Linders, valves, & pto pumps

Prince Manufacturing Corporation North Sioux City, South Dakota

RoyalPlate

Bince 3000 P.S.I.

Standard Product Index Prince

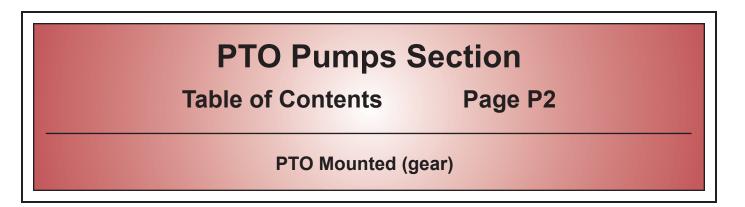
Hydraulic Cylinder and Accessories Section

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Custom	Bores up to 10" diameter welded and 5" tie-rod
Welded	Bores up to 8" diameter
	Strokes up to 60" long

Hydraulic V	alve Section	
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Directional Control	Accessory V	alves
Stack Valves Mono Block Valves Loader Valves Log Splitter	Flow Control Relief Sequence	Check Selector Priority



Electronic Catalog available Online at www.princehyd.com

TINCE CYLINDERS & ACCESSORIES

MADE IN USA

1

3000 P.

Prince Manufacturing Corporation North Sioux City, South Dakota

Rince MANDrActioning of North Sloux city, so 3000 P.S.I.

USA

MADE

RoyalPlate

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HYDRAULIC CYLINDERS

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2"	Magnum	PC2000XT	C9	2"	3000 PSI	A/B/E/F200000	C16-C18
2"	Magnum	PC2000XM	C11	2 1/2"	2500 PSI	SAE-7000	C20
2"	Magnum	PC2000XL	C12	2 1/2"	3000 PSI	A/B/E/F250000	C16-C18
2 1/2"	Magnum	PC2500CL	C8	3"	2500 PSI	SAE-7100	C20
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2 1/2"	Magnum	PC2500XT	C9	3 1/2"	3000 PSI	A/B/E/F350000	C16-C18
2 1/2"	Magnum	PC2500XM	C11	4"	2500 PSI	SAE-8600	C20
2 1/2"	Magnum	PC2500XL	C12	4"	3000 PSI	C/D/G/H400000	C20
3"	Magnum	PC3000CL	C8		Heavy Duty		
3"	Royal	PMC-8300	C4	4"	3000 PSI	A/B/E/F400000	C16-C18
3"	Fortress	SAE-63000	C5	4 1/2"	3000 PSI	A/B/E/F450000	C16-C18
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3 1/2"	Royal	PMC-5500	C4				
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NOTE: PSI ratings listed in this catalog provide a maximum operating pressure for the product used in a hydraulic system. Column Load limits result from longer strokes and can greatly reduce the safe operating pressure. Any reference to intermittent pressure ratings in our literature no longer apply. Unless otherwise specified, our cylinders are designated for use with a good quality petroleum-based hydraulic fluid. Please contact our Engineering Department for help.

PRINCE FOR EXCELLENT SERVICE AND HIGH QUALITY

Pride in individual work and accomplishment is the trade. It means more than just getting the order out. All cylinders or components, whatever the size or type get individual skilled attention. You will find that Prince cylinders meet all of your highest requirements and that you receive years of maintenance-free dependable usage. Prince builds most of their own tools, jigs and fixtures with a fully staffed and equipped tool room. Modern precision equipment is utilized to produce and maintain these high production tools. Prince maintains a vast assortment of tubing, bars, casting and packing to give customers the best possible service available. Prince Manufacturing is relieved of any liability due to typographical errors in specifications. If you have any questions regarding any product specifications, please contact your representative.



CUSTOM CYLINDERS



EXECUTIVE SUMMARY:

Custom cylinder designs provide our customers with a competitive advantage as a result of a collaborative design approach which delivers an optimized solution to meet their needs. Custom cylinder designs translate into a durable product, compact in size and weight and packed with integrated features like rephasing, cushioning, valve cavities, position senors and more. Prince has over 70 years of experience producing custom cylinder designs utilizing the latest CAD.

MANUFACTURING CAPABILITIES:

- Welded designs with 1" to 10" Bores
- Tie Rod Designs with 2" to 5" Bores
- Large Bore Air Cylinders
- Designed for Pressures up to 7,500 PSI

CUSTOM CYLINDER FEATURES:

- Integrated Linear Position Sensors
- Built-in Valves and Manifolds
- Double Ended cylinder designs
- Integrated Cushioning and Rephasing
- Safety Designs with Velocity Fuses
- Spherical and High-Wear Bushings
- Custom Mounts and End Fittings
- High-Strength/Weight-Saving Materials
- Color Matched Paint and Labeling

QUALITY:

- Products 100% Tested
- ISO 9001:2015 Certified
- Real-time Quality Process Monitoring
- In-house Gravimetric Cleanliness Testing
- Gauge calibration Traceable to NIST standards
- Oil filtration to ISO 4406: 1999 19/17/14 Standard

ENGINEERING AND R&D SUPPORT:

- Factory Direct Sales Support
- Burst Testing (Up to 15,000 PSI)
- Fatigue and Impulse Testing
- 3D Modeling Design (AutoDesk Inventor)
- Dedicated CASS and B117 Corrosion Testing
- Finite Element Analysis

SERVING OIL & GAS • MINING • CONSTRUCTION • DEMOLITION • AGRICULTURE • TRANSPORTATION • SOLID WASTE

THE ROYAL LINE

THE "ROYAL" Welded–DA

PORT (TYP.)



FEATURES:

- Double Acting
- Chromed, ground & polished rod
- Ductile iron piston & gland
- Crosstube end fittings with grease zerks
- Urethane u-cup and urethane wiper in gland
- O-ring with backup washers & cast iron ring piston seals
- Snap ring gland retainer
- Color is gloss black

Model No. * PMC-5408 * PMC-5412 PMC-5414 * PMC-5416 * PMC-5420 * PMC-5424	Style 2 1/2 X 8 2 1/2 X 12 2 1/2 X 14	Wt.	PSI	Column Load (Lbs)	Ret	Rod	Α	PORTS	D	Е	G	н	L1	
* PMC-5412 PMC-5414 * PMC-5416 * PMC-5420	2 1/2 X 12					Dia.		NPTF						L 2
PMC-5414 * PMC-5416 * PMC-5420		00 1	2500	FULL PSI	16	1 3/8	3/16	3/8	3/4	9/16	3/4	2 9/16	3	1 3/8
* PMC-5416 * PMC-5420	2 1/2 X 14	20	2500	FULL PSI	20	1 3/8	3/16	3/8	3/4	9/16	3/4	2 9/16	3	1 3/8
* PMC-5420		22	2500	FULL PSI	22	1 3/8	3/16	3/8	3/4	7/16	3/4	2 9/16	3	1 3/8
	2 1/2 X 16	23	2500	FULL PSI	24	1 3/8	3/16	3/8	3/4	9/16	3/4	2 9/16	3	1 3/8
* PMC-5424	2 1/2 X 20	27	2500	FULL PSI	28	1 3/8	3/16	3/8	3/4	9/16	3/4	2 9/16	3	1 3/8
	2 1/2 X 24	30	2500	FULL PSI	32	1 3/8	3/16	3/8	3/4	9/16	3/4	2 9/16	3	1 3/8
* PMC-5430	2 1/2 X 30	35	2500	8,975 LBS	38	1 3/8	3/16	3/8	3/4	9/16	3/4	2 9/16	3	1 3/8
* PMC-5432	2 1/2 X 32	41	2500	8,000 LBS	40	1 3/8	3/16	3/8	3/4	9/16	3/4	2 9/16	3	1 3/8
* PMC-5436	2 1/2 X 36	44	2500	6,475 LBS	44	1 3/8	3/16	3/8	3/4	9/16	3/4	2 9/16	3	1 3/8
* PMC-5442	2 1/2 X 42	47	2500	4,870 LBS	50	1 3/8	3/16	3/8	3/4	9/16	3/4	2 9/16	3	1 3/8
* PMC-8308	3 X 8	22	2500	FULL PSI	16	1 1/2	3/16	1/2	1	11/16	1	2 5/16	3 1/2	1 1/2
* PMC-8312	3 X 12	26	2500	FULL PSI	20	1 1/2	3/16	1/2	1	11/16	1	2 5/16	3 1/2	1 1/2
PMC-8314	3 X 14	29	2500	FULL PSI	22	1 1/2	3/16	1/2	1	11/16	1	2 5/16	3 1/2	1 1/2
* PMC-8316	3 X 16	31	2500	FULL PSI	24	1 1/2	3/16	1/2	1	11/16	1	2 5/16	3 1/2	1 1/2
* PMC-8320	3 X 20	35	2500	FULL PSI	28	1 1/2	3/16	1/2	1	11/16	1	2 5/16	3 1/2	1 1/2
* PMC-8324	3 X 24	41	2500	FULL PSI	32	1 1/2	3/16	1/2	1	11/16	1	2 5/16	3 1/2	1 1/2
* PMC-8330	3 X 30	46	2500	13,000 LBS	38	1 1/2	3/16	1/2	1	11/16	1	2 5/16	3 1/2	1 1/2
PMC-8332	3 X 32	48	2500	11,540 LBS	40	1 1/2	3/16	1/2	1	11/16	1	2 5/16	3 1/2	1 1/2
* PMC-8336	3 X 36	52	2500	9,320 LBS	44	1 1/2	3/16	1/2	1	11/16	1	2 5/16	3 1/2	1 1/2
PMC-8340	3 X 40	56	2500	7,660 LBS	48	1 1/2	3/16	1/2	1	11/16	1	2 5/16	3 1/2	1 1/2
* PMC-8342	3 X 42	59	2500	7,020 LBS	50	1 1/2	3/16	1/2	1	11/16	1	2 5/16	3 1/2	1 1/2
* PMC-8348	3 X 48	65	2500	5,460 LBS	56	1 1/2	3/16	1/2	1	11/16	1	2 5/16	3 1/2	1 1/2
* PMC-5508	3 1/2 X 8	26	2500	FULL PSI	16	1 1/2	3/16	1/2	1	11/16	1	1 11/16	4	1 1/2
* PMC-5512	3 1/2 X 12	29	2500	FULL PSI	20	1 1/2	3/16	1/2	1	11/16	1	1 11/16	4	1 1/2
PMC-5514	3 1/2 X 14	32	2500	FULL PSI	22	1 1/2	3/16	1/2	1	11/16	1	1 11/16	4	1 1/2
* PMC-5516	3 1/2 X 16	34	2500	FULL PSI	24	1 1/2	3/16	1/2	1	11/16	1	1 11/16	4	1 1/2
* PMC-5520	3 1/2 X 20	38	2500	FULL PSI	28	1 1/2	3/16	1/2	1	11/16	1	1 11/16	4	1 1/2
* PMC-5524	3 1/2 X 24	44	2500	20,210 LBS	32	1 1/2	3/16	1/2	1	11/16	1	1 11/16	4	1 1/2
* PMC-5530	3 1/2 X 30	48	2500	13,540 LBS	38	1 1/2	3/16	1/2	1	11/16	1	1 11/16	4	1 1/2
PMC-5532	3 1/2 X 32	52	2500	12,040 LBS	40	1 1/2	3/16	1/2	1	11/16	1	1 11/16	4	1 1/2
* PMC-5536	3 1/2 X 36	56	2500	9,700 LBS	44	1 1/2	3/16	1/2	1	11/16	1	1 11/16	4	1 1/2
PMC-5540	3 1/2 X 40	60	2500	7,975 LBS	48	1 1/2	3/16	1/2	1	11/16	1	1 11/16	4	1 1/2
PMC-5542	3 1/2 X 42	64	2500	7,300 LBS	50	1 1/2	3/16	1/2	1	11/16	1	1 11/16	4	1 1/2
PMC-5548	3 1/2 X 48	70	2500	5,680 LBS	56	1 1/2	3/16	1/2	1	11/16	1	1 11/16	4	1 1/2
* PMC-5608	4 X 8	35	2500	FULL PSI	17	2	3/16	1/2	1 1/4	15/16	1 1/8	2 1/8	4 1/2	2
* PMC-5612	4 X 12	41	2500	FULL PSI	21	2	3/16	1/2	1 1/4	15/16	1 1/8	2 1/8	4 1/2	2
PMC-5614	4 X 14	45	2500	FULL PSI	23	2	3/16	1/2	1 1/4	15/16	1 1/8	2 1/8	4 1/2	2
* PMC-5616	4 X 16	48	2500	FULL PSI	25	2	3/16	1/2	1 1/4	15/16	1 1/8	2 1/8	4 1/2	2
* PMC-5620	4 X 20	56	2500	FULL PSI	29	2	3/16	1/2	1 1/4	15/16	1 1/8	2 1/8	4 1/2	2
* PMC-5624	4 X 24	62	2500	FULL PSI	33	2	3/16	1/2	1 1/4	15/16	1 1/8	2 1/8	4 1/2	2
* PMC-5630	4 X 30	72	2500	FULL PSI	39	2	3/16	1/2	1 1/4	15/16	1 1/8	2 1/8	4 1/2	2
* PMC-5632	4 X 32	74	2500	FULL PSI	41	2	3/16	1/2	1 1/4	15/16	1 1/8	2 1/8	4 1/2	2
* PMC-5636	4 X 36	80	2500	28,710 LBS	45	2	3/16	1/2	1 1/4	15/16	1 1/8	2 1/8	4 1/2	2
* PMC-5640	4 X 40	85	2500	23,700 LBS	49	2	3/16	1/2	1 1/4	15/16	1 1/8	2 1/8	4 1/2	2
* PMC-5642	4 X 42	92	2500	21,680 LBS	51	2	3/16	1/2	1 1/4	15/16	1 1/8	2 1/8	4 1/2	2
* PMC-5648	4 X 48	100	2500	16,930 LBS	57	2	3/16	1/2	1 1/4	15/16	1 1/8	2 1/8	4 1/2	2
* PMC-5660	4 X 60	120	2500	11,160 LBS	69	2	3/16	1/2	1 1/4	15/16	1 1/8	2 1/8	4 1/2	2

D (TYP

(TUBI

* Frequently stocked items

NOTE: If disassembly is necessary - Be sure to put a wire or "0" Ring in snap ring groove so when the piston is pulled out - The cast iron ring will not catch in groove

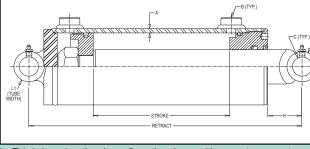


THE FORTRESS LINE 3000 PSI EXTENDED DUTY

THE "FORTRESS" Welded-DA-Heavy Duty

FEATURES:

- Double Acting
- · Heavy duty welded construction
- · Chromed, ground, & polished rod
- Ductile iron piston
- Thread-in ductile iron gland
- Crosstube end fittings with grease zerks
- Urethane u-cup, metal encased wiper,
- Color is gloss black
- · Matches closed length of Royal line cylinders (up to 42" stroke)



teflon cap seal a			-	ers included in thes					RETRAC	т ———			
Rods are	sized for a max	ximum s	afe push lo	ad (2:1 safety facto	or) given ir	n the table. T	his is base	d on the pin co	onfiguration	shown v	vith no ce	enter suppo	ort.
Model No.	Style	Wt	PSI	Column Load (Lbs)	Ret	Rod Dia.	A	В	с	R	н	L1	L2
SAE-62506 SAE-62508 SAE-62510 SAE-62512 SAE-62514 SAE-62516 SAE-62520 SAE-62520 SAE-62522 SAE-62530 SAE-62532 SAE-62530 SAE-62540 SAE-62540	2 1/2 X 6 2 1/2 X 8 2 1/2 X 10 2 1/2 X 12 2 1/2 X 14 2 1/2 X 14 2 1/2 X 16 2 1/2 X 18 2 1/2 X 18 2 1/2 X 20 2 1/2 X 24 2 1/2 X 30 2 1/2 X 32 2 1/2 X 40 2 1/2 X 42	25 27 29 30 32 34 36 37 41 46 48 51 55 57	3000 3000 3000 3000 3000 3000 3000 300	FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI 8,975 LBS 8,000 LBS 6,475 LBS 5,330 LBS 4,870 LBS	14 16 18 20 22 24 26 28 32 38 40 44 48 50	1 3/8 1 3/8	3/16 3/16 3/16 3/16 3/16 3/16 3/16 3/16	E #8 #8 #8 #8 #8 #8 #8 #8 #8 #8	3/4 3/4 3/4 3/4 3/4 3/4 3/4 3/4 3/4 3/4	5/8 5/8 5/8 5/8 5/8 5/8 5/8 5/8 5/8 5/8	2 1/2 2 1/2	3 1/4 3 1/4	2 1/4 2 1/4
SAE-63006 SAE-63008 SAE-63012 SAE-63012 SAE-63016 SAE-63018 SAE-63020 SAE-63020 SAE-63030 SAE-63032 SAE-63036 SAE-63040 SAE-63042 SAE-63048*	3 X 6 3 X 8 3 X 10 3 X 12 3 X 14 3 X 16 3 X 18 3 X 20 3 X 20 3 X 20 3 X 20 3 X 30 3 X 30 3 X 30 3 X 36 3 X 40 3 X 42 3 X 48	30 32 34 37 41 43 45 49 55 57 61 66 68 75	3000 3000 3000 3000 3000 3000 3000 300	FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI 13,540 LBS 9,700 LBS 7,975 LBS 7,300 LBS 3,480 LBS	14 16 20 24 26 28 28 38 40 44 48 58	1 1/2 1 1/2	3/16 3/16 3/16 3/16 3/16 3/16 3/16 3/16	#8#8##################################	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	13/16 13/16 13/16 13/16 13/16 13/16 13/16 13/16 13/16 13/16 13/16 13/16 13/16 13/16	N N N N N N N N N N N N N N N N N N N	3 3/4 3 3/4	2 3/4 2 3/4
SAE-63506 SAE-63508 SAE-63510 SAE-63512 SAE-63514 SAE-63516 SAE-63520 SAE-63520 SAE-63520 SAE-63530 SAE-63532 SAE-63532 SAE-63542 SAE-63542	$\begin{array}{c} 3 \ 1/2 \ X \ 6 \\ 3 \ 1/2 \ X \ 8 \\ 3 \ 1/2 \ X \ 10 \\ 3 \ 1/2 \ X \ 10 \\ 3 \ 1/2 \ X \ 10 \\ 3 \ 1/2 \ X \ 12 \\ 3 \ 1/2 \ X \ 14 \\ 3 \ 1/2 \ X \ 14 \\ 3 \ 1/2 \ X \ 18 \\ 3 \ 1/2 \ X \ 18 \\ 3 \ 1/2 \ X \ 20 \\ 3 \ 1/2 \ X \ 30 \\ 3 \ 1/2 \ X \ 30 \\ 3 \ 1/2 \ X \ 30 \\ 3 \ 1/2 \ X \ 40 \\ 3 \ 1/2 \ X \ 42 \\ 3 \ 1/2 \ X \ 42 \\ 3 \ 1/2 \ X \ 48 \\ \end{array}$	25 27 30 33 35 38 40 43 48 56 59 64 69 72 80	3000 3000 3000 3000 3000 3000 3000 300	FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI 24,360 LBS 21,670 LBS 17,470 LBS 14,330 LBS 13,140 LBS 9,900 LBS	14 16 18 20 24 26 28 32 38 40 44 48 58	1 3/4 1 3/4	3/16 3/16 3/16 3/16 3/16 3/16 3/16 3/16	#8 \$AEE \$\$\$AEE \$\$\$AEE #8 \$\$\$AEE \$\$\$\$AEE #8 \$\$\$\$AEE #8 \$\$\$\$AEE #8 \$\$\$AEE #8 \$\$\$AEE #8 \$\$AEE #8 \$\$AEE	1 1 1 1 1 1 1 1 1 1 1 1 1	13/16 13/16 13/16 13/16 13/16 13/16 13/16 13/16 13/16 13/16 13/16 13/16 13/16 13/16	1 7/8 1 7/8	4 1/4 4 1/4	2 3/4 2 3/4
SAE-64008 SAE-64012 SAE-64016 SAE-64020 SAE-64024 SAE-64032 SAE-64032 SAE-64036 SAE-64040 SAE-64042 SAE-64048* SAE-64060*	4 X 8 4 X 12 4 X 16 4 X 20 4 X 24 4 X 30 4 X 32 4 X 36 4 X 40 4 X 42 4 X 48 4 X 48 4 X 60	42 48 55 62 69 79 83 90 96 100 115 138	3000 3000 3000 3000 3000 3000 3000 300	FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI 28,710 LBS 23,700 LBS 21,680 LBS 16,640 LBS 10,890 LBS	17 21 25 29 33 41 45 45 59 73	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	7/32 7/32 7/32 7/32 7/32 7/32 7/32 7/32	#10 SAE #10 SAE	1 1/4 1 1/4	1 1 1 1 1 1 1 1 1 1	2 1/4 2 1/4	4 3/4 4 3/4	3 1/4 3 1/4
SAE-64508 SAE-64512 SAE-64516 SAE-64520 SAE-64520 SAE-64530 SAE-64532 SAE-64536 SAE-64542 SAE-64542 SAE-64548* SAE-64560*	4 1/2 X 8 4 1/2 X 12 4 1/2 X 16 4 1/2 X 20 4 1/2 X 20 4 1/2 X 20 4 1/2 X 30 4 1/2 X 32 4 1/2 X 36 4 1/2 X 40 4 1/2 X 42 4 1/2 X 48 4 1/2 X 60	54 62 71 80 89 104 106 115 124 128 147 177	3000 3000 3000 3000 3000 3000 3000 300	FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI 46,860 LBS 38,650 LBS 38,630 LBS 36,630 LBS 17,210 LBS	17 21 25 29 33 45 49 59 59 73	2 1/4 2 1/4	1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4	#10 SAE #10 SAE	1 1/4 1 1/4	1 1 1 1 1 1 1 1 1 1 1 1	2 1/4 2 1/4	5 1/4 5 1/4	3 1/4 3 1/4

CYLINDERS AND ACCESSORIES

CYLINDERS AND ACCESSORIES

THE GLADIATOR LINE

3000 PSI EXTENDED DUTY

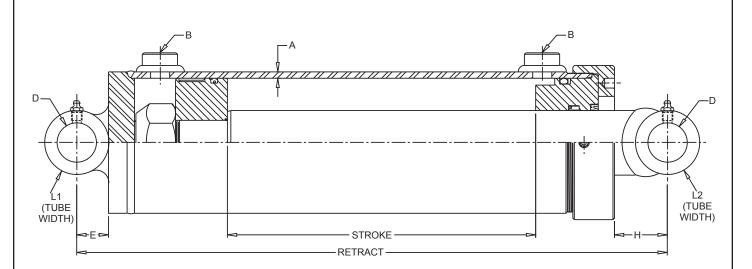
THE "GLADIATOR" Welded-DA-Heavy Duty



FEATURES:

- Double Acting
- · Heavy duty welded construction
- Chromed, ground, & polished rod
- Ductile iron piston
- Externally threaded gland cap
- Urethane u-cup, metal encased wiper, polyurethane crown seal and wear ring
- Crosstube end fittings with grease zerks
- Color is gloss black
- * Spacer included in these models

Refer to Magnum Cylinders for 5" and 6" cross tube options.



Rods ar	e sized for a n	naximum	safe push	load (2:1 safety fa	ictor) giver	n in the t	able. Thi	s is based	on the pin c	onfiguration	shown with no	o center sup	port.
Model No.	Style	Wt.	PSI	Column Load (Lbs.)	Retract	Rod Dia.	А	B SAE	D	E	н	L1	L2
SAE-21008 SAE-21012 SAE-21016 SAE-21020 SAE-21024 SAE-21030 SAE-21036 SAE-21048* SAE-21054* SAE-21060*	5 x 8 5 x 12 5 x 16 5 x 20 5 x 24 5 x 30 5 x 36 5 x 48 5 x 54 5 x 60	75 85 90 105 115 130 145 180 195 215	3000 3000 3000 3000 3000 3000 3000 300	FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI 39,125 LBS 31,150 LBS 25,360 LBS	19" 23" 27" 31" 35" 41" 47" 61" 68" 75"	2 1/2 2 1/2	1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4	#12 #12 #12 #12 #12 #12 #12 #12 #12 #12	1 1/2 1 1/2	1 1/4 1 1/4	2 1/16 2 1/16 2 1/16 2 1/16 2 1/16 2 1/16 2 1/16 2 1/16 2 1/16 2 1/16	5 3/4 5 3/4	4" 4" 4" 4" 4" 4" 4" 4" 4"
SAE-22008 SAE-22012 SAE-22016 SAE-22024 SAE-22030 SAE-22036 SAE-22036 SAE-22048* SAE-22054* SAE-22060*	6 x 8 6 x 12 6 x 16 6 x 24 6 x 30 6 x 36 6 x 48 6 x 54 6 x 60	100 110 125 150 170 190 240 265 290	3000 3000 3000 3000 3000 3000 3000 300	FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI FULL PSI 79,700 LBS 63,400 LBS 51,700 LBS	19" 23" 27" 35" 41" 47" 61" 68" 75"	3 3 3 3 3 3 3 3 3 3 3	1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4	#12 #12 #12 #12 #12 #12 #12 #12 #12 #12	1 1/2 1 1/2	1 1/4 1 1/4 1 1/4 1 1/4 1 1/4 1 1/4 1 1/4 1 1/4 1 1/4 1 1/4	2 1/16 2 1/16 2 1/16 2 1/16 2 1/16 2 1/16 2 1/16 2 1/16 2 1/16 2 1/16	6 3/4 6 3/4 6 3/4 6 3/4 6 3/4 6 3/4 6 3/4 6 3/4 6 3/4 6 3/4	4" 4" 4" 4" 4" 4" 4" 4"

ØC (TYP)

L2

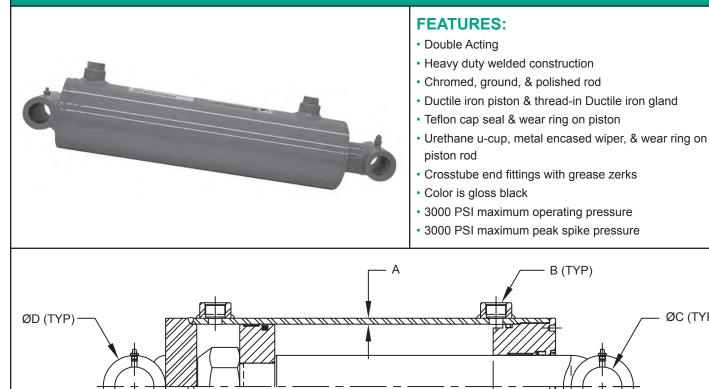
(TUBE

ŴIDTH)

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8 INCH BORE WELDED CYLINDER 3000 PSI STANDARD DUTY

8 INCH BORE Welded-DA-Heavy Duty



Rods are sized for a maximum safe push load (2:1 safety factor) given in the table. This is based on the pin configuration shown with no center support. Recommended pin material 100,000 PSI minimum yield strength

RETRACT

STROKE

Model No.	Style	Wt	PSI	Column Load (Lbs)	Ret	Rod Dia.	А	В	с	R	н	L1	L2
SAE-68008	8 x 8	250	3000	Full PSI	24	4	.38	#16 SAE	2 1/2	4	3	9	5
SAE-68012	8 x 12	275	3000	Full PSI	28	4	.38	#16 SAE	2 1/2	4	3	9	5
SAE-68016	8 x 16	300	3000	Full PSI	32	4	.38	#16 SAE	2 1/2	4	3	9	5
SAE-68020	8 x 20	325	3000	Full PSI	36	4	.38	#16 SAE	2 1/2	4	3	9	5
SAE-68024	8 x 24	350	3000	Full PSI	40	4	.38	#16 SAE	2 1/2	4	3	9	5
SAE-68030	8 x 30	385	3000	Full PSI	46	4	.38	#16 SAE	2 1/2	4	3	9	5
SAE-68036	8 x 36	425	3000	Full PSI	52	4	.38	#16 SAE	2 1/2	4	3	9	5
SAE-68048*	8 x 48	500	3000	Full PSI	66	4	.38	#16 SAE	2 1/2	4	3	9	5
SAE-68054*	8 x 54	540	3000	Full PSI	73	4	.38	#16 SAE	2 1/2	4	3	9	5
SAE-68060*	8 x 60	580	3000	Full PSI	80	4	.38	#16 SAE	2 1/2	4	3	9	5

Application Note:

11

(TUBE

WIDTH)

This Prince standard cylinder is designed for standard duty applications. It is not appropriate for applications that experience high shock loads, high spike pressures, high side loads, or have a high duty cycle. This product is not intended for use on personnel lift or crane applications. Consult your sales representative for cylinders designed to meet these applications.

* Spacers included in these models Note:

3000 PSI

THE "MAGNUM" Welded–DA–Heavy Duty

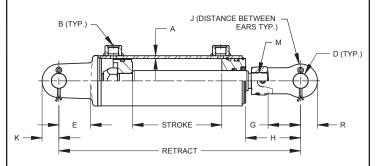


FEATURES:

- Double Acting • • Heavy duty welded
- construction Chromed, ground, & polished .
 - rod
- 3000 PSI maximum operating pressure
 - · Replaces The Sword Line

Color is gloss black

- Use of stroke controls not applicable to Magnum cylinders •



 Unitized piston Clevis cylinders

applicab

Rods are size	ed for a maxin	num sa	afe push	load (2:1 safe	ty factor)	given in	the ta	ble. This is	based	on the p	oin confi	guration s	hown wit	h no ce	enter suppo	rt.
Model No.	Style	Wt.	PSI	Column Load (Lbs.)	Retract	Rod. Dia	Α	В	D	Е	G	н	J	к	м	R
PC2008CL	2 X 8	14	3000	FULL PSI	18 1/4	1 1/8	3/16	#8 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1	1 1/8-12	1 1/8
*PC2008CL-ASAE	2 X 8	15	3000	FULL PSI	20 1/4	1 1/8	3/16	#8 SAE	1	2 1/8	2 1/8	5 11/16	1 1/16	1	1 1/8-12	1 1/8
*PC2010CL *PC2012CL	2 X 10 2 X 12	16 16	3000 3000	FULL PSI FULL PSI	20 1/4	1 1/8 1 1/8	3/16 3/16	#8 SAE #8 SAE	1	2 1/8 2 1/8	2 1/8 2 1/8	3 11/16 3 11/16	1 1/16	1	1 1/8-12 1 1/8-12	1 1/8
PC2012CL PC2016CL	2 X 12 2 X 16	19	3000	FULL PSI	26 1/4	1 1/8	3/16	#8 SAE		2 1/8	2 1/8	3 11/16	1 1/16		1 1/8-12	1 1/8
*PC2016CL-ASAE	2 X 16	21	3000	7,059	31 1/2	1 1/8	3/16	#8 SAE		2 1/8	2 1/8	8 15/16	1 1/16		1 1/8-12	1 1/8
*PC2020CL	2 X 20	22	3000	7,132	30 1/4	1 1/8	3/16	#8 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1	1 1/8-12	1 1/8
*PC2024CL	2 X 24	24	3000	5,304	34 1/4	1 1/8	3/16	#8 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1	1 1/8-12	1 1/8
PC2508CL	2 1/2 X 8	17	3000	FULL PSI	18 1/4	1 1/4	3/16	#8 SAE	1	2 1/8	2 1/8	3 15/16	1 1/16	1	1 1/8-12	1 1/8
*PC2508CL-ASAE	2 1/2 X 8	18	3000	FULL PSI	20 1/4	1 1/4	3/16	#8 SAE	1	2 1/8	2 1/8	5 11/16	1 1/16	1	1 1/8-12	1 1/8
*PC2510CL	2 1/2 X 10	19	3000	FULL PSI	20 1/4	1 1/4	3/16	#8 SAE	1	2 1/8	2 1/8	3 15/16	1 1/16	1	1 1/8-12	1 1/8
*PC2512CL	2 1/2 X 12	20	3000	FULL PSI	22 1/4	1 1/4	3/16	#8 SAE	1	2 1/8	2 1/8	3 15/16	1 1/16		1 1/8-12	1 1/8
PC2516CL *PC2516CL-ASAE	2 1/2 X 16 2 1/2 X 16	24 25	3000 3000	FULL PSI 10,710	26 1/4	1 1/4	3/16 3/16	#8 SAE #8 SAE	1	2 1/8 2 1/8	2 1/8 2 1/8	3 15/16 9 1/4	1 1/16	1	1 1/8-12	1 1/8
*PC2516CL-ASAE	2 1/2 X 16 2 1/2 X 20	25	3000	10,710	30 1/4	1 1/4	3/16	#8 SAE	1	2 1/8	2 1/8	3 15/16	1 1/16	1	1 1/8-12 1 1/8-12	1 1/8
*PC2524CL	2 1/2 X 20 2 1/2 X 24	30	3000	8,067	34 1/4	1 1/4	3/16	#8 SAE		2 1/8	2 1/8	3 15/16	1 1/16		1 1/8-12	1 1/8
PC3008CL	3 X 8	21	3000	FULL PSI	18 1/4	1 3/8	3/16	#8 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1 1/8	1 1/8-12	1 1/8
*PC3008CL-ASAE	3 X 8	22	3000	FULL PSI	20 1/4	1 3/8	3/16	#8 SAE		2 1/8	2 1/8	5 11/16	1 1/16	1 1/8	1 1/8-12	1 1/8
*PC3010CL	3 X 10	23	3000	FULL PSI	20 1/4	1 3/8	3/16	#8 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1 1/8	1 1/8-12	1 1/8
*PC3012CL	3 X 12	25	3000	FULL PSI	22 1/4	1 3/8	3/16	#8 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1 1/8	1 1/8-12	1 1/8
PC3016CL	3 X 16	29	3000	FULL PSI	26 1/4	1 3/8	3/16	#8 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1 1/8	1 1/8-12	1 1/8
PC3016CL-ASAE	3 X 16	31	3000	15,896	31 1/2	1 3/8	3/16	#8 SAE	1	2 1/8	2 1/8	8 15/16	1 1/16	1 1/8	1 1/8-12	1 1/8
*PC3020CL	3 X 20	33	3000	16,119	30 1/4	1 3/8	3/16	#8 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1 1/8	1 1/8-12	1 1/8
*PC3024CL	3 X 24	37	3000	11,988	34 1/4	1 3/8	3/16	#8 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1 1/8	1 1/8-12	1 1/8
PC3508CL	3 1/2 X 8	27	3000	FULL PSI	18 1/4	1 3/8	3/16	#8 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1 1/4	1 5/16-12	1 1/4
*PC3508CL-ASAE *PC3510CL	3 1/2 X 8 3 1/2 X 10	28 29	3000 3000	FULL PSI FULL PSI	20 1/4 20 1/4	1 3/8 1 3/8	3/16 3/16	#8 SAE #8 SAE	1	2 1/8 2 1/8	2 1/8 2 1/8	5 11/16 3 11/16	1 1/16		1 5/16-12 1 5/16-12	1 1/4
*PC3510CL	3 1/2 X 10	31	3000	FULL PSI	20 1/4	1 3/8	3/16	#8 SAE		2 1/8	2 1/8	3 11/16	1 1/16		1 5/16-12	1 1/4
PC3516CL	3 1/2 X 16	35	3000	23,121	26 1/4	1 3/8	3/16	#8 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16		1 5/16-12	1 1/4
PC3516CL-ASAE	3 1/2 X 16	38	3000	16,047	31 1/2	1 3/8	3/16	#8 SAE	1	2 1/8	2 1/8	8 15/16	1 1/16		1 5/16-12	1 1/4
PC3520CL	3 1/2 X 20	40	3000	16,329	30 1/4	1 3/8	3/16	#8 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1 1/4	1 5/16-12	1 1/4
*PC3524CL	3 1/2 X 24	44	3000	12,143	34 1/4	1 3/8	3/16	#8 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1 1/4	1 5/16-12	1 1/4
PC4008CL	4 X 8	35	3000	FULL PSI	18 1/4	1 3/4	7/32	#10 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1 1/4	1 1/2-12	1 1/4
*PC4008CL-ASAE	4 X 8	36	3000	FULL PSI	20 1/4	1 3/4	7/32	#10 SAE	1	2 1/8	2 1/8	5 11/16	1 1/16	1 1/4	1 1/2-12	1 1/4
*PC4010CL	4 X 10	38	3000	FULL PSI	20 1/4	1 3/4	7/32	#10 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1 1/4	1 1/2-12	1 1/4
*PC4012CL	4 X 12	41	3000	FULL PSI	22 1/4	1 3/4	7/32	#10 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1 1/4	1 1/2-12	
PC4016CL PC4016CL-ASAE	4 X 16 4 X 16	47 50	3000 3000	FULL PSI FULL PSI	26 1/4	1 3/4 1 3/4	7/32 7/32	#10 SAE #10 SAE	1	2 1/8 2 1/8	2 1/8 2 1/8	3 11/16 8 15/16	1 1/16	1 1/4 1 1/4	1 1/2-12 1 1/2-12	1 1/4
*PC4010CL-ASAE	4 X 20	53	3000	FULL PSI	30 1/4	1 3/4	7/32	#10 SAE		2 1/8	2 1/8	3 11/16	1 1/16	1 1/4	1 1/2-12	1 1/4
*PC4024CL	4 X 24	59	3000	31,557	34 1/4	1 3/4	7/32	#10 SAE		2 1/8	2 1/8	3 11/16	1 1/16	1 1/4	1 1/2-12	1 1/4
*PC4030CL	4 X 30	68	3000	21,673	40 1/4	1 3/4	7/32	#10 SAE	1	2 1/8	2 1/8	3 11/16	1 1/16	1 1/4	1 1/2-12	1 1/4
PC5008CL	5 X 8	62	3000	FULL PSI	20 1/4	2	3/8	#12 SAE	1 1/4	2 1/8	2 1/8	4 13/32	1 3/8	1 3/8	1 3/4-12	1 1/4
PC5010CL	5 X 10	67	3000	FULL PSI	22 1/4	2	3/8	#12 SAE	1 1/4	2 1/8	2 1/8	4 13/32	1 3/8	1 3/8	1 3/4-12	1 1/4
PC5012CL	5 X 12	72	3000	FULL PSI	24 1/4	2	3/8	#12 SAE	1 1/4	2 1/8	2 1/8	4 13/32	1 3/8	1 3/8	1 3/4-12	1 1/4
PC5016CL	5 X 16	82	3000	FULL PSI	28 1/4	2	3/8	#12 SAE	1 1/4	2 1/8	2 1/8	4 13/32	1 3/8	1 3/8	1 3/4-12	1 1/4
PC5016CL-ASAE	5 X 16	85	3000	FULL PSI	31 1/2	2	3/8	#12 SAE	1 1/4	2 1/8	2 1/8	4 13/32	1 3/8	1 3/8	1 3/4-12	1 1/4
PC5020CL	5 X 20	92 101	3000 3000	FULL PSI	32 1/4	2	3/8	#12 SAE	1 1/4	2 1/8	2 1/8	4 13/32	1 3/8 1 3/8	1 3/8	1 3/4-12	
PC5024CL PC5030CL	5 X 24 5 X 30	101	3000	50,970 35,411	36 1/4 42 1/4	2	3/8 3/8	#12 SAE #12 SAE	1 1/4 1 1/4	2 1/8 2 1/8	2 1/8 2 1/8	4 13/32 4 13/32	1 3/8	1 3/8 1 3/8	1 3/4-12 1 3/4-12	1 1/4
	0 / 00		3000	00,411	42 1/4	-	5/0	#12 0AL	1 1/4	2 1/0	2 1/0	4 10/02	1 3/3	1 3/3	1 3/4-12	
* Frequently stocked	items															

CYLINDERS AND ACCESSORIES

D (TYP.)

R

THE MAGNUM LINE

3000 PSI

B (TYP.)

Е

L1 (TUBE WIDTH)

κ

L2 (TUBE WIDTH)

STROKE

RETRACT

THE "MAGNUM" Welded–DA–Heavy Duty–Crosstube



FEATURES:

Unitized piston

- Double Acting
- · Heavy duty welded construction · Chromed, ground, & polished rod
- · Color is gloss black
- 3000 PSI maximum operating pressure
- Use of stroke controls not applicable to Magnum cylinders
- Crosstube cylinders · Crosstube end fitting with grease

zerks		9.040													
Rods a	re sized for a r	naxim	um safe p	ush load (2:1 s	afety facto		in the ta	ble. This is I	based or	the pin co	nfiguration	shown wi	th no ce	nter supp	ort.
Model No.	Style	Wt.	PSI	Column Load (Lbs.)	Retract	Rod. Dia	А	в	D	Е	н	к	L1	L2	R
PC2006XT	2 X 6	11	3000	FULL PSI	14	1 1/8	3/16	#8 SAE	1	-	3 5/16	1	2 3/8	1 1/2	3/4
*PC2008XT	2 X 8	12	3000	FULL PSI	16	1 1/8	3/16	#8 SAE	1	-	3 5/16	1	2 3/8	1 1/2	3/4
*PC2010XT	2 X 10	14	3000	FULL PSI	18	1 1/8	3/16	#8 SAE	1	-	3 5/16	1	2 3/8	1 1/2	3/4
*PC2012XT	2 X 12	15	3000	FULL PSI	20	1 1/8	3/16	#8 SAE	1	-	3 5/16	1	2 3/8	1 1/2	3/4
PC2014XT	2 X 14	16	3000	FULL PSI	22	1 1/8	3/16	#8 SAE	1	-	3 5/16	1	2 3/8	1 1/2	3/4
*PC2016XT	2 X 16	17	3000	FULL PSI	24	1 1/8	3/16	#8 SAE	1	-	3 5/16	1	2 3/8	1 1/2	3/4
PC2018XT	2 X 18	19	3000	8,939	26	1 1/8	3/16	#8 SAE	1	-	3 5/16	1	2 3/8	1 1/2	3/4
*PC2020XT	2 X 20	20	3000	7,533	28	1 1/8	3/16	#8 SAE	1	-	3 5/16	1	2 3/8	1 1/2	3/4
*PC2024XT	2 X 24	23	3000	5,559	32	1 1/8	3/16	#8 SAE	1	-	3 5/16	1	2 3/8	1 1/2	3/4
PC2030XT	2 X 30	27	3000	3,788	38	1 1/8	3/16	#8 SAE	1	-	3 5/16	1	2 3/8	1 1/2	3/4
PC2506XT	2 1/2 X 6	14	3000	FULL PSI	14	1 3/8	3/16	#8 SAE	1	3/8	3 1/2	3/4	3	1 3/8	7/8
PC2508XT	2 1/2 X 8	16	3000	FULL PSI	16	1 3/8	3/16	#8 SAE	1	3/8	3 1/2	3/4	3	1 3/8	7/8
PC2510XT	2 1/2 X 10	18	3000	FULL PSI	18	1 3/8	3/16	#8 SAE	1	3/8	3 1/2	3/4	3	1 3/8	7/8
PC2512XT	2 1/2 X 12	19	3000	FULL PSI	20	1 3/8	3/16	#8 SAE	1	3/8	3 1/2	3/4	3	1 3/8	7/8
PC2514XT	2 1/2 X 14	21	3000	FULL PSI	22	1 3/8	3/16	#8 SAE	1	3/8	3 1/2	3/4	3	1 3/8	7/8
PC2516XT	2 1/2 X 16	23	3000	FULL PSI	24	1 3/8	3/16	#8 SAE		3/8	3 1/2	3/4	3	1 3/8	7/8
PC2518XT	2 1/2 X 18	25	3000	FULL PSI	26	1 3/8	3/16	#8 SAE		3/8	3 1/2	3/4	3	1 3/8	7/8
PC2520XT	2 1/2 X 20	26	3000	FULL PSI	28	1 3/8	3/16	#8 SAE		3/8	3 1/2	3/4	3	1 3/8	7/8
PC2524XT	2 1/2 X 24	30 35	3000 3000	12,185	32 38	1 3/8 1 3/8	3/16 3/16	#8 SAE	1	3/8 3/8	3 1/2 3 1/2	3/4 3/4	3	1 3/8	7/8 7/8
PC2530XT	2 1/2 X 30			8,314				#8 SAE				-		1 3/8	
PC3006XT	3 X 6	18	3000	FULL PSI	14	1 1/2	3/16	#8 SAE		3/8	3 1/4	3/4	3 1/2	1 1/2	1 3/16
PC3008XT	3 X 8	20	3000	FULL PSI	16	1 1/2	3/16	#8 SAE		3/8	3 1/4	3/4	3 1/2	1 1/2	1 3/16
PC3010XT PC3012XT	3 X 10 3 X 12	22 24	3000 3000	FULL PSI FULL PSI	18 20	1 1/2 1 1/2	3/16 3/16	#8 SAE #8 SAE	1	3/8 3/8	3 1/4 3 1/4	3/4 3/4	3 1/2 3 1/2	1 1/2 1 1/2	1 3/16 1 3/16
PC3012X1 PC3014XT	3 X 12 3 X 14	24	3000	FULL PSI	20	1 1/2	3/16	#8 SAE		3/8	3 1/4	3/4	3 1/2	1 1/2	1 3/16
PC3014X1	3 X 14 3 X 16	29	3000	FULL PSI	24	1 1/2	3/16	#8 SAE		3/8	3 1/4	3/4	3 1/2	1 1/2	1 3/16
PC3018XT	3 X 18	31	3000	FULL PSI	26	1 1/2	3/16	#8 SAE		3/8	3 1/4	3/4	3 1/2	1 1/2	1 3/16
PC3020XT	3 X 20	33	3000	FULL PSI	28	1 1/2	3/16	#8 SAE		3/8	3 1/4	3/4	3 1/2	1 1/2	1 3/16
PC3024XT	3 X 24	37	3000	17,571	32	1 1/2	3/16	#8 SAE	1	3/8	3 1/4	3/4	3 1/2	1 1/2	1 3/16
PC3030XT	3 X 30	43	3000	11,971	38	1 1/2	3/16	#8 SAE	1	3/8	3 1/4	3/4	3 1/2	1 1/2	1 3/16
PC3032XT	3 X 32	45	3000	10,690	40	1 1/2	3/16	#8 SAE	1	3/8	3 1/4	3/4	3 1/2	1 1/2	1 3/16
PC3036XT	3 X 36	49	3000	8,677	44	1 1/2	3/16	#8 SAE	1	3/8	3 1/4	3/4	3 1/2	1 1/2	1 3/16
PC3040XT	3 X 40	53	3000	7,182	48	1 1/2	3/16	#8 SAE	1	3/8	3 1/4	3/4	3 1/2	1 1/2	1 3/16
PC3048XT	3 X 48	62	3000	5,155	56	1 1/2	3/16	#8 SAE	1	3/8	3 1/4	3/4	3 1/2	1 1/2	1 3/16
PC3506XT	3 1/2 X 6	24	3000	FULL PSI	14	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1	4	1 3/4	1 3/16
PC3508XT	3 1/2 X 8	27	3000	FULL PSI	16	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1	4	1 3/4	1 3/16
PC3510XT	3 1/2 X 10	29	3000	FULL PSI	18	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1	4	1 3/4	1 3/16
PC3512XT	3 1/2 X 12	32	3000	FULL PSI	20	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1	4	1 3/4	1 3/16
PC3514XT	3 1/2 X 14	35	3000	FULL PSI	22	1 3/4	3/16	#8 SAE	1 1/4	5/8	3		4	1 3/4	1 3/16
PC3516XT	3 1/2 X 16	37	3000	FULL PSI	24	1 3/4	3/16	#8 SAE		5/8	3	1	4	1 3/4	1 3/16
PC3518XT PC3520XT	3 1/2 X 18 3 1/2 X 20	40 42	3000 3000	FULL PSI FULL PSI	26 28	1 3/4 1 3/4	3/16 3/16	#8 SAE #8 SAE	1 1/4	5/8 5/8	3		4	1 3/4 1 3/4	1 3/16 1 3/16
PC3520X1 PC3524XT	3 1/2 X 20 3 1/2 X 24	42	3000	FULL PSI	20 32	1 3/4	3/16	#0 SAE #8 SAE	1 1/4	5/8	3		4	1 3/4	1 3/16
PC3524X1 PC3530XT	3 1/2 X 24 3 1/2 X 30	40 55	3000	22,150	32	1 3/4	3/16	#8 SAE	1 1/4	5/8	3		4	1 3/4	1 3/16
PC3532XT	3 1/2 X 32	58	3000	19,772	40	1 3/4	3/16	#8 SAE	1 1/4	5/8	3		4	1 3/4	1 3/16
PC3536XT	3 1/2 X 36	63	3000	16,034	44	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1	4	1 3/4	1 3/16
PC3540XT	3 1/2 X 40	68	3000	13,264	48	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1	4	1 3/4	1 3/16
PC3542XT	3 1/2 X 42	71	3000	12,141	50	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1	4	1 3/4	1 3/16
DC2E40VT	2 4/2 V 40	1 70 I	2000	0 544	50	4 3/4	2/40	#0 CAE	4 4/4	E /0	l .			4 9/4	4 2/40

* Frequently stocked items

PRINCE MANUFACTURING CORPORATION • NORTH SIOUX CITY, SOUTH DAKOTA 57049 URL: www.princehyd.com • E-MAIL: prince@princehyd.com • PHONE: (605) 235-1220

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Continued on next page

#8 SAE

1 1/4

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3

1

PC3548XT

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4

SEE PAGE 2 OF THE STANDARD PRODUCT PRICE LIST FOR PRICING

56

1 3/4

3 1/2 X 48

3000

9,511

79



3000 PSI

THE "MAGNUM" Welded–DA–Heavy Duty–Crosstube

Continued from C9

Rods ar	re sized for a	maxim	um safe p	oush load (2:1 s	afety facto	or) given	in the ta	ble. This is I	based or	n the pin co	nfiguration :	shown wi	th no cen	ter supp	ort.
Model No.	Style	Wt.	PSI	Column Load (Lbs.)	Retract	Rod. Dia	A	в	D	Е	н	к	L1	L2	R
PC4008XT	4 X 8	36	3000	FULL PSI	17	2	7/32	#10 SAE	1 1/4	25/32	3 27/32	1	4 1/2	2	1 5/16
PC4012XT	4 X 12	43	3000	FULL PSI	21	2	7/32	#10 SAE	1 1/4	25/32	3 27/32	1	4 1/2	2	1 5/16
PC4016XT	4 X 16	50	3000	FULL PSI	25	2	7/32	#10 SAE	1 1/4	25/32	3 27/32	1	4 1/2	2	1 5/16
PC4020XT	4 X 20	56	3000	FULL PSI	29	2	7/32	#10 SAE	1 1/4	25/32	3 27/32	1	4 1/2	2	1 5/16
PC4024XT	4 X 24	63	3000	FULL PSI	33	2	7/32	#10 SAE	1 1/4	25/32	3 27/32	1	4 1/2	2	1 5/16
PC4030XT	4 X 30	73	3000	36,361	39	2	7/32	#10 SAE	1 1/4	25/32	3 27/32	1	4 1/2	2	1 5/16
PC4032XT	4 X 32	77	3000	32,527	41	2	7/32	#10 SAE	1 1/4	25/32	3 27/32	1	4 1/2	2	1 5/16
PC4036XT	4 X 36	84	3000	26,476	45	2	7/32	#10 SAE	1 1/4	25/32	3 27/32	1	4 1/2	2	1 5/16
PC4040XT	4 X 40	91	3000	21,970	49	2	7/32	#10 SAE	1 1/4	25/32	3 27/32	1	4 1/2	2	1 5/16
PC4042XT	4 X 42	94	3000	20,136	51	2	7/32	#10 SAE	1 1/4	25/32	3 27/32	1	4 1/2	2	1 5/16
PC4048XT	4 X 48	104	3000	15,828	57	2	7/32	#10 SAE	1 1/4	25/32	3 27/32	1	4 1/2	2	1 5/16
PC4060XT	4 X 60	125	3000	10,516	69	2	7/32	#10 SAE	1 1/4	25/32	3 27/32	1	4 1/2	2	1 5/16
*PC5008XT	5 X 8	73	3000	FULL PSI	19	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
*PC5012XT	5 X 12	84	3000	FULL PSI	23	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
*PC5016XT	5 X 12	96	3000	FULL PSI	23	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
*PC5020XT	5 X 20	108	3000	FULL PSI	31	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
*PC5024XT	5 X 24	120	3000	FULL PSI	35	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
*PC5030XT	5 X 30	138	3000	FULL PSI	41	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
*PC5036XT	5 X 36	155	3000	FULL PSI	47	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
*PC5048XT	5 X 48	191	3000	39,125	59	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
PC5050XT	5 X 50	195	3000	36,900	61	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
PC5054XT	5 X 54	210	3000	32,100	65	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
PC5057XT	5 X 57	215	3000	29,075	68	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
*PC5060XT	5 X 60	226	3000	26,000	71	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
PC5064XT	5 X 64	235	3000	23,500	75	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
PC5066XT	5 X 66	245	3000	22,100	77	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
PC5071XT	5 X 71	255	3000	19,300	82	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
PC5072XT	5 X 72	260	3000	18,800	83	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
PC5078XT	5 X 78	280	3000	16,000	89	2.5	5/16	#12	1 1/2	1 1/8	4	1 1/4	5 3/4	4	1 13/32
PC6008XT	6 X 8	100	3000	FULL PSI	19	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
PC6012XT	6 X 12	110	3000	FULL PSI	23	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
PC6016XT	6 X 16	125	3000	FULL PSI	27	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
PC6024XT	6 X 24	150	3000	FULL PSI	35	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
PC6030XT	6 X 30	170	3000	FULL PSI	41	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
PC6036XT	6 X 36	190	3000	FULL PSI	47	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
*PC6048XT	6 X 48	240	3000	83,000	59	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
PC6050XT	6 X 50	250	3000	77,200	61	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
PC6054XT	6 X 54	265	3000	66,900	65	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
PC6057XT	6 X 57	270	3000	60,500	68	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
PC6060XT	6 X 60	290	3000	55,000	71	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
PC6064XT	6 X 64	305	3000	48,700	75	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
PC6066XT	6 X 66	315	3000	46,000	77	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
PC6071XT	6 X 71	335	3000	40,100	82	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
PC6072XT	6 X 72	340	3000	39,000	83	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
PC6078XT	6 X 78	370	3000	33,500	89	3	1/4	#12	1 1/2	1 5/16	2 1/16	1 1/4	6 3/4	4	1 13/32
* Frequently sto						-							r	· ·	

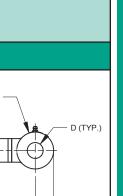
* Frequently stocked items

Magnum 5" and 6" cylinder cross-reference to Gladiator Line

Any Magnum 5 & 6 inch bore cylinder, with a stroke of less than 48 inches, has the same correlating retract of the Gladiator Line. For cylinders with 48 inches of stroke or longer, see the chart below for a cross-reference.

Gladiator Line	Stroke	Retract	Magnum Line (Stroke Match)	Stroke	Retract	Magnum Line (Retract Match)	Stroke	Retract
SAE-21048 SAE-21054 SAE-21060 SAE-21066 SAE-21072	48 54 60 66 72	61 68 75 82 89	PC5048XT PC5054XT PC5060XT PC5066XT PC5066XT PC5072XT	48 54 60 66 72	59 65 71 77 83	PC5050XT PC5057XT PC5064XT PC5071XT PC5074XT	50 57 64 71 78	61 68 75 82 89
SAE-22072 SAE-22048 SAE-22054 SAE-22060 SAE-22066 SAE-22072	48 54 60 66 72	61 68 75 82 89	PC6048XT PC6054XT PC6054XT PC6060XT PC6066XT PC6072XT	48 54 60 66 72	59 65 71 77 83	PC6050XT PC6057XT PC6064XT PC6071XT PC6074XT	50 57 64 71 78	61 68 75 82 89

Reference engineering drawing for column load ratings.



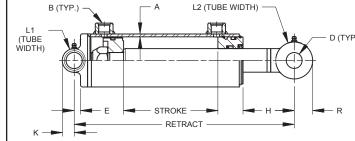
3000 PSI

THE "MAGNUM" Welded–DA–Heavy Duty–Crosstube (Medium)



FEATURES:

- Double Acting
 Heavy duty welded construction
 Chromed, ground, & polished rod
- Unitized piston Crosstube cylinders
- · Crosstube end fitting with grease zerks
- Color is gloss black
 3000 PSI maximum operating pressure
- · Use of stroke controls not applicable to
- Magnum cylinders



_	Rods a	re sized for a r	maxim	um safe p	ush load (2:1 s	afety facto	or) given	in the ta	ble. This is t	based or	the pin co	nfiguration	shown wi	th no cen	ter suppo	ort.
	Model No.	Style	Wt.	PSI	Column Load (Lbs.)	Retract	Rod. Dia	A	в	D	Е	н	к	L1	L2	R
	C2006XM	2 X 6	12	3000	FULL PSI	14	1 1/8	3/16	#8 SAE	1	-	3 9/32	1	2 3/8	2	3/4
	C2008XM C2010XM	2 X 8 2 X 10	13 15	3000 3000	FULL PSI FULL PSI	16 18	1 1/8 1 1/8	3/16 3/16	#8 SAE #8 SAE	1	-	3 9/32 3 9/32	1	2 3/8 2 3/8	2 2	3/4 3/4
	C2010XW	2 X 10 2 X 12	16	3000	FULL PSI	20	1 1/8	3/16	#8 SAE			3 9/32		2 3/8	2	3/4
	C2014XM	2 X 14	17	3000	FULL PSI	22	1 1/8	3/16	#8 SAE	li	-	3 9/32	1	2 3/8	2	3/4
P	C2016XM	2 X 16	19	3000	FULL PSI	24	1 1/8	3/16	#8 SAE	1	-	3 9/32	1	2 3/8	2	3/4
	C2018XM	2 X 18	20	3000	8,939	26	1 1/8	3/16	#8 SAE		-	3 9/32		2 3/8	2	3/4
	C2020XM C2024XM	2 X 20 2 X 24	21 24	3000 3000	7,533 5,559	28 32	1 1/8 1 1/8	3/16 3/16	#8 SAE #8 SAE	1		3 9/32 3 9/32		2 3/8 2 3/8	2 2	3/4 3/4
	C2030XM	2 X 30	28	3000	3,788	38	1 1/8	3/16	#8 SAE	1		3 9/32	1	2 3/8	2	3/4
P	C2506XM	2 1/2 X 6	14	3000	FULL PSI	14	1 3/8	3/16	#8 SAE	1	13/32	3 17/32	25/32	3	2	25/32
	C2508XM	2 1/2 X 8	16	3000	FULL PSI	16	1 3/8	3/16	#8 SAE	1	13/32	3 17/32	25/32	3	2	25/32
	C2510XM	2 1/2 X 10	17	3000	FULL PSI FULL PSI	18	1 3/8	3/16	#8 SAE		13/32	3 17/32	25/32	3	2 2	25/32
	C2512XM C2514XM	2 1/2 X 12 2 1/2 X 14	19 20	3000 3000	FULL PSI	20 22	1 3/8 1 3/8	3/16 3/16	#8 SAE #8 SAE	1	13/32 13/32	3 17/32 3 17/32	25/32 25/32	3 3	2	25/32 25/32
	C2516XM	2 1/2 X 16	22	3000	FULL PSI	24	1 3/8	3/16	#8 SAE	li	13/32	3 17/32	25/32	3	2	25/32
	C2518XM	2 1/2 X 18	24	3000	FULL PSI	26	1 3/8	3/16	#8 SAE	1	13/32	3 17/32	25/32	3	2	25/32
	C2520XM	2 1/2 X 20	25	3000	FULL PSI	28	1 3/8	3/16	#8 SAE		13/32	3 17/32	25/32	3	2	25/32
	C2524XM C2530XM	2 1/2 X 24 2 1/2 X 30	28 33	3000 3000	12,124 8,280	32 38	1 3/8 1 3/8	3/16 3/16	#8 SAE #8 SAE	1	13/32 13/32	3 17/32 3 17/32	25/32 25/32	3 3	2 2	25/32 25/32
	C3006XM	3 X 6	19	3000	FULL PSI	14	1 1/2	3/16	#8 SAE	1	13/32	3 1/4	13/16	3 1/2	2	29/32
	C3008XM	3 X 8	21	3000	FULL PSI	16	1 1/2	3/16	#8 SAE	1	13/32	3 1/4	13/16	3 1/2	2	29/32
	C3010XM	3 X 10	22	3000	FULL PSI	18	1 1/2	3/16	#8 SAE		13/32	3 1/4	13/16	3 1/2	2	29/32
	C3012XM C3014XM	3 X 12 3 X 14	24 26	3000 3000	FULL PSI FULL PSI	20 22	1 1/2 1 1/2	3/16 3/16	#8 SAE #8 SAE	1	13/32 13/32	3 1/4 3 1/4	13/16 13/16	3 1/2 3 1/2	2 2	29/32 29/32
	C3016XM	3 X 16	28	3000	FULL PSI	24	1 1/2	3/16	#8 SAE	li	13/32	3 1/4	13/16	3 1/2	2	29/32
	C3018XM	3 X 18	30	3000	FULL PSI	26	1 1/2	3/16	#8 SAE	1	13/32	3 1/4	13/16	3 1/2	2	29/32
	C3020XM	3 X 20	32	3000	FULL PSI	28	1 1/2	3/16	#8 SAE	1	13/32	3 1/4	13/16	3 1/2	2	29/32
	C3024XM	3 X 24	36	3000	17,571	32	1 1/2	3/16	#8 SAE		13/32	3 1/4	13/16	3 1/2	2	29/32
	C3030XM C3032XM	3 X 30 3 X 32	42 43	3000 3000	11,973 10,687	38 40	1 1/2 1 1/2	3/16 3/16	#8 SAE #8 SAE	1	13/32 13/32	3 1/4 3 1/4	13/16 13/16	3 1/2 3 1/2	2 2	29/32 29/32
	C3036XM	3 X 36	47	3000	8,677	44	1 1/2	3/16	#8 SAE	li	13/32	3 1/4	13/16	3 1/2	2	29/32
P	C3040XM	3 X 40	51	3000	7,182	48	1 1/2	3/16	#8 SAE	1	13/32	3 1/4	13/16	3 1/2	2	29/32
	C3048XM	3 X 48	61	3000	5,155	56	1 1/2	3/16	#8 SAE	1	13/32	3 1/4	13/16	3 1/2	2	29/32
	C3506XM	3 1/2 X 6	22	3000	FULL PSI	14	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/4	1 3/32
	C3508XM C3510XM	3 1/2 X 8 3 1/2 X 10	24 26	3000 3000	FULL PSI FULL PSI	16 18	1 3/4 1 3/4	3/16 3/16	#8 SAE #8 SAE	1 1/4	5/8 5/8	3	1 1/32 1 1/32	4 4	2 1/4 2 1/4	1 3/32 1 3/32
	C3512XM	3 1/2 X 12	28	3000	FULL PSI	20	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/4	1 3/32
P	C3514XM	3 1/2 X 14	30	3000	FULL PSI	22	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/4	1 3/32
	C3516XM	3 1/2 X 16	32	3000	FULL PSI	24	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/4	1 3/32
	C3518XM C3520XM	3 1/2 X 18 3 1/2 X 20	35 37	3000 3000	FULL PSI FULL PSI	26 28	1 3/4 1 3/4	3/16 3/16	#8 SAE #8 SAE	1 1/4	5/8 5/8	3	1 1/32 1 1/32	4 4	2 1/4 2 1/4	1 3/32 1 3/32
	C3524XM	3 1/2 X 24	41	3000	FULL PSI	32	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/4	1 3/32
	C3530XM	3 1/2 X 30	47	3000	22,050	38	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/4	1 3/32
	C3532XM	3 1/2 X 32	49	3000	19,693	40	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/4	1 3/32
	C3536XM	3 1/2 X 36 3 1/2 X 40	53 57	3000	15,980	44 48	1 3/4 1 3/4	3/16 3/16	#8 SAE		5/8 5/8	3	1 1/32 1 1/32	4 4	2 1/4 2 1/4	1 3/32 1 3/32
	C3540XM C3542XM	3 1/2 X 40 3 1/2 X 42	57	3000 3000	13,221 12,103	40 50	1 3/4	3/16	#8 SAE #8 SAE	1 1/4 1 1/4	5/8	3	1 1/32	4	2 1/4 2 1/4	1 3/32
	C3548XM	3 1/2 X 48	68	3000	9,485	56	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/4	1 3/32
	C4008XM	4 X 8	36	3000	FULL PSI	17	2	7/32	#10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	2 1/2	1 5/16
	C4012XM	4 X 12	43	3000	FULL PSI	21	2	7/32	#10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	2 1/2	1 5/16
	C4016XM C4020XM	4 X 16 4 X 20	50 56	3000 3000	FULL PSI FULL PSI	25 29	2 2	7/32 7/32	#10 SAE #10 SAE	1 1/4 1 1/4	25/32 25/32	3 13/16 3 13/16	1 1/16 1 1/16	4 1/2 4 1/2	2 1/2 2 1/2	1 5/16 1 5/16
	C4024XM	4 X 24	63	3000	FULL PSI	33	2	7/32	#10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	2 1/2	1 5/16
*P	C4030XM	4 X 30	73	3000	36,361	39	2	7/32	#10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	2 1/2	1 5/16
	C4032XM	4 X 32	77	3000	32,527	41	2	7/32	#10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	2 1/2	1 5/16
	C4036XM C4040XM	4 X 36	84 91	3000	26,476	45	2 2	7/32	#10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	2 1/2	1 5/16 1 5/16
	C4040XM	4 X 40 4 X 42	91	3000 3000	21,970 20,136	49 51	2	7/32 7/32	#10 SAE #10 SAE	1 1/4 1 1/4	25/32 25/32	3 13/16 3 13/16	1 1/16 1 1/16	4 1/2 4 1/2	2 1/2 2 1/2	1 5/16
	C4048XM	4 X 48	104	3000	15,828	57	2	7/32	#10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	2 1/2	1 5/16
	C4060XM	4 X 60	125	3000	10,516	69	2	7/32	#10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	2 1/2	1 5/16
* Fn	equently st	ocked items														

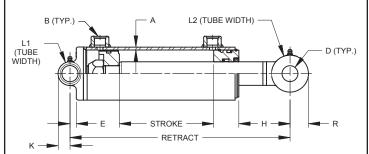
CATC 11-11-23-01

THE "MAGNUM" Welded–DA–Heavy Duty–Crosstube (Long)



FEATURES:

- Double Acting
- Heavy duty welded construction
- · Chromed, ground, & polished rod
- Unitized piston
- Crosstube cylinders
- Crosstube end fitting with grease zerks
- Color is gloss black
- 3000 PSI maximum operating pressure
 Use of stroke controls not applicable to
- Magnum cylinders



Rods a	re sized for a r	maxim	um safe p	oush load (2:1 s	afety facto	or) given	in the ta	ble. This is t	based on	the pin cor	nfiguration	shown wi	th no cen	ter supp	ort.
Model	Style	Wt.	PSI	Column	Retract	Rod.		_		_					
No. PC2006XL	2 X 6	12	3000	Load (Lbs.) FULL PSI	14	Dia 1 1/8	A 3/16	B #8 SAE	D 1	E -	H 3 9/32	<u>к</u> 1	L1 2 3/8	L2 2 1/4	R 3/4
PC2006XL PC2008XL	2 X 8	12	3000	FULL PSI	14	1 1/8	3/16	#0 SAE #8 SAE		-	3 9/32	1	2 3/0	2 1/4	3/4
PC2010XL	2 X 10	15	3000	FULL PSI	18	1 1/8	3/16	#8 SAE	1	-	3 9/32	1	2 3/8	2 1/4	3/4
PC2012XL	2 X 12	16	3000	FULL PSI	20	1 1/8	3/16	#8 SAE	1	-	3 9/32	1	2 3/8	2 1/4	3/4
PC2014XL PC2016XL	2 X 14 2 X 16	17 19	3000 3000	FULL PSI FULL PSI	22 24	1 1/8 1 1/8	3/16 3/16	#8 SAE #8 SAE	1	-	3 9/32 3 9/32	1	2 3/8 2 3/8	2 1/4 2 1/4	3/4 3/4
PC2018XL	2 X 18	20	3000	8,939	24	1 1/8	3/16	#8 SAE		-	3 9/32	1	2 3/8	2 1/4	3/4
PC2020XL	2 X 20	21	3000	7,533	28	1 1/8	3/16	#8 SAE	1	-	3 9/32	1	2 3/8	2 1/4	3/4
PC2024XL	2 X 24	24	3000	5,559	32	1 1/8	3/16	#8 SAE	1	-	3 9/32	1	2 3/8	2 1/4	3/4
PC2030XL	2 X 30	28	3000	3,788	38	1 1/8	3/16	#8 SAE	1	-	3 9/32	1	2 3/8	2 1/4	3/4
PC2506XL *PC2508XL	2 1/2 X 6 2 1/2 X 8	14 16	3000 3000	FULL PSI FULL PSI	14 16	1 3/8 1 3/8	3/16 3/16	#8 SAE #8 SAE	1	13/32 13/32	3 17/32 3 17/32	25/32 25/32	3 3	2 1/4 2 1/4	25/32 25/32
PC2510XL	2 1/2 X 10	17	3000	FULL PSI	18	1 3/8	3/16	#8 SAE		13/32	3 17/32	25/32	3	2 1/4	25/32
PC2512XL	2 1/2 X 12	19	3000	FULL PSI	20	1 3/8	3/16	#8 SAE	1	13/32	3 17/32	25/32	3	2 1/4	25/32
PC2514XL	2 1/2 X 14	20	3000	FULL PSI	22	1 3/8	3/16	#8 SAE	1	13/32	3 17/32	25/32	3	2 1/4	25/32
PC2516XL *PC2518XL	2 1/2 X 16 2 1/2 X 18	22 24	3000 3000	FULL PSI FULL PSI	24 26	1 3/8 1 3/8	3/16 3/16	#8 SAE #8 SAE	1	13/32 13/32	3 17/32 3 17/32	25/32 25/32	3 3	2 1/4 2 1/4	25/32 25/32
*PC2520XL	2 1/2 X 20	25	3000	FULL PSI	28	1 3/8	3/16	#8 SAE		13/32	3 17/32	25/32	3	2 1/4	25/32
*PC2524XL	2 1/2 X 24	28	3000	12,124	32	1 3/8	3/16	#8 SAE	1	13/32	3 17/32	25/32	3	2 1/4	25/32
PC2530XL	2 1/2 X 30	33	3000	8,280	38	1 3/8	3/16	#8 SAE	1	13/32	3 17/32	25/32	3	2 1/4	25/32
PC3006XL	3 X 6	19	3000	FULL PSI	14	1 1/2	3/16	#8 SAE		13/32	3 1/4	13/16	3 1/2	2 1/4	29/32
*PC3008XL PC3010XL	3 X 8 3 X 10	21 22	3000 3000	FULL PSI FULL PSI	16 18	1 1/2 1 1/2	3/16 3/16	#8 SAE #8 SAE	1	13/32 13/32	3 1/4 3 1/4	13/16 13/16	3 1/2 3 1/2	2 1/4 2 1/4	29/32 29/32
*PC3012XL	3 X 12	24	3000	FULL PSI	20	1 1/2	3/16	#8 SAE		13/32	3 1/4	13/16	3 1/2	2 1/4	29/32
PC3014XL	3 X 14	26	3000	FULL PSI	22	1 1/2	3/16	#8 SAE	1	13/32	3 1/4	13/16	3 1/2	2 1/4	29/32
*PC3016XL	3 X 16	28	3000	FULL PSI	24	1 1/2	3/16	#8 SAE		13/32	3 1/4	13/16	3 1/2	2 1/4	29/32
*PC3018XL *PC3020XL	3 X 18 3 X 20	30 32	3000 3000	FULL PSI FULL PSI	26 28	1 1/2 1 1/2	3/16 3/16	#8 SAE #8 SAE	1	13/32 13/32	3 1/4 3 1/4	13/16 13/16	3 1/2 3 1/2	2 1/4 2 1/4	29/32 29/32
*PC3024XL	3 X 24	36	3000	17,571	32	1 1/2	3/16	#8 SAE		13/32	3 1/4	13/16	3 1/2	2 1/4	29/32
PC3030XL	3 X 30	42	3000	11,973	38	1 1/2	3/16	#8 SAE	1	13/32	3 1/4	13/16	3 1/2	2 1/4	29/32
PC3032XL	3 X 32	43	3000	10,687	40	1 1/2	3/16	#8 SAE		13/32	3 1/4	13/16	3 1/2	2 1/4	29/32
PC3036XL PC3040XL	3 X 36 3 X 40	47 51	3000 3000	8,677 7,182	44 48	1 1/2 1 1/2	3/16 3/16	#8 SAE #8 SAE	1	13/32 13/32	3 1/4 3 1/4	13/16 13/16	3 1/2 3 1/2	2 1/4 2 1/4	29/32 29/32
PC3048XL	3 X 48	61	3000	5,155	56	1 1/2	3/16	#8 SAE		13/32	3 1/4	13/16	3 1/2	2 1/4	29/32
PC3506XL	3 1/2 X 6	22	3000	FULL PSI	14	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/2	1 3/32
PC3508XL	3 1/2 X 8	24	3000	FULL PSI	16	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/2	1 3/32
PC3510XL PC3512XL	3 1/2 X 10 3 1/2 X 12	26 28	3000 3000	FULL PSI FULL PSI	18 20	1 3/4 1 3/4	3/16 3/16	#8 SAE #8 SAE	1 1/4 1 1/4	5/8 5/8	3 3	1 1/32 1 1/32	4 4	2 1/2 2 1/2	1 3/32 1 3/32
PC3512XL	3 1/2 X 12	30	3000	FULL PSI	20	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/2	1 3/32
PC3516XL	3 1/2 X 16	32	3000	FULL PSI	24	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/2	1 3/32
PC3518XL	3 1/2 X 18	35	3000	FULL PSI	26	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/2	1 3/32
PC3520XL	3 1/2 X 20 3 1/2 X 24	37 41	3000 3000	FULL PSI FULL PSI	28 32	1 3/4 1 3/4	3/16 3/16	#8 SAE #8 SAE	1 1/4 1 1/4	5/8 5/8	3 3	1 1/32 1 1/32	4 4	2 1/2 2 1/2	1 3/32 1 3/32
PC3524XL PC3530XL	3 1/2 X 24	41	3000	22,050	32 38	1 3/4	3/16	#8 SAE	1 1/4	5/6 5/8	3	1 1/32	4	2 1/2	1 3/32
PC3532XL	3 1/2 X 32	49	3000	19,693	40	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/2	1 3/32
PC3536XL	3 1/2 X 36	53	3000	15,980	44	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/2	1 3/32
PC3540XL PC3542XL	3 1/2 X 40 3 1/2 X 42	57 59	3000 3000	13,221 12,103	48 50	1 3/4 1 3/4	3/16 3/16	#8 SAE #8 SAE	1 1/4 1 1/4	5/8 5/8	3 3	1 1/32 1 1/32	4	2 1/2 2 1/2	1 3/32 1 3/32
PC3542XL PC3548XL	3 1/2 X 42	68	3000	9,485	50 56	1 3/4	3/16	#8 SAE	1 1/4	5/8	3	1 1/32	4	2 1/2	1 3/32
PC4008XL	4 X 8	36	3000	FULL PSI	17	2	7/32	#10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	4	1 1/8
PC4012XL	4 X 12	43	3000	FULL PSI	21	2	7/32	#10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	4	1 1/8
PC4016XL PC4020XL	4 X 16 4 X 20	50 56	3000 3000	FULL PSI FULL PSI	25 29	2 2	7/32 7/32	#10 SAE #10 SAE	1 1/4 1 1/4	25/32 25/32	3 13/16 3 13/16	1 1/16 1 1/16	4 1/2 4 1/2	4	1 1/8 1 1/8
PC4020XL PC4024XL	4 X 20 4 X 24	63	3000	FULL PSI	29 33	2	7/32	#10 SAE #10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	4	1 1/8
PC4030XL	4 X 30	73	3000	36,361	39	2	7/32	#10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	4	1 1/8
PC4032XL	4 X 32	77	3000	32,527	41	2	7/32	#10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	4	1 1/8
PC4036XL PC4040XL	4 X 36 4 X 40	84 91	3000 3000	26,476 21,970	45 49	2 2	7/32 7/32	#10 SAE #10 SAE	1 1/4 1 1/4	25/32 25/32	3 13/16 3 13/16	1 1/16 1 1/16	4 1/2 4 1/2	4	1 1/8 1 1/8
PC4040XL PC4042XL	4 X 40 4 X 42	94	3000	20,136	49 51	2	7/32	#10 SAE #10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	4	1 1/8
PC4048XL	4 X 48	104	3000	15,828	57	2	7/32	#10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	4	1 1/8
PC4060XL	4 X 60	125	3000	10,516	69	2	7/32	#10 SAE	1 1/4	25/32	3 13/16	1 1/16	4 1/2	4	1 1/8
* Frequently st	ocked items														

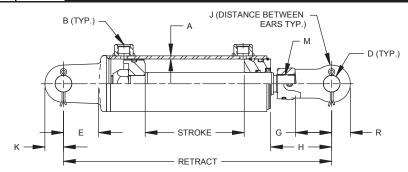
THE MAGNUM LINE 3000 PSI

MODEL		ROD DI	AMETER		IS	Α	B (SAE)	PSI
PC20	1.125	-	-	-	-	3/16	#8	3000
PC25	*1.250	1.375	-	-	-	3/16	#8	3000
PC30	*1.375	1.500	1.750	-	-	3/16	#8	3000
PC35	*1.375	*1.500	1.750	2.000	-	3/16	#8	3000
PC40	1.750	2.000	2.250	2.500	-	7/32	#10	3000
PC50	2.000	2.250	2.500	2.750	3.000	5/16	#12	3000
PC60	3.000	-	-	-	-	1/4	#12	3000

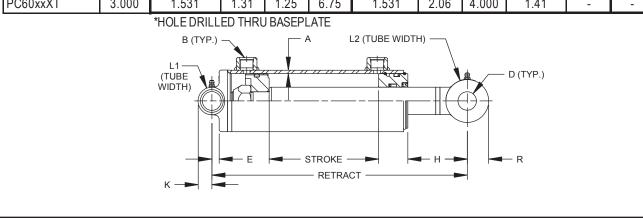
For custom configurations contact Prince **Manufacturing Corporation** or use the Customer Portal at www.princehyd.com.

*ONLY AVAILABLE WITH ROD END CLEVIS

		CL	EVIS BA	SE			CLE	VIS ROD		
Model	Rod Dia.	D	E	K	D	G	Н	J	М	R
PC20xxCL	1.125	1.015	2.12	1.00	1.015	2.15	3.67	1.06	1 1/8-12	1.13
PC25xxCL	1.250	1.015	2.14	1.00	1.015	2.15	3.97	1.06	1 1/8-12	1.13
PC30xxCL	1.375	1.015	2.13	1.13	1.015	2.15	3.70	1.06	1 1/8-12	1.13
PC35xxCL	1.375	1.015	2.13	1.25	1.015	2.18	3.70	1.06	1 5/16-12	1.25
PC40xxCL	1.750	1.015	2.13	1.25	1.015	2.19	3.65	1.06	1 1/2-12	1.25
PC50xxCL	2.000	1.265	2.13	1.38	1.265	2.18	4.41	1.38	1 3/4-12	1.25



		CR	OSSTUB	E BASE				CROS	STUBE RO	D		
Model	Rod Dia.	D	Е	K	L1	D	Н	L2 (XT)	R (XT)	L2 (XM)	L2 (XL)	R (XL)
PC20xxXT/XM//XL	1.125	.75/1.00	-	1.00	*2.38	.75/1.00	3.29	1.500	0.75	2.000	2.250	0.75
PC25xxXT/XM//XL	1.375	.75/1.00	0.40	0.77	3.00	.75/1.00	3.53	1.380	0.88	2.000	2.250	0.78
PC30xxXT/XM//XL	1.500	1.030	0.40	0.75	3.50	1.015	3.26	1.500	1.17	2.000	2.250	0.91
PC35xxXT/XM//XL	1.750	1.00/1.265	0.63	1.02	4.00	1.00/1.265	3.01	1.750	1.17	2.250	2.500	1.10
PC40xxXT/XM//XL	2.000	1.265	0.78	1.00	4.50	1.265	3.83	2.000	1.29	2.500	4.000	1.10
PC50xxXT	2.500	1.531	1.15	1.25	5.75	1.531	4.00	4.000	1.41	-	-	1.13
PC60xxXT	3.000	1.531	1.31	1.25	6.75	1.531	2.06	4.000	1.41	-	-	-



Prince

THE MAGNUM LINE

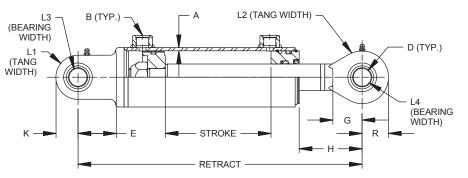
3000 PSI

MODEL		ROD DI	AMETER	OPTION	IS	Α	B (SAE)	PSI
PC20	1.125	-	-	-	-	3/16	#8	3000
PC25	*1.250	1.375	-	-	-	3/16	#8	3000
PC30	*1.375	1.500	1.750	-	-	3/16	#8	3000
PC35	*1.375	*1.500	1.750	2.000	-	3/16	#8	3000
PC40	1.750	2.000	2.250	2.500	-	7/32	#10	3000

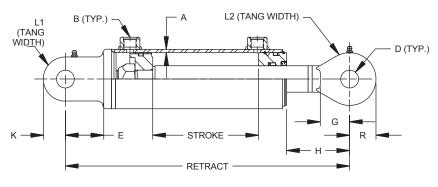
For custom configurations contact Prince Manufacturing Corporation or use the Customer Portal at www.princehyd.com.

*ONLY AVAILABLE WITH ROD END CLEVIS

			SPHE	RICAL E	BASE		SPHERICAL ROD					
Model	Rod Dia.	D	E	K	L1	L3	D	G	Н	L2	L4	R
PC20xxSP	1.125	1.000	2.20	1.15	1.00	.875	1.000	1.34	3.67	1.00	.875	1.15
PC25xxSP	1.375	1.000	2.18	1.25	1.00	.875	1.000	1.47	3.97	1.00	.875	1.25
PC30xxSP	1.500	1.000	2.20	1.25	1.00	.875	1.000	1.67	3.70	1.00	.875	1.50
PC35xxSP	1.750	1.000	2.20	1.50	1.00	.875	1.000	1.67	3.70	1.00	.875	1.50
PC40xxSP	2.000	1.250	2.38	1.50	1.00	1.09	1.250	1.79	3.52	1.00	1.09	1.70



	TANG BASE							TANG R	OD	
Model	Rod Dia.	D	E	K	L1	D	G	Н	L2	R
PC20xxTG	1.125	1.015	2.20	1.15	1.00	1.015	1.34	3.67	1.00	1.15
PC25xxTG	1.375	1.015	2.18	1.25	1.00	1.015	1.47	3.97	1.00	1.25
PC30xxTG	1.500	1.015	2.20	1.25	1.00	1.015	1.67	3.70	1.00	1.50
PC35xxTG	1.750	1.015	2.20	1.50	1.00	1.015	1.67	3.70	1.00	1.50
PC40xxTG	2.000	1.265	2.38	1.50	1.00	1.265	1.79	3.52	1.00	1.70



3 / 7 Warranty

3 year warranty on standard products means you can confidently utilize equipment year after year. RoyalPlate Plus[®] rods are warranted against rust and corrosion for 7 years.

RoyalPlate Plus[®] Plating – A & B Versions

Prevents rust and corrosion more than twice as long as hard chrome plating and gas nitride treated steel bar.

Flexible Configurations

Cylinders are easily configured by available options such as port size and location, stroke length, pin size and paint color.

Exceptional Paint Performance

Aircraft quality two-part chemical cure polyester urethane paint will not fade and will outperform powder coating for the life of the cylinder.





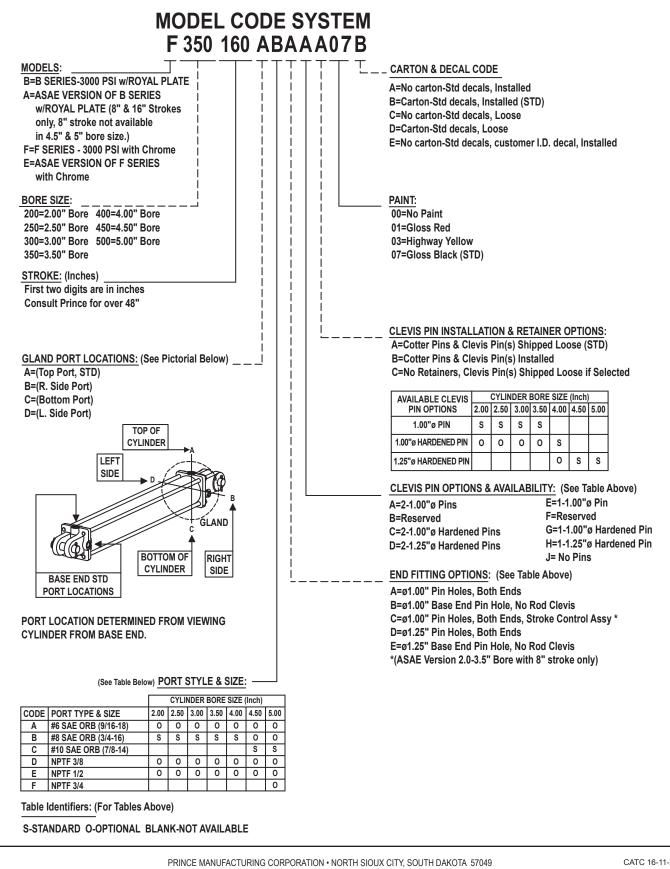
USA

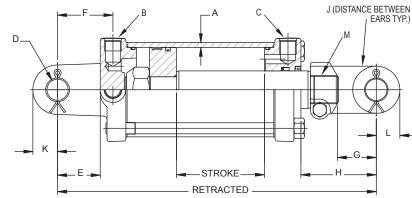
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Standard Tie-Rod Options

TIE-ROD MODEL CODE IDENTIFICATION MATRIX





- FEATURES: Heavy duty, high strength tie-rods •
- Induction hardened piston rods plated with RoyalPlate Plus[®] (piston rods on 2" bore not hardened)
- Ductile iron piston, butt, gland & clevis Urethane u-cup & metal encased wiper 2 1/2" • • bore & larger models
- Crown seal on piston •
- Pins & cotter pins (Hardened pins on 4", 4 1/2" • & 5" models)
- Standard color is gloss black Stroke control may be installed on 8" strokes (2" 3.5" bore, A models only) •
- Side ports available on request •
- Nylon piston bearing ring on 4", 4 1/2" & 5" bore models •

	RETRACTEI)			•	3000 PS	I continuous operating pressure
		2 INC	ΗB	ORE CY	LIND	ERS	
E & F Series Chrome Rod	A & B Series Royal Plate Rod	Stroke	Wt	Column Load (lbs)	Retract	Tare Dist. (H)	Standard Dimensions of 2 Inch Bore Cylinders
*F200040ABAAA07B	B200040ABAAA07B	4"	17	9425 lbs	14 ¼	3 1/2	Note: 1 ¹ / ₈ " rod diameter
*F200060ABAAA07B	B200060ABAAA07B	6"	19	9425 lbs	16 ¼	3 1/2	Outside Sq. Dim. Butt - 2.875, Gland 2.875
F200080ABAAA07B	B200080ABAAA07B	8"	20	9425 lbs	18 1⁄4	3 1/2	A $\frac{3}{16}$ cylinder tube wall thickness B, C SAE $\frac{3}{4}$ -16 extend & retract ports
*E200080ABAAA07B	A200080ABAAA07B	8"	21	9425 lbs	20 1/4	ASAE 5 1/2	D 1.015" clevis pin hole size
*F200100ABAAA07B	B200100ABAAA07B	10"	22	9425 lbs	20 1/4	3 1/2	E, F $1^{7}/_{8}$ " base clevis throat depth with $2^{7}/_{16}$ " from pin
*F200120ABAAA07B	B200120ABAAA07B	12" 14"	23	9425 lbs	22 1/4	3 1/2	center to port center
*F200140ABAAA07B	B200140ABAAA07B	14"	25 28	9425 lbs 9425 lbs	24 ¹ / ₄ 26 ¹ / ₄	3 ½ 3 ½	
*F200160ABAAA07B *E200160ABAAA07B	B200160ABAAA07B A200160ABAAA07B	16"	28	7630 lbs	31 ½	3 72 ASAE 8 3/4	K ¹⁵ / ₁₆ " base clevis ear radius
*F200180ABAAA07B	B200180ABAAA07B	18"	28	9200 lbs	28 ¹ ⁄ ₄	ASAE 0 /4 3 ½	
*F200200ABAAA07B	B200200ABAAA07B	20"	30	7760 lbs	30 1/4	3 1/2	M $1 \frac{1}{8}$ – 12 UNF-3 piston rod clevis thread size
*F200240ABAAA07B	B200240ABAAA07B	24"	33	5730 lbs	34 1/4	3 1/2	
*F200300ABAAA07B	B200300ABAAA07B	30"	37	3910 lbs	40 1/4	3 1/2	
	r A, B, E, F & SAE-320XX C	linder M	odels =				
Universal	Seal Kit for SAE-90XX, SAE	-320XXX	, A, B, E	& F Cylinder N	lodels =	24004002	2
	2	.5 IN	CH E	BORE C	LINI	DERS	3
E & F Series	A & B Series			Column		Tare	
Chrome Rod	Royal Plate Rod	Stroke	Wt	Load (lbs)	Retract	Dist. (H)	Standard Dimensions of 2.5 Inch Bore Cylinders
*F250060ABAAA07B	B250060ABAAA07B	6"	22	14730 lbs	16 1⁄4	3 3/4	Note: 1 ¹ / ₄ " rod diameter
F250080ABAAA07B	B250080ABAAA07B	8"	25	14730 lbs	18 1/4	3 3/4	Outside Sq. Dim. Butt - 3.375, Gland 3.375
*E250080ABAAA07B	A250080ABAAA07B	8"	25	14730 lbs	20 1/4	ASAE 5 3/4	A ³ / ₁₆ " cylinder tube wall thickness B. C SAE ³ / ₄ -16 extend & retract ports
*F250100ABAAA07B	B250100ABAAA07B	10"	26	14730 lbs	20 1/4	3 3/4	B, C SAE ³ / ₄ -16 extend & retract ports D 1.015" clevis pin hole size
*F250120ABAAA07B	B250120ABAAA07B	12"	28	14730 lbs	22 1/4		E, F $1.7/_8$ base clevis throat depth with $2.3/_8$ from pin
*F250140ABAAA07B	B250140ABAAA07B	14"	30	14730 lbs	24 1/4	3 3/4	center to port center
*F250160ABAAA07B	B250160ABAAA07B	16"	25	14730 lbs	26 1/4	3 3⁄4	G 1 ¹³ / ₁₆ " rod clevis throat depth
*E250160ABAAA07B	A250160ABAAA07B	16"	34	11520 lbs	31 ½	ASAE 9	J 1.06" min. distance between ears at pin center line K ¹⁵ / ₁₆ " base clevis ear radius
*F250180ABAAA07B	B250180ABAAA07B	18"	34	13880 lbs	28 1⁄4	3 ¾	1 1 ¹ / ₈ " rod clevis ear radius
*F250200ABAAA07B	B250200ABAAA07B	20"	36	11720 lbs	30 1⁄4	3 ¾	M 1 ¹ / ₈ " – 12 UNF-3 piston rod clevis thread size
*F250240ABAAA07B	B250240ABAAA07B	24"	41	8670 lbs	34 1/4	3 3/4	
*F250300ABAAA07B	B250300ABAAA07B	30"	47	5930 lbs	40 1/4	3 ¾	
Seal Kits: Seal Kit fo Universal	r A, B, E, F & SAE-325XX C Seal Kit for SAE-91XX, SAE	ylinder M -325XXX	lodels = , A, B, E	PMCK-B25000 & F Cylinder N	0 Iodels =	24004002	3
		3 INC	ΗB	ORE CY	LIND	ERS	
E & F Series	A & B Series			Column		Tare	
Chrome Rod	Royal Plate Rod	Stroke	Wt	Load (lbs)	Retract	Dist. (H)	Standard Dimensions of 3 Inch Bore Cylinders
*F300060ABAAA07B	B300060ABAAA07B	6"	26	21210 lbs	16 ¼	3 ³ /4	Note: 1 ³ / ₈ " rod diameter
F300080ABAAA07B	B300080ABAAA07B	8"	29	21210 lbs	18 1/4	3 ³ /4	Outside Sq. Dim. Butt - 3.875, Gland 3.875
*E300080ABAAA07B	A300080ABAAA07B	8"	29	21210 lbs	20 1/4 AS		A ³ / ₁₆ " cylinder tube wall thickness
*F300100ABAAA07B	B300100ABAAA07B	10"	30	21210 lbs	20 1/4	3 ³ /4	B, C SAE ³ / ₄ -16 extend & retract ports D 1.015" clevis pin hole size
*F300120ABAAA07B	B300120ABAAA07B	12"	33	21210 lbs	22 1⁄4	3 ³ ⁄4	E, F $1.7/_8$ " base clevis throat depth with $2^7/_{16}$ " from pin
*F300140ABAAA07B	B300140ABAAA07B	14"	35	21210 lbs	24 ¹ / ₄	3 ³ /4	center to port center
F300160ABAAA07B	B300160ABAAA07B	16"	29	21210 lbs	26 1/4	3 3/4	G 1 ¹³ / ₁₆ " rod clevis throat depth
*E300160ABAAA07B	A300160ABAAA07B	16"	40	16730 lbs	31 1/2	ASAE 9	J 1.06" min. distance between ears at pin center line
*F300180ABAAA07B	B300180ABAAA07B	18"	40	20120 lbs	28 1/4	3 ³ / ₄	K 1 $\frac{1}{16}$ base clevis ear radius L 1 $\frac{1}{8}$ rod clevis ear radius
*F300200ABAAA07B	B300200ABAAA07B	20"	42	17010 lbs	30 1/4	$3^{3/4}$	M $1 \frac{1}{8}$ – 12 UNF-3 piston rod clevis thread size
*F300240ABAAA07B	B300240ABAAA07B	24"	47	12620 lbs	34 1/4	$3^{3/4}$	
*F300300ABAAA07B	B300300ABAAA07B	30"	54	8640 lbs	40 1/4	$3^{3/4}$	
*F300360ABAAA07B *F300480ABAAA07B	B300360ABAAA07B B300480ABAAA07B	36" 48"	61	6290 lbs	46 1/4	3 ³ / ₄	
		-	75	3760 lbs	58 ¹ / ₄	3 ¾	
	r A, B, E, F & SAE-330XX C Seal Kit for SAE-92XX, SAE					24004002	4

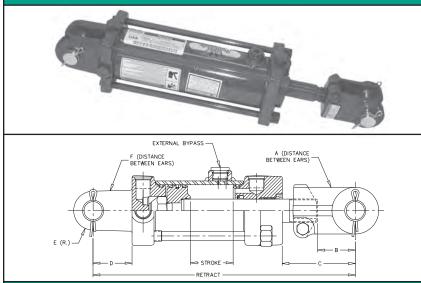
* Frequently stocked items

CATC 17-11-23-01

	3	.5 <u>IN</u>	CH E	BORE C	<u>LINI</u>	DERS	· · · · · · · · · · · · · · · · · · ·
E & F Series Chrome Rod	A & B Series Royal Plate Rod	Stroke	Wt	Column Load (Ibs)	Retract	Tare Dist. (H)	Standard Dimensions of 3.5 Inch Bore Cylinders
F350080ABAAA07B	B350080ABAAA07B	8"	35	28860 lbs	18 1⁄4	3 ³ ⁄4	Note: 1 ³ / ₈ " rod diameter
*E350080ABAAA07B	A350080ABAAA07B	8"	35	28860 lbs	20 1/4	ASAE 5 3/4	Outside Sq. Dim. Butt - 4.313, Gland 4.313
*F350100ABAAA07B	B350100ABAAA07B	10"	37	28860 lbs	20 1/4	3 ³ / ₄	A ³ / ₁₆ " cylinder tube wall thickness
*F350120ABAAA07B	B350120ABAAA07B	12"	39	28860 lbs	22 1/4	3 ³ /4	B, C SAE ³ / ₄ -16 extend & retract ports D 1.015" clevis pin hole size
*F350140ABAAA07B	B350140ABAAA07B	14"	42	28860 lbs	24 1/4	3 ³ /4	E, F $1^{7}/_{6}$ base clevis throat depth with $2^{7}/_{16}$ from pin
F350160ABAAA07B	B350160ABAAA07B	16"	35	24700 lbs	26 1/4	3 ³ ⁄4	center to port center
*E350160ABAAA07B	A350160ABAAA07B	16"	46	16900 lbs	31 ½	ASAE 9	G 1 ¹³ / ₁₆ " rod clevis throat depth
*F350180ABAAA07B	B350180ABAAA07B	18"	47	20400 lbs	28 1/4	3 ³ ⁄4	J 1.06" min. distance between ears at pin center lin
*F350200ABAAA07B	B350200ABAAA07B	20"	49	17240 lbs	30 1⁄4	3 ³ ⁄ ₄	K 1 ¹ / ₄ " base clevis ear radius L 1 ¹ / ₄ " rod clevis ear radius
*F350240ABAAA07B	B350240ABAAA07B	24"	54	12780 lbs	34 1/4	3 ³ / ₄	M $1^{5/_{16}}$ – 12 UNF-3 piston rod clevis thread size
*F350300ABAAA07B	B350300ABAAA07B	30"	62	8760 lbs	40 1/4	3 ³ /4	
*F350360ABAAA07B	B350360ABAAA07B	36"	69	6370 lbs	46 1/4	3 ³ / ₄	
*F350480ABAAA07B	B350480ABAAA07B	48"	85	3800 lbs	<u>58 ¼</u>	3 ³ ⁄ ₄	
Seal Kits: Seal Kit fo Universal	or A, B, E, F & SAE-335XX C Seal Kit for SAE-93XX, SAE	-335XXX	, A, B, E	& F Cylinder N	odels = :	24004002	5
		4 INC	ΗB	ORE CY	LIND	ERS	
E & F Series	A & B Series	Otralia	18/4	Column	Detrest	Tare	Standard Dimensions of Alash Dava Culindara
Chrome Rod	Royal Plate Rod	Stroke	Wt	Load (lbs)	Retract	. ,	Standard Dimensions of 4 Inch Bore Cylinders
F400080ABACA07B	B400080ABACA07B	8"	48	37700 lbs	18 1/4	3 1/4	Note: 1 ³ / ₄ " rod diameter
*E400080ABACA07B	A400080ABACA07B	8"	48	37700 lbs	20 1/4	ASAE 5 1/4	Outside Sq. Dim. Butt - 5.063, Gland 5.063 A ³ / ₁₆ " cylinder tube wall thickness
*F400100ABACA07B	B400100ABACA07B	10"	50	37700 lbs	20 1/4	3 1/4	B, C SAE $\frac{3}{4}$ -16 extend & retract ports
*F400120ABACA07B	B400120ABACA07B B400140ABACA07B	12" 14"	54 57	37700 lbs 37700 lbs	22 ¹ / ₄	3 ¼ 3 ¼	D 1.015" clevis pin hole size
*F400140ABACA07B F400160ABACA07B	B400140ABACA07B B400160ABACA07B	14	48	37700 lbs	24 1/4	3 1/4 3 1/4	E, F $1^{3}/4^{"}$ base clevis throat depth with $2^{7}/16^{"}$ from pin
*E400160ABACA07B	A400160ABACA07B	16"	64	37700 lbs	31 1/2	ASAE 8 1/2	Center to port center G $1^{7}/_{8}$ " rod clevis throat depth
*F400180ABACA07B	B400180ABACA07B	18"	64	37700 lbs	28 1/4	ASAE 0 72 3 1/4	J 1.13" min. distance between ears at pin center lir
*F400200ABACA07B	B400200ABACA07B	20"	68	37700 lbs	30 1/4	3 1/4	K 1 ¹ / ₄ " base clevis ear radius
*F400240ABACA07B	B400240ABACA07B	24"	75	33710 lbs	34 1/4	3 1/4	L 1 ¹ / ₄ " rod clevis ear radius
*F400300ABACA07B	B400300ABACA07B	30"	85	22990 lbs	40 1/4	3 1/4	M $1 \frac{1}{2}$ – 12 UNF-3 piston rod clevis thread size
*F400360ABACA07B	B400360ABACA07B	36"	95	16680 lbs	46 1/4	3 1/4	
*F400480ABACA07B	B400480ABACA07B	48"	116	9920 lbs	58 ¼	3 1⁄4	
Seal Kits: Seal Kit fo Universal	or A, B, E, F & SAE-340XX C Seal Kit for SAE-94XX, SAE	ylinder M	odels =	PMCK-B40000 & F Cylinder N) odels = 1	24004002	6
				BORE C			
E & F Series	A & B Series			Column		Tare	
Chrome Rod	Royal Plate Rod	Stroke	Wt	Load (lbs)	Retract		Standard Dimensions of 4.5 Inch Bore Cylinders
F450080ACDDA07B	B450080ACDDA07B	8"	60	47710 lbs	20 1⁄4	4	Note: 2" rod diameter
F450120ACDDA07B	B450120ACDDA07B	12"	69	47710 lbs	24 1/4	4	Outside Sq. Dim. Butt - 5.5, Gland 5.56
F450140ACDDA07B	B450140ACDDA07B	14"	74	47710 lbs	26 1⁄4	4	A ¹ / ₄ " cylinder tube wall thickness B, C SAE ⁷ / ₈ -14 extend & retract ports
F450160ACDDA07B	B450160ACDDA07B	16"	60	47710 lbs	28 1/4	4	D 1.265" clevis pin hole size
E450160ACDDA07B	A450160ACDDA07B	16"	81	47710 lbs	31 1/2	ASAE 7 1/4	E, F $2^{1/4}$ base clevis throat depth with $2^{15/16}$ from pin
F450180ACDDA07B	B450180ACDDA07B	18"	83	47710 lbs	30 1/4	4	center to port center
F450200ACDDA07B	B450200ACDDA07B	20"	87	47710 lbs			
					32 1/4	4	G 2" rod clevis throat depth 1 13" min_distance between ears at nin center lin
F450240ACDDA07B	B450240ACDDA07B	24"	97	44710 lbs	36 1⁄4	4	
F450240ACDDA07B F450300ACDDA07B	B450300ACDDA07B	30"	110	44710 lbs 37530 lbs	36 ¼ 42 ¼	4 4	J 1.13" min. distance between ears at pin center lin K 1 ⁵ / ₁₆ " base clevis ear radius L 1 ¹ / ₄ " rod clevis ear radius
F450240ACDDA07B F450300ACDDA07B F450360ACDDA07B	B450300ACDDA07B B450360ACDDA07B	30" 36"	110 124	44710 lbs 37530 lbs 27430 lbs	36 ¼ 42 ¼ 48 ¼	4 4 4	$\begin{array}{cc} J & 1.13"\text{min. distance between ears at pin center lir} \\ K & 1{}^{5}\!/_{16}"\text{base clevis ear radius} \end{array}$
F450240ACDDA07B F450300ACDDA07B F450360ACDDA07B F450480ACDDA07B Seal Kits: Seal Kit fo	B450300ACDDA07B B450360ACDDA07B B450480ACDDA07B or A, B, E, F & SAE-345XX C	30" 36" 48"	110 124 152	44710 lbs 37530 lbs 27430 lbs 16470 lbs	36 ¹ / ₄ 42 ¹ / ₄ 48 ¹ / ₄ 60 ¹ / ₄	4 4	$ \begin{array}{lll} J & 1.13" \text{ min. distance between ears at pin center lin} \\ K & 1.5'_{16}" \text{ base clevis ear radius} \\ L & 1.1'_{4}" \text{ rod clevis ear radius} \end{array} $
F450240ACDDA07B F450300ACDDA07B F450360ACDDA07B F450480ACDDA07B Seal Kits: Seal Kit fo	B450300ACDDA07B B450360ACDDA07B B450480ACDDA07B or A, B, E, F & SAE-345XX C sal Seal Kit offered	30" 36" 48" ylinder M	110 124 152 odels =	44710 lbs 37530 lbs 27430 lbs 16470 lbs PMCK-B45000	36 ¹ / ₄ 42 ¹ / ₄ 48 ¹ / ₄ 60 ¹ / ₄	4 4 4 4	$ \begin{array}{lll} J & 1.13" \text{ min. distance between ears at pin center line } \\ K & 1.5'_{16}" \text{ base clevis ear radius} \\ L & 1.1'_{4}" \text{ rod clevis ear radius} \end{array} $
F450240ACDDA07B F450300ACDDA07B F450360ACDDA07B F450480ACDDA07B Seal Kits: Seal Kit fo	B450300ACDDA07B B450360ACDDA07B B450480ACDDA07B or A, B, E, F & SAE-345XX C sal Seal Kit offered	30" 36" 48" ylinder M	110 124 152 odels =	44710 lbs 37530 lbs 27430 lbs 16470 lbs	36 ¼ 42 ¼ 48 ¼ 60 ¼ 0	4 4 4 ERS Tare	$ \begin{array}{lll} J & 1.13" \text{ min. distance between ears at pin center lin} \\ K & 1.5'_{16}" \text{ base clevis ear radius} \\ L & 1.1'_{4}" \text{ rod clevis ear radius} \end{array} $
F450240ACDDA07B F450300ACDDA07B F450360ACDDA07B F450480ACDDA07B Seal Kits: Seal Kit fo No Univer	B450300ACDDA07B B450360ACDDA07B B450480ACDDA07B or A, B, E, F & SAE-345XX C sal Seal Kit offered	30" 36" 48" ylinder M	110 124 152 odels =	44710 lbs 37530 lbs 27430 lbs 16470 lbs PMCK-B45000 ORE CY	36 ¼ 42 ¼ 48 ¼ 60 ¼ 0	4 4 4 8	$ \begin{array}{lll} J & 1.13" \text{ min. distance between ears at pin center lin} \\ K & 1.5'_{16}" \text{ base clevis ear radius} \\ L & 1.1'_{4}" \text{ rod clevis ear radius} \end{array} $
F450240ACDDA07B F450300ACDDA07B F450360ACDDA07B F450480ACDDA07B Seal Kits: Seal Kit fo No Univer	B450300ACDDA07B B450360ACDDA07B B450480ACDDA07B or A, B, E, F & SAE-345XX C sal Seal Kit offered A & B Series Royal Plate Rod	30" 36" 48" ylinder M 5 INC	110 124 152 odels =	44710 lbs 37530 lbs 27430 lbs 16470 lbs PMCK-B45000 ORE CY Column Load (lbs)	36 ¹ / ₄ 42 ¹ / ₄ 48 ¹ / ₄ 60 ¹ / ₄ 0	4 4 4 4 ERS Tare Dist. (H)	J 1.13" min. distance between ears at pin center lin K 1 ⁵ / ₁₆ " base clevis ear radius L 1 ¹ / ₄ " rod clevis ear radius M 1 ¹ / ₂ " – 12 UNF-3 piston rod clevis thread size Standard Dimensions of 5 Inch Bore Cylinders
F450240ACDDA07B F450300ACDDA07B F450360ACDDA07B F450480ACDDA07B Seal Kits: Seal Kit fo No Univer	B450300ACDDA07B B450360ACDDA07B B450480ACDDA07B or A, B, E, F & SAE-345XX C sal Seal Kit offered A & B Series	30" 36" 48" ylinder M 5 INC Stroke	110 124 152 odels =	44710 lbs 37530 lbs 27430 lbs 16470 lbs PMCK-B45000 ORE CY Column	36 ¼ 42 ¼ 48 ¼ 60 ¼ 0	4 4 4 ERS Tare	J 1.13" min. distance between ears at pin center lin K 1 ⁵ / ₁₆ " base clevis ear radius L 1 ¹ / ₄ " rod clevis ear radius M 1 ¹ / ₂ " – 12 UNF-3 piston rod clevis thread size Standard Dimensions of 5 Inch Bore Cylinders Note: 2" rod diameter Outside Sq. Dim. Butt - 5.875, Gland 5.875
F450240ACDDA07B F450300ACDDA07B F450360ACDDA07B F450480ACDDA07B Seal Kits: Seal Kit fo No Univer	B450300ACDDA07B B450360ACDDA07B B450480ACDDA07B or A, B, E, F & SAE-345XX C sal Seal Kit offered A & B Series Royal Plate Rod B500080ACDDA07B	30" 36" 48" ylinder M 5 INC Stroke 8"	110 124 152 lodels = H B Wt 72	44710 lbs 37530 lbs 27430 lbs 16470 lbs PMCK-B45000 ORE CY Column Load (lbs) 58900 lbs	36 ¼ 42 ¼ 48 ¼ 60 ¼ 0 C	4 4 4 4 ERS Tare Dist. (H) 4	J 1.13" min. distance between ears at pin center lin K 1 ⁵ / ₁₆ " base clevis ear radius L 1 ¹ / ₄ " rod clevis ear radius M 1 ¹ / ₂ " – 12 UNF-3 piston rod clevis thread size Standard Dimensions of 5 Inch Bore Cylinders Note: 2" rod diameter Outside Sq. Dim. Butt - 5.875, Gland 5.875 A ¹ / ₄ " cylinder tube wall thickness
F450240ACDDA07B F450300ACDDA07B F450360ACDDA07B F450480ACDDA07B Seal Kits: Seal Kit fo No Univer	B450300ACDDA07B B450360ACDDA07B B450480ACDDA07B or A, B, E, F & SAE-345XX C sal Seal Kit offered A & B Series Royal Plate Rod B500080ACDDA07B B500120ACDDA07B	30" 36" 48" ylinder M 5 INC Stroke 8" 12" 14" 16"	110 124 152 odels = H B Wt 72 83	44710 lbs 37530 lbs 27430 lbs 16470 lbs PMCK-B45000 ORE CY Column Load (lbs) 58900 lbs 58900 lbs	36 ¹ / ₄ 42 ¹ / ₄ 48 ¹ / ₄ 60 ¹ / ₄ 0 LIND Retract 20 ¹ / ₄ 24 ¹ / ₄	4 4 4 4 ERS Tare Dist. (H) 4 4	J 1.13" min. distance between ears at pin center lin K 1 ⁵ / ₁₆ " base clevis ear radius L 1 ¹ / ₄ " rod clevis ear radius M 1 ¹ / ₂ " – 12 UNF-3 piston rod clevis thread size Standard Dimensions of 5 Inch Bore Cylinders Note: 2" rod diameter Outside Sq. Dim. Butt - 5.875, Gland 5.875 A ¹ / ₄ " cylinder tube wall thickness B, C SAE ⁷ / ₈ -14 extend & retract ports
F450240ACDDA07B F450300ACDDA07B F450360ACDDA07B F450480ACDDA07B Seal Kits: Seal Kit fo No Univer E & F Series Chrome Rod *F500080ACDDA07B *F500120ACDDA07B F500140ACDDA07B F500160ACDDA07B *E500160ACDDA07B	B450300ACDDA07B B450360ACDDA07B B450480ACDDA07B or A, B, E, F & SAE-345XX C sal Seal Kit offered A & B Series Royal Plate Rod B500080ACDDA07B B500120ACDDA07B B500140ACDDA07B B500160ACDDA07B	30" 36" 48" ylinder M 5 INC Stroke 8" 12" 14" 16" 16"	110 124 152 odels = H B Wt 72 83 88 96 96	44710 lbs 37530 lbs 27430 lbs 16470 lbs PMCK-B45000 ORE CY Column Load (lbs) 58900 lbs 58900 lbs 58900 lbs 58900 lbs 58900 lbs	36 ¹ / ₄ 42 ¹ / ₄ 48 ¹ / ₄ 60 ¹ / ₄ 0 LIND Retract 20 ¹ / ₄ 24 ¹ / ₄ 26 ¹ / ₄ 26 ¹ / ₄ 28 ¹ / ₂ 31 ¹ / ₂	4 4 4 4 ERS Tare Dist. (H) 4 4 4 4 4 4 5 8 5 7 ¹ / ₄	J 1.13" min. distance between ears at pin center lin K 1 ⁵ / ₁₆ " base clevis ear radius L 1 ¹ / ₄ " rod clevis ear radius M 1 ¹ / ₂ " – 12 UNF-3 piston rod clevis thread size Standard Dimensions of 5 Inch Bore Cylinders Note: 2" rod diameter Outside Sq. Dim. Butt - 5.875, Gland 5.875 A ¹ / ₄ " cylinder tube wall thickness
F450240ACDDA07B F450300ACDDA07B F450360ACDDA07B F450480ACDDA07B Seal Kits: Seal Kit fo No Univer E & F Series Chrome Rod *F500080ACDDA07B F500120ACDDA07B F500160ACDDA07B F500160ACDDA07B F500180ACDDA07B	B450300ACDDA07B B450360ACDDA07B B450480ACDDA07B or A, B, E, F & SAE-345XX C sal Seal Kit offered A & B Series Royal Plate Rod B500080ACDDA07B B500120ACDDA07B B500140ACDDA07B B500160ACDDA07B B500160ACDDA07B B500180ACDDA07B	30" 36" 48" ylinder M 5 INC 5 INC 5 INC 5 INC 8" 14" 14" 16" 16" 16" 18"	110 124 152 odels = H B Wt 72 83 88 96 96 98	44710 lbs 37530 lbs 27430 lbs 16470 lbs PMCK-B45000 ORE CY Column Load (lbs) 58900 lbs 58900 lbs 58900 lbs 58900 lbs 58900 lbs 58900 lbs	36 ¹ / ₄ 42 ¹ / ₄ 48 ¹ / ₄ 60 ¹ / ₄ 0 LIND Retract 20 ¹ / ₄ 24 ¹ / ₄ 26 ¹ / ₄ 26 ¹ / ₄ 26 ¹ / ₄ 28 ¹ / ₂ 31 ¹ / ₂ 30 ¹ / ₄	4 4 4 4 ERS Tare Dist. (H) 4 4 4 4 4 ASAE 7 ¹ / ₄ 4	 J 1.13" min. distance between ears at pin center lin K 1⁵/₁₆" base clevis ear radius L 1¹/₄" rod clevis ear radius M 1¹/₂" – 12 UNF-3 piston rod clevis thread size Standard Dimensions of 5 Inch Bore Cylinders Note: 2" rod diameter Outside Sq. Dim. Butt - 5.875, Gland 5.875 A 1/₄" cylinder tube wall thickness B, C SAE ⁷/₈ -14 extend & retract ports D 1.265" clevis pin hole size E, F 1³/₄" base clevis throat depth with 2⁵/₈" from pin center to port center
F450240ACDDA07B F450300ACDDA07B F450360ACDDA07B F450480ACDDA07B Seal Kits: Seal Kit fo No Univer E & F Series Chrome Rod *F500080ACDDA07B F500120ACDDA07B F500140ACDDA07B F500160ACDDA07B *E500160ACDDA07B *500180ACDDA07B *500180ACDDA07B	B450300ACDDA07B B450360ACDDA07B B450480ACDDA07B or A, B, E, F & SAE-345XX C sal Seal Kit offered A & B Series Royal Plate Rod B500080ACDDA07B B500120ACDDA07B B500160ACDDA07B B500160ACDDA07B B500160ACDDA07B B500160ACDDA07B B500180ACDDA07B B500180ACDDA07B	30" 36" 48" ylinder M 5 INC Stroke 8" 12" 14" 16" 16" 16" 18" 20"	110 124 152 odels = H B Wt 72 83 88 96 96 98 103	44710 lbs 37530 lbs 27430 lbs 16470 lbs PMCK-B45000 ORE CY Column Load (lbs) 58900 lbs 58900 lbs 58900 lbs 58900 lbs 58900 lbs 58900 lbs 58900 lbs	36 ¹ / ₄ 42 ¹ / ₄ 48 ¹ / ₄ 60 ¹ / ₄ 0 LIND Retract 20 ¹ / ₄ 24 ¹ / ₄ 26 ¹ / ₄ 28 ¹ / ₂ 31 ¹ / ₂ 30 ¹ / ₄ 32 ¹ / ₄	4 4 4 ERS Tare Dist. (H) 4 4 4 4 ASAE 7 ¹ / ₄ 4 4	J 1.13" min. distance between ears at pin center lin K 1 ⁵ / ₁₆ " base clevis ear radius L 1 ¹ / ₄ " rod clevis ear radius M 1 ¹ / ₂ " – 12 UNF-3 piston rod clevis thread size Standard Dimensions of 5 Inch Bore Cylinders Note: 2" rod diameter Outside Sq. Dim. Butt - 5.875, Gland 5.875 A ¹ / ₄ " cylinder tube wall thickness B, C SAE ⁷ / ₈ -14 extend & retract ports D 1.265" clevis pin hole size E, F 1 ³ / ₄ " base clevis throat depth with 2 ⁵ / ₈ " from pin center to port center G 2" rod clevis throat depth
F450240ACDDA07B F450300ACDDA07B F450360ACDDA07B F450480ACDDA07B F450480ACDDA07B Seal Kits: Seal Kit fo No Univer E & F Series Chrome Rod *F500080ACDDA07B *F500120ACDDA07B F500120ACDDA07B F500160ACDDA07B F500160ACDDA07B F500160ACDDA07B F500160ACDDA07B *F500180ACDDA07B *F500180ACDDA07B *F500180ACDDA07B *F500200ACDDA07B *F500200ACDDA07B *F500200ACDDA07B *F500240ACDDA07B	B450300ACDDA07B B450360ACDDA07B B450480ACDDA07B or A, B, E, F & SAE-345XX C sal Seal Kit offered A & B Series Royal Plate Rod B500080ACDDA07B B500120ACDDA07B B500160ACDDA07B B500160ACDDA07B B500160ACDDA07B B500180ACDDA07B B500180ACDDA07B B500200ACDDA07B B500200ACDDA07B	30" 36" 48" ylinder M 5 INC Stroke 8" 12" 14" 16" 16" 18" 20" 24"	110 124 152 odels = H B Wt 72 83 88 96 96 98 103 113	44710 lbs 37530 lbs 27430 lbs 16470 lbs PMCK-B45000 ORE CY Column Load (lbs) 58900 lbs 58900 lbs	36 ¹ / ₄ 42 ¹ / ₄ 48 ¹ / ₄ 60 ¹ / ₄ 0	4 4 4 4 ERS Tare Dist. (H) 4 4 4 4 ASAE 7 ¼ 4 4 4	J 1.13" min. distance between ears at pin center lin K 1 ⁵ / ₁₆ " base clevis ear radius L 1 ¹ / ₄ " rod clevis ear radius M 1 ¹ / ₂ " – 12 UNF-3 piston rod clevis thread size Standard Dimensions of 5 Inch Bore Cylinders Note: 2" rod diameter Outside Sq. Dim. Butt - 5.875, Gland 5.875 A ¹ / ₄ " cylinder tube wall thickness B, C SAE ⁷ / ₈ - 14 extend & retract ports D 1.265" clevis pin hole size E, F 1 ³ / ₄ " base clevis throat depth with 2 ⁵ / ₈ " from pin center to port center G 2" rod clevis throat depth J 1.13" min. distance between ears at pin center lin
F450240ACDDA07B F450300ACDDA07B F450360ACDDA07B F450480ACDDA07B Seal Kits:	B450300ACDDA07B B450360ACDDA07B B450480ACDDA07B or A, B, E, F & SAE-345XX C sal Seal Kit offered A & B Series Royal Plate Rod B500080ACDDA07B B500120ACDDA07B B500160ACDDA07B B500160ACDDA07B B500160ACDDA07B B500180ACDDA07B B500200ACDDA07B B500240ACDDA07B B500240ACDDA07B	30" 36" 48" ylinder M 5 INC 5 INC 5 INC 5 INC 8" 12" 14" 16" 16" 16" 16" 16" 20" 24" 30"	110 124 152 odels = H B Wt 72 83 88 96 96 98 103 113 129	44710 lbs 37530 lbs 27430 lbs 16470 lbs PMCK-B45000 ORE CY Column Load (lbs) 58900 lbs 58900 lbs	36 ¹ / ₄ 42 ¹ / ₄ 48 ¹ / ₄ 60 ¹ / ₄ 0	4 4 4 4 ERS Tare Dist. (H) 4 4 4 4 ASAE 7 ¹ / ₄ 4 4 4 4	J 1.13" min. distance between ears at pin center lin K 1 ⁵ / ₁₆ " base clevis ear radius L 1 ¹ / ₄ " rod clevis ear radius M 1 ¹ / ₂ " – 12 UNF-3 piston rod clevis thread size Standard Dimensions of 5 Inch Bore Cylinders Note: 2" rod diameter Outside Sq. Dim. Butt - 5.875, Gland 5.875 A ¹ / ₄ " cylinder tube wall thickness B, C SAE ⁷ / ₈ -14 extend & retract ports D 1.265" clevis pin hole size E, F 1 ³ / ₄ " base clevis throat depth with 2 ⁵ / ₈ " from pin center to port center G 2" rod clevis throat depth
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ince SERIES CYLINDER SYSTEMS

TIE-ROD CONSTRUCTION - EXTERNAL STYLE BYPASS



TO RAISE LOADS EQUALLY

LOAD LOAD LOAD

TO RESERVOIR

NOTES:

- · Master cylinder provides power for the entire system
- Each cylinder in series has less pressure in proportion to the load on it
- Designed for use in a series cylinder circuit at a maximum of 3000 PSI, cylinder not to be used at 3000 PSI in push or pull as a single cylinder
- Stroke control assemblies may be installed on 8" stroke models
- Can be used with remote stroke control valve PM-SC-10

- Can be used with holding valves HC-V-AA21 and HC-V-AA22
- Master cylinder equipped with series/rephase and stroke control are available. Contact Prince Sales Department.
- Custom designs in welded or tie-rod style for larger or smaller bore sizes
- · Exact matched sets available
- Contact Prince Engineering Department for special applications

Bore	Rod Dia.	8" Stroke 20 1/4" Retract	10" Stroke 22 1/4" Retract	12" Stroke 24 1/4" Retract	16" Stroke 28 1/4" Retract	A	в	с	D	E	F
2 1/2	1 1/8	PMS-AM-2586	PMS-AM-2629	PMS-AM-2588	PMS-AM-2590	1 1/8	1 13/16	5 23/32	1 7/8	15/16	1 1/16
2 3/4	1 1/8	PMS-AM-2580	PMS-AM-2627	PMS-AM-2582	PMS-AM-2584	1 1/8	1 13/16	5 23/32	1 7/8	1 1/16	1 1/16
3	1 1/4	PMS-AM-2574	PMS-AM-2625	PMS-AM-2576	PMS-AM-2578	1 1/8	1 13/16	5 23/32	1 7/8	1 1/16	1 1/16
3 1/4	1 1/4	PMS-AM-2568	PMS-AM-2623	PMS-AM-2570	PMS-AM-2572	1 1/8	1 13/16	5 23/32	1 7/8	1 1/4	1 1/16
3 1/2	1 1/4	PMS-AM-2562	PMS-AM-2621	PMS-AM-2564	PMS-AM-2566	1 1/8	1 13/16	5 23/32	1 7/8	1 1/4	1 1/16
3 3/4	1 3/8	PMS-AM-2556A	PMS-AM-2619A	PMS-AM-2558A	PMS-AM-2560A	1 1/8	1 7/8	5 11/32	1 3/4	1 1/4	1 1/8
4	1 3/8	PMS-AM-2550A	PMS-AM-2617A	PMS-AM-2552A	PMS-AM-2554A	1 1/8	1 7/8	5 11/32	1 3/4	1 1/4	1 1/8
4 1/2	2	PMS-AM-2544	PMS-AM-2615	PMS-AM-2546	PMS-AM-2548	1 1/8	1 7/8	4 1/32	1 3/4	1 3/8	1 1/8
4 3/4	1 1/2	PMS-AM-2538	PMS-AM-2613	PMS-AM-2540	PMS-AM-2542	1 1/8	1 7/8	4 1/32	1 3/4	1 3/8	1 1/8
5	1 1/2	PMS-AM-2532	PMS-AM-2611	PMS-AM-2534	PMS-AM-2536	1 1/8	1 7/8	4 1/32	1 3/4	1 3/8	1 1/8

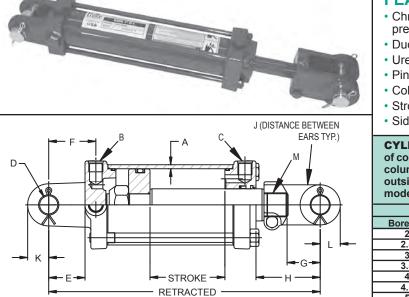
FEATURES:

- Heavy duty tie-rod construction
- Induction hardened piston rods plated with RoyalPlate Plus[®]
- High performance polyamide rod bearing
- •#8 S.A.E.(3/4-16 ORB) ports
- For use with 1" pins
- Pins, clips & cotters included
- ORB to pipe adaptors are not included
- · Color is gloss black
- Same high quality features found in all Prince Tie-rod Cylinders with the addition of an external bypass (rephase)



2500 PSI TIE-ROD DOUBLE ACTING

THE "MAJESTIC LINE" Tie-Rod–DA–Medium Duty Rods



FEATURES:

- Chromed, ground & polished piston rod will operate at full pressure through 16" stroke
- Ductile iron piston, butt, gland & clevis
- Urethane u-cup & urethane wiper in gland
- Pins, clips & cotters included
- Color is gloss black
- · Stroke control may be installed on 8" strokes
- · Side ports available on request at no additional cost

CYLINDER DIMENSIONAL FEATURES: For dimensional data of configured cylinders, please refer to the Standard Dimensions column of the standard cylinder tables on page C17-C18. For outside cylinder dimensions and clevis widths for both A & B models, see table below.

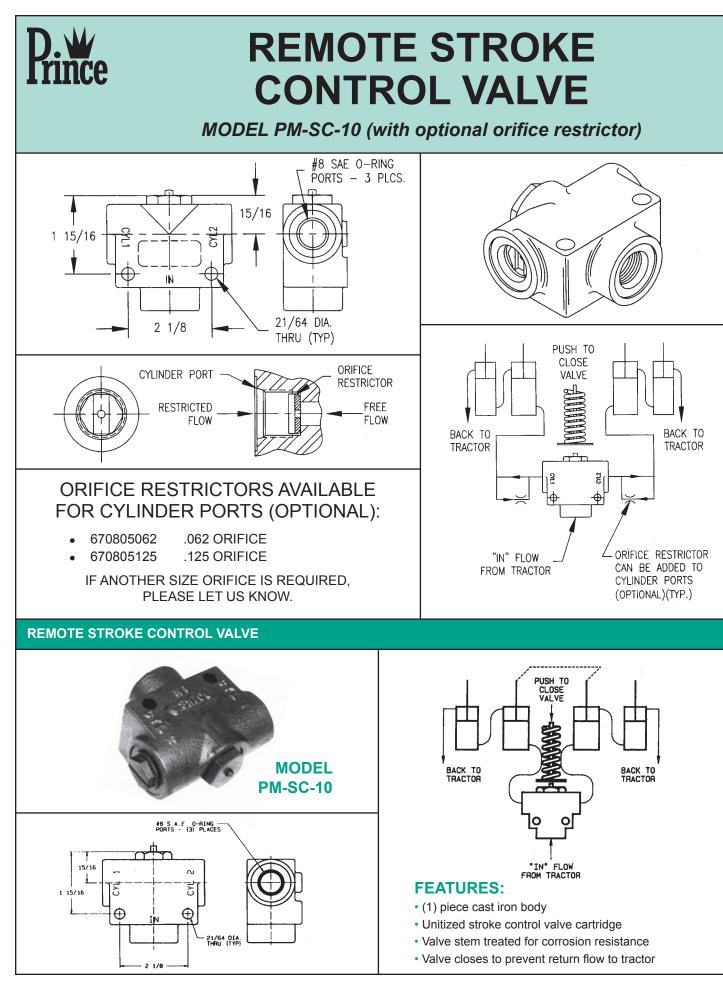
	Outside	Sq. Dim	Clevis	Width
Bore Size	Butt	Gland	Butt	Rod
2"	2.875"	2.875"	2.500"	2.500"
2.5"	3.375"	3.375"	2.440"	2.500"
3"	3.875"	3.875"	2.500"	2.500"
3.5"	4.313"	4.313"	2.750"	2.875"
4"	5.063"	5.063"	2.750"	2.875"
4.5"	5.500"	5.560"	3.180"	2.875"
5"	5.875"	5.875"	3.180"	2.875"

Rods are sized for a maximum safe push load (2:1 safety factor) given in the table. This is based on the pin configuration shown with no center support.

	Model No.	Style	Wt.	PSI	Column Load (Lbs.)	Re- tract	Rod Dia.	A	B SAE	C SAE	D	Е	F	G	Н	J	к	L	М
S	AE-8404 AE-8406 AE-8408 AE-8410	2 x 4 2 x 6 2 x 8 2 x 10	18 19 20 21	2500 2500 2500 2500 2500	FULL PSI FULL PSI FULL PSI FULL PSI	14 1/4 16 1/4 20 1/4 20 1/4	1 1 1	3/16 3/16 3/16 3/16	3/4-16 3/4-16 3/4-16 3/4-16	3/4-16 3/4-16 3/4-16 3/4-16	1.015 1.015 1.015 1.015 1.015	1 7/8 1 7/8 1 7/8 1 7/8 1 7/8	2 7/16 2 7/16 2 7/16 2 7/16 2 7/16	1 13/16 1 13/16 1 13/16 1 13/16 1 13/16	3 1/2 3 1/2 5 1/2 3 1/2	1.06 1.06 1.06 1.06	15/16 15/16 15/16 15/16	1 1/8 1 1/8 1 1/8 1 1/8 1 1/8	1-14 1-14 1-14 1-14
	AE-7006	2 1/2 x 6	22	2500	FULL PSI	16 1/4	1 1/8	3/16	3/4-16	3/4-16	1.015	1 7/8	2 13/32	1 13/16	3 3/4	1.06	15/16	1 1/8	1 1/8-12
	AE-7008	2 1/2 x 8	23	2500	FULL PSI	20 1/4	1 1/8	3/16	3/4-16	3/4-16	1.015	1 7/8	2 13/32	1 13/16	5 3/4	1.06	15/16	1 1/8	1 1/8-12
	AE-7106	3 x 6	24	2500	FULL PSI	16 1/4	1 1/8	3/16	3/4-16	3/4-16	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/16	1 1/8	1 1/8-12
	AE-7108	3 x 8	26	2500	FULL PSI	20 1/4	1 1/8	3/16	3/4-16	3/4-16	1.015	1 7/8	2 7/16	1 13/16	5 3/4	1.06	1 1/16	1 1/8	1 1/8-12
SA	AE-7208A	3 1/2 x 8	31	2500	FULL PSI	20 1/4	1 1/8	3/16	3/4-16	3/4-16	1.015	1 7/8	2 7/16	1 13/16	5 3/4	1.06	1 1/4	1 1/4	1 1/8-12
	AE-8608	4 x 8	42	2500	FULL PSI	20 1/4	1 1/2	3/16	3/4-16	3/4-16	1.015	1 3/4	2 7/16	1 7/8	5 1/4	1.13	1 1/4	1 1/4	1 1/2-12
	AE-8610	4 x 10	45	2500	FULL PSI	20 1/4	1 1/2	3/16	3/4-16	3/4-16	1.015	1 3/4	2 7/16	1 7/8	3 1/4	1.13	1 1/4	1 1/4	1 1/2-12
-	AE-8208	5 x 8	64	2500	FULL PSI	20 1/4	1 3/4	1/4	7/8-14	7/8-14	1.265	1 3/4	2 5/8	2	4	1.13	1 3/8	1 1/4	1 1/2-12
	AE-8210	5 x 10	67	2500	FULL PSI	22 1/4	1 3/4	1/4	7/8-14	7/8-14	1.265	1 3/4	2 5/8	2	4	1.13	1 3/8	1 1/4	1 1/2-12

3000 PSI Tie-Rod-DA-With 2" Rod

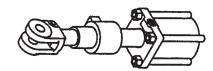
Model No.	Style	Wt.	PSI	Column Load (Lbs.)	Re- tract	Rod Dia.	Α	B SAE	C SAE	D	Е	F	G	Н	J	K, L	м
C400080ABDDA07B	4 x 8	50	3000PSI	Full PSI	20 1/4	2	3/16	3/4 - 16	3/4 - 16	1.265	1 3/4	2 7/16	1.875	5 1/4	1.13	1 1/4	1 1/2-12
C400160ABDDA07B	4 x 16	68	3000PSI	Full PSI	31 1/2	2	3/16	3/4 - 16	3/4 - 16	1.265	1 3/4	2 7/16	1.875	8 1/2	1.13	1 1/4	1 1/2-12
C400240ABDDA07B	4 x 24	81	3000PSI	Full PSI	36 1/4	2	3/16	3/4 - 16	3/4 - 16	1.265	1 3/4	2 7/16	1.875	5 1/4	1.13	1 1/4	1 1/2-12
C400260ABDDA07B	4 x 26	84	3000PSI	Full PSI	38 1/4	2	3/16	3/4 - 16	3/4 - 16	1.265	1 3/4	2 7/16	1.875	5 1/4	1.13	1 1/4	1 1/2-12



PRINCE MANUFACTURING CORPORATION • NORTH SIOUX CITY, SOUTH DAKOTA 57049 URL: www.princehyd.com • E-MAIL: prince@princehyd.com • PHONE: (605) 235-1220 **CYLINDERS AND ACCESSORIES**

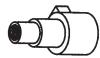
nince OTHER PRINCE ACCESSORIES

STROKE CONTROL ASSEMBLY



All components plated (including the base casting) to retard rust.

THREE-SLEEVE STROKE CONTROL ASSEMBLY



Practical, efficient and easily adapted to Prince Standard Series Cylinders. Positive stroke control adjustment Open 5 5/8" Closed 2 1/2"

- MODEL: PM-SC-8—Adapting Sleeve Thread size 1 1/8"-12 and will accept shaft size thru 1 3/8" Dia. Wt. 3 lbs. Will fit models: SAE-7008, SAE-7108, SAE-7208A, A200080, A250080, A300080, E200080, E250080, E300080.
- MODEL: PM-SC-11—Adapting Sleeve Thread size 1 5/16"-12. Will fit models: A/B/E/F350080.

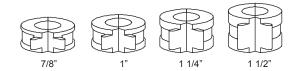
REMOTE HYDRAULIC STROKE CONTROL

A remote hydraulic stroke control is available. This stroke control makes use of the same reliable cartridge used in the internal stroke control cylinder. But it can be mounted remotely to control 2 cylinders. (See pg. C21)

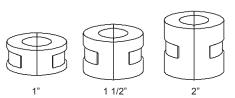


Collars are made of die cast aluminum in split halves. Flat steel springs are easy to open and snap onto the cylinder rod.

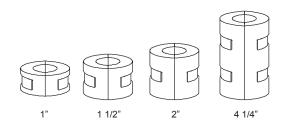
- Light Weight
- Durable
- Non-Abrasive



PM-SLCS-10: For 1 1/8" THRU 1 1/2" DIA RODS (THIS SET HAS FINGER TABS, WITH RELIEF NOTCHES)



PM-SLCS-14: For 1 3/4" THRU 2" DIA RODS (THIS SET HAS NO FINGER TABS)



PM-SLCS-15: For 1 3/4" THRU 2" DIA RODS (THIS SET HAS NO FINGER TABS)

RESTRICTORS



Full-flow in one direction, with restriction of flow on return. Simple design permits complete reversible mounting for restricting either output or return. Interchangeable discs of various sizes for different flow metering can be quickly changed in the field. Use with pumps up to 12 GPM. 5,000 psi. 1/2" NPTF, inlet and outlet.

MODEL	SIZE	WT.
PM-R-10	BLANK	3 oz.
PM-R-12	1/16"	3 oz.
PM-R-13	3/32"	3 oz.
PM-R-14	1/8"	3 oz.
PM-R-15	5/32"	3 oz.
PM-R-16	3/16"	3 oz.
PM-R-17	7/32"	3 oz.
PM-R-18	1/4"	3 oz.
PM-R-19	.041"	3 oz.
PM-R-20	1/64"	3 oz.
PM-R-21	.031"	3 oz.
PM-R-22	.078"	3 oz.

Prince OTHER PRINCE ACCESSORIES

1" DIA. CLEVIS PIN KITS



1" x 2 1/8" Between Retainer grooves which use #220001504 Cotter Pins – qty. 4 and #190400005 clevis pins – qty. 2

Part #1904K0005 (PSP-1376)

Part #1904K0001 (PSP-1377) 1" x 2 3/4" Between Retainer grooves which use #220001504 Cotter Pins – qty. 4 and #190400001 clevis pins – qty. 2

*Part #1904K0004 1" x 3 1/4" Between Retainer grooves which use #220001504 Cotter Pins – qty. 4 and #190400004 clevis pins – qty. 2

1" DIA. SWAGED WASHER ONE END CLEVIS PIN KITS WITH HOLE



Part #1904K0012 1" x 2-1/8" Between Retainers with 13/64" hole drilled in one end to use #220001504 Cotter Pins – qty. 2 and #190400012 clevis pins – qty. 2

Part #1904K0013 1" x 2-3/4" Between Retainer with 13/64" hole drilled in one end to use #220001504 Cotter Pins – qty. 2 and #190400013 clevis pins – qty. 2

Part #220001504 Cotter Pin for above.

1" DIA. HARDENED PIN KIT



*Part #1904K0035 1" x 3 7/16" Between Retainer grooves which use #220001504 Cotter Pins – qty. 4 and #190400035 clevis pins – qty. 2



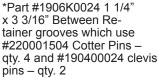




Part #1906K0016 1 1/4" x 3-3/16" Between Retainers with 13/64" hole drilled in BOTH ends to use #220001504 Cotter Pins qty. 4 and #190600016 clevis pins – qty. 2







Part #190600025 1 1/4" x 3" Between Retainer grooves which use #220001504 Cotter Pins – qty. 4 and #190400025 clevis pins – qty. 2

SMALL BREATHERS



MODEL *PM-BHF-6

 THREAD SIZE
 WT.

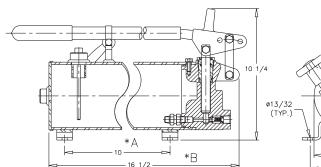
 6
 3/4" ORB. (with "0" Ring)
 3 oz.

Plug-type breather/filter for converting double action unit to single action. Aluminum body contains two fine filter screens retained by star washer.

* Frequently stocked items



PRINCE HAND PUMPS



5/32 YP.)	
5 3/8	
6	

MODEL	WT.
PM-HP-15B	35 lbs.
PM-HP-10B	30 lbs.
PM-HP-5B	27 lbs.
Use	ed for 1000

RESERVOIR SIZE

1 1/2 Gallon 1 Gallon 1/2 Gallon

Used for 1000-3000 PSI

	Α	В
PM-HP-15B	16 9/16	22 5/8
*PM-HP-10B	10	16 1/2
PM-HP-5B	3 7/16	9 15/16
	*PM-HP-10B	PM-HP-15B 16 9/16 *PM-HP-10B 10

* Frequently stocked items

FEATURES



FEATURES

The Prince Hand Pump offers definite advantages over similar components of higher cost. The pump has unique design features which insure versatility. The handle can be used in (2) positions. The pump can be mounted vertically and horizontally. There are (3) different volume and pressure settings.

Position 1: 1.25 cu. in. per stroke—1500 psi* Position 2: .95 cu. in. per stroke—2000 psi*

Position 3: .60 cu. in. per stroke-3000 psi*

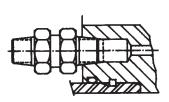
*At applied force of 60-65 lbs. on handle. (Pressure to 6,000 psi can be developed with more force)

APPLICATIONS

This hand pump is designed for use wherever hydraulic pressure is needed without large flow requirements. Its sturdy design and positive sealing features will provide excellent service with a minimum of care. Uses range from mobile equipment to shop presses. Recommended temperatures may range from -40°F to 300°F. Most general purpose hydraulic oils can be used.

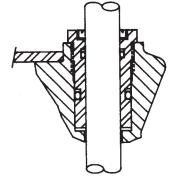
HYDRAULIC CYLINDER APPLICATIONS

This pump is designed for use with single acting cylinders. It may be used with double acting cylinders provided a two-way hand valve is used to direct the flow and a return port is installed on the reservoir.



REPLACEABLE INLET CHECK VALVE

Zero leakage check valve assembly can be easily replaced when necessary.



REMOVABLE PACKING GLAND

Packing gland seals can be easily replaced when necessary. Gland is removable with standard tools. New seals are readily available.

SPECIFICATIONS

D.J. Prince VALVES

Prince Manufacturing Corporation North Sioux City, South Dakota

MADE IN AMERIC

INDEX

MODEL	DESCRIPTION	PAGE
Series 20	20 GPM Stack Type Directional Control Valve	V3
Series 20	20 GPM Load Sense and Load Sense Pressure	
	Compensated Stack Type Directional and Control Valve	V13
Series 20	20 GPM Solenoid Operated Work Section	V18
Series 20	20 GPM Proportional Work Section	V24
Model SV	12 GPM Stack Type Directional Control Valve	V29
Model SV	12 GPM Solenoid Operated Work Section	
Model SV	12 GPM Proportional Work Section	V49
	Radio Remotes and Proportional Operators	V52
RD5100	30 GPM Single Spool Mono-Block Directional Control Valve	V53
RD5200	25 GPM Two Spool Mono-Block Direction Control Valve	V53
RD5300	25 GPM Three Spool Mono-Block Directional Control Valve	V53
RD5000	Solenoid Operated 1, 2, or 3 Spool Mono-Block Valve	V61
RD4100	15 GPM Single Spool Mono-Block Directional Control Valve	V63
LVS	11 GPM Two Spool Series Mono-Block Loader Valve	V66
LVT	10 GPM Two Spool Mono-Block Loader Valve	V68
LVR	14 GPM Two Spool Mono-Block Loader Valve	V69
LS3000	25 GPM Single Spool Log Splitter Control Valve	V71
RD2500	20 GPM Single Spool Mono-Block Directional Control Valve	V73
RD-100	30 GPM Adjustable Flow Control	V76
RD-1900	30 GPM Adjustable Flow Control	V76
RD-400	30 GPM Priority Divider, Fixed Flow	V78
RD-500	30 GPM Priority Divider, Adjustable Flow	V78
RD-200	30 GPM Proportional Divider, Fixed Ratio	V80
RD-300	30 GPM Proportional Divider with Reverse Flow	V80
RD-500P	30 GPM Proportional Divider, Adjustable Ratio	V80
RD-1000-S	30 GPM Sequence Valve	V80
RV	30 GPM Inline Relief Valve	V82
DRV	30 GPM Double Relief Valve	V82
RD-1800	20 GPM Ball/Spring Relief	V84
RD-900	30 GPM Single Selector Valve	V84
MODEL SS	20 GPM Single Selector Valve	V85
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RD-1400	30 GPM Lock Valve, Double Pilot Check	V87
RD-1600	20 GPM Pilot-Operated Check Valve	V87
	Design Charts, Hydraulic Formulas, Metric Conversions	
	Valve Quick Reference Guide	V89

CATV 2-11-23-01

Directional Control Valves

SECTIONAL BODY

Series "20"

STANDARD FEATURES

- 1 -10 Work Sections
- Power Beyond Capability
- Load Checks on Each Work Port
- Extra Fine Spool Metering
- Reversible Handle
- Hard Chrome Plated Spools
- A Float Section can be Installed in any Location in Valve Assembly
- Interchangeable Mounting With Other Popular "20" gpm Stack Valves
- Optional Work Section with Pilot Operated Checks

SPECIFICATIONS

Parallel or Tandem Circuit	
Pressure Rating	
Maximum Operating Pressure	. 350

Maximum Operating Pressure 3500 psi Maximum Tank Pressure 500 psi

Nominal Flow Rating20 gpm Please Refer to Pressure Drop Charts. Allowable Pressure Loss thru Valve Determines the Maximum flow.

Foot Mounting Weight

Maximum Operating Temp180°F

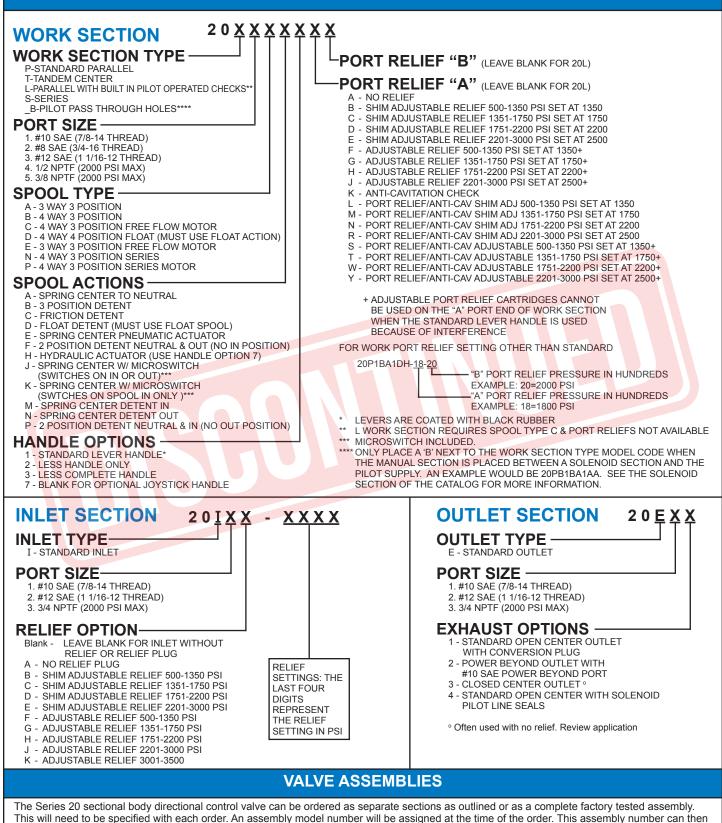
Filtration: For general purpose valves, fluid cleanliness should meet the ISO 4406 19/17/14 level . For extended life or for pilot operated valves, the 18/16/13 fluid cleanliness level is recommended.

INLET SECTIONS

2012D SHIM ADJUSTABLE 1751 2012E SHIM ADJUSTABLE 2201 2012G ADJUSTABLE 1351-1750 2012H ADJUSTABLE 1750-2200		PM	PORT SIZE #12 SAE ORB #12 SAE ORB #12 SAE ORB #12 SAE ORB #12 SAE ORB #12 SAE ORB #12 SAE ORB
20P1CA1AA 4-WAY FREE FLOW MOT 20P1CB1AA 4-WAY FREE FLOW MOT 20P1DD1AA 4-WAY FREE FLOW MOT 20P1BA1DD 4-WAY A POSITION FLO/ 20P1DD1DD 4-WAY A POSITION FLO/ 20P1DD1DD 4-WAY A POSITION FLO/ 20P1DD1DD 4-WAY A POSITION FLO/ 20L1CA1 4-WAY 3 POSITION W/SF 20LP1JA1AA LOAD SENSE 4-WAY DO 20T1BA1AA LOAD SENSE 4-WAY DO 20T1BA1AA 4-WAY DOUBLE ACTING 20T1BA1DD 4-WAY DOUBLE ACTING 20T1CA1AA 4-WAY FREE FLOW MOT OUTLET SECTIONS ALL SECTIONS HAVE SIDE OUTLET PART NO. EXHAUST OPTION 20E21 OPEN CENTER OUTLET 20E22 POWER BEYOND OUTLI 20E23 CLOSED CENTER OUTLET	PORTS, LOAD CHECKS, AND STAN DJUSTABLE. ION W/SPRING CENTER W/SPRING CENTER (WORK PORTS W/SPRING CENTER, 12VDC SOLEN W/SPRING CENTER, 12VDC SOLEN W/SPRING CENTER, 12VDC SOLEN W/SPRING CENTER, 12VDC SOLEN W/SPRING CENTER (WORK PORTS TOR W/SPRING CENTER AND FLOAT I W/SPRING CENTER AND FLOAT I W/SPRING CENTER (WORK PORTS AT W/SPRING CENTER AND FLOAT I PRING CENTER AND FLOAT I PRING CENTER AND FLOAT I W/SPRING CENTER (WORK PORTS DUBLE ACTING WITH SPRING CENTER W/ SPRING CENTER (WORK PORTS TOR W/ SPRING CENTER (WORK PORTS	BLOCKED IN NEUTRAL IOID OPERATED IOID OPERATED W/LEVE RTS BLOCKED IN NEUTI RTS OPEN TO TANK IN N PORTS OPEN TO TANK IN N DETENT BLOCKED IN NEUTRAL DETENT ER S BLOCKED IN NEUTRAL BLOCKED IN NEUTRAL BLOCKED IN NEUTRAL BLOCKED IN NEUTRAL RT	PORT RELIEFS PLUGGED PLUGGED PLUGGED PLUGGED PLUGGED NEUTRAL) PLUGGED PLUGGED PLUGGED PLUGGED PLUGGED PLUGGED PLUGGED PLUGGED PLUGGED PLUGGED PLUGGED
TIE-ROD TORQUE 660402001 30-32 ft-lbs 660402002 660402003 660402003	WORK SECTIONS 1 SECTION 2 SECTION	PART NO. 660402006 660402007	WORK SECTIONS 6 SECTION 7 SECTION
660402004 660402005	3 SECTION 4 SECTION 5 SECTION	660402008 660402009 660402010	8 SECTION 9 SECTION 10 SECTION
660402005	4 SECTION	660402009 660402010	9 SECTION
660402005	4 SECTION 5 SECTION RIES 20 HARDWARE ANI 660585006 SOLENOID PILOT PASSAGE SEA 660390103 20 WORK SECT COIL & CART AS: 660390107 20 WORK SECT COIL & CART AS: 660290010 20 UTIL SECT CONTINUOUS ON 660390157 20 UTIL SECT PBU COIL & CART. 660390157 20 UTIL SECT PBU COIL & CART. 660390157 20 UTIL SECT PBU COIL & CART. 660290012 20 UTIL SECT POWER BEYOND F PORT RELIEF KITS (FOR PRESET CARTRIDGE USE 20PR-OX PG N 660290021 NO RELIEF LOAD CHECK PLUG 660290031 SHIM ADJ. 350 - 1350 PSI 660290303 SHIM ADJ. 2201 - 3000 PSI 660290305 SHIM ADJ. 2201 - 3000 PSI 660290401 ADJUSTABLE 1751 - 2200 PSI 660290403 ADJUSTABLE 1751 - 200 PSI 660290405 ADJUSTABLE 1751 - 200 PSI 660290405 ADJUSTABLE 201 - 3000 PSI 660290405 ADJUSTABLE 201 - 3000 PSI 66029003 ANTI-CAVITATION CARTRIDGE	660402009 660402010 D SEAL KITS I KIT SY 12VDC/LEADS SY 24VDC/LEADS ASSY 12VDC/LEADS ASSY 12VDC/LEADS CING CART PLUG #10 SAE (602902 6602902 6602902 (28) RELI 66079000 6607900 66079000 660790000 660790000000000	9 SECTION 10 SECTION 10 SECTION TRELIEF KITS ESET CARTRIDGE USE 20 IR-OX PG V28) 01 NO RELIEF PLUG 01 SHIM ADJ. 500 - 1350 PSI 03 SHIM ADJ. 151 - 1750 PSI 05 SHIM ADJ. 1751 - 2200 PSI 05 SHIM ADJ. 2201 - 3000 PSI 06 ADJUSTABLE 1351 - 1750 PSI 07 ADJUSTABLE 1351 - 1750 PSI 08 ADJUSTABLE 1201 - 3000 PSI 09 ADJUSTABLE 2201 - 3000 PSI 09 ADJUSTABLE 2201 - 3000 PSI 09 ADJUSTABLE 2201 - 3000 PSI 01 ADJUSTABLE 2201 - 3000 PSI 02 ADJUSTABLE 2201 - 3000 PSI 03 ADJUSTABLE 2201 - 3000 PSI 04 ADJUSTABLE 2201 - 3000 PSI 05 ADJUSTABLE 2201 - 3000 PSI 06 ADJUSTABLE 2201 - 3000 PSI 07 ADJUSTABLE 2201 - 3000 PSI 07 ADJUSTABLE 2201 - 3000 PSI 08 ADJUSTABLE 2201 - 3000 PSI 09 ADJUSTABLE 2201 - 3000 PSI 01 ADJUSTABLE 2201 - 3000 PSI 03 ADJUSTABLE 1251 - 1750 PSI 04 ADJUSTABLE 2201 - 3000 PSI 04 SHIM FOR RELIEF 05 .041 SHIM FOR REL

SPECIAL SECTIONS AVAILABLE:

Use order code Matrix below to generate a model number that meets your requirements. If you prefer, contact your Sales Representative with your specific requirements and a model number will be assigned for you. This model number can then be used for future orders. A minimum order quantity will apply to special valves. Please consult Sales Representative.



ASSEMBLY MODEL NUMBER 20A - X X X X

XXXX = Sequence of Numbers. This number will be assigned to final valve to be assembled and tested at the factory. Each new order or quote will be assigned a new assembly model number.

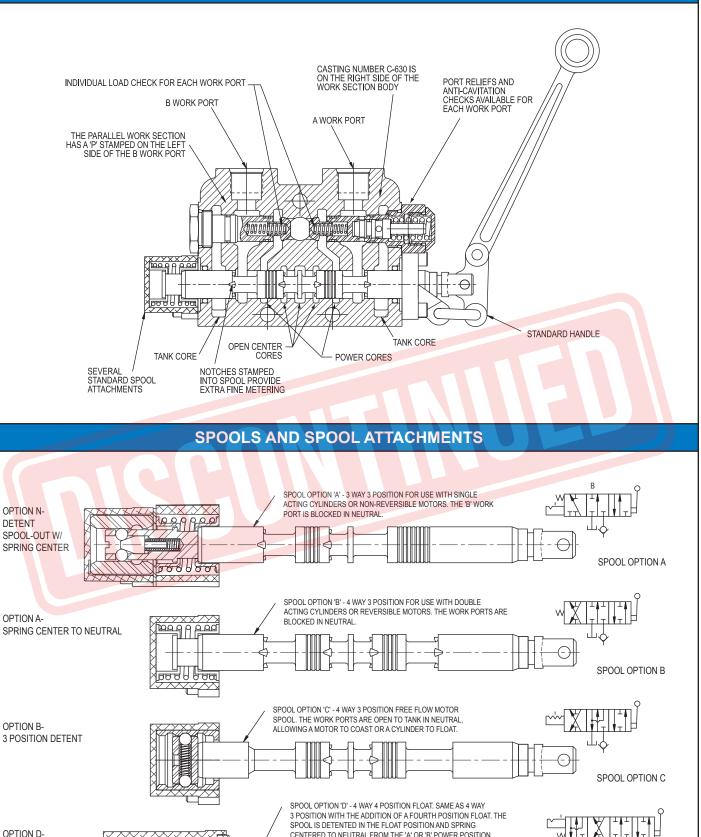
CATV 5-11-23-01

be used for future orders.

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V5

CROSS SECTION OF 20P1BA1DA PARALLEL WORK SECTION

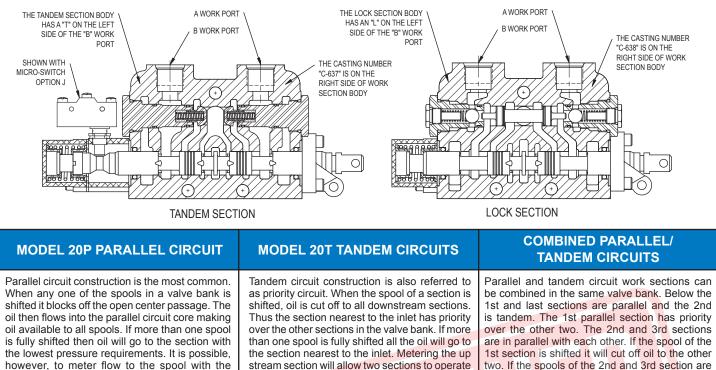


OPTION D-FLOAT DETENT WITH SPRING CENTER

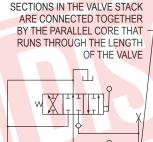
SPOOL OPTION D

Ð

CROSS SECTION OF TANDEM WORK SECTION AND LOCK SECTION



however, to meter flow to the spool with the least load and power two unequal loads. The schematic below shows a three section parallel circuit stack valve THE POWER CORE OF ALL



LOAD CHECK

Each work port of the Series 20 stack valve has

a separate load check. The load check prevents

the fall of a cylinder as the spool is shifted. It

also prevents the back-flow of oil from the work

port to the inlet. The pump must build up enough

pressure to overcome the pressure on the work

port caused by the weight of the load before the

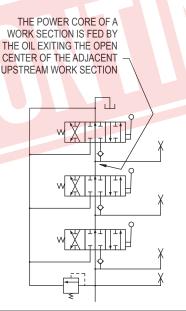
PLEASE NOTE that the load check has nothing to

do with how well the valve will hold up a cylinder

with the spool in neutral. The load check is

functional only when the spool is shifted.

stream section will allow two sections to operate at the same time. The schematic below shows a three section tandem circuit stack valve.



OPEN CENTER APPLICATIONS

The standard Series 20 stack valve is open center. When the spools are in neutral hydraulic oil is directed from the inlet to the outlet (or power beyond) through the open center core. Moving one or more spools closes off the open center core and directs oil to the work ports. Open center systems most often contain fixed displacement pumps like The Prince SP series gear pumps.

PLEASE NOTE that the maximum pressure in an open center system is controlled by a relief valve. The Series 20 inlet sections are available with a built in inlet relief for this purpose.

CLOSED CENTER APPLICATIONS

both shifted oil will go to the one with the least

resistance. It should be noted that it is the section just prior to the tandem section that has priority,

not the tandem section. Further if a parallel section

is placed just after a tandem, the two sections will

20T TANDEM WORK SECTION

20P PARALLEL WORK SECTIONS >

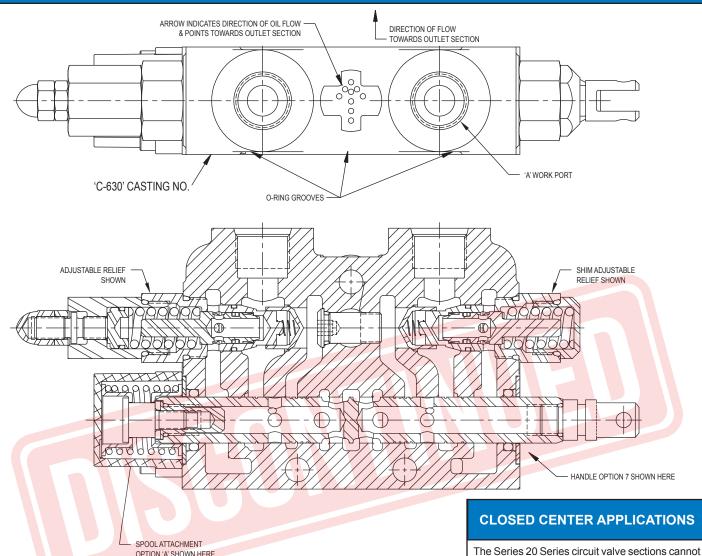
be in a parallel.

The Series 20 stack valve can be converted to closed center by adding the closed center plug to the outlet section. This blocks off the open center core when the spools are in neutral. These systems often use a variable displacement pressure compensated pump that limits the maximum pressure. When spools are in neutral system pressure is maintained at inlet of the valve. A relief is normally not required or must be set at a higher pressure than the pump compensator.

PLEASE NOTE that this closed center option does not provide for the drain off of standby spool leakage. This can allow a very small amount of oil to enter the work ports when in neutral.

cylinder can move.

SERIES CIRCUIT SERIES 20 WORK SECTIONS CROSS SECTION OF SERIES SECTION



MODEL 20S SERIES CIRCUIT

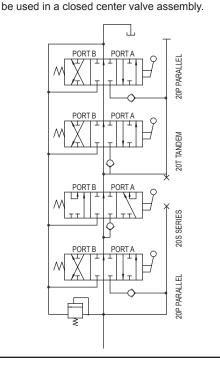
A series circuit valve is most commonly used to control more than one hydraulic component simultaneously. The entire circuit flow is available to each valve section that is actuated. In a two spool series valve with both spools actuated, the oil flows from the inlet to the work port of the first section. The return flow of the first section is directed to the open center core of the second section. (In a parallel valve the return oil from the work port is directed to the tank core.) From the open center core of the second section, the oil flows to the work port with the return oil going to the outlet. In a series circuit valve, the summation of the pressures required for each work section will equal the total pressure required for the circuit. The total pressure required must not exceed the system relief setting for the pump pressure rating. It is not required to have a Series 20 series section as the last section, unless series flow is required to a downstream valve. In this application, a power beyond plug must be used in the outlet section.

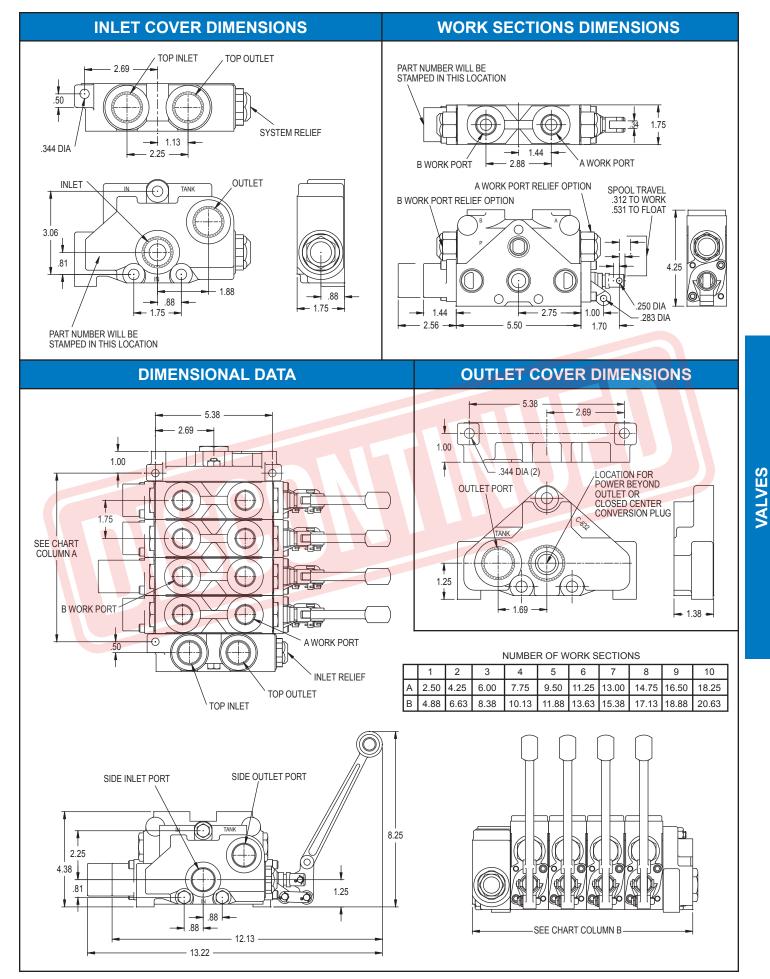
COMBINED SERIES/ PARALLEL CIRCUITS

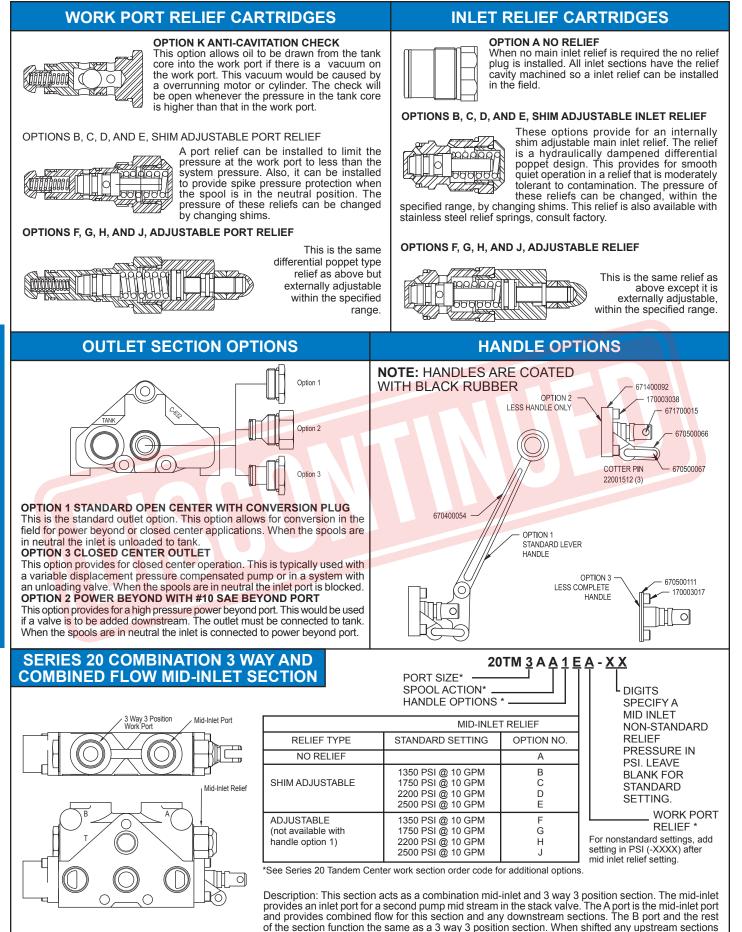
The Series 20 series sections may be stacked with 20P parallel circuit valve sections. When using a series section, the immediate downstream section needs to be a series, tandem, or outlet section. 20P sections can be either in front of the Series 20 series sections or behind a combination of series and tandem sections.

For solenoid operation with series sections and a 20U utility section, there needs to be a Series 20 tandem section with pilot passageways between the series section and the utility section.

In the valve assembly shown below, the first and fourth sections are parallel. The second section is series, the third section is tandem. The first parallel section has priority over all downstream valves. When the spool of the first parallel section is actuated, the return oil from the work port is directed to the tank core, thus oil flow to downstream sections is cut off. The second and third sections are in series with each other as well as the second and fourth sections. The third and fourth sections are in parallel with each other.





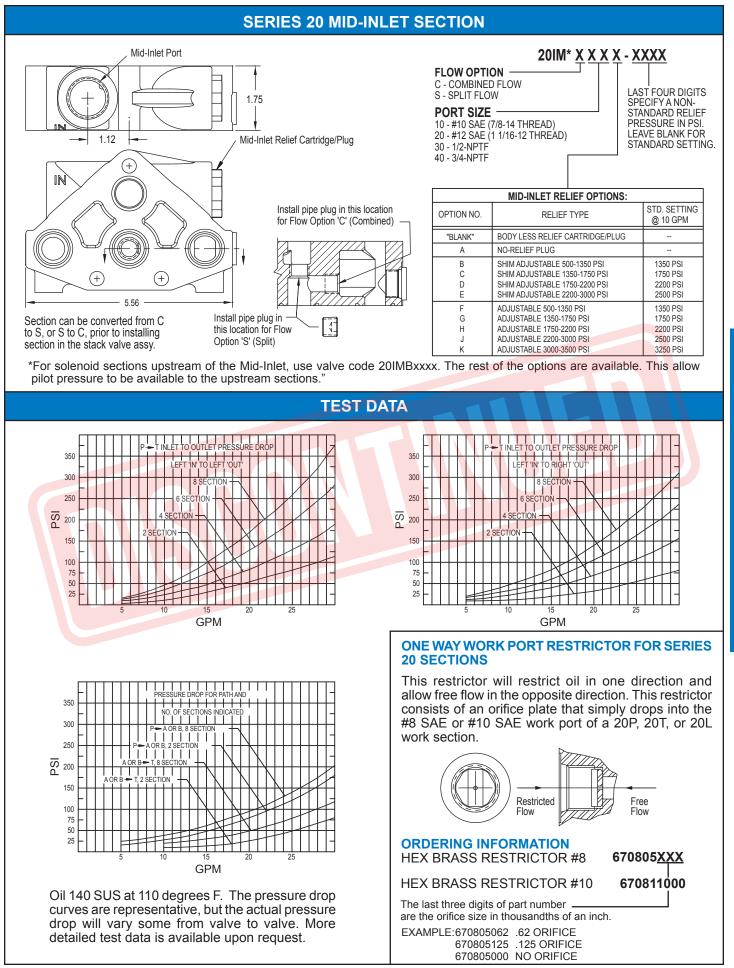


*See Series 20 Tandem Center work section for dimensional data.

take priority of the main inlet flow over downstream sections. Both an inlet relief and a mid-inlet relief are required to provide relief protection when both upstream and downstream sections are shifted.

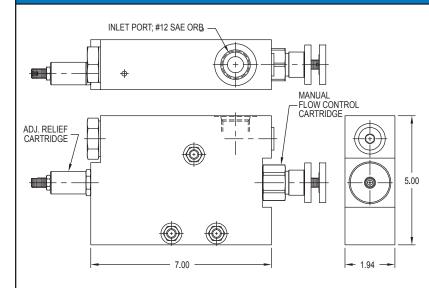
V10

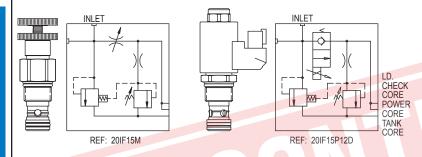
VALVES



SERIES 20 FLOW CONTROL INLET SECTION

20IF15







M – Manual Control P – Electro-Proportional

Pilot Operated Relief Adjustable From 2000-3500 PSI.

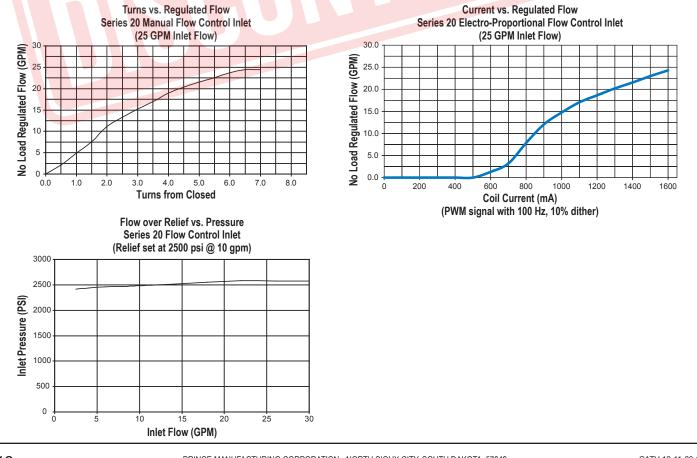
Standard Relief Setting: 2500 PSI @ 10 GPM

MANUAL (OPT 'M') DESCRIPTION:

This inlet incorporates a manually operated pressure compensated flow control. With the flow control knob turned fully in (clockwise), all of the inlet flow is diverted to the tank core. By turning the flow control knob counter-clockwise, the inlet flow directed to the power core will be proportionally increased. (Approximately 6 turns varies the controlled flow from no flow to 26 GPM. Maximum number of turns on flow control is approximately 8 turns.)

ELECTRO-PROPORTIONAL (OPT 'P') DESCRIPTION:

This inlet incorporates a solenoid operated, electrically variable pressure-compensated flow control. With no current going through the solenoid, all of the inlet flow is diverted to the tank core. By increasing the current through the solenoid, the flow being directed to the power core will be proportionally increased. (The current range is 400-1600 mA. At a current of 1600 mA max controlled flow is approximately 25 GPM.) Control current is provided via a controller card providing a PWM signal. See Page V38 for more information on a controller.



TEST DATA

Directional Control Valves

LOAD SENSE SECTIONS

Series "20"

STANDARD FEATURES

SPECIFICATIONS

- Extended Length Notches for Very Fine Metering
 Machined Internal Lands for Precise
- Control and reduced Dead Band
- Low Standby Pressures
- Spool Design for reduced Flow Forces

-				
•	low	Spool	Actuating	Forces

- Use of Standard Series 20 Inlet Sections
- (20I) and Tie Rod Kits
 Same Mounting Pattern and Envelope as Standard Series 20 Valve

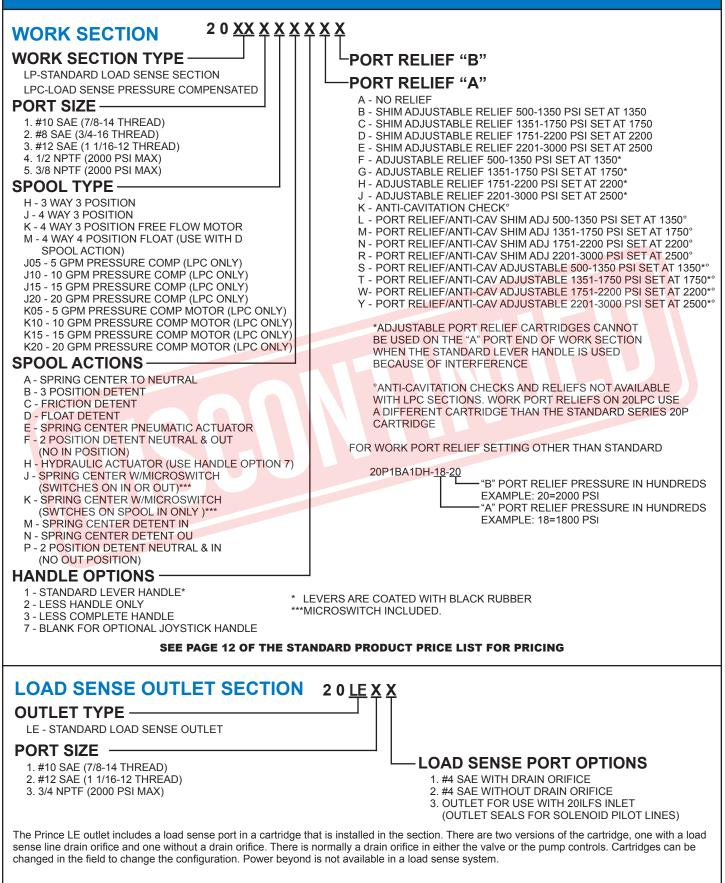
Prossure Rating

Flessule Rating	
Maximum Operating Pressure	3500 psi
Maximum Tank Pressure	
Nominal Flow Rating	20 GPM
Please Refer to Pressure Drop ar	nd Flow
Charts for Your Application	

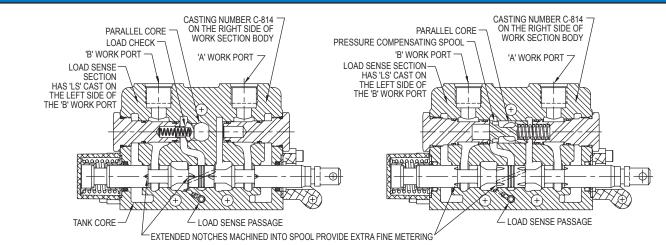
Foot Mounting Maximum Operating Temp	180°F
20LP Section Weight 20LE Section Weight	

SPECIAL SECTIONS AVAILABLE:

Use order code Matrix below to generate a model number that meets your requirements. If you prefer, contact your Sales Representative with your specific requirements and a model number will be assigned for you. This model number can then be used for future orders. A minimum order quantity will apply to special valves. Please consult Sales Representative.



CROSS SECTION OF LOAD SENSE & LOAD SENSE PRESSURE COMPENSATED WORK SECTIONS

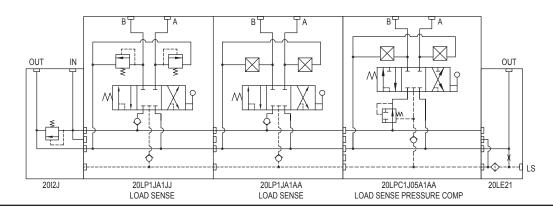


MODEL 20LP LOAD SENSE & 20LPC LOAD SENSE PRESSURE COMPENSATED CIRCUITS

The Series 20LP and 20LPC work sections are specifically designed to be used with a pressure-flow compensated pump, commonly known as a load sense pump. The valve is a parallel circuit, closed center design, where flow does not flow through the valve when the spools are centered. A load sense signal line must be connected to the load sense port on the pump and to the load sense port on the 20LE outlet section of the valve. The pressure-flow compensator portion of a load sense pump will maintain (within its flow and pressure limitations) an output pressure equal to the pressure at the load sense port plus the load sense differential pressure. The differential pressure is typically between 150 and 350 psi. The valve is designed so that when a spool is shifted, the pressure at the out flow work port is presented to the valves load sense port. The valve incorporates logic and load sense check valves so that when multiple spools are shifted, the highest pressure of any of the work ports is directed to the load sense port. A load sense line bleed orifice needs to be present in either the Prince load sense outlet or the load sense pump controls. The bleed orifice will prevent high pressure from being trapped in the load sense line and sending false signals to the pump.

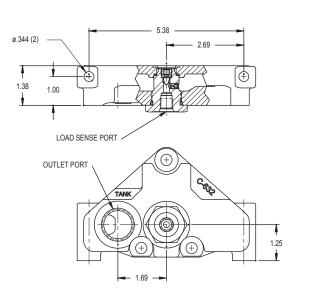
There are a number of benefits to load sense systems, one of the primary ones being in the metering of the flow to the work ports. Metering is typically accomplished when the flow passes through metering notches in the spool. In a load sense valve, the pressure that drives the flow through the notches is typically limited to the relatively low and nearly constant differential pressure. This relatively low differential pressure makes the notches more effective and gives more resolution in regard to spool travel versus flow out of the work port. Also, this "resolution" remains relatively the same regardless of the pressure required at the work port. The metering notches in the Prince load sense valve have been optimized to give excellent metering characteristics over an extended portion of the spool travel and over the full flow rating of the valve. The internal lands of the casting have also been machined to give repeatable, precise control to the metering characteristics. Another benefit to load sense valves is that, in the minimum flow standby mode, the pump only has to generate the rather low differential pressure thus saving energy as compared to typical open center or standard closed center systems.

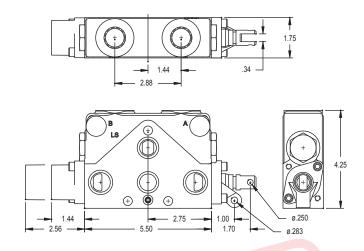
The Series 20LPC load sense pressure compensated valve incorporates a pressure compensator upstream to the metering notches on the spool ("pre-comp"). With either a fully shifted or partially shifted spool, work port flow will remain constant regardless of changing load pressure requirements. Pressure compensated sections are particularly useful in applications where the metering of flow, with varying pressure and flow conditions is required. The 20LPC sections have flow rated spools that determine the maximum flow from the individual work section. For instance the maximum flow from a work sections with a J10 spool is 10 gpm. Metering notches extend to the full travel of the spool. The lower flow spools will provide increased flow vs. spool travel resolution. With parallel circuitry, multiple sections can be used simultaneously to meter flow. If the sum of the flow rating of the shifted spools is less than the flow rating of the pump, all sections will receive flow. If the call for flow based on spool position from all work sections calls for more flow than the output of the pump, there may be some division of flow based on the section with the lowest pressure demand. The 20LPC is an optimal choice for proportional solenoid operation. It provides the greatest resolution of all the Prince proportional solenoid valves.



LOAD SENSE OUTLET DIMENSIONS

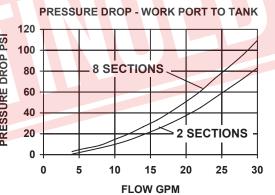
LOAD SENSE WORK SECTION DIMENSIONS



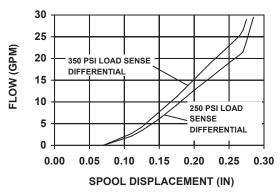




PRESSURE DROP - INLET TO WORK PORT 300 PRESSURE DROP PSI PRESSURE DROP PSI 250 **8 SECTIONS** 200 150 100 **2 SECTIONS** 50 0 0 5 10 15 20 25 30 FLOW GPM

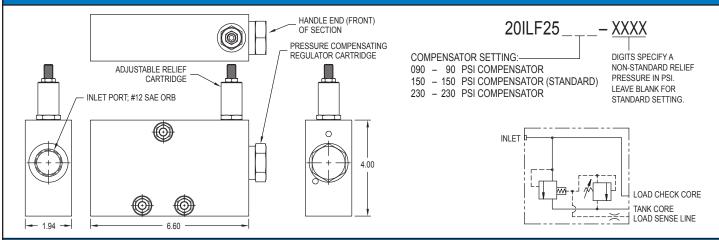


WORK PORT FLOW VS. SPOOL POSITION

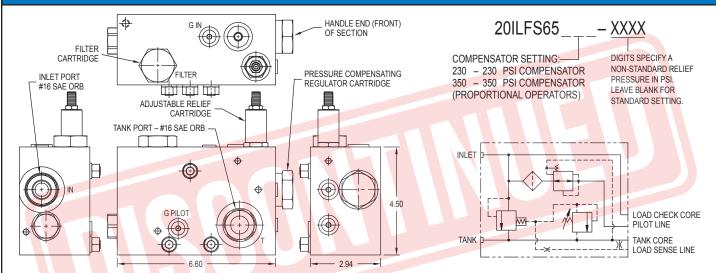




SERIES 20 LOAD SENSE INLET (FOR FIXED DISPLACEMENT PUMP)



SERIES 20 LOAD SENSE INLET (FOR FIXED DISPLACEMENT PUMP w/SOLENOID OPERATORS)



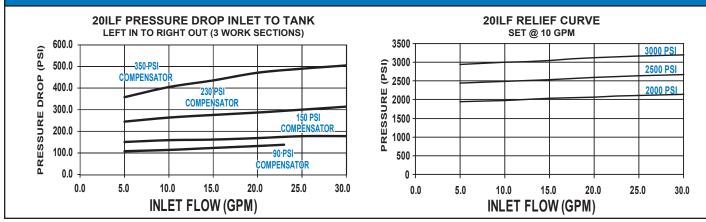
APPLICATION NOTES – 20ILF and 20ILFS:

- 1. These inlets are for use with a fixed displacement pump (such as a gear pump) and Prince Series 20 load sense sections.
- When all spools are centered, the inlet allows the pump flow to be diverted to tank at relatively low pressure.
 When a spool is shifted, the compensator directs the flow to the
- work port at a flow and pressure relative to the work port/load sense pressure. The inlet retains the enhanced metering control of the load sense work sections.
- 4. For the 20ILF inlet, the 150 psi compensator is standard. It is typically used with flows up to approximately 25 gpm. For lower flows, a 90 psi compensator can be used. For higher flows, a 230 psi compensator can be used. For the 20ILFS inlet, a 230 psi compensator is standard.

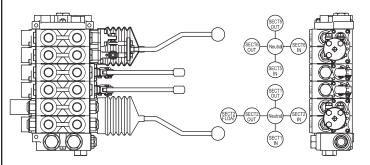
For proportional operators a 350 psi compensator is needed. In the 20ILFS, the compensator generates pilot pressure to initiate a spool shift when a solenoid is energized. Load induced pressure is required to complete and then maintain the spool shift. 5. For the 20ILFS, the flow to the solenoid cartridges is filtered through

- a 10 μ replaceable cartridge pressure filter. Only the pilot flow is filtered thus providing a long filter life.
- A Series 20 load sense outlet (20LEx1 for the 20ILF or a 20LEx3 for the 20ILFS) must be used in the stack valve assembly.
- The load sense port on the outlet needs to be plugged with a steel plug. There is no external load sense line. 8. The 20ILFS requires a tie rod kit for one extra section.

TEST DATA



JOYSTICK HANDLES FOR SERIES "20"



This is a special handle for the SERIES 20 stack valve that allows the spools of two adjacent sections to be operated by one common handle. The spools can be operated independently or simultaneously depending on handle movement. The option is typically used on spring center to neutral sections. Normally, the handle is installed at the factory on sections ordered with handle option 7. However, the handle can also be installed in the field on valves originally equipped with standard handles (handle options 1 through 4). This drawing shows two joysticks with offset handles installed on a six section valve. A typical handle to spool movement pattern is shown. Different patterns are also available. The Joystick handle can be used with standard three position spools or with four position float spools. If work port reliefs are required on the joystick end of a section, the relief cartridges must be the shim adjustable type. When two joysticks are installed on the same valve assembly, it is recommended that there be two standard section between them to prevent handle interference.

When ordering a valve assembly, please refer to the following part numbers and indicate which sections the handle is to be installed on. The part numbers refer to the complete joystick assembly required to control two valve sections. Use the same part numbers to order kits for field installation.

JOYSTICK ASSEMBLY W/S ASSEMBLED ON VALVE	
KIT	660190016
JOYSTICK ASSEMBLY W/	
ASSEMBLED ON VALVE	
KIT	

SERIES 20 SOLENOID OPERATED WORK SECTIONS

The solenoid operated Series 20 work sections allow remote electrical on-off control or, depending on the model, manual control. The solenoid operated sections contain two, 3 way-2 position screw in style cartridge valves. The screw in cartridges provide a robust platform for the higher tank pressures often seen in mobile applications.

Prince solenoid operated valves are pilot operated valves where pilot pressure is used to shift the spool. Depending on the model, the pilot pressure will be applied either directly to the end of the spool or to a piston that is connected to the spool. When both solenoids are de-energized, both spool end cavities or piston cavities are connected to tank. When the "A" solenoid is energized, pilot pressure is applied to the "A" end of the spool/piston, causing the spool to shift, against spring bias, and allow flow to the "A" work port. Energizing the "B" solenoid causes similar action on the "B" end. Internal pilot passageways convey pilot pressure to the solenoid actuators.

Pilot pressure is typically supplied by a utility section, but in the case of load sense sections or closed center assemblies, it can also be provided by an inlet manifold, which can be provided with filtered pilot flow. If a utility section is used, it must be installed between the last work section and the outlet cover. The utility section, or inlet manifold, limit the pilot pressure to approximately 350 psi.

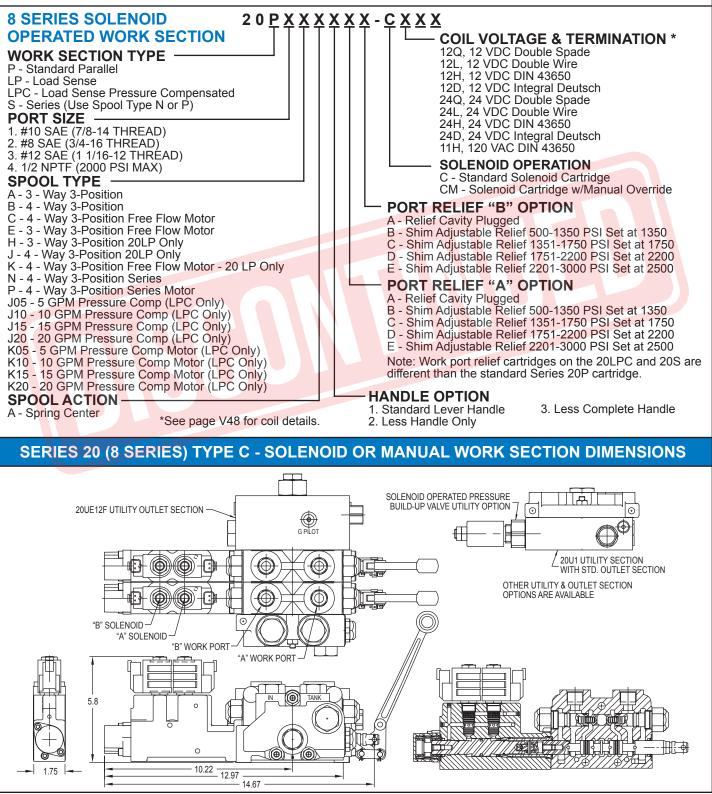
For an open center system, a pressure build up cartridge is needed in the utility section. The pressure build up section provides pilot pressure to initiate the spool shift. A minimum of approximately 300 psi load induced pressure is required to complete the spool shift and hold the spool in the shifted position. For over center or light load applications a restrictor installed in the work port line may be required. Manual sections used in the same assembly with solenoid sections must either be upstream of solenoid sections or be custom sections machined with pilot passage ways in an assembly using a utility section. In assemblies with an inlet manifold, both solenoid and manual sections can be in the same assembly but, manual sections may have to be machined with pilot pass through passageways. For solenoid operated series sections, a tandem section with pilot pass through passageways must be between the series section and the utility section. Consult your sales representative for your application.

Prince solenoid operators are offered in both a divided design (a solenoid on each end of the section) and a combined design (both solenoids on the end opposite the handle). We also currently offer models in both 10 thread size and 8 thread size solenoid cartridges. The 8 thread size offers a more compact assembly and a more economical choice as compared to a 10 thread size.

SERIES 20 (8 SERIES) COMBINED SOLENOID OPERATORS (BOTH OPERATORS ON ONE END)

A Series 20 solenoid operated section with a handle code of 1, 2, 3 or 4 will designate a combined configuration with both solenoid cartridges on one end, opposite the handle end of the section. The combined operator configurations provide for either electric or manual operation. Handle configurations will be the same as the standard manual sections.

A "C" prefix on the solenoid and coil designation will designate an 8 series design and will have screw in solenoid cartridges with a #8 thread size. The #8 size cartridges allow for a more compact section size. An optional manual override feature is available for the #8 solenoid cartridges. Cartridges and coils on the 8 series are not interchangeable with the Prince 10 series solenoid sections or sections manufactured prior to November 2014. Any of the standard "-S", "-T", "-C" or "-D" style Prince Series 20 solenoid operated work sections may be used in any combination within a stack valve assembly.

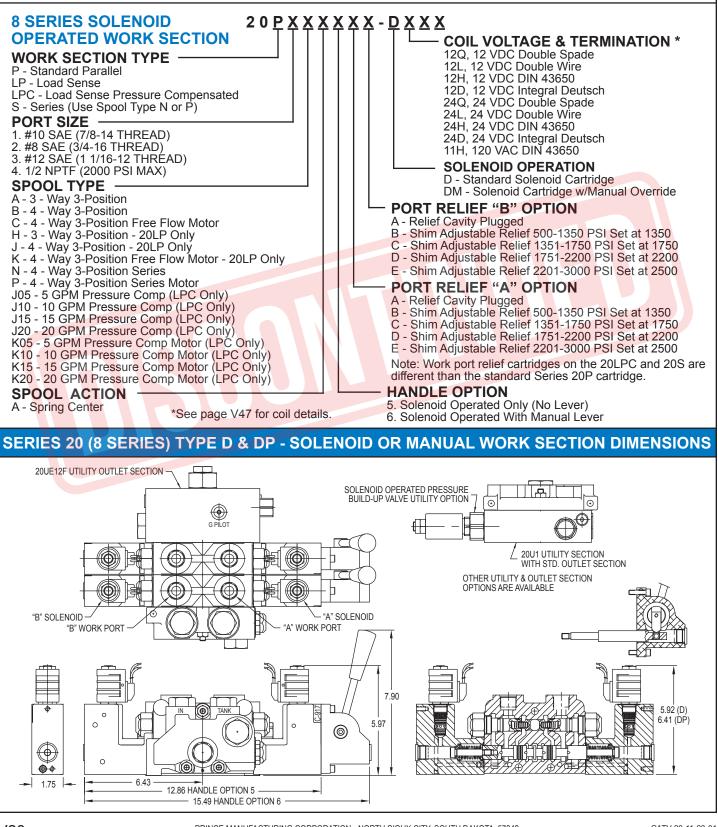


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SERIES 20 (8 SERIES) DIVIDED SOLENOID OPERATORS (OPERATORS ON BOTH ENDS)

A Series 20 solenoid operated section with a handle code of 5 or 6 will designate a split configuration with a solenoid cartridge on each end of the section. Handle option 5 provides electric operation only. Handle option 6 provides a lever handle for either electric or manual operation.

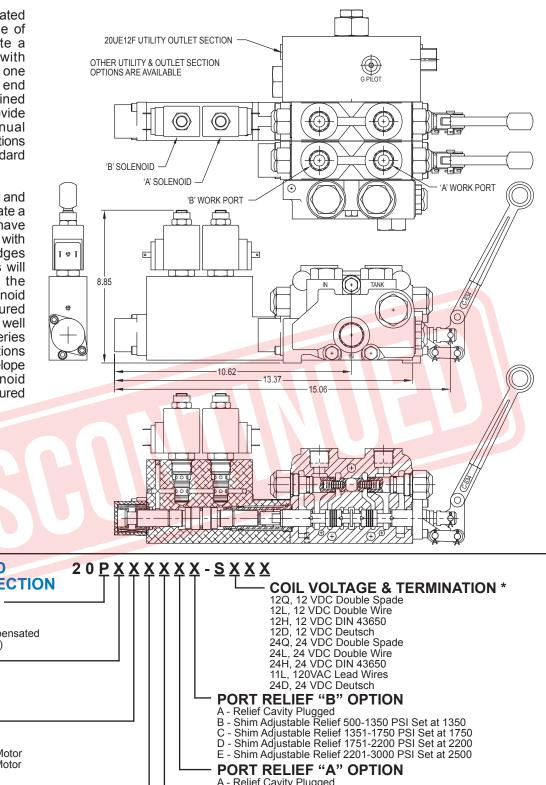
A "D" prefix on the solenoid and coil designation will designate an 8 series design and will have screw in solenoid cartridges with a #8 thread size. The #8 size cartridges allow for a more compact section size. An optional manual override feature is available for the #8 solenoid cartridges. Cartridges and coils on the 8 series are not interchangeable with the Prince 10 series solenoid sections or sections manufactured prior to November 2014. Any of the standard "-S", "-T", "-C" or "-D" style Prince Series 20 solenoid operated work sections may be used in any combination within a stack valve assembly.



SERIES 20 (10 SERIES) COMBINED SOLENOID OPERATORS (BOTH OPERATORS ON ONE END)

A Series 20 solenoid operated section with a handle code of 1, 2, 3 or 4 will designate a combined configuration with both solenoid cartridges on one end, opposite the handle end of the section. The combined operator configurations provide for either electric or manual operation. Handle configurations will be the same as the standard manual sections.

An "S" prefix on the solenoid and coil designation will designate a 10 series design and will have screw in solenoid cartridges with a #10 thread size. Cartridges and coils on the 10 series will be interchangeable with the components on Prince solenoid operated valves manufactured prior to November 2014 as well as current production 10 series valves. The 10 series sections will have a dimensional envelope the same as Prince solenoid operated sections manufactured prior to November, 2014.



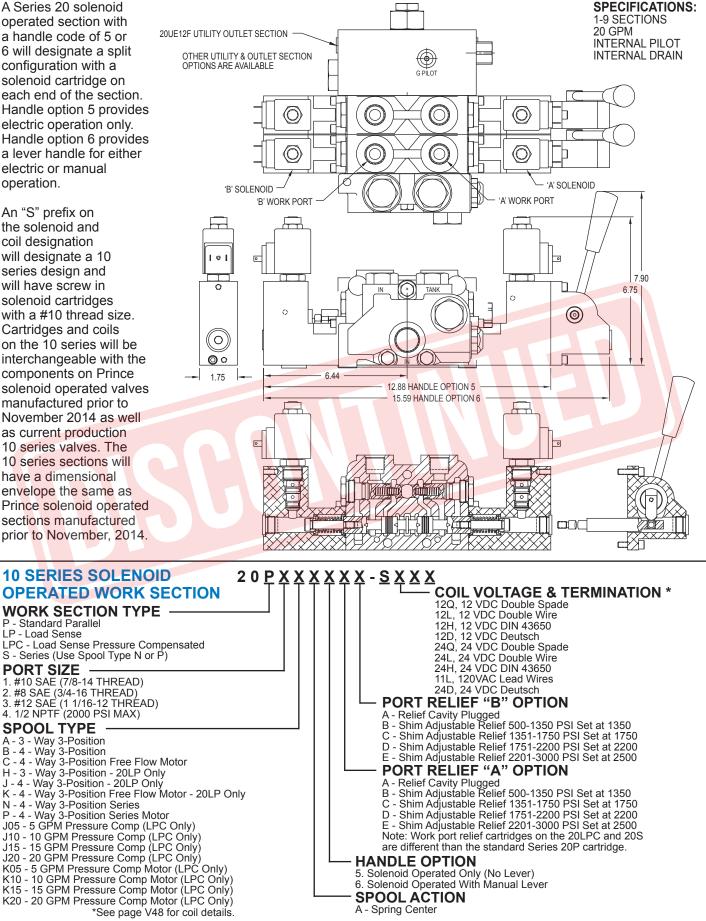
· ·	10 SERIES SOLENOID 2 0 P X X	XXX	<u>X X</u>	<u>(-SXXX</u>
	OPERATED WORK SECTION WORK SECTION TYPE P - Standard Parallel LP - Load Sense LPC - Load Sense Pressure Compensated S - Series (Use Spool Type N or P) PORT SIZE 1. #10 SAE (7/8-14 THREAD) 2. #8 SAE (3/4-16 THREAD) 3. #12 SAE (1 1/16-12 THREAD) 3. #12 SAE (1 1/16-12 THREAD) 4. 1/2 NPTF (2000 PSI MAX) SPOOL TYPE A - 3 - Way 3-Position B - 4 - Way 3-Position Free Flow Motor E - 3 - Way 3-Position Free Flow Motor H - 3 - Way 3-Position 20LP Only	××2		 SXXXX COIL VOLTAGE & TERMINATION * 12Q, 12 VDC Double Spade 12L, 12 VDC Double Wire 12H, 12 VDC Double Wire 12H, 12 VDC Deutsch 24Q, 24 VDC Double Spade 24L, 24 VDC Double Wire 24H, 24 VDC Double Wire 24H, 24 VDC Deutsch 11L, 120VAC Lead Wires 24D, 24 VDC Deutsch PORT RELIEF "B" OPTION A - Relief Cavity Plugged B - Shim Adjustable Relief 500-1350 PSI Set at 1350 C - Shim Adjustable Relief 1751-2200 PSI Set at 2200 E - Shim Adjustable Relief 2201-3000 PSI Set at 2500 PORT RELIEF "A" OPTION
	J - 4 - Waý 3-Position 20LP Onlý K - 4 - Way 3-Position Free Flow Motor - 20 LP Only N - 4 - Way 3-Position Series P - 4 - Way 3-Position Series Motor J05 - 5 GPM Pressure Comp (LPC Only) J10 - 10 GPM Pressure Comp (LPC Only) J15 - 15 GPM Pressure Comp (LPC Only) J20 - 20 GPM Pressure Comp (LPC Only) K05 - 5 GPM Pressure Comp Motor (LPC Only) K10 - 10 GPM Pressure Comp Motor (LPC Only) K15 - 15 GPM Pressure Comp Motor (LPC Only) K20 - 20 GPM Pressure Comp Motor (LPC Only)			 A - Relief Cavity Plugged B - Shim Adjustable Relief 500-1350 PSI Set at 1350 C - Shim Adjustable Relief 1351-1750 PSI Set at 1750 D - Shim Adjustable Relief 1751-2200 PSI Set at 2200 E - Shim Adjustable Relief 2201-3000 PSI Set at 2500 Note: Work port relief cartridges on the 20LPC and 20S are different than the standard Series 20P cartridge. HANDLE OPTION Standard Lever Handle Less Handle Only SPOOL ACTION A - Spring Center

VALVES

SERIES 20 (10 SERIES) SPLIT SOLENOID OPERATORS (OPERATORS ON BOTH ENDS)

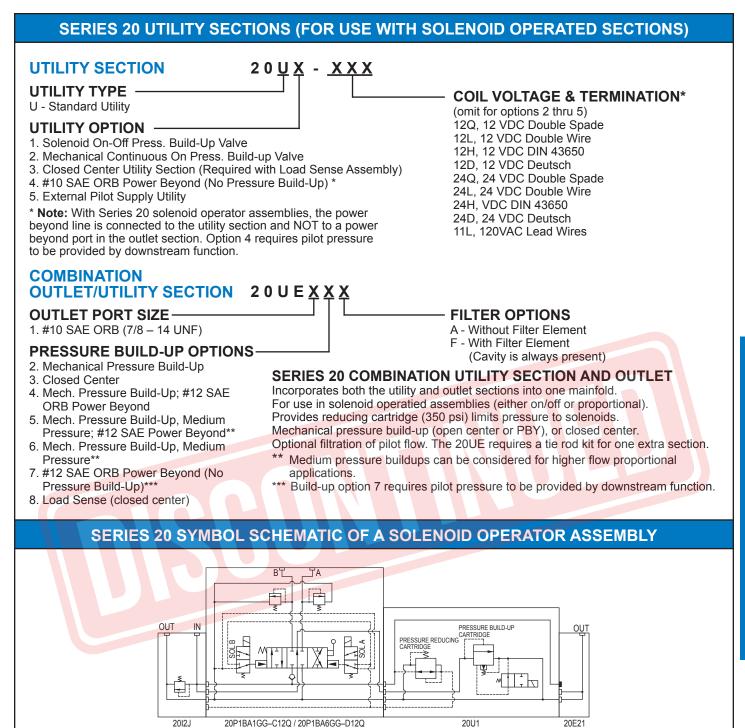
A Series 20 solenoid operated section with a handle code of 5 or 6 will designate a split configuration with a solenoid cartridge on each end of the section. Handle option 5 provides electric operation only. Handle option 6 provides a lever handle for either electric or manual operation.

An "S" prefix on the solenoid and coil designation will designate a 10 series design and will have screw in solenoid cartridges with a #10 thread size. Cartridges and coils on the 10 series will be interchangeable with the components on Prince solenoid operated valves manufactured prior to November 2014 as well as current production 10 series valves. The 10 series sections will have a dimensional envelope the same as Prince solenoid operated sections manufactured prior to November, 2014.



V22

VALVES



For remote control options for on/off and proportional solenoids, see page V52.

POWER BEYOND

TANK

PRESSURE BUILD-UP CARTRIDGE

20U2

PRESSURE REDUCING CARTRIDGE

OR 20P1BA1GG-S12Q / 20P1BA6GG-S12Q

> PRESSURE BUILD-UP

PILOT GAUGE

RESSURE

20UE14F

REDUCING

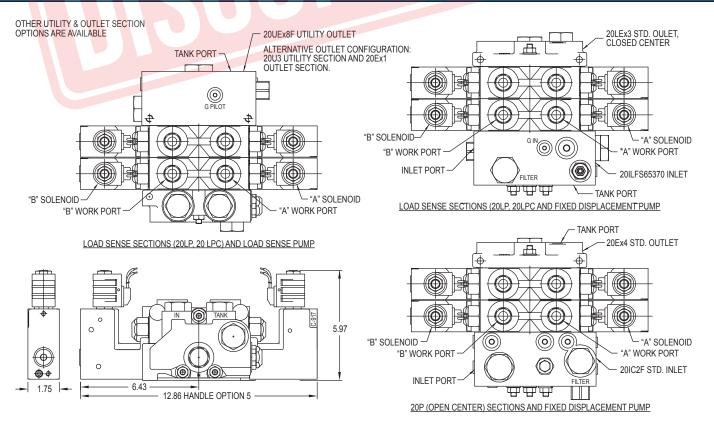
SERIES 20 PROPORTIONAL WORK SECTIONS

In the Series 20 proportional work sections, varying pilot pressure is applied to the end of the spools to shift the spool against spring bias. Proportional pressure reducing cartridges are used to vary the pressure on the spools. As the current through the cartridge coil increases, the amount of the available pilot pressure applied to the ends of the spools also, proportionally increases. There will be a threshold pressure/current (dead band) to overcome the initial spring centering force and initial land coverage. Once this pressure/current has been exceeded, increasing the current through the coil will increase the flow from the work ports.

Current to the coils is typically provided by a PWM current control module and a joystick or other input device. The coils require a maximum current of approximately 1300 mA (@ 12 volts), and for reduced hysteresis, a dither frequency of approximately 100 Hz and a dither amplitude of 50 to 100 mA. The controller should have adjustable minimum current and maximum current settings to minimize the dead band before work port flow starts and to maximize the control resolution. See page V38.6 for examples of control module and joystick components.

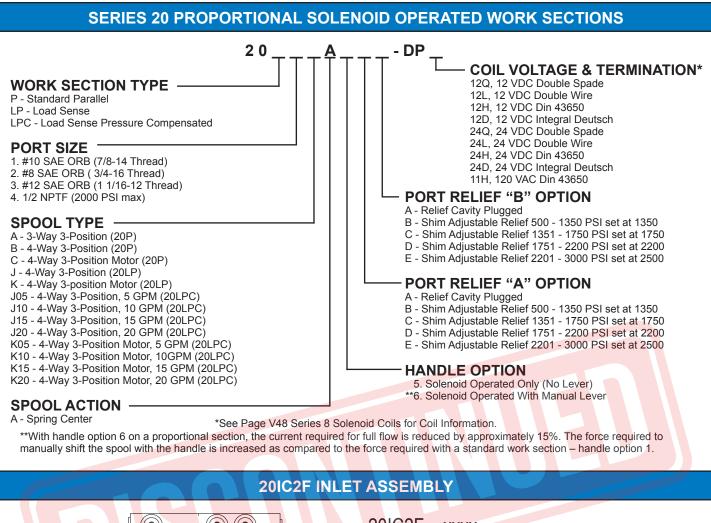
The proportional work sections require pilot pressure to shift the spools. Approximately 325 psi pilot pressure will fully shift the spool in Prince proportional sections. With open center valve assemblies, the pilot pressure is typically supplied by a compensator inlet (20IC). The compensator inlets will provide adequate pilot pressure regardless of the load induced pressure. On load sense or load sense pressure comp systems used with a fixed displacement pump, a 20ILFS65370 inlet will provide pilot pressure. For load sense and load sense pressure comp systems used with a load sense pump, the standby pressure setting should be approximately 325 psi or more to provide for completely shifting the spool.

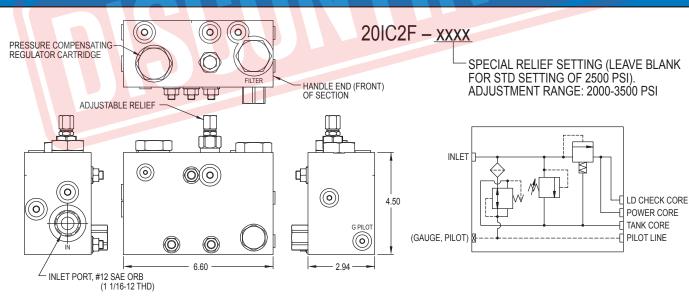
Prince offers three basic proportional families. The first is open center proportional (based on the 20P family). The open center family, which is typically used with a fixed displacement (gear) pump is the least expensive of the three families. The open center family will provide controlled starts and stops of the work port flow, however, the metering band is not as wide as the other proportional families. The flow rate is also somewhat pressure dependent. The second family is load sense proportional and is based on the 20LP family. The load sense proportional has a wider metering band and the flow is not pressure dependent. The third family, based on the 20LPC family, is load sense pressure comp proportional. The load sense pressure comp family has the widest metering band, giving the most control and resolution. The load sense pressure comp family also has flow rated spools, providing for high resolution and control even for a few gpm with the 5 gpm spool. Using current minimum and current maximum settings on the controller will enhance the control in all three families.



SERIES 20 PROPORTIONAL ASSEMBLIES

VALVES





APPLICATION NOTES:

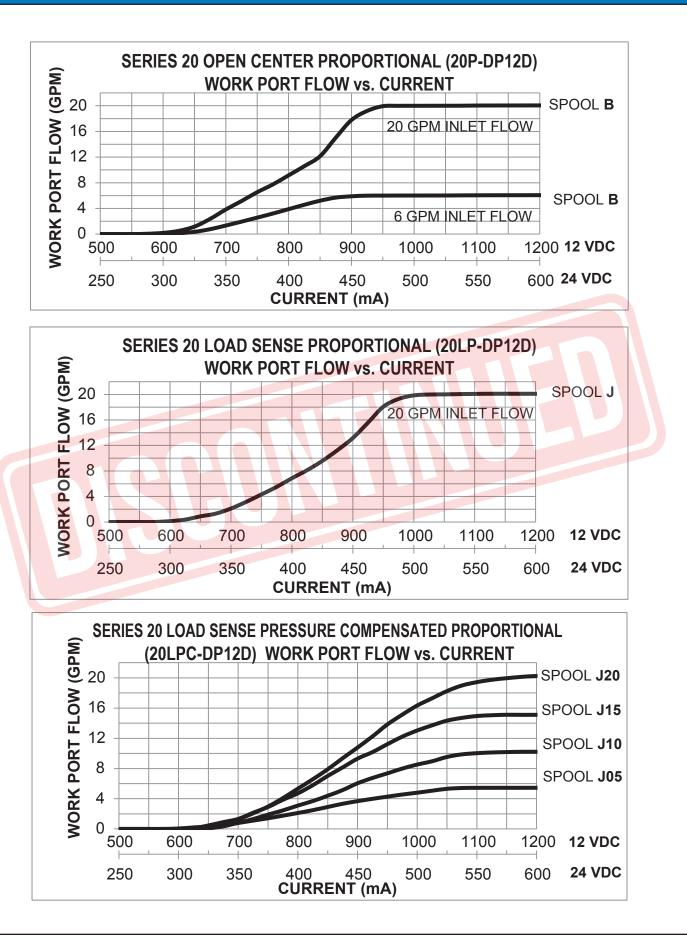
The 20IC2F is an inlet assembly used with the "20P" (open center) proportional solenoid assemblies. It is used with fixed displacement pumps (typically gear pumps) and has a compensator cartridge in the manifold that provides approximately 370psi pilot pressure for the proportional solenoids. It also incorporates a pressure reducing cartridge to limit the pressure to the solenoid cartridges, and a 10µ filter cartridge to filter the pilot flow. The 20IC2F requires a tie rod kit for one extra section, and requires a 20Ex4 outlet section to be used.

The 20IC2F has other applications such as low flow systems. The inlet can provide a constant pilot pressure regardless of flow, guaranteeing a shift in either on/off or proportional solenoids. Likewise, systems that also have little to no load induced pressure can benefit from the constant pilot pressure the 20IC2F provides, guaranteeing a shift regardless of work port pressure.

The 10 micron filter included in the inlet helps keep the pilot lines clean. This helps eliminate contamination in the oil being sent to the solenoid cartridges.

VALVES

SERIES 20 PROPORTIONAL WORK SECTIONS PERFORMANCE CURVES



V26

ON – OFF SOLENOID ASSEMBLIES

SERIES 20 COMMON WORK SECTIONS

20P1BA1AA-C12D (8 series solenoids) 20P1BA5AA-DM12D (8 series-manual override solenoids) 20P1BA6AA-C12L (8 series solenoids) 20P1BA1AA-S12Q (10 series solenoids) 20P1BA5AA-S12H (10 series solenoids) 20P1BA6AA-S12L (10 series solenoids)

SERIES 20 common assemblies

20I2J; 20P1BA1AA-C12D; 20U2 (utility section); 20E21 20I2J; 20P1BA1AA-C12D; 20UE12F (combination utility & outlet section w/ filter)

OPEN CENTER PROPORTIONAL (fixed displacement pump)

SERIES 20 COMMON WORK SECTION

20P1BA5AA-DP12D (proportional solenoids)

LOAD SENSE PROPORTIONAL

SERIES 20 COMMON WORK SECTION

20LP1JA5AA-DP12D (proportional solenoids)

Series 20 common assemblies

20I2A; 20LP1JA5AA-DP12D; 20U3; 20LE21 (load sense pump) 20I2A; 20LP1JA5AA-DP12D; 20UE18F (load sense pump, combination utility outlet - load sense w/ filter) 20ILFS65370; 20LP1JA5AA-DP12D; 20LE23 (fixed displacement pump, compensator inlet w/ filter, load sense - pilot seal outlet)

LOAD SENSE PRESSURE COMPENSATED PROPORTIONAL

SERIES 20 COMMON WORK SECTION

20LPC1J15A5AA-DP12D (proportional solenoids, 15 gpm spool)

Series 20 common assemblies

20I2A; 20LPC1J15A5AA-DP12D; 20U3; 20LE21 (load sense pump) 20I2A; 20LPC1J15A5AA-DP12D; 20UE18F (load sense pump, combination utility outlet - load sense w/ filter) 20ILFS65370; 20LPC1J15A5AA-DP12D; 20LE23 (fixed displacement pump, compensator inlet w/ filter, load sense pilot seal outlet)

	ON - OFF SOL	PUMP TYPE			
Work Sect.	Inlet	Utility	Outlet		
20(P/S)	20lxx	20Ux	20Ex1	FIXED DISPLACEMENT PUMP	
20(P/S)	20lxx	n/a	20UE12x	FIXED DISPLACEMENT PUMP	
20(LP/LPC)	20ILFS65230	n/a	20LEx3	FIXED DISPLACEMENT PUMP	
20(P/S)	20Ixx	20U3	20Ex1	PRESSURE COMPENSATED PUMP	
20(P/S)	20lxx	n/a	20UE13x	PRESSURE COMPENSATED PUMP	
20(LP/LPC)	20lxx	20U3	20LExx	LOAD SENSE PUMP	
20(LP/LPC)	20lxx	n/a	20UE18x	LOAD SENSE PUMP	
OPEN CENT	FER PROPORT	IONAL SOI	ENOID	PUMP TYPE	
20P	20IC2F	n/a	20Ex4	FIXED DISPLACEMENT PUMP	
LOAD SEN	SE PROPORTI	ONAL SOL	ENOID	PUMP TYPE	
20LP	20ILFS65370	n/a	20LEx3	FIXED DISPLACEMENT PUMP	
20LP	20Ixx	20U3	20LExx	LOAD SENSE PUMP	
20LP	20lxx	n/a	20UE18x	LOAD SENSE PUMP	
LOAD SEN	LOAD SENSE PRESSURE COMPENSATED				
PRO	PORTIONAL S	PUMP TYPE			
20LPC	20ILFS65370	n/a	20LEx3	FIXED DISPLACEMENT PUMP	
20LPC	20Ixx	20U3	20LExx	LOAD SENSE PUMP	
20LPC	20lxx	n/a	20UE18x	LOAD SENSE PUMP	

Series 20 common assembly

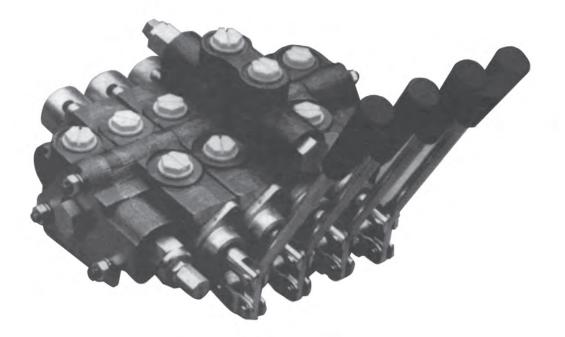
20IC2F (compensator inlet); 20P1BA5AA-DP12D; 20E24 (pilot seal outlet)

SERIES 20 PRESET RELIEF CARTRIDGES

CARTRIDGE CODE / STYLE STD SETTING B - SHIM ADJ 500-1350 PSI STD SETTING 1350 PSI @ 10 GPM C - SHIM ADJ 1351-1750 PSI 1750 PSI @ 10 GPM C - SHIM ADJ 1351-1750 PSI 1750 PSI @ 10 GPM D - SHIM ADJ 2201-3000 PSI 2200 PSI @ 10 GPM D - SHIM ADJ 2201-3000 PSI 2200 PSI @ 10 GPM F - SCREW ADJ 500-1350 PSI 1350 PSI @ 10 GPM C - SHIM ADJ 2201-3000 PSI 2500 PSI @ 10 GPM G - SCREW ADJ 1351-1750 PSI 1750 PSI @ 10 GPM F - SCREW ADJ 1351-1750 PSI 1750 PSI @ 10 GPM H - SCREW ADJ 1351-1750 PSI 1750 PSI @ 10 GPM G - SCREW ADJ 1351-1750 PSI 1750 PSI @ 10 GPM J - SCREW ADJ 2201-3000 PSI 2200 PSI @ 10 GPM F - SCREW ADJ 1351-1750 PSI 1750 PSI J - SCREW ADJ 2201-3000 PSI 2200 PSI @ 10 GPM H - SCREW ADJ 1351-1750 PSI 1750 PSI J - SCREW ADJ 2201-3000 PSI 2500 PSI @ 10 GPM H - SCREW ADJ 2201-3000 PSI 2500 PSI J - SCREW ADJ 3001-3500 PSI 3250 PSI @ 10 GPM H - SCREW ADJ 2201-3000 PSI 2500 PSI J - SCREW ADJ 3001-3500 PSI 3250 PSI @ 10 GPM H - SCREW ADJ 2201-3000 PSI 2500 PSI J - SCREW ADJ 3001-3500 PSI 3250 PSI @ 10 GPM H - ANTI-CAV/SHIM RELIEF 500-1350 PSI 1350 PSI <th>Ank for Standard ank for Standard TD SETTING 550 PSI @ 3 GPM 550 PSI @ 3 GPM 500 PSI @ 3 GPM</th>	Ank for Standard ank for Standard TD SETTING 550 PSI @ 3 GPM 550 PSI @ 3 GPM 500 PSI @ 3 GPM
---	---

Directional Control Valves

SECTIONAL BODY



Model SV

STANDARD FEATURES

- 1-10 Sections Per Valve Bank
- Load Checks On Each Section
- Hard Chrome Plated Spools
- Compact ConstructionEnhanced Metering Section Available in both the High and Low Sections
- Differential Poppet Style Relief, Adjustable from 1500 to 3000 psi (Also available in Low Pressure Version Adjustable from 500 to 1500 psi)
 Power Beyond Capability
- Reversible Handle
- Mid-Inlet and Lock Valve Section available
- Flow Control Inlet

Parallel or Series Circuit Construction Pressure Rating

Maximum Operating Pressure	3000 psi
Maximum Tank Pressure	
Nominal Flow Rating	12 GPM

Refer to Pressure Drop Curves. Filtration: For general purpose valves, fluid cleanliness should meet the ISO 4406 19/17/14 level. For extended life or for pilot operated valves, the 18/16/13 fluid cleanliness level is recommended.

SPECIFICATIONS Foot Mounting

FOOLMOUNTING	
Maximum Operating Temp	180°F
Weight Per Section	
Inlet Section	Approx 3.75 lbs
Outlet Section	Approx 3.75 lbs.
Work Section (Standard)	Approx 5.50 lbs.
Work Section (High)	Approx 8.00 lbs.

ORDERING INFORMATION: The following is a listing of valve sections available from stock on a standard basis. STANDARD SECTIONS AVAILABLE:		
INLET SECTIONS ALL HAVE BOTH TOP AND SIDE INLET PART NO. RELIEF TYPE AND SETTING SVI21 No Relief SVI24 Adjustable Low Pressure Relief Set at 1000 P SVI15 Adjustable High Pressure Relief Set At 2000 F SVI25 Adjustable High Pressure Relief Set at 2000 F WORK SECTIONS ALL HAVE #8 SAE ORB (3/4-16 THD) F PART NO. SPOOL TYPE AND ACTION	PORT SIZE #10 SAE ORB (7/8-14 THD) SI #10 SAE ORB (7/8-14 THD) 'SI #8 SAE ORB (3/4-16 THD) 'SI #10 SAE ORB (7/8-14 THD)	
SVW1AA1 3-Way Single w/ Spring Center SVW1BA1 4-Way Double Acting w/ Spring Center (Work SVW1BB1 4-Way Double Acting w/ 3 Position Detent (Work SVW1CA1 4-Way Motor Spool w/ 3 Position Detent (Work SVW1CB1 4-Way Motor Spool w/ 3 Position Detent (Work SVW1CB1 4-Way Motor Spool w/ 3 Position Detent (Work SVW1DD1 4-Way Motor Spool w/ 3 Position Detent (Work SVW1DD1 4-Way Spool w/ Spring Center (work SVL1CA1 4-Way Spool w/ Spring Center (Work SVW1BA11 4-Way Double Acting w/ Spring Center (Work SVW1BA2 4-Way Double Acting w/ Spring Center (Work SVW1BA3 4-Way Double Acting w/ Spring Center (Work SVW1BA4 4-Way Double Acting w/ Spring Center (Work SVW1BA5 4-Way Double Acting w/ Spring Center (Work SVW1BA6 4-Way Double Acting w/ Spring Center (Work SVW1BA6 4-Way Double Acting w/ Spring Center (Work SVW1BA1-S12Q 4-Way Double Acting w/ Spring Center (Work SVW1BA1-S12Q 4-Way Double Acting w/ Spring Center (Work SVW1BA2-S12L 4-Way Double Acting w/ Spring Center (Work	ork Ports Blocked in Neutral) orts Open to Tank in Neutral) Ports Open to Tank in Neutral) Float Detent rated Checks on Both Work Ports) Ports Blocked in Neutral) / Enclosed Handle Ports Blocked in Neutral) / Less Handle Only Ports Blocked in Neutral) / Less Handle Only Ports Blocked in Neutral) / Blank for Optional Joystick Handle Float Detent / Less Handle Only Ports Blocked in Neutral) / Clevis Spool End Only Ports Blocked in Neutral) 12 VDC DIN 43650 Ports Blocked in Neutral) 12 VDC Double Spade Ports Blocked in Neutral) / Less Handle 12 VDC Double Wire	
	Float Detent Shim Adjustable 1500-3000 PSI	
PART NO. EXHAUST OPTIONS SVE11 Open Center Outlet w/ Conversion Plug SVE21 Open Center Outlet w/ Conversion Plug SVE22 Power Beyond Outlet w/ #8 SAE Power Beyon SVE23 Closed Center Outlet SVE26 Open Center Outlet Pressure Build-Up Valve SVE27 Power Beyond Pressure Build-Up Valve SVE28 Medium Pressure Build-Up (for Low Flow App TIE ROD KITS PART NO.	PORT SIZE #8 SAE ORB (3/4-16 THD) #10 SAE ORB (7/8-14 THD)	
TIE ROD TORQUE 660401001 1 Section* 150in-lbs ± 6in-lbs 660401002 2 Sections* (12 1/2 ft-lbs ±1/2) 660401003 3 Sections* *Number of Work Sections 660401005 5 Sections*	660401006 6 Sections* 660401007 7 Sections* 660401008 8 Sections* 660401009 9 Sections* 660401010 10 Sections*	
made to order. Use order code Matrix below to generate a mod	AVAILABLE: Sections other than standard models listed can be del number that meets your requirements. If you prefer, contact your Sales number will be assigned for you. This model number can be used for future . Please consult Sales Representative.	
INLET SECTIONS S V I X X - X X X PORT SIZE 1. #8 SAE ORB (3/4-16 THD) 2. #10 SAE ORB (7/8-14 THD) All inlet sections have top and side inlets. RELIEF SETTING (in RELIEF OPTION 1. No Relief Plug 4. Adj. Low Pressure 500-16 5. Adj. High Pressure 1500- 6. Plastic Plug in relief cavit Use only when cartridge i installed at a later date.	PSI) S V E X X top and side outlets. PSI) SV E X X EXHAUST OPTION 1. #8 SAE ORB (3/4-16 THD) 1. Std. Open Center Outlet w/Conversion Plug 2. #10 SAE ORB (3/4-16 THD) 2. #10 SAE ORB (7/8-14 THD) 3000 PSI y. 2. #10 SAE ORB (7/8-14 THD) 4. Medium Pressure Build-up #8 SAE Beyond Port 5. Medium Pressure Build-up (For Low	
VALVE	ASSEMBLIES	
be specified with each order. An assembly number will be assigned ASSEMBLY MC	ed as separate sections or as a complete factory tested assembly. This will need to at the time of the order. This assembly number can then be used for future orders. DDEL NUMBER SVA-XXXX	
URL: www.princehyd.com • E-MA	RATION • NORTH SIOUX CITY, SOUTH DAKOTA 57049 CATV 30-11-23-01 IL: prince@princehyd.com • PHONE: (605) 235-1220	

SPECIAL WORK SECTIONS AVAILABLE: Work Sections other than standard models listed can be made to order. Use

order code Matrix below to generate a model number that meets your requirements. If you prefer, contact your Sales Representative with your specific requirements and a model number will be assigned for you. This model number can be used for future orders. A minimum order quantity will apply to special valves. Please consult Sales Representative.

WORK SECTIONS

SECTION TYPE

- W Std. Work Section
- M Metering Work Section²
- L Work Section with Double P.O. Checks¹ F - Fine Metering³

PORT SIZE

- 1. #8 SAE ORB (3/4-16 THD) 2. #6 SAE ORB (9/16-18 THD)

SPOOL TYPE

- A 3-Way 3-Position B 4-Way 3-Position
- C 4-Way 3 Position Motor
- D 4-Way 4 Position Float (Must Use Float Action) E 4-Way 3 Position Metering (SVM only)
- K 4-Way 3 Position Counterbalance Drain (SVW)
- M 4-Way 3 Position Counterbalance Drain/Motor (SVM)
 - 1. Lock Valve Section available only with Spool Option C. 2. Metering Section available only with Spool Options E, F, or M.

SVXXXXXXX

3. Fine Metering available only with Spool Options J.

PORT RELIEF WORK SECTIONS

SECTION TYPE

- H Port Relief Section
- R Port Relief Metering Section²
- S Series Circuit Port Relief Section
- G Port Relief Fine Metering Section³

PORT SIZE

1.#8 SAE ORB (3/4-16 THD) 2.#6 SAE ORB (9/16-18 THD)

SPOOL TYPE

- A 3-Way 3-Position B 4-Way 3-Position C 4-Way 3 Position Motor D 4-Way 4 Position Float (Must Use Float Action) E 4-Way 3 Position Metering (SVR only) G 4-Way 3 Position Motor Series (SVS only) H 4-Way 3 Position Motor Series (SVS only)
- J 4-Way 3 Position Fine Metering (SVG only) K 4-Way 3 Position Counterbalance Drain (SVH)
- M 4-Way 3 Position Counterbalance Drain/Motor (SVR)
- SPOOL ACTION
- A Spring Center (SVH & SVS only) B 3 Position Detent
- C Friction Detent
- D Spring Center w/ Float Detent (SVH only)
- (Must Use Float Spool)
- G 2 Position Neutral and Out Spring Offset to Out H 2 Position Neutral and In Spring Offset to In J S/C with Micro Switch Bracket 2-Position*

- K S/C with MicroSwitch Bracket 1-Position*
- M Spring Center Detent In
- N Spring Center Detent Out R Spring Center Pneumatic Actuator
- S Spring Center (SVR & SVG)
- *MicroSwitch not provided

HANDLE OPTION

- 1. Standard Lever Handle
- 2. Less Handle Only
- 3. Less Complete Handle Assembly
- 4. Adjustable Handle
- 5. Tang Spool End Only
- 6. Clevis Spool End Only
- 7. Vertical Handle

CATV 31-11-23-01

- 9. Blank for Optional Joystick Handle
- 12. Extended Enclosed Handle

representative with your specifications.

SV<u>XXXX</u>X

HANDLE OPTION 1. Standard Lever Handle

- 2. Less Handle Only
- 3. Less Complete Handle Assembly
- 4. Adjustable Handle
- 5. Tang Spool End Only
- 6. Clevis Spool End Only
- Vertical Handle 7
- 8. Straight Handle
- 9. Blank for Optional Joystick Handle
- 11. Enclosed Handle
- 12. Extended Enclosed Handle
- 13. Locking Handle

SPOOL ACTION

- A Spring Center (SVW & SVL only)
- B 3 Position Detent
- C Friction Detent
- D Spring Center w/Float Detent (SVW only) (Must Use Float Spool)
- E Light Spring Center
- F 2 Position Detent Neutral and Out (No IN Position)
- G 2 Position (Center and Spool Out) Spring Loaded
- to Spool Out (Pressure to B Port) Position H - 2 Position (Center and Spool In)-Spring Loaded
- to Spool In (Pressure to A Port) Position
- J S/C with MicroSwitch Bracket 2-Position (MicroSwitch not provided)
- K S/C with MicroSwitch Bracket 1-Position (MicroSwitch not provided)

VALVES

V31

- (activates on spool out only)
- M Spring Center Detent In
- N Spring Center Detent Out
- P 2 Position Detent Neutral and IN (No OUT Position)
- R Spring Center Pneumatic Actuator
- S Spring Center (SVM & SVF)

PORT RELIEF "B" OPTION

A - Relief Cavity Plugged

D - Anti-Cavitation Check

1000-2500 PSI***

A - Relief Cavity Plugged

D - Anti-Cavitation Check

1000-2500 PSI**

Check 1000-2500 PSI***

interference with handle.

SVH1BA1GG-<u>18-25</u>

CUSTOM SECTION: For OEM application custom sections can often be designed to meet your specifications. Consult your sales

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Check 1000-2500 PSI***

PORT RELIEF "A" OPTION

- B Non-Adjustable Direct Acting Relief 1500-3000 PSI
- C Non-Adjustable Direct Acting Relief 500-1500 PSI

G - Adjustable Direct Acting Relief 1500-3000 PSI

B - Non-Adjustable Direct Acting Relief 1500-3000 PSI

**E - Adjustable Combination Port Relief/Anti-Cavitation Check

F - Non-Adjustable Combination Port Relief/Anti-Cavitation

** Cannot be used on work sections with float option due to

*** Do not use in applications that require low work port leakage.

B PORT RELIEF PRESSURE IN HUNDREDS

EXAMPLE: 25=2500 PSI at 3 GPM

All Port Reliefs set at 3 GPM

EXAMPLE: 18=1800 PSI at 3 GPM

All Port Reliefs set at 3 GPM

A PORT RELIEF PRESSURE IN HUNDREDS

C - Non-Adjustable Direct Acting Relief 500-1500 PSI

**G - Adjustable Direct Acting Relief 1500-3000 PSI

**H - Adjustable Direct Acting Relief 500-1500 PSI

Max allowable leakage 5 in3/min @1000 psi.

For Work Port Relief Settings Other Than Standard

H - Adjustable Direct Acting Relief 500-1500 PSI

E - Adjustable Combination Port Relief/Anti-Cavitation Check

- Non-Adjustable Combination Port Relief/Anti-Cavitation

FIELD CONVERSION KITS, REPAIR KITS AND RELIEF CARTRIDGES

SPOOL AT	TACHMENT KITS
660180001	Spring Center Kit (except SVM)
660180002	3 Position Detent Kit
660180003	Friction Detent Kit
660180051	Float Detent Kit
660180036	Spring Center Detent In
660180037	Spring Center Detent Out
660180015	S/C w/Micro-Switch, 2 Position*
660180016	S/C w/Micro-Switch, 1 Position*
HANDLE M	KITS
660180011	Std. Handle Kit
660180032	Clevis Sub-Assy
660180005	Complete Handle Kit
660180031	Pin Kit
660180026	Vertical Handle Kit
660180028	Straight Handle Kit

660180031	Pin Kit
660180026	Vertical Handle Kit
660180028	Straight Handle Kit
660180007	Complete Adjustable Handle Kit
660180006	Adjustable Handle Kit
660180055	Joystick Handle Kit Less Handle
660180234	Locking Handle Kit

*Bracket only, Micro-Switch is not provided.

660180033 660180017 660180018 671300011	Bent Joystick Handle Kit Straight Joystick Handle Kit Offset Joystick Handle Kit Rubber Boot for Joystick Handles**		
SEAL KITS			
660580001 660580002 660580003 660580004 660580010 660580009 660580011	SVW/SVM Replacement Seal Kit Inlet Seal Kit Outlet Seal Kit Between Section Seal Kit SVH/SVR Replacement Seal Kit SVL Replacement Seal Kit SVS Replacement Seal Kit		
PORT REL	IEFS		
660280008	Port Relief Plug Shim Adj. Port Relief 1500-3000 PSI Shim Adj. Port Relief 500-1500 PSI Adj. Combination Port av Check 1000-2500 PSI Shim Adj. Combination Port		
** Boot is to be ordered in addition to joystick			

handle kits

Relief/Anti-C	av Check 1000-2500 PSI			
660280005	Anti-Cavitation Check			
660280009	Adj. Port Relief 1500-3000 PSI			
660280011	Adj. Port Relief 500-1500 PSI			
672000101	.015 SHIM			
672000102	.033 SHIM			
672000103	.060 SHIM			
660180215	Shim Assortment			
INLET RELIEFS				
660250006	Inlet Relief Plug			
660250003	Adj. Low Pressure Inlet Relief			
660250002	Adj. High Pressure Inlet Relief			
OUTLET CARTRIDGES				
200400030	Open Center Plug			
660280001	#8 SAE Power Beyond Cart.			
660280002	Closed Center Plug			
660280093	Open Center Build-Up Cart.			
660280092	Power Beyond Build-Up Cart.			
660280090	Med. Press. Open Center			

Build-Up Cart.

Med. Press. Power Beyond

Build-Up Cart.

660280089

660180052 Load Check Kit

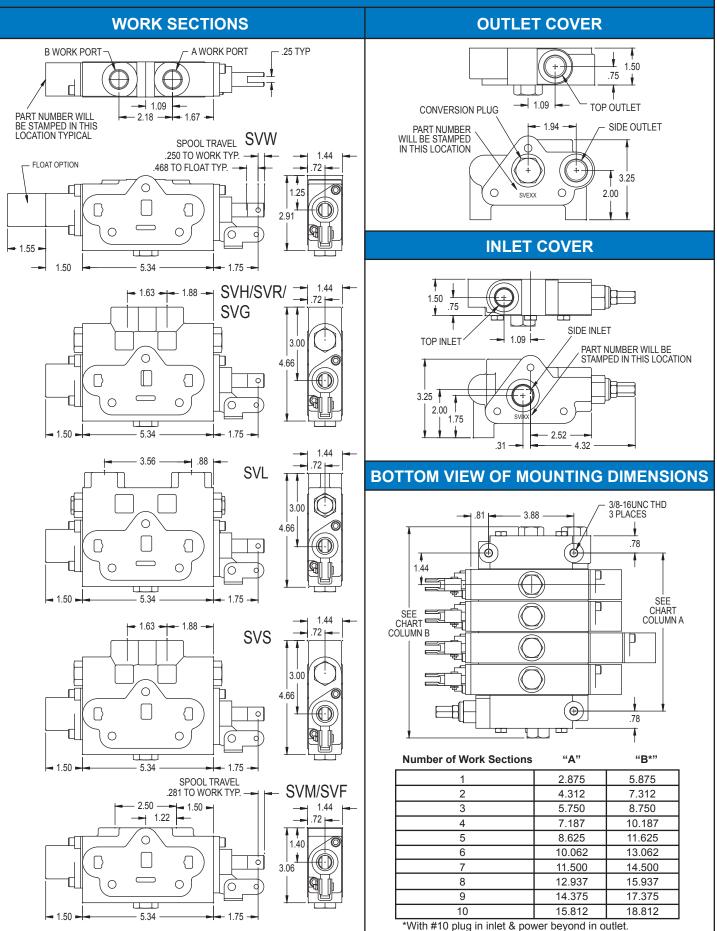
PERFORMANCE CURVES



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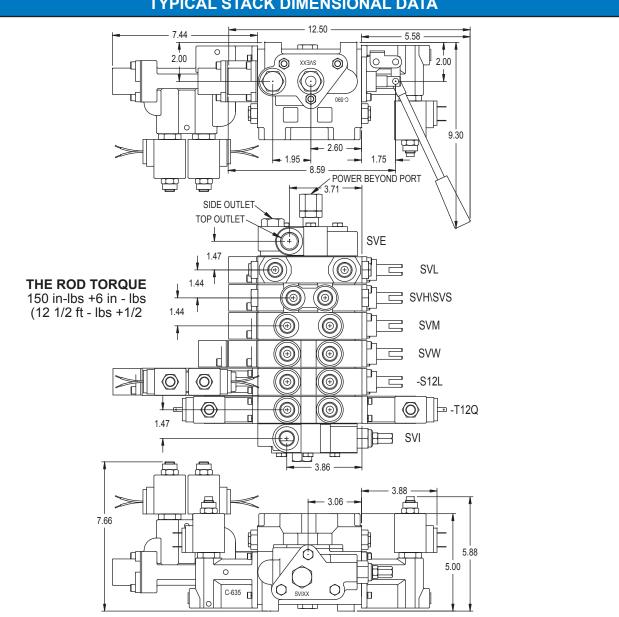
V32





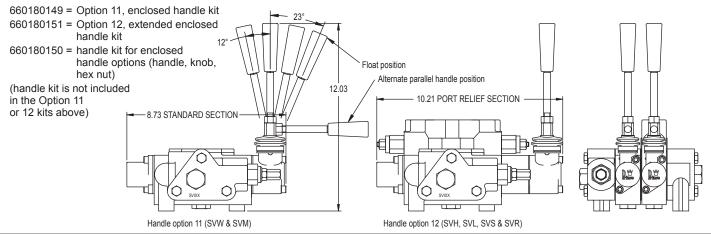
VALVES

TYPICAL STACK DIMENSIONAL DATA



ENCLOSED HANDLE, OPTIONS 11 AND 12

Durable die cast metal housing. Weather and oil resistant rubber boot. Reversible handle can be mounted in either a vertical or horizontal position. The extended handle option provides the necessary clearance for work port relief and lock cartridges. The extended handle option can also be used on the SVW and SVM, work sections when it is desired to keep handles aligned in an assembly with both low and high sections.

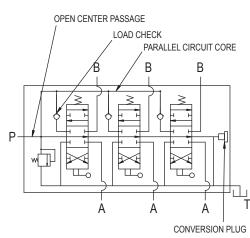


PARALLEL CIRCUIT SVW, SVM, SVF, SVH, SVR, SVG AND SVL WORK SECTIONS

Parallel circuit sections are by far the most common. The SVW, SVM, SVF, SVH, SVR, SVG and SVL are all of parallel circuit construction. They can be combined together in any order in an assembly. When any one of the spools is shifted, it blocks off the open center passage through the valve. The oil then flows into the parallel circuit core making oil available to all spools. If more than one spool is fully shifted, the oil will go to the spool with the lowest pressure requirements. However, it is possible to meter the flow to the spool with the least load and provide flow to two unequal loads.

ENHANCED METERING SECTIONS

The SVM, SVF, SVR and SVG sections have metering notches machined P into the spool to allow for better "feathering" of a load. The spool travel for these sections is also a little longer at .281" vs. .250" for the standard sections. In addition to the metering notches in the spool, the lands in the SVF and SVG bodies have been machined to give more precise control over the flow. The metering notches in the SVF and SVG have been optimized for flows of 10 gpm or less. For enhanced metering on higher flows, it is recommended that the SVM or SVR be used.

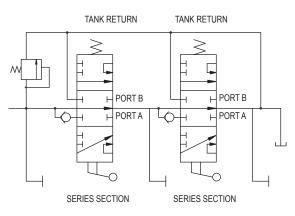


LOCK SECTIONS

The SVL section combines both a 4-way directional valve and a double pilot operated check valve. This provides very low leakage when the spool is in neutral. When the spool is shifted, oil is directed through a work port check to the cylinder. Pressure on the work port applies pressure to the shuttle spool, opening the opposite check valve and allowing oil to return into the valve. Depending on load pressures, the metering of the spool may be affected. In some cases a one way restrictor in a work port may be beneficial. Cracking pressure on the standard SVL section is 40psi. Higher pressure cartridges are available.

SERIES CIRCUIT SVS WORK SECTIONS

A series circuit valve is most commonly used to control more than one hydraulic component simultaneously. The entire circuit flow is available to each valve section that is actuated. In a two spool series valve with both spools actuated, the oil flows from the inlet to the work port of the first section. The return flow of the first section is directed to the open center core of the second section. (In a parallel valve the return oil from the work port is directed to the tank core.) From the open center core of the second section, the oil flows to the work port with the return oil going to the outlet. In a series circuit valve, the summation of the pressures required for each work section will equal the total pressure required for the circuit. The total pressure required must not exceed the system relief setting or the pump pressure rating. It is not required to have a SV Series section as the last section, unless series flow is required to a downstream valve. In this application, a power beyond plug must be used in the outlet section.



COMBINED SERIES / PARALLEL CIRCUITS

The SV Series circuit valve sections may be stacked with SV parallel circuit valve sections. This allows both series and parallel control in the same valve assembly.

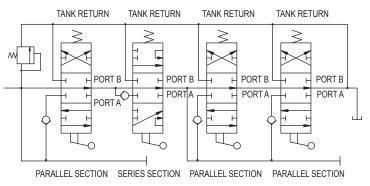
In the valve assembly shown below, the first, third and fourth sections are parallel. The second section is series. The first parallel section has priority over all downstream valves. When the spool of the first parallel section is actuated, the return oil from the work port is directed to the tank core, thus oil flow to downstream sections is cut off. The second and third sections are in series with each other as is the second and fourth sections. The third and fourth sections are in parallel with each other.

SERIES MOTOR SPOOL

The SV Series Motor Spool provides control of reversible hydraulic motors. Both work ports are connected to the open center core in the neutral position. It should be noted that in the neutral position, the work ports will be equally pressurized to the same pressure that is required of any downstream valve sections and that a work port relief in the section will also limit the pressure of any other sections in the valve. The series motor spool should not be used to control a hydraulic cylinder as unwanted cylinder drift may occur in the neutral position.

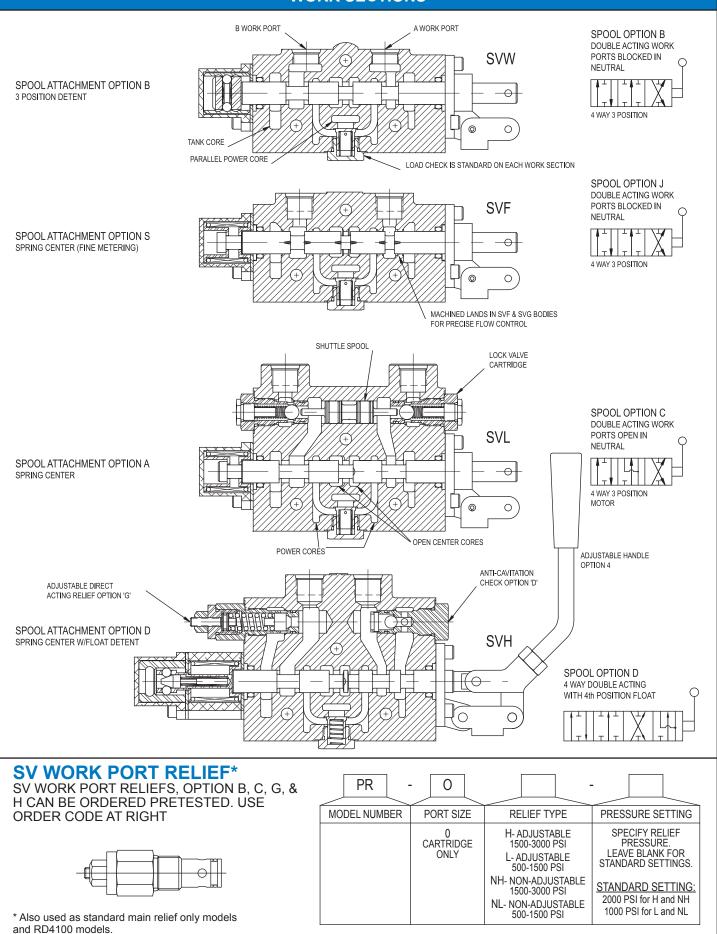
CLOSED CENTER APPLICATIONS

The SV Series Circuit Valve sections cannot be used in a closed center valve assembly.



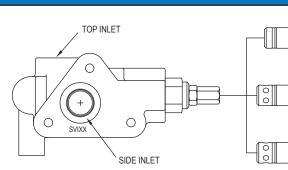
VALVES

WORK SECTIONS



VALVES

SV INLET RELIEF OPTIONS



OPTION 1 NO RELIEF

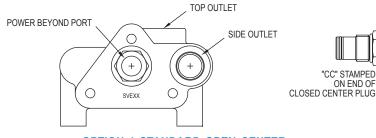
This option provides no built in relief. This is used when a relief is provided elsewhere in the system or in a closed center application. This plug can be replaced with a relief cartridge at a later date.

OPTION 4 LOW PRESSURE ADJUSTABLE RELIEF This option provides for a differential poppet relief adjustable from 500-1500 PSI. Set at 1000 PSI @ 10 GPM.

OPTION 5 HIGH PRESSURE ADJUSTABLE RELIEF

This option provides for a differential poppet relief adjustable from 1500-3000 PSI. Set at 2000 PSI @ 10 GPM. The differential poppet relief provides smooth quiet operation with high cracking pressure. RELIEF CARTRIDGES CAN BE ORDERED PRETESTED SEE RV-OX RELIEF, PAGE V68.

SV OUTLET COVER OPTIONS



OPTION 1 STANDARD OPEN CENTER OUTLET WITH CONVERSION PLUG This is the standard outlet option. This option allows for conversion in the field for power beyond or closed center applications. When spools are in neutral the inlet is unloaded to tank.

OPTION 2 POWER BEYOND OUTLET WITH #8 SAE BEYOND PORT

1 00

This option provides for a high pressure power beyond port. This would be used if a valve is to be added down stream. THE OUT-LET PORT MUST STILL BE CONNECTED TO TANK. When spools are in neutral the inlet is connected to the power beyond port.



2.00

"CC" STAMPED ON END OF

OPTION 3 CLOSED CENTER OUTLET

This option provides for closed center operation. This is typically used with a variable displacement pressure compensated pump or in a system with an unloading valve. When the spools are in neutral the inlet port is blocked. Closed center can also be accomplished by plugging the power beyond port of option 2.

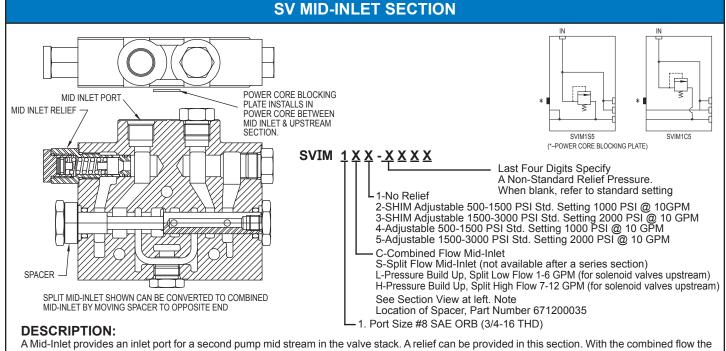
PLEASE NOTE that this closed center option does not provide for the drain off of standby spool leakage. This can allow a very small amount of oil to enter the work ports when in neutral.

OPTION 6 OPEN CENTER OUTLET PRESSURE BUILD-UP VALVE FOR SOLENOID OPTION

This option directs oil from open center core thru pressure buildup valve and then to tank. See solenoid section for description of operation. Option 8 is the same as option 6, but has a higher rate spring designed to build pressure in low flow applications. (Flows Ranging from 1 to 6 gpm.)

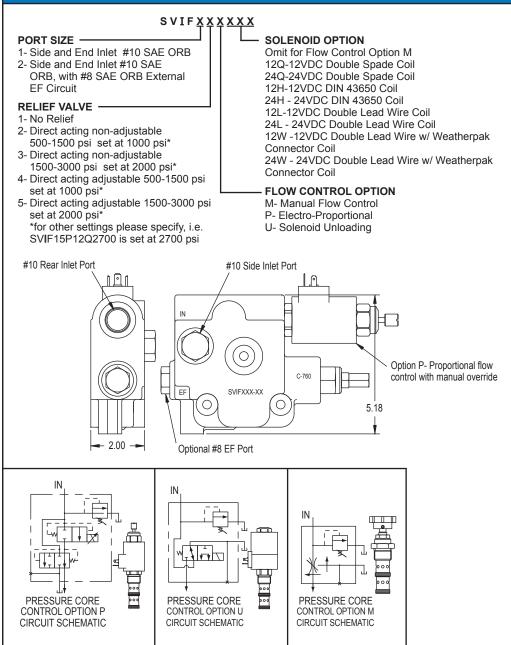
OPTION 7 POWER BEYOND PRESSURE BUILD-UP VALVE FOR SOLENOID OPTION

This option directs oil from inlet thru pressure build-up valve and then downstream. This pressure build-up valve provides a #8 SAE power beyond port. The outlet must be connected to tank. Option 9 is the same as option 7, but has a higher rate spring designed to build pressure in low flow applications. (Flows Ranging from 1 to 6 gpm.)



flow from both pumps is available to the downstream sections when all the work sections upstream are in neutral. The split flow completely separates the two pump flows. The common tank passage is all that is shared between the two pump flows. Note: Split flow mid inlet is not available when used after a series section and the core block plate is not used after a series section.

SV FLOW CONTROL INLET SECTION



The SVIF Flow Control Inlet is interchangeable with the standard SV inlet section.

FLOW CONTROL OPTIONS:

P OPTION incorporates a solenoid operated, electrically variable pressurecompensated flow control cartridge. With the solenoid de-energized, all of the inlet flow is diverted to the tank core/EF port. By increasing the current through the solenoid, the flow directed to the power core and downstream sections will be proportionally increased, (the maximum rating of the cartridge is 16 gpm at 1500 mA) Control current is normally provided via a controller card providing, a PWM signal.

U OPTION incorporates a solenoid operated, unloader cartridge. With the solenoid de-energized, all of the inlet flow is diverted to the tank core/EF port. With the solenoid energized all the inlet flow is directed to the power core and downstream sections.

M OPTION incorporates a manually operated pressure-compensated flow control cartridge. With the control knob turned fully in (clockwise), all of the inlet flow is diverted to the tank core/EF port. By turning the flow control knob counter clockwise, the inlet flow directed to the power core and downstream sections is proportionally increased. Approximately 5 revolutions varies flow from no flow to full flow,

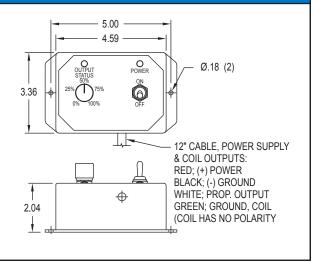
PORT OPTION 2 The flow being directed to the tank core/EF port may be utilized by a second circuit by inserting a 1/4 pipe plug into the tank core passage on the seal side of the casting and then connecting the EF port to the second circuit.

PROPORTIONAL CONTROL BOX (USE WITH SVIFP & 20IF FLOW CONTROL INLETS); P/N 671300048

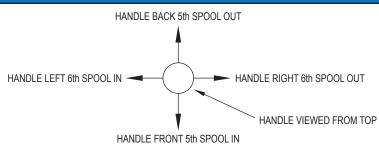
The proportional control box is used to provide an adjustable electrical signal to a proportional solenoid on the SVIF and 20IF inlet sections. Once the dial is set, the regulated flow through the valve should remain approximately constant regardless of pressure. Within the operation range, flow varies approximately linearly with dial rotation.

CONNECTIONS AND OPERATION:

- Connect leads to the power supply and solenoid coil. Power supply should be between 9 and 30 VDC.
- With the power off, the inlet flow is directed to tank (or excess flow port).
- To provide power to the control, move the power switch to 'ON'. (RED LED is on when control box is powered).
- Minimum flow is directed into the valve when 0% on the dial is aligned with the center mark. Maximum flow is directed into the valve when 100% is aligned with the center mark.
- · Clockwise knob rotation increases flow into the valve.
- Some adjustment may be needed for operation. I-min, I-max, dither frequency
 & ramp time can be adjusted. See drawing for calibration instructions



JOYSTICK HANDLE FOR MODEL SV STACK VALVE



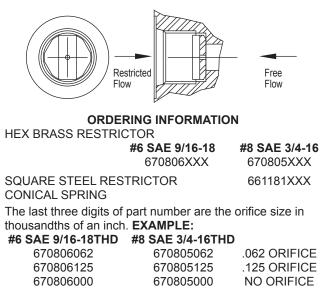
This is a special handle for the model SV stack valve that allows the spools of two adjacent sections to be operated by one common handle. The spools can be operated independently or simultaneously depending on handle movement. The option is normally used on spring center to neutral sections, but can also be used on other sections such as float sections. This handle is normally installed on valves assembled at the factory but can be installed on work sections that have handle option 3 or 9. The drawing at right shows two joysticks with offset handles installed on a six section valve. When two joysticks are installed on the same valve assembly it is recommended that there be two standard sections between them to prevent handle interference. A two section spacer is available, part no. 660380002.

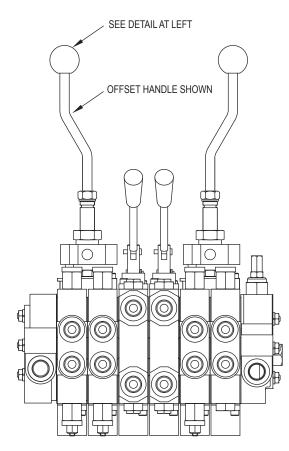
Please refer to these part numbers and state which sections the handle is to be installed on when ordering a valve assembly. This handle can be installed in the field to work sections with handle option 3 (no handle).

JOYSTICK ASSEMBLY W/STRAIGHT HANDLE: ASSEMBLED ON VALVE	
JOYSTICK ASSEMBLY W/OFFSET HANDLE: ASSEMBLED ON VALVESVJO KIT660180018	
JOYSTICK ASSEMBLY W/BENT HANDLE: ASSEMBLED ON VALVESVJB KIT660180033	

ONE WAY WORK PORT RESTRICTOR FOR SVH, SVM, SVR, SVF, SVS, SVG& SVL WORK SECTIONS

This restrictor will restrict oil in one direction and allow free flow in the opposite direction. This restrictor consists of an orifice plate that simply drops into the #8 SAE work port of a SVH, SVM, SVR, SVF, SVS, SVG & SVL work section.

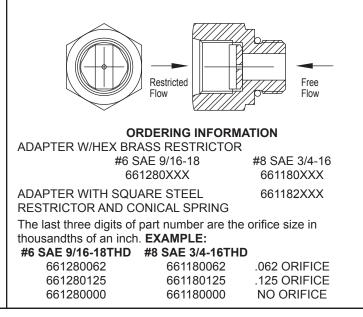




A molded rubber boot (671300011) is available for the joystick.

ONE WAY WORK PORT RESTRICTOR FOR SVW WORK SECTIONS

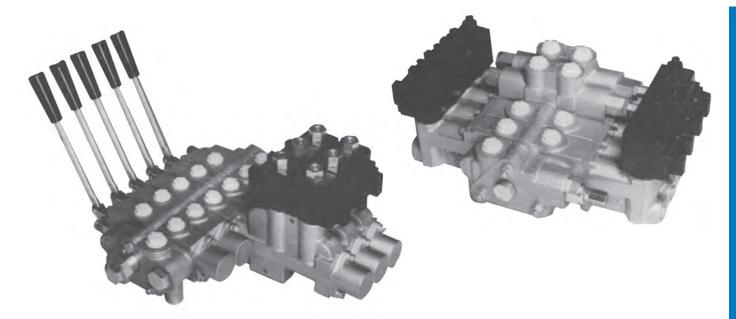
This restrictor will restrict oil in one direction and allow free flow in the opposite direction. This restrictor consists of the orifice plate as described at left and an adapter fitting that allow use in the standard SVW #8 SAE work port.



Directional Control Valves

SV SOLENOID OPERATED Work Sections

- Type "-D" and "-T" Solenoid Operated
- Type "-C" and "-S" Solenoid and Manual Operation



STANDARD FEATURES

- Open center or closed center applications
- Port relief options available
- Internal pilot supply and drain

Parallel or Series Circuit Construction

Filtration: For general purpose valves, fluid

cleanliness should meet the ISO 4406 19/17/14 level. For extended life or for pilot operated valves, the 18/16/13 fluid cleanliness level is recommended.

• 12VDC, 24VDC and 120VAC

Maximum Operating Pressure

Maximum Tank Pressure

Nominal Flow Rating

Differential Pressure Required to Actuator

Pressure Rating

- Power beyond capability
- Load checks on each section
- May be stacked with Manual SV Sections
- 8 Series ("C" and "D") more economical and compact

SPECIFICATIONS

3000 psi

150 psi

12 GPM

Approx. 150 PSI

Foot Mounting Maximum Operating Temp Weight Per Section	180°F
Inlet Section Outlet Section Solenoid Operated	
Type "-D" and "-T" Work Section Type "-C" and "-S" Work Section	Approx. 11.0 lbs. Approx. 14.5 lbs.

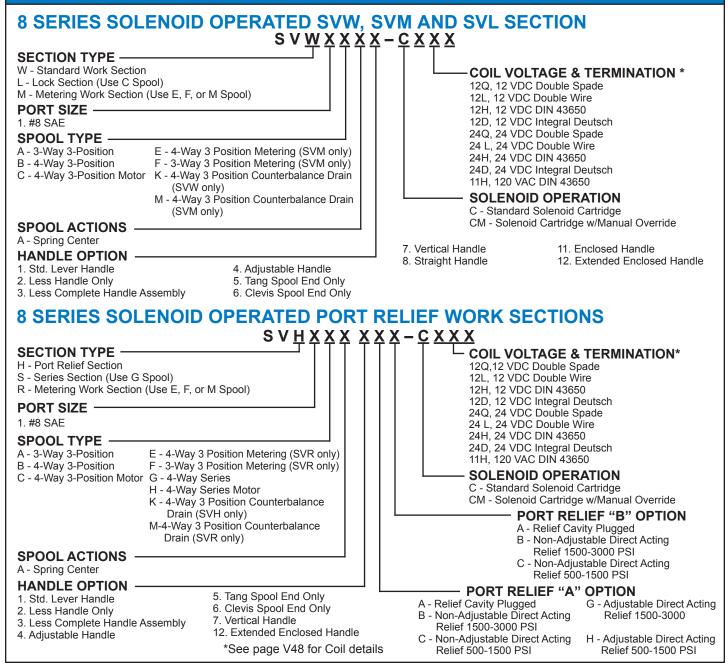
SV (8 SERIES) SOLENOID OR MANUAL WORK SECTIONS (BOTH SOLENOIDS ON ONE END) DESCRIPTION OF OPERATION

The Type "-C" SV Solenoid Work Section allows remote electrical on-off or manual control. The "-C" sections are 8 series work sections which use screw in cartridges with a #8 thread size. The screw in cartridges provide a robust platform for the higher tank pressures often seen in mobile applications and the #8 size allows for a more compact section size. Cartridges and coils on the 8 series are not interchangeable with the Prince 10 series solenoid sections or sections manufactured prior to November 2014. Any of the standard "-S", "-T", "-C" or "-D" style Prince SV solenoid operated work sections may be used in any combination within a stack valve assembly.

The Type "-C" SV Solenoid Section contains two 3-way 2-position, #8 solenoid cartridge valves and a pilot operated piston attached to the main control spool. When both solenoids are de-energized, both sides of the pilot piston are open to tank pressure and the spool remains spring centered. When solenoid "A" is energized, pilot pressure is applied to one side of the pilot piston, causing the spool to shift from the neutral position and direct flow to work port "A". When solenoid "B" is energized, pilot pressure is applied to the other side of the pilot piston, causing the spool to shift and direct flow to work port "B". An optional manual override feature is available for the solenoid cartridges.

Internal pilot lines provide pilot pressure to the solenoid actuator. Pilot pressure is generated by a "Pressure Build-Up Valve" that is installed in the standard outlet section. Two versions of the pressure build-up valve are offered, the open center pressure build-up valve and power beyond pressure build-up valve. Both versions supply 150-200 PSI pilot pressure to the solenoid actuator. A closed center assembly does not require a pressure build-up valve. For an open center system, the pilot pressure can also be provided by an in inlet manifold, which can provide filtered pilot flow.

ORDER CODE MATRIX - TYPE "-C" SOLENOID OR MANUAL WORK SECTIONS



SV (8 SERIES) SOLENOID WORK SECTION (SOLENOID ON BOTH ENDS) DESCRIPTION OF OPERATION

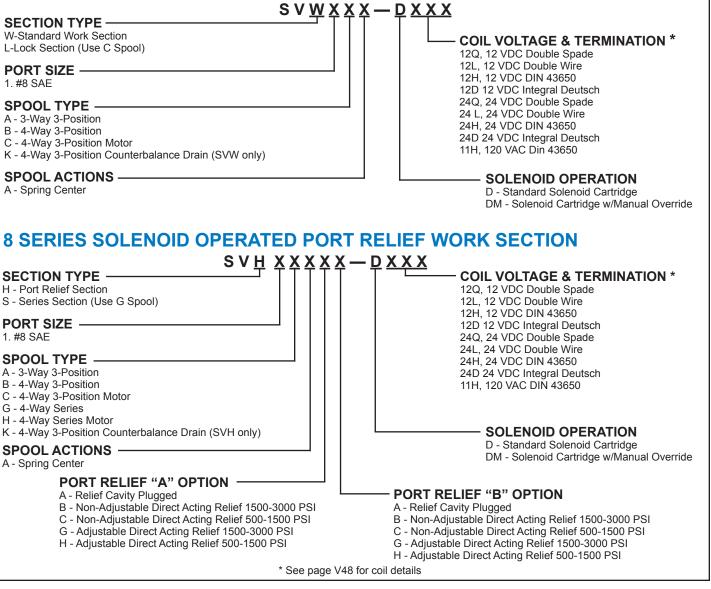
The Type "-D" SV Solenoid Work Section allows remote electrical on-off control. The "-D" sections are 8 series work sections which use screw in cartridges with a #8 thread size. The screw in cartridges provide a robust platform for the higher tank pressures often seen in mobile applications and the #8 size allows for a more compact section size. Cartridges and coils on the 8 series are not interchangeable with the Prince 10 series solenoid sections or sections manufactured prior to November 2014. Any of the standard "-S", "-T", "-C" or "-D" style Prince SV solenoid operated work sections may be used in any combination within a stack valve assembly.

The Type "-D" SV Solenoid Section contains two 3-way 2-position, #8 solenoid cartridge valves, one at each end of the main valve body. When both solenoids are de-energized, both ends of the control valve spool are open to tank pressure and the spool remains spring centered. When solenoid "A" is energized, pilot pressure is applied to one end of the control valve spool causing the spool to shift from the neutral position to full stroke which directs flow to work port "A". When solenoid "B" is energized, pilot pressure is applied to the other end of the control valve spool, causing the spool to shift to full stroke which directs flow to work port "B". An optional manual override feature is available for the solenoid cartridges.

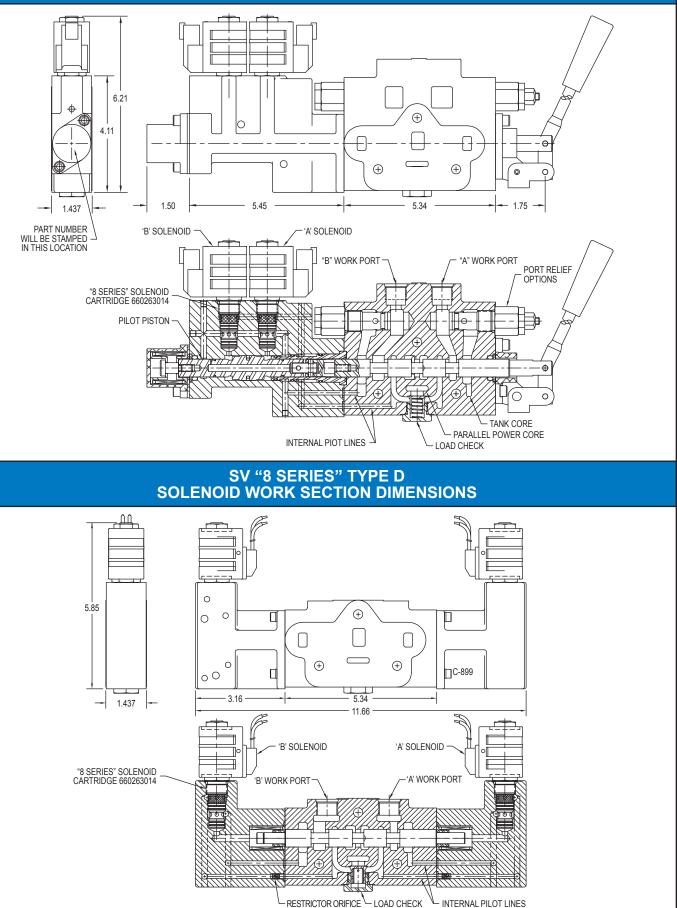
Internal pilot lines provide pilot pressure to the solenoid actuator. Pilot pressure is generated by a "Pressure Build-Up Valve" that is installed in the standard outlet section. Two versions of the pressure build-up valve are offered, the open center pressure build-up valve and power beyond pressure build-up valve. Both versions supply 150-200 PSI pilot pressure to the solenoid actuator. A closed center assembly does not require a pressure build-up valve. For an open center system, the pilot pressure can also be provided by an in inlet manifold, which can provide filtered pilot flow.

ORDER CODE MATRIX - TYPE "-D" SOLENOID OR MANUAL WORK SECTIONS

8 SERIES SOLENOID OPERATED SVW, SVM AND SVL WORK SECTIONS



SV "8 SERIES" TYPE C SOLENOID OR MANUAL WORK SECTION DIMENSIONS



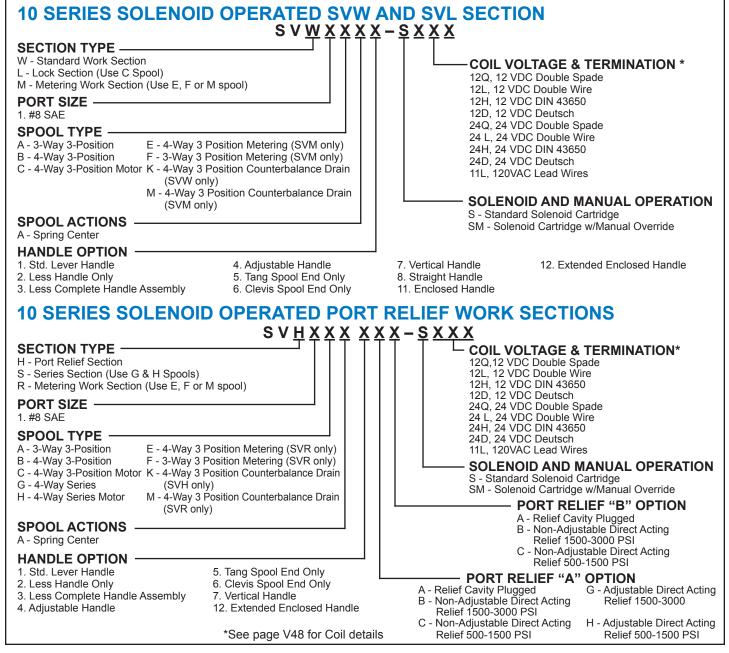
SV (10 SERIES) SOLENOID OR MANUAL WORK SECTIONS (BOTH SOLENOIDS ON ONE END) DESCRIPTION OF OPERATION

The Type "-S" SV Solenoid Work Section allows remote electrical on-off or manual control. The "-S" sections are 10 series work sections which use screw in cartridges with a #10 thread size. Cartridges and coils on the 10 series will be interchangeable with the components on Prince solenoid operated valves manufactured prior to November 2014 was well as current production 10 series valves. Any of the standard "-S", "-T", "-C" or "-D" style Prince SV solenoid operated work sections may be used in any combination within a stack valve assembly.

The Type "-S" SV Solenoid Section contains two 3-way 2-position, #10 solenoid cartridge valves and a pilot operated piston attached to the main control spool. When both solenoids are de-energized, both sides of the pilot piston are open to tank pressure and the spool remains spring centered. When solenoid "A" is energized, pilot pressure is applied to one side of the pilot piston, causing the spool to shift from the neutral position and direct flow to work port "A". When solenoid "B" is energized, pilot pressure is applied to the other side of the pilot piston, causing the spool to shift and direct flow to work port "B".

Internal pilot lines provide pilot pressure to the solenoid actuator. Pilot pressure is generated by a "Pressure Build-Up Valve" that is installed in the standard outlet section. Two versions of the pressure build-up valve are offered, the open center pressure build-up valve and power beyond pressure build-up valve. Both versions supply 150-200 PSI pilot pressure to the solenoid actuator. A closed center assembly does not require a pressure build-up valve. For an open center system, the pilot pressure can also be provided by an in inlet manifold, which can provide filtered pilot flow.





PRINCE MANUFACTURING CORPORATION • NORTH SIOUX CITY, SOUTH DAKOTA 57049 URL: www.princehyd.com • E-MAIL: prince@princehyd.com • PHONE: (605) 235-1220 VALVES

SV (10 SERIES) SOLENOID WORK SECTION (SOLENOID ON BOTH ENDS) DESCRIPTION OF OPERATION

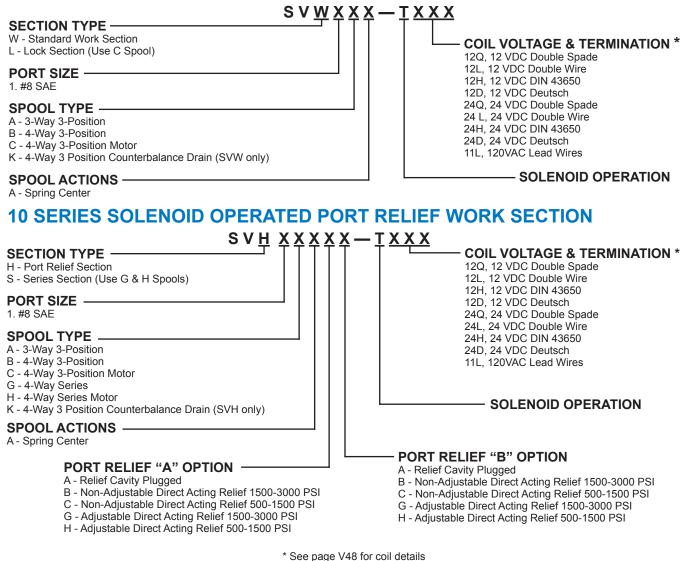
The Type "-T" SV Solenoid Work Section allows remote electrical on-off control. The "-T" sections are 10 series work sections which use screw in cartridges with a #10 thread size. Cartridges and coils on the 10 series will be interchangeable with the components on Prince solenoid operated valves manufactured prior to November 2014 was well as current production 10 series valves. Any of the standard "-S", "-T", "-C" or "-D" style Prince SV solenoid operated work sections may be used in any combination within a stack valve assembly.

The Type "-T" SV Solenoid Section contains two 3-way 2-position, #10 solenoid cartridge valves, one at each end of the main valve body. When both solenoids are de-energized, both ends of the control valve spool are open to tank pressure and the spool remains spring centered. When solenoid "A" is energized, pilot pressure is applied to one end of the control valve spool causing the spool to shift from the neutral position to full stroke which directs flow to work port "A". When solenoid "B" is energized, pilot pressure is applied to the other end of the control valve spool, causing the spool to shift to full stroke which directs flow to work port "B".

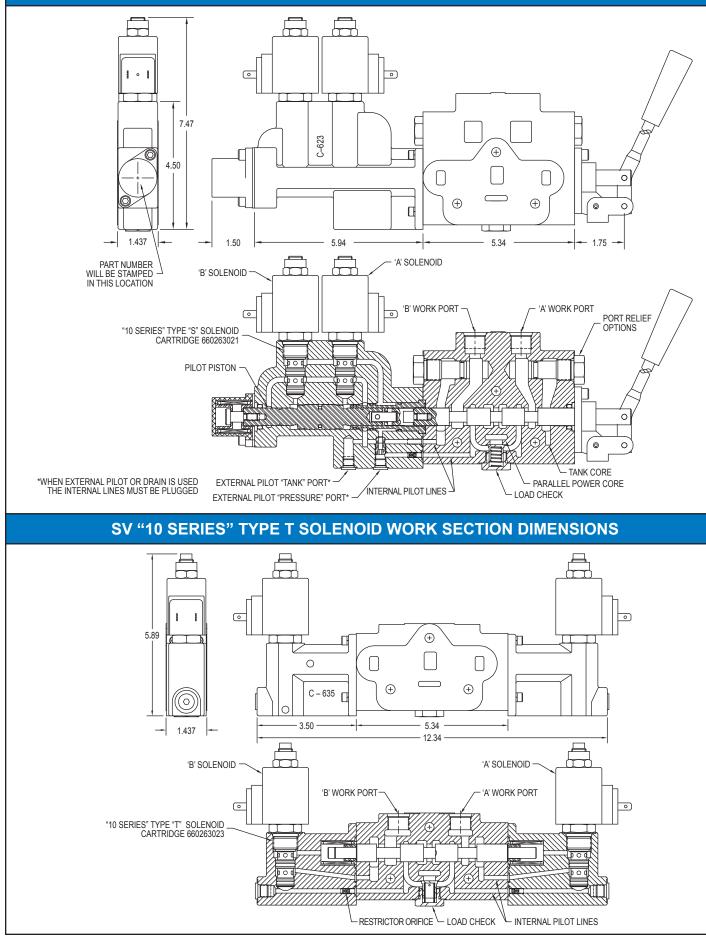
Internal pilot lines provide pilot pressure to the solenoid actuator. Pilot pressure is generated by a "Pressure Build-Up Valve" that is installed in the standard outlet section. Two versions of the pressure build-up valve are offered, the open center pressure build-up valve and power beyond pressure build-up valve. Both versions supply 150-200 PSI pilot pressure to the solenoid actuator. A closed center assembly does not require a pressure build-up valve. For an open center system, the pilot pressure can also be provided by an in inlet manifold, which can provide filtered pilot flow.

ORDER CODE MATRIX - TYPE "-T" SOLENOID OR MANUAL WORK SECTIONS

10 SERIES SOLENOID OPERATED SVW AND SVL WORK SECTIONS



SV "10 SERIES" TYPE S SOLENOID OR MANUAL WORK SECTION DIMENSIONS



SV SOLENOID OPERATED WORK SECTION - APPLICATION INFORMATION

For over center or light load applications if the required work port load pressure drops below 200 PSI, the pilot pressure to the spool will drop to the same pressure causing the spring to move the control spool back towards the neutral position. The spool will end up in an intermediate position between neutral and fully shifted. A restrictor installed in the work port or line may be required for this type of application.

For closed center applications the Pressure Build-Up Valve is not required. However, a system pressure of 200 PSI must be maintained in the closed center position to actuate the valve properly.

Proper operation of the solenoid actuators requires a pressure differential of 150-200 PSI above tank pressure. **The maximum tank port pressure should not exceed 150 PSI.** On "C" and "S" solenoid sections, excessive tank pressure will increase "Seal Drag" and may prohibit, the spool from shifting.

The solenoid operated SV section may be converted to accept an external hydraulic pilot supply to the solenoid actuators. Please consult a Sales Representative for more information.

SERIES 8 SOLENOID COILS ALL "C", "D", AND "DP" WORK SECTIONS

COIL PART NUMBERS

12H	- 671302168	-12 VDC DIN-43650
12L	- 671302160	-12 VDC DUAL LEAD WIRES
12Q	- 671302165	- 12 VDC DUAL SPADE
12D	- 671302163	- 12 VDC INTEGRAL DEUTSCH
24H	- 671302169	- 24 VDC DIN-43650
24L	- 671302167	- 24 VDC DUAL LEAD WIRES
24Q	- 671302166	- 24 VDC DUAL SPADE
24D	- 671302164	- 24 VDC INTEGRAL DEUTSCH
11H	- 671302170	- 110 VAC DIN-43650

COIL SPECIFICATIONS

DUTY RATINGCONTINUOUS AT 100% VOLTAGE
INGRESS PROTECTION RATING IP65
IP69 FOR INTEGRAL DEUTSCH COIL & CONNECTOR
WATTAGE19 WATTS
AMPERAGE DRAW (NOMINAL)
12 VOLT 1.6 AMPS
24 VOLT 0.78 AMPS
110 VOLT 0.19 AMPS
LEAD WIRE LENGTH 18 GAUGE 24" LONG
AC COILS HAVE INTERNAL FULL WAVE RECTIFIERS
RATED FOR 1000 VOLTS MAX REVERSE VOLTAGE
DIN STYLE COILS ARE DIN 43650 TYPE A

DEUTSCH COILS USE DT04-2P CONNECTORS

SERIES 10 SOLENOID COILS ALL "S" AND "T" WORK SECTIONS

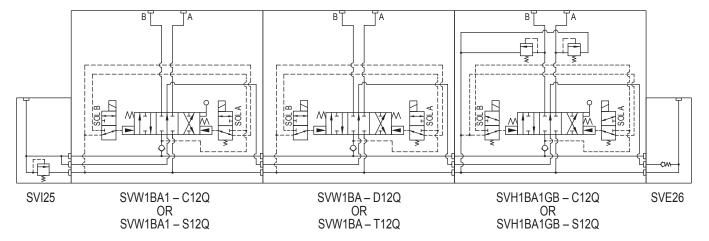
COIL PART NUMBERS

12H - 671302221 - 12 VDC COIL DIN 43650
12L - 671302220 - 12 VDC COIL DOUBLE WIRE
12Q - 671302226 - 12 VDC COIL DOUBLE SPADE
12D - 671302222 - 12 VDC COIL DEUTSCH
24H - 671302224 - 24 VDC COIL DIN 43650
24L - 671302223 - 24 VDC COIL DOUBLE WIRE
24Q - 671302227 - 24 VDC COIL DOUBLE SPADE
24D - 671302225 - 24 VDC COIL DEUTSCH
11L - 671302228 - 120 VAC LEAD WIRES

COIL SPECIFICATIONS

DUTY RATINGCONTINUOUS AT 100% VOLTAGE
INGRESS PROTECTION RATING IP65
WATTAGE
STABILIZED TEMPERATURE 217°F WITH 77°F AMBIENT
AMP DRAW AT 77°
12VOLT 1.70 AMPS
24 VOLT
120 VOLT
LEAD WIRE LENGTH 18 GAUGE 12" LONG
AC COILS HAVE A RECTIFIER ON THE LEAD WIRES.
LEAD WIRES ARE NOT TO BE REMOVED FOR USE.
AC LEAD WIRES ARE 6" LONG.
DIN STYLE COILS ARE DIN 43650 TYPE A.

SYMBOL SCHEMATIC OF A 3 SECTION, SOLENOID OPERATED STACK VALVE ASSEMBLY



V48

SV PROPORTIONAL WORK SECTIONS

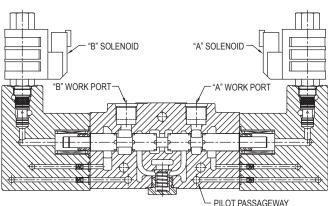
In the SV proportional work sections, varying pilot pressure is applied to the end of the spools to shift the spool against spring bias. Proportional pressure reducing cartridges are used to vary the pressure on the spools. As the current through the cartridge coil increases, the amount of the available pilot pressure applied to the ends of the spools also, proportionally increases. There will be a threshold pressure/current (dead band) to overcome the initial spring centering force and initial land coverage. Once this pressure/current has been exceeded, increasing the current through the coil will increase the flow from the work ports.

Current to the coils is typically provided by a PWM current control module and a joystick or other input device. The coils require a maximum current of approximately 1300 mA (@ 12 volts), and for reduced hysteresis, a dither frequency of approximately 100 Hz and a dither amplitude of 50 to 100 mA. The controller should have adjustable minimum current and maximum current settings to minimize the dead band before work port flow starts and to maximize the control resolution. See page V38 for examples of control module and joystick components.

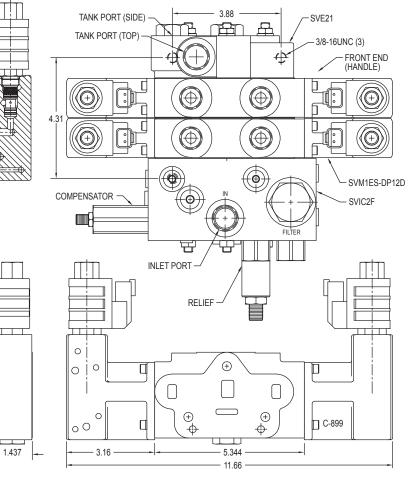
The proportional work sections require pilot pressure to shift the spools. Approximately 325 psi pilot pressure will fully shift the spool in Prince proportional sections. With open center valve assemblies, the pilot pressure is typically supplied by a compensator inlet (SVIC).

The SV proportional work sections are open center sections based on the SVM family. The open center sections, which are typically used with a fixed displacement (gear) pump, provide for a cost effective circuit. The open center sections will provide controlled starts and stops of the work port flow, however, the metering band is not as wide as the other proportional families and metering is somewhat pressure dependent. Using current minimum and current maximum settings on the controller will enhance the metering control.

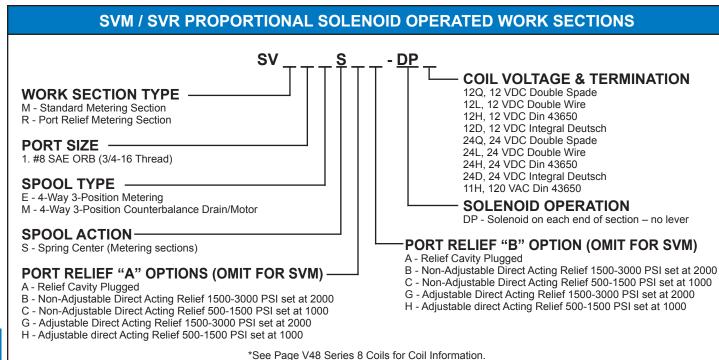
SV PROPORTIONAL WORK SECTION DIMENSIONS



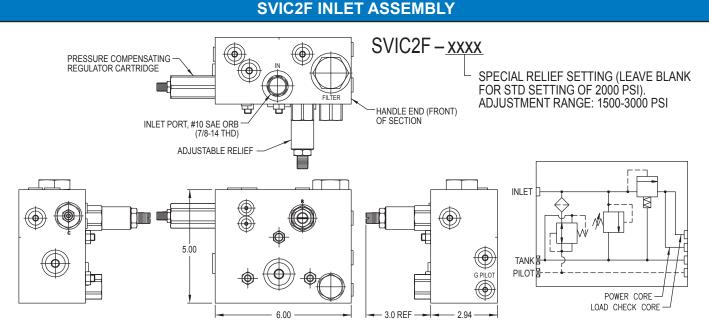
All SV proportional work sections require pilot supply passageways. All SVM-DPxxx proportional sections will automatically have pilot passageways, however, any non-proportional sections in the assembly will also have to have pilot passageways. To designate SVW, SVH, SVM, SVF, SVR or SVG non-proportional sections with pilot passageways, add a "P" after the three letter model prefix. For instance a SVW1BA1 section with pilot passageways would be called out as a SVWP1BA1. An example of a SVH with passageways would be a SVHP1BA1GG. An example of a non-proportional solenoid section to be included in a proportional assembly would be a SVWP1BA1-C12D. Please contact sales at Prince Manufacturing for additional assistance in configuring assemblies.



6.34







APPLICATION NOTES:

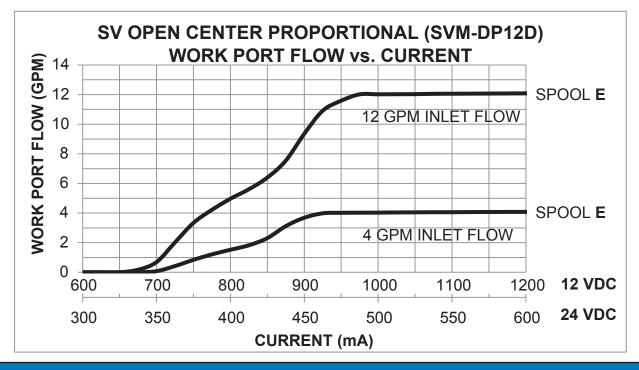
The SVIC2F is an inlet assembly used with "SVM" (open center) proportional solenoid assemblies. It is used with fixed displacement pumps (typically gear pumps) and has a compensator cartridge in the manifold that provides approximately 350 psi pilot pressure for the proportional solenoids. It also incorporates a pressure reducing cartridge to limit pressure to the solenoid cartridges, and a 10 μ filter cartridge to filter the pilot flow. The SVIC2F requires a tie rod kit for one extra section. Any non-proportional "SV" work sections in the assembly require pilot passageways. A standard "SVE" open center outlet with conversion plug should be used in the assembly.

The SVIC2F has other applications such as low flow systems. The inlet can provide a constant pilot pressure regardless of flow, guaranteeing a shift in either on/off or proportional solenoids. Likewise, systems that also have little to no load induced pressure can benefit from the constant pilot pressure the SVIC2F provides, guaranteeing a shift regardless of work port pressure.

The 10 micron filter included in the inlet helps keep the pilot lines clean. This helps eliminate contamination in the oil being sent to the solenoid cartridges.

To configure work sections to use with this inlet, refer to the text on page V49 that talks about adding a 'P' to the model codes.

SV PROPORTIONAL WORK SECTIONS PERFORMANCE CURVES



EXAMPLES OF TYPICAL SV SOLENOID OPERATED SECTIONS AND ASSEMBLIES

ON – OFF SOLENOID ASSEMBLIES

SV COMMON WORK SECTIONS: SVW1BA1-C12D (8 series solenoids)

SVW1BA1-C12D (8 series solenoids) SVW1BA-DM12D (8 series-manual override solenoids) SVW1BA1-S12L (10 series solenoids) SVW1BA-T12L (10 series solenoids) SV common assembly: SVI25; SVW1BA1-C12D; SVE26

OPEN CENTER PROPORTIONAL (fixed displacement pump)

SV COMMON WORK SECTION

SM1ES-DP12D (proportional solenoids)

SV common assembly: (note: non-solenoid sections require solenoid passageways) SVIC2F (compensator inlet); SM1ES-DP12D; SVE21

C	N – OFF SOL	PUMP TYPE		
Work Sect.	Inlet	Utility		
SV(W/L/M) SV(H/S/R)	SVIxx	n/a	SVEx6	FIXED DISPLACEMENT PUMP
SV(W/L/M) SV(H/S/R)	SVIxx	n/a	SVEx3	PRESSURE COMPENSATED PUMP
OPEN CENT		PUMP TYPE		
SV(M/R)	SVIC2F	n/a	SVEx1	FIXED DISPLACEMENT PUMP

RADIO REMOTE OFFERINGS FOR ON/OFF SOLENOID OPERATED VALVES

MACRO TRANSMITTERS



4 buttons (2 section valve) #671303111



6 buttons (3 section valve) #671303112



8 buttons (4 section valve) #671303113



4 outputs (up to 2 section valve) #671303001

8 outputs

(up to 4 section valve)

#671303002



12 VDC car charger #671303003

Wall charger #671303005

FEATURES:

- Palm sized transmitter (4.7" x 2.6" x .9" typical)
- Rechargeable transmitter micro USB (20 hr of active transmitting battery life)
- Range of up to 300 ft
- Two way communication with real time feedback
- Easy sync with receiver
- 900 Hz
- Ingress protection IP66
- Receiver input voltage (9 30VDC)

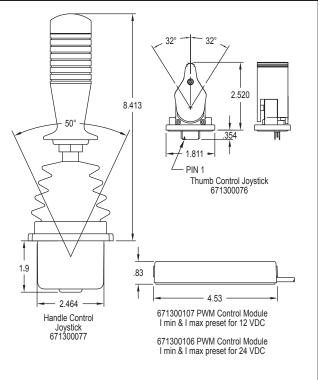
PROPORTIONAL CONTROLLERS & WIRING HARNESSES

Prince proportional operators are often controlled with a thumb or handle control and a PWM control module. Prince offers a small thumb control joystick and a larger handle control joystick, as well as a PWM control module that can be used in conjunction with these joysticks. The control module provides a performance enhancing dither to the current. The minimum and maximum current from the module can also be set to minimize the dead band before work port flow starts and to maximize the control resolution.

The connector on the thumb joystick is a Molex #CGRID/SL (7 male pins). The connector on the handle joystick is a Deutsch #HD14-9-16P (9 male pins). The connector on the PWM control module is a Deutsch #DT04-8P (8 male pins).

Prince offers a harness to connect the joystick, PWM module, and coils with Deutsch connectors. The harness system consists of a coil harness (approximately 60" long) to connect the PWM to the coils, to the power, etc. (671300108). The second part of the harness is a jumper harness that connects either the thumb control joystick or the handle control joystick to the PWM module. The standard length of the jumper harness is 10 feet, but other lengths are available. The 10 foot jumper harness for the thumb control joystick is 671304110. The 10 foot jumper harness for the handle control joystick is 671304210.

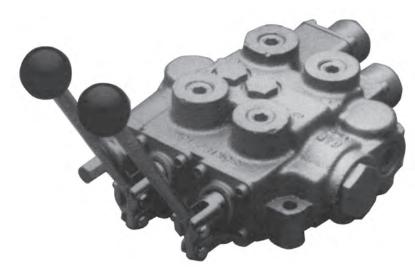
Additional controls such as multi spool proportional controllers as well as proportional RF controllers (belly packs) can be quoted upon request. Please contact sales at Prince Manufacturing for additional information.



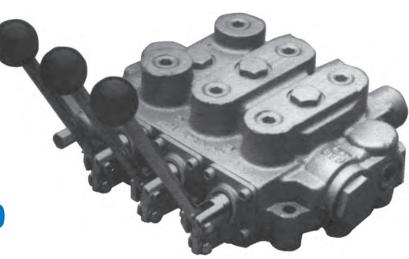
MODEL RD5000 MONO-BLOCK Directional Control Valves 1, 2, 3 Spool



Model RD5100



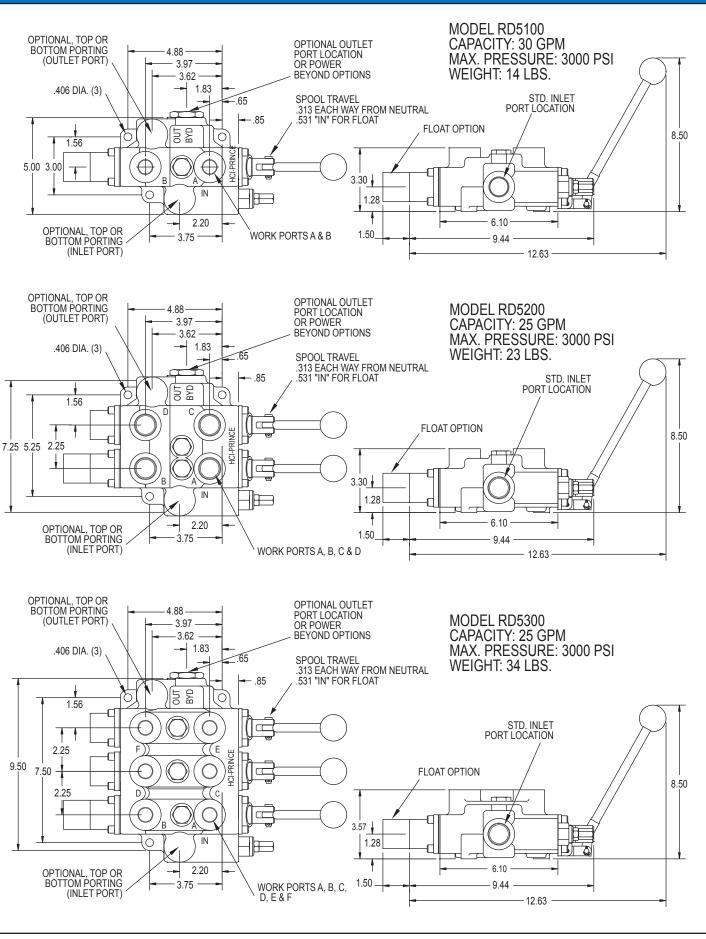
Model RD5200



Model RD5300

CATV 53-11-23-01

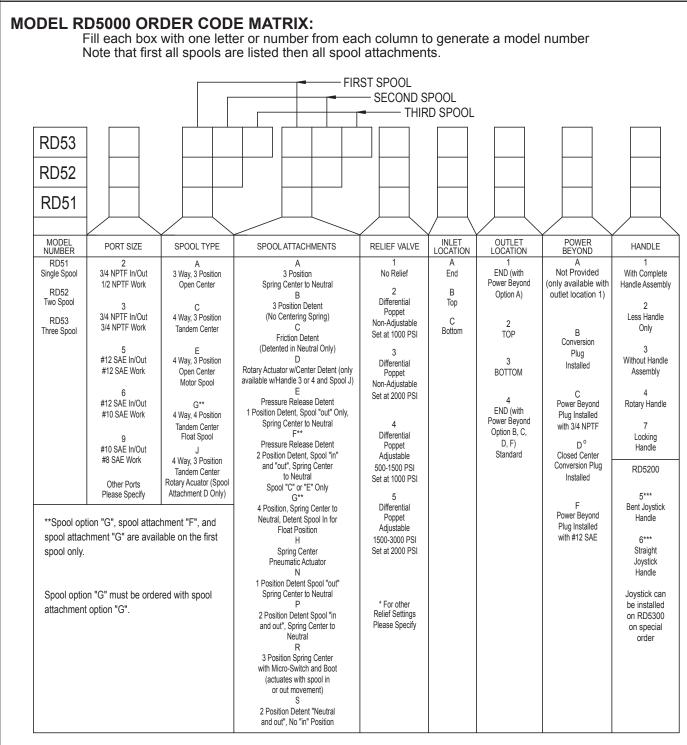
MODEL RD5000 DIMENSIONAL DATA



RD5000 ORDER CODE

SPECIAL VALVES AVAILABLE:

RD5000 Mono-block Valves can be made to order. Use the order code matrix below to generate a model number that meets your requirements. Special features not listed can often be made to your specifications. A minimum order quantity may apply to special valves. Please consult your sales representative.



*RD532CCCAAA5A4B1-25

The last two digits are Relief pressure in hundreds Example: 25=2500 psi, all relief settings are at 10 GPM & 105°F.

*** Joystick handle will operate both spools using only one lever handle. The two spools can be operated either independently or simultaneously depending on handle movement.

^o Often used with no relief. Review application.

RD5000 PRESSURE DROP, RELIEF CURVE AND STANDARD FEATURES

STANDARD FEATURES

- * Economical monoblock construction of high tensile strength gray cast iron.
- * Load check on each spool,
- * Hard chrome plated spool.
- * Optional 4 Position Float on 1st spool.

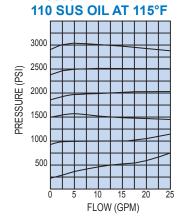
* Differential poppet style relief, adjustable from 1500 to 3000 psi (also available in low pressure version adjustable from 500 to 1500 psi)

- * Power beyond and closed center capability.
- * Reversible handle.

SPECIFICATIONS

PARALLEL CIRCUIT (RD-5200 & RD-5300)
MAXIMUM OPERATING PRESSURE
MAXIMUM OPERATING TEMPERATURE
MAXIMUM TANK PORT PRESSURE 500 PSI
RECOMMENDED SYSTEM FILTRATIONISO 4406 19/17/14
FLOW RATING
25 GPM RD5200
25 GPM RD5300
WEIGHT 14 LBS RD5100
23 LBS RD5200
34 LBS RD5300

RD5000 RELIEF VALVE



RD5100 SINGLE SPOOL VALVE PRESSURE DROP VALUES

110 SUS OIL AT 115°F												
	Δ P-PSI											
FLOW (GPM)	INLET TO INLET TO A OR B OUTLET A OR B TO OUTLE											
5	2	8	3									
10	5	17	6									
15	9	35	12									
20	21	58	21									
25	26	86	34									

RD5200 TWO SPOOL VALVE PRESSURE DROP VALUES

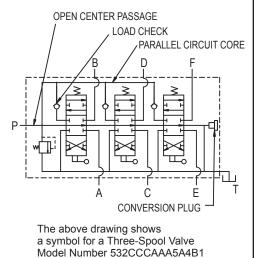
110 SUS OIL AT 115°F											
	∆ P-PSI										
FLOW (GPM)	INLET TO INLET TO A OR B C OR D TO OUTLET WORK PORTS TO OUTLET TO OUTLET										
5	3	11	2	2							
10	8	22	8	5							
15	16	38	15	11							
20	28	57	27	19							
25	44	83	43	29							

PARALLEL CIRCUIT VALVES:

Both the RD-5200 Two-Spool and RD-5300 Three-Spool Valves are parallel circuit valves. When any one of the spools is shifted it blocks off the open center passage thru the valve. The oil then flows into the parallel circuit core making oil available to all spools. If more than one spool is fully shifted then oil will go to the spool with the lowest pressure requirements. However, it is possible to meter the flow to the spool with the least load and power two unequal loads.

RD5300 THREE SPOOL VALVE PRESSURE DROP VALUES

	110 SUS OIL AT 115°F												
	∆ P-PSI												
FLOW (GPM)	INLET TO OUTLET	INLET TO A OR B	INLET TO C OR D	INLET TO E OR F	A OR B TO OUTLET	C OR D TO OUTLET	E OR F TO OUTLET						
5	2	9	9	11	4	3	2						
10	10	18	20	25	14	9	6						
15	22	33	41	49	32	22	13						
20	37	56	68	78	51	36	21						
25	58	83	101	118	76	55	32						



RD5000 ORDERING INFORMATION

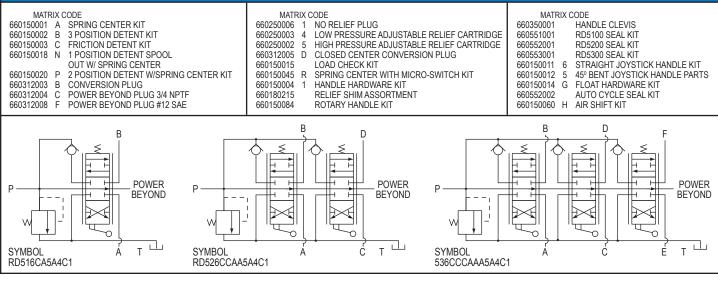
STANDARD MODELS AVAILABLE: Unless otherwise noted, all models listed have end inlet and outlet locations, power beyond (closed center) conversion plug, and complete handle assemblies. Unless otherwise noted, all models listed have adjustable differential poppet relief; preset 2000 PSI @ 10 GPM. (1500-3000 PSI)

					TIONS		SP	JOL /	ATTA	CHME	ENT C	PTIO	NS:	PORT	SIZES:
		1st	t SPC	OL	2nd	3rd		1s	SPO	OL		2nd			
VALVE PART NUMBER:	notes	TANDEM	MOTOR	FLOAT	TANDEM	TANDEM	SPR CNTR	3POS DET	FRIC DET	FLOAT	PR REL DET	SPR CNTR	SPR CNTR	OUTLET	WORK PORT
RD512CA5A4B1		Х					Х							3/4-NPTF	1/2-NPTF
RD512EA5A4B1			Х				Х							3/4-NPTF	1/2-NPTF
RD512GG5A4B1				Х						Х				3/4-NPTF	1/2-NPTF
RD513CA5A4B1		Х					Х							3/4-NPTF	3/4-NPTF
RD513CB5A4B1		Х						Х						3/4-NPTF	3/4-NPTF
RD513EB5A4B1			Х					Х						3/4-NPTF	3/4-NPTF
RD513EC5A4B1			Х						Х					3/4-NPTF	3/4-NPTF
RD515CA5A4B1		Х					Х							#12 SAE/ORB	#12 SAE/ORB
RD515EB5A4B1			Х					Х						#12 SAE/ORB	#12 SAE/ORB
RD515EC5A4B1			Х						Х					#12 SAE/ORB	#12 SAE/ORB
RD516CA5A4B1		Х					Х							#12 SAE/ORB	#10 SAE/ORB
RD516EB5A4B1			Х					Х						#12 SAE/ORB	#10 SAE/ORB
RD516GG5A4B1				Х						Х				#12 SAE/ORB	#10 SAE/ORB
D522CCAA5A4B1		Х			Х		Х					Х		3/4-NPTF	1/2-NPTF
RD522CCEA5A4B1		Х			Х						Х	Х		3/4-NPTF	1/2-NPTF
D522GCGA5A4B1				Х	Х					Х		Х		3/4-NPTF	1/2-NPTF
RD522GCGA5A4B6	а			Х	Х					Х		Х		3/4-NPTF	1/2-NPTF
D523CCAA5A4B1		Х			Х		Х					Х		3/4-NPTF	3/4-NPTF
D525CCAA5A4B1		Х			Х		Х					Х		#12 SAE/ORB	#12 SAE/ORB
RD526CCAA5A4B1		Х			Х		Х					Х		#12 SAE/ORB	#10 SAE/ORB
RD526GCGA5A4B1				Х	Х					Х		Х		#12 SAE/ORB	#10 SAE/ORB
32CCCAAA5A4B1		Х			Х	Х	Х					Х	Х	3/4-NPTF	1/2-NPTF
32GCCGAA5A4B1				Х	Х	Х				Х		Х	Х	3/4-NPTF	1/2-NPTF
36CC C AAA5A4B1		Х			Х	Х	Х					Х	Х	#12 SAE/ORB	#10 SAE/ORB
36CCCEAA5A4B1		Х			Х	Х					Х	Х	Х	#12 SAE/ORB	#10 SAE/ORB
RD523MMEE5A1A1	b	AUT	O-CY		TWO S	SPOO	L VA	LVE						3/4-NPTF	3/4-NPTF
RD523MMEE5A4B1		AUT	O-CY	CLE 1	rwo s	SPOO	L VA	LVE						3/4-NPTF	3/4-NPTF
RD525MMEE5A4B1		AUT	O-CY	CLE 1	rwo s	SPOO	L VA	LVE						#12 SAE/ORB	#12 SAE/ORB
RD525MMEE5A4F1	с	AUT	O-CY	CLE 1	rwo s	SPOO	L VA	AUTO-CYCLE TWO SPOOL VALVE						#12 SAE/ORB	#12 SAE/ORB

^a - RD522GCGA5A4B6 includes a joystick handle assy.

^b - RD523MMEE5A1A1 is not convertible & does not have power beyond or closed center capability.





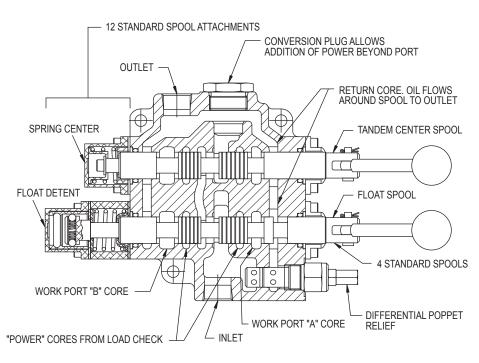
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VALVES

SEE PAGE 1 & 6 OF THE STANDARD PRODUCT PRICE LIST FOR PRICING

RD-5000 SERIES STANDARD AND SPECIAL FEATURE DESCRIPTIONS



The above drawing shows a section view of a 2-spool valve, Model RD522GCGA5A4B1. This is shown as a representative valve model. Other models will differ in appearance.

TWO SPOOL "JOYSTICK" HANDLE

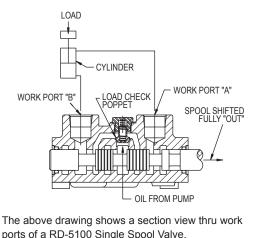
This handle will operate both spools using only one lever handle. The two spools can be operated either independently or simultaneously depending on handle movement.



LOAD CHECK:

The load check feature is standard on all RD-5000 series valves. Each spool has a separate load check. The load check will prevent the fall of a cylinder as the spool is shifted. It also prevents the back-flow of oil from the work port to the inlet. As shown below the pump must build up enough pressure to overcome the pressure on the work port caused by the weight of the load before the cylinder can move.

Please note that the load check has nothing to do with how well the valve will hold up a cylinder with the spool in neutral. The load check is functional only when the spool is shifted.



OPEN CENTER APPLICATIONS:

The Standard RD-5000 Series Valves are open center type valves. For open center valves the hydraulic oil is directed from the inlet to the outlet, or power beyond, through the open center passage when the spools are in neutral. Moving one or more spools closes off the open center passage and directs oil to the work ports.

Open center systems most often contain fixed displacement pumps. The PMC hydraulic PTO pumps are fixed displacement gear pumps. The maximum pressure in an open center system is controlled by a relief valve. The RD-5000 series valves have a built in relief valve for this purpose.

RD-5000 Series spool options A, C, E and G are all open center spools when used with power beyond options A, B, C and F.

CLOSED CENTER APPLICATIONS:

RD-5000 Series Valves are available as closed center type valves. For closed center valves the oil through the open center passage is blocked when the spools are in neutral.

Closed center systems often use a variable displacement pressure compensated pump. When this type of pump is used in a closed center system the system pressure is controlled by the pressure compensator. When the spools of RD-5000 series valve are in neutral, system pressure is maintained at the inlet of the valve. For this reason a relief is normally not required or must be set at a higher pressure than the pump compensator. RD-5000 Series spool options C, E and G are converted to closed center by installing a closed center conversion plug, power beyond option D.

PLEASE NOTE that this closed center option does not provide for the drain off of standby spool leakage. This can allow a very small amount of oil to enter the work ports when in neutral.

RD-5000 SERIES SPOOL OPTIONS

3 WAY 3 POSITION OPEN CENTER OPTION A

This spool option is used to control a single acting cylinder or a unidirectional motor. In neutral the work port is blocked and oil goes through the open center passage to the next spool of a multi-spool valve or the power beyond of a single spool valve. The "A" port is plugged for this option.



B

OPTION C

or a reversible motor. In neutral both of the work ports are blocked and oil goes through the open center passage to the next spool of a multi-spool valve or the power beyond of a single spool valve. This is the most popular spool option

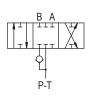


4 WAY 3 POSITION TANDEM CENTER

This spool option is used to control a double acting cylinder and is used on most Prince standard valves.

4 WAY 3 POSITION CLOSED CENTER

This spool option is similar to spool option C above except in neutral the open center passage is blocked. This function is achieved by using spool option C with a closed center conversion plug (Power beyond option D).



4 WAY 3 POSITION OPEN CENTER MOTOR SPOOL OPTION E

This spool option can be used to control a bi-rotational motor or a double acting cylinder. In neutral the work ports are open to the return. This allows a cylinder to drift or a motor to coast to a stop. In neutral the oil goes through the open center passage to the next spool of multi-spool valve or the power beyond of a single spool valve.

4 WAY 3 POSITION CLOSED CENTER MOTOR SPOOL

This option is similar to spool option E except in neutral the open center passage is blocked. This function is achieved by using spool option E with a closed center conversion plug (Power beyond option D).

4 WAY 4 POSITION OPEN CENTER FLOAT SPOOL OPTION G

PRESSURE RELEASE DETENT,

CENTER TO NEUTRAL OPTION E

DETENT SPOOL 'OUT ONLY, SPRING

This option provides a pressure release detent for

the spool 'Out' position. When the spool is manually

placed in the detent position oil is directed to the 'B' work port (the port away from the handle). When

the pressure in the 'B' port reaches a preset level

the detent will release and the spool will center. The

detent release pressure is factory set at 1400 psi. This pressure is adjustable from 1000 to 2000 psi.

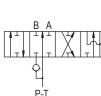
The detent release pressure is adjusted by turning the adjusting screw clockwise to increase the pressure

and counter-clockwise to decrease the pressure. The

spool is spring centered to neutral from the spool 'In'

position. This option can be used with spool options

This option is the same as spool option C, 4 way 3 position tandem center, with an added fourth "float" position. In neutral the work ports are blocked (this will hold up a cylinder) and the oil goes through the open center passage to the next spool or power beyond. In the float position the work ports are open to the return (this will allow a cylinder to drift or "float") and the oil goes to next spool or power beyond. The float position is reached by pushing the spool as far as it will go and Is held in place by a detent. This option must be ordered with spool action option G.



P-T

R

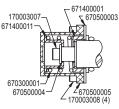
P

P-T

RD-5000 SERIES SPOOL ATTACHMENT OPTIONS

3 POSITION SPRING CENTER TO NEUTRAL OPTION A

This option has 3 positions and a spring that returns the spool to neutral when the handle is released. This option is considered standard on many Prince valve models



670300002 (2)

670700008

670700002

230009009 (4)

-170003018 (4)

671200002

670500005

This option can be converted in the field to 3 position detent by ordering Kit 660150002. It can be converted to friction detent by ordering Kit 660150003.

3 POSITION DETENT OPTION B

This option provides three detented positions. The spool will remain in any of the three positions in which it is manually placed. No centering spring is provided. Note: This option does not positively lock the spool in place. Excessive vibration or shock loads may affect operation

This option can be converted in the field to spring center by ordering Kit 660150001. It can be converted to friction detent by ordering Kit 660150003.

FRICTION DETENT OPTION C

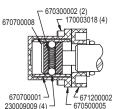
This option provides for a detent in the neutral position only. As the spool is manually moved away from the neutral position it will be held in place by the friction of the detent balls on the detent sleeve. Note: Because the spool is held in place by friction only, excessive vibration may cause spool to move when not in the neutral detented position.

This option can be converted in the field to spring center by ordering Kit 660150001 and to 3 position detent by ordering Kit 660150002.

4 POSITION SPRING CENTER TO NEUTRAL DETENT SPOOL 'IN' FOR FLOAT POSITION OPTION G

This attachment is used with spool option 'G'. This option provides for spring center to neutral from either work position. It also provides a 4th position, float detent. The float detent is reached by pushing the spool in as far as it will go. In the float position both work ports are open to return. This allows a cylinder to drift or "float"

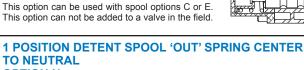
This option is available only with spool option 'G' and cannot be added to a valve in the field.



OPTION F RD-5300 valves

A, C or E.

670500005



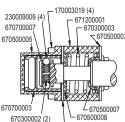
OPTION N

This option uses the same parts as option E above but is not pressure released. The handle must be manually removed from the detent position. The detent holding force is adjustable.

2 POSITION DETENT SPOOL 'IN' AND 'OUT' SPRING CENTER TO NEUTRAL

OPTION P

This option uses the same parts as option F above but is not pressure released. The handle must be manually removed from the detent position. The detent holding force is adjustable.



670500009

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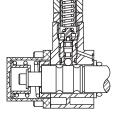
DETENT RELEASE PRESSURE ADJUSTING SCREW

VALVES

This option can not be added to a valve in the field due to special machining in the body.

PRESSURE RELEASE DETENT, DETENT SPOOL 'IN' AND 'OUT' SPRING CENTER TO NEUTRAL

This option is similar to option 'E' above except the pressure release detent function is on both the spool In' and 'Out' positions. This option is available on RD-5100 valve and number 1 spool of RD-5200 and



RD-5000 SERIES POWER BEYOND OPTIONS

ROTARY ACTUATOR OPTION D

With this option, rotating the spool approximately 90° clockwise from neutral moves the spool to the full in position, 90° counter clockwise to full out. There is a detent in the neutral position, and in this position, the spool clevis opening is approximately vertical. A handle is not included. This option cannot be added in the field.

POWER BEYOND NOT PROVIDED OPTION A

This option provides an outlet only with no provision for power beyond. This option can be used with any open center spools where there is no need for a power beyond port. The end outlet, shown at right, is considered standard but a top or bottom outlet can also be specified.

When all the valves spools are in neutral oil goes through the open center core to the outlet.

RETURN

CORE

OPEN

CENTEL

RETURN

This option cannot be converted in the field to have power beyond. It also cannot be converted from open to closed center.

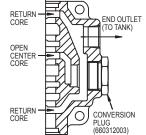
CONVERSION PLUG INSTALLED OPTION B

This option is similar in function to Option 'A' above except the conversion plug is installed in the power beyond location and the end outlet is relocated. This option should be used with the open center spool options and allows the valve to be converted to have power beyond function or be

converted from open to closed center. This option is considered the **PMC Standard** power beyond option because of the flexibility it adds to the valve.

When all the valve spools are in neutral oil goes through open center core to return core and then to outlet.

To convert a valve in the field to have power beyond, remove the conversion plug and replace it with one of the power beyond plugs listed. To convert valve to closed center, replace conversion plug with closed center plug 660312005.



END OUTLET

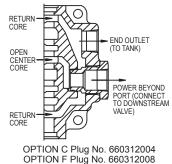
(TO TANK)

2 POSITION DETENT, NEUTRAL AND SPOOL OUT

This option provides 2 detented position, neutral and spool out. The spool is prevented from going into the "spool in" position. The spool will remain in the detented position in which it is manually placed. The option does not positively lock the spool in place and excessive vibration or shock loads may affect the operation. The three position detent kit can be converted into this option by ordering part No. 671200006.

POWER BEYOND PLUG INSTALLED OPTION C 3/4 NPTF POWER BEYOND PORT OPTION F #12 SAE POWER BEYOND PORT

This option provides both an outlet and a power beyond port (also referred to as a high pressure carry over port). This allows another valve to be connected downstream. When all the spools of a RD-5000 series valve are in neutral high pressure oil can go through the open center core and out the power beyond port



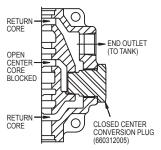
to the inlet of downstream valve. The downstream valve only receives oil when all spools of the first valve are in neutral. This option must be used with open center spools and the outlet of valve must be connected to tank.

If the power beyond port is not used on a valve in an open center system the power beyond port must be connected to tank or the power beyond plug replaced with conversion plug 660312003.

A valve with power beyond can be converted to closed center by plugging the power beyond port or installing closed center plug 660312005.

CLOSED CENTER CONVERSION PLUG INSTALLED OPTION D

This option converts an otherwise open center valve to closed center operation. The open center core is blocked by the conversion plug. Oil cannot pass through the valve when the spools are in neutral. Closed center systems are normally associated with variable displacement pumps or any other system where the pump flow is unloaded when system pressure is reached.



Note: If the closed center plug is installed in

a valve that has a relief it may be necessary to install the no relief plug or adjust the relief pressure above the compensator setting.

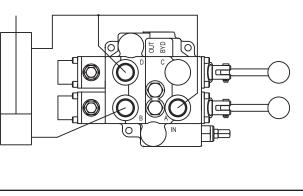
Also, this closed center option does not provide for the drain off of standby spool leakage. This can allow a very small amount of oil to enter the work ports when in neutral.

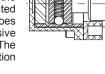
RD-5000 2 SPOOL SPECIAL APPLICATION VALVE

"AUTO-CYCLE" TWO SPOOL VALVE

This valve is a modified RD-5200 two spool valve that can be used to automatically cycle a hydraulic cylinder. The spools and the valve body have been modified to provide this function. Both spools have the pressure release detent spool attachment. The valve is shown connected to a cylinder in the sketch below. The "B" port is connected to the base of the cylinder. The "A" and "D" ports are tied together and connected to the rod end of the cylinder. The "C" port is plugged. At the beginning of the cycle the cylinder is fully retracted. To begin the cycle both handles are pulled back. Oil is directed to the "B" port and the cylinder will extend until it reaches the end of its stroke. At this point the pressure will build to the detent release pressure and the first spool and is directed out the "D" port to retract the cylinder. When the cylinder reaches the full retract position the pressure will build to the detent release pressure and the second spool and is directed out the "D" port to retract the cylinder. To begin the next cycle both handles are again manually pulled back. Please note this valve does not have the loadcheck feature of the standard RD5200 valve. Also the "B" port is open to tank in neutral. Maximum detent pressure setting is 2000 PSI.

Model Number RD525MMEE5A4B1



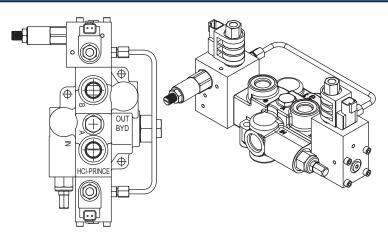


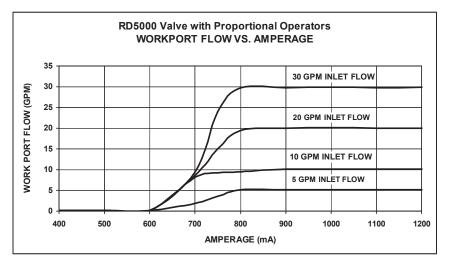
RD5000 PROPORTIONAL OPERATOR VALVE

RD5000 SERIES VALVE WITH PROPORTIONAL OPERATORS

The RD5000 valve is available with proportional solenoid operators. The valve will allow controlled starts and stops of the work port flow as well as control of the work port flow rate over a limited metered range. Pilot pressure to initiate spool shift is provided internally by means of a pressure build-up cartridge in the power beyond port. Once the spool shift is initiated, load induced pressure is required to regulate the spool position and flow. By increasing the current through one of the solenoids, increasing pressure is applied to a spool end, causing the spool to shift against spring bias. Full spool shift is at approximately 1200 mA - 12 VDC (600 mA - 24 VDC).

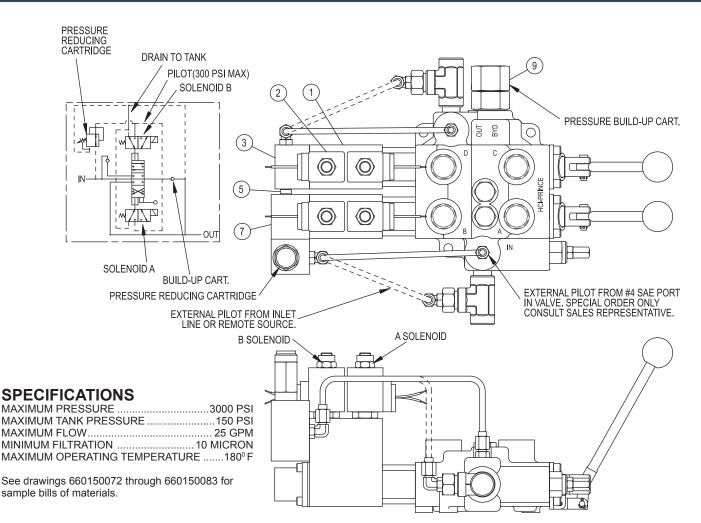
The RD5000 proportional operators are typically controlled with a thumb or handle control and a PWM control module. Prince offers a small thumb control joystick (671300076) and a larger handle control joystick (671300077). A PWM control module (671300107) that can be used in conjunction with these joysticks is also offered by Prince. See page V52 for details.





RD51								-
MODEL NUMBER	PORT SIZE	SPOOL TYPE	SPOOL ATTACHMENTS	RELIEF VALVE	INLET LOCATION	OUTLET LOCATION	POWER BEYOND	PROPORTIONAL SOLENOID COIL
RD51 Single Spool	6 #12 SAE In/Out #10 SAE Work	C 4 Way, 3 Position Tandem Center	A 3 Position, Spring Center to Neutral	1 No Relief	A End	4 End	H Open Center Pressure Build-up	DP12Q 12VDC Dual Spades DP12L 12VDC Dual Lead Wires
* RD5160	CA5A4H–DP12ł Th hu rel	ef settings, please s H–25 e last two digits are ndreds (example: 2f ief settings are at 10 Review application	relief pressure in 5=2500 PSI). All	Differential Poppet Adjustable 1500-3000 PSI Set at 2000 PSI			D ** Closed Center Conversion Plug Installed	DP12H 12DVC DIN-43650 DP12D 12VDC Integral Deutsch DP24Q 24VDC Dual Spades DP24I
are availat Please cor	ble.	two and three spoo					24VDC Dual Lead Wires DP24H 24VDC DIN-43650 DP24D 24VDC Integral Deutsch DP11H 110VAC DIN-43650	

SOLENOID OPERATED RD5000 DIRECTIONAL CONTROL VALVE



The Solenoid Operated RD5000 Directional Control Valve allows remote electrical on-off or manual control. This feature can be installed on the RD5100, RD5200, or RD5300. It can be installed on one or all spools of the RD5200 or RD5300. This option can be purchased as kits and installed by customer. Complete valves are available special order only (min. qty. 25) Consult your sales representative. Pressure release detent or float spool options cannot be converted to solenoid operated valves.

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POOL)

DESCRIPTION	PART NUMBER
PRES, BUILD-UP CART. OPEN CENTER	660312012
PRES. BUILD-UP POWER BEYOND CART (#12 SAE)	660312014
12 VDC LEAD WIRE COIL	671302220
12 VDC DOUBLE SPADE COIL	671302226
12 VDC DIN 43650 COIL	671302221
24 VDC LEAD WIRE COIL	671302223
24 VDC DOUBLE SPADE COIL	671302227
24 VDC DIN 43650 COIL	671302224
12 VDC DEUTSCH COIL	671302222
24 VDC DEUTSCH COIL	671302225
120 VAC LEAD WIRES COIL	671302228

The Solenoid Operated RD5000 contains two, 3 way-2 position solenoid cartridge valves and a pilot operated piston attached to the main control spool. When both solenoids are de-energized both sides of the pilot piston are open to tank pressure and the spool remains spring centered. When solenoid A is energized, pilot pressure is applied to one side of the pilot piston causing the spool to shift from the neutral position to work port A. When solenoid "B" is energized, pilot pressure is applied to the other side of the pilot piston causing the spool to shift to work port "B". In cases where the pilot pressure is provided by the inlet line or #4 SAE port on valve, a "Pressure Build-Up Valve" must be installed in the outlet port. Two versions of the pressure build-up valve are offered. The open center pressure build-up valve and the power beyond pressure build-up valve. Both versions supply 150-200 PSI pilot pressure to the solenoid actuator. When remote pilot is used, the pressure build-up is not required. Because the valve is internally piloted, overcenter or light loads can be a problem. The inlet pressure must be at least 200 psi during operation. Restrictors can be added to eliminate this problem.

MODEL RD4100 SINGLE SPOOL MONO-BLOCK VALVE



RD4100 SPECIFICATIONS

MAXIMUM OPERATING PRESSURE	
MAXIMUM TANK PRESSURE	500 PSI
MAXIMUM OPERATING TEMPERATURE	
180°F RECOMMENDED SYSTEM FILTRATION	
FLOW RATING	

STANDARD FEATURES

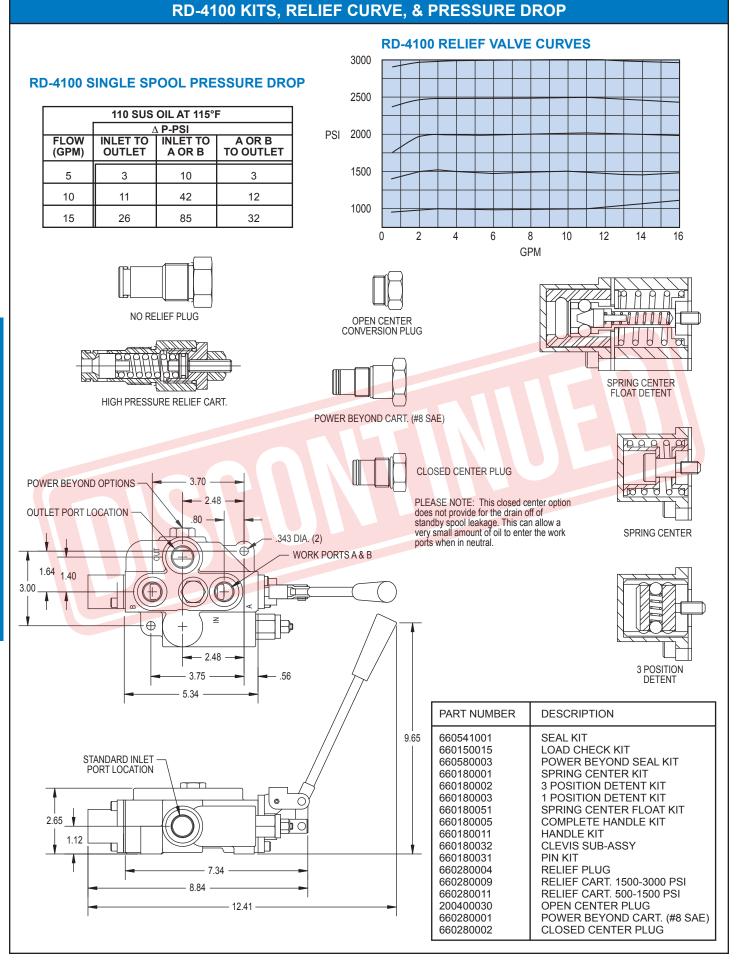
- Economical monoblock construction of high tensile strength cast iron
- gray Load check
- Hard chrome plated spool Adjustable cartridge relief ٠
- Adjustable callinge relief
 Open center, closed center, and power beyond available
 For use with system flows up to 15 gpm
 For use with system pressures up to 3000 PSI
 Optional top inlet & outlet port locations.

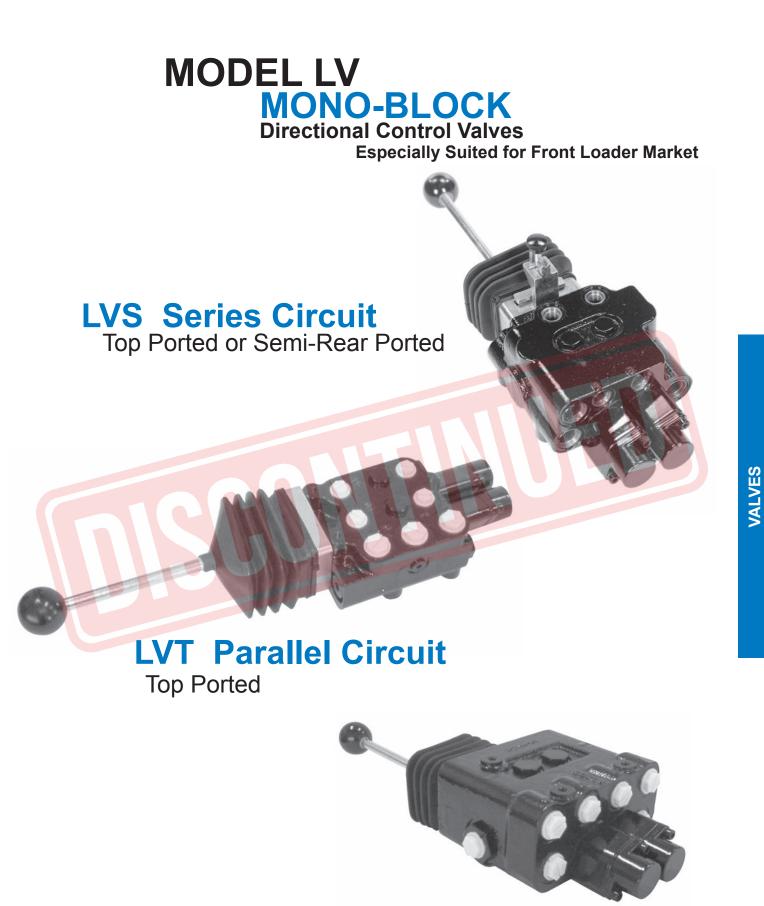
RD41					Д	具	风	
MODEL NUMBER	PORT SIZE	SPOOL TYPE	SPOOL ACTIONS	RELIEF VALVE	INLET LOCATION	OUTLET LOCATION	POWER BEYOND	HANDLE
RELIEF PRE HUNDREDS ALL RELIEFS GPM & 105°I	T NO DIGITS ARE SSURE IN EX: 25=2500 psi. 3 ARE SET AT 10 SED WITH NO RELIEF.	A 3 Way 3 Position Tandem Center B 4 Way 3 Position Tandem Center C 4 Way 3 Position Open Center Motor Spool D 4 Way 4 Position Tandem Center Float Spool	A Spring Center B 3 Position Detent C Friction Detent D Float Detent See SVW Section for Additional Spool Actions	1 No Relief 4 Direct Acting Adjustable 500-1500 PSI Set at 1000 PSI 5 Direct Acting Adjustable 1500-3000 PSI Set at 2000 PSI Set at 2000 PSI For other relief settings please specify*	A End Top	1 End W/Power Beyond Option A 2 Top W/Power Beyond Options B, C & D	A Not Provided B Conversion Plug Installed C Power Beyond Plug Installed with #8 SAE D** Closed Center Conversion Plug Installed	1 Std. Lever Handle 2 Less Handle Only 3 Less Complete Handle Assembly 5 Tang Spool End Only 6 Clevis Spool End Only 11 Enclosed Handle

STANDARD VALVES AVAILABLE:

All standard valves have a load check, a complete lever handle assembly, and an adjustable relief, see table below for settings. For other relief settings, please specify.

		SPOOL TYPE		ç	SPOOL ACTIO	N				
VALVE PART NUMBER	4 WAY 3 POSITION	4 WAY 3 POSITION MOTOR	4 WAY 4 POSITION FLOAT	SPRING CENTER TO NEUTRAL	3 POSITION DETENT	FLOAT DETENT	IN/OUT PORT SIZE	WORK PORT SIZE	RELIEF SETTING	CONVERTIBLE FROM OPEN CENTER TO CLOSED CENTER
RD412BA5A1A1	Х			Х			#10 SAE	#8 SAE	2000 PSI AT 10 GPM	NO
RD412BA5A2B1	X			Х			#10 SAE	#8 SAE	2000 PSI AT 10 GPM	YES
RD412BB5A2B1	X				Х		#10 SAE	#8 SAE	2000 PSI AT 10 GPM	YES
RD412CA5A2B1		Х		Х			#10 SAE	#8 SAE	2000 PSI AT 10 GPM	YES
RD412DD5A2B1			Х	Х		Х	#10 SAE	#8 SAE	2000 PSI AT 10 GPM	YES





LVR Parallel Circuit Rear Ported

MODEL LVS SERIES LOADER VALVE



LVS SPECIFICATIONS

STANDARD FEATURES

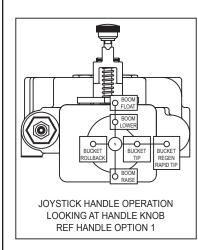
- · Economical monoblock construction of high tensile strength gray cast iron
- Load check on each spool
- Hard chrome plated spools
- No face seals on spools
 Adjustable cartridge relief
- Adjustable cartridge relief
 Power beyond available
- 4 Position Series Float Spool for loader boom
- 4 Position Regen Spool for loader bucket

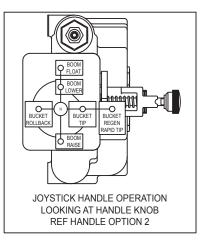
Molded rubber boot

-

Patented dual spool lock joystick available

LVS						
MODEL INI NUMBER	LET & TANK PORT OPTION	WORK PORT OPTION	SPOOL & ACTION	RELIEF OPTIONS	POWER BEYOND OPTIONS	HANDLE OPTIONS
LVS Two spool loader valve Series circuit *LVS1AGR5B THE LAST TWO DI RELIEF SETTING I EX: 25=2500 PSI (ALL RELIEFS ARE	IGITS ARE THE IN HUNDREDS. @ 10 GPM	A A & C work ports on top and B & D work ports on rear, #6 SAE ORB Work ports on top, #6 SAE ORB C Work ports on top, #8 SAE ORB	GR Standard A-B 4 way 4 position float, spring center with float detent C-D 4 way 4 position selective regen, spring center with soft stop GB A-B 4 way 4 position float, spring center with float detent C-D 4 way 3 position spring center	1 No Relief 4 Direct acting adjustable 500-1500 PSI set at 1000 PSI 5 Standard: Adjustable direct acting relief 1500-3000 PSI (set at 2000 PSI) 6 Pilot relief 500-3000 PSI (set at 2000 PSI) *For other relief settings please specify (see example on the left)	A Standard open center (field convertible to #8 SAE ORB top power beyond) B #8 SAE rear power beyond	1 Joystick & boot w/ dual spool lock, mounting feet down/to rear 2 Joystick & boot w/ dual spool lock, mounting feet to the left 3 Joystick & boot without spool lock, mounting feet down/to rear 4 Joystick & boot without spool lock, mounting feet to the left 8 No joystick or handle (tang ends on spool only)

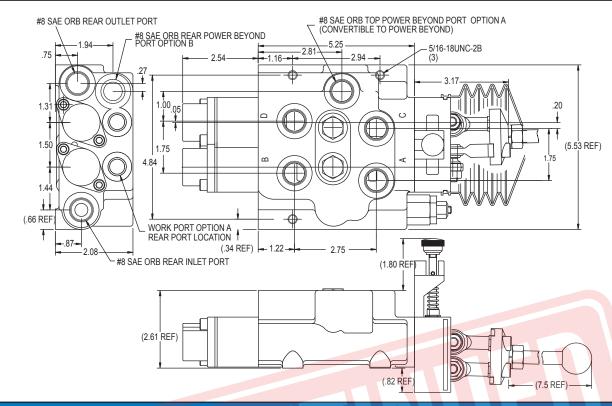




LVS PRESSURE DROP

110 SUS OIL AT 115°F							
∆ P-PSI							
FLOW (GPM)	INLET 1 OUTLE	-	INLET TO WORK	WORK PORTS TO OUTLET			
4	6		22	4			
6	18		44	19			
10	64		100	60			
			•	•			
PART NU	MBER	D	ESCRIPTION				
660180170 S 660180169 S 671400252 R 660390016 R 671900084 S		EAL KIT PRING CENTEI PRING CENTEI OD END OD END W/STU LIDING SPOOL	R REGEN KIT JD STUD				

LVS SERIES LOADER VALVE DIMENSIONAL DATA



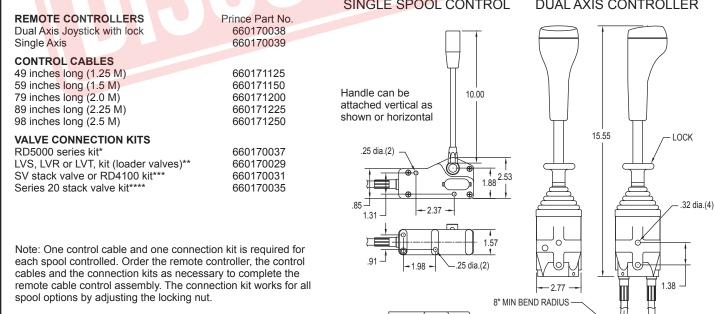
REMOTE CABLE CONTROLS FOR PRINCE VALVES

REMOTE CABLE CONTROL

Heavy duty remote cable controls are available for most Prince directional control valves. The compact controller bodies are of die-cast metal construction and are available in either dual axis or single axis configurations. Dual axis joysticks are constructed with steel swivels and anti-wear bushings. The high strength flexible control cables are jacketed and have quick attach connections.

SINGLE SPOOL CONTROL

DUAL AXIS CONTROLLER



- *Field convertible or order option 3, less handle assembly.
- ** Order loader valve handle option 8, tang end only.
- *** Field convertible from standard handle or order option 6, clevis spool end only.
- **** Field convertible or order option 3, less complete handle.

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MODEL LVT TWO SPOOL MONO-BLOCK LOADER VALVE

LVT SPECIFICATIONS

PARALLEL CIRCUIT	
MAXIMUM OPERATING PRESSURE	3000 PSI
MAXIMUM TANK PRESSURE	500 PSI
MAXIMUM OPERATING TEMPERATURE	180°F
RECOMMENDED SYSTEM FILTRATIONISO 4406	5 19/17/14
FLOW RATING	10 GPM
WEIGHT	14.6 LBS

STANDARD FEATURES

- Economical monoblock construction of high tensile strength gray cast iron
- Load check on each spool
- Hard chrome plated spool
- Adjustable cartridge relief
- Open center, and power beyond available
- 4 Position Float Spool for loader boom
- 4 Position Regen Spool for loader bucket

5/16-18 UNC MOUNTING HOLES ON BOTH TOP AND BOTTOM OF VALVE NOTE: NEUTRAL POSITION SPOOL LOCK AVAILABLE

LVT						
MODEL PO	ORT SIZE	SPOOL & ACTION	RELIEF VALVE	IN/OUT PORT	POWER BEYOND	HANDLE
LVT Top Ported Two #8 SA	ARE THE NDREDS. GPM. ALL	GR Standard: A1-B1 4 Way 4 Position Float, Spring Center with Float Detent A2-B2 4 Way 4 Position Regen, Spring Center with Soft Stop RG A1-B1 4 Way 4 Position Regen, Spring Center with Soft Stop A2-B2 4 Way 4 Position Float, Spring Center with Float Detent GB A1-B1 4 Way 4 Position Float, Spring Center with Float Detent A2-B2 4 Way 3 Position Spring Centered BG A1-B1 4 Way 3 Position Spring Centered A2-B2 4 Way 4 Position Float, Spring Center with Float Detent BB A1-B1 4 Way 3 Position Spring Centered A2-B2 4 Way 4 Position Float, Spring Center with Float Detent BB A1-B1 4 Way 3 Position Spring Centered A2-B2 4 Way 3 Position Spring Centered A2-B2 4 Way 3 Position Spring Centered A2-B2 4 Way 3 Position Spring Centered	1 No Relief 4 Direct Acting Adjustable 500-1500 PSI Set at 1000 PSI 5 Standard: Direct Acting Adjustable 1500-3000 PSI Set at 2000 PSI 6 Pilot Operated Adjustable 500-3000 PSI Set at 2000 PSI *For other relief settings please specify (see example on	A Standard: Top In, Out and Power Beyond B Side Inlet, Top Out & Power Beyond	B Standard: Open Center (Power Beyond Port Plugged) C #8 SAE Power Beyond D ** Closed Center (Often Used With No Relief. Review Application.) Note: Valve can be converted in the field.	1 Standard Handles 2 Clevis Spool End Only 3 Joystick for ports on bottom (Use with GR, GB, BG or BB) 4 Joystick for ports on left (Use with GR, GB or BB) 5 Joystick for ports on right (Use with RG, GB, BG or BB) 6 Joystick for ports on right (Use with RG, BG or BB) 7 Universal joystick contains parts and instructions for all mountings 8 Tang Spool End Only

** PLEASE NOTE that this closed center option does not provide for the drain off of standby spool leakage. This can allow a very small amount of oil to enter the work ports when in neutral. Closed center option is often used with no relief. Review application.

STANDARD VALVES AVAILABLE:

All standard valves have a load check, a complete handle assembly, and an adjustable relief.

		SPOOL TYPE	SPOOL ACTION		
VALVE PART NUMBER	4 WAY 4 POSITION FLOAT SPOOL	4 WAY 3 POSITION SPOOL	4 WAY 4 POSITION REGEN SPOOL	A1-B1 SPOOL	A2-B2 SPOOL
LVT1BB5AB1		х		SPRING CENTER	SPRING CENTER
LVT1GB5AB1	Х	х		FLOAT DETENT	SPRING CENTER
LVT1GB5AB3	Х	х		FLOAT DETENT	SPRING CENTER
LVT1GR5AB3	Х		х	FLOAT DETENT	REGEN POSITION
LVT1RG5AB5	Х		х	REGEN POSITION	FLOAT DETENT
LVT1BG5AB5	Х	х		SPRING CENTER	FLOAT DETENT

LVT PRESSURE DROP

110 SUS OIL AT 115°F						
		Δ P-PSI				
FLOW	INLET TO	INLET TO	A OR B			
(GPM)	OUTLET	WORK PORTS	TO OUTLET			
4	15	20	8			
6	35	34	20			
10	95	72	50			

PART NUMBER	DESCRIPTION
660590017	SEAL KIT
660180078	SPRING CENTER KIT
660180076	SPRING CENTER FLOAT KIT
660180077	SPRING CENTER REGEN KIT
660180073	COMPLETE HANDLE KIT
660180071	HANDLE KIT
660180072	CLEVIS SUB-ASSY
660280004	RELIEF PLUG
660280009	RELIEF CART. OPTION 5
270006122	PILOT RELIEF CART. OPTION 6

V68

MODEL LVR TWO SPOOL MONO-BLOCK LOADER VALVE



5/16-18 UNC MOUNTING HOLES ON BOTH TOP AND BOTTOM OF VALVE NOTE: NEUTRAL POSITION SPOOL LOCK AVAILABLE

LVR SPECIFICATIONS

PARALLEL CIRCUIT	
MAXIMUM OPERATING PRESSURE	000 PSI
MAXIMUM TANK PRESSURE	500 PSI
MAXIMUM OPERATING TEMPERATURE	180°F
RECOMMENDED SYSTEM FILTRATION ISO 4406 '	19/17/14
FLOW RATING	14 GPM
WEIGHT2	2.6 LBS

STANDARD FEATURES

- · Economical monoblock construction of
- high tensile strength gray cast iron
- Load check on each spool
- Hard chrome plated spool
- Adjustable cartridge relief
- Open center, and power beyond available
- 4 Position Float Spool for loader boom
- 4 Position Regen Spool for loader bucket

LVR				A		
MODEL NUMBER	PORT SIZE	SPOOL & ACTION	RELIEF VALVE	IN/OUT PORT	POWER BEYOND	HANDLE
THE LAST TW RELIEF SETT EX: 25=2500 F	1 Standard: #10 SAE in/out #8 SAE work ports 2 #8 SAE in/out #6 SAE work ports 0 DIGITS ARE THE ING IN HUNDREDS. PSI @ 10 GPM ARE SET AT 10 GPM.	GR Standard: A-B 4 Way 4 Position Float, Spring Center with Float Detent C-D 4 Way 4 Position Regen, Spring Center with Soft Stop RG A-B 4 Way 4 Position Regen, Spring Center with Soft Stop C-D 4 Way 4 Position Float, Spring Center with Float Detent GB A-B 4 Way 4 Position Float, Spring Center with Float Detent C-D 4 Way 3 Position Spring Centered C-D 4 Way 4 Position Spring Centered C-D 4 Way 4 Position Float, Spring Center with Float Detent BG A-B 4 Way 4 Position Spring Centered C-D 4 Way 4 Position Float, Spring Center with Float Detent BB A-B 4 Way 3 Position	1 No Relief 4 Direct Acting Adjustable 500-1500 PSI Set at 1000 PSI 5 Standard: Direct Acting Adjustable 1500-3000 PSI Set at 2000 PSI 6 Pilot Operated Adjustable 500-3000 PSI Set at 2000 PSI Set at 2000 PSI	A All Ports On End of Valve	B Standard: Open Center (Power Beyond Port Plugged) C #8 SAE Power Beyond D ** Closed Center Note: Valve can be converted in the field.	1 Standard Handles 2 Clevis Spool End Only 3 Joystick for power beyond on Right (Use with GR, GB, BG or BB) 4 Joystick for power beyond on Bottom (Use with RG, BG or BB) 5 Joystick for power beyond on Left (Use with RG, BG, GB or BB) 6 Joystick for power beyond on Top (Use with GR, GB or BB) 7 Universal joystick contains parts and instructions for all mounting options 8 Tang Spool End Only
		Spring Centered C-D 4 Way 3 Position Spring Centered (no float, no regen)	example on the left)		LVR PRESSUF	US OIL AT 115°F ∆ P-PSI TO INLET TO A OR B

** PLEASE NOTE that this closed center option does not provide for the drain off of standby spool leakage. This can allow a very small amount of oil to enter the work ports when in neutral. Closed center option is often used with no relief. Review application.

STANDARD VALVES AVAILABLE:

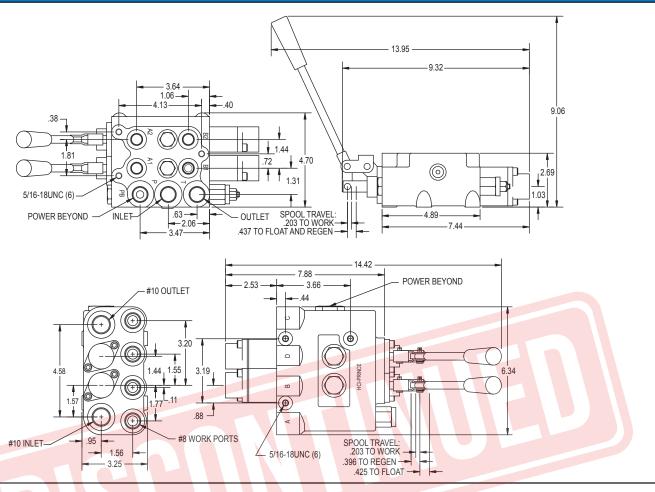
All standard valves have a load check, a complete handle assembly, and an adjustable relief.

ſ		SPOOL TYPE				SPOOL ACTION			
	VALVE PART NUMBER	4 WAY 4 POSITION FLOAT A-B SPOOL	4 WAY 3 POSITION A-B SPOOL	4 WAY 4 POSITION FLOAT C-D SPOOL	4 Way 3 POSITION C-D SPOOL	A-B SPOOL	C-D SPOOL		
	LVR1GB5AB6	х			х	FLOAT DETENT	SPRING CENTER		
	LVR1BG5AB4		X	Х		SPRING CENTER	FLOAT DETENT		

14 4 4 4 8 31 21 15 14 72 64 46 PART NUMBER DESCRIPTION 660590018 SEAL KIT 660590016 POWER BEYOND SEAL KIT 660180079 SPRING CENTER KIT SPRING CENTER 660180074 FLOAT KIT SPRING CENTER 660180075 REGEN KIT 660180073 COMPLETE HANDLE KIT 660180011 HANDI F KIT 660180072 CLEVIS SUB-ASSY RELIEF PLUG 660280004 **RELIEF CART. OPTION 5** 660280009 PILOT RELIEF CART. 270006122 **OPTION 6** 660301001 OPEN CENTER PLUG 660390008 POWER BEYOND CART.

(#8 SAE)

MODEL LVT/LVR MOUNTING DIMENSIONS AND OPERATIONS

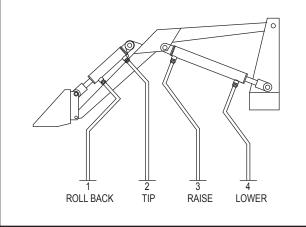


4 WAY 4 POSITION REGEN SPOOL OPERATION

This spool option allows for these four functions of the loader bucket cylinders: "NEUTRAL", cylinder ports blocked to hold bucket in place; "BUCKET ROLLBACK" directs oil to hose 1 to retract bucket cylinder; "BUCKET TIP" directs oil to hose 2 to extend the bucket cylinder with full pressure (Please Note there is a soft stop at this handle position); "BUCKET REGEN" combines the oil from the tractor pump with the oil returning from hose 1 and it directs it to hose 2 to tip the bucket faster (referred to as REGENERATION or "REGEN"). It is necessary to push the handle past the soft stop at the normal bucket tip position to get to the regen position. Also Please Note that the cylinder force will be reduced when in the regen position.

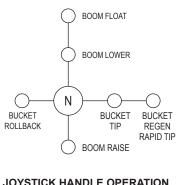
4 WAY 4 POSITION FLOAT SPOOL OPERATION

This spool option allows for these four functions of the loader boom cylinders: "NEUTRAL", cylinder ports blocked to hold boom in place; "BOOM RAISE" directs oil to hose 3 to extend boom cylinders; "BOOM LOWER" directs oil to hose 4 to retract the boom cylinders with full pressure (Please Note there is a soft stop at this handle position); "BOOM FLOAT" connects all boom cylinder ports to tank allowing the boom to fall to the ground. It is necessary to push the handle past the soft stop at the normal boom down position. There is a detent that will hold handle in the float position. While in the float position the loader boom cylinders will move up and down or "FLOAT" to match the ground level as the tractor moves forward or backward.



Joystick Handle The joystick handle will operate

both spools using one lever handle. The two spools can be operated independently or at the same time depending upon handle movement. Because we allow for maximum mounting flexibility, we have 4 options for the LVT, 2 options for the LVS and 4 options for the LVR. The handle shift pattern for all is shown at right.



JOYSTICK HANDLE OPERATION LOOKING AT HANDLE KNOB

Directional Control Valves

LOG SPLITTER CONTROL VALVE

Model LS3000

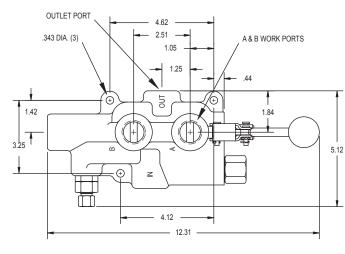
SINGLE SPOOL MONO-BLOCK 20GPM



MODEL LS3000 DIMENSIONAL DATA

On LS-3000 Models, pressure release detent is in the spool out position. On LS-3060 Models, pressure release detent is in the spool

in position.

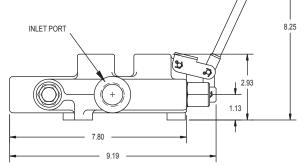


STANDARD FEATURES

- Hydraulically balanced, hard chrome plated spool
- Handle can be installed in "up" or "down" position
- Detent release pressure adjustable from 1000 to 2000 PSI
- For use with system flows up to 25 GPM
- Relief valve adjustable up to 2750 PSI
- Tandem center spool (in neutral position, both work ports blocked, pump unloaded to tank)
- Ideal for log-splitter applications. Available with 3/4" NPTF work ports for higher flow applications

SPECIFICATIONS:

- 1. Max design and test pressure 2750 PSI
- 2. Max tank port pressure-150 PSI
- 3. Flow rating-25 GPM max.
- 4. Relief valve setting-2250 PSI
- This valve has one position pressure release detent with spring center to neutral.
- 6. Weight: 10 lbs.
- 7. Recommended filtration-ISO 4406 19/17/14
- 8. Max operation temp-180°F
- 9. In exposed environments do not mount with spool vertical and handle end down.



LS-3000 HARDWARE AND SEAL KITS

PART NO.	DESCRIPTION
660130001	HANDLE KIT
660125004	RELIEF KIT
660130004	SPRING CENTER CONVERSION KIT
660130003	3 POSITION DETENT KIT
660330003	DETENT SLEEVE & PISON SUB-ASSY
660330002	DETENT ADJUSTING CARTRIDGE
660130007	COMPLETE PRESSURE RELEASE DETENT KIT
660530001	SEAL KIT (CONTAINS SEALS FOR SPOOL
	AND DETENT)
200013903	VINYL SPOOL END CAP

MODEL LSR-3060 RAPID EXTEND LOG SPLITTER VALVE

STANDARD FEATURES

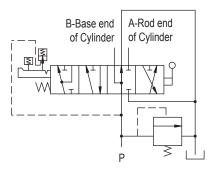
- · Hydraulically balanced, hard chrome plated spool
- Handle can be installed in "up" or "down" position
- Extend flows of up to 25 GPM with inlet flows of 4 GPM
- Relief valve adjustable up to 3500 PSI
- · Tandem center spool
- · Manual shift from high speed mode to high force mode
- · Spring center 4 position spool with soft stop
- · Pressure release detent on retract

FUNCTION:

The Prince LSR-3060-3 log splitter valve features an extremely fast "Rapid Extend" high speed mode. The LSR has been specifically designed to reduce system costs by allowing a single stage pump to be used in systems currently using two stage (hi-low) pumps. When extra splitting force is required, the LSR allows the user to manually shift from high speed mode to high force mode. A "soft stop" differentiates between high force and high speed modes. Laboratory testing has not shown a significant difference in working cycle times between single stage/rapid extend systems and two stage systems. (Working cycle is the average time between extending the cylinder to split the first log and extending to split the next log after the split wood has been removed and a new log has been placed on the log splitter.)

SPECIFICATIONS:

- 1. Max design and test pressure 3500 PSI
- 2. Max tank port pressure -150 PSI
- 3. Nominal inlet flow rating 4 gpm
- 4. Standard relief valve setting 2250 psi
- 5. This valve has a pressure release detent from spool in w/ spring center to neutral
- 6. The valve has a 4 position spool with normal extend and retract positions and a 4th rapid extend position
- 7. Max operating temperature 180°F.
- 8. In exposed environments, do not mount with spool in the vertical position
- 9. Dimensionally similar to the LS3000 valve
- 10. In center position, B port connected to tank.



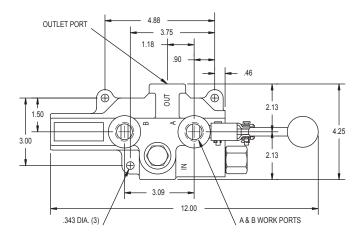
ol 1. Max c

chrome plated spool

MODEL RD2500 DIMENSIONAL DATA

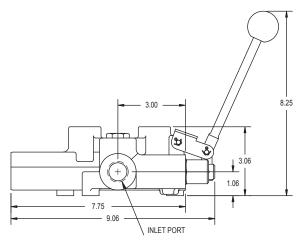
STANDARD FEATURES

- Economical monoblock construction of high tensile strength gray cast iron
- · Load check
- · Hard chrome plated spool
- Adjustable ball spring relief (1000 PSI to 3000 PSI)
- Open center to closed center conversion available on some models
- For use with system flows to 20 GPM
- For use with system pressures to 3000 PSI

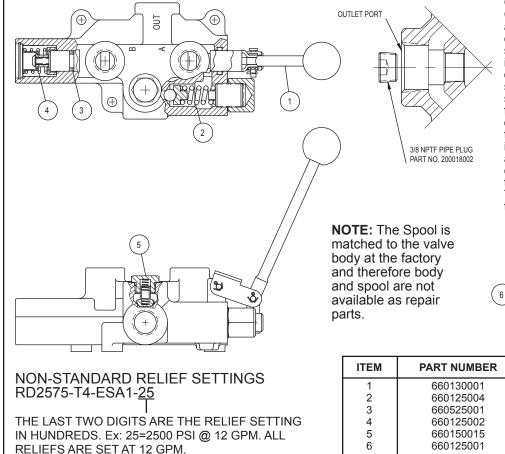


SPECIFICATIONS:

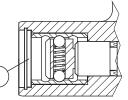
- 1. Max design and test pressure 3000 PSI
- 2. Max tank port pressure-150 PSI
- 3. Flow rating-20 GPM max.
- 4. Relief valve setting-1500 PSI
- 5. Weight: 9.5 lbs.
- 6. Recommended filtration-ISO 4406 19/17/14
- 7. Max operation temp-180°F
- 8. In exposed environments, do not mount with spool vertical and handle end down.



RD-2575-T4-ESA 1 PARTS BREAKDOWN



OPEN TO CLOSED CENTER CONVERSION This feature allows an otherwise open center valve to be converted to closed center operation. As shown, a 3/8 NPTF pipe plug is installed in the bottom of the outlet port to block open center passage. A pipe thread sealant should be used. This feature is standard on all RD-2500 valves except for the 1/2 NPTF inlet and outlet port option. The pipe plug is included with these models. Discard the pipe plug if the valve is used on an open center application. PLEASE NOTE that this closed center option does not provide for the drain off of standby spool leakage. This can allow a very small amount of oil to enter the work ports when in neutral.



3 POSITION DETENT

ITEM	PART NUMBER	DESCRIPTION
1	660130001	HANDLE KIT
2	660125004	RELIEF KIT
3	660525001	SEAL KIT
4	660125002	SPRING CENTER KIT
5	660150015	LOAD CHECK KIT
6	660125001	3 POSITION DETENT KIT

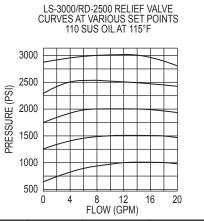
LS-3000, RD-2500 PRESSURE DROP, RELIEF CURVE AND STANDARD MODELS

PRESSURE DROP

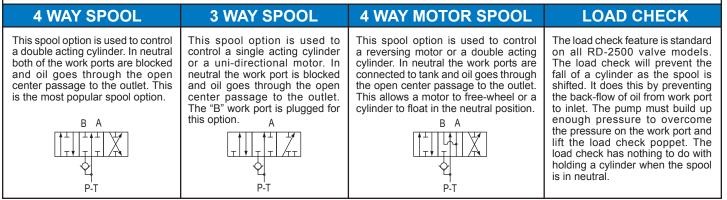
	110 SUS OIL AT 115° 🛆 P-PSI									
		RD-2500		LS-3000						
FLOW (GPM)	INLET TO OUTLET	INLET TO A OR B	A OR B TO OUTLET	INLET TO OUTLET	INLET TO A OR B	A OR B TO OUTLET				
5	5	20	8	3	5	4				
10	9	39	15	5	11	13				
15	19	60	32	7	23	24				
20	31	90	54	11	40	42				

STANDARD VALVES AVAILABLE

All standard valves have a load check (except LS3000 models), a complete lever handle assembly, and an adjustable ball-spring relief, see below for settings. For other relief settings, please specify.



		SPOOL TYPE			SPOOL ACTIC	N			RELIEF	
VALVE PART NUMBER	4 WAY 3 POSITION	4 WAY 3 POSITION MOTOR	3 WAY 3 POSITION	SPRING CENTER TO NEUTRAL	3 POSITION DETENT	PRESSURE RELEASE DETENT SPRING CENTER TO NEUTRAL	IN/OUT PORT SIZE	WORK PORT SIZE	SETTING To Specify Other Settings See Previous Page	CONVERTIBLE FROM OPEN CENTER TO CLOSED CENTER
RD-2555-T4-ESA1	Х			х			1/2 NPTF	1/2 NPTF	1500 PSI @ 12 GPM	NO
RD-2575-T4-ESA1	Х			х			3/4 NPTF	1/2 NPTF	1500 PSI @ 12 GPM	YES
RD-2575-T4-EDA1	х				Х		3/4 NPTF	1/2 NPTF	1500 PSI @ 12 GPM	YES
RD-2575-T3-ESA1			Х	х			3/4 NPTF	1/2 NPTF	1500 PSI @ 12 GPM	YES
RD-2575-M4-ESA1		Х		х			3/4 NPTF	1/2 NPTF	1500 PSI @ 12 GPM	YES
RD-2508-T4-ESA1	Х			Х			#10 SAE	#8 SAE	1500 PSI @ 12 GPM	YES
RD-2575-M4-EDA1		Х			Х		3/4 NPTF	1/2 NPTF	1500 PSI @ 12 GPM	YES
LS-3000-1 (detent spool out)	Х					х	3/4 NPTF	1/2 NPTF	2250 PSI @ 3 GPM	NO
LS-3000-9 (detent spool out)	Х					х	3/4 BSPP	3/4 BSPP	2250 PSI @ 3 GPM	NO
LS-3000-2 (detent spool out)	Х					х	3/4 NPTF	3/4 NPTF	2250 PSI @ 3 GPM	NO
LS-3060-1 (detent spool in)	Х					Х	3/4 NPTF	1/2 NPTF	2250 PSI @ 3 GPM	NO
LS-3060-9 (detent spool in)	Х					х	3/4 BSPP	3/4 BSPP	2250 PSI @ 3 GPM	NO
LS-3040-1	х				Х		3/4 NPTF	1/2 NPTF	2250 PSI @ 12 GPM	NO
LSR-3060-3 (detent spool in)		Y 4 POSITIC AL RAPID E				х	1/2 NPTF	3/4 NPTF	2250 PSI @ 3 GPM	NO
LSR-3060-8 (detent spool in)	1	Y 4 POSITIC AL RAPID E				х	1/2 BSPP	3/4 BSPP	2250 PSI @ 3 GPM	NO



PRESSURE COMPENSATED ADJUSTABLE FLOW CONTROL VALVES

MODEL RD-100 TOP PORT FLOW CONTROL



MODEL RD-1900 SIDE PORT FLOW CONTROL



The PRINCE valve models RD-100 and RD-1900 are pressure compensated adjustable flow control valves. By rotating the handle, the flow out the "CF", or controlled flow port, can be varied from approximately 0 to the maximum controlled flow shown in the chart below. Any remaining flow is bypassed to the "EF" or excess flow port. This flow can be used to power another circuit or can be returned to tank. Once the controlled flow is set it will remain nearly constant with variations in pressure on either the controlled or excess flow ports.

Please note: If during operation the controlled flow port is blocked the valve will compensate in such a way as to shut off flow to the excess port.

These valves can also be used as a restrictive flow control by plugging the excess flow port.

The PRINCE valve models RDRS-100 and RDRS-1900 have a built in adjustable pressure relief. For these models the excess flow port **must** be connected to tank.

It should be noted that whenever these or any valve is used to bypass or restrict, flow heat will be generated. Steps may be required to keep oil temperature from becoming too high.

VALVE SPECIFICATIONS:

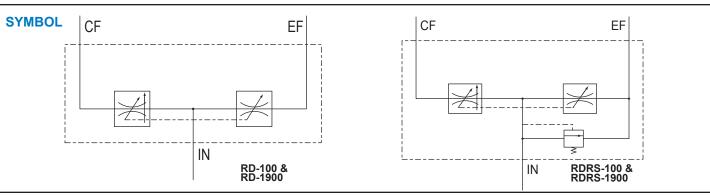
Capacity: 30 gpm max inlet flow Pressure: 3000 psi max Weight: RD-100 8 lbs. RD-1900 9 lbs.

FIELD REPAIR KITS:

Handle hardware 660301002 Seal Kit 660501001

STANDARD MO	DELS AVAILABL	E				
MODEL NUMBER		MBER PORT SIZES CONTROLLED FLOW RANGE		For Other Relief Settings Please Specify:		
RD-137-8	RD-1937-8	3/8 NPTF	0-8 GPM	RDRS-150-16-20 Relief Pressure in		
RD-150-8 RD-150-16	RD-1950-8 RD-1950-16	1/2 NPTF 1/2 NPTF	0-8 GPM 0-16 GPM	Hundreds Example: 20=2000 PSI		
RD-175-16	RD-1975-16	3/4 NPTF	0-16 GPM	RDRS-1950-16-20		
RD-175-30 RD-108-8	RD-1975-30 RD-1908-8	3/4 NPTF #8 SAE	0-30 GPM 0-8 GPM	Relief Pressure in Hundreds Example: 20=2000 PSI		
RD-112-30	RD-1912-30	#12 SAE	0-30 GPM			
RDRS-150-16	RDRS-1950-16	1/2 NPTF	0-16 GPM	These models have built in relief set at 1500 psi @ 10 GPM.		
RDRS-175-30	RDRS-1975-30	3/4 NPTF	0-30 GPM	Adjustment Range 1000 to 2500 ps		

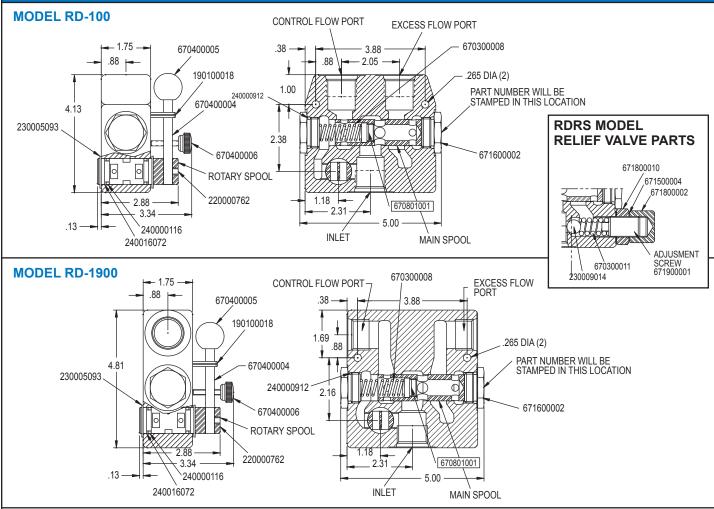
Special combinations of port size and controlled flow range are available in O E M quantities. Please consult your sales representative.



VALVES

V76

MODEL RD-100 AND RD-1900 PARTS BREAKDOWN AND DIMENSIONS

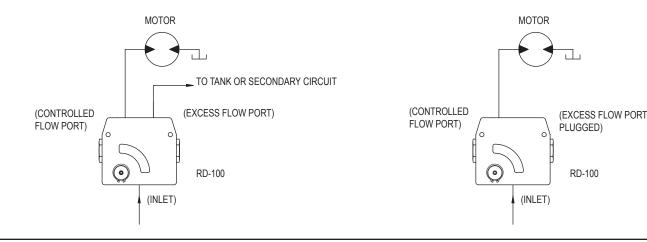


APPLICATIONS:

As illustrated in the circuit below the RD-100/RD-1900 adjustable flow control valves can be used to control the speed of a hydraulic motor. In this circuit oil from a source is directed into the inlet of the valve. By moving the handle the flow can be varied from approximately zero when handle is vertical to maximum when the handle is horizontal. Oil not going to the controlled flow port is bypassed to the excess flow port where it can be used to supply another circuit

BYPASS FLOW CIRCUIT

or returned to tank. Instead of the control flow directly supplying a motor it can be used as an adjustable priority divider and provide adjustable priority flow to a directional control valve bank. Also as illustrated the RD-100/RD-1900 can be used as a restrictive type flow control. In this circuit the excess flow port is blocked. This would normally be used with a pressure compensated pump or in a closed center system.



RESTRICTIVE FLOW CIRCUIT

CONSTANT VOLUME PRIORITY DIVIDERS

MODEL RD-400 FIXED FLOW PRIORITY DIVIDER



MODEL RD-400-R FIXED FLOW PRIORITY DIVIDER WITH PRIORITY PRESSURE RELIEF



The PRINCE model RD-400 is a constant volume priority divider. It can be used in applications where two circuits are to be supplied by a single pump such as power steering systems. In operation the flow of oil supplied to the inlet is divided into two flows, the priority flow and the excess flow. The priority flow will remain nearly constant with variations in pressure on either the priority or excess flow port and will also remain nearly constant with variations in the inlet flow.

The priority flow GPM is determined by a fixed orifice inside the main spool. The desired priority GPM must be specified with model number, see below. The PRINCE model RD-400-R provides the same function as described above with the addition of a built in pressure relief for the priority port only. This relief is internally adjustable and requires a separate line to tank. The relief is factory set at 1500 PSI. Relief Range is 500 to 2500psi.

VALVE SPECIFICATIONS:

Capacity: 30 gpm max inlet flow Pressure: 3000 psi max

Weight: RD-400 7 lbs. RD-400-R 7.5 lbs.

			PRIORITY
	PORT	SIZE	GPM
VALVE MODEL NUMBER	INLET AND EXCESS PORT	PRIORITY PORT	1.5 2 3
RD-400 RD-400-R RD-405 RD-405-R RD-412 RD-412-R RD-450 RD-450-R RD-455 RD-455-R RD-477 RD-477-R	3/4 NPTF 3/4 NPTF #12 SAE 1/2 NPTF 1/2 NPTF 3/4 NPTF	3/8 NPTF 1/2 NPTF #8 SAE 3/8 NPTF 1/2 NPTF 3/4 NPTF	4 5 6 7 8 9 10 12 14

To complete the model number fill in the blank with the desired priority GPM from the list at right. **EX:** RD-400-**3** for **3 GPM** priority flow; RD-405-R-**6** for **6 GPM** priority flow.

MODEL RD-500 ADJUSTABLE FLOW

PRIORITY DIVIDER

The PRINCE model RD-500 is an adjustable constant volume priority divider. This valve provides the same function as the PRINCE model RD-400 except the priority flow is adjustable from 2 GPM to 12 GPM. The priority flow is set using the adjusting screw and is then locked in place to maintain setting. This allows setting to be fine tuned in the field to the exact flow needed.

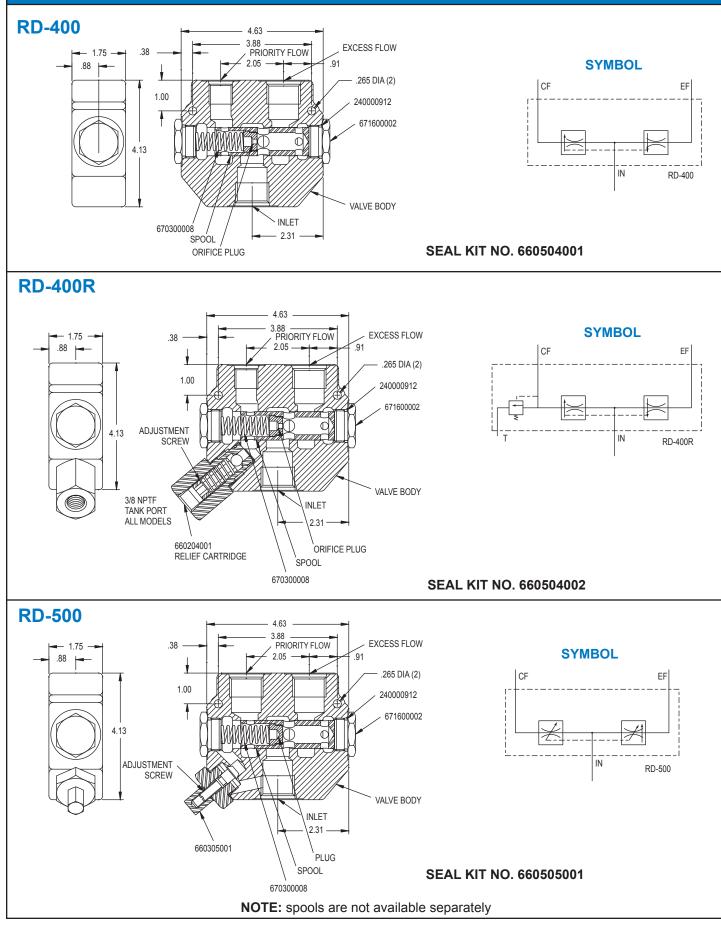
VALVE SPECIFICATIONS

Capacity: 3 Pressure: 3 Weight:

30 gpm max inlet flow 3000 psi max 7 lbs.

STANDARD MODELS AVAILABLE					
VALVE MODEL NUMBER PORT SIZE					
RD-537 RD-550 RD-575	3/8 NPTF 1/2 NPTF 3/4 NPTF				

MODEL RD-400, RD-400R AND RD-500 PARTS BREAKDOWN AND DIMENSIONS



PRESSURE COMPENSATED PROPORTIONAL FLOW DIVIDERS

MODEL RD-200 PROPORTIONAL DIVIDER



MODEL RD-300 PROPORTIONAL DIVIDER WITH FREE RETURN CHECKS



MODEL RD-500P PROPORTIONAL DIVIDER WITH ADJUSTABLE ORIFICE



INTERNALLY PILOTED SEQUENCE VALVE WITH EXTERNAL DRAIN

MODEL RD-1000-S



The PRINCE model RD-200 valve is a pressure compensated proportional flow divider. The standard models of this valve will take one inlet flow and split it into two nearly equal outlet flows. The valve is also available with special ratio spools which will split the flow into two flows proportional to the ratio specified. Because the valve is pressure compensated the valve will maintain the divider ratio with quite different loads on the outlet ports as long as the inlet flow is within the range given in the chart below. **Flow through the RD-200 cannot be reversed.**

The PRINCE model RD-300 provides the same function as the RD-200 with the added feature of free reverse checks. This allows the reverse flow of oil from the outlet ports to the inlet port. **The reverse flow is not pressure compensated.**

VALVE SPECIFICATIONS:

Capacity: 30 gpm max inlet flow Pressure: 3000 psi max

Weight: RD-200 7 lbs. RD-300 7 lbs.

MODELS AVAILABLE							
	MODEL NUM	BER	DIVIDER RATIO	PORT SIZE	INLET FLOW RANGE		
RD-237-8 RD-250-16 RD-275-30 RD-208-8 RD-212-30	RD-337-8 RD-350-16 RD-375-30 RD-308-8 RD-312-30	RD-350-AB-16 RD-375-AB-30	50:50 50:50 50:50 50:50 50:50	3/8 NPTF 1/2 NPTF 3/4 NPTF 3/4 16 SAE 1-1/16-12 SAE	4-8 GPM 8-16 GPM 16-30 GPM 4-8 GPM 16-30 GPM		

In OEM quantities the RD-200 and RD-300 valves are available with special divider ratios. Ratios available are: 2:1, 80:20, 70:30, 60:40, and others as required. When ordering specify the divider ratio after the model number. EXAMPLE: RD-250-16 (70:30)

The PRINCE model RD-500P is a pressure compensated proportional flow divider valve with one fixed and one adjustable orifice. This valve provides the same function as the RD-200 except the divider ratio can be changed in the field.

VALVE SPECIFICATIONS:

Capacity: 30 gpm max inlet flow Pressure: 3000 psi max

Weight: RD-500P 7 lbs.

MODELS AVAILABLE							
MODEL NUMBER	PORT SIZE	INLET FLOW RANGE					
RD-537P-8 RD-550P-16 RD-575P-30	3/8 NPTF 1/2 NPTF 3/4 NPTF	4-8 GPM 8-16 GPM 16-30 GPM					

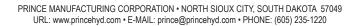
The PRINCE valve model RD-1000-S is an internally piloted adjustable sequence valve. This valve will prevent the flow of oil from going to the sequence port until the pressure on the inlet port reaches the sequence pressure. The sequence pressure is adjustable within the range given in chart below. A built in check valve allows flow from sequence port to inlet. To operate properly the **drain port must be connected to tank.** This valve is a spool type sequence valve and will provide smooth operation but should not be used in applications that require low leakage.

VALVE SPECIFICATIONS:

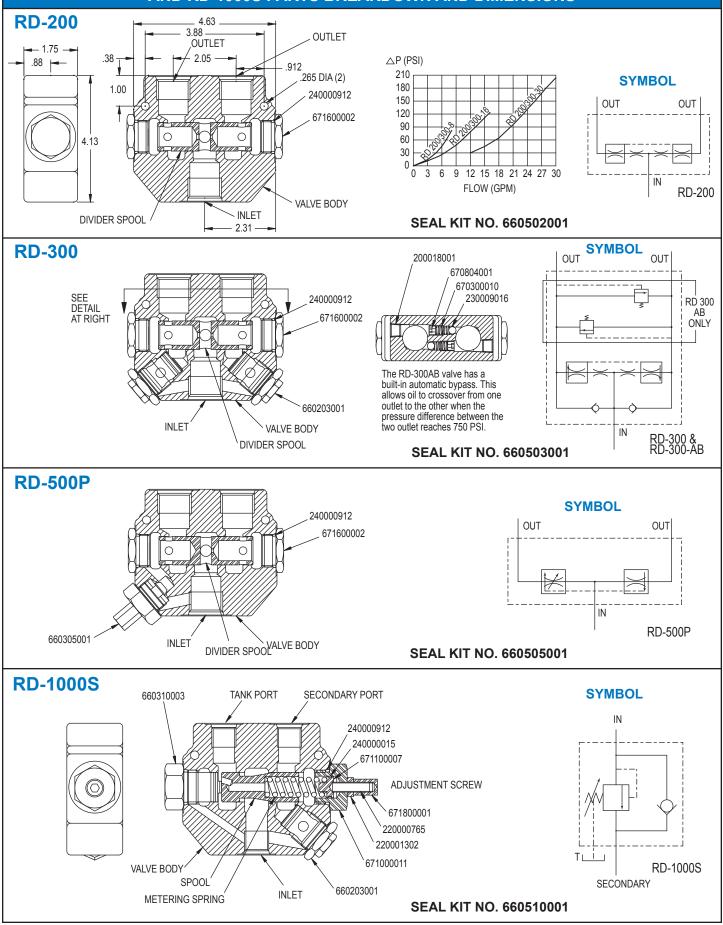
Capacity: 30 gpm max inlet flow Pressure: 3000 psi max Weight: 7 lbs.

MOD	SPRING	SEQUENCE		
MODEL NUMBER	PORT SIZE INLET	DRAIN		PRESSURE
	AND SEQUENCE	UENCE PORT		40-350 PSI
RD-1050-S RD-1075-S	1/2 NPTF 3/4 NPTF	3/8 NPTF 3/8 NPTF	M H	350-1700 PSI 1400-2500 PSI

To complete the model number fill in the blank with the spring letter that corresponds to desired counter balance pressure range. **EXAMPLE:** RD-1050SM for 350-1700 psi spring range. Standard settings are 300 psi, 1500 psi and 1500 psi for ranges L, M and H respectively.



MODEL RD-200, RD-300, RD-300AB, RD-500P, AND RD-1000S PARTS BREAKDOWN AND DIMENSIONS



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DIFFERENTIAL POPPET STYLE RELIEF VALVES - RV AND DRV SERIES

MODEL RV DIFFERENTIAL POPPET INLINE RELIEF



The PRINCE valve model RV is a differential poppet type inline relief. The valve is made up of a relief cartridge and a cast iron valve body. The differential poppet type relief provides smooth quiet performance with a minimum variation between cracking and full flow pressures. This type relief is also less sensitive to system contamination. The model RV is well suited as a system relief up to 30 GPM and 3000 psi. It is available in two pressure ranges and both an externally adjustable and shim adjustable version.

VALVE SPECIFICATIONS:

Capacity: 30 gpm max inlet flow Wei Pressure: 3000 psi max

Weight: 3 lbs.

MODEL DRV DIFFERENTIAL POPPET DOUBLE RELIEF



The PRINCE valve model DRV is a differential poppet type double relief. This valve uses the same relief cartridge as the model RV. The double relief is used in systems that require cross over relief protection such as reversible hydraulic motor, or double acting cylinders.

VALVE SPECIFICATIONS:

Capacity: 30 gpm max inlet flow Pressure: 3000 psi max

Weight: 5.5 lbs.

MODEL RV-O DIFFERENTIAL POPPET RELIEF CARTRIDGE

The PRINCE valve model RV-0 is the differential poppet relief cartridge used in many valve models. It is available preset to install into RV valves in the field or into a custom application. This relief cartridge can also be used in the RD5100, RD5200, RD5300 and SV stack valve inlet section.



VALVE SPECIFICATIONS: Capacity: 30 gpm max inlet flow Pressure: 3000 psi max

STANDARD MODELS AVAILABLE

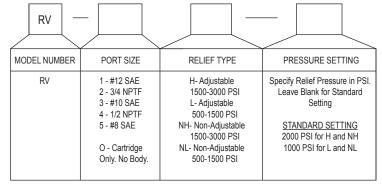
MODEL NUMBER	MODEL NUMBER	VALVE TYPE	RELIEF SETTING	PORT SIZE
RV-1H	DRV-1HH	ADJUSTABLE 1500-3000 PSI	2000 PSI @ 10 GPM	#12 SAE
RV-2H	DRV-2HH	ADJUSTABLE 1500-3000 PSI	2000 PSI @ 10 GPM	3/4" NPTF
RV-4H	DRV-4HH	ADJUSTABLE 1500-3000 PSI	2000 PSI @ 10 GPM	1/2" NPTF
RV-2L	DRV-2LL	ADJUSTABLE 500-1500 PSI	1000 PSI @ 10 GPM	3/4" NPTF

VALVES

MODEL RV AND DRV SPECIAL MODELS AND MOUNTING DIMENSIONS

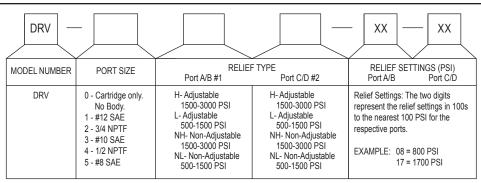
SPECIAL MODEL RV RELIEF VALVES

Other relief valve models not listed on previous page are available in OEM quantities. To select a model number use the order code matrix shown at right. Consult a sales representative if options other than those listed are required.

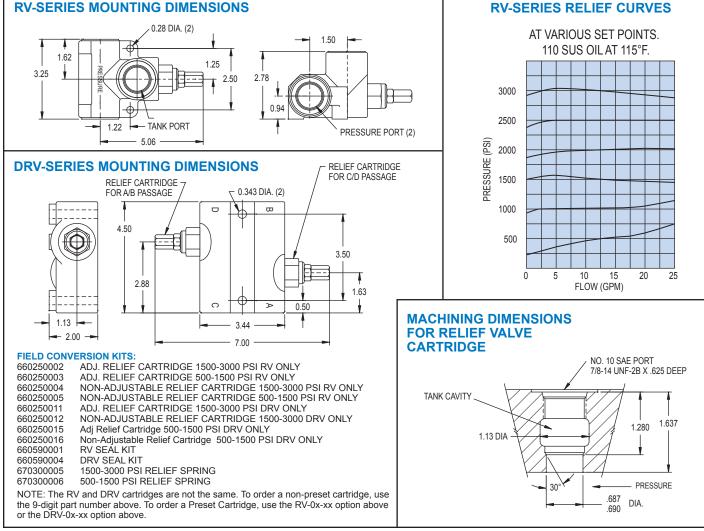


SPECIAL MODEL DRV RELIEF VALVES

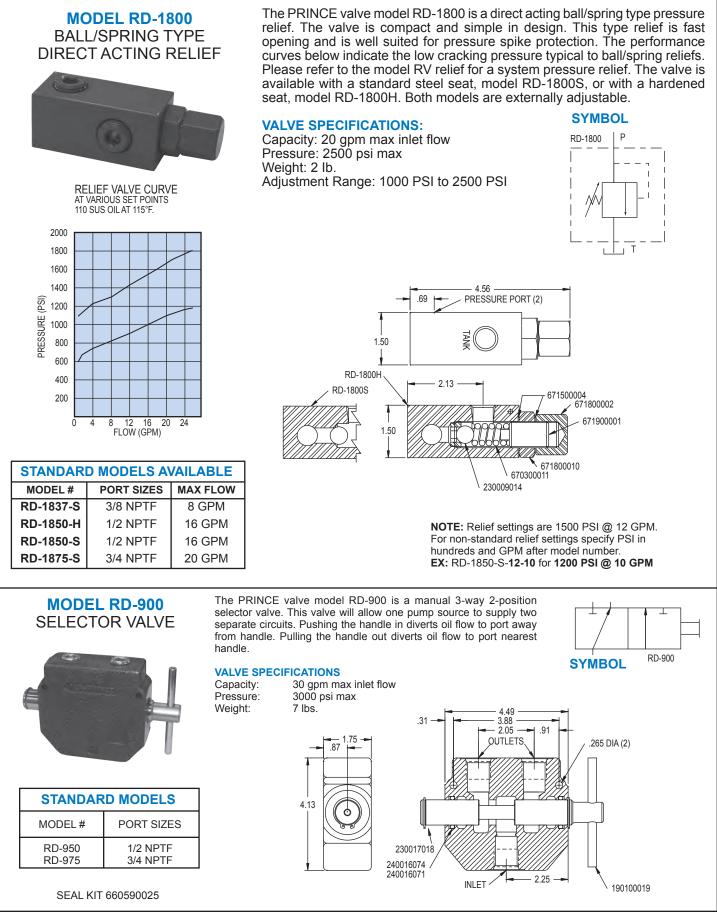
Other relief valve models not listed on previous page are available in OEM quantities. To select a model number using the order code matrix at right. Consult a sales representative if options other than those listed are required.



RV-SERIES RELIEF CURVES



MODEL RD-1800 PRESSURE RELIEF MODEL RD-900 SELECTOR VALVE



1/0

VALVES

SINGLE SELECTOR VALVE

MODEL SS SELECTOR



The PRINCE valve model SS is a manual 3-way 2 position selector valve. This valve will allow one pump source to supply two circuits. With the standard selector spool pulling the spool out diverts oil to port nearest handle, pushing the spool in diverts oil to the port away from the handle. The valve has an inlet on both the bottom and front of the valve body. Special options include lever handle and a float spool. The float spool connects the inlet to both outlets when the spool is pushed in and blocks both outlets when spool is pulled out.

VALVE SPECIFICATIONS:

Capacity: 20 gpm max inlet flow 3000 psi* Pressure: Weight: 4 lbs.

*For use at 3000 psi, a lever handle (handle option E) is recommended.

KITS-END CAP KIT

660170009 LEVER HANDLE KIT 660170007 SEAL KIT 660590006 KNOB PART NO. 670400031 SNAP RING PART NO. 230017021 CLEVIS PART NO. 671900011 SPRING OFFSET KIT 660170008

1-NONE (standard)

2-END CAP ONLY

3-SPRING OFFSET.

SPOOL OUT

4-HEAVY SPRING

OFFSET, SPOOL OUT

A-NONE

B-CLEVIS ONLY

PINS AND LINK

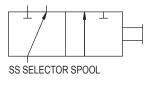
D-KNOB (standard)

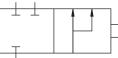
E-LEVER HANDLE

R-ROLLER (use w/attachment 4)

C-CLEVIS W/

SYMBOL





SS FLOAT SPOOL

SPECIAL MODEL SS SELECTOR VALVES

Other selector valves not listed as standard above are available in **OEM quantities**. To select a model number use the order code matrix at right. Consult a sales representative if options other than those listed are required.

	STAN		ODELS AVAI	LABLE	
MODEL NUMBER	POR	T SIZE	DE	SCRIPTION	
SS-2A1D SS-3A1D SS-2A1A SS-2A1E SS-2A1B	#8 1/2 M 1/2 M	NPTF SAE NPTF NPTF NPTF	SELECTOR W	/ITH KNOB HANDLE /ITH KNOB HANDLE /ITHOUT ATTACHME /ITH LEVER HANDLE /ITH CLEVIS	
	SS-				
	MODEL	PORT SIZE	SPOOL	SPOOL ATTACHMENTS	HANDLE

SELECTOR

(standard)

R

FLOAT

PARTS BREAKDOWN AND DIMENSIONS

SS

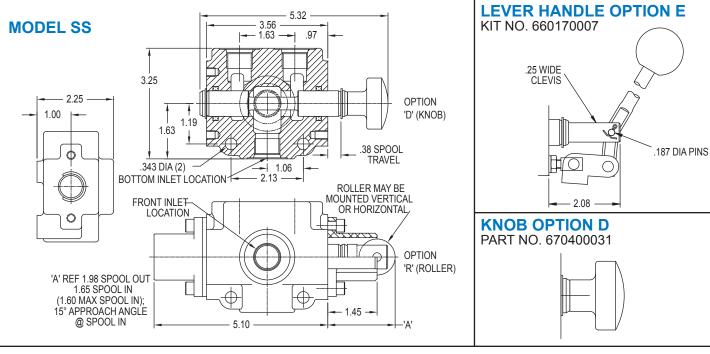
1-3/8 NPTF

2-1/2 NPTF

(standard)

3-#8 SAE

4-#10 SAE



CATV 85-11-23-01

MODEL DS DOUBLE SELECTOR VALVE



The PRINCE valve model DS is a manual 6-way 2 position double selector valve. This valve will divert the flow going to two separate hydraulic circuits. For example two double acting cylinders or two reversible hydraulic motors can be operated by one four-way valve. When the double selector spool is pushed in, the C and D ports (top ports) are connected to the A and E ports (right ports). When the selector spool is pulled out, the C and D ports are connected to the B and F ports (left ports). An optional series/parallel spool is also available. This spool will run two reversible hydraulic motors in series when the spool is out and in parallel when the spool is pushed in.

VALVE SPECIFICATIONS:

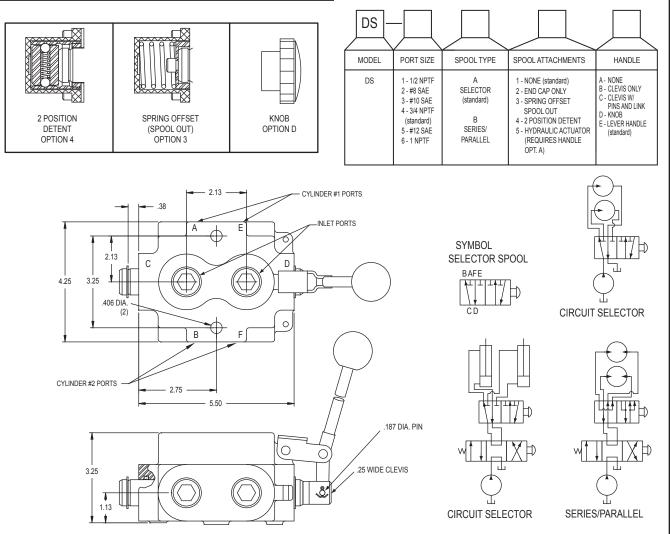
40 GPM max inlet flow Capacity: Pressure: 2500 psi Weight: 9 lbs.

KITS:	
LEVER HANDLE	66017
SPRING OFFSET KIT	66017
2 POSITION DETENT KIT	66017
END CAP KIT	66017
SEAL KIT	66059
KNOB PART NO.	67040
SNAP RING PART NO.	23001
CLEVIS PART NO.	67140

STANDARD MODELS AVAILABLE

MODEL #	PORT SIZE	DESCRIPTION
DS-4A1E	3/4 NPTF	DOUBLE SELECTOR WITH LEVER HANDLE
DS-5A1E	#12 SAE	DOUBLE SELECTOR WITH LEVER HANDLE
DS-4A1D	3/4 NPTF	DOUBLE SELECTOR WITH KNOB HANDLE
DS-4A1A	3/4 NPTF	DOUBLE SELECTOR WITHOUT ATTACHMENTS
DS-1A1E	1/2 NPTF	DOUBLE SELECTOR WITH LEVER HANDLE

SPECIAL MODEL DS SELECTOR VALVES Other double selector valves not listed as standard are available in OEM quantities. To select a model number use the order code matrix below. Consult a sales representative if options other than those listed are required.



V86

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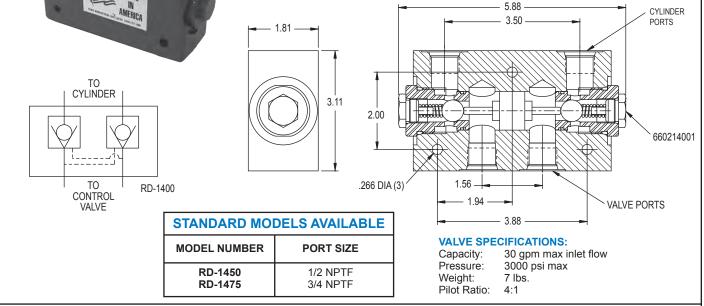
CATV 86-11-23-01

PILOT-OPERATED CHECK VALVES





The PRINCE valve model RD-1400 is a double pilot-operated lock valve. This valve will lock a cylinder in place when a directional control valve is in the neutral position. In operation oil is directed to one of the valve ports and oil can free flow to the corresponding cylinder port. The pressure on this valve port will shift the pilot spool opening the opposite check valve. This will allow oil to return through the opposite check valve. This valve has a hardened steel seat and steel ball and therefore should not be used in applications requiring absolutely zero leakage. When using a pilot operated check to lower a heavy load the valve may chatter. An orifice in the line in some cases may be beneficial.



MODEL RD-1600 PILOT OPERATED

CHECK VALVE

CYLINDER

IŃ

VALVE SPECIFICATIONS:

2 lbs.

4:1

Decompression Ratio:

PILOT

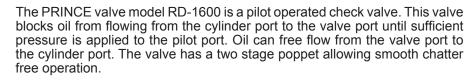
PRESSURE

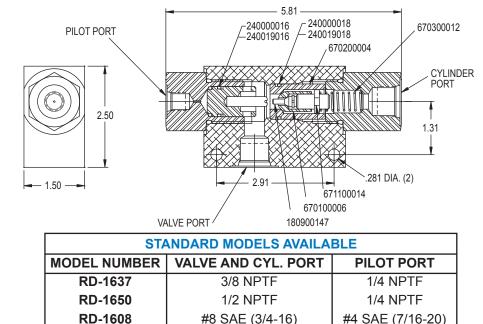
RD-1600

20 gpm max inlet flow

16:1

3000 psi max





VALVES

Capacity:

Pressure:

Pilot Ratio:

Weight:

MISCELLANEOUS INFORMATION

Hydraulic Fluid – A good quality mineral based hydraulic fluid is recommended. Any fluid used must be compatible with the BUNA -N Seals typically used in the standard valves. Filtration – For general purpose valves, fluid cleanliness should meet the ISO 4406 19/17/14 level. For extended life or for pilot operated valves, the 18/16/13 fluid cleanliness is recommended.

Thread Sealant – Use of a quality non-Teflon thread sealant is recommended for tapered pipe threads. (use of Teflon tape is not recommended.)

MISC	. HY	DRAL	JLIC F	ORN	IULA	AND	DES	IGN I	NFOF	RMA	ΓΙΟΝ
cy cy hy hp hy hy	linder for vlinder spo vdraulic ho o to drive vdraulic m vdraulic m vdraulic m 1 horsep 746 w 2545	ce (lbs.) = (eed (in/sec orse power a pump = p otor hp = to otor torque otor speed ower is eq atts or .746 BTU/hour of	= cylinder d cylinder are) = 3.85 x g = psi x gpr osi x gpm / i si x gpr / i si x	a (sq. in.): pm / cylinc n / 1714 (1714 x pu os.) x rpm / ower x 630 1 x gpm / o l/min.	x psi ler area mp efficier 63025 25 / rpm						
PRESS In the ch chart ca	nart be	ow give	s the ap	proxim	ate pres	ssure di	rop, in p	osi, acro	oss an c	orifice.	This
GPM					Orif	ice Siz	e				
	.047	.062	.078	.093	.109	.125	.140	.156	.187	.218	.250

	.047	.062	.076	.093	.109	.125	.140	. 150	.107	.210	.250
1	432	143	57	28	15	-	-	-	-	-	-
2	1729	571	228	113	60	35	22	14	-	-	-
3	3890	1285	513	254	134	78	49	32	16	-	-
4	-	2284	912	451	239	138	88	57	28	15	-
5	-	3569	1425	705	374	216	137	89	43	23	13
6	-	-	2051	1015	538	311	198	128	62	34	19
8	-	-	3647	1805	956	553	351	228	110	60	35
10	-	-	-	2820	1494	884	549	356	173	93	54
12	-	-	-	-	2152	1244	791	513	248	134	78
15	-	-	-	-	3362	1944	1235	801	388	210	121
20	-	-	-	-	-	3456	2196	1425	690	374	216
25	-	-	-	-	-	-	3432	2226	1078	584	337
30	-	-	-	-	-	-	-	3205	1552	841	486

To convert	into	multiply by
meters	inches	39.37
centimeters	inches	.3937
millimeters	inches	.03937
inches	meters	.0254
inches	centimeters	2.54
inches	millimeters	25.4
liters	gallons	.2642
gallons	liters	3.785
kg/cm ²	psi	14.22
kg/cm ²	bar	.9807
kg/cm ²	atm	.9678
psi	kg/cm ²	.0703
psi	bar	.0690
psi	atm	.0680
psi	inhg.	2.0360
bar	psi	14.50
bar	kg/cm ²	1.020
bar	atm	.9869
gallons	cubic inches	231
cubic inches	gallons	.0043
ftIbs.	kg-m	.1383
kg-m	ftIbs.	7.233

MOTOR HORSEPOWER TO DRIVE A HYDRAULIC PUMP

Pump Efficiency 90%, Formula: HP=GPM x PSI/(1714 x Efficiency)

								_															
H	YDRA				DFR				GPM	PSI 100	PSI 200	PSI 250	PSI 300	PSI 400	PSI 500	PSI 750	PSI 1000	PSI 1250	PSI 1500	PSI 2000	PSI 2500	PSI 3000	PSI 4000
								l h	0.5	0.03	0.06	0.08	0.10	0.13	0.16	0.24	0.32	0.41	0.49	0.65	0.81	0.97	1.30
	DRCE	= (ID:	S.)						1.0	0.06	0.13	0.16	0.19	0.26	0.32	0.49	0.65	0.81	0.97	1.30	1.62	1.94	2.59
for	ce (lbs)	= cylir	nder an	ea (sg.	in.) x p	ressure	(psi)		1.5	0.10	0.19	0.24	0.29	0.39	0.49	0.73	0.97	1.22	1.46	1.94	2.43	2.92	3.89
						linder in			2.0	0.13	0.26	0.32	0.39	0.52	0.65	0.97	1.30	1.62	1.94	2.59	3.24	3.89	5.19
						ine force			2.5	0.16	0.32	0.41	0.49	0.65	0.81	1.22	1.62	1.03	2.43	3.24	4.05	4.86	6.48
							\$		3.0	0.19	0.39	0.49	0.58	0.78	0.97	1.46	1.94	2.43	2.92	3.89	4.86	5.83	7.78
dev	/eloped	in ret	ract sul	btract ti	he force	e that			3.5	0.23	0.45	0.57	0.68	0.91	1.13	1.70	2.27	2.84	3.40	4.54	5.67	6.81	9.08
cor	respon	ds to c	vlinder	niston	rod dia	meter			4.0	0.26	0.52	0.65	0.78	1.04	1.30	1.94	2.59	3.24	3.89	5.19	6.48	7.78	10.37
				pieren	.ou ulu				5.0	0.32	0.65	0.81	0.97	1.30	1.62	2.43	3.24	4.05	4.86	6.48	8.10	9.72	12.97
CYL.	CYL.	500	1000	1500	2000	2500	3000		6.0	0.39	0.78	0.97	1.17	1.56	1.94	2.92	3.89	4.86	5.83	7.78	9.72	11.67	15.56
DIA	AREA	PSI	PSI	PSI	PSI	PSI	PSI		7.0 8.0	0.45 0.52	0.91 1.04	1.13 1.30	1.36 1.56	1.82 2.07	2.27 2.59	3.40 3.89	4.54 5.19	5.67 6.48	6.81 7.78	9.08 10.37	11.34 12.97	13.61 15.56	18.15 20.74
.50	.20	98	196	295	393	491	589		8.0 9.0	0.52		1.30	1.56	2.07			5.19	6.48 7.29	7.78 8.75	10.37	12.97	15.56	20.74 23.34
									9.0	0.56	1.17 1.30	1.46	1.75	2.53	2.92 3.24	4.38 4.86	6.48	8.10	9.75	12.97	14.59	17.50	25.93
.75	.44	221	442	663	884	1104	1325		11.0	0.03	1.30	1.03	2.14	2.39	3.24	5.35	7.13	8.91	10.70	14.26	17.83	21.39	28.52
.88	.60	301	601	902	1203	1503	1804		12.0	0.78	1.45	1.94	2.33	3.11	3.89	5.83	7.78	9.72	11.67	15.56	19.45	23.34	31.12
1.00	.79	393	785	1178	1571	1964	2356		13.0	0.84	1.69	2.11	2.53	3.37	4.21	6.32	8.43	10.53	12.64	16.85	21.07	25.28	33.71
1.13	.99	497	994	1491	1988	2485	2982		14.0	0.91	1.82	2.27	2.72	3.63	4.54	6.81	9.08	11.34	13.61	18.15	22.69	27.23	36.30
1.25	1.23	614	1227	1841	2454	3068	3682		15.0	0.97	1.94	2.43	2.92	3.89	4.86	7.29	9.72	12.15	14.59	19.45	24.31	29.17	38.90
1.38	1.48	742	1485	2227	2970	3712	4455		16.0	1.04	2.07	2.59	3.11	4.15	5.19	7.78	10.37	12.97	15.56	20.74	25.93	31.12	41.49
1.50	1.77	884	1767	2651	3534	4418	5301		17.0	1.10	2.20	2.76	3.31	4.41	5.51	8.27	11.02	13.78	16.53	22.04	27.55	33.06	44.08
1.75	2.41	1203	2405	3608	4811	6013	7216		18.0	1.17	2.33	2.92	3.50	4.67	5.83	8.75	11.67	14.59	17.50	23.34	29.17	35.01	46.67
2.00	3.14	1571	3142	4712	6283	7854	9425		19.0	1.23	2.46	3.08	3.70	4.93	6.16	9.24	12.32	15.40	18.48	24.63	30.79	36.95	49.27
2.50	4.91	2454	4909	7363	9817	12272	14726		20.0	1.30	2.59	3.24	3.89	5.19	6.48	9.72	12.97	16.21	19.45	25.93	32.41	38.90	51.86
3.00	7.07	3534	7069	10603	14137	17672	21206		25.0	1.62	3.24	4.05	4.86	6.48	8.10	12.15	16.21	20.26	24.31	32.41	40.52	48.62	64.83
3.50	9.62	4811	9621	14432	19242	24053	28863		30.0	1.94	3.89	4.86	5.83	7.78	9.72	14.59	19.45	24.31	29.17	38.90	48.62	58.34	77.79
4.00	12.57	6283	12566	18850	25133	31416	37699		35.0	2.27	4.54	5.67	6.81	9.08	11.34	17.02	22.69	28.36	34.03	45.38	56.72	68.07	90.76
4.00	12.57		12566	23857	25133 31809	39761	47713		40.0 45.0	2.59 2.92	5.19 5.83	6.48 7.29	7.78 8.75	10.37 11.67	12.97 14.59	19.45 21.88	25.93 29.17	32.41 36.46	38.90 43.76	51.86 58.34	64.83 73.93	77.79 87.51	103.72 116.69
		7952							45.0 50.0	2.92	5.83 6.48	7.29 8.10	8.75 9.72	11.67	14.59	21.88	29.17 32.41	36.46 40.52	43.76	58.34 64.83	73.93	87.51 97.24	129.65
5.00	19.64	9817	19635	29453	39270	49087	58905		50.0	3.24	7.13	8.91	9.72	14.26	17.83	24.31	35.65	40.52	46.62 53.48	64.63 71.31	89.14	97.24	142.62
6.00	28.27	14137	28274	42412	56549	70686	84823		60.0	3.89	7.78	9.72	11.67	15.56	19.45	29.17	38.90	48.62	58.34	77.79	97.24	116.69	155.58
8.00	50.27	25133	50266	75398	100531	125664	150797		65.0	4.21	8.43	10.53	12.64	16.85	21.07	31.60	42.14	52.67	63.20	84.27	105.34	126.41	168.55
								L L	20.0		2.10			. 5.00		200							

HYDRAULIC CYLINDER SPEED (inches/second)

cylinder speed (inches/second) = 3.85 x GPM/cylinder area (sq. in.)

The chart below gives cylinder speed in inches per second for extend and retract (for a given rod diameter). To determine the number of seconds it will take to extend or retract the cylinder divide the stroke length (inches) by the cylinder speed. EX: for a 4 x 16 cylinder with 10 gpm speed is 3.06 inches/sec. The time to extend 16 inches will be 5.23 seconds.

	11	DIA	1 1/2	DIA	20	ЛА	2 1/2	2 DIA	31	DIA	3 1/2	DIA	4 0	JIA	51	DIA	61	DIA	8	DIA
GPM	EXT	RET	EXT	RET	EXT	RET	EXT	RET												
		1/2		3/4		1 1/8		1 1/4		1 3/8		1 1/2		1 3/4		2		2 1/2		3
		ROD		ROD		ROD		ROD												
1	4.90	6.54	2.18	2.90	1.23	1.79	.78	1.05	.54	.68	.40	.47	.31	.38	.20	.23	.14	.16	.08	.09
2	9.80	13.07	4.36	5.81	2.45	3.59	1.57	2.09	1.09	1.38	.80	.95	.61	.76	.39	.47	.27	.33	.15	.18
4	19.61	26.14	8.71	11.62	4.90	7.17	3.14	4.18	2.18	2.76	1.80	1.89	1.23	1.52	.78	.93	.54	.66	.31	.38
6	29.41	39.22	13.07	17.43	7.35	10.75	4.71	6.27	3.27	4.14	2.40	2.84	1.84	2.27	1.18	1.40	.82	.99	.46	.53
8	39.22	52.29	17.43	23.24	9.80	14.34	6.27	8.37	4.36	5.52	3.20	3.79	2.45	3.03	1.57	1.87	1.09	1.32	.61	.71
10	49.02	65.36	21.79	29.05	12.25	17.93	7.84	10.46	5.45	6.90	4.00	4.72	3.06	3.79	1.96	2.33	1.36	1.65	.77	.89
12	58.82	78.43	26.14	34.86	14.71	12.51	9.41	12.55	6.54	8.27	4.82	5.68	3.68	4.55	2.35	2.80	1.63	1.98	.92	1.07
15	-	-	32.68	43.57	18.38	26.89	11.76	15.69	8.17	10.34	6.00	7.10	4.60	5.68	2.94	3.50	2.04	2.47	1.15	1.34
20	-	-	43.57	58.10	24.51	35.85	15.69	20.92	10.89	13.79	8.00	9.46	6.13	7.58	3.92	4.67	2.72	3.30	1.53	1.78
25	-	-	-	-	30.64	44.82	19.61	26.14	13.62	17.24	10.00	11.83	7.66	9.47	4.90	5.84	3.40	4.14	1.91	2.23
30	-	-	-	-	-	-	23.53	31.37	16.24	20.66	12.00	14.20	9.19	11.37	5.88	7.00	4.08	4.94	2.30	2.87
35	-	-	-	-	-	-	27.45	36.60	19.06	24.13	14.01	16.56	10.72	13.26	6.86	8.17	4.77	5.77	2.68	3.12

D.W Valve Quick Reference Guide Parker/Gresen to Prince Manufacturing

Parker/Gresen Models: V20, V10, SP, SPK, 300, 400 & Accessory		nce Manufacturing 20, SV, RD5000, RD2500 & Accessory
PARKER/GRESEN V20		S 20 STACKABLE VALVE
Parallel Work Sections		ections 20 GPM 3500 PSI
20-10-4 With K-20-VH-B Handle	20P1BA1AA	
20-50-4 With K-20-VH-B Handle	20P4BA1AA	
20-10-4 With K-20-VH-B Handle and Two	20P1BA1EE	
	ZUFIDATEE	With 2500 PSI Work Port Reliefs
RC-2550 Work Port Reliefs	Float Work S	
20-50-K4 With K-20-VH-B Handle		
	20P4DD1AA	NPTF Ports
		Work Sections
20-10-DF4 With K-20-VH-B Handle	20P1CB1AA	,
Tandem Work Sections	Tandem Work S	
20T-10-04 With K-20-VH-B Handle	20T1BA1AA	
Parallel Lock Sections With Pilot Operated Checks	Parallel Lock Se	ections With Pilot Operated Checks
20-10-L04 With K-20-VH-B Handle	20L1CA1	
Inlet Sections (Left Cover)	Inlet Sections (I	Left Cover)
20-LC-12 With WH-2550 Relief	2012E	#12 SAE Ports, Non Adjusted Relief
20-LC-75 With WH-2550 Relief and K-WH-A	2013J	3/4" NPTF Ports, Adjusted Relief
Adjusted Kit		
Outlet Sections (Right Cover)	Outlet Sections	(Right Cover)
20-RC-12-E	20E21	#12 SAE Ports
20-RC-75-E-MY With K-20-50-Y Power Beyond Kit	20E32	
		alve In Catalog, or on www.princehyd.com
PARKER/GRESEN V10		ACKABLE VALVE
Parallel Work Sections		ections 12 GPM 3000 PSI
V10 Is Not Available With Economical Handle	SVW1BA1	4 Way 3 Position, #8 SAE Ports, Standard Handle
10-8N-04 With K-10-VH Handle	SVW1BA11	4 Way 3 Position, #8 SAE Ports, Enclosed Handle
10-8-04 With K-10-VH Handle and Two	SVH1BA11G	
RP10A-3000 Adjustable Work Port Reliefs		Enclosed Handle, Work Port Reliefs
	Float Work \$	
10-8N-K4 With K-10-VH Handle	SVW1DD11	4 Way 4 Position, With Float
	OWNEEN	#8 SAE Ports, Enclosed Handle
	Motor Spoo	
10-8N-F4 With K-10-VH Handle	SVW1CA11	
		4 Way 3 Position, #8 SAE Ports, Enclosed Handle
		ctions (On-Off Operation)
10-08-03-SOL-I-12 and Two Solenoid	SVW1BA-T1	2Q 4 Way 3 Position, #8 SAE Ports,
Cartridges and Coils		12 Volt Solenoid Coils
Series Work Sections	Series Work Se	
V10 Does Not Have a Standard Series Work Section	SVS1GA1AA	4 Way 3 Position, #8 SAE Ports,
		Series Circuit, Work Port Relief Plugs
Parallel Lock Sections With Pilot Operated Checks	Parallel Lock Se	ections With Pilot Operated Checks
V10 Does Not Have a Standard Lock Section	SLV1CA1	Double P.O. Checks, #8 SAE Ports, 4
With Pilot Operated Checks		Way 3 Position Motor, Spring Center
Inlet Sections (Left Cover)	Inlet Sections (I	
10-LC10 With RCMA-3000 Relief	SV125	#10 SAE Ports, Adjusted Relief
Outlet Sections (Right Cover)	Outlet Sections	
10-RC-10-EY	SVE21	#10 SAE Ports, Convertible to
	JVEZI	
<u> </u>		Power Beyond or Closed Center
	See SV valve in	Catalog, or on www.princehyd.com

PRINCE VALVE	1,2,3 SPOOL MONO-BLOCK
RD5000 Series	30 GPM – 3000 PSI
RD512CA5A4B1	4 Way 3 Position, 3/4" In & Out, 1/2" Work Ports, Spring Center
	4 Way 4 Position with Float Detent, 3/4" In & Out,
RD512GC5A4B1	1/2" Work Ports, Spring Center
RD522CCAA5A4B1	4 Way 3 Position, 3/4" In & Out, 1/2" Work Ports, Spring Center
	4 Way 4 Position with 1st Spool Float Detent, 3/4" In & Out,
RD522GCGA5A4B1	1/2" Work Ports, Spring Center
RD532CCCAAA5A4B1	4 Way 3 Position, 3/4" In & Out, 1/2" Work Ports, Spring Center
RD532GCCGAA5A4B1	4 Way 4 Position with 1 st Spool Float Detent, 3/4" In & Out,
	1/2" Work Ports, Spring Center
	3 Way 3 Position, 3/4" In & Out, 1/2" Work Ports, Spring Center
	4 Way 3 Position, 3/4" In & Out, 1/2" Work Ports, Spring Center
RD2575-14-EDA1	4 Way 3 Position Detent, 3/4" In & Out, 1/2" Work Ports
RD2575-M4-EDA1	4 Way 3 Position Detent, Motor Spool, 3/4" In & Out, 1/2" Work Ports
RD-412-5	Constant Volume Priority Flow Divider, #12 Ports
	Constant Volume Priority Flow Divider, #12 Ports
	Constant Volume Priority Flow Divider, 3/4" Ports
	Constant Volume Priority Flow Divider, 3/4" Ports
	Constant Volume Priority Flow Divider, 3/4 Ports
	Constant Volume Priority Flow Divider, 1/2 Ports
	Constant Volume Priority Flow Divider, 3/4" Ports
	Constant Volume Priority Flow Divider, 3/4" Ports
	Constant Volume Priority Flow Divider, 3/4" Ports
	Constant Volume Priority Flow Divider, 3/4" Ports
	Constant Volume Priority Flow Divider, 3/4" Ports
	Screw Adjust Priority Flow Control, 1/2" Ports
	Screw Adjust Priority Flow Control, 3/4" Ports
	Lever Adjust Priority Flow Control, 1/2" Ports
	Lever Adjust Priority Flow Control, 3/4" Ports, Adjustable Relief Screw Adjust Priority Flow Control, 3/4" Ports
	Double Selector, 3/4" Ports
	Double Selector, #12 Ports
	Double Cross-Over Relief (Cushion), #12 Ports
	Double Cross-Over Relief (Cushion), #12 Ports
	Double Cross-Over Relief (Cushion), 1/2" Ports
	Double Cross-Over Relief (Cushion), 3/4" Ports Double Cross-Over Relief (Cushion), 3/4" Ports
	Two Position Float Valve, 1/2" Ports
	Adjustable Relief (Ball Spring), 1/2" Ports Single Lock Valve, 1/2" Ports
	Double Lock Valve, 1/2" Ports
	Proportional Flow Divider, #12 Ports
	Proportional Flow Divider, 1/2" Ports
· · · · · · · · · · · · · · · · · · ·	Proportional Flow Divider, 1/2" Ports
	Proportional Flow Divider, 3/4" Ports
	Selector Valve, 1/2" Ports
RD-975	Selector Valve, 3/4" Ports
SS-2A1D, RD-950	Single Selector 1/2" Work Ports
	Cincle Colorton #0 Marts Darts
SS-3A1D	Single Selector #8 Work Ports
SS-3A1D RV-3H	Adjustable Relief (Differential Poppet), #10 Ports
SS-3A1D	
	RD532GCCGAA5A4B1 RD2500 Series RD2575-T3-ESA1 RD2575-T4-ESA1 RD2575-T4-EDA1 RD2575-M4-EDA1 RD-412-5 RD-412-R-6 RD-400-R-3 RD-400-R-4 RD-400-R-7 RD-400-R-8 RD-405-R-2 RD-405-R-3 RD-405-R-3 RD-405-S RD-405-10 RD-550 RD-150-16, RD-1950-16 RDRS-175-30, RDRS-1975-30 RD-575-P-30 DS-5A1D DRV-1NHNH-2500 DRV-4LL-12-12 DRV-4NHNH-2000 SS-2B1B RD-1850H RD-1650 RD-1450 RD-212-30 RD-250-16(60/40) RD-25



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Dince PTO PUMPS

Prince Manufacturing Corporation North Sioux City, South Dakota

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PTO Hydraulic Pump	P3-P7
Hydraulic Pump Accessories	P8
SP-Accessories	
(Repair Kits Etc.)See	Price Book

The Hand Pumps, PM-HP-15B, PM-HP-10B and PM-HP-5B, Are In The Cylinder Section On Page C24.

PLEASE NOTE: Parts Manuals For All Standard Prince Pumps Are Available On The Prince Web Site At www.princehyd.com

PRINCE PTO HYDRAULIC PUMPS Up to 40 gallons per minute and up to 2250 psi

UNIQUE FEATURES:

- Self-adjusting wear plates on both sides of the gears.
- Proper size hose adapters are provided for inlet ports.
- Two outlet ports are provided with a NPT adapter for one port and a plug to seal unused port.
- Center section available in high strength aluminum alloy for std. duty cycle or in high strength cast iron for high duty cycle use.

IDEAL FOR USE WITH.....

- Tractor front end loaders
- Pull-type cotton pickers
- Cotton balers (module builders)



 Tractors imported without integral hydraulics

MODEL FEATURES

Landscape equipment

PLUS STANDARD FEATURES:

- Reliable
- Efficient
- Roller Bearings
- Run fitted body
- Internally splined drive shaft.
- High-tensile cast iron end plates.
- Slips onto tractor PTO shaft (no gear box required).
- Two-bolt installation on farm tractors of all sizes.
- Rotary mowers
- Street Sweepers
- Back hoes

ALUMINUM CENTER HOUSING

- Standard duty cycle
- Reduced weight
- Smaller housing

- **CAST IRON CENTER HOUSING**
- High duty cycle
- Use in circuits with motors
- Better at higher temperatures
- Increased wear resistance

REAR PORTED

- Higher flows
- Simplified hose connections
- Higher flows at reduced engine rpm as compared to other PTO pumps
- Prince PTO pumps are specifically designed for PTO drive operation on all sizes of farm tractors. No additional gear box is required. Pumps are mounted by sliding the internally splined pump onto the PTO splined shaft and restraining rotation with a torgue arm. See page P6 for the PTO pump torgue arm kit.

SELF ADJUSTING WEAR PLATES

Prince PTO pumps have self-adjusting wear plates that seal around the two unequal size gears. These plates, activated by internal fluid pressure, offset wear or expansion.

FILTRATION

The pump must be used in a clean system with clean oil. The fluid cleanliness should meet the ISO 4406 17/14 level. As a minimum, 10 micron filtration is recommended.

HYDRAULIC FLUID

A good quality mineral base hydraulic fluid with a viscosity in the 70-250 SUS range at operating temperature is recommended.

• OPERATING TEMPERATURE

Oil operating temperature should not exceed 180°F. If it does, the reservoir may be too small or a heat exchanger may be needed.

• SHAFT SPEEDS

Prince PTO pumps are designed to operate at up to 110% of standard PTO shaft speeds. Standard speeds are 540 rpm for the 6 tooth shaft and 1000 rpm for the 21 tooth shaft.

 CLOSE RUNNING CLEARANCE FOR HIGH FLOW RATE

Another feature that contributes to the excellent and long-lived efficiency of the PTO-Series pump is the minimum clearance between the gears and the center housing. Each pump is assembled with zero clearance between the housing and the tips of the gear teeth, then test run until the teeth establish a proper wear path in the housing. The result is a much tighter clearance than found in traditional pumps.

• PRESSURE RATING

Pumps are designed for 2250 PSI max. relief valve setting. A relief valve, external to the pump, must be provided in the system.

PORTS

All pumps are provided with an inlet port adapter (SAE O-ring boss to hose barb) and outlet port adapter (SAE O-ring boss to female pipe thread) sized appropriately for the ports and required line sizes. A steel plug is provided for the second outlet port.

RESERVOIR

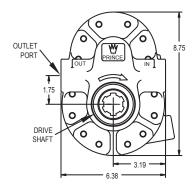
As a guideline, a reservoir size in gallons should equal the pump output in gallons per minute. A larger reservoir and/or an oil cooler may be needed for high duty cycle applications.

ALUMINUM CENTER HOUSING PTO PUMPS

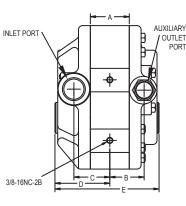
DIMENSIONAL D	ATA
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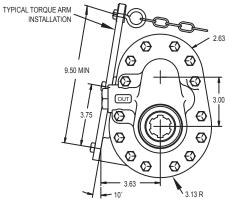
	DIMENSIONAL DATA										
PUMP MODEL	ACTUAL DISPLACEMENT	А	в	с	D	Е	INLET PORTS	OUTLET PORTS 3	RECOMMENDED HOSE SIZES	DRIVE SHAFT REQUIRED	SHIP WT. (LB)
HC-PTO-1A	9.9 CI/REV	2.37	2.09	2.19	3.35	6.35	#16 SAE 1	#12 SAE	1 1/4" IN, 3/4 " OUT	1 3/8 DIA. 6 TOOTH	40
HC-PTO-9A	7.8 CI/REV	2.00	1.91	2.00	3.16	5.97	#16 SAE 1	#12 SAE	1 1/4" IN, 3/4 " OUT	1 3/8 DIA. 6 TOOTH	38
HC-PTO-2A	5.7 CI/REV	1.62	1.72	1.81	2.97	5.60	#16 SAE 2	#12 SAE	1" IN, 1/2 "OUT	1 3/8 DIA. 6 TOOTH	36
HC-PTO-3A	5.7 CI/REV	1.62	1.72	1.81	2.97	5.60	#16 SAE 1	#12 SAE	1 1/4" IN, 3/4 " OUT	1 3/8 DIA. 21 TOOTH	36
HC-PTO-7A	3.6 CI/REV	1.26	1.54	1.63	2.78	5.23	#16 SAE 2	#12 SAE	1" IN, 1/2 "OUT	1 3/8 DIA. 6 TOOTH	33
HC-PTO-8A	3.6 CI/REV	1.26	1.54	1.63	2.78	5.23	#16 SAE	#12 SAE	1 1/4" IN, 3/4" OUT	1 3/8 DIA. 21 TOOTH	33

1. Barbed adapter for 1 1/4" hose included. 2. Barbed adapter for 1 " hose included. 3. Female pipe adaptor for 3/4" NPT included. 270011013 270011017 500204011



Seal kit No. for all models: PMCK-PTO-1A

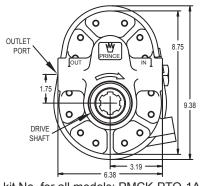




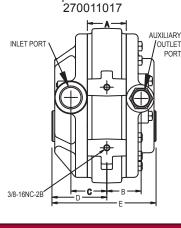
CAST IRON CENTER HOUSING PTO PUMPS

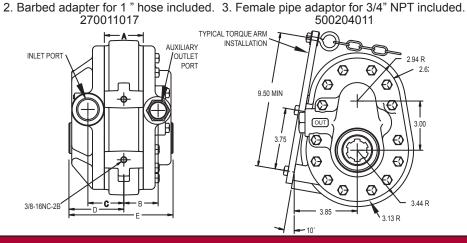
	DIMENSIONAL DATA										
PUMP MODEL	ACTUAL DISPLACEMENT	A	в	С	D	E	INLET PORTS	OUTLET PORTS ³	RECOMMENDED HOSE SIZES	DRIVE SHAFT REQUIRED	SHIP WT. (LB)
HC-PTO-1AC	9.9 CI/REV	2.37	2.09	2.19	3.35	6.35	#16 SAE 1	#12 SAE	1 1/4" IN, 3/4 " OUT	1 3/8 DIA. 6 TOOTH	54
HC-PTO-2AC	5.7 CI/REV	1.62	1.72	1.81	2.97	5.60	#16 SAE 2	#12 SAE	1" IN, 1/2 "OUT	1 3/8 DIA. 6 TOOTH	44
HC-PTO-3AC	5.7 CI/REV	1.62	1.72	1.81	2.97	5.60	#16 SAE 1	#12 SAE	1 1/4" IN, 3/4 " OUT	1 3/8 DIA. 21 TOOTH	44
HC-PTO-8AC	3.6 CI/REV	1.26	1.54	1.63	2.78	5.23	#16 SAE	#12 SAE	1 1/4" IN, 3/4 " OUT	1 3/8 DIA. 21 TOOTH	42

1. Barbed adapter for 1 1/4" hose included. 270011013



Seal kit No. for all models: PMCK-PTO-1A

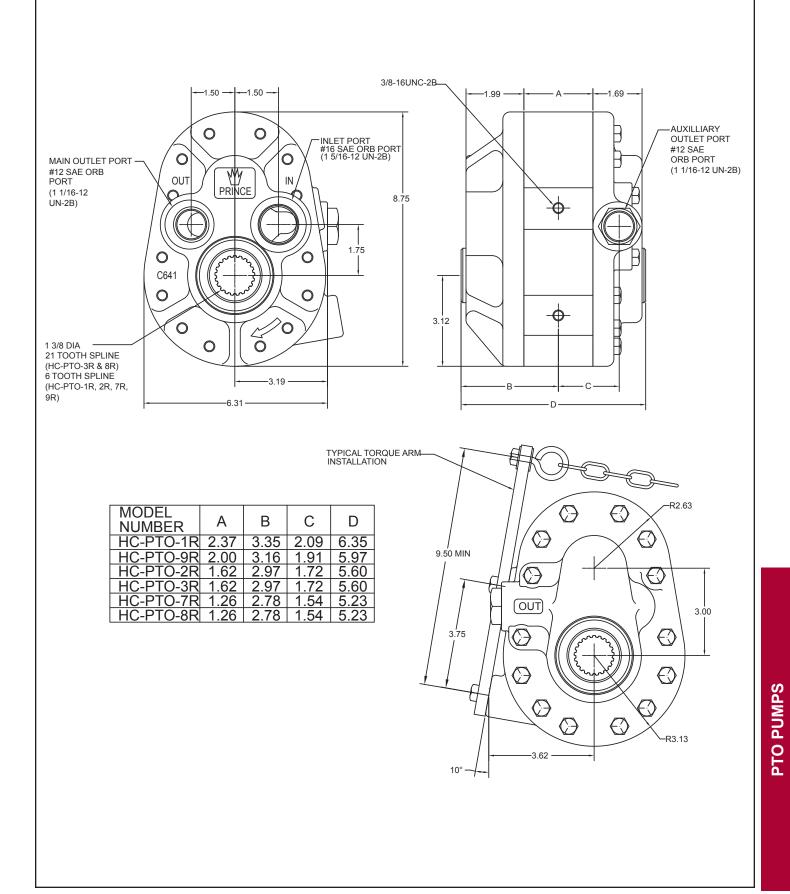




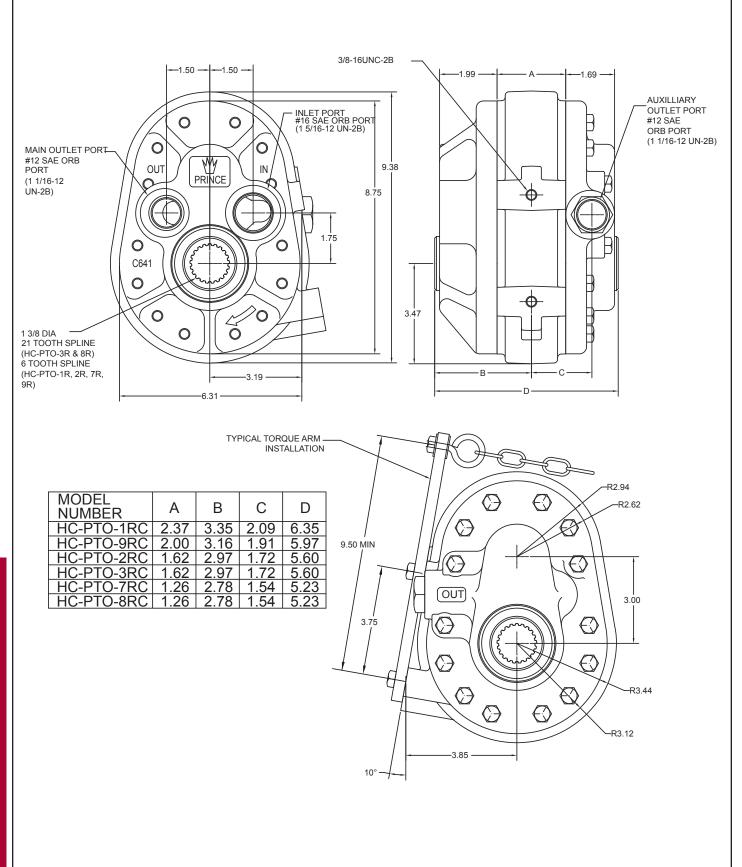
PERFORMANCE DATA

		500 PSI		1000 PSI		1500 PSI		2000 PSI	
PUMP MODEL	RPM	INPUT HP	GPM OUTPUT	INPUT HP	GPM OUTPUT	INPUT HP	GPM OUTPUT	INPUT HP	GPM OUTPUT
HC-PTO-1A & HC-PTO-1AC	540	8.4	21.4	16.1	21.0	23.8	21.0	32.1	21.0
HC-PTO-9A	540	7.1	17.2	13.6	17.0	20.4	16.9	27.4	17.1
HC-PTO-2A & HC-PTO-2AC	540	4.9	12.2	9.3	11.9	13.8	11.6	18.1	11.4
HC-PTO-3A & HC-PTO-3AC	1000	9.3	23.4	17.4	23.0	25.9	22.6	34.3	22.4
HC-PTO-7A	540	2.9	7.6	5.9	7.2	8.8	7.2	11.9	7.1
HC-PTO-8A & HC-PTO-8AC	1000	5.5	14.4	11.0	13.8	16.5	13.5	22.6	13.5
NOTE: Performance values are	average val	ues. Individu	al pump perform	mance may	vary. Performanc	e based on 14	0 SUS oil at 120°	F.	

ALUMINUM CENTER HOUSING REAR PORT PTO PUMP



CAST IRON CENTER HOUSING REAR PORT PTO PUMP



P6

REAR PORTED PTO PUMPS

PERFORMANCE	DATA
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		500	Del	100	0 PSI	46	00 PSI	2000 PSI	
		HP	GPM	HP	GPM	HP	GPM	HP	GPM
HC-P-K11	RPM 1000	15.5	OUTPUT 40.7	INPUT 29.4	OUTPUT 40.1	INPUT 43.4	OUTPUT 40.0	58.8	OUTPUT 40.0
OR	1000	15.5	40.7	29.4	40.1	43.4	40.0	56.6	40.0
HC-P-K11C	540	8.4	21.4	16.1	21.0	23.8	21.0	32.1	21.0

NOTE: Performance values are average values. Individual pump performance may vary. Performance based on 140 SUS oil at 120° F.

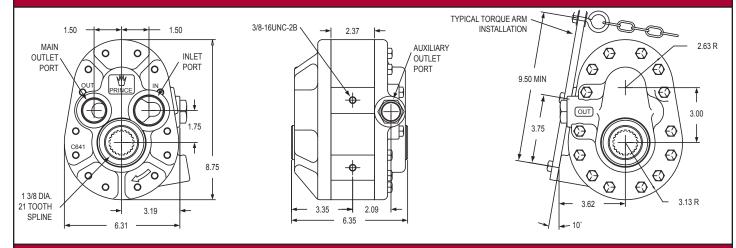
	SPECIFICATIONS								
PUMP MODEL	ACTUAL DISP.	INLET PORT	MAIN OUTLET PORT	AUXILIARY OUTLET PORT	INLET ADAPTER	OUTLET ADAPTER	SHIP WT. (LB)		
HC-P-K11 OR HC-P-K11C	9.9 CI/REV	#20 SAE O-RING (1 5/8-12UN-2B)	#16 SAE O-RING (1 5/16-12UN-2B)	#12 SAE O-RING (1 1/16-12UN-2B)	#20 SAE TO 2" HOSE BARB	#16 SAE TO 1" FEMALE PIPE	40 OR 54		

SPECIAL NOTE: Recommended hose sizes for the HC-P-K11 and HC-P-K11C are 2" for the inlet line and 1" for the outlet line.

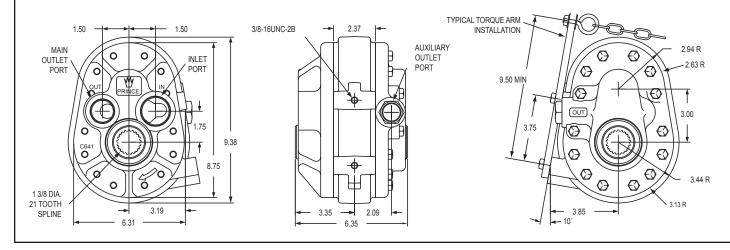
Seal kit No. for the HC-P-K11 and HC-P-K11C is: PMCK-PTO-1A. HC-P-K11 and HC-P-K11C pumps available with 1 3/8 diameter 21 tooth spline drive only.

HC-P-K26 same as HC-P-K11 except 1 3/8"- dia. 6 tooth spline. HC-P-K26C same as HC-P-K11C except 1 3/8" dia. 6 tooth spline. For use at 540 RPM.

ALUMINUM CENTER HOUSING (HC-P-K11)



CAST IRON CENTER HOUSING (HC-P-K11C)



CATP 7-11-23-01

PUMP ACCESSORIES

PUMP TORQUE ARM KIT 000 The 180900877 torgue arm kit was designed to simplify Prince PTO pump installation by eliminating the need to fabricate a custom torque arm. Items included in the kit are: 1-Torque arm 2-3/8-16 mounting bolts 1-Eye bolt/chain assembly NOTE THAT TORQUE ARM KIT NO. 180900877 FITS ALL MODEL PTO PUMPS **RESERVOIR BREATHER ADAPTER** FA10 MICRON) The 200400039 breather adapter enables a standard Prince 10 micron spin-on filter element* to be used as 34-NPT FEMALE FITTING WELDED TO TANK a reservoir breather. [10 *Part Number FA10 #200400039 1"-12 UNF-2A-

FITTINGS AND ADAPTERS

MODEL NUMBER	DESCRIPTION	CONFIGURATION
500204013	#16 SAE (1 5/16-12) Male, 1 1/4-NPTF Female	Fig. 1
500204011	#12 SAE (1 1/16-12) Male, 3/4-NPTF Female	Fig. 1
270011013	#16 SAE (1 5/16-12) Male, 1 1/4 Hose Barb	Fig. 2
270011017	#16 SAE (1 5/16-12) Male, 1 Hose Barb	Fig. 2
270011046	#20 SAE (1 5/8-12) Male, 2 Hose Barb	Fig. 2
500204012	#16 SAE (1 5/16-12) Male, 1-NPTF Female	Fig. 1

FIG.1

34-NPT

FIG.2

HYDRAULIC RESERVOIR

Prince Manufacturing Corporation Warranty

Prince warrants only standard and custom products of its manufacture to be free from defects in materials or workmanship under normal use for the time periods set forth below.

- Standard Prince product (listed in Prince's standard products catalog) is warranted for 36 months from the date of purchase by Prince's customer or 30 months from date the product is first put into service, whichever is earlier.
- <u>Wolverine standard products</u> are warranted for 15 months from the date of purchase by Prince's customer or 12 months from the date the product is first put into service, whichever is earlier.
- <u>Custom product</u> is warranted for 15 months from the date of purchase by Prince's customer or 12 months from the date the product is first put into service, whichever is earlier.

Prince's obligation is to repair or replace free of charge or give credit for any part of its product that its inspection shows to be defective, including the lowest roundtrip transportation charges from Prince's customer to Sioux City, Iowa, and return, but excluding all transportation costs from Prince's customer to its customer and all other costs such as removal and installation expenses.

Prince shall not be liable for loss of time, manufacturing costs, labor, material, loss of profits, or any other consequential damages caused directly or indirectly by defective products, whether or not such claim is based on contract, tort, warranty, or other legal basis.

Written permission for any warranty claim return must first be obtained from authorized Prince personnel. <u>All returns must be accompanied with a complete written explanation of claimed defects and the circumstances of failure.</u>

PRODUCTS MANUFACTURED OR SOLD BY PRINCE ARE NOT WARRANTED EXPRESSLY OR BY IMPLICATION FOR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NOTWITHSTANDING ANY DISCLOSURE TO PRINCE OF THE USE TO WHICH THE PRODUCT IS TO BE PUT. THIS EXPRESS WARRANTY IS THE SOLE WARRANTY OF PRINCE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE WARRANTY EXPRESSLY SET FORTH IN THIS DOCUMENT. THE SALE OF PRODUCTS OF PRINCE UNDER ANY OTHER WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, IS NOT AUTHORIZED.

(This warranty voids all previous issues.) (Effective Date: November 1, 2015)



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