

# PIN-PIN CYLINDERS

## SINGLE-ACTING TELESCOPIC



### HIGH PERFORMANCE IN A LIGHTER CYLINDER

The combination of strict machining tolerances, solid stop contact faces and larger overlap between the stages has resulted in one of the strongest and most stable cylinder columns currently available on the market. These improvements help to increase safety for dumping applications, helping to prevent accidents due to vehicle roll-over.



### KEY FEATURES

- Self-bleeding design for easier installation process
- No packing or head nuts on each stage. Only one head nut that doesn't need adjustments
- Chrome-plated final stage extends the life of the cylinder
- Solid stops machined into top and bottom of each stage, eliminating stop rings and threaded stops
- Stages are machined and precision ground inside and out to allow for optimal seal/wiper performance
- Each cylinder is equipped with bearing supports at both the top and bottom. Longer stages have increased overlap for improved column stability.
- Tight machining tolerances cause smaller tube clearances that result in increased rigidity
- One of the lightest cylinders on the market which translates to greater payloads, less oil consumption and faster dumping
- Low maintenance requirements offer many years of top performance without additional expenses

### QUALITY MATERIALS

- All steel tubing are made from seamless hot rolled steel, this results in higher tensile tubes for increased column strength and stiffness
- Stages have no welded seams allowing for higher pressure capabilities
- The quality steel used increases resistance to mechanical stress and increases cylinder life
- Seals and wipers are made of polyurethane and feature a double lip design assuring optimum performance in all climate conditions (-40°F to 212°F/-40°C to 100°C)
- Bearing supports are made of DELRIN®, they are compatible with all types of hydraulic oils approved by pump makers and are capable of withstanding high and low pressures

# MODEL NUMBER CONSTRUCTION

**8 - 5 - 265 - A - 00**

**SERIES (NOMINAL DIAMETER)**  
(8, 7, 6, 5)

**NUMBER OF STAGES**  
(5, 4, 3)

**NOMINAL STROKE (IN)**  
84" - 285"

**DESIGN CODE**

- Pin-Eye Options:  
 00 = 2.01" x 2.01"  
 01 = 2.13" x 2.06"  
 02 = 2.06" x 2.06"  
 06 = 2.06" x 2.01"

**STYLE: A - PIN TO PIN**

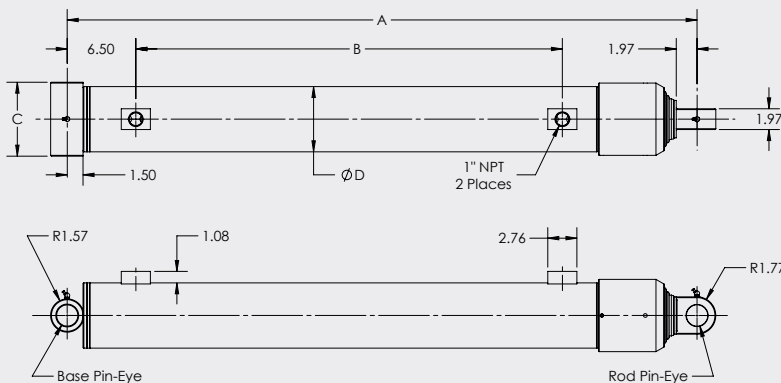
**Note:** Some options are limited to specific models, please contact customer service for more information.

## DIMENSIONS

### AVAILABLE MODELS (ENGLISH MEASUREMENTS: in., gal., lbs.)

Model No.	Available Design Codes	Stroke Length (in.)	A = Closed / Open Length (in.)	B = Port to Port (in.)	C = Base Pin Width (in.)	D = Tube OD (in.)	Stage Diameter (in.)	Gallons to Extend	Cylinder Weight (lbs.)
5-3-084-A00	00	85.91	39.57 / 125.48	20.3	7.00	5.39	4.57 / 3.86 / 3.11	4.40	179
5-3-104-A00	00	103.23	47.32 / 150.55	28.3	7.00	5.39	4.57 / 3.86 / 3.11	5.26	220
6-3-084-A00	00	84.02	39.57 / 123.59	20.3	7.00	6.18	5.31 / 4.57 / 3.86	6.12	189
6-3-104-A00	00	102.28	47.32 / 149.60	28.3	7.00	6.18	5.31 / 4.57 / 3.86	7.35	255
6-3-110-A00	00	109.61	49.76 / 159.37	30.8	7.00	6.18	5.31 / 4.57 / 3.86	7.93	278
6-3-120-A00	00	118.35	52.48 / 170.83	33.5	7.00	6.18	5.31 / 4.57 / 3.86	8.55	280
6-3-126-A00	00	126.02	54.96 / 180.98	36.0	7.00	6.18	5.31 / 4.57 / 3.86	9.18	300
6-3-130-A00	00	128.46	55.75 / 184.21	36.0	7.00	6.18	5.31 / 4.57 / 3.86	9.24	300
6-3-140-A00	00	140.00	59.80 / 199.80	40.6	7.00	6.18	5.31 / 4.57 / 3.86	10.19	329
7-3-110-A00	00	109.69	49.92 / 159.61	30.8	8.23	6.93	6.06 / 5.31 / 4.57	10.62	303
7-4-135-A**	00, 01, 06	135.67	47.67 / 183.43	27.6	8.23	6.93	6.06 / 5.31 / 4.57 / 3.86	11.49	330
7-4-156-A**	00, 01, 06	157.68	52.91 / 210.59	33.5	8.23	6.93	6.06 / 5.31 / 4.57 / 3.86	13.43	365
7-4-161-A00	00	162.99	55.39 / 218.38	36.5	8.23	6.93	6.06 / 5.31 / 4.57 / 3.86	14.14	374
7-4-167-A**	00, 01, 02, 06	167.01	55.39 / 222.40	36.5	8.23	6.93	6.06 / 5.31 / 4.57 / 3.86	14.44	374
7-4-180-A**	00, 06	180.00	56.69 / 236.69	40.4	8.23	6.93	6.06 / 5.31 / 4.57 / 3.86	15.40	408
8-4-170-A**	00, 06	168.98	56.65 / 225.63	36.7	9.49	7.87	6.85 / 6.06 / 5.31 / 4.57	19.15	467
8-5-169-A00	00	168.94	47.95 / 216.89	28.4	9.49	7.87	6.85 / 6.06 / 5.31 / 4.57 / 3.86	16.87	425
8-5-190-A**	00, 06	188.98	53.98 / 242.96	32.1	9.49	7.87	6.85 / 6.06 / 5.31 / 4.57 / 3.86	18.70	464
8-5-220-A**	00, 06	219.92	59.88 / 279.80	39.1	9.49	7.87	6.85 / 6.06 / 5.31 / 4.57 / 3.86	21.74	531
8-5-235-A**	00, 06	235.00	64.53 / 299.53	44.9	9.49	7.87	6.85 / 6.06 / 5.31 / 4.57 / 3.86	23.34	584
8-5-250-A**	00, 06	246.89	68.35 / 315.24	44.9	9.49	7.87	6.85 / 6.06 / 5.31 / 4.57 / 3.86	24.53	588
8-5-265-A**	00, 06	265.83	69.72 / 335.55	48.7	9.49	7.87	6.85 / 6.06 / 5.31 / 4.57 / 3.86	26.35	620
8-5-285-A00	00	285.98	75.87 / 361.85	56.8	9.49	7.87	6.85 / 6.06 / 5.31 / 4.57 / 3.86	29.55	690
9-5-220-A01	01	221.00	60.24 / 281.24	40.1	10.67	9.92	8.72 / 7.72 / 6.85 / 6.06 / 5.31	37.10	671

**Notes:** All cylinders MAX pressure: 2,750 PSI due to NPT ports (rated MAX pressure 2,900 PSI)



Design Code	Base Pin-Eye	Rod Pin-Eye
A00	Ø 2.010"	Ø 2.010"
A01	Ø 2.125"	Ø 2.063"
A02	Ø 2.063"	Ø 2.063"
A06	Ø 2.063"	Ø 2.010"

# ADDITIONAL INSTALLATION HARDWARE

## OPTIONS FOR ALL CYLINDERS

### PIN-EYE MOUNT SPACERS

PART NUMBER	DESCRIPTION
18T42906-181025	3.00 OD X 1.81 ID X 0.25 W
18T42906-181050	3.00 OD X 1.81 ID X 0.50 W
18T42906-181075	3.00 OD X 1.81 ID X 0.75 W
18T42906-181100	3.00 OD X 1.81 ID X 1.00 W
18T42906-212025	3.00 OD X 2.12 ID X 0.25 W
18T42906-212050	3.00 OD X 2.12 ID X 0.50 W
18T42906-212075	3.00 OD X 2.12 ID X 0.75 W
18T42906-212200	3.00 OD X 2.12 ID X 1.00 W

## OPTIONS FOR "A00" CYLINDERS ONLY

### PIN-EYE BUSHING FOR TOP PIN

PART NUMBER	DESCRIPTION
18T42905-131200	2.00 OD X 1.31 ID X 2.00 W
18T42905-150150	2.00 OD X 1.50 ID X 1.50 W
18T42905-150200	2.00 OD X 1.50 ID X 2.00 W
18T42905-168200	2.00 OD X 1.68 ID X 2.00 W
18T42905-175150	2.00 OD X 1.75 ID X 1.50 W
18T42905-175200	2.00 OD X 1.75 ID X 2.00 W

### PIN-EYE BUSHING FOR LOWER PIN

PART NUMBER	DESCRIPTION
18T43392-131200	2.00 OD X 1.51 ID X 6.80 W
18T43392-150150	2.00 OD X 1.69 ID X 6.80 W
18T43392-150200	2.00 OD X 1.76 ID X 6.80 W

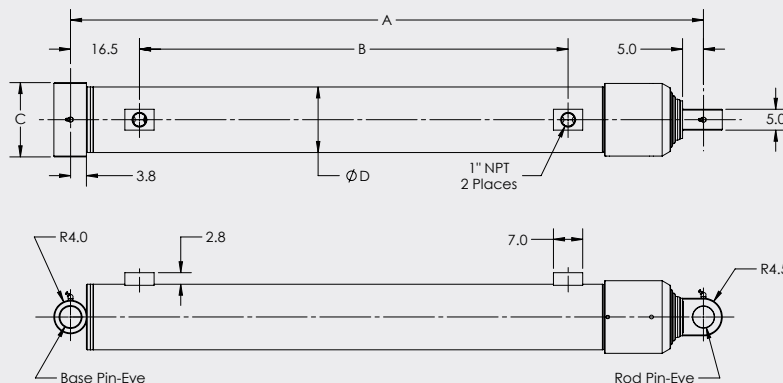
(Note: Lower Bushing Designed for 5 & 6 in. models only)

## DIMENSIONS

### AVAILABLE MODELS (METRIC MEASUREMENTS: cm, L, Kgs.)

Model No.	Available Design Codes	Stroke Length (cm)	A = Closed / Open Length (cm)	B = Port to Port (cm)	C = Base Pin Width (cm)	D = Tube OD (cm)	Stage Diameter (cm)	Liters to Extend	Cylinder Weight (kg)
5-3-084-A00	00	218.2	100.5 / 318.7	51.6	17.78	13.69	11.60 / 9.80 / 7.90	16.65	81
5-3-104-A00	00	262.2	120.2 / 328.4	71.9	17.78	13.69	11.60 / 9.80 / 7.90	19.91	100
6-3-084-A00	00	213.4	100.5 / 313.9	51.6	17.78	15.70	13.49 / 11.60 / 9.80	23.16	86
6-3-104-A00	00	259.8	120.2 / 380.1	71.9	17.78	15.70	13.19 / 11.60 / 9.80	27.82	116
6-3-110-A00	00	278.4	126.4 / 404.8	78.2	17.78	15.70	13.49 / 11.60 / 9.81	30.02	126
6-3-120-A00	00	300.6	133.3 / 433.9	85.1	17.78	15.70	13.19 / 11.60 / 9.81	32.36	127
6-3-126-A00	00	320.1	139.6 / 459.7	91.4	17.78	15.70	13.49 / 11.60 / 9.82	34.74	136
6-3-130-A00	00	326.3	141.6 / 467.9	91.4	17.78	15.70	13.19 / 11.60 / 9.82	34.74	136
6-3-140-A00	00	355.6	151.9 / 507.5	103.1	17.78	15.70	13.49 / 11.60 / 9.83	38.57	149
7-3-110-A00	00	278.6	126.8 / 405.4	78.2	20.90	17.60	15.39 / 13.49 / 11.60	40.20	137
7-4-135-A**	00, 01, 06	344.6	121.3 / 465.9	70.0	20.90	17.60	15.39 / 13.49 / 11.60 / 9.80	43.49	150
7-4-156-A**	00, 01, 06	400.5	134.4 / 534.9	85.0	20.90	17.60	15.39 / 13.49 / 11.60 / 9.80	50.83	166
7-4-161-A00	00	414.0	140.7 / 544.7	92.6	20.90	17.60	15.39 / 13.49 / 11.60 / 9.80	53.52	170
7-4-167-A**	00, 01, 02, 06	424.2	140.7 / 564.9	92.6	20.90	17.60	15.39 / 13.49 / 11.60 / 9.80	54.65	170
7-4-180-A**	00, 06	457.2	151.6 / 608.8	151.6	20.90	17.60	15.39 / 13.49 / 11.60 / 9.80	58.30	185
8-4-170-A**	00, 06	429.2	143.9 / 573.1	93.1	24.10	19.99	17.40 / 15.39 / 13.49 / 11.60	72.50	212
8-5-169-A00	00	429.1	121.8 / 550.9	72.0	24.10	19.99	17.40 / 15.39 / 13.49 / 11.60 / 9.80	63.85	193
8-5-190-A**	00, 06	480.0	137.1 / 617.1	81.6	24.10	19.99	17.40 / 15.39 / 13.49 / 11.60 / 9.80	70.78	210
8-5-220-A**	00, 06	558.6	152.1 / 710.7	99.3	24.10	19.99	17.40 / 15.39 / 13.49 / 11.60 / 9.80	82.28	241
8-5-235-A**	00, 06	596.9	163.9 / 760.8	114.1	24.10	19.99	17.40 / 15.39 / 13.49 / 11.60 / 9.80	88.34	265
8-5-250-A**	00, 06	627.1	173.6 / 800.7	114.1	24.10	19.99	17.40 / 15.39 / 13.49 / 11.60 / 9.80	92.85	267
8-5-265-A**	00, 06	675.2	177.1 / 852.3	123.8	24.10	19.99	17.40 / 15.39 / 13.49 / 11.60 / 9.80	99.73	281
8-5-285-A00	00	726.4	192.7 / 919.1	144.3	24.10	19.99	17.40 / 15.39 / 13.49 / 11.60 / 9.80	111.85	313
9-5-220-A01	01	561.3	153.0 / 714.3	101.9	27.10	25.20	22.20 / 19.60 / 17.40 / 15.39 / 13.49	140.40	305

Note: All cylinders MAX pressure: 189.7 BAR due to NPT ports (rated MAX pressure 200 BAR)



Design Code	Base Pin-Eye	Rod Pin-Eye
A00	Ø 5.1 cm	Ø 5.1 cm
A01	Ø 5.4 cm	Ø 5.2 cm
A02	Ø 5.4 cm	Ø 5.4 cm
A06	Ø 5.4 cm	Ø 5.1 cm

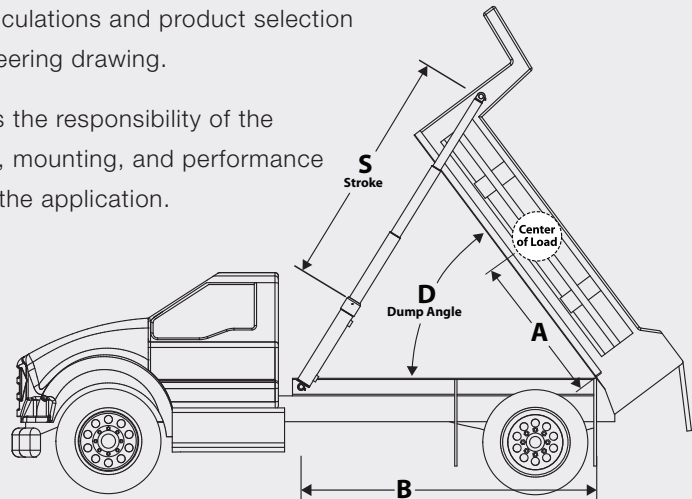
# DUMP BODY CYLINDER CALCULATIONS

These calculations provide approximate values. Final calculations and product selection should be determined by a qualified engineer and engineering drawing.

When selecting a hydraulic cylinder for replacement. It is the responsibility of the purchaser and installer/user to verify that all dimensions, mounting, and performance features of the replacement cylinder are appropriate for the application.

- A** = Dump hinge pin to center of load in inches
- B** = Dump hinge pin to cylinder base pin in inches
- D** = Dump body to frame angle
- S** = Stroke of cylinder

\*Normal minimum dump angle is 45° and normal maximum dump angle is 57°.



DUMP ANGLE*	42°	43°	44°	45°	46°	47°	48°	49°	50°	51°	52°	53°	54°	55°	56°	57°
"D"	.715	.733	.750	.765	.780	.797	.813	.830	.845	.861	.877	.892	.903	.923	.939	.954

## CYLINDER STROKE

Approximate Stroke (inches) = "B" x "D"

- Example: B = 162" and Desired Dump Angle = 49°
- Approximate Cylinder Stroke = 162" x .830
- Approximate Cylinder Stroke = 135"

## REQUIRED FORCE

Force required to lift a load = [Load (lbs.) x "A"] / "B"

- Example: Load = 40,000 lbs., A = 85 in., and B = 162 in.
- Force required = [40,000 lbs. x 85 in.] / 162 in.
- Force Required = 20,988 lbs.

## LIFTING CAPACITY AT GIVEN PRESSURES FOR EACH STAGE DIAMETER

Stage Dia. (in.)	Eff. Area (in. <sup>2</sup> )	800 PSI	1,000 PSI	1,500 PSI	2,000 PSI	2,500 PSI	2,750 PSI*	2,900 PSI*
6.85	36.85	29,482	36,853	55,279	73,706	92,132	101,345	106,873
6.06	28.84	23,074	28,843	43,264	57,685	72,107	79,317	83,644
5.31	22.15	17,716	22,145	33,218	44,290	55,363	60,899	64,221
4.57	16.40	13,122	16,403	24,604	32,806	41,007	45,108	47,569
3.86	11.70	9,362	11,702	17,553	23,404	29,255	32,181	33,936
3.11	7.60	6,077	7,596	11,395	15,193	18,991	20,890	22,030

Note: MAX Pressure: 2,750 PSI (189.7 BAR) due to NPT ports (rated for 2,900 PSI (200 BAR))

### Notes:

A properly designed system should operate at approximately 800 psi or less during the start of the lift. The load imposed on a cylinder by a dump body is dynamic, and as such, your system pressure will be changing to accommodate the difference in force required to lift the changing load. You will see system pressure increase as your cylinder extends from stage to stage. You will also see a decrease in cycle time due to the effective volume change from stage to stage as the cylinder extends (your cylinder will move faster).