or Pull</i>	FORCE = Pressure (psi) x NET AREA (Square Inches)	$F = \text{psi} \times A$ or $F = PA$
<b>CYLINDER VELOCITY</b> <i>or SPEED In Feet/Second</i>	VELOCITY = $\frac{231 \times \text{FLOW RATE (GPM)}}{12 \times 60 \times \text{NET AREA (Square Inches)}}$	$v = \frac{231Q}{720A}$ or $v = \frac{.3208Q}{A}$
<b>CYLINDER VOLUME CAPACITY</b> <i>In Cubic Ft. of Air</i>	VOLUME = $\frac{\text{PISTON AREA (Square Inches)} \times \text{STROKE (Inches)}}{1728}$	$V = \frac{Al}{1728}$ l = Length of Stroke
<b>FREE AIR USAGE</b> <i>(Output Volume of Free Air in Cubic Ft.) Used to size a Compressor</i>	FREE AIR (psia) = $\frac{\text{Cyl. Piston Area in Sq. Inches} \times \text{Cyl. Stroke in Inches} \times (\text{Cyl. Output Force} + 14.7)}{14.7 \times 1728}$	FA (Cu.Ft.) = $\frac{A \times \text{Stroke} \times (\text{Force} + 14.7)}{14.7 \times 1728}$