

Choosing the right cylinder

Cylinder selection basics

- Step 1:** Select the hydraulic cylinder that best suits the application. See page 179.
- Step 2:** Select the hydraulic pump, with valve option, that best matches the cylinder and application. See pages 178, 181-184.
- Step 3:** Select the hydraulic accessories you need. See pages 74-80, 156-171.

Considerations:

- 1** What **push or pull tonnage** is required per cylinder in your application? (Rule of thumb; Always choose a cylinder with a tonnage rating of 20% or more than what is required to lift the load.)
- 2** What is the **push or pull stroke** length required?
- 3** Does the cylinder need to push, **pull or both**? (Single-acting cylinders extend the piston under hydraulic pressure; double-acting cylinders extend and retract the piston under pressure.)
- 4** Does the application require **multiple cylinders**?
- 5** Is the application **stationary**, or must the components be light in weight for easy **portability**?
- 6** Do you need to **extend a rod or cable through the center** of the cylinder for the application, as in a **tensioning** operation?
- 7** Does the application require that the cylinder fit within **limited-clearance** work areas?
- 8** Does the application require that the cylinder be **“dead-ended”** at the end of it’s work stroke?
- 9** Will the cylinder need to withstand **off-center loads**? Cylinders with swivel caps are available.
- 10** Does the application require that the lifted load be **supported for extended periods** of time? **Locking collars** are ideal for such jobs, as are cribbing blocks.
- 11** Is **corrosion resistance** required? Our unique **“Power Tech”** surface treatment is standard on many Power Team cylinders, and optional on many of our cylinders which feature steel construction.
- 12** Will the application involve **high cycles** (over 2,500 in the cylinders lifetime)? Our **“RD”, “RH”, “RP”** and **“C”** series cylinders are ideal choices. Please refer to pages 176-177 for the capabilities of each cylinder.

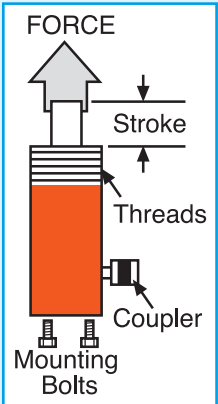
What type of cylinder do you need?

1. To determine a cylinder’s force capacity

2. To determine oil capacity of a cylinder
Note: For double-acting cylinders, oil in rod end of cylinder must be subtracted to determine capacity.

3. To determine reservoir capacity needed for a multiple cylinder system

Force pounds	Cylinder Effective Area (sq. in.)	X	PSI from Pump
Oil Capacity (cu. in.)	Cylinder Effective Area (sq. in.)	X	Cylinder Stroke (in.)
Usable Oil	Oil Cap. of Cyl. (cu. in.)	X	Number of Cyl. in System



Superior Features of Power Team Hydraulic Cylinders:

Good reasons to specify Power Team hydraulic cylinders: We build our own cylinders in our ISO 9001 registered manufacturing facility, honored by Industry Week magazine as one of the 10 best plants in the United States. All Power Team cylinders are date-coded and maximum pressure rating and capacity are metal stamped on the cylinder. All cylinders comply to the demanding ASME B30.1 standard. All cylinders are proof tested to 125% of capacity before leaving our factory. Cylinder bores are roller burnished to harden surface and make it smoother, increasing seal life by 30%. Base mounting holes withstand full capacity of cylinder. Typical cylinder burst pressures range from 25,000 to 35,000 psi. Cylinders with gland nuts may be “dead-ended” at 10,000 psi. Cylinders are assembled and tested by certified assemblers. Eddy current and mag particle inspection detects flaws in the steel. Cylinder bodies are solid steel, not welded like some competitive cylinders. Material is removed from surface, to assure that any flaws are removed. Others use material just as it is rolled at the mill.

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Cylinder selection basics

Only Power Team provides the “Power Tech” surface treatment:

•High corrosion and wear resistance, anti-galling properties. •Significantly increases the life expectancy of a cylinder. •Retains lubricants, prevents bronze and other materials from sticking to surface. •Increases fatigue strength and impact strength. •Increases surface yield and tensile strength. •Provides improved abrasion and scratch resistance. •Causes no appreciable dimensional change. •56 Rc minimum surface hardness. •Passes ASTM B117-85 100 hour salt spray corrosion resistance tests.

The “Power Tech” surface treatment is standard on the gland nut, cylinder body and piston/piston rod of the following cylinders: RLS50, RLS100, RLS200, RLS300, RLS500S, RLS750S, RLS1000S, RLS1500S, and RSS1002. **NOTE:** Bronze plating may be used in place of the “Power Tech” surface finish for the piston/piston rod of any of the above cylinders. The “Power Tech” surface treatment is standard on the standpipe of all “RH” series single and double-acting cylinders. The “Power Tech” surface treatment is standard on the piston/piston rod of the RT172, RT302 and RT503 cylinders.

General purpose, “C” Series

Single-acting Cylinders

(Listed on pages 6-7. Threaded end models listed on page 8)

Capacity range from 5 to 100 tons, stroke lengths from 1" to 16". Over 40 models to choose from. On 5 to 25 ton cylinders, **adapters** and **accessories** are available for attachment to the cylinder's base or piston, to apply force for spreading, lifting or other tasks. Swivel caps are available for 10, 15, 25, 55 and 75 ton cylinders. **Collar threads** permit mounting cylinders in a fixture or attachment. Base mounting holes and threaded piston rod ends also provided for versatility of application.



Low Profile, “RLS” Series

Single-acting Cylinders

(Listed on page 10)

Capacity range from 5 to 150 tons, stroke lengths from 7/16" to 5/8". These are **low profile** “pancake” cylinders for use where clearances are limited. A unique heavy duty return spring provides rapid return of the piston. Swivel caps reduce the effects of **off-center loading**. Unique “Power-Tech” surface treatment for **corrosion resistance**.



“Shorty”, “RSS” Series

Single-acting Cylinders

(Listed on page 11)

Capacity range from 10 to 250 tons, stroke lengths from 1 1/2" to 3". “Shorty” cylinders have a heavy duty **return spring** for rapid piston return and **low collapsed height** for limited-clearance jobs. Large capacity models have **removable carrying handles**. Optional swivel caps minimize effects of **off-center loading**. **Cribbing block accessories** available for use with these cylinders give stable load support and increase cylinder stroke.



Center hole, “RH” Series

Single and Double-acting Cylinders

(Listed on pages 12-13)

Capacity range of 10 to 200 tons, stroke lengths of 5/16" to 10 1/8". “Center-Hole” design enables you to run cables, screws, etc, through the center of the cylinder, enabling cylinder to push or pull, if a pull rod is used. Withstand full “dead-end” loads, **double-acting** models provide **rapid piston return**. Standpipe has unique “Power-Tech” surface treatment for **corrosion resistance**. Threaded, plain or **solid head inserts** are available for most models. Cylinders have removable **carrying handles**. **Lightweight aluminum** models now available. These have high corrosion resistance and are one half the weight of a steel cylinder.



Center Hole “Twin”, “RT” Series

Single & Double-acting Cylinders

(Listed on page 14)

Capacities of 17 1/2 to 100 tons, stroke lengths of 2" to 4 7/8". “Center-Hole” allows jacking screws, puller screws, cables, etc., to be extended through the cylinder for application versatility. A record of proven **reliability** for over 40 years!



Pull Cylinders "RP" Series

Pull Cylinders

(Listed on page 15)

In capacities of **2 and 5 tons**, stroke lengths of 5" and 5½". Designed for **pulling** and **tensioning** applications. Heavy duty compression spring provides long cycle life and rapid extension of piston; **spring automatically extends piston rod** when pump pressure is released.



"RD" Series

Double-acting Cylinders

(Listed on pages 16-17)

In capacities of **10 to 500 tons**, stroke lengths of 6" to 20⅞". Ideally suited to **severe applications**, high cycle usage, various mountings, production fixturing, cabling, ect. Accessory swivel caps on some models reduce the effects of **off-center loads**. Ideal for bridge lifting, building reconstruction, shipyard, utility, mining equipment maintenance and high cycle production applications.



"R" Series

Load-Return Cylinders

(Listed on page 18)

In capacities of **150 to 565 tons**, stroke lengths of 2" to 10". Features an improved **overflow port design** for stroke limiting. Optional swivel caps reduce effects of **off-center loading**.



Load-Return, Locking Collar Cylinders

(Listed on page 21)

In capacities of **55 to 565 tons**, stroke lengths of 2" to 10". Ideal for certain applications allowing pump to be disconnected from cylinder while retaining lifted load on **locking collar**. Optional swivel caps reduce the effect of off-center loading.



Double-acting

(Listed on page 19)

In capacities of **100 to 565 tons**, stroke lengths of 2" to 10". Swivel caps reduce the effects of **off-center loading**; cylinders may be "dead-ended" without damage. Removable carrying handles.

"RA" Series

Aluminum Single-acting Cylinders

(Listed on pages 9)

In capacities of **20 to 100 tons**, stroke lengths of 2⅞" to 10". **Half the weight of steel** cylinders of comparable capacity! Ideal for applications in which **portability** is a key factor. Designed for jacking and other non-production applications. Special **corrosion resistant** finish. Optional swivel caps reduce the effects of **off-center loading**; models with **locking collars** allow load to be supported without the pump being pressurized.



"RL" Locking Collar Cylinders

Spring Return

(Listed on page 20)

Locking collar enables cylinder to support load indefinitely with hydraulic pressure released. **Aluminum** models available in **55 and 100 ton capacities**, stroke lengths of 6⅞" and 6¼"; **steel** models available in **55, 100 and 150 ton capacities**, 6" and 6¼" stroke lengths. Special **corrosion resistant finish**.



Choosing the right cylinder





Cylinder/Pump speed matching chart

CYLINDER/PUMP SELECTION/MATCHING CHART

The following guidelines are for general lifting and construction applications. Hydraulic tools, pullers and presses may fall outside these recommendations. Always check to see that the pump's "usable reservoir capacity" exceeds the cylinder(s) oil capacity.

* Hand Pumps = Number of Strokes Required to Move Piston 1".

Air, Electric and Gasoline Engine/Hydraulic Pumps = Number of Seconds Required To Move Piston 1".

10,000 psi Maximum Working Pressure		PRESSURE STAGE	Cylinder Capacity (Tons)													
		▼	5	10	15	20	25	30	55	75	100	150	200	300	400	500
	P12‡	Single	14	32	44	65	72	93	-	-	-	-	-	-	-	-
	P55‡	Single	6	14	19	28	31	40	71	-	-	-	-	-	-	-
	P19‡	Low	4	8	10	15	17	21	-	-	-	-	-	-	-	-
		High	13	30	42	59	68	86	-	-	-	-	-	-	-	-
	P59F	Low	1.8	4.1	5.7	8	9	12	20	29	-	-	-	-	-	-
		High	8	17	24	34	40	50	85	122	-	-	-	-	-	-
	P59‡/ P157‡	Low	1.5	3.2	4.7	7	7.7	9.7	16.7	23.9	-	-	-	-	-	-
High		6	14	19	28	31	40	71	101	-	-	-	-	-	-	
P159‡/ P300‡	Low	.5	1	1.3	1.9	2.2	2.8	5	7	9	13	18	-	-	-	
	High	7	15	21	30	34	43	77	110	143	200	250	-	-	-	
P460‡	Low	.1	.3	.6	.6	.7	.9	1.5	2.2	2.8	4.2	5.6	8.4	11.2	-	
	High	3.3	7.7	9	14	17.5	22	37	55	71	105	143	213	284	-	
	PE10	Low	.5	1.2	1.6	2.2	2.6	3.2	5.5	-	-	-	-	-	-	-
		High	6	13.4	18.9	27	31	39	66.2	-	-	-	-	-	-	-
	PE17‡	Low	.2	.5	.7	.9	1.1	1.4	2.3	3.3	4.3	6.5	8.7	-	-	-
		High	3.5	7.9	10.9	16	18	23	39	56.3	73	109	146	-	-	-
	PE18	Low	.4	.8	1.2	1.6	1.8	2.3	3.9	5.7	7.3	10.8	14.6	21.9	29.2	-
		High	3.3	7.5	10.3	15	17	21	37	53	69	102	136	207	276	-
	PE21‡	Low	.2	.5	.7	1.0	1.1	1.4	2.5	3.6	4.6	6.8	9.2	13.8	18.4	-
		High	2.8	6.4	9	13	15	19	32	45.5	59	88	118	177	236	-
	PED25	Low	.2	.4	.6	.9	1.0	1.3	2.2	3.2	4.1	6.1	8.3	12.0	15.7	19.9
		High	2.4	5.4	7.5	10.6	12.4	15.6	26.5	38.2	49.5	73.6	99.1	144.3	188.5	238.6
	PE30‡	Low	.2	.45	.6	.9	1	1.3	2.2	3.2	4.1	6	-	-	-	-
		High	2	4.5	6	9	10	13	22	32	41	60	-	-	-	-
	PE46‡	Low	.1	.3	.4	.5	.6	.7	1.3	1.8	2.4	3.5	4.7	7.2	9.6	-
		High	1.3	2.9	4.1	5.9	6.8	8.6	14	22	28	42	56	84	112	-
	PE55‡/ PE60‡	Low	.1	.2	.3	.4	.4	.6	.9	1.4	1.8	2.6	3.5	5.4	7.2	-
High		1.1	2.4	3.4	4.8	5.6	7.1	12	17.8	23	34	45	69	92	-	
PQ60	Low	.1	.2	.3	.4	.4	.5	.9	1.3	1.7	2.5	3.4	5.1	6.8	8.5	
	High	1	2.2	3.3	4.4	5.2	6.5	11	16.2	21	31	41	63	84	105	
PQ120	Low	.1	.2	.3	.4	.4	.5	.9	1.3	1.7	2.5	3.4	5.1	6.8	8.5	
	High	.5	1.1	1.6	2.2	2.6	3.2	5.5	7.7	10	15	21	30	40	50	
PE400	Low	.1	.1	.2	.2	.3	.3	.6	.8	1	1.5	2.1	3	4	5	
	High	.1	.3	.4	.6	.7	.9	1.6	2.2	2.9	4.4	5.9	8.7	11.6	14.5	
	PA6‡	Single	10	22.4	31	44.4	51.3	65.2	-	-	-	-	-	-	-	
	PA9‡	Single	10	22.4	31	44.4	51.3	65.2	-	-	-	-	-	-	-	
	PA17‡	Low	.2	.5	.7	.9	1.1	1.4	2.3	3.3	4.3	6.5	8.7	-	-	
		High	3.5	7.9	10.9	16	18	23	39	56	73	109	146	-	-	
	PA46‡	Low	.1	.3	.4	.5	.6	.7	1.3	2	2.4	3.5	4.7	7.2	9.6	
High		1.3	2.9	4.1	5.9	6.8	8.6	14	22	28	42	56	84	112		
PA55‡	Low	.1	.3	.4	.6	.7	.9	1.5	2.2	2.8	4.1	5.5	8.4	11.2		
	High	1.1	2.4	3.4	4.8	5.6	7.1	12	18	23	34	45	69	92		
	PG30	Low	.3	.7	1	1.3	1.6	2	3.3	4.8	6.2	9.3	12.4	18.1	-	
		High	2	4.5	6.3	8.9	10.3	13	22	31.8	41.3	61.4	83	121	-	
	PG55‡	Low	.1	.3	.4	.6	.7	.8	1.4	2	2.6	3.9	5.2	7.6	9.9	12.5
		High	1.1	2.5	3.5	4.9	5.6	7.1	12.1	17.3	22.5	33.5	45	66	86	109
	PG120‡	Low	.1	.3	.4	.6	.7	.8	1.4	2	2.6	3.9	5.2	7.6	9.9	12.5
High		.5	1.0	1.5	2.0	2.4	3.0	5.1	7.3	9.5	14.2	19.1	27.8	36.3	46.0	
PG400	Low	.1	.1	.2	.2	.3	.3	.6	.8	1.0	1.5	2.0	3.0	3.8	4.9	
	High	.2	.3	.5	.7	.8	1.0	1.7	2.4	3.1	4.6	6.2	9.0	11.8	15.0	

Generally Recommended

Marginal, Check Requirements

Not recommended for most applications.

‡ Some Power Team pumps are available in special configurations not listed in this catalog. Power Team can "Assemble to Order" pumps with special seals, voltages, valves, relief valve settings, etc. For your special requirements please consult your local distributor or the Power Team factory.

Choosing the right cylinder

Cylinder selection by application

