
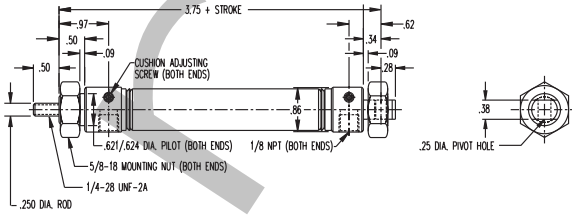

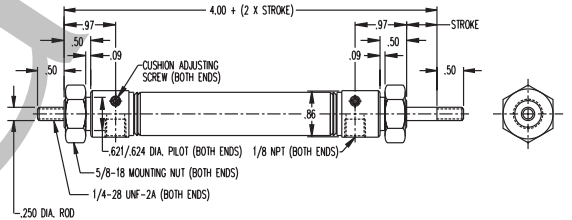

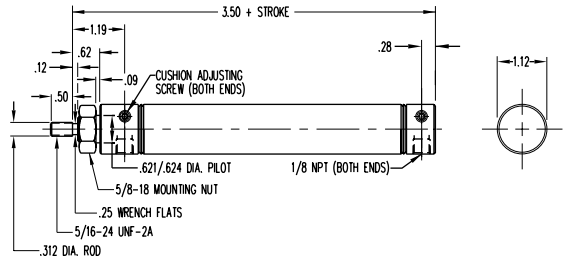


Air Cylinders with Adjustable Cushions

3/4" Bore Air Cylinders with Adjustable Cushions (continued)


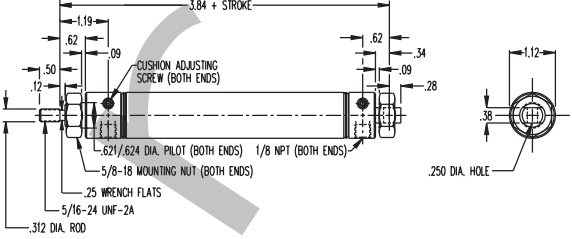

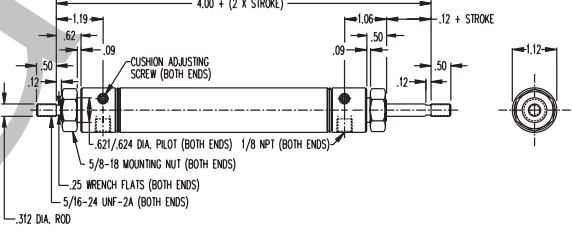
MODEL/PRICE	DESCRIPTION/WEIGHT (lbs.)	DIMENSIONS
<p>C-04□-DXP</p>  <p>\$33.90 BASE PRICE Add \$1.35 per inch of stroke Cushion one end only, deduct \$5.75 from base price. CF-04□-DXP (Front only) CR-04□-DXP (Rear only)</p>	<p>Double Acting – Double End or Rear Pivot Mounting – Air Return Standard Stroke Lengths: 1", 1½", 2", 2½", 3", 4", 5", 6", 7", 8", 9", 10", 11", 12" Maximum Stroke – 32" Stainless Steel Rod Standard Optional Rod Wiper Optional Accessories: D-129 Mounting Bracket D-13498-A Pivot Bracket D-166-3 Piston Rod Clevis Base Weight: .29 Adder Per Inch of Stroke: .03</p>	
<p>C-04□-DXDE</p>  <p>\$41.55 BASE PRICE Add \$1.80 per inch of stroke Cushion one end only, deduct \$5.75 from base price. CS-04□-DXDE (One end only)</p>	<p>Double Acting – Double End Rod – Air Return – Double End Mounting Standard Stroke Lengths: 1", 2", 3", 4", 5", 6" Maximum Stroke – 12" Stainless Steel Rod Standard Optional Rod Wiper Optional Accessory: D-129 Mounting Bracket Base Weight: .30 Adder Per Inch of Stroke: .06</p>	

1-1/16" Bore Air Cylinders with Adjustable Cushions


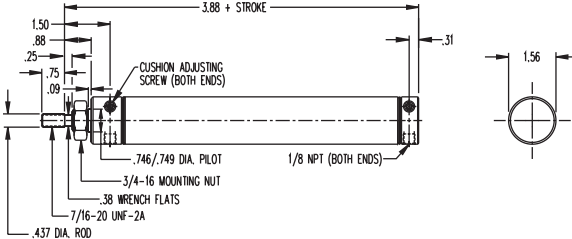
MODEL/PRICE	DESCRIPTION/WEIGHT (lbs.)	DIMENSIONS
<p>C-09□-D</p>  <p>\$32.35 BASE PRICE Add \$1.35 per inch of stroke Cushion one end only, deduct \$6.30 from base price. CF-09□-D (Front only) CR-09□-D (Rear only)</p>	<p>Double Acting – Air Return – Front Nose Mounting Standard Stroke Lengths: 1", 1½", 2", 2½", 3", 4", 5", 6" Maximum Stroke – 12" Stainless Steel Rod Standard Optional Rod Wiper Optional Accessory: D-129 Mounting Bracket Base Weight: .38 Adder Per Inch of Stroke: .04</p>	

Air Cylinders with Adjustable Cushions

1-1/16" Bore Air Cylinders with Adjustable Cushions (continued)

MODEL/PRICE	DESCRIPTION/WEIGHT (lbs.)	DIMENSIONS
<p>C-09□-DXP</p>  <p>\$38.15 BASE PRICE Add \$1.35 per inch of stroke Cushion one end only, deduct \$6.30 from base price. CF-09□-DXP (Front only) CR-09□-DXP (Rear only)</p>	<p>Double Acting – Universal Mounting Pivot, or Double End Mounting – Air Return Standard Stroke Lengths: 1", 1½", 2", 2½", 3", 4", 5", 6", 7", 8", 9", 10", 11", 12" Maximum Stroke – 32" Stainless Steel Rod Standard Optional Rod Wiper Optional Accessories: D-13498-A Pivot Bracket D-129 Mounting Bracket D-166-1 Piston Rod Clevis Base Weight: .44 Adder Per Inch of Stroke: .04</p>	
<p>C-09□-DXDE</p>  <p>\$45.85 BASE PRICE Add \$1.80 per inch of stroke Cushion one end only, deduct \$6.30 from base price. CS-09□-DXDE (One end only)</p>	<p>Double Acting – Double End Rod – Air Return – Double End Mounting Standard Stroke Lengths: 1", 2", 3", 4", 5", 6" Maximum Stroke – 12" Stainless Steel Rod Standard Optional Rod Wiper Optional Accessory: D-129 Mounting Bracket Base Weight: .46 Adder Per Inch of Stroke: .08</p>	


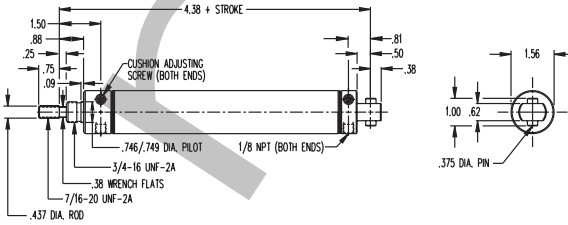

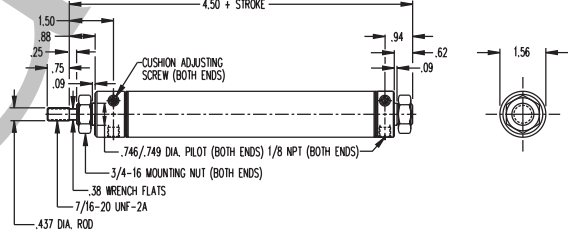

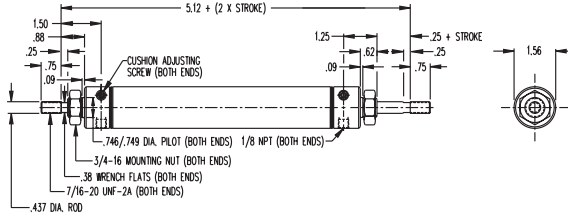
1-1/2" Bore Air Cylinders with Adjustable Cushions

MODEL/PRICE	DESCRIPTION/WEIGHT (lbs.)	DIMENSIONS
<p>C-17□-D</p>  <p>\$48.15 BASE PRICE Add \$2.10 per inch of stroke Cushion one end only, deduct \$7.35 from base price. CF-17□-D (Front only) CR-17□-D (Rear only)</p>	<p>Double Acting – Air Return – Front Nose Mounting Standard Stroke Lengths: 1", 1½", 2", 2½", 3", 4", 5", 6" Maximum Stroke – 12" Stainless Steel Rod Standard Optional Rod Wiper Optional Accessory: D-241 Mounting Bracket Base Weight: .76 Adder Per Inch of Stroke: .09</p>	

Flow Controls
Alignment Couplers
Original Line Cylinders
Cushion Cylinders
MRS Cylinders
Non-Rotating Cylinders
PC Cylinders
Z-Line Cylinders
Rod Lock Cylinders
500 Hydraulic Cylinders
Hole Punchers Air Reservoirs
Position Sens Switches


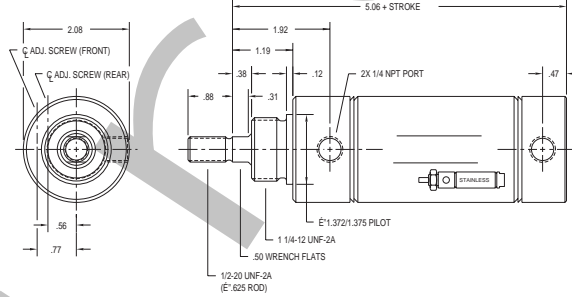

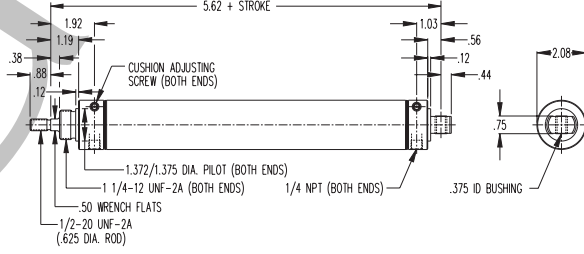

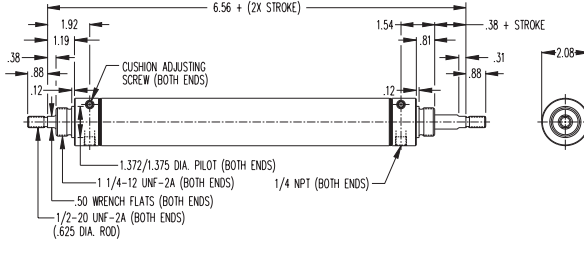
Air Cylinders with Adjustable Cushions

1-1/2" Bore Air Cylinders with Adjustable Cushions (continued)

MODEL/PRICE	DESCRIPTION/WEIGHT (lbs.)	DIMENSIONS
<p>C-17□-DP</p>  <p>\$52.70 BASE PRICE</p> <p>Add \$2.10 per inch of stroke Cushion one end only, deduct \$7.35 from base price. CF-17□-DP (Front only) CR-17□-DP (Rear only)</p>	<p>Double Acting – Pivot Type – Air Return – Rear Pivot Mounting Standard Stroke Lengths: 1", 1½", 2", 2½", 3", 4", 5", 6", 7", 8", 9", 10", 11", 12" Maximum Stroke – 32" Stainless Steel Rod Standard Optional Rod Wiper Optional Accessories: D-231-1 Piston Rod Clevis D-229 Pivot Brackets Base Weight: .77 Adder Per Inch of Stroke: .09</p>	 <p>Technical drawing showing side and end views of the C-17□-DP air cylinder. Dimensions include: 1.50, .88, .25, .75, .09, 4.38 + STROKE, .81, .50, .38, 1.56, 1.00, .62, .375 DIA. PIN, .746/.749 DIA. PILOT, 1/8 NPT (BOTH ENDS), .38 WRENCH FLATS, 7/16-20 UNF-2A, .437 DIA. ROD.</p>
<p>C-17□-DX</p>  <p>\$55.60 BASE PRICE</p> <p>Add \$2.10 per inch of stroke Cushion one end only, deduct \$7.35 from base price. CF-17□-DX (Front only) CR-17□-DX (Rear only)</p>	<p>Double Acting – Double End Mounting – Air Return Standard Stroke Lengths: 1", 1½", 2", 2½", 3", 4", 5", 6", 7", 8", 9", 10", 11", 12" Maximum Stroke – 32" Stainless Steel Rod Standard Optional Rod Wiper Optional Accessory: D-241 Mounting Bracket Base Weight: .84 Adder Per Inch of Stroke: .09</p>	 <p>Technical drawing showing side and end views of the C-17□-DX air cylinder. Dimensions include: 1.50, .88, .25, .75, .09, 4.50 + STROKE, .94, .62, .09, 1.56, .746/.749 DIA. PILOT (BOTH ENDS) 1/8 NPT (BOTH ENDS), .38 WRENCH FLATS, 7/16-20 UNF-2A, .437 DIA. ROD, 3/4-16 MOUNTING NUT (BOTH ENDS).</p>
<p>C-17□-DXDE</p>  <p>\$70.70 BASE PRICE</p> <p>Add \$3.35 per inch of stroke Cushion one end only, deduct \$7.35 from base price. CS-17□-DXDE (One end only)</p>	<p>Double Acting – Double End Rod – Air Return – Double End Mounting Standard Stroke Lengths: 1", 2", 3", 4", 5", 6", 7", 8", 9", 10", 11", 12" Maximum Stroke – 12" Stainless Steel Rod Standard Optional Rod Wiper Optional Accessory: D-241 Mounting Bracket Base Weight: .90 Adder Per Inch of Stroke: .18</p>	 <p>Technical drawing showing side and end views of the C-17□-DXDE air cylinder. Dimensions include: 1.50, .88, .25, .75, .09, 5.12 + (2 x STROKE), 1.25, .62, .25, .25 + STROKE, .75, 1.56, .746/.749 DIA. PILOT (BOTH ENDS) 1/8 NPT (BOTH ENDS), .38 WRENCH FLATS, 7/16-20 UNF-2A (BOTH ENDS), .437 DIA. ROD, 3/4-16 MOUNTING NUT (BOTH ENDS).</p>

Air Cylinders with Adjustable Cushions

2" Bore Air Cylinders with Adjustable Cushions


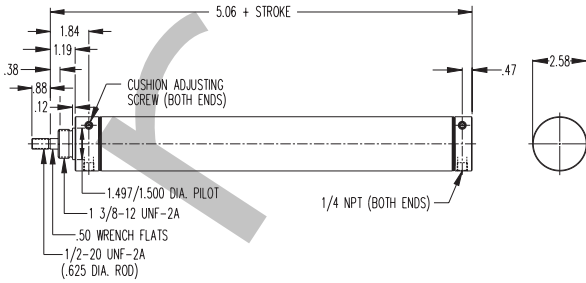

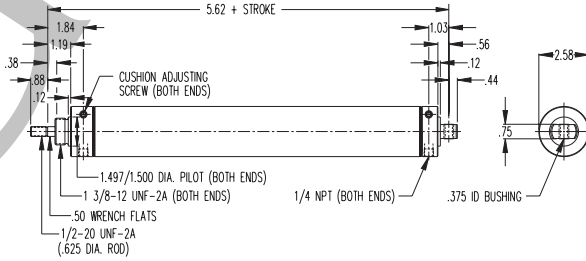

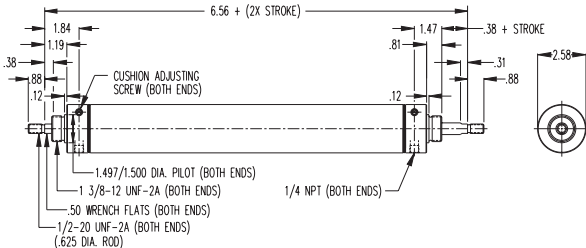
MODEL/PRICE	DESCRIPTION/WEIGHT (lbs.)	DIMENSIONS
<p>C-31□-D</p>  <p>\$81.45 BASE PRICE Add \$2.40 per inch of stroke Cushion one end only, deduct \$12.00 from base price. CF-31□-D (Front only) CR-31□-D (Rear only)</p>	<p>Double Acting – Air Return – Front Nose Mounting Standard Stroke Lengths: 1", 1½", 2", 2½", 3", 4", 5", 6" Maximum Stroke – 12" Stainless Steel Rod Standard Optional Accessories: D-615 Mounting Bracket D-508 Mounting Nut Base Weight: 1.64 Adder Per Inch of Stroke: .15</p>	
<p>C-31□-DXP</p>  <p>\$99.10 BASE PRICE Add \$2.40 per inch of stroke Cushion one end only, deduct \$12.00 from base price. CF-31□-DXP (Front only) CR-31□-DXP (Rear only)</p>	<p>Double Acting – Double End or Rear Pivot Mounting – Air Return Standard Stroke Lengths: 1", 1½", 2", 2½", 3", 4", 5", 6", 7", 8", 9", 10", 11", 12" Maximum Stroke – 32" Stainless Steel Rod Standard Optional Accessories: D-615 Mounting Bracket D-620 Pivot Bracket D-231-3 Piston Rod Clevis D-508 Mounting Nut Base Weight: 1.68 Adder Per Inch of Stroke: .15</p>	
<p>C-31□-DXDE</p>  <p>\$123.40 BASE PRICE Add \$3.45 per inch of stroke Cushion one end only, deduct \$12.00 from base price. CS-31□-DXDE (One end only)</p>	<p>Double Acting – Double End Rod – Air Return – Double End Mounting Standard Stroke Lengths: 1", 2", 3", 4", 5", 6" Maximum Stroke – 12" Stainless Steel Rod Standard Optional Accessories: D-615 Mounting Bracket D-508 Mounting Nut Base Weight: 1.99 Adder Per Inch of Stroke: .24</p>	

- Flow Controls
- Alignment Couplers
- Original Line Cylinders
- Cushion Cylinders
- MRS Cylinders
- Non-Rotating Cylinders
- PC Cylinders
- ZLine Cylinders
- Rod Lock Cylinders
- 500 Hydraulic Cylinders
- Hole Punchers Air Reservoirs
- Position Sens Switches

*U.S. Patent nos. 4,794,681 and 4,862,786


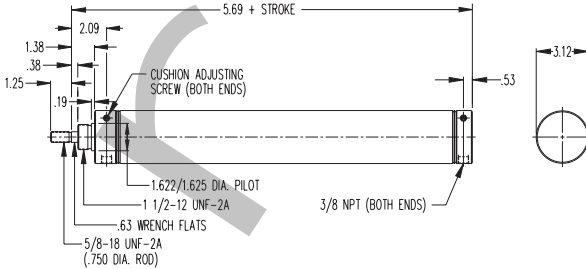

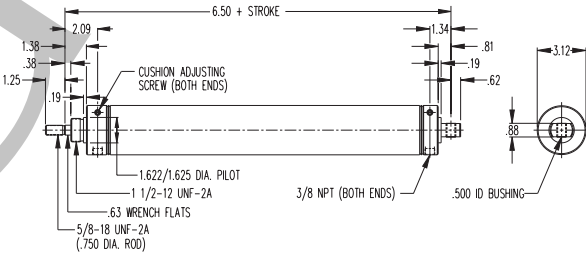

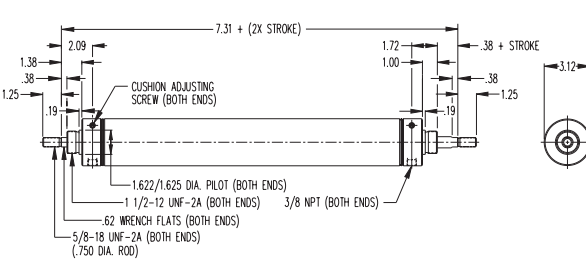
Air Cylinders with Adjustable Cushions

2-1/2" Bore Air Cylinders with Adjustable Cushions

MODEL/PRICE	DESCRIPTION/WEIGHT (lbs.)	DIMENSIONS
<p>C-50□-D</p>  <p>\$100.75 BASE PRICE</p> <p>Add \$2.60 per inch of stroke Cushion one end only, deduct \$15.00 from base price.</p> <p>CF-50□-D (Front only) CR-50□-D (Rear only)</p>	<p>Double Acting – Air Return – Front Nose Mounting Standard Stroke Lengths: 1", 1½", 2", 2½", 3", 4", 5", 6" Maximum Stroke – 12" Stainless Steel Rod Standard Optional Accessories: D-615-1 Mounting Bracket D-2540 Mounting Nut Base Weight: 2.21 Adder Per Inch of Stroke: .17</p>	
<p>C-50□-DXP</p>  <p>\$114.55 BASE PRICE</p> <p>Add \$2.60 per inch of stroke Cushion one end only, deduct \$15.00 from base price.</p> <p>CF-50□-DXP (Front only) CR-50□-DXP (Rear only)</p>	<p>Double Acting – Universal Mounting Pivot, or Double End Mounting – Air Return Standard Stroke Lengths: 1", 1½", 2", 2½", 3", 4", 5", 6", 7", 8", 9", 10", 11", 12" Maximum Stroke – 32" Stainless Steel Rod Standard Optional Accessories: D-615-1 Mounting Bracket D-620 Pivot Bracket D-231-3 Piston Rod Clevis D-2540 Mounting Nut Base Weight: 2.33 Adder Per Inch of Stroke: .17</p>	
<p>C-50□-DXDE</p>  <p>\$151.60 BASE PRICE</p> <p>Add \$4.05 per inch of stroke Cushion one end only, deduct \$15.00 from base price.</p> <p>CS-50□-DXDE (One end only)</p>	<p>Double Acting – Double End Rod – Air Return – Double End Mounting Standard Stroke Lengths: 1", 2", 3", 4", 5", 6" Maximum Stroke – 12" Stainless Steel Rod Standard Optional Accessories: D-615-1 Mounting Bracket D-2540 Mounting Nut Base Weight: 2.38 Adder Per Inch of Stroke: .34</p>	

Air Cylinders with Adjustable Cushions

3" Bore Air Cylinders with Adjustable Cushions

MODEL/PRICE	DESCRIPTION/WEIGHT (lbs.)	DIMENSIONS
<p>C-70□-D</p>  <p>\$132.35 BASE PRICE</p> <p>Add \$3.15 per inch of stroke Cushion one end only, deduct \$17.00 from base price. CF-70□-D (Front only) CR-70□-D (Rear only)</p>	<p>Double Acting – Air Return – Front Nose Mounting Standard Stroke Lengths: 1", 1½", 2", 2½", 3", 4", 5", 6" Maximum Stroke – 12" Stainless Steel Rod Standard Optional Accessories: D-19127 Mounting Bracket D-5379 Mounting Nut Base Weight: 3.81 Adder Per Inch of Stroke: .26</p>	
<p>C-70□-DXP</p>  <p>\$148.80 BASE PRICE</p> <p>Add \$3.15 per inch of stroke Cushion one end only, deduct \$17.00 from base price. CF-70□-DXP (Front only) CR-70□-DXP (Rear only)</p>	<p>Double Acting – Pivot Type – Air Return – Rear Pivot Mounting Standard Stroke Lengths: 1", 1½", 2", 2½", 3", 4", 5", 6", 7", 8", 9", 10", 11", 12" Maximum Stroke – 32" Stainless Steel Rod Standard Optional Accessories: D-8314-A Piston Rod Clevis D-13512-A Pivot Brackets D-5379 Mounting Nut Base Weight: 3.97 Adder Per Inch of Stroke: .26</p>	
<p>C-70□-DXDE</p>  <p>\$165.10 BASE PRICE</p> <p>Add \$4.25 per inch of stroke Cushion one end only, deduct \$17.00 from base price. CS-70□-DXDE (One end only)</p>	<p>Double Acting – Double End Rod – Air Return – Double End Mounting Standard Stroke Lengths: 1", 2", 3", 4", 5", 6", 7", 8", 9", 10", 11", 12" Maximum Stroke – 12" Stainless Steel Rod Standard Optional Accessories: D-19127 Mounting Bracket D-5379 Mounting Nut Base Weight: 4.15 Adder Per Inch of Stroke: .52</p>	

• **Accessories** – For ¾" bore, see page 35. For 1 ¼" bore, see page 47. For 1 ½" bore, see page 60. For 2" bore, see page 67. For 2 ½" bore, see page 69. For 3" bore, see page 71.

- Flow Controls
- Alignment Couplers
- Original Line Cylinders
- Cushion Cylinders
- MRS Cylinders
- Non-Rotating Cylinders
- PC Cylinders
- ZLine Cylinders
- Rod Lock Cylinders
- 500 Hydraulic Cylinders
- Hole Punchers Air Reservoirs
- Position Sens Switches

Air Cylinders with Adjustable Cushions

Cushion Energy Absorption

Cylinders with air cushions provide a possible solution to destructive energies. The air cushion traps a small amount of exhaust air at the end of stroke, providing an air pocket that decelerates the load. This reduces the potentially destructive energy being transmitted to the cylinder and other components. The following is a brief explanation on how to determine the energy level of your application and decide if an air cushion can provide adequate energy absorption. For a more detailed description, consult the factory at 1-800-44-BIMBA.

- Step 1. Determine the load to be stopped by the cylinder.
- Step 2. Determine the velocity at which the load impacts the cylinder endcap.
- Step 3. Calculate the energy the cylinder generates. Use the following equation:

$$\text{energy (e)} = \left(\frac{W}{64} \times v^2\right) + (p \times k)$$

w = weight of the load (lbs.)

V = velocity of the cylinder as the piston impacts the endcap (feet per second)

p = driving pressure (psi)

k = bore constant

Example: C-316-D at 80 psi with total load of 8 lbs.

driving pressure (p) = 80 psi

total load (w) = 8 lbs.

bore constant (k) = .24

maximum velocity (v) = 6 fps

$$= (8/64) \times (6^2) + (80 \times .24) = 23.7 \text{ ft. lbs.}$$

Maximum Energy Calculation Data

Bore	Max Energy (ft-lbs)	k
04	4.47	0.03
09	10.40	0.05
17	18.80	0.11
31	27.60	0.24
50	40.11	0.37
70	77.72	0.58

Cushion Lengths
0.75"
0.75"
0.75"
0.90"
0.90"
0.99"