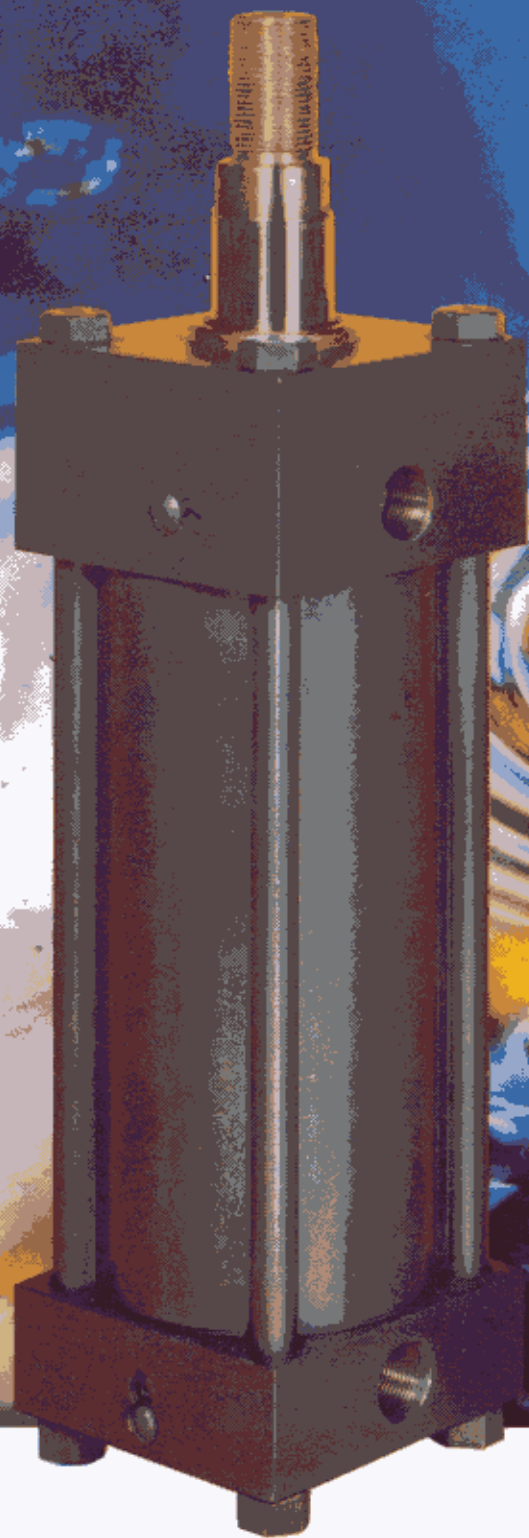


# HYDRAULIC CYLINDERS

Series HP — Heavy Duty  
High Pressure Hydraulic  
1½" through 12" Bore



*New ideas are happening at...*

**LEHIGH**<sup>®</sup>

**FLUID POWER, INC.**

# Lehigh High Pressure Hydraulic Cylinders...

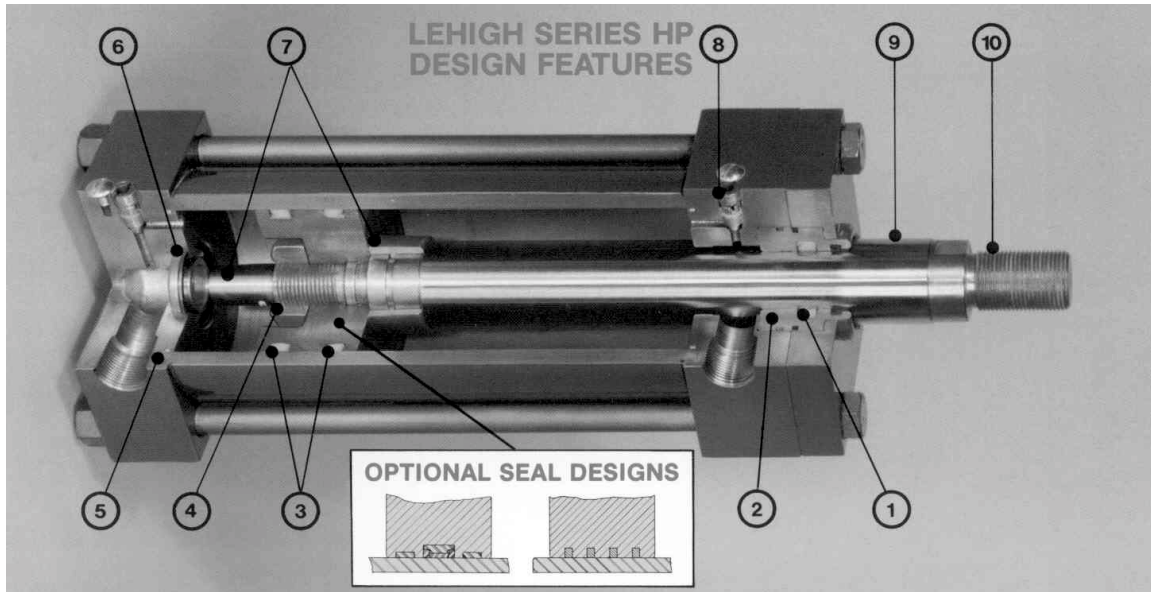
## Nominal Pressure 3000 PSI\* (5000 PSI Non-Shock)

### ...Manufacturing Engineering At It's Best

To meet today's wide range of advanced technology for pressure and force in available space, Lehigh manufactures a complete line of hydraulic cylinders- both medium duty\*\* and high pressure cylinders- *all* given the same dedicated attention to quality.

Skillful engineering encourages a delicate balance between design, materials, and precision workmanship. In designing the Series HP High Pressure Hydraulic Cylinder, Lehigh developed a product for which there is no equal in responsive performance.

Other custom engineered Lehigh state-of-the-art fluid power products include end-of-stroke and mid-position indicators with magnetic or electronic sensors.



1. The cast/compression molded, abrasion resistant polyurethane rod seal is positioned in the bearing to minimize seal loading, thus extending seal life.
2. Longer SAE-660 Naval Bronze wetted rod bearing for extended active service life. Separately bolted front flange contains the rod bearing, seal and rod wiper. Bearing assembly can be readily removed without disassembling the cylinder on most mounts.
3. Abrasion resistant, cast/compression molded polyurethane piston seals are standard. Step-cut cast iron piston rings or single energized Teflon seals are also available.
4. The piston is secured to the rod with both internal piston threads and an additional lock nut to prevent loosening and to increase strength.
5. Cast/compression molded polyurethane O-ring tube end seals in conjunction with piloted tube outside diameter effectively prevents expansion under pressure and resists seal extrusion.
6. Rod end cushion utilizes a ball check (not shown) for fast breakaway and cap end cushion ring lifts off its seat providing fast return.
7. Proportionally tapered cushions at each end of the stroke help achieve smoother deceleration. Both cushions incorporate radial floating action to prevent wear, thus enhancing cushion response.
8. Cushion adjustment needle valve can be locked at the desired setting to prevent drift. Safety lock screws prevent accidental blowout when adjusting under pressure.
9. Ground, polished, and chrome-plated rods are resistant to abrasion providing longer seal life. Case hardened thru 3-1/2" diameter rod to resist accidental damage.
10. Rolled thread rod stud for greater strength of male rod ends, 5/8" thru 1-3/8" diameter rods.
11. Standard seals for the operating temperature range of 0 to 165 degrees F. Other seal compounds are available for special fluids, and higher or lower temperatures.

\*For operating pressures exceeding 3000 psi, consult Lehigh for an engineering evaluation. \*\*See catalog 8201

This information should be used as a guide for your consideration, investigation, and verification. This information does not constitute a warranty or representation and we assume no legal responsibility or obligation with respect thereto, and the use of which such information may be put.

As product improvement is a continuous process, specifications are subject to change without notice.

**INDEX**

**1½" to 12" BORE  
HIGH PRESSURE HYDRAULIC CYLINDERS**

Design Advantages of Lehigh High Pressure Hydraulic Cylinders ..... Inside Front Cover

**1½" to 8" BORE**

**TIE ROD MOUNTED CYLINDERS**

- Single Rod End Cylinders (NFPA Style MX1, MX2, MX3) ..... 3-4
- Double Rod End Cylinders (NFPA Styles MDX1, MDX3) ..... 3-4

**TRUNNION and CLEVIS MOUNTED CYLINDERS**

- Rod End Trunnion Cylinders (NFPA Style MT1) ..... 5-6
- Cap End Trunnion Cylinders (NFPA Style MT2) ..... 5-6
- Intermediate Trunnion Cylinders (NFPA Style MT4) ..... 5-6
- Fixed Clevis Cylinders (NFPA Style MP1) ..... 5-6

**FLANGE MOUNTED CYLINDERS**

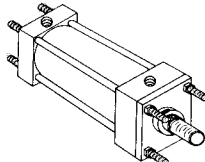
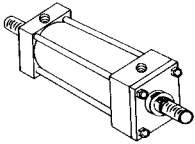
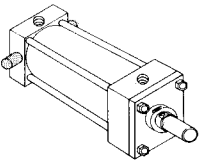
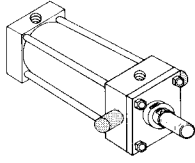
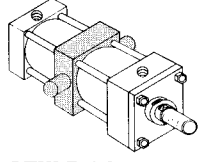
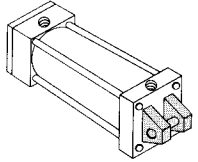
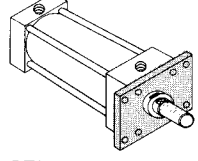
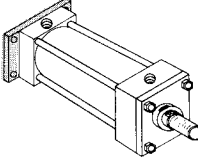
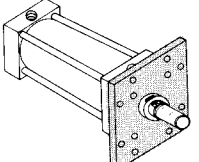
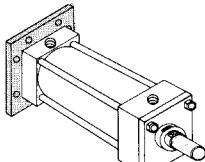
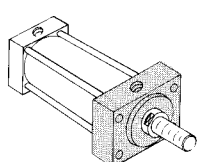
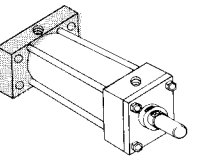
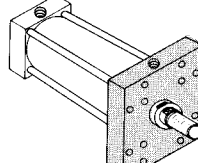
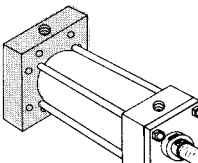
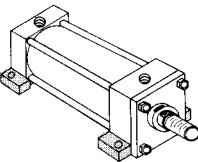
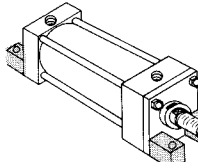
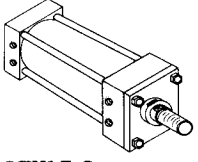

- Rectangular Flange Rod End Cylinders (NFPA Style MF1) ..... 7-8
- Square Flange Rod End Cylinders (NFPA Styles ME3, MF5) ..... 7-8
- Rectangular Flange Rod Head Cylinders (NFPA Style ME5) ..... 7-8
- Rectangular Flange Cap End Cylinders (NFPA Style MF2) ..... 9-10
- Square Flange Cap End Cylinders (NFPA Styles ME4, MF6) ..... 9-10
- Rectangular Flange Cap Head Cylinders (NFPA Style ME6) ..... 9-10

**FOOT and FLUSH MOUNTED CYLINDERS**

- Side Foot Cylinders (NFPA Style MS2) ..... 11-12
- End Foot Cylinders (NFPA Style MS7) ..... 11-12
- Flush Mounted Cylinders (NFPA Style MS4) ..... 11-12
- Key Mounted Cylinders ..... 11-12

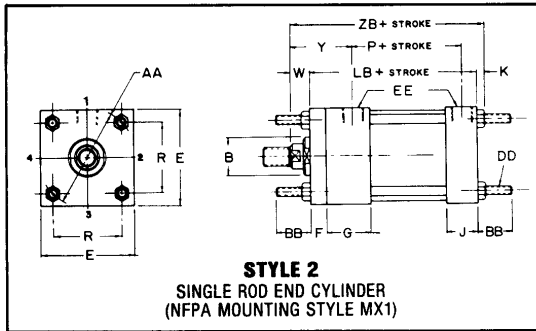
**10" to 12" BORE**

- Rod End Flange Mounted Cylinders (NFPA Styles ME3, ME5, MF1, MF5) ..... 13
- Cap End Flange Mounted Cylinders (NFPA Styles ME4, ME6, MF2, MF6) ..... 14
- Side Foot, Clevis, Double End Cylinders (NFPA Styles MS2, MP1, MDX) ..... 15
- Trunnion Mounted Cylinders (NFPA Styles MT1, MT2, MT4) ..... 16
- Lehigh Mounting Accessories ..... 17-18
- Lehigh Piston Rod Selection Chart ..... 19
- Lehigh Cylinder Capacity Chart ..... 20
- Lehigh Coding System for Cylinder Orders ..... 21
- Lehigh Warranty ..... Inside Back Cover
- Lehigh Video ..... Consult Factory
- Lehigh Product Catalogs ..... Back Cover

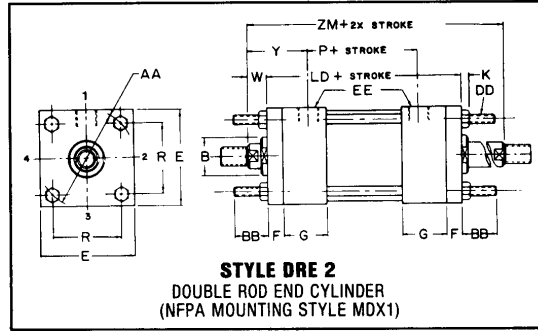
<b>TIE ROD MOUNTS</b>		
	<b>STYLES 1, 2, 3, &amp; 4</b> (MX1) (MX2) (MX3)	<b>STYLES DRE 1, 2, &amp; 3</b> (MDX1) (MDX3)
<b>TRUNNION and CLEVIS MOUNTS</b>		
	<b>STYLE 12</b> (MT2)	<b>STYLE 13</b> (MT1)
		
	<b>STYLE 14</b> (MT4)	<b>STYLE 8F</b> (MP1)
<b>FLANGE MOUNTS</b>		
	<b>STYLE 6</b> (MF1)	<b>STYLE 7</b> (MF2)
		
	<b>STYLE 16</b> (MF5)	<b>STYLE 17</b> (MF6)
		
	<b>STYLE 26</b> (ME5)	<b>STYLE 27</b> (ME6)
		
	<b>STYLE 36</b> (ME3)	<b>STYLE 37</b> (ME4)
<b>FOOT and FLUSH MOUNTS</b>		
	<b>STYLE 11</b> (MS2)	<b>STYLE 15</b> (MS7)
		 <b>LEHIGH</b> FLUID POWER, INC.
	<b>STYLE 9</b> (MS4)	



**TIE ROD MOUNTED CYLINDERS**  
**1 1/2" to 8" BORE SERIES HP HIGH PRESSURE HYDRAULIC CYLINDERS**



Standard Port location is Position 1.  
 Standard Cushion location is Position 2.



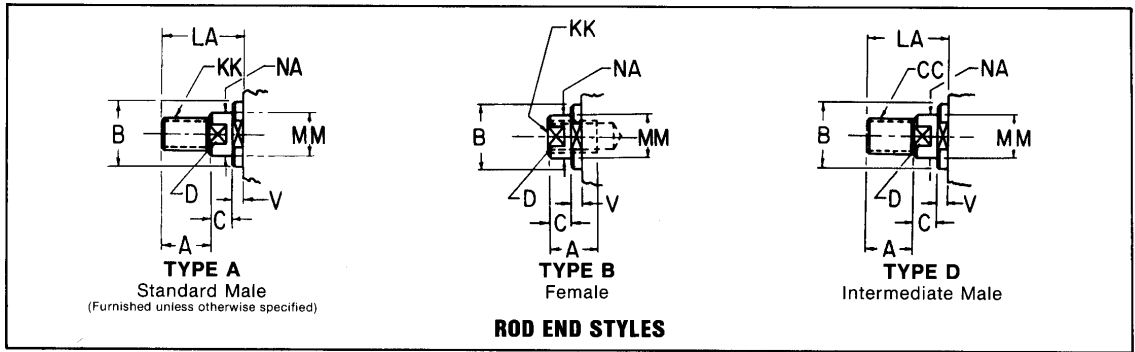
Standard Port location is Position 1.  
 Standard Cushion location is Position 2.

**MOUNTING DESCRIPTION**

MOUNTING STYLE	NFA MOUNTING STYLE	DESCRIPTION
1	-	No tie rod extensions
2	MX1	Tie rods extended both ends (above left)
3	MX2	Tie rods extended cap end
4	MX3	Tie rods extended rod end
DRE 1	-	No tie rod extensions
DRE 2	MDX1	Tie rods extended both ends (above right)
DRE 3	MDX3	Tier rods extended one end

**ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER**

BORE	AA	BB	DD	E	EE		F	G	J	K	R	LB	LD	P
					NPTF	SAE								
1 1/2	2.3	1 3/8	3/8-24	2 1/2	1/2-14	10	3/8	1 3/4	1 1/2	3/8	1.63	5	5 5/8	2 7/8
2	2.9	1 13/16	1/2-20	3	1/2-14	10	5/8	1 3/4	1 1/2	7/16	2.05	5 1/4	6 1/8	2 7/8
2 1/2	3.6	1 13/16	1/2-20	3 1/2	1/2-14	10	5/8	1 3/4	1 1/2	7/16	2.55	5 3/8	6 1/4	3
3 1/4	4.6	2 5/16	5/8-18	4 1/2	3/4-14	12	3/4	2	1 3/4	9/16	3.25	6 1/4	7 1/4	3 1/2
4	5.4	2 5/16	5/8-18	5	3/4-14	12	7/8	2	1 3/4	9/16	3.82	6 5/8	7 3/4	3 3/4
5	7.0	3 3/16	7/8-14	6 1/2	3/4-14	12	7/8	2	1 3/4	3/4	4.95	7 1/8	8 1/4	4 1/4
6	8.1	3 5/8	1-14	7 1/2	1-11 1/2	16	1	2 1/4	2 1/4	7/8	5.73	8 3/8	9 3/8	4 7/8
7	9.3	4 1/8	1 1/8-12	8 1/2	1 1/4-11 1/2	20	1	2 3/4	2 3/4	1	6.58	9 1/2	10 1/2	5 3/8
8	10.6	4 1/2	1 1/4-12	9 1/2	1 1/2-11 1/2	24	1	3	3	1 1/16	7.50	10 1/2	11 1/2	6 1/8



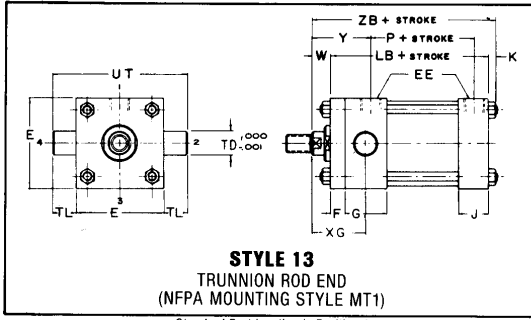
### DIMENSIONS AFFECTED BY ROD DIAMETER

BORE	ROD DIA.	THREAD SIZE		ROD EXTENSIONS & PILOT DIMENSIONS										
	MM	KK STD.	CC	A	B +0.000 -0.002	C	D	LA	NA	V	W	Y	ZB ADD STROKE	ZM ADD 2X STROKE
1 1/2	5/8	7/16-20	1/2-20	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	2	6	6 7/8
	1	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	2 3/8	6 3/8	7 5/8
2	1	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 3/8	6 7/16	7 5/8
	1 3/8*	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	2 5/8	1 5/16	3/8	1	2 5/8	6 11/16	8 1/8
2 1/2	1	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 3/8	6 9/16	7 3/4
	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	2 5/8	1 5/16	3/8	1	2 5/8	6 13/16	8 1/4
	1 3/4*	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	3 1/4	1 11/16	1/2	1 1/4	2 7/8	7 1/16	8 3/4
3 1/4	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	2 1/2	1 5/16	1/4	7/8	2 3/4	7 11/16	9
	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	3 1/8	1 11/16	3/8	1 1/8	3	7 15/16	9 1/2
	2	1 1/2-12	1 3/4-12	2 1/4	2.624	7/8	1 11/16	3 1/2	1 15/16	3/8	1 1/4	3 1/8	8 1/16	9 3/4
4	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	3	1 11/16	1/4	1	3	8 3/16	9 3/4
	2	1 1/2-12	1 3/4-12	2 1/4	2.624	7/8	1 11/16	3 3/8	1 15/16	1/4	1 1/8	3 1/8	8 5/16	10
	2 1/2	1 7/8-12	2 1/4-12	3	3.124	1	2 1/16	4 3/8	2 7/16	3/8	1 3/8	3 3/8	8 9/16	10 1/2
5	2	1 1/2-12	1 3/4-12	2 1/4	2.624	7/8	1 11/16	3 3/8	1 15/16	1/4	1 1/8	3 1/8	9	10 1/2
	2 1/2	1 7/8-12	2 1/4-12	3	3.124	1	2 1/16	4 3/8	2 7/16	3/8	1 3/8	3 3/8	9 1/4	11
	3	2 1/4-12	2 3/4-12	3 1/2	3.749	1	2 5/8	4 7/8	2 15/16	3/8	1 3/8	3 3/8	9 1/4	11
6	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 7/8	3 7/16	3/8	1 3/8	3 3/8	9 1/4	11
	2 1/2	1 7/8-12	2 1/4-12	3	3.124	1	2 1/16	4 1/4	2 7/16	1/4	1 1/4	3 1/2	10 1/2	11 7/8
	3	2 1/4-12	2 3/4-12	3 1/2	3.749	1	2 5/8	4 3/4	2 15/16	1/4	1 1/4	3 1/2	10 1/2	11 7/8
	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 3/4	3 7/16	1/4	1 1/4	3 1/2	10 1/2	11 7/8
7	4	3-12	3 3/4-12	4	4.749	1	3 3/8	5 1/4	3 15/16	1/4	1 1/4	3 1/2	10 1/2	11 7/8
	3	2 1/4-12	2 3/4-12	3 1/2	3.749	1	2 5/8	4 3/4	2 7/8	1/4	1 1/4	3 13/16	11 3/4	13
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8	5	3 1/2-12	4 3/4-12	5	5.749	1	4 1/4	6 1/4	4 7/8	1/4	1 1/4	3 13/16	11 3/4	13
	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 3/4	3 3/8	1/4	1 1/4	3 15/16	12 13/16	14
	4	3-12	3 3/4-12	4	4.749	1	3 3/8	5 1/4	3 7/8	1/4	1 1/4	3 15/16	12 13/16	14
	5 1/2	4-12	5 1/4-12	5 1/2	6.249	1	4 5/8	6 3/4	5 3/8	1/4	1 1/4	3 15/16	12 13/16	14

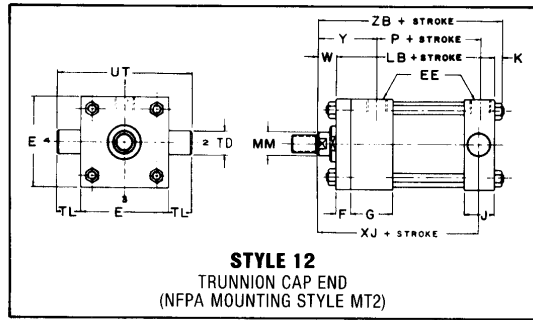
\*Rod end cushions available only as non-adjustable type- Consult Lehigh.



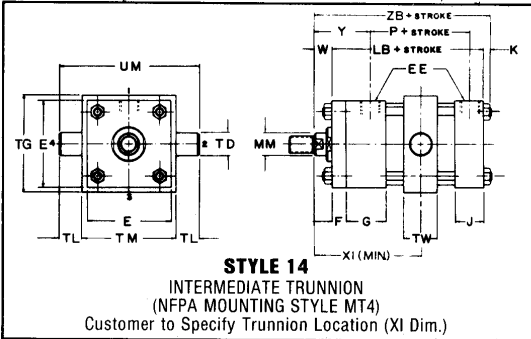
**TRUNNION AND CLEVIS MOUNTED CYLINDERS**  
**1 1/2" to 8" BORE SERIES HP HIGH PRESSURE HYDRAULIC CYLINDERS**



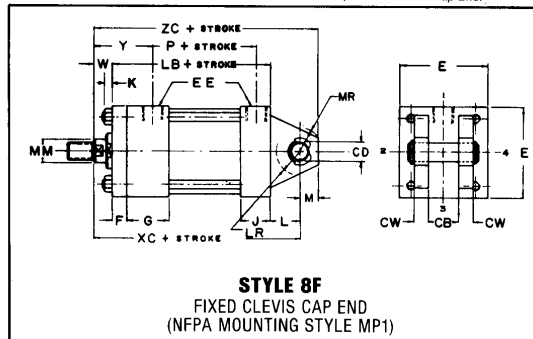
Standard Port location is Position 1.  
 Standard Cushion location is Position 3 Rod End, and Position 2 Cap End.



Standard Port location is Position 1.  
 Standard Cushion location is Position 2 Rod End, and Position 3 Cap End.



Standard Port location is Position 1. Standard Cushion location is Position 2.



**ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER**

BORE	CB	CD* +.001 -.001	CW	E	EE		F	G	J	K	L
					NPTF	SAE					
					1 1/2	3/4					
2	1 1/4	.750	5/8	3	1/2-14	10	5/8	1 3/4	1 1/2	7/16	1 1/4
2 1/2	1 1/4	.750	5/8	3 1/2	1/2-14	10	5/8	1 3/4	1 1/2	7/16	1 1/4
3 1/4	1 1/2	1.000	3/4	4 1/2	3/4-14	12	3/4	2	1 3/4	9/16	1 1/2
4	2	1.375	1	5	3/4-14	12	7/8	2	1 3/4	9/16	2 1/8
5	2 1/2	1.750	1 1/4	6 1/2	3/4-14	12	7/8	2	1 3/4	3/4	2 1/4
6	2 1/2	2.000	1 1/4	7 1/2	1-11 1/2	16	1	2 1/4	2 1/4	7/8	2 1/2
7	3	2.500	1 1/2	8 1/2	1 1/4-11 1/2	20	1	2 3/4	2 3/4	1	3
8	3	3.000	1 1/2	9 1/2	1 1/2-11 1/2	24	1	3	3	1 1/16	3 1/4

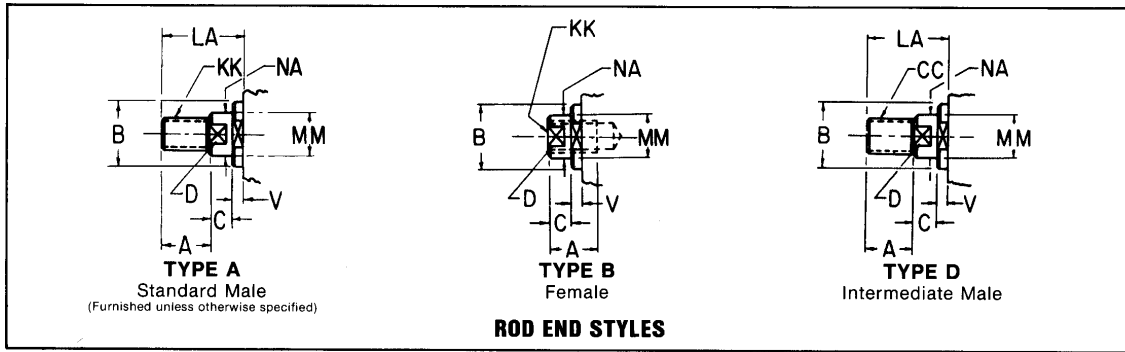
The trunnion pintles are not removable. For information on removable pintles, please consult the engineering department.

The position of the intermediate trunnion mount is not adjustable.

**NOTE:** Cylinders with #13 mounts in bores 5" thru 8" with piston rods other than standard should not be used for pressures in excess of 2000 psi. Pintles on trunnion mounted cylinders are designed to withstand shear loads, but not high bending loads. Pillow blocks must be rigidly mounted to provide full support with minimum clearances.

BORE	LR	M	MR	TD +.000 -.001	TG	TL	TM	TW	UM	UT	LB	P
											ADD STROKE	
											1 1/2	5/8
2	1	3/4	15/16	1.375	3 1/4	1 3/8	3 1/2	1 1/2	6 1/4	5 3/4	5 1/4	2 7/8
2 1/2	15/16	3/4	15/16	1.375	3 3/4	1 3/8	4	1 1/2	6 3/4	6 1/4	5 3/8	3
3 1/4	1 1/4	1	1 1/4	1.750	4 3/4	1 3/4	5	2	8 1/2	8	6 1/4	3 1/2
4	1 3/4	1 3/8	1 5/8	1.750	5 1/4	1 3/4	5 1/2	2	9	8 1/2	6 5/8	3 3/4
5	2 1/16	1 3/4	2 1/8	1.750	6 3/4	1 3/4	7	2	10 1/2	10	7 1/8	4 1/4
6	2 5/16	2	2 3/8	2.000	7 3/4	2	8 1/2	3	12 1/2	11 1/2	8 3/8	4 7/8
7	2 3/4	2 1/2	2 7/8	2.500	9 1/4	2 1/2	9 3/4	3	14 3/4	13 1/2	9 1/2	5 3/8
8	3 1/4	2 3/4	3 1/8	3.000	10 1/2	3	11	3 1/2	17	15 1/2	10 1/2	6 1/8

\*CD is pin diameter.



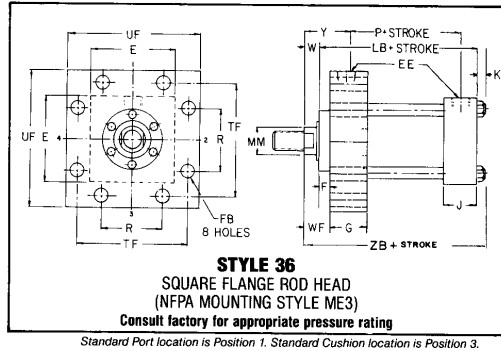
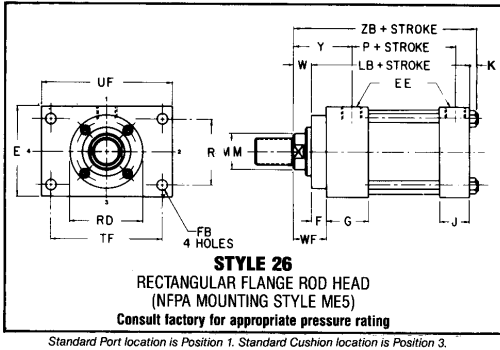
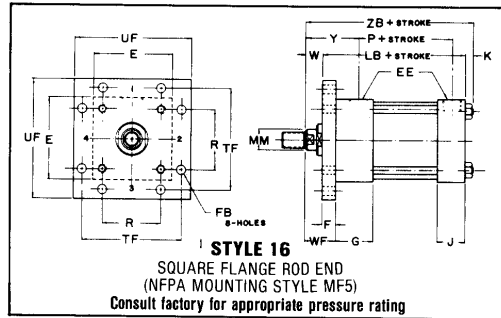
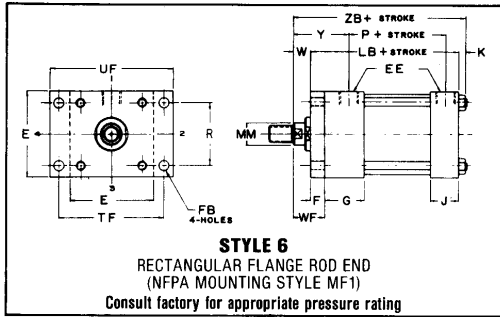
### DIMENSIONS AFFECTED BY ROD DIAMETER

BORE	ROD DIA. MM	THREAD SIZE		ROD EXTENSIONS & PILOT DIMENSIONS							ENVELOPE DIMENSIONS							
		KK STD.	CC	A	B +.000/ -.002	C	D	LA	NA	V	W	Y	XG	XI MIN.	XC	XJ	ZB	ZC
ADD STROKE																		
1 1/2	5/8	7/16-20	1/2-20	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	2	1 7/8	3 3/8	6 3/8	4 7/8	6	6 7/8
	1*	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	2 3/8	2 1/4	3 3/4	6 3/4	5 1/4	6 3/8	7 1/4
2	1	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 3/8	2 1/4	3 7/8	7 1/4	5 1/4	6 7/16	8
	1 3/8*	1-14	1 1/4-12	1 5/8	1.499	5/8	1 1/8	2 5/8	1 5/16	3/8	1	2 5/8	2 1/2	4 1/8	7 1/2	5 1/2	6 11/16	8 1/4
2 1/2	1	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 3/8	2 1/4	3 7/8	7 3/8	5 3/8	6 9/16	8 1/8
	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	2 5/8	1 5/16	3/8	1	2 5/8	2 1/2	4 1/8	7 5/8	5 5/8	6 13/16	8 3/8
	1 3/4*	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	3 1/4	1 11/16	1/2	1 1/4	2 7/8	2 3/4	4 3/8	7 7/8	5 7/8	7 1/16	8 5/8
3 1/4	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	2 1/2	1 5/16	1/4	7/8	2 3/4	2 5/8	4 5/8	8 5/8	6 1/4	7 11/16	9 5/8
	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	3 1/8	1 11/16	3/8	1 1/8	3	2 7/8	4 7/8	8 7/8	6 1/2	7 15/16	9 7/8
	2	1 1/2-12	1 3/4-12	2 1/4	2.624	7/8	1 11/16	3 1/2	1 15/16	3/8	1 1/4	3 1/8	3	5	9	6 5/8	8 1/16	10
4	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	3	1 11/16	1/4	1	3	2 7/8	4 7/8	9 3/4	6 3/4	8 3/16	11 1/8
	2	1 1/2-12	1 3/4-12	2 1/4	2.624	7/8	1 11/16	3 3/8	1 15/16	1/4	1 1/8	3 1/8	3	5	9 7/8	6 7/8	8 5/16	11 1/4
	2 1/2	1 7/8-12	2 1/4-12	3	3.124	1	2 1/16	4 3/8	2 7/16	3/8	1 3/8	3 3/8	3 1/4	5 1/4	10 1/8	7 1/8	8 9/16	11 1/2
5	2	1 1/2-12	1 3/4-12	2 1/4	2.624	7/8	1 11/16	3 3/8	1 15/16	1/4	1 1/8	3 1/8	3	5	10 1/2	7 3/8	9	12 1/4
	2 1/2	1 7/8-12	2 1/4-12	3	3.124	1	2 1/16	4 3/8	2 7/16	3/8	1 3/8	3 3/8	3 1/4	5 1/4	10 3/4	7 5/8	9 1/4	12 1/2
	3	2 1/4-12	2 3/4-12	3 1/2	3.749	1	2 5/8	4 7/8	2 15/16	3/8	1 3/8	3 3/8	3 1/4	5 1/4	10 3/4	7 5/8	9 1/4	12 1/2
	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 7/8	3 7/16	3/8	1 3/8	3 3/8	3 1/4	5 1/4	10 3/4	7 5/8	9 1/4	12 1/2
6	2 1/2	1 7/8-12	2 1/4-12	3	3.124	1	2 1/16	4 1/4	2 7/16	1/4	1 1/4	3 1/2	3 3/8	6	12 1/8	8 3/8	10 1/2	14 1/8
	3	2 1/4-12	2 3/4-12	3 1/2	3.749	1	2 5/8	4 3/4	2 15/16	1/4	1 1/4	3 1/2	3 3/8	6	12 1/8	8 3/8	10 1/2	14 1/8
	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 3/4	3 7/16	1/4	1 1/4	3 1/2	3 3/8	6	12 1/8	8 3/8	10 1/2	14 1/8
	4	3-12	3 3/4-12	4	4.749	1	3 3/8	5 1/4	3 15/16	1/4	1 1/4	3 1/2	3 3/8	6	12 1/8	8 3/8	10 1/2	14 1/8
7	3	2 1/4-12	2 3/4-12	3 1/2	3.749	1	2 5/8	4 3/4	2 7/8	1/4	1 1/4	3 13/16	3 5/8	6 1/2	13 3/4	9 3/8	11 3/4	16 1/4
	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 3/4	3 3/8	1/4	1 1/4	3 13/16	3 5/8	6 1/2	13 3/4	9 3/8	11 3/4	16 1/4
	4	3-12	3 3/4-12	4	4.749	1	3 3/8	5 1/4	3 7/8	1/4	1 1/4	3 13/16	3 5/8	6 1/2	13 3/4	9 3/8	11 3/4	16 1/4
8	5	3 1/2-12	4 3/4-12	5	5.749	1	4 1/4	6 1/4	4 7/8	1/4	1 1/4	3 13/16	3 5/8	6 1/2	13 3/4	9 3/8	11 3/4	16 1/4
	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 3/4	3 3/8	1/4	1 1/4	3 15/16	3 3/4	7	15	10 1/4	12 13/16	17 3/4
	4	3-12	3 3/4-12	4	4.749	1	3 3/8	5 1/4	3 7/8	1/4	1 1/4	3 15/16	3 3/4	7	15	10 1/4	12 13/16	17 3/4
	5 1/2	4-12	5 1/4-12	5 1/2	6.249	1	4 5/8	6 3/4	5 3/8	1/4	1 1/4	3 15/16	3 3/4	7	15	10 1/4	12 13/16	17 3/4

\*Rod end cushions available only as non-adjustable type- Consult Lehigh



**ROD END FLANGE MOUNTED CYLINDERS**  
**1½" to 8" BORE SERIES HP HIGH PRESSURE HYDRAULIC CYLINDERS**



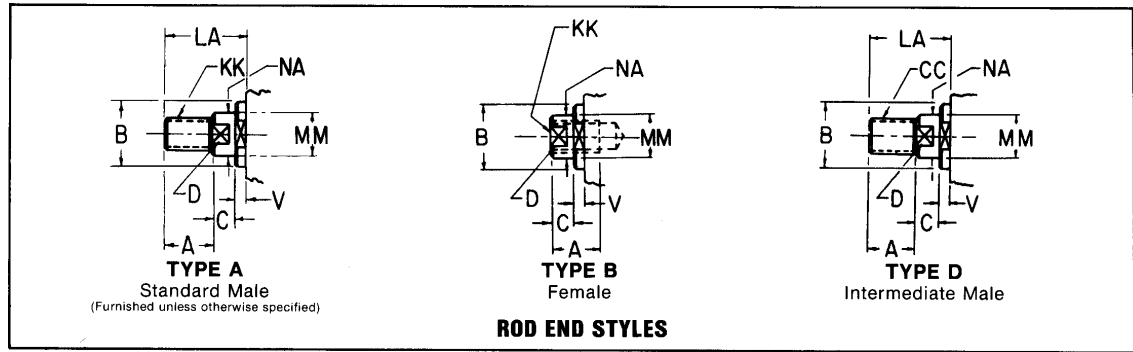
**ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER**

BORE	E	EE		F	FB	G	J	K	R	TF	UF	LB	P
		NPTF	SAE										
1 1/2	2 1/2	1/2-14	10	3/8	7/16	1 3/4	1 1/2	3/8	1.63	3 7/16	4 1/4	5	2 7/8
2	3	1/2-14	10	5/8	9/16	1 3/4	1 1/2	7/16	2.05	4 1/8	5 1/8	5 1/4	2 7/8
2 1/2	3 1/2	1/2-14	10	5/8	9/16	1 3/4	1 1/2	7/16	2.55	4 5/8	5 5/8	5 3/8	3
3 1/4	4 1/2	3/4-14	12	3/4	11/16	2	1 3/4	9/16	3.25	5 7/8	7 1/8	6 1/4	3 1/2
4	5	3/4-14	12	7/8	11/16	2	1 3/4	9/16	3.82	6 3/8	7 5/8	6 5/8	3 3/4
5	6 1/2	3/4-14	12	7/8	15/16	2	1 3/4	3/4	4.95	8 3/16	9 3/4	7 1/8	4 1/4
6	7 1/2	1-11 1/2	16	1	1 1/16	2 1/4	2 1/4	7/8	5.73	9 7/16	11 1/4	8 3/8	4 7/8
7	8 1/2	1 1/4-11 1/2	20	1	1 3/16	2 3/4	2 3/4	1	6.58	10 5/8	12 5/8	9 1/2	5 3/8
8	9 1/2	1 1/2-11 1/2	24	1	1 5/16	3	3	1 1/16	7.50	11 13/16	14	10 1/2	6 1/8

Styles 6 and 7 particularly those above the 4" bore size, are not recommended for maximum operating pressures. For operating pressures above 1500 psi on the 5" and 6" bore cylinders, and 1000 psi on the 7" and 8" bore cylinders, we recommend the use of styles 16 and 17. Maximum operating pressure for 16 and 17 style flanges, in bores 5" thru 8", should not exceed 3000 psi. We recommend the use of high tensile mounting bolts on all flange mounted cylinders subjected to maximum pressures and shock loads.

BORE	ROD DIA.	MOUNT STYLE	PORT POSITION	MAX. OPER. PRESSURE-PSI
5	3 1/2	26	1 or 3	2500
6	3 1/2	26	1 or 3	2500
	4	26	1 or 3	1500
7	4	26	1 or 3	2500
	5	26	1 or 3	1500
8	5	26	1 or 3	2500
	5 1/2	26	1 or 3	1500





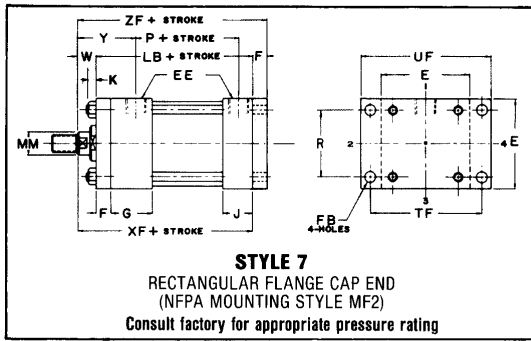
### DIMENSIONS AFFECTED BY ROD DIAMETER

BORE	ROD DIA. MM	THREAD SIZE		ROD EXTENSIONS & PILOT DIMENSIONS							ENVELOPE DIMENSIONS				
		KK STD.	CC	A	B +.000/-0.002	C	D	LA	NA	V	RD	W	WF	Y	ZB ADD STROKE
1 1/2	5/8	7/16-20	1/2-20	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	2.38	5/8	1	2	6
	1*	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	2.5 SQ	1	1 3/8	2 3/8	6 3/8
2	1	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	2.87	3/4	1 3/8	2 3/8	6 7/16
	1 3/8*	1-14	1 1/4-12	1 5/8	1.499	5/8	1 1/8	2 5/8	1 5/16	3/8	3.0 SQ	1	1 5/8	2 5/8	6 11/16
2 1/2	1	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	2.87	3/4	1 3/8	2 3/8	6 9/16
	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	2 5/8	1 5/16	3/8	3.37	1	1 5/8	2 5/8	6 13/16
3 1/4	1 3/4*	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	3 1/4	1 11/16	1/2	3.5 SQ	1 1/4	1 7/8	2 7/8	7 1/16
	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	2 1/2	1 5/16	1/4	3.37	7/8	1 5/8	2 3/4	7 11/16
3 1/4	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	3 1/8	1 11/16	3/8	4.00	1 1/8	1 7/8	3	7 15/16
	2	1 1/2-12	1 3/4-12	2 1/4	2.624	7/8	1 11/16	3 1/2	1 15/16	3/8	4.25	1 1/4	2	3 1/8	8 1/16
4	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	3	1 11/16	1/4	4.00	1	1 7/8	3	8 3/16
	2	1 1/2-12	1 3/4-12	2 1/4	2.624	7/8	1 11/16	3 3/8	1 15/16	1/4	4.25	1 1/8	2	3 1/8	8 5/16
4	2 1/2	1 7/8-12	2 1/4-12	3	3.124	1	2 1/16	4 3/8	2 7/16	3/8	4.50	1 3/8	2 1/4	3 3/8	8 9/16
	2	1 1/2-12	1 3/4-12	2 1/4	2.624	7/8	1 11/16	3 3/8	1 15/16	1/4	4.25	1 1/8	2	3 1/8	9
5	2 1/2	1 7/8-12	2 1/4-12	3	3.124	1	2 1/16	4 3/8	2 7/16	3/8	4.50	1 3/8	2 1/4	3 3/8	9 1/4
	3	2 1/4-12	2 3/4-12	3 1/2	3.749	1	2 5/8	4 7/8	2 15/16	3/8	5.50	1 3/8	2 1/4	3 3/8	9 1/4
5	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 7/8	3 7/16	3/8	5.75	1 3/8	2 1/4	3 3/8	9 1/4
	2 1/2	1 7/8-12	2 1/4-12	3	3.124	1	2 1/16	4 1/4	2 7/16	1/4	4.50	1 1/4	2 1/4	3 1/2	10 1/2
6	3	2 1/4-12	2 3/4-12	3 1/2	3.749	1	2 5/8	4 3/4	2 15/16	1/4	5.50	1 1/4	2 1/4	3 1/2	10 1/2
	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 3/4	3 7/16	1/4	5.75	1 1/4	2 1/4	3 1/2	10 1/2
6	4	3-12	3 3/4-12	4	4.749	1	3 3/8	5 1/4	3 15/16	1/4	6.50	1 1/4	2 1/4	3 1/2	10 1/2
	3	2 1/4-12	2 3/4-12	3 1/2	3.749	1	2 5/8	4 3/4	2 7/8	1/4	5.50	1 1/4	2 1/4	3 13/16	11 3/4
7	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 3/4	3 3/8	1/4	5.75	1 1/4	2 1/4	3 13/16	11 3/4
	4	3-12	3 3/4-12	4	4.749	1	3 3/8	5 1/4	3 7/8	1/4	6.50	1 1/4	2 1/4	3 13/16	11 3/4
7	5	3 1/2-12	4 3/4-12	5	5.749	1	4 1/4	6 1/4	4 7/8	1/4	7.50	1 1/4	2 1/4	3 13/16	11 3/4
	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 3/4	3 3/8	1/4	5.75	1 1/4	2 1/4	3 15/16	12 13/16
8	4	3-12	3 3/4-12	4	4.749	1	3 3/8	5 1/4	3 7/8	1/4	6.50	1 1/4	2 1/4	3 15/16	12 13/16
	5	3 1/2-12	4 3/4-12	5	5.749	1	4 1/4	6 1/4	4 7/8	1/4	7.50	1 1/4	2 1/4	3 15/16	12 13/16
8	5 1/2	4-12	5 1/4-12	5 1/2	6.249	1	4 5/8	6 3/4	5 3/8	1/4	8.50	1 1/4	2 1/4	3 15/16	12 13/16

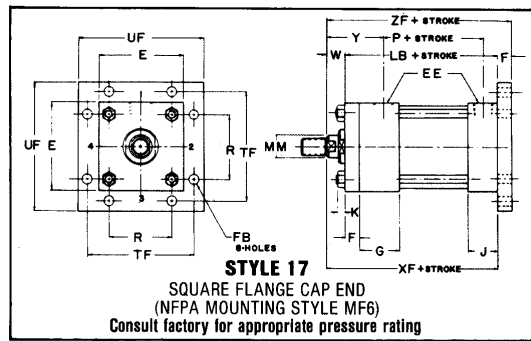
\*Rod end cushions available only as non-adjustable type- Consult Lehigh



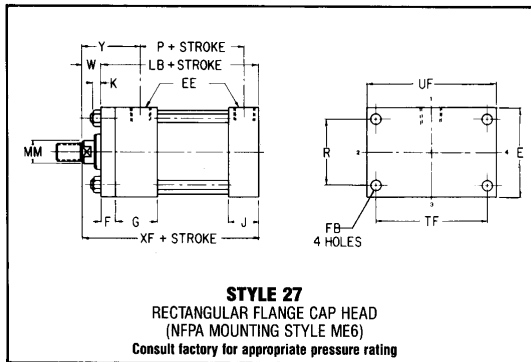
**CAP END FLANGE MOUNTED CYLINDERS**  
**1 1/2" to 8" BORE SERIES HP HIGH PRESSURE HYDRAULIC CYLINDERS**



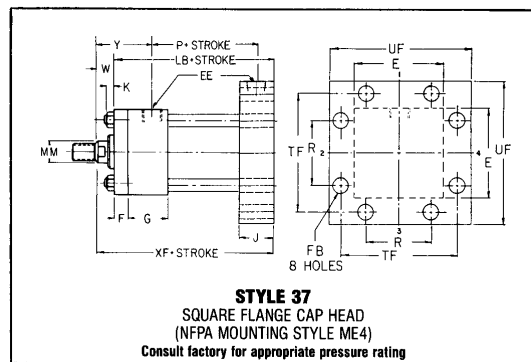
Standard Port location is Position 1.  
 Standard Cushion location is Position 2.



Standard Port location is Position 1.  
 Standard Cushion location is Position 2.



Standard Port location is Position 1. Standard Cushion location is Position 3.

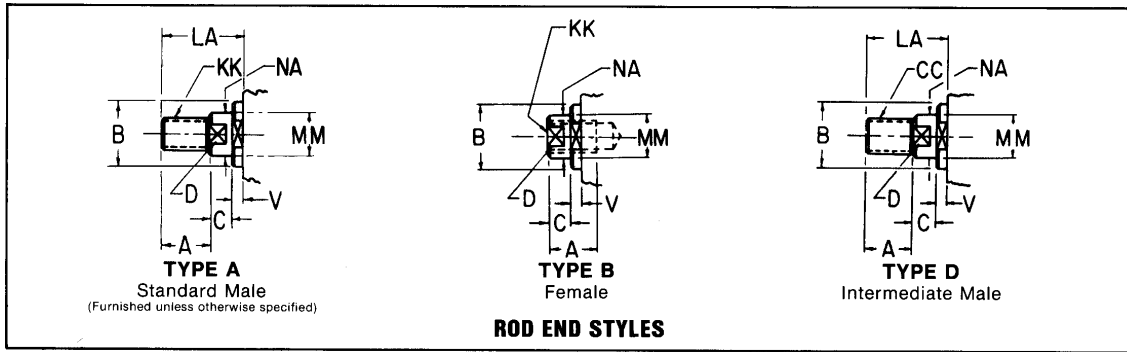


Standard Port location is Position 1. Standard Cushion location is Position 3.

Styles 6 and 7 particularly those above the 4" bore size, are not recommended for maximum operating pressures. For operating pressures above 1500 psi on the 5" and 6" bore cylinders, and 1000 psi on the 7" and 8" bore cylinders, we recommend the use of styles 16 and 17. Maximum operating pressure for 16 and 17 style flanges, in bores 5" thru 8", should not exceed 3000 psi. We recommend the use of high tensile mounting bolts on all flange mounted cylinders subjected to maximum pressure and shock loads.

**ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER**

BORE	E	EE		F	FB	G	J	K	R	TF	UF	LB	P
		NPTF	SAE										
1 1/2	2 1/2	1/2-14	10	3/8	7/16	1 3/4	1 1/2	3/8	1.63	3 7/16	4 1/4	5	2 7/8
2	3	1/2-14	10	5/8	9/16	1 3/4	1 1/2	7/16	2.05	4 1/8	5 1/8	5 1/4	2 7/8
2 1/2	3 1/2	1/2-14	10	5/8	9/16	1 3/4	1 1/2	7/16	2.55	4 5/8	5 5/8	5 3/8	3
3 1/4	4 1/2	3/4-14	12	3/4	11/16	2	1 3/4	9/16	3.25	5 7/8	7 1/8	6 1/4	3 1/2
4	5	3/4-14	12	7/8	11/16	2	1 3/4	9/16	3.82	6 3/8	7 5/8	6 5/8	3 3/4
5	6 1/2	3/4-14	12	7/8	15/16	2	1 3/4	3/4	4.95	8 3/16	9 3/4	7 1/8	4 1/4
6	7 1/2	1-11 1/2	16	1	1 1/16	2 1/4	2 1/4	7/8	5.73	9 7/16	11 1/4	8 3/8	4 7/8
7	8 1/2	1 1/4-11 1/2	20	1	1 3/16	2 3/4	2 3/4	1	6.58	10 5/8	12 5/8	9 1/2	5 3/8
8	9 1/2	1 1/2-11 1/2	24	1	1 5/16	3	3	1 1/16	7.50	11 13/16	14	10 1/2	6 1/8



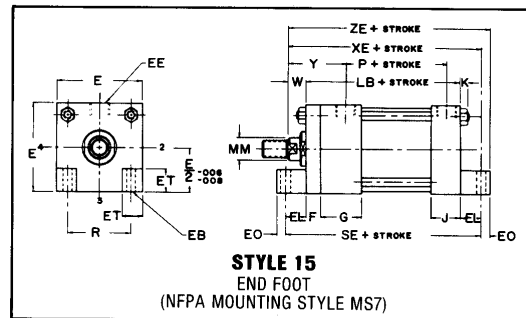
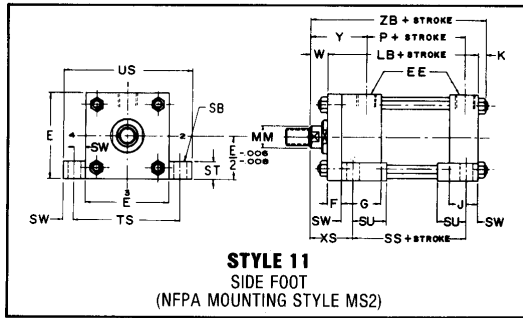
### DIMENSIONS AFFECTED BY ROD DIAMETER

BORE	ROD DIA. MM	THREAD SIZE		ROD EXTENSIONS & PILOT DIMENSIONS							ENVELOPE DIMENSIONS				
		KK	CC	A	B	C	D	LA	NA	V	W	Y	XF	ZF	
		STD.			+0.000/-0.002								ADD STROKE		
1 1/2	5/8	7/16-20	1/2-20	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	2	5 5/8	6	
	1*	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	2 3/8	6	6 3/8	
2	1	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 3/8	6	6 5/8	
	1 3/8*	1-14	1 1/4-12	1 5/8	1.499	5/8	1 1/8	2 5/8	1 5/16	3/8	1	2 5/8	6 1/4	6 7/8	
2 1/2	1	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 3/8	6 1/8	6 3/4	
	1 3/8*	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	3 1/4	1 11/16	1/2	1 1/4	2 7/8	6 5/8	7 1/4	
3 1/4	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	2 1/2	1 5/16	1/4	7/8	2 3/4	7 1/8	7 7/8	
	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	3 1/8	1 11/16	3/8	1 1/8	3	7 3/8	8 1/8	
4	2	1 1/2-12	1 3/4-12	2 1/4	2.624	7/8	1 11/16	3 1/2	1 15/16	3/8	1 1/4	3 1/8	7 1/2	8 1/4	
	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	3	1 11/16	1/4	1	3	7 5/8	8 1/2	
	2	1 1/2-12	1 3/4-12	2 1/4	2.624	7/8	1 11/16	3 3/8	1 15/16	1/4	1 1/8	3 1/8	7 3/4	8 5/8	
5	2 1/2	1 7/8-12	2 1/4-12	3	3.124	1	2 1/16	4 3/8	2 7/16	3/8	1 3/8	3 3/8	8	8 7/8	
	2	1 1/2-12	1 3/4-12	2 1/4	2.624	7/8	1 11/16	3 3/8	1 15/16	1/4	1 1/8	3 1/8	8 1/4	9 1/8	
	2 1/2	1 7/8-12	2 1/4-12	3	3.124	1	2 1/16	4 3/8	2 7/16	3/8	1 3/8	3 3/8	8 1/2	9 3/8	
	3	2 1/4-12	2 3/4-12	3 1/2	3.749	1	2 5/8	4 7/8	2 15/16	3/8	1 3/8	3 3/8	8 1/2	9 3/8	
6	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 7/8	3 7/16	3/8	1 3/8	3 3/8	8 1/2	9 3/8	
	2 1/2	1 7/8-12	2 1/4-12	3	3.124	1	2 1/16	4 1/4	2 7/16	1/4	1 1/4	3 1/2	9 5/8	10 5/8	
	3	2 1/4-12	2 3/4-12	3 1/2	3.749	1	2 5/8	4 3/4	2 15/16	1/4	1 1/4	3 1/2	9 5/8	10 5/8	
	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 3/4	3 7/16	1/4	1 1/4	3 1/2	9 5/8	10 5/8	
7	4	3-12	3 3/4-12	4	4.749	1	3 3/8	5 1/4	3 15/16	1/4	1 1/4	3 1/2	9 5/8	10 5/8	
	3	2 1/4-12	2 3/4-12	3 1/2	3.749	1	2 5/8	4 3/4	2 7/8	1/4	1 1/4	3 13/16	10 3/4	11 3/4	
	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 3/4	3 3/8	1/4	1 1/4	3 13/16	10 3/4	11 3/4	
	4	3-12	3 3/4-12	4	4.749	1	3 3/8	5 1/4	3 7/8	1/4	1 1/4	3 13/16	10 3/4	11 3/4	
8	5	3 1/2-12	4 3/4-12	5	5.749	1	4 1/4	6 1/4	4 7/8	1/4	1 1/4	3 13/16	10 3/4	11 3/4	
	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 3/4	3 3/8	1/4	1 1/4	3 15/16	11 3/4	12 3/4	
	4	3-12	3 3/4-12	4	4.749	1	3 3/8	5 1/4	3 7/8	1/4	1 1/4	3 15/16	11 3/4	12 3/4	
	5	3 1/2-12	4 3/4-12	5	5.749	1	4 1/4	6 1/4	4 7/8	1/4	1 1/4	3 15/16	11 3/4	12 3/4	
8	5 1/2	4-12	5 1/4-12	5 1/2	6.249	1	4 5/8	6 3/4	5 3/8	1/4	1 1/4	3 15/16	11 3/4	12 3/4	

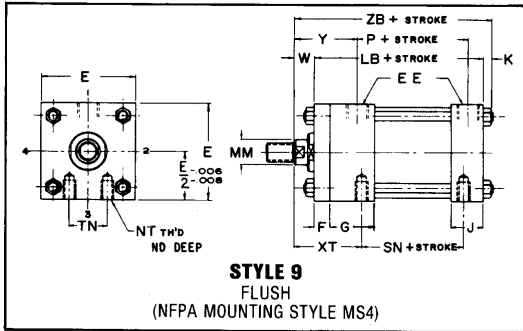
\*Rod end cushions available only as non-adjustable type- Consult Lehigh



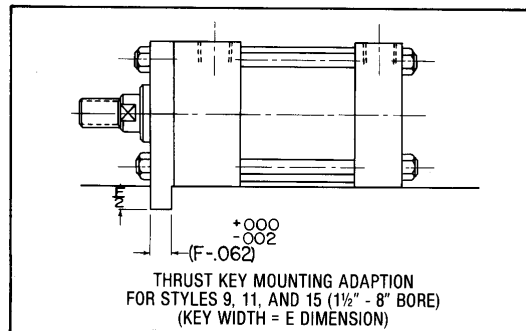
## FOOT AND FLUSH MOUNTED CYLINDERS 1 1/2" to 8" BORE SERIES HP HIGH PRESSURE HYDRAULIC CYLINDERS



*Standard Port location is Position 1. Standard Cushion location is Position 2.*



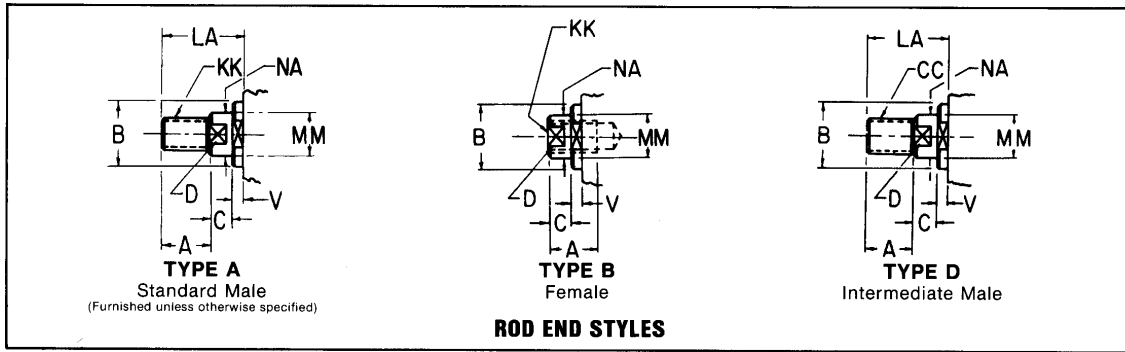
*Standard Port location is Position 1.  
Standard Cushion location is Position 2.*



### ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER

BORE	E	EB	EE		EL	EO	ET	F	G	J	K	NT
			NPTF	SAE								
1 1/2	2 1/2	7/16	1/2-14	10	7/8	3/8	7/8	3/8	1 3/4	1 1/2	3/8	3/8-16
2	3	9/16	1/2-14	10	15/16	1/2	15/16	5/8	1 3/4	1 1/2	7/16	1/2-13
2 1/2	3 1/2	9/16	1/2-14	10	15/16	1/2	15/16	5/8	1 3/4	1 1/2	7/16	5/8-11
3 1/4	4 1/2	11/16	3/4-14	12	1 1/8	5/8	1 1/4	3/4	2	1 3/4	9/16	3/4-10
4	5	11/16	3/4-14	12	1 1/8	5/8	1 3/16	7/8	2	1 3/4	9/16	1-8
5	6 1/2	15/16	3/4-14	12	1 1/2	3/4	1 9/16	7/8	2	1 3/4	3/4	1-8
6	7 1/2	1 1/16	1-11 1/2	16	1 11/16	13/16	1 3/4	1	2 1/4	2 1/4	7/8	1 1/4-7
7	8 1/2	1 3/16	1 1/4-11 1/2	20	1 13/16	1	1 15/16	1	2 3/4	2 3/4	1	1 1/2-6
8	9 1/2	1 5/16	1 1/2-11 1/2	24	2	1 1/8	2	1	3	3	1 1/16	1 1/2-6

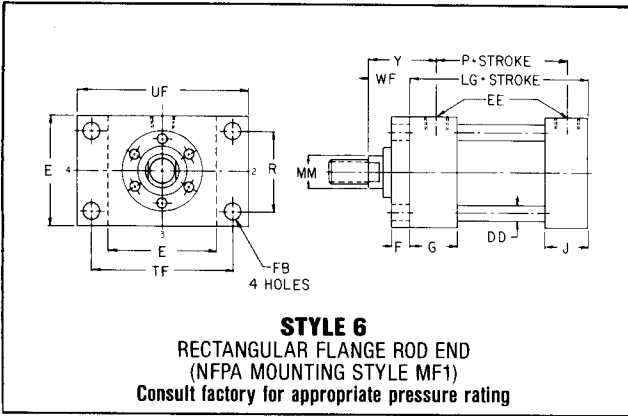
BORE	R	SB	ST	SU	SW	TN	TS	US	LB	P	SE	SN	SS
									ADD STROKE				
1 1/2	1.63	7/16	1/2	15/16	3/8	3/4	3 1/4	4	5	2 7/8	6 3/4	2 7/8	3 7/8
2	2.05	9/16	3/4	1 1/4	1/2	15/16	4	5	5 1/4	2 7/8	7 1/8	2 7/8	3 5/8
2 1/2	2.55	13/16	1	1 9/16	11/16	1 5/16	4 7/8	6 1/4	5 3/8	3	7 1/4	3	3 3/8
3 1/4	3.25	13/16	1	1 9/16	11/16	1 1/2	5 7/8	7 1/4	6 1/4	3 1/2	8 1/2	3 1/2	4 1/8
4	3.82	1 1/16	1 1/4	2	7/8	2 1/16	6 3/4	8 1/2	6 5/8	3 3/4	8 7/8	3 3/4	4
5	4.95	1 1/16	1 1/4	2	7/8	2 15/16	8 1/4	10	7 1/8	4 1/4	10 1/8	4 1/4	4 1/2
6	5.73	1 5/16	1 1/2	2 1/2	1 1/8	3 5/16	9 3/4	12	8 3/8	4 7/8	11 3/4	5 1/8	5 1/8
7	6.58	1 9/16	1 3/4	2 7/8	1 3/8	3 3/4	11 1/4	14	9 1/2	5 3/8	13 1/8	5 7/8	5 3/4
8	7.50	1 9/16	1 3/4	2 7/8	1 3/8	4 1/4	12 1/4	15	10 1/2	6 1/8	14 1/2	6 5/8	6 3/4



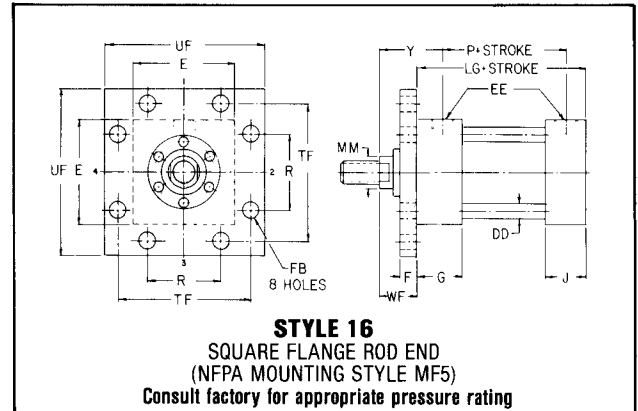
### DIMENSIONS AFFECTED BY ROD DIAMETER

BORE	ROD DIA. MM	THREAD SIZE		ROD EXTENSIONS & PILOT DIMENSIONS							ENVELOPE DIMENSIONS								
		KK STD.	CC	A	B +.000/ -.002	C	D	LA	NA	V	W	Y	ND	XS	XT	XE	ZB	ZE	
ADD STROKE																			
1 1/2	5/8	7/16-20	1/2-20	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	2	9/16	1 3/8	2	6 1/2	6	6 7/8	
	1*	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	2 3/8	7/16	1 3/4	2 3/8	6 7/8	6 3/8	7 1/4	
2	1	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 3/8	5/8	1 7/8	2 3/8	6 15/16	6 7/16	7 7/16	
	1 3/8*	1-14	1 1/4-12	1 5/8	1.499	5/8	1 1/8	2 5/8	1 5/16	3/8	1	2 5/8	7/16	2 1/8	2 5/8	7 3/16	6 11/16	7 11/16	
2 1/2	1	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 3/8	11/16	2 1/16	2 3/8	7 1/16	6 9/16	7 9/16	
	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	2 5/8	1 5/16	3/8	1	2 5/8	7/16	2 5/16	2 5/8	7 5/16	6 13/16	7 13/16	
	1 3/4*	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	3 1/4	1 11/16	1/2	1 1/4	2 7/8	7/16	2 9/16	2 7/8	7 9/16	7 1/16	8 1/16	
3 1/4	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	2 1/2	1 5/16	1/4	7/8	2 3/4	13/16	2 5/16	2 3/4	8 1/4	7 11/16	8 7/8	
	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	3 1/8	1 11/16	3/8	1 1/8	3	13/16	2 9/16	3	8 1/2	7 15/16	9 1/8	
4	2	1 1/2-12	1 3/4-12	2 1/4	2.624	7/8	1 11/16	3 1/2	1 15/16	3/8	1 1/4	3 1/8	3/4	2 11/16	3 1/8	8 5/8	8 1/16	9 1/4	
	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	3	1 11/16	1/4	1	3	7/8	2 3/4	3	8 3/4	8 3/16	9 3/8	
	2	1 1/2-12	1 3/4-12	2 1/4	2.624	7/8	1 11/16	3 3/8	1 15/16	1/4	1 1/8	3 1/8	3/4	2 7/8	3 1/8	8 7/8	8 5/16	9 1/2	
5	2 1/2	1 7/8-12	2 1/4-12	3	3.124	1	2 1/16	4 3/8	2 7/16	3/8	1 3/8	3 3/8	3/4	3 1/8	3 3/8	9 1/8	8 9/16	9 3/4	
	2	1 1/2-12	1 3/4-12	2 1/4	2.624	7/8	1 11/16	3 3/8	1 15/16	1/4	1 1/8	3 1/8	15/16	2 7/8	3 1/8	9 3/4	9	10 1/2	
	2 1/2	1 7/8-12	2 1/4-12	3	3.124	1	2 1/16	4 3/8	2 7/16	3/8	1 3/8	3 3/8	15/16	3 1/8	3 3/8	10	9 1/4	10 3/4	
	3 1/2	2 1/4-12	2 3/4-12	3 1/2	3.749	1	2 5/8	4 7/8	2 15/16	3/8	1 3/8	3 3/8	13/16	3 1/8	3 3/8	10	9 1/4	10 3/4	
6	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 7/8	3 7/16	3/8	1 3/8	3 3/8	13/16	3 1/8	3 3/8	10	9 1/4	10 3/4	
	2 1/2	1 7/8-12	2 1/4-12	3	3.124	1	2 1/16	4 1/4	2 7/16	1/4	1 1/4	3 1/2	1 3/4	3 3/8	3 1/2	11 5/16	10 1/2	12 3/16	
	3	2 1/4-12	2 3/4-12	3 1/2	3.749	1	2 5/8	4 3/4	2 15/16	1/4	1 1/4	3 1/2	1 3/4	3 3/8	3 1/2	11 5/16	10 1/2	12 3/16	
7	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 3/4	3 7/16	1/4	1 1/4	3 1/2	15/16	3 3/8	3 1/2	11 5/16	10 1/2	12 3/16	
	4	3-12	3 3/4-12	4	4.749	1	3 3/8	5 1/4	3 15/16	1/4	1 1/4	3 1/2	15/16	3 3/8	3 1/2	11 5/16	10 1/2	12 3/16	
	3	2 1/4-12	2 3/4-12	3 1/2	3.749	1	2 5/8	4 3/4	2 7/8	1/4	1 1/4	3 13/16	2 1/8	3 5/8	3 13/16	12 9/16	11 3/4	13 9/16	
	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 3/4	3 3/8	1/4	1 1/4	3 13/16	2 1/8	3 5/8	3 13/16	12 9/16	11 3/4	13 9/16	
8	4	3-12	3 3/4-12	4	4.749	1	3 3/8	5 1/4	3 7/8	1/4	1 1/4	3 13/16	1 3/4	3 5/8	3 13/16	12 9/16	11 3/4	13 9/16	
	5	3 1/2-12	4 3/4-12	5	5.749	1	4 1/4	6 1/4	4 7/8	1/4	1 1/4	3 13/16	1 1/8	3 5/8	3 13/16	12 9/16	11 3/4	13 9/16	
	3 1/2	2 1/2-12	3 1/4-12	3 1/2	4.249	1	3	4 3/4	3 3/8	1/4	1 1/4	3 15/16	2 1/4	3 5/8	3 15/16	13 3/4	12 13/16	14 7/8	
	5 1/2	4-12	5 1/4-12	5 1/2	6.249	1	4 5/8	6 3/4	5 3/8	1/4	1 1/4	3 15/16	1 1/2	3 5/8	3 15/16	13 3/4	12 13/16	14 7/8	

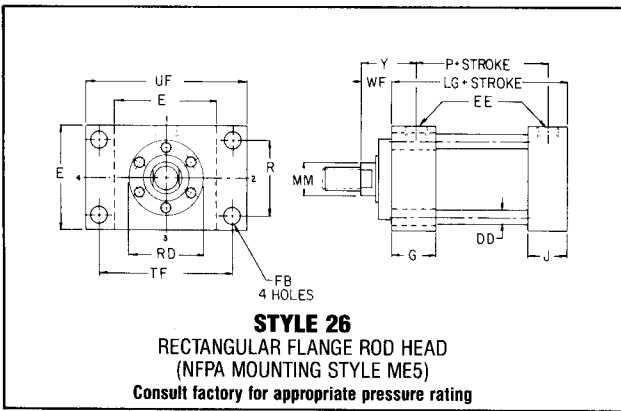
\*Rod end cushions available only as non-adjustable type- Consult Lehigh



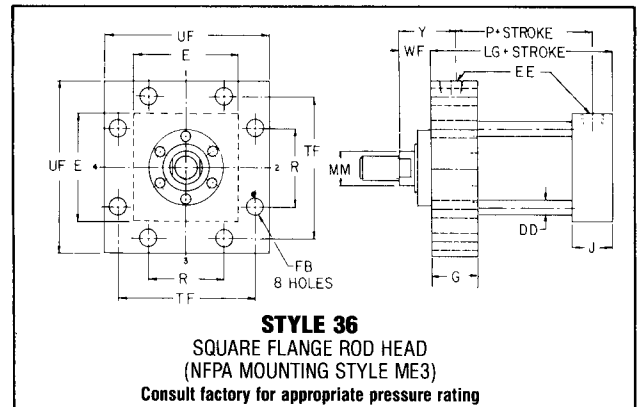
Standard Port location is Position 1.  
Standard Cushion location is Position 2.



Standard Port location is Position 1.  
Standard Cushion location is Position 2.



Standard Port location is Position 1.  
Standard Cushion location is Position 3 Rod End and Position 2 Cap End.



Standard Port location is Position 1.  
Standard Cushion location is Position 3 Rod End and Position 2 Cap End.

Style 26 mounts can be used at full rated pressure except as indicated in the chart below:

Styles 6, 7, 16 and 17 are not recommended for maximum operating pressures. Styles 6 and 7 can be used for 1000 psi maximum; styles 16 and 17 should be limited to 2500 psi maximum operating pressure. We recommend the use of high tensile mounting bolts on all flange mounted cylinders subjected to maximum pressures and shock loads.

BORE	ROD DIA.	MOUNT STYLE	PORT POSITION	MAX. OPER. PRESSURE—PSI
10	5	26	1 or 3	2500
	7	26	1 or 3	1500
12	8½	26	1 or 3	1500

### ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER FOR BOTH ROD END & CAP END MOUNTINGS

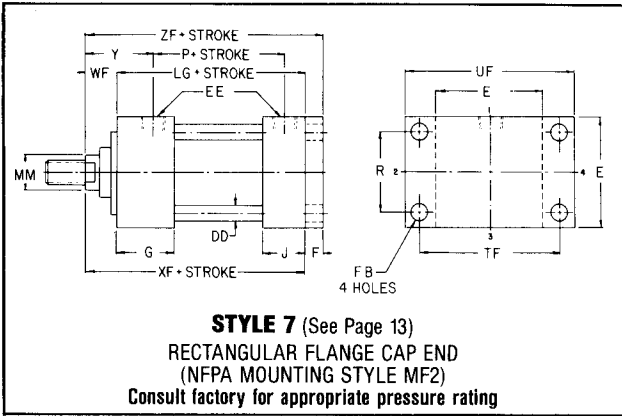
BORE	DD DIA.	E	EE		F	FB	G	J	R	TF	UF	LG	P
			NPTF	SAE									
10	1	12 5/8	2—11 1/2	32	1 11/16	1 13/16	3 11/16	3 11/16	9.62	15 7/8	19	12 1/8	8 1/2
12	1	14 7/8	2 1/2—8	32	1 15/16	2 1/16	4 7/16	4 7/16	11.45	18 1/2	22	14 1/2	10 1/8

### DIMENSIONS NOT AFFECTED BY ROD DIAMETER FOR BOTH ROD END & CAP END MOUNTINGS

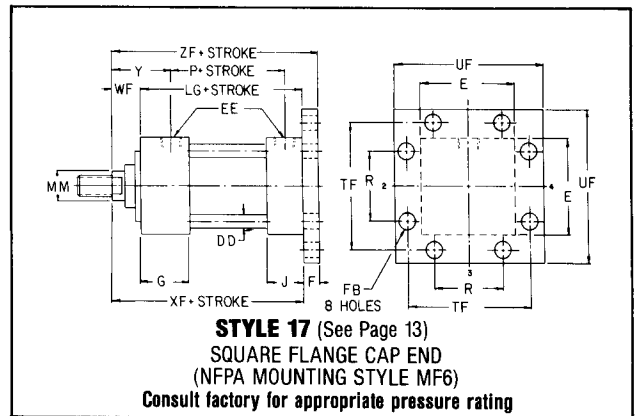
BORE	ROD DIA MM	THREAD SIZE		A	B +.000 - .005	C	D	LA	LAH	NA	V	W	VH	RD MAX	WF	Y	ADD STROKE	
		KK	CC														XF	ZF
10	5	3 1/2—12	4 3/4—12	5	5.749	1	4 1/4	6 1/4	7 15/16	4 7/8	1/4	1 1/4	1	9 1/2	2 15/16	4 3/4	15 1/16	16 3/4
	7	4—12	4 3/4—12	5	7.749	1	6	6 1/2	8 3/16	6 7/8	1/2	1 1/2	1 1/8	10 3/4	3 3/16	5	15 5/16	17
12	5 1/2	4—12	5 1/4—12	5 1/2	6.249	1	4 5/8	6 3/4	8 11/16	5 3/8	1/4	1 1/4	1 5/16	10 1/8	3 3/16	5 3/8	17 11/16	19 5/8
	8 1/2	4 1/2—12	5 1/4—12	5 1/2	9.249	1	7 1/4	7	8 15/16	8 3/8	1/2	1 1/2	1 1/8	13 1/4	3 7/16	5 5/8	17 15/16	19 7/8



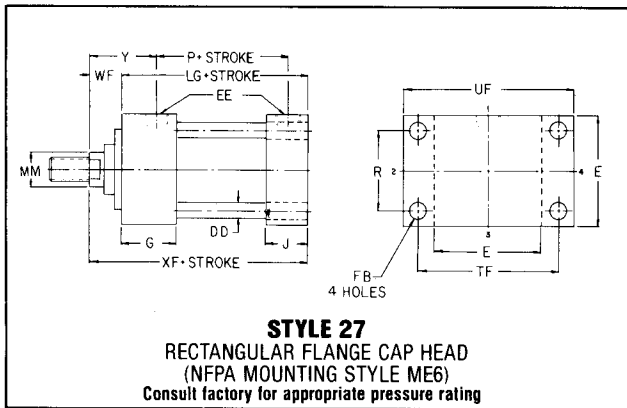
**CAP END FLANGE MOUNTED CYLINDERS  
10" AND 12" BORE SERIES HP HIGH PRESSURE HYDRAULIC CYLINDERS**



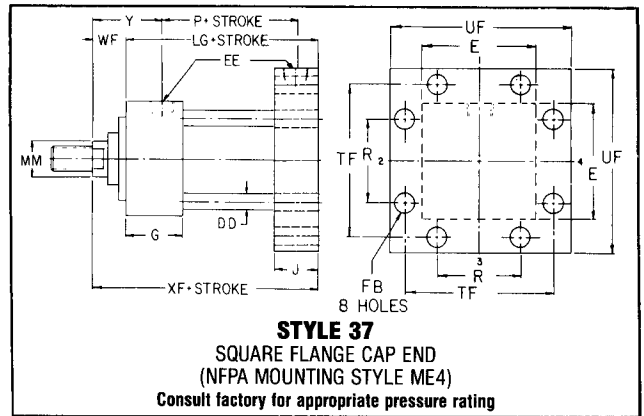
Standard Port location is Position 1.  
Standard Cushion location is Position 2.



Standard Port location is Position 1.  
Standard Cushion location is Position 2.



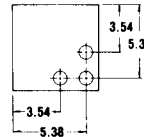
Standard Port location is Position 1.  
Standard Cushion location is Position 2 Rod End and Position 3 Cap End.



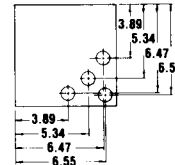
Standard Port location is Position 1.  
Standard Cushion location is Position 2 Rod End and Position 3 Cap End.

**TIE ROD SPACING—**

**10" BORE**



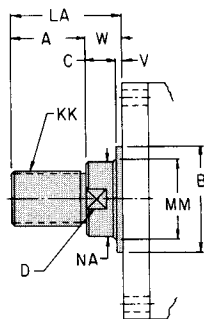
**12" BORE**



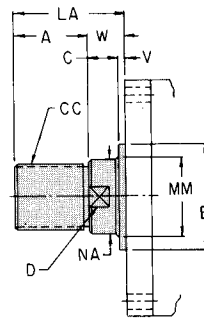
**ROD END DIMENSIONS—**

**FOR MOUNTING STYLES 6, 16**

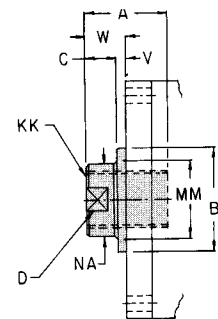
**TYPE A  
STANDARD  
MALE**



**TYPE D  
INTERMEDIATE  
MALE**

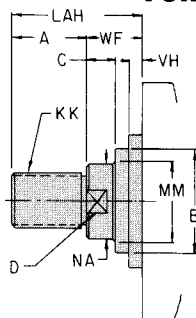


**TYPE B  
FEMALE**

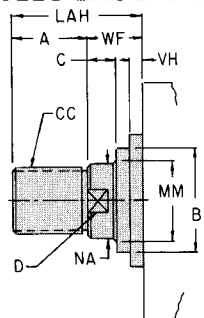


**FOR ALL MOUNTING STYLES EXCEPT #6 & #16**

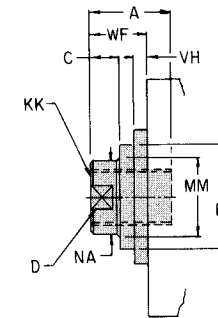
**TYPE A  
STANDARD  
MALE**



**TYPE D  
INTERMEDIATE  
MALE**

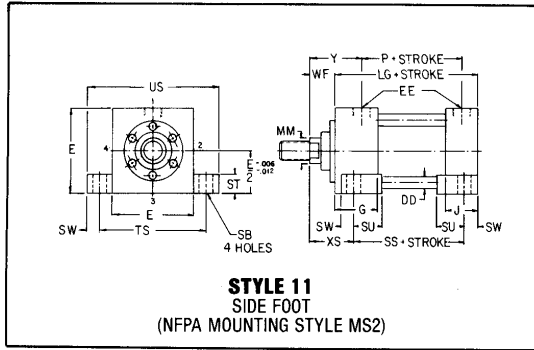


**TYPE B  
FEMALE**



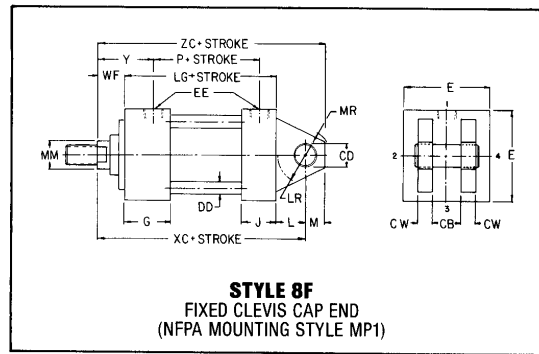


**SIDE FOOT, CLEVIS AND DOUBLE END CYLINDERS  
10" & 12" BORE SERIES HP HIGH PRESSURE HYDRAULIC CYLINDERS**



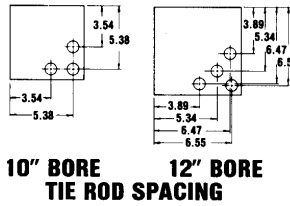
**STYLE 11**  
SIDE FOOT  
(NFPA MOUNTING STYLE MS2)

Standard Port location is Position 1.  
Standard Cushion location is Position 2.

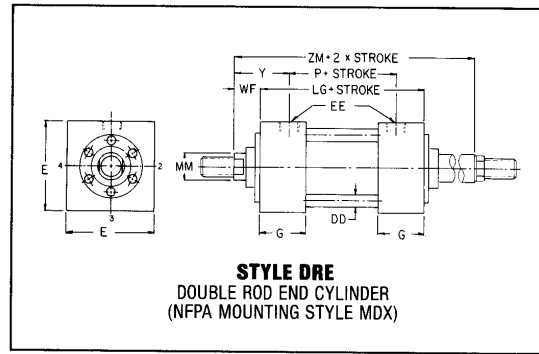


**STYLE 8F**  
FIXED CLEVIS CAP END  
(NFPA MOUNTING STYLE MP1)

Standard Port location is Position 1.  
Standard Cushion location is Position 2.



**10" BORE**  
**12" BORE**  
TIE ROD SPACING



**STYLE DRE**  
DOUBLE ROD END CYLINDER  
(NFPA MOUNTING STYLE MDX)

Standard Port location is Position 1.  
Standard Cushion location is Position 2.

**ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER**

BORE	CB	CD* +/- .001	CW	DD DIA.	E	EE		G	J	L	LR	M	MR	SB	ST	SU	SW	TS	US	ADD STROKE		
						NPTF	SAE													LG	P	SS
10	4	3.500	2	1	12 5/8	2-11 1/2	32	3 11/16	3 11/16	4	3 7/8	3 1/2	4 1/2	1 9/16	2 1/4	3 1/2	1 5/8	15 7/8	19 1/8	12 1/8	8 1/2	8 7/8
12	4 1/2	4.000	2 1/4	1	14 7/8	2 1/2-8	32	4 7/16	4 7/16	4 1/2	4 3/8	4	4 3/8	1 9/16	3	4 1/4	2	18 7/8	22 7/8	14 1/2	10 1/8	10 1/2

\*CD = Pin Diameter

**DIMENSIONS AFFECTED BY ROD DIAMETER**

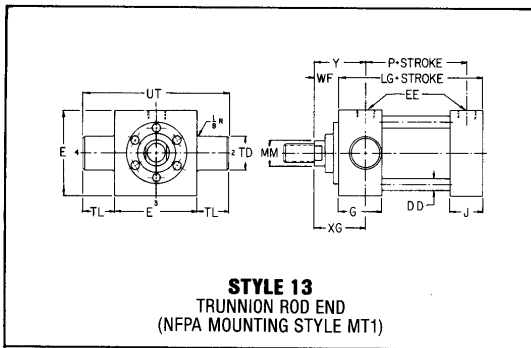
BORE	ROD DIA. MM	THREAD SIZE		A	B	C	D	LAH	NA	VH	WF	RD MAX.	Y	XS	ADD STROKE		ADD 2X STROKE
		KK	CC		+ .000										- .005	XC	
																ZM	
10	5	3 1/2-12	4 3/4-12	5	5.749	1	4 1/4	7 15/16	4 7/8	1	2 15/16	9 1/2	4 3/4	4 9/16	19 1/16	22 9/16	18
	7	4-12	4 3/4-12	5	7.749	1	6	8 3/16	6 7/8	1 1/8	3 3/16	10 3/4	5	4 13/16	19 5/16	22 13/16	18 1/2
12	5 1/2	4-12	5 1/4-12	5 1/2	6.249	1	4 5/8	8 11/16	5 3/8	1 5/16	3 3/16	10 1/8	5 3/8	5 3/16	22 3/16	26 3/16	20 7/8
	8 1/2	4 1/2-12	5 1/4-12	5 1/2	9.249	1	7 1/4	8 15/16	8 3/8	1 1/8	3 7/16	13 1/4	5 5/8	5 7/16	22 7/16	16 7/16	21 3/8

See Page 14 for Rod End Dimensions



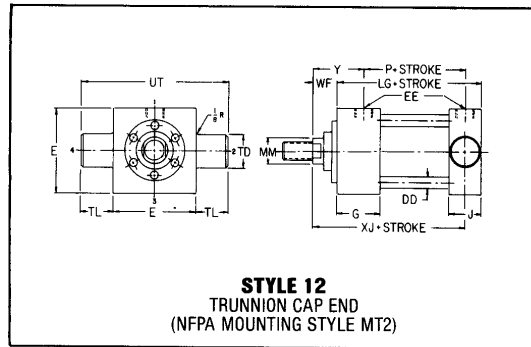


## TRUNNION MOUNTED CYLINDERS 10" AND 12" BORE SERIES HP HIGH PRESSURE HYDRAULIC CYLINDERS



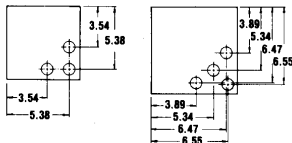
**STYLE 13**  
TRUNNION ROD END  
(NFA MOUNTING STYLE MT1)

Standard Port location is Position 1.  
Standard Cushion location is Position 3 Rod End  
and Position 2 Cap End.

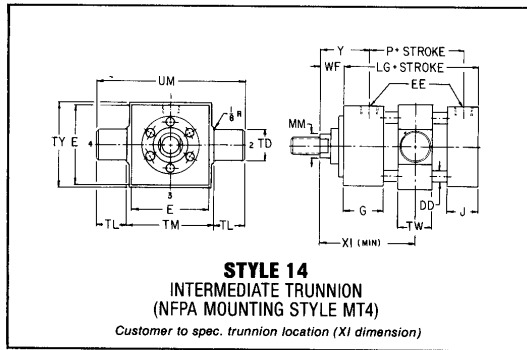


**STYLE 12**  
TRUNNION CAP END  
(NFA MOUNTING STYLE MT2)

Standard Port location is Position 1.  
Standard Cushion location is Position 2 Rod End  
and Position 3 Cap End.



**10" BORE**  
**12" BORE**  
TIE ROD SPACING



**STYLE 14**  
INTERMEDIATE TRUNNION  
(NFA MOUNTING STYLE MT4)

Customer to spec. trunnion location (XI dimension)

Standard Port location is Position 1.  
Standard Cushion location is Position 2.

The trunnion pintles are not removable. For information on removable pintles, please consult the engineering department.

The position of the intermediate trunnion mount is not adjustable.

**NOTE:** Cylinders with 12, 13 and 14 in. bores 10.0" thru 12" should not be used for pressures in excess of 2000 psi.

Pintles on trunnion mounted cylinders are designed to withstand shear loads, but not high bending loads. Pillow blocks must be rigidly mounted to provide full support with minimum clearances.

### ENVELOPE & MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER

BORE	DD DIA.	E	EE		G	J	TD +0.000 -0.001	TL	TM	TW	TY	UM	UT	UW	ADD STROKE	
			NPTF	SAE											LG	P
10	1	12 5/8	2-11 1/2	32	3 11/16	3 11/16	3.500	3 1/2	14	4 1/2	13	21	19 5/8	17 1/2	12 1/8	8 1/2
12	1	14 7/8	2 1/2-8	32	4 7/16	4 7/16	4.000	4	16 1/2	5 1/2	15 1/2	24 1/2	22 7/8	20 3/4	14 1/2	10 1/8

### DIMENSIONS AFFECTED BY ROD DIAMETER

BORE	ROD DIA. MM	THREAD SIZE		A	B +0.000 -0.005	C	D	LAH	NA	VH	WF	RD MAX.	XG	XI MIN.	Y	ADD STROKE XJ
		KK	CC													
10	5	3 1/2-12	4 3/4-12	5	5.749	1	4 1/4	7 15/16	4 7/8	1	2 15/16	9 1/2	4 3/4	8 7/8	4 3/4	13 1/4
	7	4/12	4 3/4-12	5	7.749	1	6	8 3/16	6 7/8	1 1/8	3 3/16	10 3/4	5	9 1/8	5	13 1/2
12	5 1/2	4/12	5 1/4-12	5 1/2	6.249	1	4 5/8	8 11/16	5 3/8	1 5/16	3 3/16	10 1/8	5 3/8	10 3/8	5 3/8	15 1/2
	8 1/2	4 1/2-12	5 1/4-12	5 1/2	9.249	1	7 1/4	8 15/16	8 3/8	1 1/8	3 7/16	13 1/4	5 3/8	10 5/8	5 3/8	15 3/4

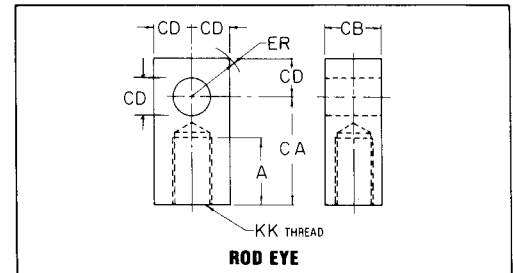
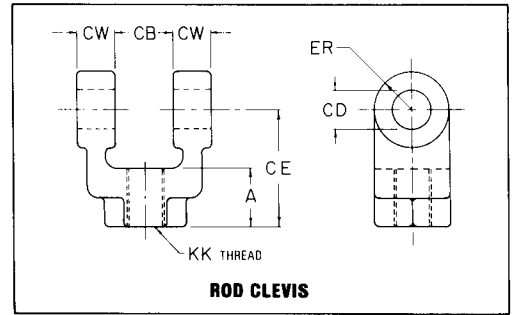
See Page 14 for Rod End Dimensions



# CYLINDER CAP AND ROD END MOUNTING ACCESSORIES 1½" to 12" BORE SERIES HP HIGH PRESSURE HYDRAULIC CYLINDERS

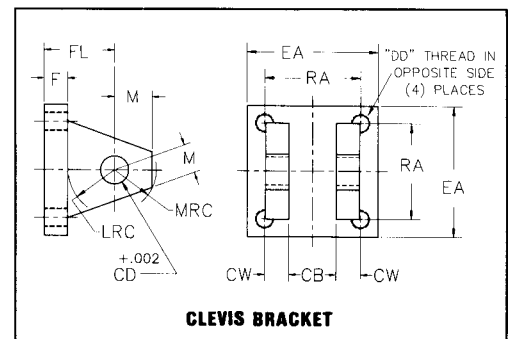
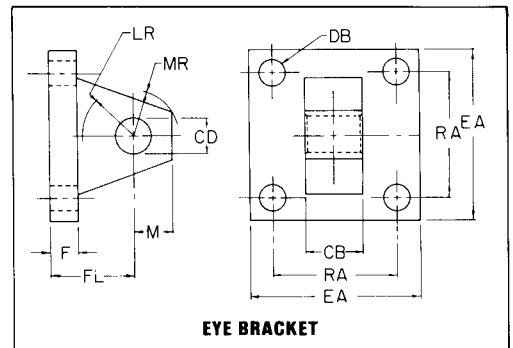
## ROD END ACCESSORIES

ROD THREAD SIZE (KK)	ROD CLEVIS	ROD EYE	EYE BRACKET	PIVOT PIN	CLEVIS BRACKET
7/16"—20	MACCL01	MACRE01	MACEB01	MACPN01	MACCB01
3/4"—16	MACCL02	MACRE02	MACEB02	MACPN02	MACCB02
1"—14	MACCL03	MACRE03	MACEB03	MACPN03	MACCB03
1¼"—12	MACCL04	MACRE04	MACEB04	MACPN04	MACCB04
1½"—12	MACCL05	MACRE05	MACEB05	MACPN05	MACCB05
1¾"—12	MACCL06	MACRE06	MACEB06	MACPN06	MACCB06
2¼"—12	MACCL07	MACRE07	MACEB07	MACPN07	MACCB07
2½"—12	MACCL08	MACRE08	MACEB08	MACPN08	MACCB08
3¼"—12	MACCL09	MACRE09	MACEB09	MACPN09	MACCB09
4"—12	MACCL010	MACRE010	MACEB010	MACPN010	MACCB010



## CAP END ACCESSORIES

CYLINDER BORE	EYE BRACKET	PIVOT PIN	CLEVIS BRACKET
1½"	MACEB01	MACPN01	MACCB01
2" & 2½"	MACEB02	MACPN02	MACCB02
3¼"	MACEB03	MACPN03	MACCB03
4"	MACEB04	MACPN04	MACCB04
5"	MACEB05	MACPN05	MACCB05
6"	MACEB06	MACPN06	MACCB06
7"	MACEB07	MACPN07	MACCB07
8"	MACEB08	MACPN08	MACCB08
10"	MACEB09	MACPN09	MACCB09
12"	MACEB010	MACPN010	MACCB010



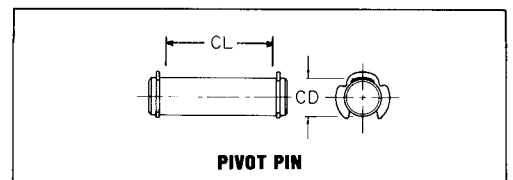
### NOTES

#### ROD END ACCESSORIES

1. Rod Clevises and Rod Eyes are stocked to fit the standard KK thread (Small Male). The CC thread (Intermediate Male) can be supplied on special order, but should be avoided if possible.
2. Rod Clevises are supplied with Pivot Pin as standard. Pivot Pins are not supplied with Rod Eyes or Eye Brackets. They must be ordered as a separate item if desired.

#### CAP END ACCESSORIES

1. Pivot Pins are not supplied with Eye Brackets. They must be ordered as a separate item if desired.
2. Eye Brackets are designed to match with cylinder mounting Style 8F (NFPA MP1).
3. Clevis Brackets are designed to match with cylinder Rod Eyes.





**CYLINDER CAP AND ROD END MOUNTING ACCESSORIES  
1-1/2" TO 12" BORE SERIES HP HIGH PRESSURE HYDRAULIC  
CYLINDERS**

**ROD CLEVIS PART NUMBER**

	MACCL01	MACCL02	MACCL03	MACCL04	MACCL05	MACCL06	MACCL07	MACCL08	MACCL09	MACCL10
<b>A</b>	3/4	1 1/8	1 5/8	2	2 1/4	3	3 1/2	3 1/2	4 1/2	5 1/2
<b>CB</b>	3/4	1 1/4	1 1/2	2	2 1/2	2 1/2	3	3	4	4 1/2
<b>CD</b>	1/2	3/4	1	1 3/8	1 3/4	2	2 1/2	3	3 1/2	4
<b>CE</b>	1 1/2	2 3/8	3 1/8	4 1/8	4 1/2	5 1/2	6 1/2	6 3/4	8 1/2	10
<b>CW</b>	1/2	5/8	3/4	1	1 1/4	1 1/4	1 1/2	1 1/2	2	2 1/4
<b>ER</b>	1/2	3/4	1	1 3/8	1 3/4	2	2 1/2	3	3 1/2	4
<b>K</b>	7/16-20	3/4-16	1-14	1 1/4-12	1 1/2-12	1 7/8-12	2 1/4-12	2 1/2-12	3 1/4-12	4-12

**ROD EYE PART NUMBER**

	MACRE01	MACRE02	MACRE03	MACRE04	MACRE05	MACRE06	MACRE07	MACRE08	MACRE09	MACRE010
<b>A</b>	3/4	1 1/8	1 5/8	2	2 1/4	3	3 1/2	3 1/2	4 1/2	5 1/2
<b>CA</b>	1 1/2	2 1/16	2 13/16	3 7/16	4	5	5 13/16	6 1/8	7 5/8	9 1/8
<b>CB</b>	3/4	1 1/4	1 1/2	2	2 1/2	2 1/2	3	3	4	4 1/2
<b>CD</b>	1/2	3/4	1	1 3/8	1 3/4	2	2 1/2	3	3 1/2	4
<b>ER</b>	23/32	1 1/16	1 7/16	1 31/32	2 1/2	2 27/32	3 9/16	3 1/4	3 3/4	4 1/4
<b>KK</b>	7/16-20	3/4-16	1-14	1 1/4-12	1 1/2-12	1 7/8-12	2 1/4-12	2 1/2-12	3 1/4-12	4-12

**EYE BRACKET PART NUMBER (MACEB) OR CLEVIS BRACKET PART NUMBER (MACCB)**

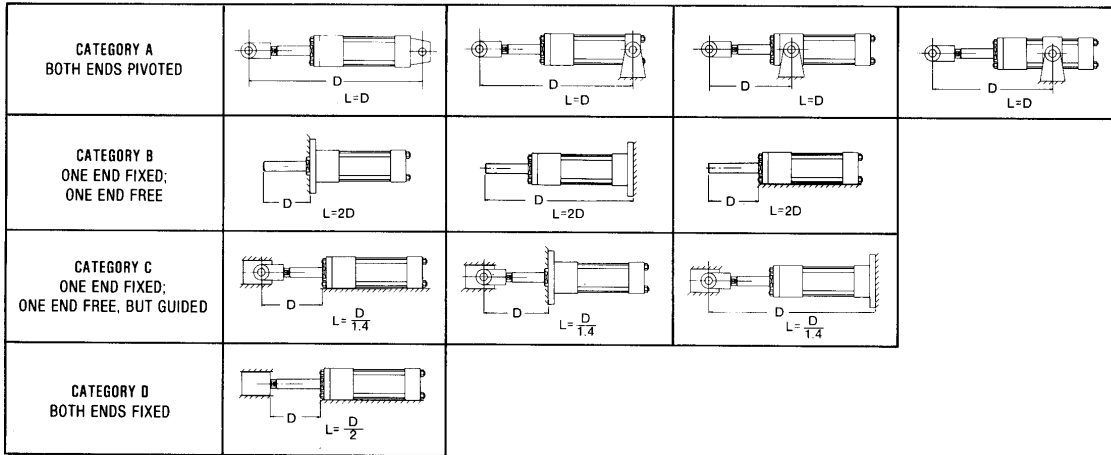
	MACCB01	MACCB02	MACCB03	MACCB04	MACCB05	MACCB06	MACCB07	MACCB08	MACCB09	MACCB010
	MACEB01	MACEB02	MACEB03	MACEB04	MACEB05	MACEB06	MACEB07	MACEB08	MACEB09	MACEB010
<b>CB</b>	3/4	1 1/4	1 1/2	2	2 1/2	2 1/2	3	3	4	4 1/2
<b>CD</b>	1/2	3/4	1	1 3/8	1 3/4	2	2 1/2	3	3 1/2	4
<b>CW</b>	1/2	5/8	3/4	1	1 1/4	1 1/4	1 1/2	1 1/2	2	2 1/4
<b>DB</b>	13/32	17/32	21/32	21/32	29/32	1 1/16	1 3/16	1 5/16	1 13/16	2 1/16
<b>DD</b>	3/8-24	1/2-20	5/8-18	5/8-18	7/8-14	1-14	1 1/8-12	1 1/4-12	1 3/4-12	2-12
<b>EA</b>	2 1/2	3 1/2	4 1/2	5	6 1/2	7 1/2	8 1/2	9 1/2	12 5/8	14 7/8
<b>F</b>	3/8	5/8	3/4	7/8	7/8	1	1	1	1 11/16	1 15/16
<b>FL</b>	1 1/8	1 7/8	2 1/4	3	3 1/8	3 1/2	4	4 1/4	5 11/16	6 7/16
<b>LR</b>	3/4	1 1/4	1 1/2	2 1/8	2 1/4	2 1/2	3	3 1/4	4	4 1/2
<b>LRC</b>	1/2	1 1/16	1 1/4	1 7/8	2	2 1/8	2 5/8	2 7/8	3 5/8	4
<b>M</b>	1/2	3/4	1	1 3/8	1 3/4	2	2 1/2	3	3 1/2	4
<b>MR</b>	9/16	7/8	1 1/4	1 5/8	2 1/8	2 7/16	3	3 1/4	3 7/8	5 1/4
<b>MRC</b>	9/16	1 1/16	1 1/8	1 3/4	1 7/8	2 1/8	2 1/2	2 3/4	3 1/2	4
<b>RA</b>	1.63	2.55	3.25	3.82	4.95	5.73	6.58	7.50	9.62	11.45

**PIVOT PIN PART NUMBER**

	MACPN01	MACPN02	MACPN03	MACPN04	MACPN05	MACPN06	MACPN07	MACPN08	MACPN09	MACPN010
<b>CD</b>	1/2	3/4	1	1 3/8	1 3/4	2	2 1/2	3	3 1/2	4
<b>CL</b>	1 3/4	2 1/2	3	4	5	5	6	6	8	9



## CYLINDER PISTON ROD SELECTION CHART 1 1/2" to 12" BORE SERIES HP HIGH PRESSURE HYDRAULIC CYLINDERS



### DETERMINING PROPER PISTON ROD DIAMETER

To determine proper Piston Rod Diameter for your specific application, follow the sequence outlined below:

**STEP 1)** Determine the maximum extension thrust (push) in pounds that your selected bore cylinder will develop.

**STEP 2)** Using the drawings above, locate your mounting category, noting the value of "L" in relation to the extended cylinder dimension "D".

**STEP 3)** Prior to determining final "D" dimension in inches, check to see if cylinder stop tube is necessary for proper cylinder operation. As a general rule, whenever the "D" dimension exceeds 40", use 1" of stop tube length for each additional 10" of "D" dimension.

Example: If "D" dimension is 54", the stop tube length should be 2".

**STEP 4)** Determine the final value of "D" in inches, including stop tube addition if applicable. Convert "D" dimension to chart value "L" in inches, using formula shown on applicable drawing.

**STEP 5)** In the Selection Chart at right, locate line showing the maximum Thrust in Pounds and read to the right until the approximate value of "L" is located. Read vertically upward to find the necessary rod diameter in inches.

Example: If the maximum thrust is 5,000 lbs., and value of "L" has been determined as 110", the minimum rod diameter recommended would be 2".

**STEP 6)** Note that in some cases the recommended minimum rod diameter may exceed that possible for the cylinder bore size selected. In such cases it may be necessary to select a larger bore cylinder operating at a lower pressure which will still provide the required operation thrust. The larger cylinder may accommodate a larger rod size which will meet the minimum requirement.

ROD DIA.	5/8"	1"	1 3/8"	1 3/4"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	7"	8 1/2"
THRUST IN LBS	VALUE OF "L" IN INCHES													
1,000	27	60	105	155	190	257	330							
1,400	24	53	92	142	174	244	308	385						
1,800	23	48	82	127	160	230	296	366	440					
2,400	19	45	75	114	145	213	281	347	415	488				
3,200	16	41	67	103	130	194	261	329	400	461				
4,000	13	38	63	94	119	175	240	310	378	446				
5,000	9	34	60	87	110	163	225	289	360	426	494			
6,000		30	56	82	102	152	208	274	342	410	476			
8,000		26	50	76	93	137	188	245	310	375	447			
10,000		21	45	70	89	125	172	222	279	349	412	482		
15,000			36	61	78	114	154	197	248	326	388	454		
20,000			28	52	68	103	136	172	218	292	350	420		
25,000			20	45	61	95	128	164	203	270	326	385		
30,000				39	55	87	120	156	189	230	285	330		
40,000				22	43	74	108	142	177	210	248	294		
50,000					30	66	96	130	165	200	234	269	408	
60,000						57	88	119	154	190	225	256	384	
80,000						36	71	104	137	170	204	240	348	
100,000							57	90	120	154	199	222	324	435
120,000							45	77	108	146	175	207	313	396
140,000								64	98	128	160	194	301	365
160,000								47	86	118	148	182	279	345
200,000									67	98	131	161	260	306
250,000										72	109	141	236	275
300,000											86	120	212	251
350,000											52	100	195	234
400,000												77	182	301
500,000													152	269



# CYLINDER THEORETICAL CAPACITY CHART

## 1-1/2" TO 12" BORE SERIES HP HIGH PRESSURE HYDRAULIC CYLINDERS

### PUSH AND PULL STROKE FORCE AND DISPLACEMENT

CYLINDER BORE DIAMETER	PISTON ROD DIAMETER	PISTON AREA SQ. INCH	HYDRAULIC CYLINDER PRESSURE P.S.I							FLUID REQUIRED PER INCH OF STROKE	
			500	750	1,000	1,500	2,000	2,500	3,000	CUBIC INCH	GALLON
1 1/2	*	1.767	883	1,325	1,767	2,651	3,534	4,417	5,301	1.767	.00765
	5/8	1.460	730	1,095	1,460	2,190	2,920	3,650	4,380	1.460	.00632
	1	.982	491	736	982	1,473	1,964	2,455	2,946	.982	.00425
2	*	3.141	1,571	2,356	3,141	4,711	6,283	7,853	9,423	3.141	.01360
	1	2.356	1,178	1,767	2,356	3,534	4,721	5,894	7,068	2.356	.01020
	1 3/8	1.656	828	1,242	1,656	2,484	3,312	4,140	4,968	1.656	.00717
2 1/2	*	4.909	2,454	3,682	4,909	7,363	9,818	12,272	14,727	4.909	.02125
	1	4.124	2,062	3,093	4,124	6,186	8,248	10,310	12,372	4.124	.01785
	1 3/8	3.424	1,712	2,568	3,424	5,136	6,848	8,560	10,272	3.424	.01482
	1 3/4	2.504	1,252	1,878	2,504	3,756	5,008	6,260	7,512	2.504	.01084
3 1/4	*	8.296	4,148	6,222	8,296	12,444	16,592	20,740	24,888	8.296	.0359
	1 3/8	6.811	3,405	5,108	6,811	10,216	13,622	17,027	20,433	6.811	.0259
	1 3/4	5.891	2,945	4,418	5,891	8,836	11,782	14,727	17,673	5.891	.0225
	2	5.145	2,577	3,865	5,154	7,731	10,308	12,890	15,462	5.154	.0223
4	*	12.57	6,283	9,425	12,566	18,849	25,132	31,415	37,698	12.57	.0544
	1 3/4	10.16	5,080	7,621	10,161	15,241	20,322	25,402	30,483	10.16	.0440
	2	9.424	4,712	7,068	9,424	14,136	18,848	23,560	28,272	9.424	.0408
	2 1/2	7.657	3,828	5,743	7,657	11,485	15,314	19,142	22,971	7.657	.0331
5	*	19.64	9,818	14,726	19,635	29,453	39,270	49,087	58,905	19.64	.0850
	2	16.49	8,246	12,369	16,492	24,738	32,648	41,212	49,476	16.49	.0714
	2 1/2	14.73	7,363	11,044	14,726	22,089	29,542	36,815	44,178	14.73	.0637
	3	12.57	6,283	9,424	12,566	18,849	25,132	31,415	37,698	12.57	.0544
	3 1/2	10.01	5,007	7,510	10,014	15,021	20,028	25,035	30,042	10.01	.0433
6	*	28.27	14,137	21,205	28,274	42,411	56,548	70,685	84,822	28.27	.1224
	2 1/2	23.37	11,682	17,524	23,365	35,047	46,730	58,412	70,095	23.37	.1011
	3	21.21	10,602	15,904	21,205	31,807	42,410	53,012	63,615	21.21	.0918
	3 1/2	18.65	9,326	13,990	18,653	27,979	37,306	46,632	55,959	18.65	.0807
	4	15.71	7,854	11,781	15,708	23,562	31,416	39,270	47,124	15.71	.0680
7	*	38.48	19,242	28,864	38,485	57,728	76,970	96,213	115,445	38.48	.1666
	3	31.42	15,708	23,562	31,416	47,124	62,832	78,540	92,248	31.42	.1360
	3 1/2	28.86	14,432	21,648	28,864	43,296	57,728	72,160	86,592	28.86	.1250
	4	25.92	12,957	19,436	25,916	38,872	51,830	64,787	77,745	25.92	.1122
	5	18.85	9,425	14,137	18,850	28,275	37,700	47,125	56,550	18.85	.0816
8	*	50.26	25,132	37,698	50,265	75,398	100,530	125,663	150,795	50.26	.2176
	3 1/2	40.64	20,322	30,483	40,644	60,966	81,288	101,610	121,932	40.64	.1759
	4	37.70	18,850	28,273	37,699	56,548	75,398	94,247	113,097	37.70	.1632
	5	30.63	15,315	22,973	30,630	45,945	61,260	76,575	91,890	30.62	.1326
	5 1/2	26.51	13,253	19,880	26,507	39,760	53,014	66,267	79,521	26.51	.1147
10	*	78.54	39,270	58,905	78,540	117,810	157,080	196,350	235,620	78.54	.3400
	5	58.90	29,453	44,179	58,905	88,357	117,810	147,262	176,715	58.89	.2549
	7	40.05	20,027	30,041	40,055	60,082	80,110	100,137	120,165	40.07	.1740
12	*	113.10	56,550	84,825	113,100	169,650	226,200	282,750	339,300	113.10	.4896
	5 1/2	89.34	44,670	67,005	89,340	134,010	178,680	223,350	268,020	89.34	.3868
	8 1/2	56.35	28,175	42,262	56,350	84,525	112,700	140,875	169,050	56.40	.2441

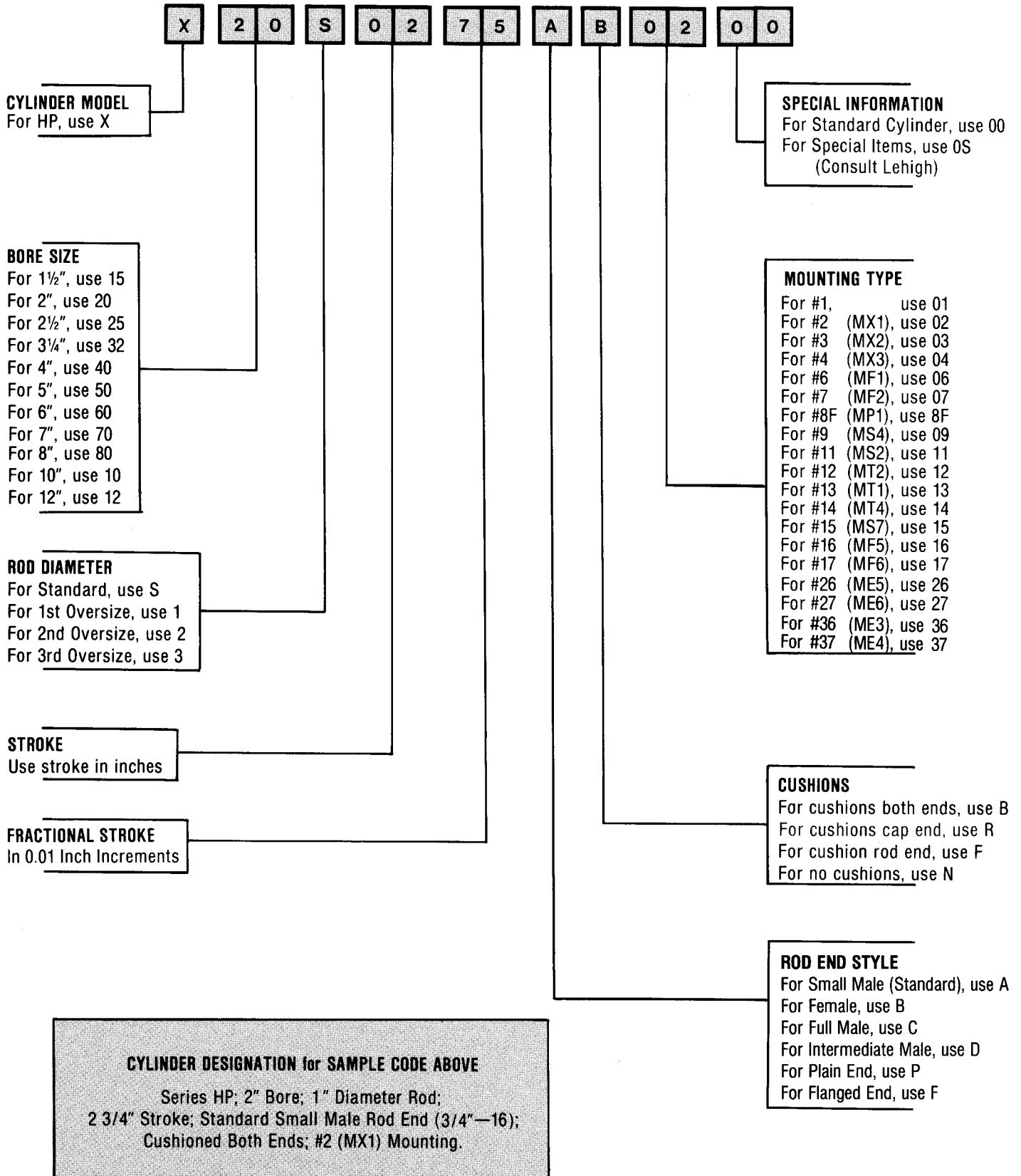
**Description:** This chart lists the force and displacement values for the full piston area on the push or extend stroke. Also listed are the force and displacement values for the reduced piston area, depending on rod diameter, for the pull or retraction stroke.

**Example:** Assume 4" bore cylinder with 2" diameter rod, operating at 1000 psi. Using chart, theoretical values as follows are obtained:  
 Push or extend force = 12,566 lbs.  
 Pull or retraction force = 9,424 lbs.  
 Push or extend volume = 12.57 cubic inch/inch of stroke  
 Pull or retraction volume = 9.424 cubic inch/inch of stroke  
 Total volume for one complete reciprocation = 12.57 + 9.424 = 21.994 cubic inch/inch of stroke

\*Full piston area (see DESCRIPTION paragraph).



## PART NUMBER CODE FOR CYLINDER ORDERS



# **Lehigh Fluid Power, Inc.**

## **Warranty**

Seller warrants its products free from defects in material and workmanship for a period of one year from date of shipment. This warranty excludes normal wear attributable to the particular application in which the product is used.

Further, this warranty is limited exclusively to the replacement or repair of defective products, which, in the opinion of Lehigh Fluid Power, Inc., have not been modified, misused, misapplied, repaired, or altered by the user.

Lehigh Fluid Power, Inc. accepts no responsibility or liability for damages to the purchaser arising out of a delay or failure of delivery or resulting from any breach of any other term or obligation of Lehigh under this contract.

In order to make a claim, buyer must notify Lehigh within the warranty period. Promptly after receiving such notification, Lehigh will either examine the product at the user's site or issue shipping instructions for return to it, transportation costs prepaid by buyer. All items returned must be accompanied by a copy of this acknowledgement.

The above warranty comprises Lehigh's sole and entire obligation and liability to buyer and all those claiming under buyer as to the products sold hereunder. All other warranties, express or implied, including but not limited to, warranties or merchantability and fitness, are expressly excluded.

These terms and conditions of sale constitute the complete and exclusive statement of agreement superseding all oral or written communications and any prior agreements between the parties relating to its subject matter.

**THE COMPANY'S ACCEPTANCE OF THIS ORDER IS MADE EXPRESSLY  
CONDITIONAL UPON THE FOREGOING TERMS AND CONDITIONS.**