PUSH AND PULL FORCES FOR PRESSURE RATED HYDRAULIC CYLINDERS
SERIES JHDH AND LSSE

THEORETICAL PUSH FORCE, IN POUNDS

BORE	PISTON AREA SQ. IN.	PUSH FORCE IN LBS OBTAINED AT FOLLOWING PRESSURES						FLUID REQUIRED PER INCH OF STROKE	
		100 PSI	250 PSI	500 PSI	700 PSI	1000 PSI	1500 PSI	CUBIC INCH	GALLON
1 1/2	1.77	177	443	885	1239	1770	2655	1.77	.008
2	3.14	314	785	1570	2198	3140	4710	3.14	.014
2 1/2	4.91	491	1228	2455	3437	4910	N/A	4.91	.021
3 1/4	8.30	830	2075	4150	5810	8300	N/A	8.30	.036
4	12.57	1257	3143	6285	8799	N/A	N/A	12.57	.054
5	19.64	1964	4910	9820	N/A	N/A	N/A	19.64	.085
6	28.27	2827	7068	14135	N/A	N/A	N/A	28.27	.122

This table lists full piston areas and push force values on the extend stroke at various input pressures.
The formula used is : F = PA (Force = Pressure x Area).

Also listed are displacement values in cubic feet by bore size and the corresponding value of gallons required to move the piston one inch.
The formulae used are: In^3 = A x 1 (Cubic Inches = Area x 1")
G = In^3 / 231(Gallons = Cubic Inches / 231)

DEDUCTIONS FOR PULL FORCE, IN POUNDS, PER ROD DIAMETER

PISTON ROD DIA.	PISTON ROD AREA SQ. IN.	FOR PULL STROKE FORCE, DEDUCT FROM THE PUSH FORCE THE FORCE CORRESPONDING TO ROD SIZE AND PRESSURE						FLUID REQUIRED PER INCH OF STROKE	
		100 PSI	250 PSI	500 PSI	700 PSI	1000 PSI	1500 PSI	CUBIC INCH	GALLON
5/8	.306	31	77	153	214	306	459	.306	.001
1	.785	79	196	393	550	785	1178	.785	.003
1 3/8	1.485	149	371	743	1040	1485	2228	1.485	.006
1 3/4	2.405	241	601	1203	1684	2405	N/A	2.405	.010
2	3.142	314	786	1571	2199	3142	N/A	3.142	.014
2 1/2	4.909	491	1227	2455	N/A	N/A	N/A	4.909	.021
3	7.069	707	1767	N/A	N/A	N/A	N/A	7.069	.031
3 1/2	9.621	962	2405	N/A	N/A	N/A	N/A	9.621	.042
4	12.566	1257	3142	N/A	N/A	N/A	N/A	12.566	.054

This table lists the rod areas and the corresponding force and displacement values calculated in the same manner as those for pistons in the top table. To determine the values of the pull force and the gallons per inch on the retract stroke, deduct those values in the table for the rod size of your cylinder.

Example: Assume a 4" bore cylinder with a 2" diameter rod operating at 700 PSI.
Using the charts, the following theoretical values are obtained:
Push (or Extend) Force = 8,799 lbs.
Pull (or Retract) Force = 6,600 lbs (8,799 lbs from the top table, less 2,199 lbs from the bottom table)