

Choosing the right cylinder

Cylinder selection basics

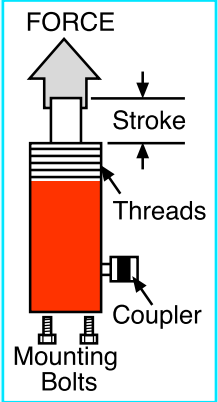
- Step 1:** Select the hydraulic cylinder that best suits the application. See page 179.
- Step 2:** Select the hydraulic pump, with valve option, that best matches the cylinder and application. See pages 178, 181-184.
- Step 3:** Select the hydraulic accessories you need. See pages 74-80, 156-171.

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	Force kg (force)	Cylinder Effective Area (sq. cm.)	X	Bar from Pump
2. To determine oil capacity of a cylinder <i>Note: For double-acting cylinders, oil in rod end of cylinder must be subtracted to determine capacity.</i>	Oil Capacity (cu. cm.)	Cylinder Effective Area (sq. cm.)	X	Cylinder Stroke (cm)
3. To determine reservoir capacity needed for a multiple cylinder system	Usable Oil	Oil Cap. of Cyl. (cu. cm.)	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 1,723 to 2,412 bar. Cylinders with gland nuts may be “dead-ended” at 700 bar. 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 25.4 to 406.4 mm. 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 11.1 to 15.9 mm. 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 38.1 to 76.2 mm. “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 7.9 to 257.2 mm. “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 **17½ to 100 tons**, stroke lengths of 50.8 to 123.8 mm. “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 127 and 139.7 mm. 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 152.4 to 511.2 mm. 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 50.8 to 254 mm. 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 50.8 to 254 mm. 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 50.8 to 254 mm. 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 54 to 254 mm. **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 156 and 159 mm; **steel** models available in **55, 100 and 150 ton capacities**, 152 and 159 mm 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 25.4 mm.

Air, Electric and Gasoline Engine/Hydraulic Pumps = Number of Seconds Required To Move Piston 25.4 mm.

700 bar Maximum Working Pressure		PRESSURE STAGE	Cylinder Capacity (Tons)													
		▼	5	10	15	20	25	30	55	75	100	150	200	300	400	500
Hand Pumps 	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	-	
Electric/Hydraulic Pumps 	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	
Air/Hydraulic Pumps 	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		
Gas/Hydraulic Pumps 	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

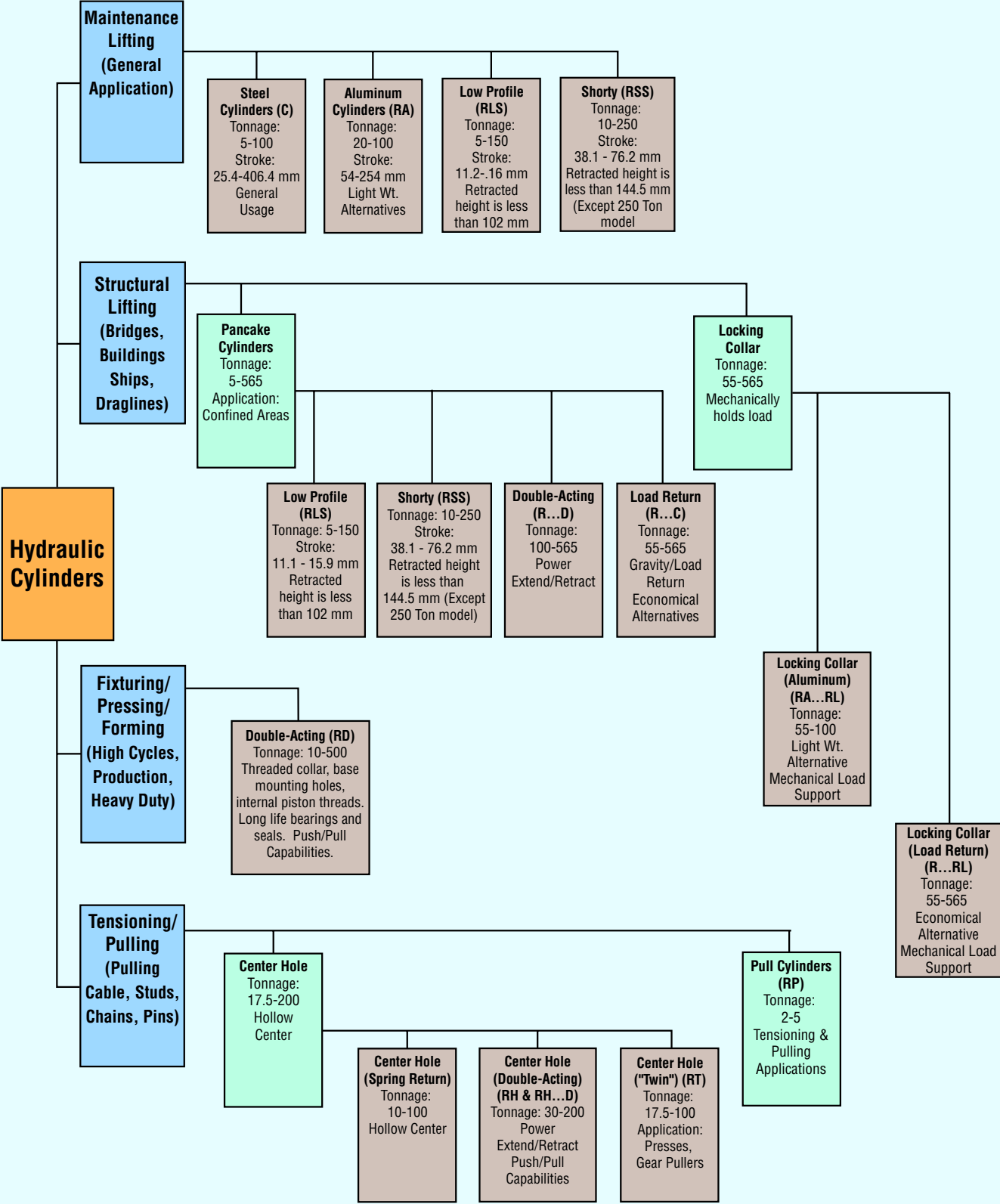
Marginal, Check Requirements

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



Choosing the right cylinder

Cylinder selection chart

Cylinders by tonnage, stroke and retracted height

All Power Team cylinders are furnished with cylinder half couplers.

Cyl. Cap. (tons)	Cyl. Stroke (mm)	Retracted Height (mm)	ORDER NUMBER
2 ton pull	127	233	RP25
	139.7	302	RP55
5 ton pull	14.3	41	RLS50
	25.4	111	C51C
	82.6	165	C53C
	133.4	216	C55C
	133.4	267	C55CBT
	184.2	273	C57C
	235	324	C59C

10	11.1	45	RLS100
	25.4	92	C101C
	38.1	89	RSS101
	54	121	C102C
	63.5	133	RH102
	104.8	172	C104C
	155.6	248	C106C
	155.6	292	C106CBT
	158.8	297	RD106
	203.2	287	RH108
	206.4	299	C108C
	254	391	RD1010
	257.2	349	C1010C
	257.2	394	C1010CBT

12	7.9	56	RH120
	41.3	122	RH121
	41.3	122	RH121T

15	25.4	124	C151C
	54	149	C152C
	104.8	200	C154C
	155.6	271	C156C
	206.4	322	C158C
	257.2	373	C1510C
	308	424	C1512C
358.8	475	C1514C	
406.4	522	C1516C	

17.5	50.8	175	RT172
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20	11.1	50.8	RLS200
	44.5	95	RSS202
	50.8	156	RH202
	54	162	RA202
	76.2	154	RH203
	104.8	213	RA204
	152.4	308	RH206
155.6	264	RA206	

25	25.4	140	C251C
	50.8	165	C252C
	101.6	216	C254C
	158.8	273	C256C
	158.8	314	C256CBT
	158.8	340	RD256
	209.6	324	C258C
	260.4	375	C2510C
	311.2	425	C2512C
	362	476	C2514C
362	543	C2514CBT	
362	518	RD2514	

30	12.7	59	RLS300
	54	187	RA302
	61.9	117	RSS302
	63.5	159	RH302
	63.5	214	RT302
	76.2	179	RH303
	104.8	238	RA304
	149.2	283	RHA306
	152.4	248	RH306
	152.4	281	RH306D

50	15.9	67	RLS500S
	60.3	127	RSS502
	76.2	181	RH503
	76.2	268	RT503

55	50.8	125.4	R552C
	50.8	162	R552L
	50.8	175	C552C
	54	171	RA552
	104.8	222	RA554
	108	232	C554C
	152.4	264	R556C
	152.4	321	R556L
	155.6	273	RA556
	155.6	318	RA556L
55	158.8	283	C556C
	158.8	329	RD556
	254	328.6	R5510C
	254	365	R5510L
	254	384	RA5510
	260.4	384	C5510C
60	333.4	504	RD5513
	336.6	460	C5513C
	463.6	657	RD5518
	76.2	235	RH603
	101.6	241	RHA604D
	127	241	RH605
75	152.4	318	RH606
	257.2	459	RH6010
	15.9	79	RLS750S
	155.6	314	C756C
333.4	492	C7513C	

60	76.2	235	RH603
	101.6	241	RHA604D
	127	241	RH605
	152.4	318	RH606
257.2	459	RH6010	

75	15.9	79	RLS750S
	155.6	314	C756C
	333.4	492	C7513C

80	333.4	518	RD8013
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100	15.9	86	RLS1000S
	38.1	144	RSS1002D
	38.1	165	RH1001
	50.8	139.7	R1002C
	50.8	169	R1002D
	50.8	184	R1002L
	50.8	219	C1002C
	54	197	RA1002
	57.2	139.7	RSS1002
	76.2	254	RH1003
	123.8	384	RT1004
	152.4	241.3	R1006C
	152.4	270	R1006D
	152.4	286	R1006L
152.4	314	RH1006	
158.8	298	RA1006	
158.8	340	RA1006L	
168.3	337	C1006C	
168.3	350	RD1006	
254	342.9	R10010C	
254	372	R10010D	
254	387	R10010L	
260.4	503	RH10010	
260.4	429	C10010C	
333.4	515	RD10013	
511.2	718	RD10020	

150	14.3	102	RLS1500S
	50.8	162	R1502C
	50.8	189	R1502D
	50.8	206	R1502L
	127	308	RH1505
	152.4	264	R1506C
	152.4	291	R1506D
	152.4	308	R1506L
	168.3	378	RD1506
	203.2	349	RH1508
	254	365	R15010C
	254	392	R15010D
	254	410	R15010L
	333.4	543	RD15013
460.4	674	RD15018	

200	50.8	191	R2002C
	50.8	207	R2002D
	50.8	241	R2002L
	152.4	292	R2006C
	152.4	308	R2006D
	152.4	343	R2006L
	168.3	406	RD2006
	203.2	408	RH2008
	254	394	R20010C
	254	410	R20010D
	254	445	R20010L
	333.4	572	RD20013
	18 ¹ / ₈	723.9	RD20018

250	76.2	290	RSS2503
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280	50.8	191	R2802C
	50.8	234	R2802D
	50.8	248	R2802L
	152.4	292	R2806C
	152.4	335	R2806D
	152.4	349	R2806L
	254	394	R28010C
254	437	R28010D	
254	451	R28010L	

300	152.4	439	RD3006
	330.2	617	RD30013

355	50.8	232	R3552C
	50.8	292	R3552L
	50.8	290	R3552D
	152.4	333	R3556C
	152.4	394	R3556L
	152.4	448	R3556D
	254	435	R35510C
254	495	R35510L	
254	550	R35510D	

400	152.4	473	RD4006
	330.2	651	RD40013

430	50.8	264	R4302C
	50.8	333	R4302L
	50.8	313	R4302D
	152.4	365	R4306C
	152.4	435	R4306L
	152.4	413	R4306D
	254	467	R43010C
254	537	R43010L	
254	516	R43010D	

500	6	19 ²¹ / ₃₂	RD5006
	13	26 ²¹ / ₃₂	RD50013

565	50.8	292	R5652C
	50.8	371	R5652L
	50.8	345	R5652D
	152.4	394	R5656C
	152.4	473	R5656L
	152.4	447	R5656D
	254	495	R56510C
254	575	R56510L	
254	548	R56510D	