



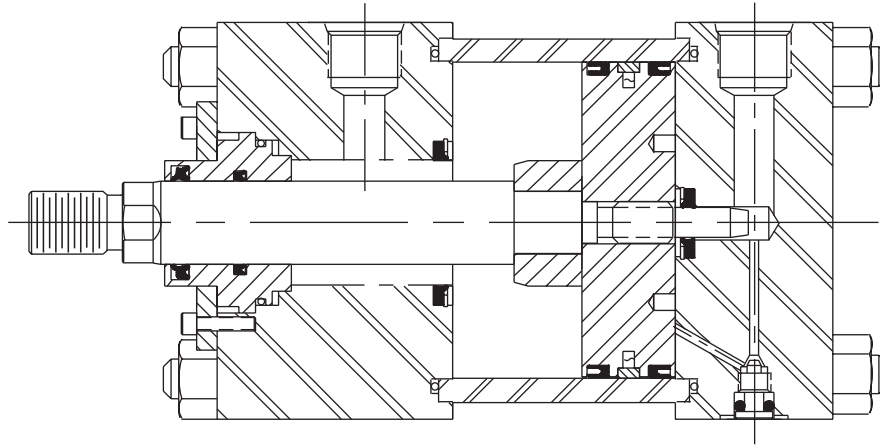
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Universal™*

“NC9” Series Medium Duty Pre-Lubricated Pneumatic Cylinders

* These cylinders are specified for Automotive and Foundry Applications under the brand name “UNIVERSAL”.



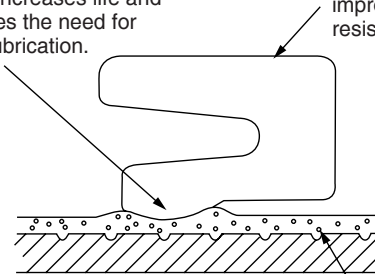
GENERAL SPECIFICATIONS NC9 Series Pneumatic Cylinders

INDUSTRY STANDARDS	Meets J.I.C. and ANSI/(NFPA) T 3.6.7R2-1996 standards.
PRESSURE RATING	250 PSI Air
TEMPERATURE RANGE	Buna-N Seal: -10°F to +165°F
BORE SIZES	1-1/2" through 12"
PISTON ROD DIAMETER	1" through 5-1/2"
MOUNTINGS	10 styles Ford approved
PISTON END THREAD	One standard style; Thread rolled on 1-1/2" through 8" bore size through 1" thread with rounded root radius for maximum strength.
CUSHIONS	Available at either end or both ends; all bore sizes
HEAD AND CAP ENDS	Machined from steel blocks
PISTON	Steel with non-metallic wear ring
PISTON RODS	100,000 PSI minimum yield strength steel. Induction hardened to Rc54. Ground, polished and hard chrome plated to a 10 micro-inch finish.
TUBE	Steel tubing is finished to 10-15 micro-inch finish and I.D. hard chrome plated.
TIE RODS	High tensile steel with rolled threads
TIE ROD NUTS	All steel, prevailing torque type
ROUNDED LIP U-CUP	Carboxylated Nitrile standard.

Anatomy of Series NC9 Sealing and Lubricant Retention Systems

Rounded sealing lip glides over lubricant film instead of scraping it off. Reduces friction, increases life and eliminates the need for added lubrication.

Increased heel thickness and outer lip extension improve stability, resist rolling.



Drawing not to scale
 High integrity lubricant film with suspended PTFE particles

Ford NC9 Medium Duty Air Cylinder

Ordering Code

Ordering Example NC9 MF1 1.5 X 6.0 1.0A CC2-HC2 CP1-HP1 S

Ford Series
NC9

Mounting Code	Description
MX1	Tie Rods Extended Both Ends
MX2	Tie Rods Extended Cap End
MX3	Tie Rods Extended Head End
MF1	Head Rect Flange 1 1/2"-6"
MF2	Cap Rect Flange 1 1/2"-6"
ME3	Head Square 8"-12"
ME4	Cap Square 8"-12"
MS2	Side Lug
MP1	Cap Fixed Clevis
MT4	Intermediate Fixed Trunnion

Cylinder Bore and Stroke

Piston Rod Diameter and Rod End Style	
Only one rod size is specified per bore (Other rod diameters available for replacement only. Modified rod ends must be described completely with KK, A, W or WF dimensions. If otherwise special, furnish dimensioned sketch.)	Ford spec (see pages 52 & 88)

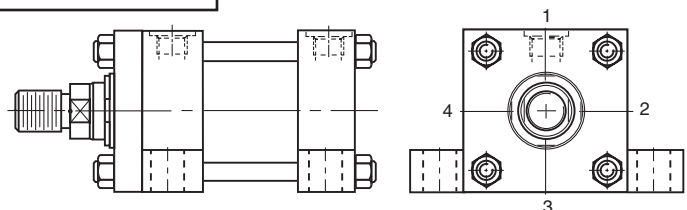
Cushion Location
"C" indicates Cap End Cushion "H" indicates Head End Cushion Cushion Adjust available @ positions 1, 2, 3, or 4

Port Type and Location
"C" indicates Cap End Port "H" indicates Head End Port "P" indicates NPTF pipe thread (standard) "T" indicates SAE straight thread Ports available @ positions 1, 2, or 3

S — Special Modifications
"S" in this position is used to describe all special features that are other than standard, or advise serial number if for replacement.

NOTE: Add the letter "D" for double rod end cylinder.
 EXAMPLE: NC9-MDF2

NOTE: Add the letter "K" if key extension is required.
 EXAMPLE: NC9-MS2K



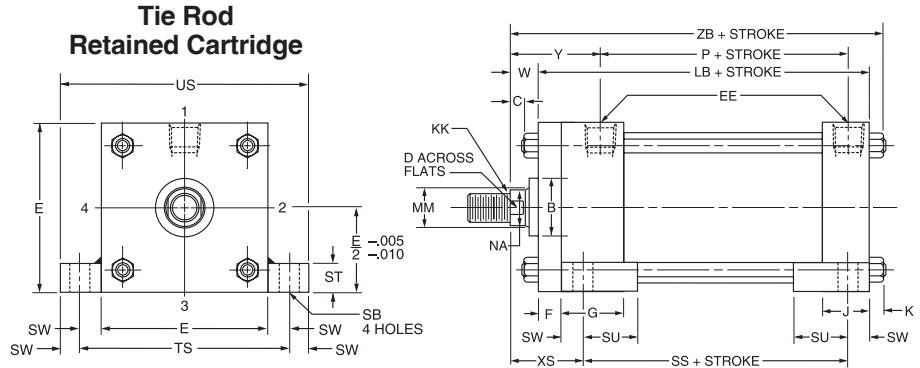
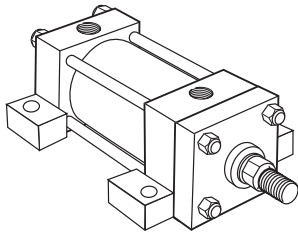
NC9 cylinders are built to Ford Motor Company Vehicle Operations Specifications.
 Any deviation from this standard should be approved in writing by Ford Motor Company.

Mounting Information – 1 1/2" to 6" Bore

Side Lug Mount

Style MS2

1 1/2" - 2" - 2 1/2" - 5" and 6" Bore
With Maximum Oversize Rods

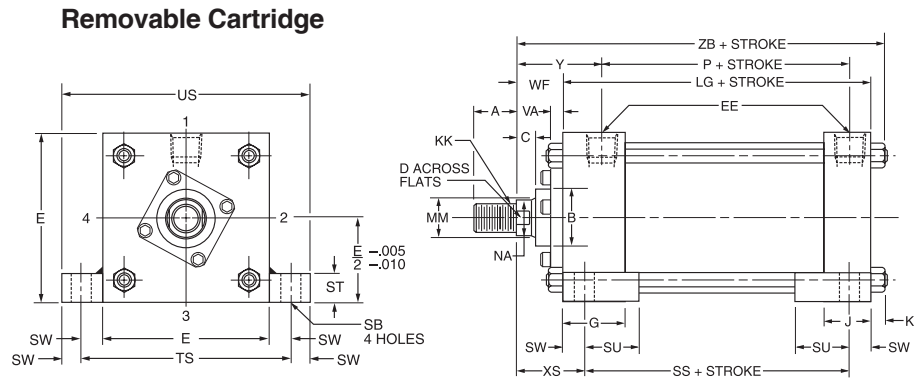
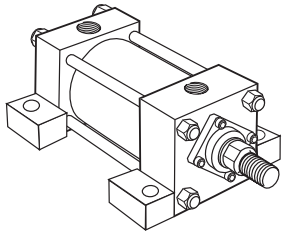


Before determining dimensions: See chart on page 87 for cylinder rod combinations that have removable cartridges.

Side Lug Mount

Style MS2

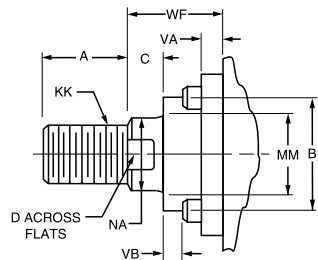
1 1/2" - 6" Bore



Rod End Dimensions — see table 2

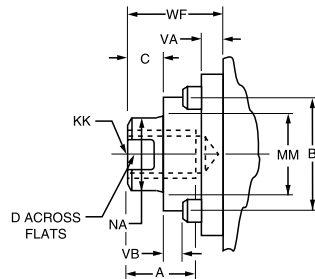
Thread Style 2

Small Male



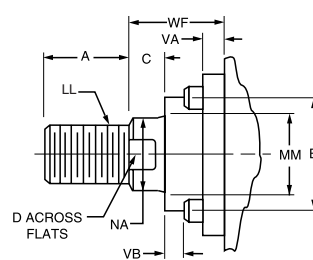
Thread Style 3

Short Female



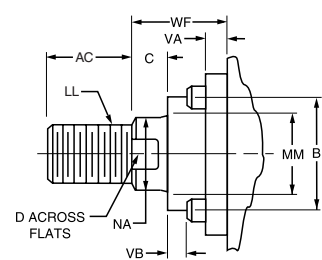
Thread Style 4

Intermediate Male



Thread Style 5

Automotive Male



"Special" Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify "Style 0" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

Table 1—Envelope and Mounting Dimensions

Bore	E	EE		F	G	J	K	SB*	ST	SU	SW	TS	US	Add Stroke			
		NPTF	SAE											LB	LG	P	SS
1½	2	¾†	#6**	¾	1½	1	¼	7/16	½	15/16	¾	2¾	3½	4	35/8	2¼	27/8
2	2½	¾†	#6	¾	1½	1	5/16	7/16	½	15/16	¾	3¼	4	4	35/8	2¼	27/8
2½	3	¾†	#6	¾	1½	1	5/16	7/16	½	15/16	¾	3¾	4½	4½	3¾	2¾	3
3¼	3¾	½	#10	—	1¾	1¼	¾	9/16	¾	1¼	½	4¾	5¾	47/8	4¼	25/8	3¼
4	4½	½	#10	—	1¾	1¼	¾	9/16	¾	1¼	½	5½	6½	47/8	4¼	25/8	3¼
5	5½	½	#10	5/8	1¾	1¼	7/16	13/16	1	19/16	11/16	67/8	8¼	5½	4½	27/8	3½
6	6½	¾	#12	¾	2	1½	7/16	13/16	1	19/16	11/16	77/8	9¼	5¾	5	3½	35/8

† On 1½", 2" and 2½" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

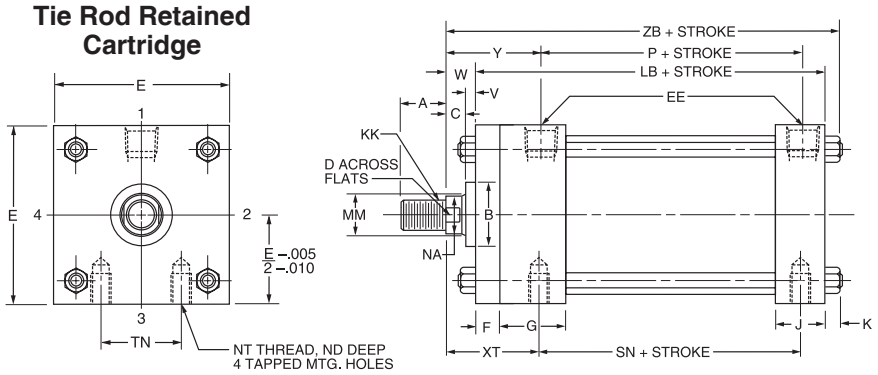
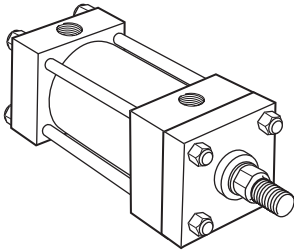
• Upper surface spot-faced for socket head screws.

** Port adapter fitting furnished at head end only.

Table 2—Rod Dimensions and Envelope Dimensions Affected by Rod Size

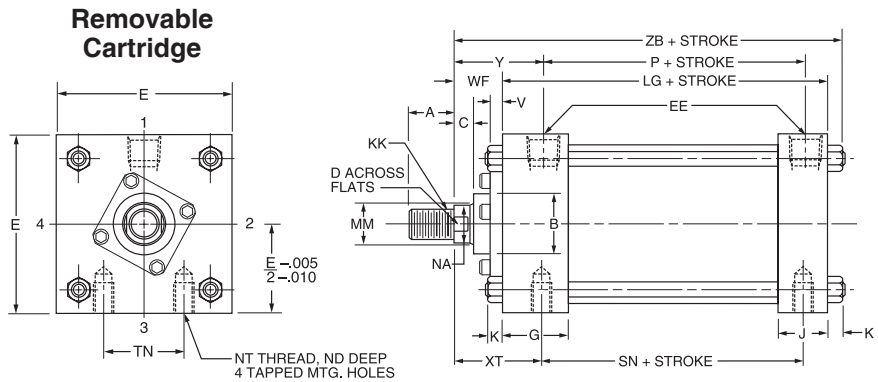
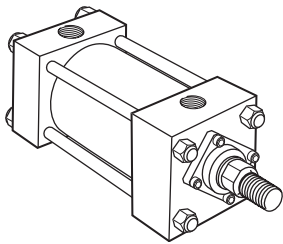
Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size														Add Stroke ZB
		Style 4 & 5 LL	Style 2 & 3 KK	A	AC	+0.000 -0.002 B	C	D	NA	V	VA	VB	W	WF	XS	Y		
1½	5/8	1/2-20	7/16-20	¾	17/8	1.124	¾	½	9/16	—	¼	3/16	—	1	1¾	115/16	47/8	
	1	7/8-14	¾-16	17/8	17/8	1.499	½	7/8	15/16	½	—	—	1	—	1¾	25/16	5¼	
2	5/8	1/2-20	7/16-20	¾	17/8	1.124	¾	½	9/16	—	¼	3/16	—	1	1¾	115/16	415/16	
	13/8	1¼-12	1-14	15/8	2½	1.999	5/8	17/8	15/16	5/8	—	—	1¼	—	2	29/16	59/16	
2½	5/8	1/2-20	7/16-20	¾	17/8	1.124	¾	½	9/16	—	¼	3/16	—	1	1¾	115/16	51/16	
	13/4	1½-12	1¼-12	2	3	2.374	¾	1½	111/16	¾	—	—	1½	—	2¼	213/16	515/16	
3¼	1	7/8-14	¾-16	17/8	17/8	1.499	½	7/8	15/16	—	¼	3/8	—	13/8	17/8	27/16	6	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	111/16	115/16	—	¼	9/16	—	2	2½	31/16	65/8	
4	13/8	1¼-12	1-14	15/8	2½	1.999	5/8	17/8	15/16	—	¼	½	—	15/8	21/8	211/16	6¼	
	13/4	1½-12	1¼-12	2	3	2.374	¾	1½	111/16	—	¼	9/16	—	17/8	23/8	215/16	6½	
5	1	7/8-14	¾-16	17/8	17/8	1.499	½	7/8	15/16	—	¼	3/8	—	13/8	17/8	27/16	6	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	111/16	115/16	—	¼	9/16	—	2	2½	31/16	65/8	
6	13/8	1¼-12	1-14	15/8	2½	1.999	5/8	17/8	15/16	—	¼	7/16	—	15/8	25/16	213/16	71/16	
	13/4	1½-12	1¼-12	2	3	2.374	¾	1½	111/16	—	¼	9/16	—	17/8	29/16	31/16	75/16	
7	1	7/8-14	¾-16	17/8	17/8	1.499	½	7/8	15/16	—	¼	3/8	—	13/8	17/8	27/16	6	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	111/16	115/16	—	¼	9/16	—	2	2½	31/16	65/8	
8	13/8	1¼-12	1-14	15/8	2½	1.999	5/8	17/8	15/16	—	¼	7/16	—	15/8	25/16	213/16	71/16	
	13/4	1½-12	1¼-12	2	3	2.374	¾	1½	111/16	—	¼	9/16	—	17/8	29/16	31/16	75/16	
9	1	7/8-14	¾-16	17/8	17/8	1.499	½	7/8	15/16	—	¼	3/8	—	13/8	17/8	27/16	6	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	111/16	115/16	—	¼	9/16	—	2	2½	31/16	65/8	
10	13/8	1¼-12	1-14	15/8	2½	1.999	5/8	17/8	15/16	—	¼	7/16	—	15/8	25/16	213/16	71/16	
	13/4	1½-12	1¼-12	2	3	2.374	¾	1½	111/16	—	¼	9/16	—	17/8	29/16	31/16	75/16	
11	1	7/8-14	¾-16	17/8	17/8	1.499	½	7/8	15/16	—	¼	3/8	—	13/8	17/8	27/16	6	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	111/16	115/16	—	¼	9/16	—	2	2½	31/16	65/8	
12	13/8	1¼-12	1-14	15/8	2½	1.999	5/8	17/8	15/16	—	¼	7/16	—	15/8	25/16	213/16	71/16	
	13/4	1½-12	1¼-12	2	3	2.374	¾	1½	111/16	—	¼	9/16	—	17/8	29/16	31/16	75/16	
13	1	7/8-14	¾-16	17/8	17/8	1.499	½	7/8	15/16	—	¼	3/8	—	13/8	17/8	27/16	6	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	111/16	115/16	—	¼	9/16	—	2	2½	31/16	65/8	
14	13/8	1¼-12	1-14	15/8	2½	1.999	5/8	17/8	15/16	—	¼	7/16	—	15/8	25/16	213/16	71/16	
	13/4	1½-12	1¼-12	2	3	2.374	¾	1½	111/16	—	¼	9/16	—	17/8	29/16	31/16	75/16	
15	1	7/8-14	¾-16	17/8	17/8	1.499	½	7/8	15/16	—	¼	3/8	—	13/8	17/8	27/16	6	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	111/16	115/16	—	¼	9/16	—	2	2½	31/16	65/8	
16	13/8	1¼-12	1-14	15/8	2½	1.999	5/8	17/8	15/16	—	¼	7/16	—	15/8	25/16	213/16	71/16	
	13/4	1½-12	1¼-12	2	3	2.374	¾	1½	111/16	—	¼	9/16	—	17/8	29/16	31/16	75/16	
17	1	7/8-14	¾-16	17/8	17/8	1.499	½	7/8	15/16	—	¼	3/8	—	13/8	17/8	27/16	6	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	111/16	115/16	—	¼	9/16	—	2	2½	31/16	65/8	
18	13/8	1¼-12	1-14	15/8	2½	1.999	5/8	17/8	15/16	—	¼	7/16	—	15/8	25/16	213/16	71/16	
	13/4	1½-12	1¼-12	2	3	2.374	¾	1½	111/16	—	¼	9/16	—	17/8	29/16	31/16	75/16	
19	1	7/8-14	¾-16	17/8	17/8	1.499	½	7/8	15/16	—	¼	3/8	—	13/8	17/8	27/16	6	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	111/16	115/16	—	¼	9/16	—	2	2½	31/16	65/8	
20	13/8	1¼-12	1-14	15/8	2½	1.999	5/8	17/8	15/16	—	¼	7/16	—	15/8	25/16	213/16	71/16	
	13/4	1½-12	1¼-12	2	3	2.374	¾	1½	111/16	—	¼	9/16	—	17/8	29/16	31/16	75/16	
21	1	7/8-14	¾-16	17/8	17/8	1.499	½	7/8	15/16	—	¼	3/8	—	13/8	17/8	27/16	6	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	111/16	115/16	—	¼	9/16	—	2	2½	31/16	65/8	
22	13/8	1¼-12	1-14	15/8	2½	1.999	5/8	17/8	15/16	—	¼	7/16	—	15/8	25/16	213/16	71/16	
	13/4	1½-12	1¼-12	2	3	2.374	¾	1½	111/16	—	¼	9/16	—	17/8	29/16	31/16	75/16	
23	1	7/8-14	¾-16	17/8	17/8	1.499	½	7/8	15/16	—	¼	3/8	—	13/8	17/8	27/16	6	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	111/16	115/16	—	¼	9/16	—	2	2½	31/16	65/8	
24	13/8	1¼-12	1-14	15/8	2½	1.999	5/8	17/8	15/16	—	¼	7/16	—	15/8	25/16	213/16	71/16	
	13/4	1½-12	1¼-12	2	3	2.374	¾	1½	111/16	—	¼	9/16	—	17/8	29/16	31/16	75/16	
25	1	7/8-14	¾-16	17/8	17/8	1.499	½	7/8	15/16	—	¼	3/8	—	13/8	17/8	27/16	6	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	111/16	115/16	—	¼	9/16	—	2	2½	31/16	65/8	
26	13/8	1¼-12	1-14	15/8	2½	1.999	5/8	17/8	15/16	—	¼	7/16	—	15/8	25/16	213/16	71/16	
	13/4	1½-12	1¼-12	2	3	2.374	¾	1½	111/16	—	¼	9/16	—	17/8	29/16	31/16	75/16	
27	1	7/8-14	¾-16	17/8	17/8	1.499	½	7/8	15/16	—	¼	3/8	—	13/8	17/8	27/16	6	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	111/16	115/16	—	¼	9/16	—	2	2½	31/16	65/8	
28	13/8	1¼-12	1-14	15/8	2½	1.999	5/8	17/8	15/16	—	¼	7/16	—	15/8	25/16	213/16	71/16	
	13/4	1½-12	1¼-12	2	3	2.374	¾	1½	111/16	—	¼	9/16	—	17/8	29/16	31/16	75/16	
29	1	7/8-14	¾-16	17/8	17/8	1.499	½	7/8	15/16	—	¼	3/8	—	13/8	17/8	27/16	6	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	111/16	115/16	—	¼	9/16	—	2	2½	31/16	65/8	
30	13/8	1¼-12	1-14	15/8	2½	1.999	5/8	17/8	15/16	—	¼	7/16	—	15/8	25/16	213/16	71/16	

Side Tap Mount
Style MS4
1 1/2" - 2" - 2 1/2" - 5"
and 6" Bore
With Maximum Oversize Rods



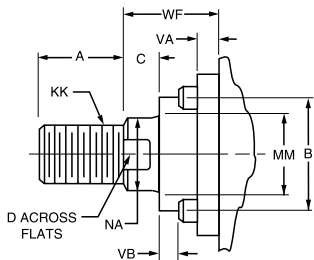
Before determining dimensions: See chart on page 87 for cylinder rod combinations that have removable cartridges.

Side Tap Mount
Style MS4
1 1/2" - 6" Bore

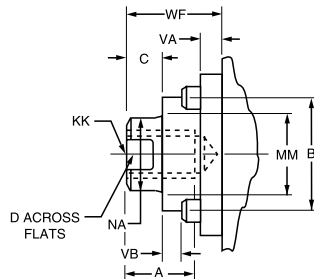


Rod End Dimensions — see table 2

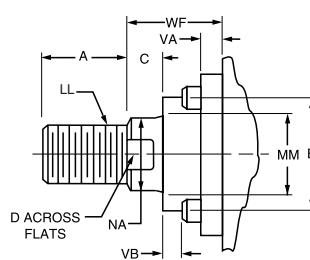
Thread Style 2
Small Male



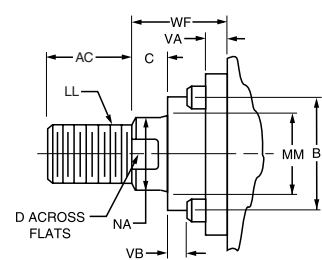
Thread Style 3
Short Female



Thread Style 4
Intermediate Male



Thread Style 5
Automotive Male



“Special” Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify “Style 0” and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

Table 1—Envelope and Mounting Dimensions

Bore	E	EE		F	G	J	K	NT	TN	Add Stroke			
		NPT†	SAE							LB	LG	P	SN
1½	2	¾†	#6**	¾	1½	1	¼	¼-20	⅝	4	3⅝	2¼	2¼
2	2½	¾†	#6	¾	1½	1	⅝	⅝-18	⅞	4	3⅝	2¼	2¼
2½	3	¾†	#6	¾	1½	1	⅝	¾-16	1¼	4⅞	3¾	2⅝	2⅝
3¼	3¾	½	#10	⅝	1¾	1¼	¾	½-13	1½	4⅞	4¼	2⅝	2⅝
4	4½	½	#10	⅝	1¾	1¼	¾	½-13	2⅞	4⅞	4¼	2⅝	2⅝
5	5½	½	#10	⅝	1¾	1¼	⅞	⅝-11	2⅞	5⅞	4½	2⅞	2⅞
6	6½	¾	#12	¾	2	1½	⅞	¾-10	3¼	5¾	5	3⅞	3⅞

† On 1½", 2" and 2½" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

** Port adapter fitting furnished at head end only.

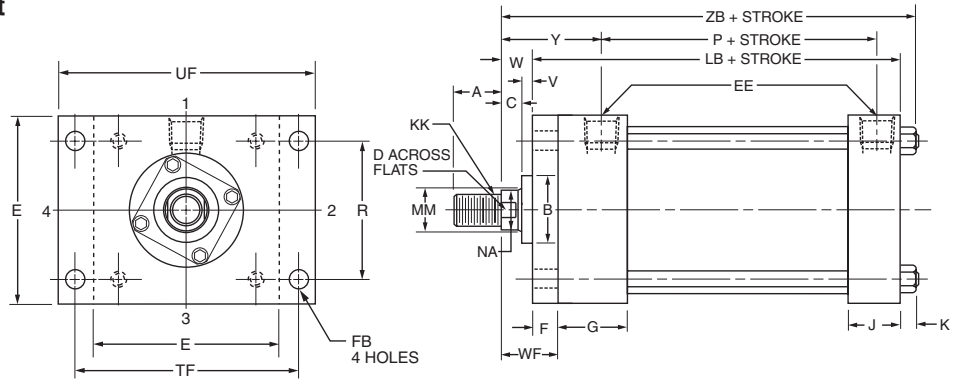
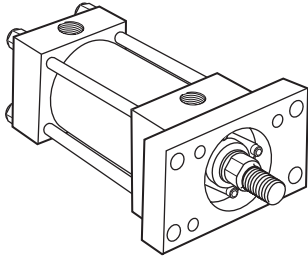
Table 2—Rod Dimensions and Envelope Dimensions Affected by Rod Size

Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size																Add Stroke ZB
		Style 4 & 5 LL	Style 2 & 3 KK	A	AC	+0.000 -0.002 B	C	D	NA	V	VA	VB	W	WF	XT	Y	ND			
1½	⅝	½-20	⅞-20	¾	1⅞	1.124	¾	½	⅞	15/16	—	¼	⅜	—	1	1⅞	1⅞	¾	4⅞	
	1	⅞-14	¾-16	1⅞	1⅞	1.499	½	⅞	15/16	½	—	—	1	—	2⅞	2⅞	¾	5¼		
2	⅝	½-20	⅞-20	¾	1⅞	1.124	¾	½	⅞	15/16	—	¼	⅜	—	1	1⅞	1⅞	¾	4⅞	
	1	⅞-14	¾-16	1⅞	1⅞	1.499	½	⅞	15/16	½	—	¼	⅜	—	1⅞	2⅞	2⅞	¾	5⅞	
2½	⅝	½-20	⅞-20	¾	1⅞	1.124	¾	½	⅞	15/16	—	¼	⅜	—	1	1⅞	1⅞	¾	5⅞	
	1	⅞-14	¾-16	1⅞	1⅞	1.499	½	⅞	15/16	½	—	¼	⅜	—	1⅞	2⅞	2⅞	¾	5⅞	
3¼	⅝	½-20	⅞-20	¾	1⅞	1.124	¾	½	⅞	15/16	—	¼	⅜	—	1	1⅞	1⅞	¾	5⅞	
	1	⅞-14	¾-16	1⅞	1⅞	1.499	½	⅞	15/16	½	—	¼	⅜	—	1⅞	2⅞	2⅞	¾	5⅞	
4	⅝	½-20	⅞-20	¾	1⅞	1.124	¾	½	⅞	15/16	—	¼	⅜	—	1	1⅞	1⅞	¾	5⅞	
	1	⅞-14	¾-16	1⅞	1⅞	1.499	½	⅞	15/16	½	—	¼	⅜	—	1⅞	2⅞	2⅞	¾	5⅞	
5	⅝	½-20	⅞-20	¾	1⅞	1.124	¾	½	⅞	15/16	—	¼	⅜	—	1	1⅞	1⅞	¾	5⅞	
	1	⅞-14	¾-16	1⅞	1⅞	1.499	½	⅞	15/16	½	—	¼	⅜	—	1⅞	2⅞	2⅞	¾	5⅞	
6	⅝	½-20	⅞-20	¾	1⅞	1.124	¾	½	⅞	15/16	—	¼	⅜	—	1	1⅞	1⅞	¾	5⅞	
	1	⅞-14	¾-16	1⅞	1⅞	1.499	½	⅞	15/16	½	—	¼	⅜	—	1⅞	2⅞	2⅞	¾	5⅞	

Head Rectangular Flange Mount

Style MF1

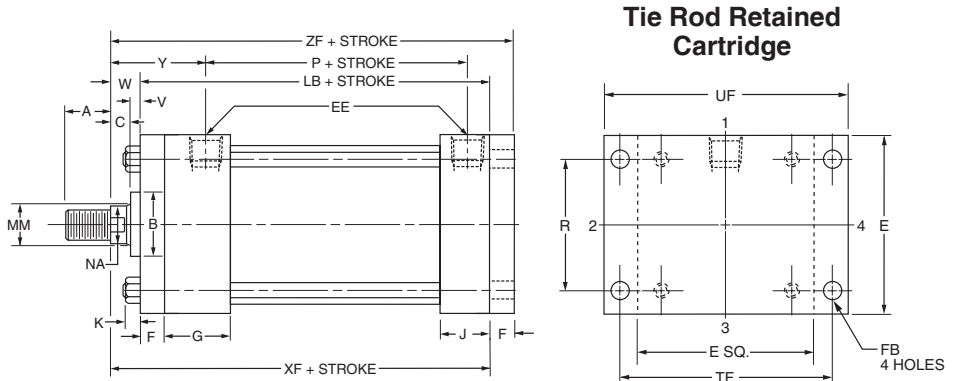
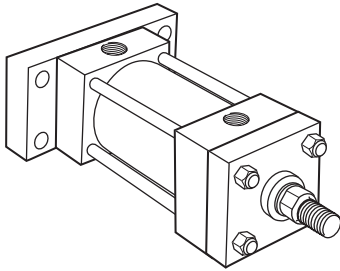
1 1/2" - 6" Bore



Cap Rectangular Flange Mount

Style MF2

1 1/2" - 2" - 2 1/2" - 5" and 6" Bore
With Maximum Oversize Rods



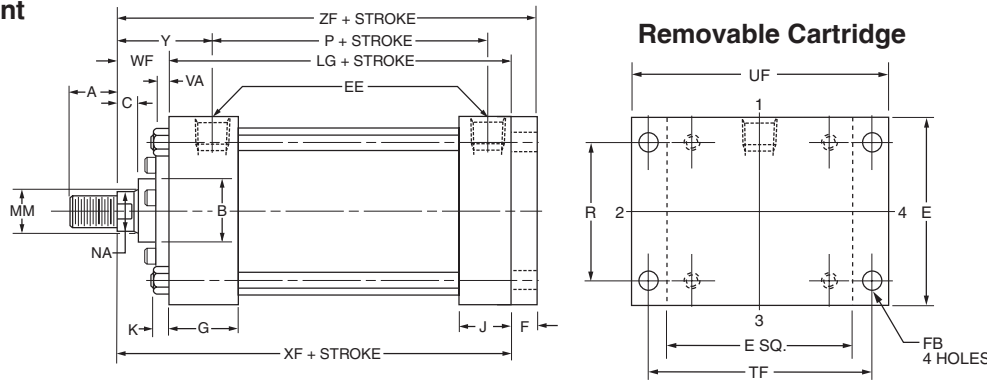
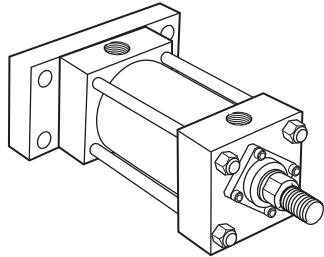
Tie Rod Retained Cartridge

Before determining dimensions: See chart on page 87 for cylinder rod combinations that have removable cartridges.

Cap Rectangular Flange Mount

Style MF2

1 1/2" - 6" Bore

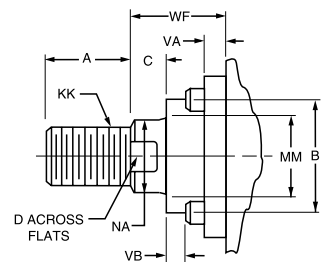


Removable Cartridge

Rod End Dimensions — see table 2

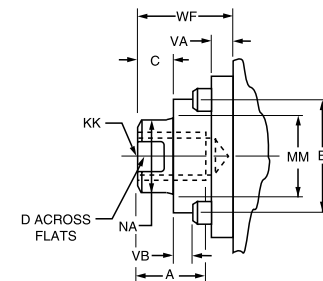
Thread Style 2

Small Male



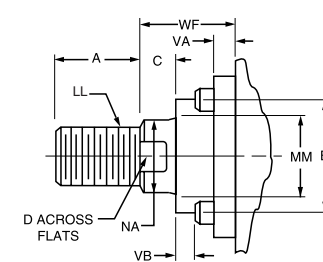
Thread Style 3

Short Female



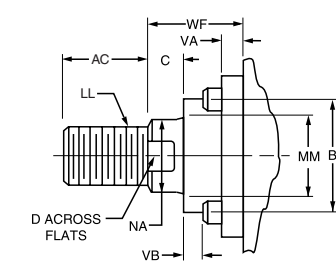
Thread Style 4

Intermediate Male



Thread Style 5

Automotive Male



"Special" Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify "Style 0" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

Table 1—Envelope and Mounting Dimensions

Bore	E	EE		F	FB	G	J	K	R	TF	UF	Add Stroke		
		NPTF	SAE									LB	LG	P
1½	2	¾†	#6**	¾	5/16	1½	1	¼	1.43	2¾	3¾	4	3⅝	2¼
2	2½	¾†	#6	¾	¾	1½	1	5/16	1.84	3¾	4½	4	3⅝	2¼
2½	3	¾†	#6	¾	¾	1½	1	5/16	2.19	3¾	4⅝	4½	3¾	2⅝
3¼	3¾	½	#10	5/8	7/16	1¾	1¼	¾	2.76	4½	5½	—	4¼	2⅝
4	4½	½	#10	5/8	7/16	1¾	1¼	¾	3.32	5½	6¼	—	4¼	2⅝
5	5½	½	#10	5/8	9/16	1¾	1¼	7/16	4.10	6⅝	7⅝	5½	4½	2⅞
6	6½	¾	#12	¾	9/16	2	1½	7/16	4.88	7⅝	8⅝	5¾	5	3⅞

† On 1½", 2" and 2½" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

** Port adapter fitting furnished at head end only.

Table 2—Rod Dimensions and Envelope Dimensions Affected by Rod Size

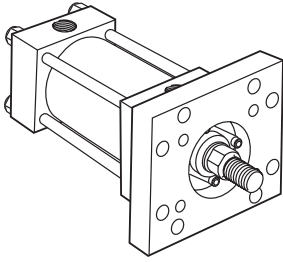
Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size														Add Stroke		
		Style 4 & 5 LL	Style 2 & 3 KK	A	AC	+0.00 -0.02 B	C	D	NA	V	VA	VB	W	WF	Y	XF	ZB	ZF		
		1½	5/8	1/2-20	7/16-20	¾	1⅞	1.124	¾	1/2	9/16	—	¼	3/16	—	1	1½	4⅝	4⅞	5
2	1	7/8-14	¾-16	1⅞	1⅞	1.499	½	7/8	15/16	½	—	—	1	—	2⅝	5	5¼	5⅝		
	5/8	1/2-20	7/16-20	¾	1⅞	1.124	¾	1/2	9/16	—	¼	3/16	—	1	1½	4⅝	4⅞	5		
2½	1⅞	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	15/16	5/8	—	—	1¼	—	2⅞	5¼	5⅞	5⅝		
	1	7/8-14	¾-16	1⅞	1⅞	1.499	½	7/8	15/16	—	¼	3/8	—	1⅞	2⅝	5	5⅞	5⅝		
	5/8	1/2-20	7/16-20	¾	1⅞	1.124	¾	1/2	9/16	—	¼	3/16	—	1	1½	4¾	5⅞	5⅞		
3¼	1	7/8-14	¾-16	1⅞	1⅞	1.499	½	7/8	15/16	—	¼	3/8	—	1⅞	2⅝	5⅞	5⅞	5¾		
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	15/16	—	¼	9/16	—	2	3⅞	6¼	6	6⅞		
	1⅞	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	15/16	—	¼	1/2	—	1⅞	2⅞	5⅞	6⅞	6½		
4	1¾	1½-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	2⅝	6⅞	6¼	6¾		
	1	7/8-14	¾-16	1⅞	1⅞	1.499	½	7/8	15/16	—	¼	3/8	—	1⅞	2⅞	5⅞	6½	6¼		
	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	—	¼	11/16	—	2¼	3⅞	6½	6	7⅞		
	1⅞	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	15/16	—	¼	1/2	—	1⅞	2⅞	5⅞	6¼	6½		
5	1¾	1½-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	2⅝	6⅞	6½	6¾		
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	15/16	—	¼	9/16	—	2	3⅞	6¼	6⅝	6⅞		
	1	7/8-14	¾-16	1⅞	1⅞	1.499	½	7/8	15/16	—	¼	3/8	—	1⅞	2⅞	5⅞	6⅞	6½		
	3½	3¼-12	2½-12	3½	—	4.249	1	3	3⅞	5/8	—	—	1⅞	—	3⅞	6¾	7⅞	7⅞		
	1⅞	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	15/16	—	¼	1/2	—	1⅞	2⅞	6⅞	6⅞	6¾		
	1¾	1½-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	2⅝	6⅞	6⅞	7		
6	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	15/16	—	¼	9/16	—	2	3⅞	6½	6⅞	7⅞		
	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	—	¼	11/16	—	2¼	3⅞	6½	6⅞	7⅞		
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	15/16	—	¼	9/16	—	2	3⅞	6¾	6⅞	7⅞		
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	5/8	—	—	1⅞	—	3⅞	6¼	7⅞	7⅞		
	1⅞	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	15/16	—	¼	7/16	—	1⅞	2⅞	6⅞	7⅞	7⅞		
	4	3¾-12	3-12	4	—	4.749	1	3⅞	3⅞	½	—	—	1½	—	3⅞	7¼	7⅞	8		
	1¾	1½-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	3⅞	6⅞	7⅞	7⅞		
6	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	15/16	—	¼	9/16	—	2	3⅞	7	7⅞	7¾		
	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	—	¼	11/16	—	2¼	3⅞	7¼	7⅞	8		
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	½	—	—	1½	—	3⅞	7¼	7⅞	8		
	3½	3¼-12	2½-12	3½	—	4.249	1	3	3⅞	½	—	—	1½	—	3⅞	7¼	7⅞	8		

Mounting Information – 1 1/2" to 6" Bore

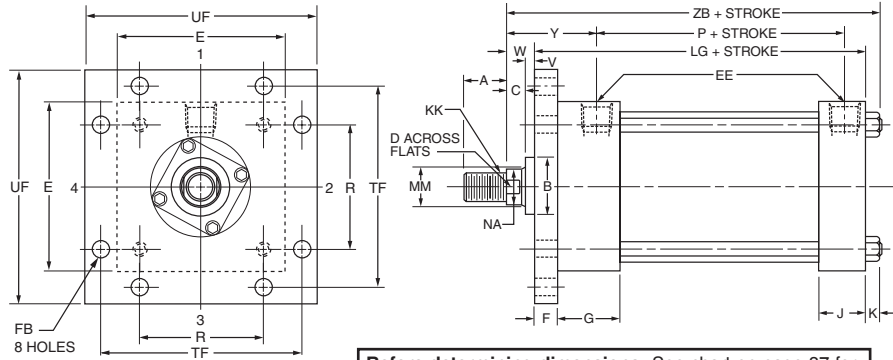
Head Square Flange Mount

Style MF5

1 1/2" - 6" Bore



Removable Cartridge

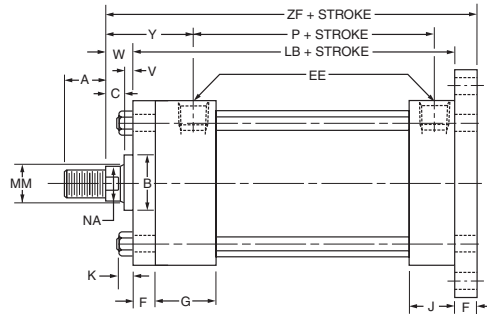
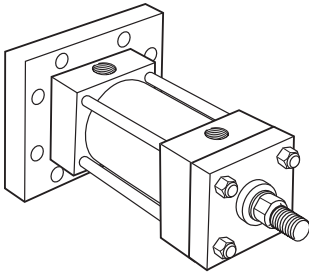


Before determining dimensions: See chart on page 87 for cylinder rod combinations that have removable cartridges.

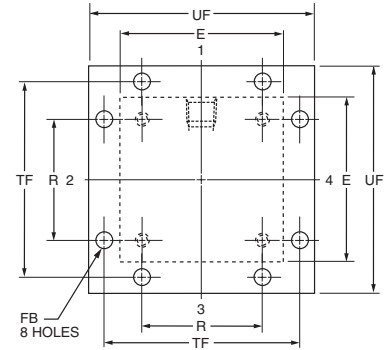
Cap Square Flange Mount

Style MF6

1 1/2" - 2" - 2 1/2" - 5" and 6" Bore
With Maximum Oversize Rods



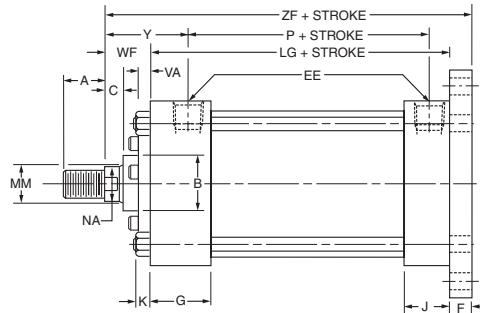
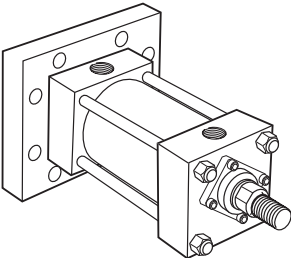
Tie Rod Retained Cartridge



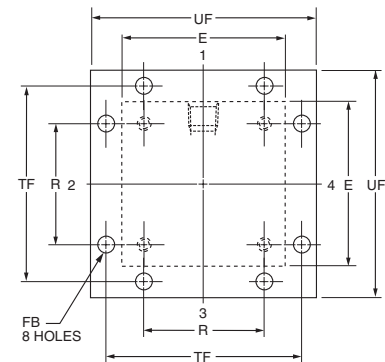
Cap Square Flange Mount

Style MF6

1 1/2" - 6" Bore



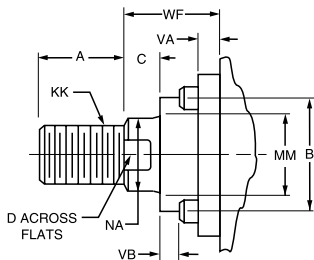
Removable Cartridge



Rod End Dimensions — see table 2

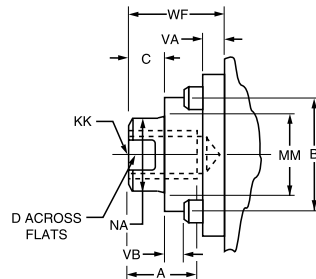
Thread Style 2

Small Male



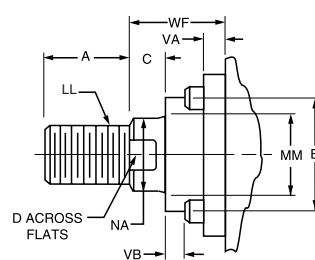
Thread Style 3

Short Female



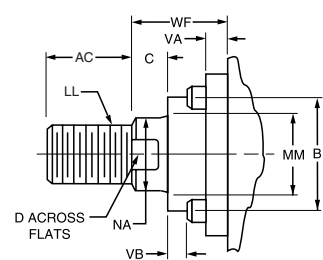
Thread Style 4

Intermediate Male



Thread Style 5

Automotive Male



"Special" Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify "Style 0" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

Table 1—Envelope and Mounting Dimensions

Bore	E	EE		F	FB	G	J	K	R	TF	UF	Add Stroke		
		NPTF	SAE									LB	LG	P
1½	2	¾†	#6**	¾	5/16	1½	1	¼	1.43	2¾	3¾	4	3⅝	2¼
2	2½	¾†	#6	¾	¾	1½	1	5/16	1.84	3¾	4⅞	4	3⅝	2¼
2½	3	¾†	#6	¾	¾	1½	1	5/16	2.19	3⅞	4⅝	4⅞	3¾	2⅝
3¼	3¾	½	#10	5/8	7/16	1¾	1¼	¾	2.76	4⅞	5½	4⅞	4¼	2⅝
4	4½	½	#10	5/8	7/16	1¾	1¼	¾	3.32	5⅞	6¼	4⅞	4¼	2⅝
5	5½	½	#10	5/8	9/16	1¾	1¼	7/16	4.10	6⅝	7⅝	5⅞	4½	2⅞
6	6½	¾	#12	¾	9/16	2	1½	7/16	4.88	7⅝	8⅝	5¾	5	3⅞

† On 1½", 2" and 2½" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

** Port adapter fitting furnished at head end only.

Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size													Add Stroke	
		Style 4 & 5 LL	Style 2 & 3 KK	A	AC	+0.000 -0.002 B	C	D	NA	V	VA	VB	W	WF	Y	ZB	ZF	
1½	5/8	1/2-20	7/16-20	¾	1⅞	1.124	¾	1/2	9/16	1/4**	1/4	3/16	1/4	1	1⅞	4⅞	5	
	1	7/8-14	¾-16	1⅞	1⅞	1.499	1/2	7/8	15/16	1/2	—	—	1	—	2⅞	5¼	5⅝	
2	5/8	1/2-20	7/16-20	¾	1⅞	1.124	¾	1/2	9/16	1/4**	1/4	3/16	5/8	1	1⅞	4⅞	5	
	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	5/8	—	—	1¼	—	2⅞	5⅞	5⅝	
2½	1	7/8-14	¾-16	1⅞	1⅞	1.499	1/2	7/8	15/16	1/2**	1/4	3/8	1	1⅞	2⅞	5⅞	5⅝	
	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	5/8	—	—	1¼	—	2⅞	5⅞	5¾	
3¼	1	7/8-14	¾-16	1⅞	1⅞	1.499	1/2	7/8	15/16	1/4**	1/4	3/8	¾	1⅞	2⅞	6	6¼	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	1⅞	1/2**	1/4	9/16	1⅞	2	3⅞	6⅞	6⅞	
4	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	3/8**	1/4	1/2	1	1⅞	2⅞	6¼	6½	
	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	3/8**	1/4	1/2	1	1⅞	2⅞	6¼	6½	
5	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	3/8**	1/4	1/2	1	1⅞	2⅞	6¼	6½	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	1⅞	1/2**	1/4	9/16	1⅞	2	3⅞	6⅞	6⅞	
6	1	7/8-14	¾-16	1⅞	1⅞	1.499	1/2	7/8	15/16	1/4**	1/4	3/8	¾	1⅞	2⅞	6	6¼	
	3½	3¼-12	2½-12	3½	—	4.249	1	3	3⅞	5/8	—	—	1⅞	—	3⅞	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	3/8**	1/4	1/2	1	1⅞	2⅞	6¼	6½	
	4	3¾-12	3-12	4	—	4.749	1	3⅞	3⅞	3/8	—	—	1½	—	3⅞	7⅞	8	
6	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	3/8**	1/4	9/16	1⅞	1⅞	2⅞	6¼	6½	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	1⅞	1/2**	1/4	9/16	1¼	2	3⅞	6⅞	6⅞	
6	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	1/2**	1/4	1⅞	1½	2¼	3⅞	6⅞	6⅞	
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	5/8	—	—	1⅞	—	3⅞	6⅞	6⅞	
6	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	3/8**	1/4	1/4	7/16	7/8	1⅞	2⅞	6¼	
	4	3¾-12	3-12	4	—	4.749	1	3⅞	3⅞	3/8	—	—	1½	—	3⅞	7⅞	8	
6	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	3/8**	1/4	9/16	1⅞	1⅞	2⅞	6¼	6½	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	1⅞	1/2**	1/4	9/16	1¼	2	3⅞	6⅞	6⅞	
6	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	1/2**	1/4	1⅞	1½	2¼	3⅞	6⅞	6⅞	
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	5/8	—	—	1⅞	—	3⅞	6⅞	6⅞	
6	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	3/8**	1/4	1/4	7/16	7/8	1⅞	2⅞	6¼	
	4	3¾-12	3-12	4	—	4.749	1	3⅞	3⅞	3/8	—	—	1½	—	3⅞	7⅞	8	
6	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	3/8**	1/4	9/16	1⅞	1⅞	2⅞	6¼	6½	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	1⅞	1/2**	1/4	9/16	1¼	2	3⅞	6⅞	6⅞	
6	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	1/2**	1/4	1⅞	1½	2¼	3⅞	6⅞	6⅞	
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	5/8	—	—	1⅞	—	3⅞	6⅞	6⅞	
6	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	3/8**	1/4	1/4	7/16	7/8	1⅞	2⅞	6¼	
	4	3¾-12	3-12	4	—	4.749	1	3⅞	3⅞	3/8	—	—	1½	—	3⅞	7⅞	8	
6	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	3/8**	1/4	9/16	1⅞	1⅞	2⅞	6¼	6½	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	1⅞	1/2**	1/4	9/16	1¼	2	3⅞	6⅞	6⅞	
6	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	1/2**	1/4	1⅞	1½	2¼	3⅞	6⅞	6⅞	
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	5/8	—	—	1⅞	—	3⅞	6⅞	6⅞	
6	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	3/8**	1/4	1/4	7/16	7/8	1⅞	2⅞	6¼	
	4	3¾-12	3-12	4	—	4.749	1	3⅞	3⅞	3/8	—	—	1½	—	3⅞	7⅞	8	
6	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	3/8**	1/4	9/16	1⅞	1⅞	2⅞	6¼	6½	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	1⅞	1/2**	1/4	9/16	1¼	2	3⅞	6⅞	6⅞	
6	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	1/2**	1/4	1⅞	1½	2¼	3⅞	6⅞	6⅞	
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	5/8	—	—	1⅞	—	3⅞	6⅞	6⅞	
6	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	3/8**	1/4	1/4	7/16	7/8	1⅞	2⅞	6¼	
	4	3¾-12	3-12	4	—	4.749	1	3⅞	3⅞	3/8	—	—	1½	—	3⅞	7⅞	8	
6	1⅜	1¼-12	1-14	1⅞	2½	1.999	5/8	1⅞	1⅞	3/8**	1/4	9/16	1⅞	1⅞	2⅞	6¼	6½	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	1⅞	1/2**	1/4	9/16	1¼	2	3⅞	6⅞	6⅞	
6	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	1/2**	1/4	1⅞	1½	2¼	3⅞	6⅞	6⅞	
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	5/8	—	—	1⅞	—	3⅞	6⅞	6⅞	

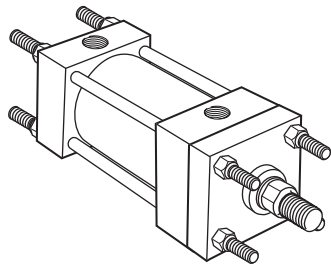
** For all MF5 mounts and MF6 mounts with maximum oversized rods.

Tie Rods Extended Mount

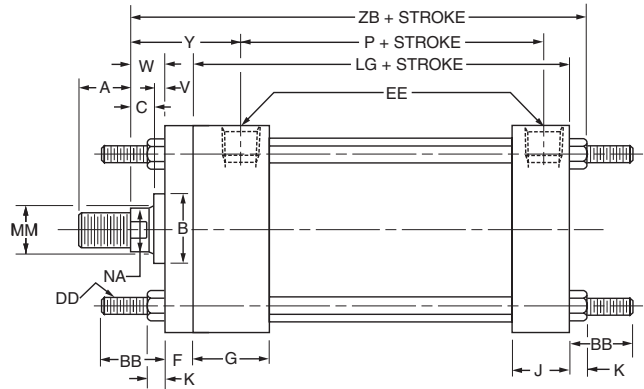
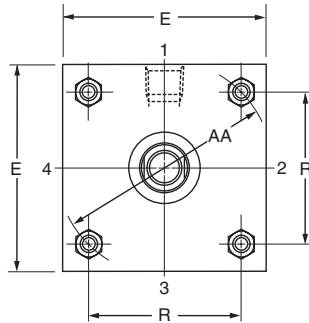
Style MX1

1 1/2" - 2" - 2 1/2" - 5" and 6" Bore

With Maximum Oversize Rods



Tie Rod Retained Cartridge



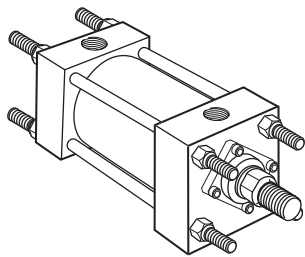
Tie Rods can be extended: Both Ends — Model MX1;
Cap End — Model MX2; Head End — Model MX3.

Before determining dimensions: See chart on page 87 for
cylinder rod combinations that have removable cartridges.

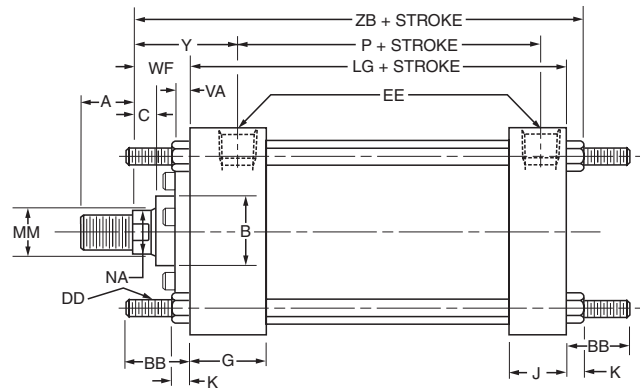
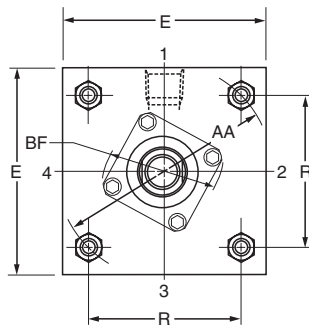
Tie Rods Extended Mount

Style MX1

1 1/2" - 6" Bore



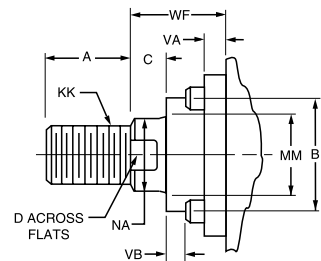
Removable Cartridge



Rod End Dimensions — see table 2

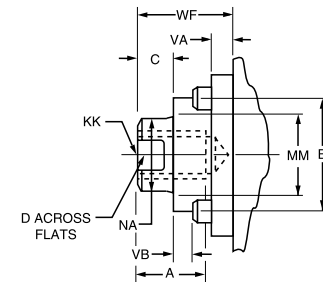
Thread Style 2

Small Male



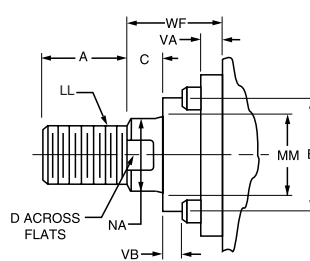
Thread Style 3

Short Female



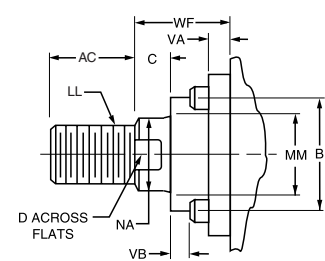
Thread Style 4

Intermediate Male



Thread Style 5

Automotive Male



“Special” Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify “Style 0” and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

Table 1—Envelope and Mounting Dimensions

Bore	AA	BB	DD	E	EE		F	G	J	K	R	Add Stroke	
					NPTF	SAE						LG	P
1½	2.02	1	¼-28	2	⅜†	#6**	⅜	1½	1	¼	1.43	3⅝	2¼
2	2.6	1⅝	⅝-24	2½	⅜†	#6	⅜	1½	1	⅝	1.84	3⅝	2¼
2½	3.1	1⅝	⅝-24	3	⅜†	#6	⅜	1½	1	⅝	2.19	3¾	2⅝
3¼	3.9	1⅝	⅝-24	3¾	½	#10	—	1¾	1¼	⅝	2.76	4¼	2⅝
4	4.7	1⅝	⅝-24	4½	½	#10	—	1¾	1¼	⅝	3.32	4¼	2⅝
5	5.8	1⅝	½-20	5½	½	#10	—	1¾	1¼	⅝	4.10	4½	2⅝
6	6.9	1⅝	½-20	6½	¾	#12	¾	2	1½	⅝	4.88	5	3⅝

† On 1½", 2" and 2½" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

** Port adapter fitting furnished at head end only.

Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

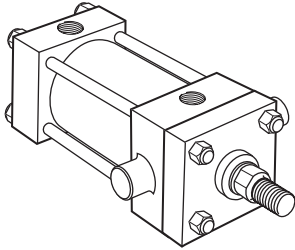
Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size														Add Stroke ZB
		Style 4 & 5 LL	Style 2 & 3 KK	A	AC	+0.000 -0.002 B	BF	C	D	NA	V	VA	VB	W	WF	Y		
1½	⅝	½-20	⅞-20	¾	1⅝	1.124	1.968	⅜	½	⅞	—	¼	⅜	—	1	1⅝	4⅞	
	1	⅞-14	¾-16	1⅝	1⅞	1.499	—	½	⅞	1⅝	½	—	1	—	2⅝	5¼		
2	⅝	½-20	⅞-20	¾	1⅝	1.124	1.968	⅜	½	⅞	—	¼	⅜	—	1	1⅝	4⅝	
	1⅜	1¼-12	1-14	⅝	2½	1.999	—	⅝	1⅝	1⅝	⅝	—	1¼	—	2⅞	5⅞		
2½	⅝	½-20	⅞-20	¾	1⅝	1.124	1.968	⅜	½	⅞	—	¼	⅜	—	1	1⅝	5⅝	
	1¾	1½-12	1¼-12	2	3	2.374	—	¾	1½	1⅞	¾	—	1½	—	2⅓	5⅝		
3¼	⅝	½-20	⅞-20	¾	1⅝	1.124	1.968	⅜	½	⅞	—	¼	⅜	—	1	1⅝	5⅝	
	1	⅞-14	¾-16	1⅝	1⅞	1.499	2.468	½	⅞	1⅝	—	¼	⅜	—	1⅜	2⅞	6	
4	2	1¾-12	1½-12	2¼	3½	2.624	3.735	⅞	1⅞	1⅝	—	¼	⅞	—	2	3⅝	6⅝	
	1⅜	1¼-12	1-14	⅝	2½	1.999	2.968	⅝	1⅝	1⅝	—	¼	½	—	1⅝	2⅞	6¼	
5	1¾	1½-12	1¼-12	2	3	2.374	3.735	¾	1½	1⅞	—	¼	⅞	—	1⅞	2⅝	6½	
	1	⅞-14	¾-16	1⅝	1⅞	1.499	2.468	½	⅞	1⅝	—	¼	⅜	—	1⅜	2⅞	6⅝	
6	3½	3¼-12	2½-12	3½	—	4.249	—	1	3	3⅝	⅝	—	—	1⅝	—	3⅝	7⅝	
	1⅜	1¼-12	1-14	⅝	2½	1.999	2.968	⅝	1⅝	1⅝	—	¼	½	—	1⅝	2⅞	6⅞	
7	1¾	1½-12	1¼-12	2	3	2.374	3.735	¾	1½	1⅞	—	¼	⅞	—	1⅞	2⅝	6⅝	
	1	⅞-14	¾-16	1⅝	1⅞	1.499	2.468	½	⅞	1⅝	—	¼	⅜	—	1⅜	2⅞	6⅝	
8	2½	2¼-12	1⅞-12	3	4½	3.124	5.000	1	2⅞	2⅝	—	¼	1⅞	—	2¼	3⅝	7⅞	
	1⅜	1¼-12	1-14	⅝	2½	1.999	2.968	⅝	1⅝	1⅝	—	¼	½	—	1⅝	2⅞	6¼	
9	1¾	1½-12	1¼-12	2	3	2.374	3.735	¾	1½	1⅞	—	¼	⅞	—	1⅞	2⅝	6⅝	
	1	⅞-14	¾-16	1⅝	1⅞	1.499	2.468	½	⅞	1⅝	—	¼	⅜	—	1⅜	2⅞	6⅝	
10	2	1¾-12	1½-12	2¼	3½	2.624	3.735	⅞	1⅞	1⅝	—	¼	⅞	—	2	3⅝	6⅝	
	1⅜	1¼-12	1-14	⅝	2½	1.999	2.968	⅝	1⅝	1⅝	—	¼	½	—	1⅝	2⅞	6¼	
11	2	1¾-12	1½-12	2¼	3½	2.624	3.735	⅞	1⅞	1⅝	—	¼	⅞	—	2	3⅝	6⅝	
	1¾	1½-12	1¼-12	2	3	2.374	3.735	¾	1½	1⅞	—	¼	⅞	—	1⅞	2⅝	6⅝	
12	2½	2¼-12	1⅞-12	3	4½	3.124	5.000	1	2⅞	2⅝	—	¼	1⅞	—	2¼	3⅝	7⅞	
	1⅜	1¼-12	1-14	⅝	2½	1.999	2.968	⅝	1⅝	1⅝	—	¼	½	—	1⅝	2⅞	6¼	
13	2	1¾-12	1½-12	2¼	3½	2.624	3.735	⅞	1⅞	1⅝	—	¼	⅞	—	2	3⅝	6⅝	
	1¾	1½-12	1¼-12	2	3	2.374	3.735	¾	1½	1⅞	—	¼	⅞	—	1⅞	2⅝	6⅝	
14	2½	2¼-12	1⅞-12	3	4½	3.124	5.000	1	2⅞	2⅝	—	¼	1⅞	—	2¼	3⅝	7⅞	
	1⅜	1¼-12	1-14	⅝	2½	1.999	2.968	⅝	1⅝	1⅝	—	¼	½	—	1⅝	2⅞	6¼	
15	2	1¾-12	1½-12	2¼	3½	2.624	3.735	⅞	1⅞	1⅝	—	¼	⅞	—	2	3⅝	6⅝	
	1¾	1½-12	1¼-12	2	3	2.374	3.735	¾	1½	1⅞	—	¼	⅞	—	1⅞	2⅝	6⅝	
16	2½	2¼-12	1⅞-12	3	4½	3.124	5.000	1	2⅞	2⅝	—	¼	1⅞	—	2¼	3⅝	7⅞	
	1⅜	1¼-12	1-14	⅝	2½	1.999	2.968	⅝	1⅝	1⅝	—	¼	½	—	1⅝	2⅞	6¼	
17	2	1¾-12	1½-12	2¼	3½	2.624	3.735	⅞	1⅞	1⅝	—	¼	⅞	—	2	3⅝	6⅝	
	1¾	1½-12	1¼-12	2	3	2.374	3.735	¾	1½	1⅞	—	¼	⅞	—	1⅞	2⅝	6⅝	
18	2½	2¼-12	1⅞-12	3	4½	3.124	5.000	1	2⅞	2⅝	—	¼	1⅞	—	2¼	3⅝	7⅞	
	1⅜	1¼-12	1-14	⅝	2½	1.999	2.968	⅝	1⅝	1⅝	—	¼	½	—	1⅝	2⅞	6¼	
19	2	1¾-12	1½-12	2¼	3½	2.624	3.735	⅞	1⅞	1⅝	—	¼	⅞	—	2	3⅝	6⅝	
	1¾	1½-12	1¼-12	2	3	2.374	3.735	¾	1½	1⅞	—	¼	⅞	—	1⅞	2⅝	6⅝	
20	2½	2¼-12	1⅞-12	3	4½	3.124	5.000	1	2⅞	2⅝	—	¼	1⅞	—	2¼	3⅝	7⅞	
	1⅜	1¼-12	1-14	⅝	2½	1.999	2.968	⅝	1⅝	1⅝	—	¼	½	—	1⅝	2⅞	6¼	
21	2	1¾-12	1½-12	2¼	3½	2.624	3.735	⅞	1⅞	1⅝	—	¼	⅞	—	2	3⅝	6⅝	
	1¾	1½-12	1¼-12	2	3	2.374	3.735	¾	1½	1⅞	—	¼	⅞	—	1⅞	2⅝	6⅝	
22	2½	2¼-12	1⅞-12	3	4½	3.124	5.000	1	2⅞	2⅝	—	¼	1⅞	—	2¼	3⅝	7⅞	
	1⅜	1¼-12	1-14	⅝	2½	1.999	2.968	⅝	1⅝	1⅝	—	¼	½	—	1⅝	2⅞	6¼	
23	2	1¾-12	1½-12	2¼	3½	2.624	3.735	⅞	1⅞	1⅝	—	¼	⅞	—	2	3⅝	6⅝	
	1¾	1½-12	1¼-12	2	3	2.374	3.735	¾	1½	1⅞	—	¼	⅞	—	1⅞	2⅝	6⅝	
24	2½	2¼-12	1⅞-12	3	4½	3.124	5.000	1	2⅞	2⅝	—	¼	1⅞	—	2¼	3⅝	7⅞	
	1⅜	1¼-12	1-14	⅝	2½	1.999	2.968	⅝	1⅝	1⅝	—	¼	½	—	1⅝	2⅞	6¼	
25	2	1¾-12	1½-12	2¼	3½	2.624	3.735	⅞	1⅞	1⅝	—	¼	⅞	—	2	3⅝	6⅝	
	1¾	1½-12	1¼-12	2	3	2.374	3.735	¾	1½	1⅞	—	¼	⅞	—	1⅞	2⅝	6⅝	
26	2½	2¼-12	1⅞-12	3	4½	3.124	5.000	1	2⅞	2⅝	—	¼	1⅞	—	2¼	3⅝	7⅞	
	1⅜	1¼-12	1-14	⅝	2½	1.999	2.968	⅝	1⅝	1⅝	—	¼	½	—	1⅝	2⅞	6¼	
27	2	1¾-12	1½-12	2¼	3½	2.624	3.735	⅞	1⅞	1⅝	—	¼	⅞	—	2	3⅝	6⅝	
	1¾	1½-12	1¼-12	2	3	2.374	3.735	¾	1½	1⅞	—	¼	⅞	—	1⅞	2⅝	6⅝	
28	2½	2¼-12	1⅞-12	3	4½	3.124	5.000	1	2⅞	2⅝	—	¼	1⅞	—	2¼	3⅝	7⅞	
	1⅜	1¼-12	1-14	⅝	2½	1.999	2.968	⅝	1⅝	1⅝	—	¼	½	—	1⅝	2⅞	6¼	
29	2	1¾-12	1½-12	2¼	3½	2.624	3.735	⅞	1⅞	1⅝	—	¼	⅞	—	2	3⅝	6⅝	
	1¾	1½-12	1¼-12	2	3	2.374	3.735	¾	1½	1⅞	—	¼	⅞	—	1⅞	2⅝	6⅝	
30	2½	2¼-12	1⅞-12	3	4½	3.124	5.000	1	2⅞	2⅝	—	¼	1⅞	—	2¼	3⅝	7⅞	
	1⅜	1¼-12	1-14	⅝	2½	1.999	2.968	⅝	1⅝	1⅝	—	¼	½	—	1⅝	2⅞	6¼	

Head Trunnion Mount

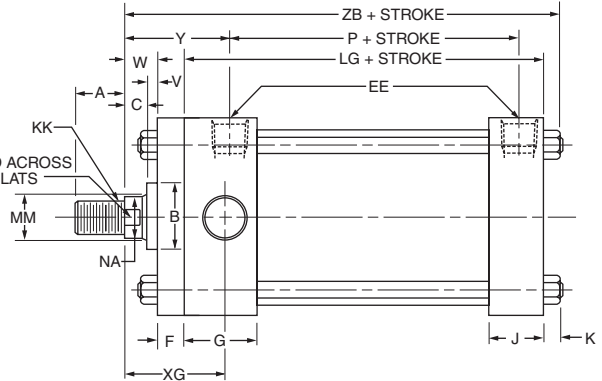
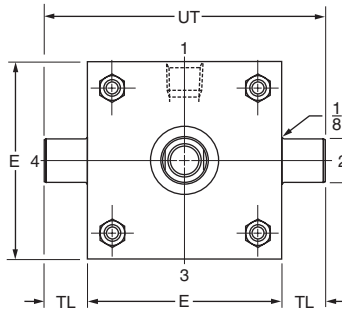
Style MT1

1 1/2" - 2" - 2 1/2" - 5" and 6" Bore

With Maximum Oversize Rods



Tie Rod Retained Cartridge

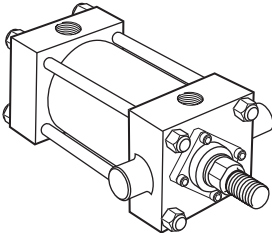


Before determining dimensions: See chart on page 87 for cylinder rod combinations that have removable cartridges.

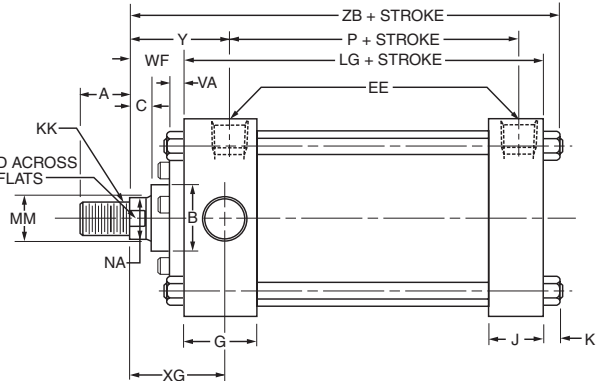
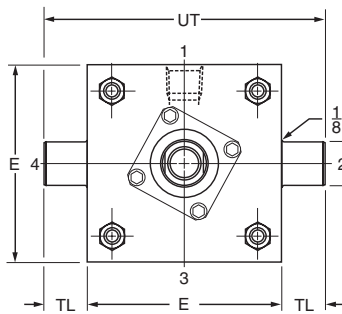
Head Trunnion Mount

Style MT1

1 1/2" - 6" Bore



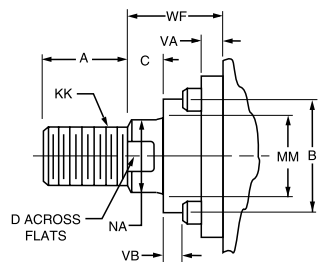
Removable Cartridge



Rod End Dimensions — see table 2

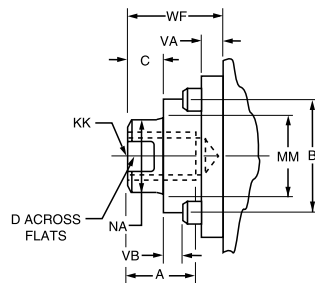
Thread Style 2

Small Male



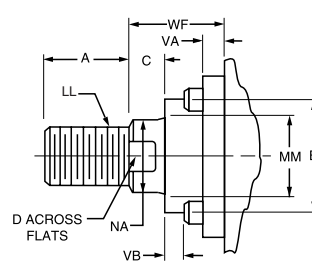
Thread Style 3

Short Female



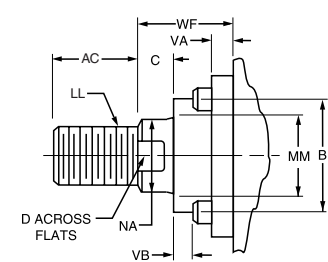
Thread Style 4

Intermediate Male



Thread Style 5

Automotive Male



“Special” Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify “Style 0” and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

Mounting Information – 1½" to 6" Bore

Table 1—Envelope and Mounting Dimensions

Bore	E	EE		F	G	J	K	+0.000 TD -0.001	TL	UT	Add Stroke	
		NPTF	SAE**								LG	P
1½	2	¾†	#6**	¾	1½	1	¼	1.000	1	4	3⅝	2¼
2	2½	¾†	#6	¾	1½	1	⅝	1.000	1	4½	3⅝	2¼
2½	3	¾†	#6	¾	1½	1	⅝	1.000	1	5	3¾	2⅝
3¼	3¾	½	#10	—	1¾	1¼	⅜	1.000	1	5¾	4¼	2⅝
4	4½	½	#10	—	1¾	1¼	⅜	1.000	1	6½	4¼	2⅝
5	5½	½	#10	⅝	1¾	1¼	⅞	1.000	1	7½	4½	2⅞
6	6½	¾	#12	¾	2	1½	⅞	1.375	1¾	9¼	5	3⅝

† On 1½", 2" and 2½" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

** Port adapter fitting furnished at head end only.

Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

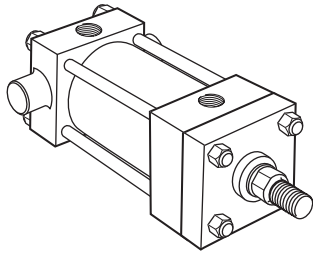
Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size														Add Stroke ZB
		Style 4 & 5 LL	Style 2 & 3 KK	A	AC	+0.000 -0.002 B	C	D	NA	V	VA	VB	W	WF	XG	Y		
1½	⅝	½-20	⅞-20	¾	1⅝	1.124	⅜	½	⅞	—	¼	⅜	—	1	1¾	1⅝	4⅞	
	1	⅞-14	¾-16	1⅝	1⅞	1.499	½	⅞	1⅝	½	—	—	1	—	2⅝	2⅝	5¼	
2	⅝	½-20	⅞-20	¾	1⅝	1.124	⅜	½	⅞	—	¼	⅜	—	1	1¾	1⅝	4⅞	
	1⅝	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅝	1⅝	⅝	—	—	1¼	—	2⅝	2⅝	5⅞	
2½	⅝	½-20	⅞-20	¾	1⅝	1.124	⅜	½	⅞	—	¼	⅜	—	1	1¾	1⅝	5⅞	
	1¾	1½-12	1¼-12	2	3	2.374	¾	1½	1⅞	¾	—	—	1½	—	2⅝	2⅝	5⅝	
3¼	⅝	½-20	⅞-20	¾	1⅝	1.124	⅜	½	⅞	—	¼	⅜	—	1	1¾	1⅝	5⅞	
	1¾	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅝	1⅝	⅝	—	—	1¼	—	2⅝	2⅝	5⅞	
4	⅝	½-20	⅞-20	¾	1⅝	1.124	⅜	½	⅞	—	¼	⅜	—	1	1¾	1⅝	5⅞	
	1¾	1¼-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	⅞	—	1⅞	2¾	2⅝	6½	
5	⅝	½-20	⅞-20	¾	1⅝	1.124	⅜	½	⅞	—	¼	⅜	—	1	1¾	1⅝	5⅞	
	1¾	1¼-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	⅞	—	1⅞	2¾	2⅝	6½	
6	⅝	½-20	⅞-20	¾	1⅝	1.124	⅜	½	⅞	—	¼	⅜	—	1	1¾	1⅝	5⅞	
	1¾	1¼-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	⅞	—	1⅞	2¾	2⅝	6½	

Cap Trunnion Mount

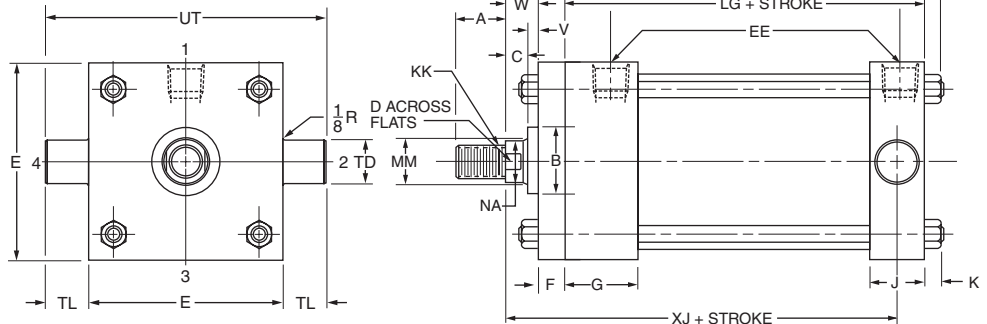
Style MT2

1 1/2" - 2" 2 1/2" - 5" and 6" Bore

With Maximum Oversize Rods



Tie Rod Retained Cartridge

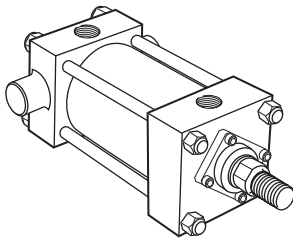


Before determining dimensions: See chart on page 87 for cylinder rod combinations that have removable cartridges.

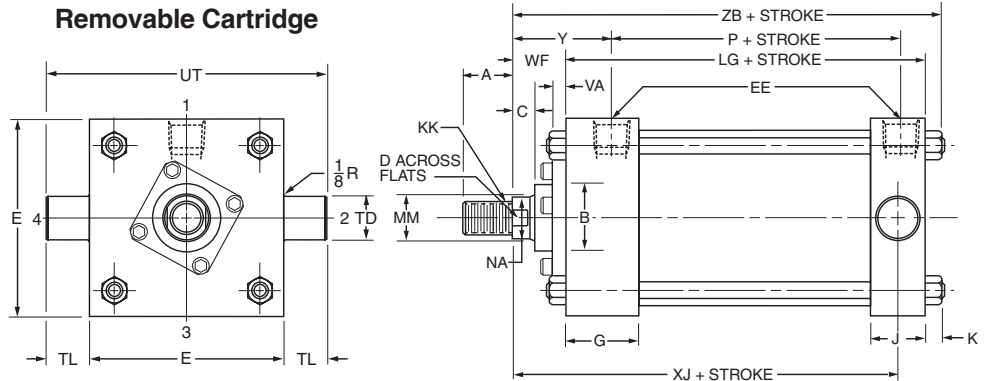
Cap Trunnion Mount

Style MT2

1 1/2" - 6" Bore



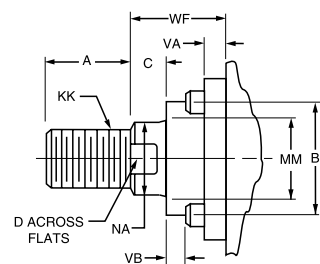
Removable Cartridge



Rod End Dimensions — see table 2

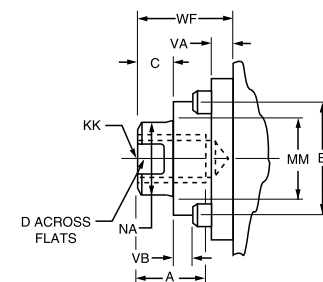
Thread Style 2

Small Male



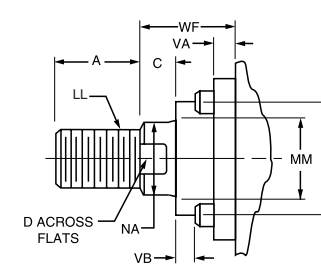
Thread Style 3

Short Female



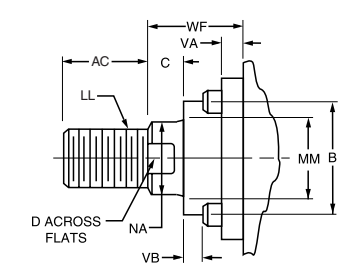
Thread Style 4

Intermediate Male



Thread Style 5

Automotive Male



"Special" Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify "Style 0" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

Table 1—Envelope and Mounting Dimensions

Bore	E	EE		F	G	J	K	+.000 TD -.001	TL	UT	Add Stroke	
		NPTF	SAE #6**								LG	P
1½	2	¾†	#6**	¾	1½	1	¼	1.000	1	4	3⅝	2¼
2	2½	¾†	#6	¾	1½	1	⅝	1.000	1	4½	3⅝	2¼
2½	3	¾†	#6	¾	1½	1	⅝	1.000	1	5	3¾	2⅝
3¼	3¾	½	#10	—	1¾	1¼	¾	1.000	1	5¾	4¼	2⅝
4	4½	½	#10	—	1¾	1¼	¾	1.000	1	6½	4¼	2⅝
5	5½	½	#10	⅝	1¾	1¼	⅞	1.000	1	7½	4½	2⅞
6	6½	¾	#12	¾	2	1½	⅞	1.375	1⅜	9¼	5	3⅝

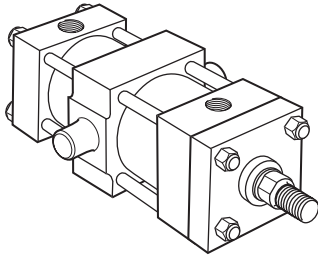
† On 1½", 2" and 2½" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

** Port adapter fitting furnished at head end only.

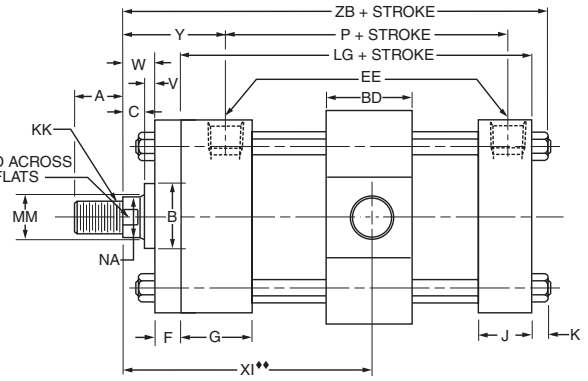
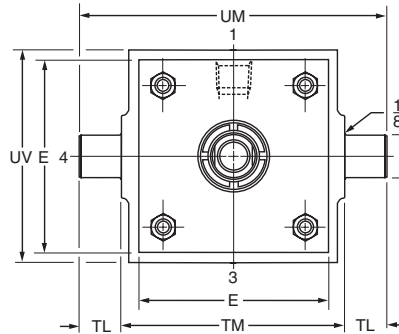
Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size													
		Style 4 & 5 LL	Style 2 & 3 KK	A	AC	+.000 -.002 B	C	D	NA	V	VA	VB	W	WF	Y	Add Stroke	
																XJ	ZB
1½	⅝	½-20	7/16-20	¾	1⅞	1.124	¾	½	9/16	—	¼	¾	—	1	1⅝	4⅞	4⅞
	1	7/8-14	¾-16	1⅞	1⅞	1.499	½	7/8	15/16	½	—	—	1	—	2⅝	4½	5¼
2	⅝	½-20	7/16-20	¾	1⅞	1.124	¾	½	9/16	—	¼	¾	—	1	1⅝	4⅞	4⅞
	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝	⅝	—	—	1¼	—	2⅞	4¾	5⅞
2½	1	7/8-14	¾-16	1⅞	1⅞	1.499	½	7/8	15/16	—	¼	¾	—	1⅜	2⅝	4½	5⅞
	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝	⅝	—	—	1¼	1⅝	2⅞	4⅞	5⅞
3¼	1	7/8-14	¾-16	1⅞	1⅞	1.499	½	7/8	15/16	—	¼	¾	—	1⅜	2⅞	5	6
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	1⅝	—	¼	9/16	—	2	3⅞	5⅞	6⅞
4	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝	—	¼	½	—	1⅝	2⅞	5¼	6¼
	1¾	1½-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	2⅝	5½	6½
5	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	1⅝	—	¼	9/16	—	2	3⅞	5⅞	6⅞
	1	7/8-14	¾-16	1⅞	1⅞	1.499	½	7/8	15/16	—	¼	¾	—	1⅜	2⅞	5¼	6⅞
6	3½	3¼-12	2½-12	3½	—	4.249	1	3	3⅞	⅝	—	—	1⅝	—	3⅝	6⅞	7⅞
	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝	—	¼	½	—	1⅝	2⅞	5½	6⅞
7	1¾	1½-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	2⅝	5¾	6⅞
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	1⅝	—	¼	9/16	—	2	3⅞	5⅞	6⅞
8	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	—	¼	1⅞	—	2¼	3⅝	6⅞	7⅞
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	⅝	—	—	1⅝	—	3⅝	6⅞	7⅞
9	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝	—	¼	7/16	—	1⅝	2⅞	5⅞	7⅞
	4	3¼-12	3-12	4	—	4.749	1	3⅞	3⅞	½	—	—	1½	—	3⅞	6½	7⅞
10	1¾	1½-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	3⅞	6⅞	7⅞
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	1⅝	—	¼	9/16	—	2	3⅞	6¼	7⅞
11	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	—	¼	1⅞	—	2¼	3⅞	6½	7⅞
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	½	—	—	1½	—	3⅞	6½	7⅞
12	3½	3¼-12	2½-12	3½	—	4.249	1	3	3⅞	½	—	—	1½	—	3⅞	6½	7⅞

Intermediate Fixed Trunnion Mount
Style MT4
1 1/2" - 2" - 2 1/2" - 5" and 6" Bore
With Maximum Oversize Rods



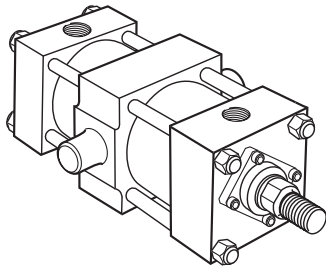
Tie Rod Retained Cartridge



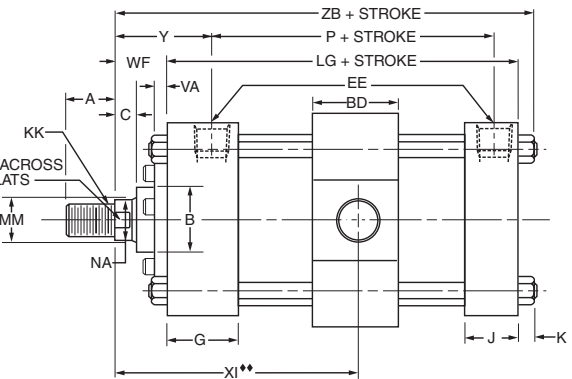
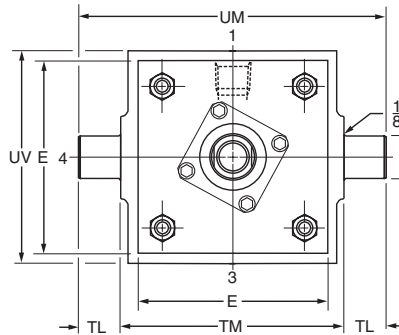
♦♦ Dimension X1 to be specified by customer.

Before determining dimensions: See chart on page 87 for cylinder rod combinations that have removable cartridges.

Intermediate Fixed Trunnion Mount
Style MT4
1 1/2" - 6" Bore



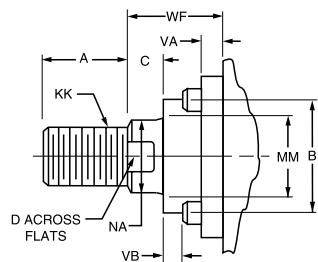
Removable Cartridge



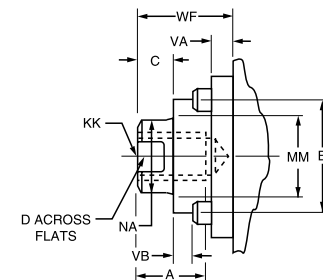
♦♦ Dimension X1 to be specified by customer.

Rod End Dimensions — see table 2

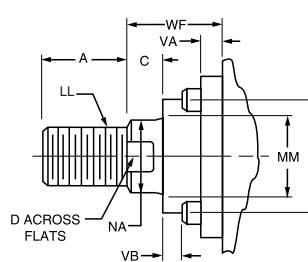
Thread Style 2
Small Male



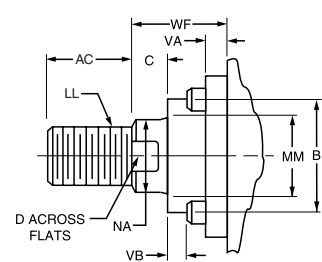
Thread Style 3
Short Female



Thread Style 4
Intermediate Male



Thread Style 5
Automotive Male



"Special" Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify "Style 0" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

Mounting Information – 1½" to 6" Bore

Table 1—Envelope and Mounting Dimensions

Bore	BD	E	EE		F	G	J	K	+0.000 TD -0.001	TL	TM	UM	UV	Minimum Stroke	Add Stroke	
			NPTF	SAE											LG	P
1½	1¼	2	¾†	#6**	¾	1½	1	¼	1.000	1	2½	4½	2½	¼	3⅝	2¼
2	1½	2½	¾†	#6	¾	1½	1	⅝	1.000	1	3	5	3	½	3⅝	2¼
2½	1½	3	¾†	#6	¾	1½	1	⅝	1.000	1	3½	5½	3½	¾	3¾	2⅝
3¼	2	3¾	½	#10	⅝	1¾	1¼	¾	1.000	1	4½	6½	4¼	⅞	4¼	2⅝
4	2	4½	½	#10	—	1¾	1¼	¾	1.000	1	5¼	7¼	5	⅞	4¼	2⅝
5	2	5½	½	#10	—	1¾	1¼	⅞	1.000	1	6¼	8¼	6	⅝	4½	2⅞
6	2½	6½	¾	#12	¾	2	1½	⅞	1.375	1¾	7⅝	10¾	7	1⅞	5	3⅞

† On 1½", 2" and 2½" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

** Port adapter fitting furnished at head end only.

Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

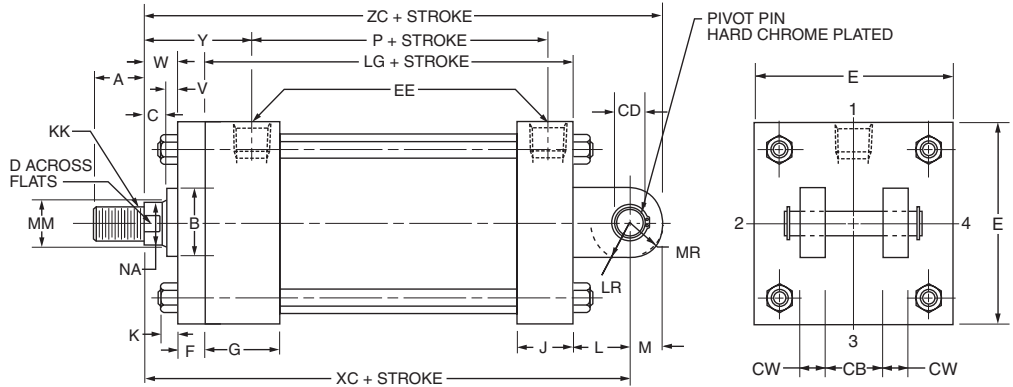
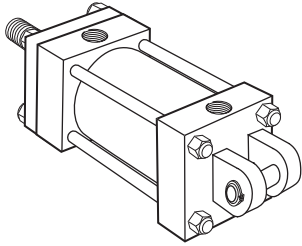
Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size														Add Stroke ZB
		Style 4 & 5 LL	Style 2 & 3 KK	A	AC	+0.000 -0.002 B	C	D	NA	V	VA	VB	W	WF	Min.** XI	Y		
1½	⅝	1/2-20	7/16-20	¾	1⅞	1.124	¾	½	9/16	—	¼	¾	—	1	3⅜	1⅝	4⅞	
	1	7/8-14	¾-16	1⅞	1⅞	1.499	½	7/8	15/16	½	—	—	1	—	3⅞	2⅝	5¼	
2	⅝	1/2-20	7/16-20	¾	1⅞	1.124	¾	½	9/16	—	¼	¾	—	1	3⅜	1⅝	4⅞	
	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	15/16	⅝	—	—	1¼	—	3⅝	2⅞	5⅞	
2½	⅝	1/2-20	7/16-20	¾	1⅞	1.124	¾	½	9/16	—	¼	¾	—	1	3⅜	1⅝	4⅞	
	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	15/16	⅝	—	—	1¼	—	3⅝	2⅞	5⅞	
3¼	1	7/8-14	¾-16	1⅞	1⅞	1.499	½	7/8	15/16	—	¼	¾	—	1⅜	4⅞	2⅞	6	
	2	1¼-12	1½-12	2¼	3½	2.624	⅞	1⅞	15/16	—	¼	9/16	—	2	4⅞	3⅞	6⅝	
4	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	15/16	—	¼	¾	—	1⅜	4⅞	2⅞	6¼	
	1⅜	1¼-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	4⅞	2⅝	6½	
5	1	7/8-14	¾-16	1⅞	1⅞	1.499	½	7/8	15/16	—	¼	¾	—	1⅜	4⅞	2⅞	6	
	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	—	¼	1⅞	—	2¼	5⅞	3⅞	6⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	15/16	—	¼	¾	—	1⅜	4⅞	2⅞	6¼	
	1⅜	1¼-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	4⅞	2⅝	6½	
7	1	7/8-14	¾-16	1⅞	1⅞	1.499	½	7/8	15/16	—	¼	¾	—	1⅜	4⅞	2⅞	6	
	2	1¼-12	1½-12	2¼	3½	2.624	⅞	1⅞	15/16	—	¼	9/16	—	2	4⅞	3⅞	6⅝	
8	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	—	¼	1⅞	—	2¼	5⅞	3⅞	6⅞	
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	⅝	—	—	1⅝	—	5⅞	3⅞	7⅞	
9	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	15/16	—	¼	¾	—	1⅜	4⅞	2⅞	6¼	
	4	3¾-12	3-12	4	—	4.749	1	3⅞	3⅞	½	—	—	1½	—	5⅞	3⅞	7⅞	
10	1⅜	1¼-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	4⅞	2⅞	6¼	
	2	1¾-12	1½-12	2¼	3½	2.624	⅞	1⅞	15/16	—	¼	9/16	—	2	4⅞	3⅞	6⅝	
11	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	—	¼	1⅞	—	2¼	5⅞	3⅞	6⅞	
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	⅝	—	—	1½	—	5⅞	3⅞	7⅞	
12	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	15/16	—	¼	¾	—	1⅜	4⅞	2⅞	6¼	
	4	3¾-12	3-12	4	—	4.749	1	3⅞	3⅞	½	—	—	1½	—	5⅞	3⅞	7⅞	
13	1⅜	1¼-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	4⅞	2⅞	6¼	
	2	1¾-12	1½-12	2¼	3½	2.624	⅞	1⅞	15/16	—	¼	9/16	—	2	4⅞	3⅞	6⅝	
14	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	—	¼	1⅞	—	2¼	5⅞	3⅞	6⅞	
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	⅝	—	—	1½	—	5⅞	3⅞	7⅞	
15	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	15/16	—	¼	¾	—	1⅜	4⅞	2⅞	6¼	
	4	3¾-12	3-12	4	—	4.749	1	3⅞	3⅞	½	—	—	1½	—	5⅞	3⅞	7⅞	
16	1⅜	1¼-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	4⅞	2⅞	6¼	
	2	1¾-12	1½-12	2¼	3½	2.624	⅞	1⅞	15/16	—	¼	9/16	—	2	4⅞	3⅞	6⅝	
17	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	—	¼	1⅞	—	2¼	5⅞	3⅞	6⅞	
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	⅝	—	—	1½	—	5⅞	3⅞	7⅞	
18	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	15/16	—	¼	¾	—	1⅜	4⅞	2⅞	6¼	
	4	3¾-12	3-12	4	—	4.749	1	3⅞	3⅞	½	—	—	1½	—	5⅞	3⅞	7⅞	
19	1⅜	1¼-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	4⅞	2⅞	6¼	
	2	1¾-12	1½-12	2¼	3½	2.624	⅞	1⅞	15/16	—	¼	9/16	—	2	4⅞	3⅞	6⅝	
20	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	—	¼	1⅞	—	2¼	5⅞	3⅞	6⅞	
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	⅝	—	—	1½	—	5⅞	3⅞	7⅞	
21	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	15/16	—	¼	¾	—	1⅜	4⅞	2⅞	6¼	
	4	3¾-12	3-12	4	—	4.749	1	3⅞	3⅞	½	—	—	1½	—	5⅞	3⅞	7⅞	
22	1⅜	1¼-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	4⅞	2⅞	6¼	
	2	1¾-12	1½-12	2¼	3½	2.624	⅞	1⅞	15/16	—	¼	9/16	—	2	4⅞	3⅞	6⅝	
23	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	—	¼	1⅞	—	2¼	5⅞	3⅞	6⅞	
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	⅝	—	—	1½	—	5⅞	3⅞	7⅞	
24	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	15/16	—	¼	¾	—	1⅜	4⅞	2⅞	6¼	
	4	3¾-12	3-12	4	—	4.749	1	3⅞	3⅞	½	—	—	1½	—	5⅞	3⅞	7⅞	
25	1⅜	1¼-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	4⅞	2⅞	6¼	
	2	1¾-12	1½-12	2¼	3½	2.624	⅞	1⅞	15/16	—	¼	9/16	—	2	4⅞	3⅞	6⅝	
26	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	—	¼	1⅞	—	2¼	5⅞	3⅞	6⅞	
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	⅝	—	—	1½	—	5⅞	3⅞	7⅞	
27	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	15/16	—	¼	¾	—	1⅜	4⅞	2⅞	6¼	
	4	3¾-12	3-12	4	—	4.749	1	3⅞	3⅞	½	—	—	1½	—	5⅞	3⅞	7⅞	
28	1⅜	1¼-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	4⅞	2⅞	6¼	
	2	1¾-12	1½-12	2¼	3½	2.624	⅞	1⅞	15/16	—	¼	9/16	—	2	4⅞	3⅞	6⅝	
29	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	—	¼	1⅞	—	2¼	5⅞	3⅞	6⅞	
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	⅝	—	—	1½	—	5⅞	3⅞	7⅞	
30	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	15/16	—	¼	¾	—	1⅜	4⅞	2⅞	6¼	
	4	3¾-12	3-12	4	—	4.749	1	3⅞	3⅞	½	—	—	1½	—	5⅞	3⅞	7⅞	
31	1⅜	1¼-12	1¼-12	2	3	2.374	¾	1½	1⅞	—	¼	9/16	—	1⅞	4⅞	2⅞	6¼	
	2	1¾-12	1½-12	2¼	3½	2.624	⅞	1⅞	15/16	—	¼	9/16	—	2	4⅞	3⅞	6⅝	
32	2½	2¼-12	1⅞-12	3	4½	3.124	1	2⅞	2⅞	—	¼	1⅞	—	2¼	5⅞	3⅞	6⅞	
	3	2¾-12	2¼-12	3½	—	3.749	1	2⅞	2⅞	⅝	—	—	1½	—	5⅞	3⅞	7⅞	
33	1																	

Cap Fixed Clevis Mount

Style MP1

1 1/2" - 2" - 2 1/2" - 5" and 6" Bore

With Maximum Oversize Rods



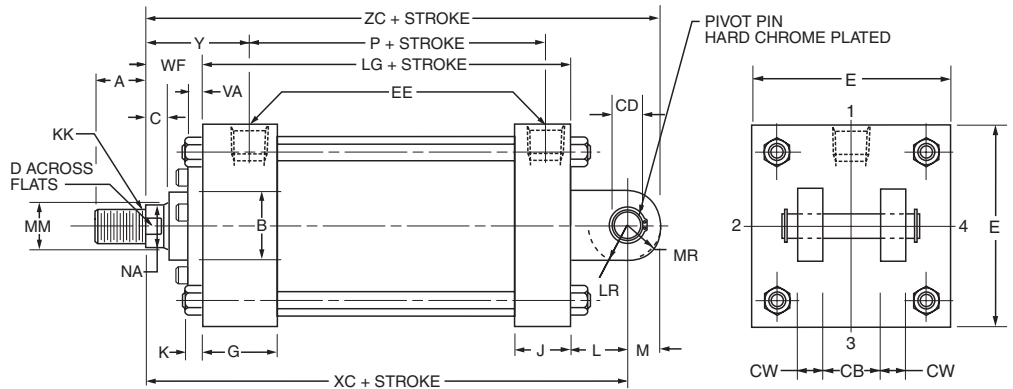
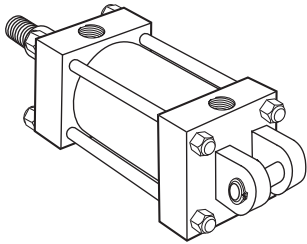
The 4", 5" and 6" bore sizes have the tie rod nuts at both ends as shown. Tie rods thread into cap on all other bore sizes.

Before determining dimensions: See chart on page 87 for cylinder rod combinations that have removable cartridges.

Cap Fixed Clevis Mount

Style MP1

1 1/2" - 6" Bore

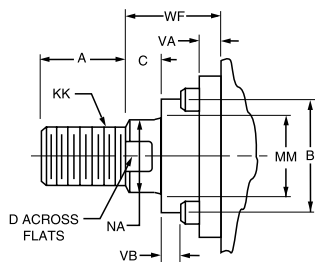


The 4", 5" and 6" bore sizes have the tie rod nuts at both ends as shown. Tie rods thread into cap on all other bore sizes.

Rod End Dimensions — see table 2

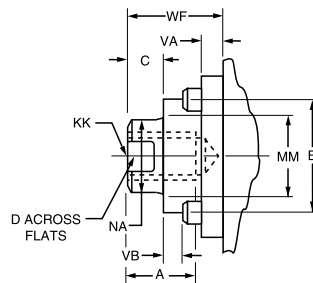
Thread Style 2

Small Male



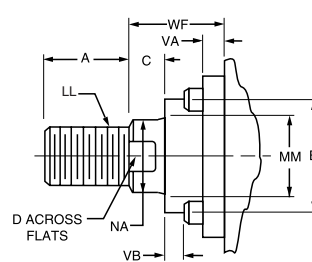
Thread Style 3

Short Female



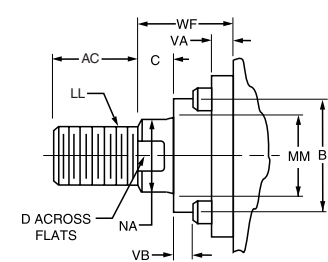
Thread Style 4

Intermediate Male



Thread Style 5

Automotive Male



"Special" Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify "Style 0" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

Table 1—Envelope and Mounting Dimensions

Bore	CB	+.000 CD -.002	CW	E	EE		F	G	J	K	L	LR	M	MR	Add Stroke	
					NPTF	SAE									LG	P
1½	¾	.501	½	2	¾†	#6**	¾	1½	1	¼	¾	¾	½	⅝	3⅝	2¼
2	¾	.501	½	2½	¾†	#6	¾	1½	1	⅝	¾	¾	½	⅝	3⅝	2¼
2½	¾	.501	½	3	¾†	#6	¾	1½	1	⅝	¾	¾	½	⅝	3¾	2⅜
3¼	1¼	.751	⅝	3¾	½	#10	—	1¾	1¼	¾	1¼	1	¾	¾	4¼	2⅝
4	1¼	.751	⅝	4½	½	#10	—	1¾	1¼	¾	1¼	1	¾	¾	4¼	2⅝
5	1¼	.751	⅝	5½	½	#10	⅝	1¾	1¼	7/16	1¼	1	¾	¾	4½	2⅞
6	1½	1.001	¾	6½	¾	#12	¾	2	1½	7/16	1½	1¼	1	1	5	3⅝

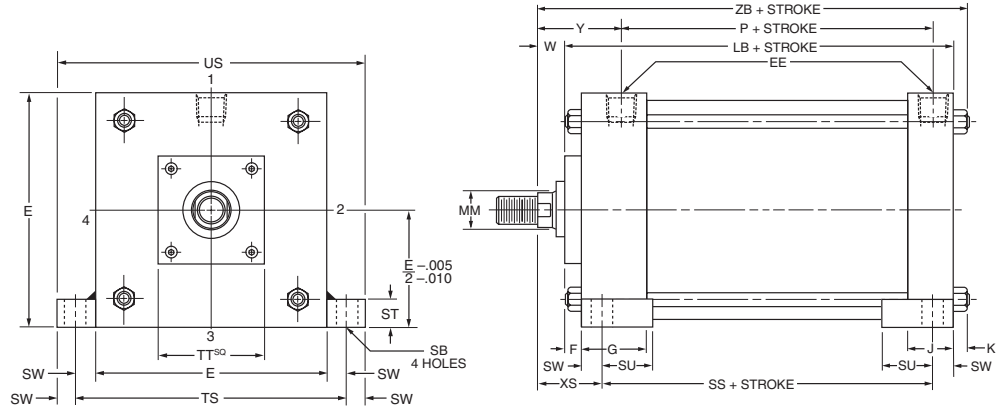
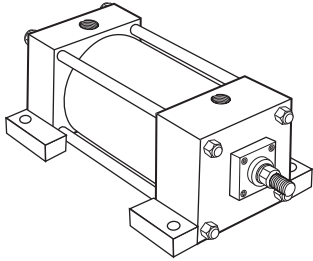
† On 1½", 2" and 2½" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

** Port adapter fitting furnished at head end only.

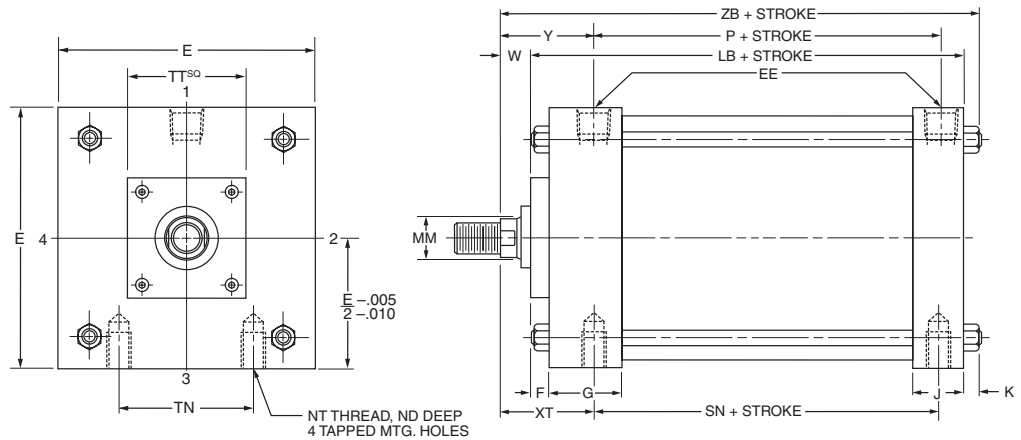
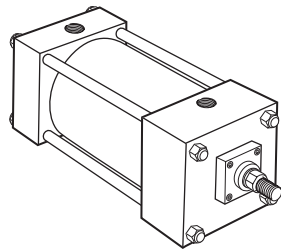
Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size													Add Stroke	
		Style 4 & 5 LL	Style 2 & 3 KK	A	AC	+.000 -.002 B	C	D	NA	V	VA	VB	W	WF	Y	XC	ZC	
1½	⅝	½-20	7/16-20	¾	1⅞	1.124	¾	½	9/16	—	¼	¾	—	1	1⅝/16	5⅜	5⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	½	—	—	1	—	2⅝/16	5¾	6¼	
2	⅝	½-20	7/16-20	¾	1⅞	1.124	¾	½	9/16	—	¼	¾	—	1	1⅝/16	5⅜	5⅞	
	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	⅝	—	—	1¼	—	2⅞/16	6	6½	
2½	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	2⅝/16	5¾	6¼	
	⅝	½-20	7/16-20	¾	1⅞	1.124	¾	½	9/16	—	¼	¾	—	1	1⅝/16	5½	6	
3¼	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	⅝	—	—	1¼	1⅝/16	6⅞	6⅞		
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	6⅞	7⅝	
4	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	6⅞	7⅝	
	2	1¾-12	1½-12	2¼	3½	2.624	7/8	1⅞	1⅝/16	—	¼	9/16	—	2	3⅞/16	7½	8¼	
5	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1.499	½	7/8	15/16	—	¼	¾	—	1⅞	27/16	7⅞	7⅞	
6	1⅜	1¼-12	1-14	1⅝	2½	1.999	⅝	1⅞	1⅝/16	—	¼	9/16	—	1⅞	21⅞/16	7⅞	8⅞	
	1	7/8-14	¾-16	1⅞	17/8	1												

Side Lug Mount
Style MS2
8" - 12" Bore

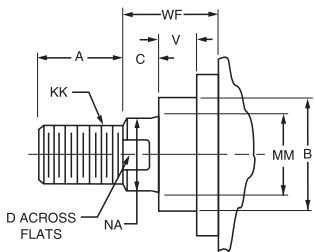


Side Tap Mount
Style MS4
8" - 12" Bore

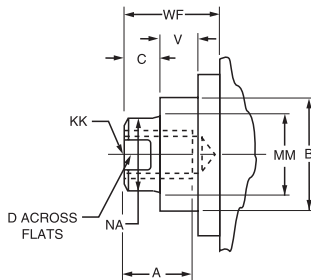


Rod End Dimensions — see table 2

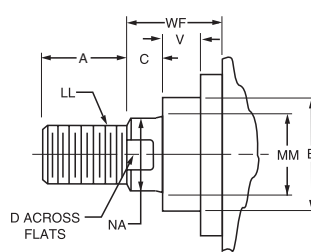
Thread Style 2
Small Male



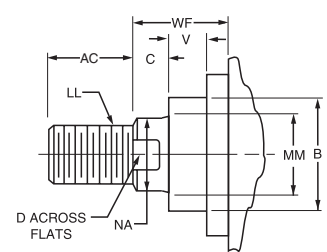
Thread Style 3
Short Female



Thread Style 4
Intermediate Male



Thread Style 5
Automotive Male



"Special" Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify "Style 0" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

Mounting Information – 8" to 12" Bore

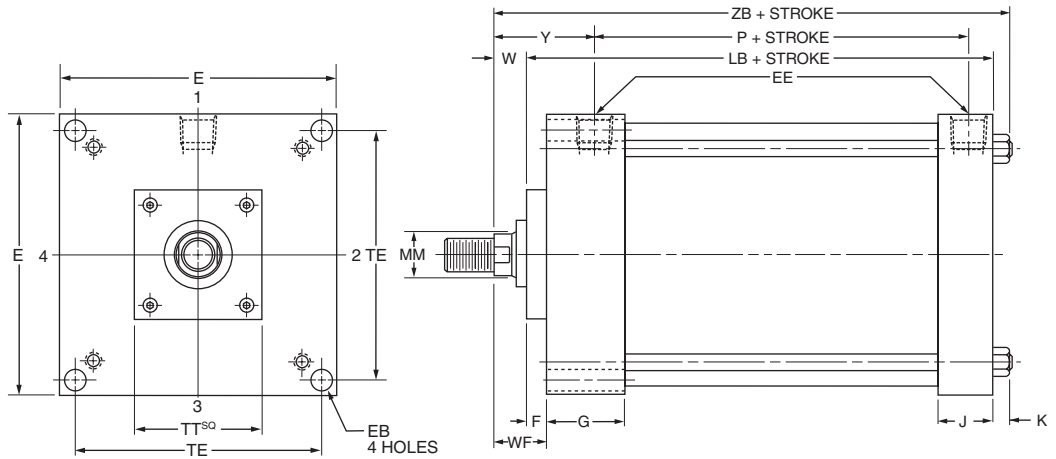
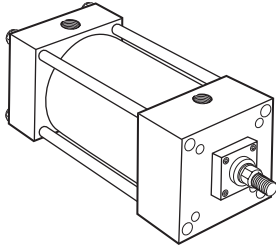
Table 1—Envelope and Mounting Dimensions

Bore	E	EE		F	G	J	K	ND	NT	SB*	ST	SU	SW	TN	TS	US	Add Stroke			
		NPTF	SAE														LB	P	SN	SS
8	8 ¹ / ₂	³ / ₄	#12	³ / ₄	2	1 ¹ / ₂	⁹ / ₁₆	1 ¹ / ₈	³ / ₄ -10	¹³ / ₁₆	1	1 ⁹ / ₁₆	¹¹ / ₁₆	4 ¹ / ₂	9 ⁷ / ₈	11 ¹ / ₄	5 ⁷ / ₈	3 ¹ / ₄	3 ¹ / ₄	3 ³ / ₄
10	10 ⁵ / ₈	1	#16	³ / ₄	2 ¹ / ₄	2	¹¹ / ₁₆	1 ¹ / ₂	1-8	1 ¹ / ₁₆	1 ¹ / ₄	2	⁷ / ₈	5 ¹ / ₂	12 ³ / ₈	14 ¹ / ₈	7 ¹ / ₈	4 ¹ / ₈	4 ¹ / ₈	4 ⁵ / ₈
12	12 ³ / ₄	1	#16	³ / ₄	2 ¹ / ₄	2	¹¹ / ₁₆	1 ¹ / ₂	1-8	1 ¹ / ₁₆	1 ¹ / ₄	2	⁷ / ₈	7 ¹ / ₄	14 ¹ / ₂	16 ¹ / ₄	7 ⁵ / ₈	4 ⁵ / ₈	4 ⁵ / ₈	5 ¹ / ₈

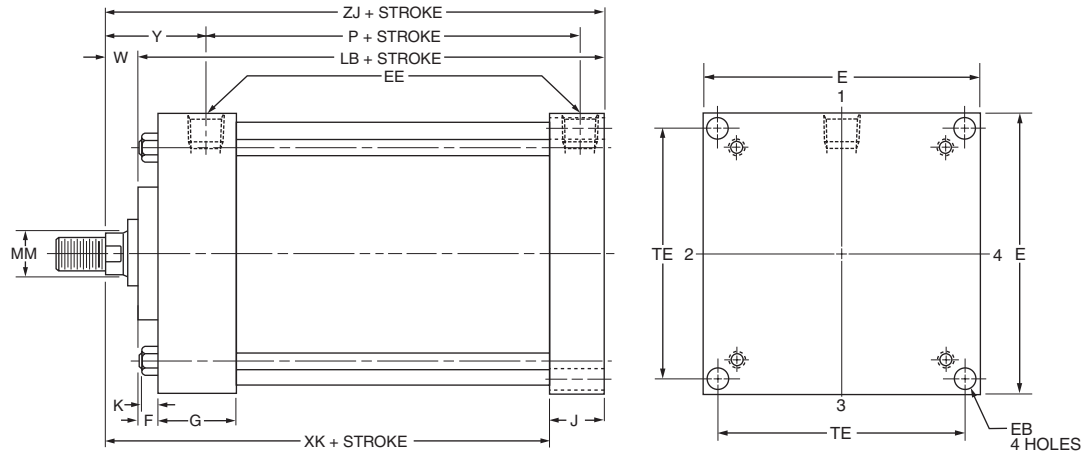
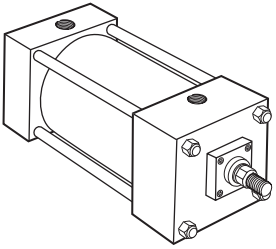
Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

Bore	Rod Dia. MM	Thread		Rod End Dimensions and Envelope Dimensions Affected By Rod Size													Add Stroke
		Style 4 & 5 LL	Style 2 & 3 KK	A	AC	+0.000 -0.002 B	C	D	NA	TT	V	W	XS	XT	Y	ZB	
8	1 ³ / ₈	1 ¹ / ₄ -12	1-14	1 ⁵ / ₈	2 ¹ / ₂	1.999	⁵ / ₈	1 ¹ / ₈	1 ⁵ / ₁₆	4	¹ / ₄	⁷ / ₈	2 ⁵ / ₁₆	2 ¹³ / ₁₆	2 ¹³ / ₁₆	7 ⁵ / ₁₆	
	5 ¹ / ₂	5 ¹ / ₄ -12	4-12	5 ¹ / ₂	—	6.249	1	4 ⁵ / ₈	5 ³ / ₈	7	¹ / ₂	1 ¹ / ₂	2 ¹⁵ / ₁₆	3 ⁷ / ₁₆	3 ⁷ / ₁₆	7 ¹⁵ / ₁₆	
	1 ³ / ₄	1 ¹ / ₂ -12	1 ¹ / ₄ -12	2	3	2.374	³ / ₄	1 ¹ / ₂	1 ¹¹ / ₁₆	4	³ / ₈	1 ¹ / ₈	2 ⁹ / ₁₆	3 ¹ / ₁₆	3 ¹ / ₁₆	7 ⁹ / ₁₆	
	2	1 ³ / ₄ -12	1 ¹ / ₂ -12	2 ¹ / ₄	3 ¹ / ₂	2.624	⁷ / ₈	1 ¹¹ / ₁₆	1 ¹⁵ / ₁₆	4	³ / ₈	1 ¹ / ₄	2 ¹¹ / ₁₆	3 ³ / ₁₆	3 ³ / ₁₆	7 ¹¹ / ₁₆	
	2 ¹ / ₂	2 ¹ / ₄ -12	1 ⁷ / ₈ -12	3	4 ¹ / ₂	3.124	1	2 ¹ / ₁₆	2 ³ / ₈	4	¹ / ₂	1 ¹ / ₂	2 ¹⁵ / ₁₆	3 ⁷ / ₁₆	3 ⁷ / ₁₆	7 ¹⁵ / ₁₆	
	3	2 ³ / ₄ -12	2 ¹ / ₄ -12	3 ¹ / ₂	—	3.749	1	2 ⁵ / ₈	2 ⁷ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	2 ¹⁵ / ₁₆	3 ⁷ / ₁₆	3 ⁷ / ₁₆	7 ¹⁵ / ₁₆	
	3 ¹ / ₂	3 ¹ / ₄ -12	2 ¹ / ₂ -12	3 ¹ / ₂	—	4.249	1	3	3 ³ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	2 ¹⁵ / ₁₆	3 ⁷ / ₁₆	3 ⁷ / ₁₆	7 ¹⁵ / ₁₆	
	4	3 ³ / ₄ -12	3-12	4	—	4.749	1	3 ³ / ₈	3 ⁷ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	2 ¹⁵ / ₁₆	3 ⁷ / ₁₆	3 ⁷ / ₁₆	7 ¹⁵ / ₁₆	
4 ¹ / ₂	4 ¹ / ₄ -12	3 ³ / ₄ -12	4 ¹ / ₂	—	5.249	1	3 ⁷ / ₈	4 ³ / ₈	7	¹ / ₂	1 ¹ / ₂	2 ¹⁵ / ₁₆	3 ⁷ / ₁₆	3 ⁷ / ₁₆	7 ¹⁵ / ₁₆		
5	4 ³ / ₄ -12	3 ¹ / ₂ -12	5	—	5.749	1	4 ¹ / ₄	4 ⁷ / ₈	7	¹ / ₂	1 ¹ / ₂	2 ¹⁵ / ₁₆	3 ⁷ / ₁₆	3 ⁷ / ₁₆	7 ¹⁵ / ₁₆		
10	1 ³ / ₄	1 ¹ / ₂ -12	1 ¹ / ₄ -12	2	3	2.374	³ / ₄	1 ¹ / ₂	1 ¹¹ / ₁₆	4	³ / ₈	1 ¹ / ₈	2 ³ / ₄	3 ¹ / ₈	3 ¹ / ₈	8 ¹⁵ / ₁₆	
	2	1 ³ / ₄ -12	1 ¹ / ₂ -12	2 ¹ / ₄	3 ¹ / ₂	2.624	⁷ / ₈	1 ¹¹ / ₁₆	1 ¹⁵ / ₁₆	4	³ / ₈	1 ¹ / ₄	2 ⁷ / ₈	3 ¹ / ₄	3 ¹ / ₄	9 ¹ / ₁₆	
	2 ¹ / ₂	2 ¹ / ₄ -12	1 ⁷ / ₈ -12	3	4 ¹ / ₂	3.124	1	2 ¹ / ₁₆	2 ³ / ₈	4	¹ / ₂	1 ¹ / ₂	3 ¹ / ₈	3 ¹ / ₂	3 ¹ / ₂	9 ⁵ / ₁₆	
	3	2 ³ / ₄ -12	2 ¹ / ₄ -12	3 ¹ / ₂	—	3.749	1	2 ⁵ / ₈	2 ⁷ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	3 ¹ / ₈	3 ¹ / ₂	3 ¹ / ₂	9 ⁵ / ₁₆	
	3 ¹ / ₂	3 ¹ / ₄ -12	2 ¹ / ₂ -12	3 ¹ / ₂	—	4.249	1	3	3 ³ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	3 ¹ / ₈	3 ¹ / ₂	3 ¹ / ₂	9 ⁵ / ₁₆	
	4	3 ³ / ₄ -12	3-12	4	—	4.749	1	3 ³ / ₈	3 ⁷ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	3 ¹ / ₈	3 ¹ / ₂	3 ¹ / ₂	9 ⁵ / ₁₆	
	4 ¹ / ₂	4 ¹ / ₄ -12	3 ³ / ₄ -12	4 ¹ / ₂	—	5.249	1	3 ⁷ / ₈	4 ³ / ₈	7	¹ / ₂	1 ¹ / ₂	3 ¹ / ₈	3 ¹ / ₂	3 ¹ / ₂	9 ⁵ / ₁₆	
	5	4 ³ / ₄ -12	3 ¹ / ₂ -12	5	—	5.749	1	4 ¹ / ₄	4 ⁷ / ₈	7	¹ / ₂	1 ¹ / ₂	3 ¹ / ₈	3 ¹ / ₂	3 ¹ / ₂	9 ⁵ / ₁₆	
5 ¹ / ₂	5 ¹ / ₄ -12	4-12	5 ¹ / ₂	—	6.249	1	4 ⁵ / ₈	5 ³ / ₈	7	¹ / ₂	1 ¹ / ₂	3 ¹ / ₈	3 ¹ / ₂	3 ¹ / ₂	9 ⁵ / ₁₆		
12	2	1 ³ / ₄ -12	1 ¹ / ₂ -12	2 ¹ / ₄	3 ¹ / ₂	2.624	⁷ / ₈	1 ¹¹ / ₁₆	1 ¹⁵ / ₁₆	4	³ / ₈	1 ¹ / ₄	2 ⁷ / ₈	3 ¹ / ₄	3 ¹ / ₄	9 ⁹ / ₁₆	
	2 ¹ / ₂	2 ¹ / ₄ -12	1 ⁷ / ₈ -12	3	4 ¹ / ₂	3.124	1	2 ¹ / ₁₆	2 ³ / ₈	4	¹ / ₂	1 ¹ / ₂	3 ¹ / ₈	3 ¹ / ₂	3 ¹ / ₂	9 ¹³ / ₁₆	
	3	2 ³ / ₄ -12	2 ¹ / ₄ -12	3 ¹ / ₂	—	3.749	1	2 ⁵ / ₈	2 ⁷ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	3 ¹ / ₈	3 ¹ / ₂	3 ¹ / ₂	9 ¹³ / ₁₆	
	3 ¹ / ₂	3 ¹ / ₄ -12	2 ¹ / ₂ -12	3 ¹ / ₂	—	4.249	1	3	3 ³ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	3 ¹ / ₈	3 ¹ / ₂	3 ¹ / ₂	9 ¹³ / ₁₆	
	4	3 ³ / ₄ -12	3-12	4	—	4.749	1	3 ³ / ₈	3 ⁷ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	3 ¹ / ₈	3 ¹ / ₂	3 ¹ / ₂	9 ¹³ / ₁₆	
	4 ¹ / ₂	4 ¹ / ₄ -12	3 ³ / ₄ -12	4 ¹ / ₂	—	5.249	1	3 ⁷ / ₈	4 ³ / ₈	7	¹ / ₂	1 ¹ / ₂	3 ¹ / ₈	3 ¹ / ₂	3 ¹ / ₂	9 ¹³ / ₁₆	
	5	4 ³ / ₄ -12	3 ¹ / ₂ -12	5	—	5.749	1	4 ¹ / ₄	4 ⁷ / ₈	7	¹ / ₂	1 ¹ / ₂	3 ¹ / ₈	3 ¹ / ₂	3 ¹ / ₂	9 ¹³ / ₁₆	
5 ¹ / ₂	5 ¹ / ₄ -12	4-12	5 ¹ / ₂	—	6.249	1	4 ⁵ / ₈	5 ³ / ₈	7	¹ / ₂	1 ¹ / ₂	3 ¹ / ₈	3 ¹ / ₂	3 ¹ / ₂	9 ¹³ / ₁₆		

Head Square Mount
Style ME3
8" - 12" Bore

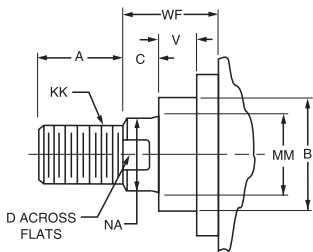


Cap Square Mount
Style ME4
8" - 12" Bore

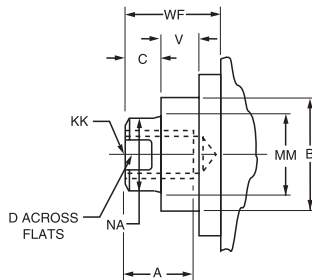


Rod End Dimensions — see table 2

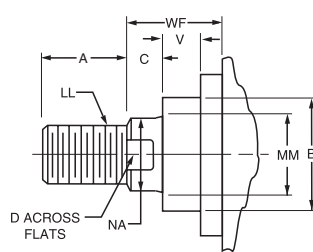
Thread Style 2
Small Male



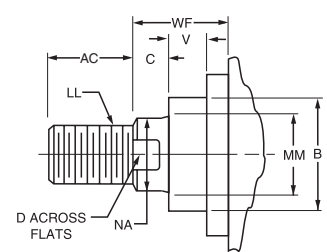
Thread Style 3
Short Female



Thread Style 4
Intermediate Male



Thread Style 5
Automotive Male



"Special" Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify "Style 0" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

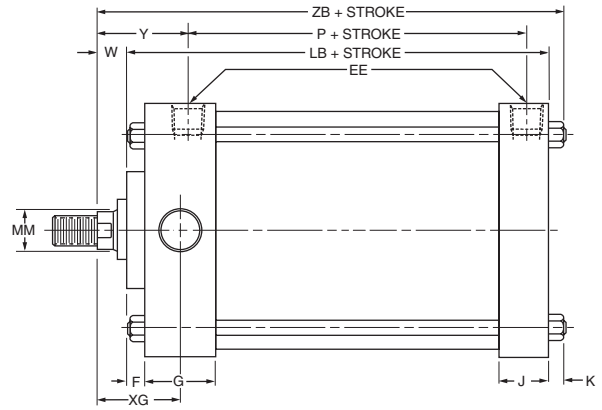
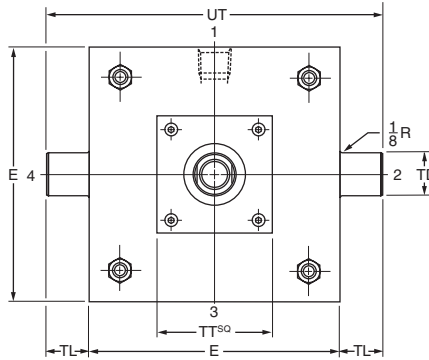
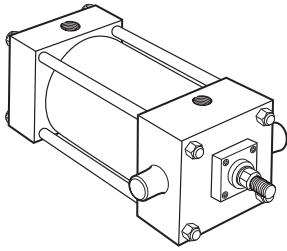
Table 1—Envelope and Mounting Dimensions

Bore	E	EB	EE		F	G	J	K	TE	Add Stroke	
			NPTF	SAE						LB	P
8	8 ¹ / ₂	1 ¹ / ₁₆	³ / ₄	#12	³ / ₄	2	1 ¹ / ₂	⁹ / ₁₆	7.57	5 ⁷ / ₈	3 ¹ / ₄
10	10 ⁵ / ₈	¹³ / ₁₆	1	#16	³ / ₄	2 ¹ / ₄	2	¹¹ / ₁₆	9.40	7 ¹ / ₈	4 ¹ / ₈
12	12 ³ / ₄	¹³ / ₁₆	1	#16	³ / ₄	2 ¹ / ₄	2	¹¹ / ₁₆	11.10	7 ⁵ / ₈	4 ⁵ / ₈

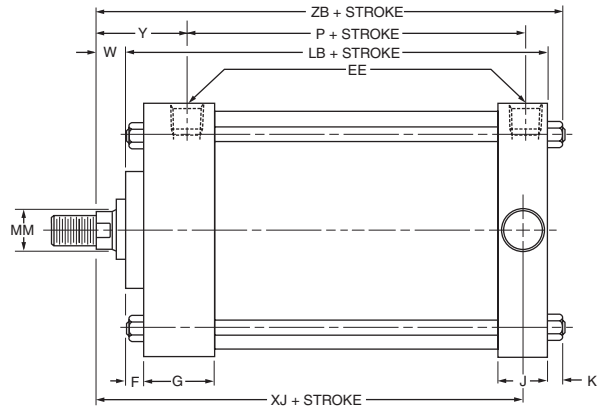
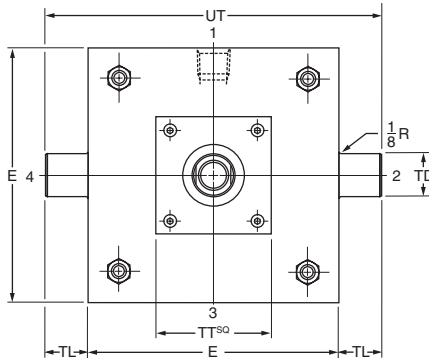
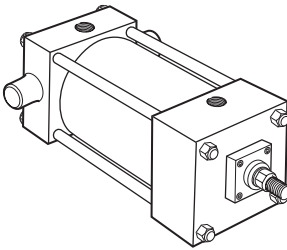
Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

Bore	Rod Dia. MM	Thread		Rod End Dimensions and Envelope Dimensions Affected By Rod Size													
		Style 4 & 5 LL	Style 2 & 3 KK	A	AC	+.000 -.002 B	C	D	NA	TT	V	W	WF	Y	Add Stroke		
															XK	ZB	ZJ
8	1 ³ / ₈	1 ¹ / ₄ -12	1-14	1 ⁵ / ₈	2 ¹ / ₂	1.999	⁵ / ₈	1 ¹ / ₈	1 ⁵ / ₁₆	4	¹ / ₄	⁷ / ₈	1 ⁵ / ₈	2 ¹³ / ₁₆	5 ¹ / ₄	7 ⁵ / ₁₆	6 ³ / ₄
	5 ¹ / ₂	5 ¹ / ₄ -12	4-12	5 ¹ / ₂	—	6.249	1	4 ⁵ / ₈	5 ³ / ₈	7	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ⁷ / ₁₆	5 ⁷ / ₈	7 ¹⁵ / ₁₆	7 ³ / ₈
	1 ³ / ₄	1 ¹ / ₂ -12	1 ¹ / ₄ -12	2	3	2.374	³ / ₄	1 ¹ / ₂	1 ¹¹ / ₁₆	4	³ / ₈	1 ¹ / ₈	1 ⁷ / ₈	3 ¹ / ₁₆	5 ¹ / ₂	7 ⁹ / ₁₆	7
	2	1 ³ / ₄ -12	1 ¹ / ₂ -12	2 ¹ / ₄	3 ¹ / ₂	2.624	⁷ / ₈	1 ¹¹ / ₁₆	1 ¹⁵ / ₁₆	4	³ / ₈	1 ¹ / ₄	2	3 ³ / ₁₆	5 ⁵ / ₈	7 ¹¹ / ₁₆	7 ¹ / ₈
	2 ¹ / ₂	2 ¹ / ₄ -12	1 ⁷ / ₈ -12	3	4 ¹ / ₂	3.124	1	2 ¹ / ₁₆	2 ³ / ₈	4	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ⁷ / ₁₆	5 ⁷ / ₈	7 ¹⁵ / ₁₆	7 ³ / ₈
	3	2 ³ / ₄ -12	2 ¹ / ₄ -12	3 ¹ / ₂	—	3.749	1	2 ⁵ / ₈	2 ⁷ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ⁷ / ₁₆	5 ⁷ / ₈	7 ¹⁵ / ₁₆	7 ³ / ₈
	3 ¹ / ₂	3 ¹ / ₄ -12	2 ¹ / ₂ -12	3 ¹ / ₂	—	4.249	1	3	3 ³ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ⁷ / ₁₆	5 ⁷ / ₈	7 ¹⁵ / ₁₆	7 ³ / ₈
	4	3 ³ / ₄ -12	3-12	4	—	4.749	1	3 ³ / ₈	3 ⁷ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ⁷ / ₁₆	5 ⁷ / ₈	7 ¹⁵ / ₁₆	7 ³ / ₈
10	1 ³ / ₄	1 ¹ / ₂ -12	1 ¹ / ₄ -12	2	3	2.374	³ / ₄	1 ¹ / ₂	1 ¹¹ / ₁₆	4	³ / ₈	1 ¹ / ₈	1 ⁷ / ₈	3 ¹ / ₈	6 ¹ / ₄	8 ¹⁵ / ₁₆	8 ¹ / ₄
	2	1 ³ / ₄ -12	1 ¹ / ₂ -12	2 ¹ / ₄	3 ¹ / ₂	2.624	⁷ / ₈	1 ¹¹ / ₁₆	1 ¹⁵ / ₁₆	4	³ / ₈	1 ¹ / ₄	2	3 ¹ / ₄	6 ³ / ₈	9 ¹ / ₁₆	8 ³ / ₈
	2 ¹ / ₂	2 ¹ / ₄ -12	1 ⁷ / ₈ -12	3	4 ¹ / ₂	3.124	1	2 ¹ / ₁₆	2 ³ / ₈	4	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ¹ / ₂	6 ⁵ / ₈	9 ⁵ / ₁₆	8 ⁵ / ₈
	3	2 ³ / ₄ -12	2 ¹ / ₄ -12	3 ¹ / ₂	—	3.749	1	2 ⁵ / ₈	2 ⁷ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ¹ / ₂	6 ⁵ / ₈	9 ⁵ / ₁₆	8 ⁵ / ₈
	3 ¹ / ₂	3 ¹ / ₄ -12	2 ¹ / ₂ -12	3 ¹ / ₂	—	4.249	1	3	3 ³ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ¹ / ₂	6 ⁵ / ₈	9 ⁵ / ₁₆	8 ⁵ / ₈
	4	3 ³ / ₄ -12	3-12	4	—	4.749	1	3 ³ / ₈	3 ⁷ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ¹ / ₂	6 ⁵ / ₈	9 ⁵ / ₁₆	8 ⁵ / ₈
	4 ¹ / ₂	4 ¹ / ₄ -12	3 ¹ / ₄ -12	4 ¹ / ₂	—	5.249	1	3 ⁷ / ₈	4 ³ / ₈	7	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ¹ / ₂	6 ⁵ / ₈	9 ⁵ / ₁₆	8 ⁵ / ₈
	5	4 ³ / ₄ -12	3 ¹ / ₂ -12	5	—	5.749	1	4 ¹ / ₄	4 ⁷ / ₈	7	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ¹ / ₂	6 ⁵ / ₈	9 ⁵ / ₁₆	8 ⁵ / ₈
12	5 ¹ / ₂	5 ¹ / ₄ -12	4-12	5 ¹ / ₂	—	6.249	1	4 ⁵ / ₈	5 ³ / ₈	7	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ¹ / ₂	6 ⁵ / ₈	9 ⁵ / ₁₆	8 ⁵ / ₈
	2	1 ³ / ₄ -12	1 ¹ / ₂ -12	2 ¹ / ₄	3 ¹ / ₂	2.624	⁷ / ₈	1 ¹¹ / ₁₆	1 ¹⁵ / ₁₆	4	³ / ₈	1 ¹ / ₄	2	3 ¹ / ₄	6 ⁷ / ₈	9 ⁹ / ₁₆	8 ⁷ / ₈
	2 ¹ / ₂	2 ¹ / ₄ -12	1 ⁷ / ₈ -12	3	4 ¹ / ₂	3.124	1	2 ¹ / ₁₆	2 ³ / ₈	4	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ¹ / ₂	7 ¹ / ₈	9 ¹³ / ₁₆	9 ¹ / ₈
	3	2 ³ / ₄ -12	2 ¹ / ₄ -12	3 ¹ / ₂	—	3.749	1	2 ⁵ / ₈	2 ⁷ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ¹ / ₂	7 ¹ / ₈	9 ¹³ / ₁₆	9 ¹ / ₈
	3 ¹ / ₂	3 ¹ / ₄ -12	2 ¹ / ₂ -12	3 ¹ / ₂	—	4.249	1	3	3 ³ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ¹ / ₂	7 ¹ / ₈	9 ¹³ / ₁₆	9 ¹ / ₈
	4	3 ³ / ₄ -12	3-12	4	—	4.749	1	3 ³ / ₈	3 ⁷ / ₈	5 ¹ / ₂	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ¹ / ₂	7 ¹ / ₈	9 ¹³ / ₁₆	9 ¹ / ₈
	4 ¹ / ₂	4 ¹ / ₄ -12	3 ¹ / ₄ -12	4 ¹ / ₂	—	5.249	1	3 ⁷ / ₈	4 ³ / ₈	7	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ¹ / ₂	7 ¹ / ₈	9 ¹³ / ₁₆	9 ¹ / ₈
	5	4 ³ / ₄ -12	3 ¹ / ₂ -12	5	—	5.749	1	4 ¹ / ₄	4 ⁷ / ₈	7	¹ / ₂	1 ¹ / ₂	2 ¹ / ₄	3 ¹ / ₂	7 ¹ / ₈	9 ¹³ / ₁₆	9 ¹ / ₈

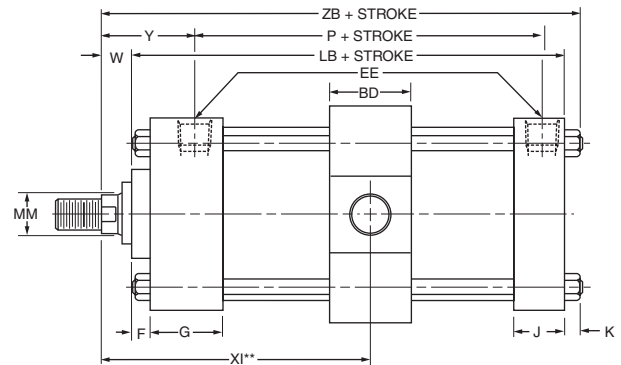
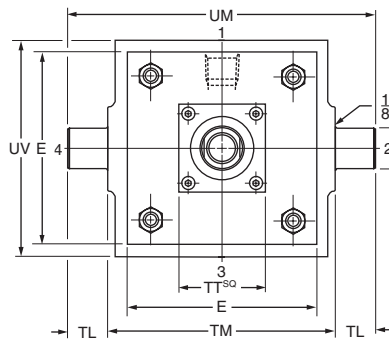
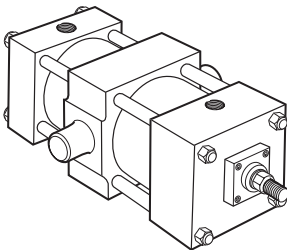
Head Trunnion Mount
Style MT1
8" - 12" Bore



Cap Trunnion Mount
Style MT2
8" - 12" Bore



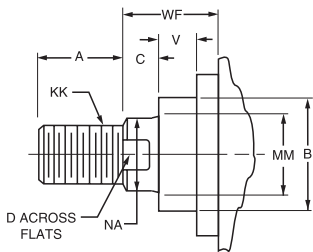
Intermediate Fixed Trunnion Mount
Model MT4
8" - 12" Bore



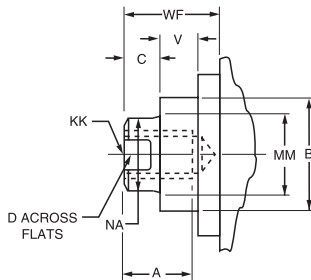
♦♦Dimension XI to be specified by customer.

Rod End Dimensions — see table 2

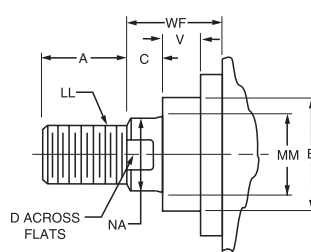
Thread Style 2
Small Male



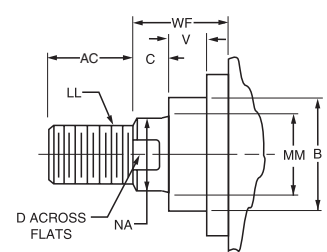
Thread Style 3
Short Female



Thread Style 4
Intermediate Male



Thread Style 5
Automotive Male



“Special” Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify “Style 0” and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

Table 1—Envelope and Mounting Dimensions

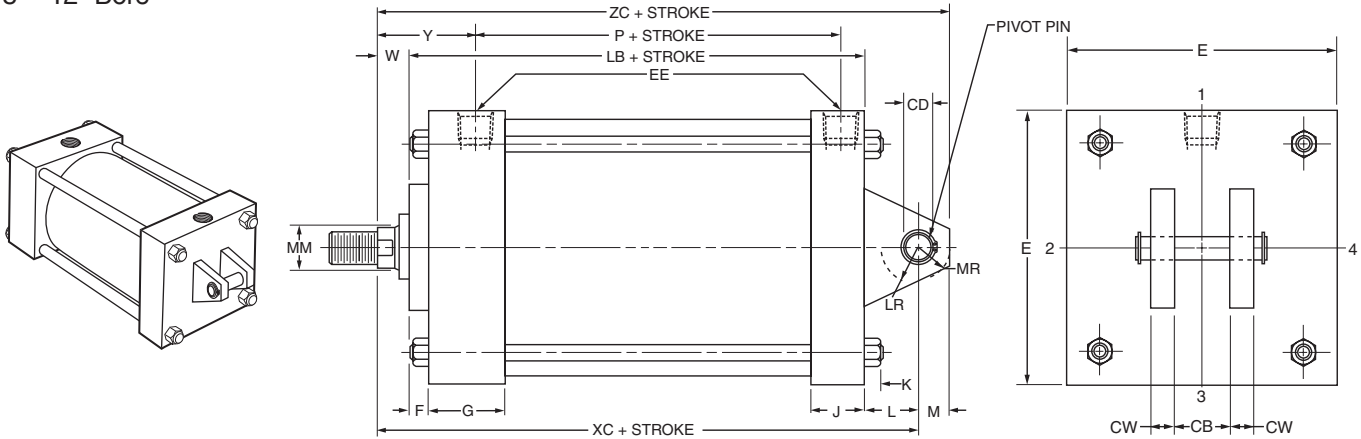
Bore	BD	E	EE		F	G	J	K	+0.000 TD -0.001	TL	TM	UT	UM	UV	Add Stroke	
			NPTF	SAE											LB	P
8	2 1/2	8 1/2	3/4	#12	3/4	2	1 1/2	9/16	1.375	1 3/8	9 3/4	11 1/4	12 1/2	9 1/2	5 7/8	3 1/4
10	3	10 5/8	1	#16	3/4	2 1/4	2	1 1/16	1.750	1 3/4	12	14 1/8	15 1/2	11 3/4	7 1/8	4 1/8
12	3	12 3/4	1	#16	3/4	2 1/4	2	1 1/16	1.750	1 3/4	14	16 1/4	17 1/2	13 3/4	7 5/8	4 5/8

Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

Bore	Rod Dia. MM	Thread		Rod End Dimensions and Envelope Dimensions Affected By Rod Size													Add Stroke	
		Style 4 & 5 LL	Style 2 & 3 KK	A	AC	+0.000 -0.002 B	C	D	NA	TT	V	W	XG	XI* (Min.)	Y	XJ	ZB	
8	1 3/8	1 1/4-12	1-14	1 5/8	2 1/2	1.999	5/8	1 1/8	1 5/16	4	1/4	7/8	2 5/8	4 15/16	2 13/16	6	7 5/16	
	5 1/2	5 1/4-12	4-12	5 1/2	—	6.249	1	4 5/8	5 3/8	7	1/2	1 1/2	3 1/4	5 9/16	3 7/16	6 5/8	7 15/16	
	1 3/4	1 1/2-12	1 1/4-12	2	3	2.374	3/4	1 1/2	1 11/16	4	3/8	1 1/8	2 7/8	5 3/16	3 1/16	6 1/4	7 9/16	
	2	1 3/4-12	1 1/2-12	2 1/4	3 1/2	2.624	7/8	1 11/16	1 15/16	4	3/8	1 1/4	3	5 5/16	3 3/16	6 3/8	7 11/16	
	2 1/2	2 1/4-12	1 7/8-12	3	4 1/2	3.124	1	2 1/16	2 3/8	4	1/2	1 1/2	3 1/4	5 9/16	3 7/16	6 5/8	7 15/16	
	3	2 3/4-12	2 1/4-12	3 1/2	—	3.749	1	2 5/8	2 7/8	5 1/2	1/2	1 1/2	3 1/4	5 3/16	3 7/16	6 5/8	7 15/16	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	—	4.249	1	3	3 3/8	5 1/2	1/2	1 1/2	3 1/4	5 9/16	3 7/16	6 5/8	7 15/16	
	4	3 3/4-12	3-12	4	—	4.749	1	3 3/8	3 7/8	5 1/2	1/2	1 1/2	3 1/4	5 9/16	3 7/16	6 5/8	7 15/16	
4 1/2	4 1/4-12	3 1/4-12	4 1/2	—	5.249	1	3 7/8	4 3/8	7	1/2	1 1/2	3 1/4	5 9/16	3 7/16	6 5/8	7 15/16		
5	4 3/4-12	3 1/2-12	5	—	5.749	1	4 1/4	4 7/8	7	1/2	1 1/2	3 1/4	5 9/16	3 7/16	6 5/8	7 15/16		
10	1 3/4	1 1/2-12	1 1/4-12	2	3	2.374	3/4	1 1/2	1 11/16	4	3/8	1 1/8	3	5 11/16	3 1/8	7 1/4	8 15/16	
	2	1 3/4-12	1 1/2-12	2 1/4	3 1/2	2.624	7/8	1 11/16	1 15/16	4	3/8	1 1/4	3 1/8	5 13/16	3 1/4	7 3/8	9 1/16	
	2 1/2	2 1/4-12	1 7/8-12	3	4 1/2	3.124	1	2 1/16	2 3/8	4	1/2	1 1/2	3 3/8	6 1/16	3 1/2	7 5/8	9 5/16	
	3	2 3/4-12	2 1/4-12	3 1/2	—	3.749	1	2 5/8	2 7/8	5 1/2	1/2	1 1/2	3 3/8	6 1/16	3 1/2	7 5/8	9 5/16	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	—	4.249	1	3	3 3/8	5 1/2	1/2	1 1/2	3 3/8	6 1/16	3 1/2	7 5/8	9 5/16	
	4	3 3/4-12	3-12	4	—	4.749	1	3 3/8	3 7/8	5 1/2	1/2	1 1/2	3 3/8	6 1/16	3 1/2	7 5/8	9 5/16	
	4 1/2	4 1/4-12	3 1/4-12	4 1/2	—	5.249	1	3 7/8	4 3/8	7	1/2	1 1/2	3 3/8	6 1/16	3 1/2	7 5/8	9 5/16	
	5	4 3/4-12	3 1/2-12	5	—	5.749	1	4 1/4	4 7/8	7	1/2	1 1/2	3 3/8	6 1/16	3 1/2	7 5/8	9 5/16	
5 1/2	5 1/4-12	4-12	5 1/2	—	6.249	1	4 5/8	5 3/8	7	1/2	1 1/2	3 3/8	6 1/16	3 1/2	7 5/8	9 5/16		
12	2	1 3/4-12	1 1/2-12	2 1/4	3 1/2	2.624	7/8	1 11/16	1 15/16	4	3/8	1 1/4	3 1/8	5 13/16	3 1/4	7 7/8	9 9/16	
	2 1/2	2 1/4-12	1 7/8-12	3	4 1/2	3.124	1	2 1/16	2 3/8	4	1/2	1 1/2	3 3/8	6 1/16	3 1/2	8 1/8	9 13/16	
	3	2 3/4-12	2 1/4-12	3 1/2	—	3.749	1	2 5/8	2 7/8	5 1/2	1/2	1 1/2	3 3/8	6 1/16	3 1/2	8 1/8	9 13/16	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	—	4.249	1	3	3 3/8	5 1/2	1/2	1 1/2	3 3/8	6 1/16	3 1/2	8 1/8	9 13/16	
	4	3 3/4-12	3-12	4	—	4.749	1	3 3/8	3 7/8	5 1/2	1/2	1 1/2	3 3/8	6 1/16	3 1/2	8 1/8	9 13/16	
	4 1/2	4 1/4-12	3 1/4-12	4 1/2	—	5.249	1	3 7/8	4 3/8	7	1/2	1 1/2	3 3/8	6 1/16	3 1/2	8 1/8	9 13/16	
	5	4 3/4-12	3 1/2-12	5	—	5.749	1	4 1/4	4 7/8	7	1/2	1 1/2	3 3/8	6 1/16	3 1/2	8 1/8	9 13/16	
5 1/2	5 1/4-12	4-12	5 1/2	—	6.249	1	4 5/8	5 3/8	7	1/2	1 1/2	3 3/8	6 1/16	3 1/2	8 1/8	9 13/16		

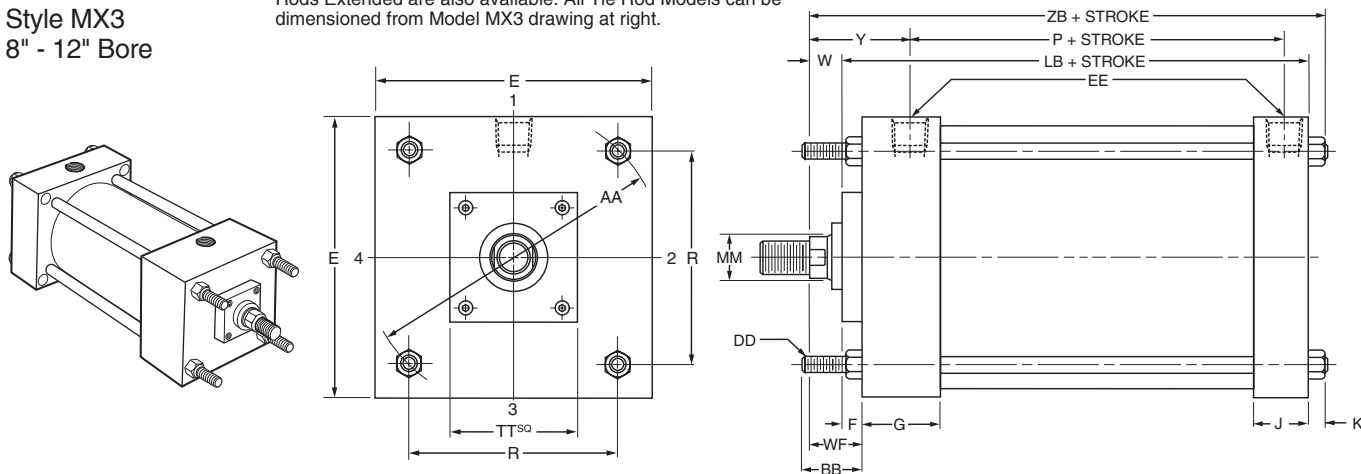
* Dimension XI to be specified by customer.

Cap Fixed Clevis Mount
Style MP1
8" - 12" Bore



Tie Rod Extended Mount
Style MX3
8" - 12" Bore

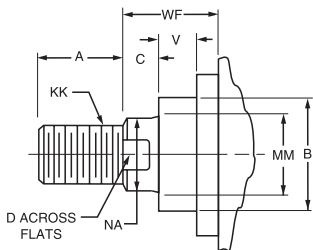
Model MX3 Head Tie Rods Extended, Illustrated. Model MX2 Cap Tie Rods Extended; and Model MX1, Both Ends Tie Rods Extended are also available. All Tie Rod Models can be dimensioned from Model MX3 drawing at right.



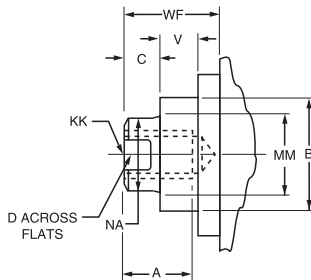
Models MX3 and MX1 not offered in 8" bore, rod diameters 4 1/2", 5" and 5 1/2".

Rod End Dimensions — see table 2

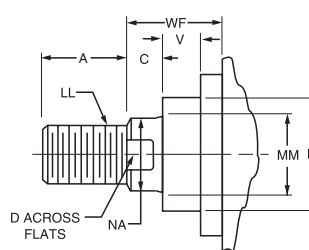
Thread Style 2
Small Male



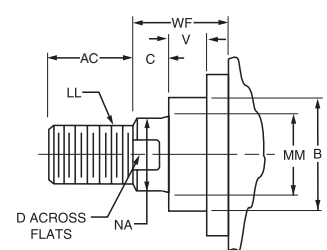
Thread Style 3
Short Female



Thread Style 4
Intermediate Male



Thread Style 5
Automotive Male



"Special" Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify "Style 0" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

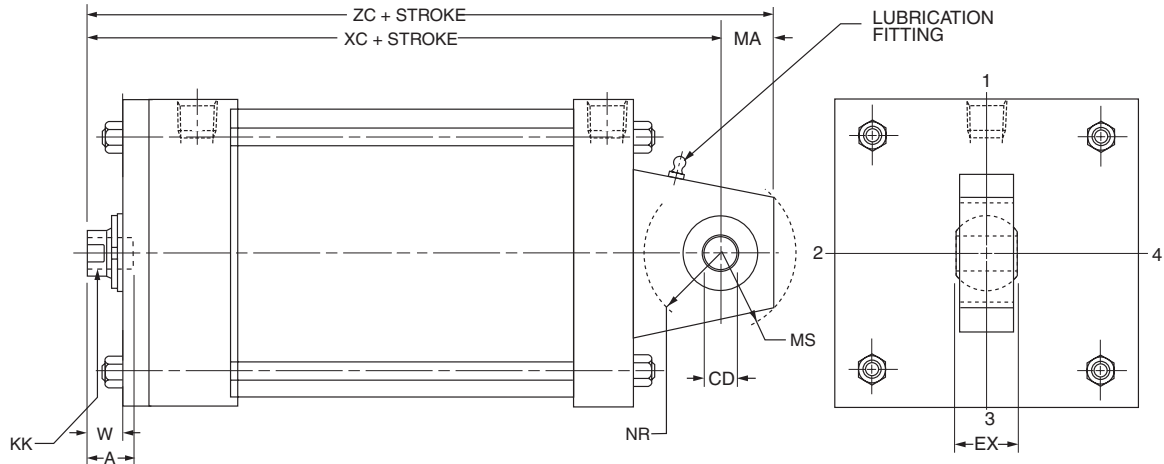
Table 1—Envelope and Mounting Dimensions

Bore	AA	BB	CB	+.000 CD -.001	CW	DD	E	EE		F	G	J	K	L	LR	M	MR	R	Add Stroke	
								NPTF	SAE										LB	P
8	9.1	2 ⁵ / ₁₆	1½	1.000	³ / ₄	5 ⁵ / ₈ -18	8½	³ / ₄	#12	³ / ₄	2	1½	⁹ / ₁₆	1½	1¼	1	1 ³ / ₁₆	6.44	5 ⁷ / ₈	3¼
10	11.2	2 ¹¹ / ₁₆	2	1.375	1	³ / ₄ -16	10 ⁵ / ₈	1	#16	³ / ₄	2¼	2	¹¹ / ₁₆	2½	1 ⁷ / ₈	1 ³ / ₈	1 ⁵ / ₈	7.92	7 ¹ / ₈	4 ¹ / ₈
12	13.3	2 ¹¹ / ₁₆	2½	1.750	1¼	³ / ₄ -16	12 ³ / ₄	1	#16	³ / ₄	2¼	2	¹¹ / ₁₆	2¼	2½	1 ³ / ₄	2½	9.40	7 ⁵ / ₈	4 ⁵ / ₈

Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

Bore	Rod Dia. MM	Thread		Rod End Dimensions and Envelope Dimensions Affected By Rod Size														Add Stroke	
		Style 4 & 5 LL	Style 2 & 3 KK	A	AC	+.000 -.002 B	C	D	NA	TT	V	W	WF	Y	ZB	XC	ZC		
8	1 ³ / ₈	1¼-12	1-14	1 ⁵ / ₈	2½	1.999	⁵ / ₈	1½	1 ⁵ / ₁₆	4	¹ / ₄	⁷ / ₈	1 ⁵ / ₈	2 ¹³ / ₁₆	7 ⁵ / ₁₆	8¼	9¼		
	5½	5¼-12	4-12	5½	—	6.249	1	4 ⁵ / ₈	5 ³ / ₈	7	¹ / ₂	1½	2¼	3 ⁷ / ₁₆	7 ¹⁵ / ₁₆	8 ⁷ / ₈	9 ⁷ / ₈		
	1¾	1½-12	1¼-12	2	3	2.374	³ / ₄	1½	1 ¹¹ / ₁₆	4	³ / ₈	1 ⁷ / ₈	1 ⁷ / ₈	3 ¹ / ₁₆	7 ⁹ / ₁₆	8½	9½		
	2	1¾-12	1½-12	2¼	3½	2.624	⁷ / ₈	1 ¹¹ / ₁₆	1 ¹⁵ / ₁₆	4	³ / ₈	1¼	2	3 ³ / ₁₆	7 ¹¹ / ₁₆	8 ⁵ / ₈	9 ⁵ / ₈		
	2½	2¼-12	1 ⁷ / ₈ -12	3	4½	3.124	1	2 ¹ / ₁₆	2 ³ / ₈	4	¹ / ₂	1½	2¼	3 ⁷ / ₁₆	7 ¹⁵ / ₁₆	8 ⁷ / ₈	9 ⁷ / ₈		
	3	2¾-12	2¼-12	3½	—	3.749	1	2 ⁵ / ₈	2 ⁷ / ₈	5½	¹ / ₂	1½	2¼	3 ⁷ / ₁₆	7 ¹⁵ / ₁₆	8 ⁷ / ₈	9 ⁷ / ₈		
	3½	3¼-12	2½-12	3½	—	4.249	1	3	3 ³ / ₈	5½	¹ / ₂	1½	2¼	3 ⁷ / ₁₆	7 ¹⁵ / ₁₆	8 ⁷ / ₈	9 ⁷ / ₈		
	4	3¾-12	3-12	4	—	4.749	1	3 ³ / ₈	3 ⁷ / ₈	5½	¹ / ₂	1½	2¼	3 ⁷ / ₁₆	7 ¹⁵ / ₁₆	8 ⁷ / ₈	9 ⁷ / ₈		
10	4½	4¼-12	3¾-12	4½	—	5.249	1	3 ⁷ / ₈	4 ³ / ₈	7	¹ / ₂	1½	2¼	3 ⁷ / ₁₆	7 ¹⁵ / ₁₆	8 ⁷ / ₈	9 ⁷ / ₈		
	5	4¾-12	3½-12	5	—	5.749	1	4¼	4 ⁷ / ₈	7	¹ / ₂	1½	2¼	3 ⁷ / ₁₆	7 ¹⁵ / ₁₆	8 ⁷ / ₈	9 ⁷ / ₈		
	1¾	1½-12	1¼-12	2	3	2.374	³ / ₄	1½	1 ¹¹ / ₁₆	4	³ / ₈	1 ⁷ / ₈	1 ⁷ / ₈	3 ¹ / ₁₆	8 ¹⁵ / ₁₆	10 ³ / ₈	11 ³ / ₄		
	2	1¾-12	1½-12	2¼	3½	2.624	⁷ / ₈	1 ¹¹ / ₁₆	1 ¹⁵ / ₁₆	4	³ / ₈	1¼	2	3¼	9 ¹ / ₁₆	10½	11 ⁷ / ₈		
	2½	2¼-12	1 ⁷ / ₈ -12	3	4½	3.124	1	2 ¹ / ₁₆	2 ³ / ₈	4	¹ / ₂	1½	2¼	3½	9 ⁵ / ₁₆	10 ³ / ₄	12 ¹ / ₈		
	3	2¾-12	2¼-12	3½	—	3.749	1	2 ⁵ / ₈	2 ⁷ / ₈	5½	¹ / ₂	1½	2¼	3½	9 ⁵ / ₁₆	10 ³ / ₄	12 ¹ / ₈		
	3½	3¼-12	2½-12	3½	—	4.249	1	3	3 ³ / ₈	5½	¹ / ₂	1½	2¼	3½	9 ⁵ / ₁₆	10 ³ / ₄	12 ¹ / ₈		
	4	3¾-12	3-12	4	—	4.749	1	3 ³ / ₈	3 ⁷ / ₈	5½	¹ / ₂	1½	2¼	3½	9 ⁵ / ₁₆	10 ³ / ₄	12 ¹ / ₈		
12	4½	4¼-12	3¾-12	4½	—	5.249	1	3 ⁷ / ₈	4 ³ / ₈	7	¹ / ₂	1½	2¼	3½	9 ⁵ / ₁₆	10 ³ / ₄	12 ¹ / ₈		
	5	4¾-12	3½-12	5	—	5.749	1	4¼	4 ⁷ / ₈	7	¹ / ₂	1½	2¼	3½	9 ⁵ / ₁₆	10 ³ / ₄	12 ¹ / ₈		
	2	1¾-12	1½-12	2¼	3½	2.624	⁷ / ₈	1 ¹¹ / ₁₆	1 ¹⁵ / ₁₆	4	³ / ₈	1¼	2	3¼	9 ⁹ / ₁₆	11 ¹ / ₈	12 ⁷ / ₈		
	2½	2¼-12	1 ⁷ / ₈ -12	3	4½	3.124	1	2 ¹ / ₁₆	2 ³ / ₈	4	¹ / ₂	1½	2¼	3½	9 ¹³ / ₁₆	11 ³ / ₈	13 ¹ / ₈		
	3	2¾-12	2¼-12	3½	—	3.749	1	2 ⁵ / ₈	2 ⁷ / ₈	5½	¹ / ₂	1½	2¼	3½	9 ¹³ / ₁₆	11 ³ / ₈	13 ¹ / ₈		
	3½	3¼-12	2½-12	3½	—	4.249	1	3	3 ³ / ₈	5½	¹ / ₂	1½	2¼	3½	9 ¹³ / ₁₆	11 ³ / ₈	13 ¹ / ₈		
	4	3¾-12	3-12	4	—	4.749	1	3 ³ / ₈	3 ⁷ / ₈	5½	¹ / ₂	1½	2¼	3½	9 ¹³ / ₁₆	11 ³ / ₈	13 ¹ / ₈		
	4½	4¼-12	3¾-12	4½	—	5.249	1	3 ⁷ / ₈	4 ³ / ₈	7	¹ / ₂	1½	2¼	3½	9 ¹³ / ₁₆	11 ³ / ₈	13 ¹ / ₈		

Spherical Bearing Mount – Style MPU3
1 1/2" to 6" Bore Sizes



Bore	Rod Dia. MM	Thread		A	CD ²	EX	MA	MS	NR	W	Add Stroke		Max. Oper. PSI ¹ PA-2
		Style 3 KK ³	Style 7 KK ³								XC	ZC	
1½	5/8	7/16-20	—	3/4	-.0005	7/16	3/4	15/16	5/8	5/8	5³/₈	6¹/₈	250
	1	**	7/16-20	3/4	.5000					1	5³/₄	6¹/₂	
2	5/8	7/16-20	—	3/4	-.0005	7/16	3/4	15/16	5/8	5/8	5³/₈	6¹/₈	250
	1³/₈	**	7/16-20	3/4						1¼	6	6³/₄	
	1	**	7/16-20	3/4						1	5³/₄	6¹/₂	
2½	5/8	7/16-20	—	3/4	-.0005	7/16	3/4	15/16	5/8	5/8	5¹/₂	6¹/₄	250
	1³/₄	**	7/16-20	3/4						1½	6³/₈	7¹/₈	
	1	**	7/16-20	3/4						1	5⁷/₈	6⁵/₈	
	1³/₈	**	7/16-20	3/4						1¼	6¹/₈	6⁷/₈	
3¼	1	¾-16	—	1¹/₈	-.0005	2¹/₃₂	1	1³/₈	1	¾	6⁷/₈	7⁷/₈	250
	2	**	¾-16	1¹/₈						1³/₈	7¹/₂	8¹/₂	
	1³/₈	**	¾-16	1¹/₈						1	7¹/₈	8¹/₈	
	1³/₄	**	¾-16	1¹/₈						1¼	7³/₈	8³/₈	
4	1	¾-16	—	1¹/₈	-.0005	2¹/₃₂	1	1³/₈	1	¾	6⁷/₈	7⁷/₈	250
	2½	**	¾-16	1¹/₈						1⁵/₈	7³/₄	8³/₄	
	1³/₈	**	¾-16	1¹/₈						1	7¹/₈	8¹/₈	
	1³/₄	**	¾-16	1¹/₈						1¼	7³/₈	8³/₈	
	2	**	¾-16	1¹/₈						1³/₈	7¹/₂	8¹/₂	
5	1	¾-16	—	1¹/₈	-.0005	2¹/₃₂	1	1³/₈	1	¾	7¹/₈	8¹/₈	250
	3½	**	¾-16	1¹/₈						1⁵/₈	8	9	
	1³/₈	**	¾-16	1¹/₈						1	7³/₈	8³/₈	
	1³/₄	**	¾-16	1¹/₈						1¼	7⁵/₈	8⁵/₈	
	2	**	¾-16	1¹/₈						1³/₈	7³/₄	8³/₄	
	2½	**	¾-16	1¹/₈						1⁵/₈	8	9	
	3	**	¾-16	1¹/₈						1⁵/₈	8	9	
6	1³/₈	1-14	—	1⁵/₈	-.0005	7/8	1¼	1¹¹/₁₆	1¼	7/8	8¹/₈	9³/₈	250
	4	**	1-14	1⁵/₈						1½	8³/₄	10	
	1³/₄	**	1-14	1⁵/₈						1¹/₈	8³/₈	9⁵/₈	
	2	**	1-14	1⁵/₈						1¼	8¹/₂	9³/₄	
	2½	**	1-14	1⁵/₈						1½	8³/₄	10	
	3	**	1-14	1⁵/₈						1½	8³/₄	10	
	3½	**	1-14	1⁵/₈						1½	8³/₄	10	

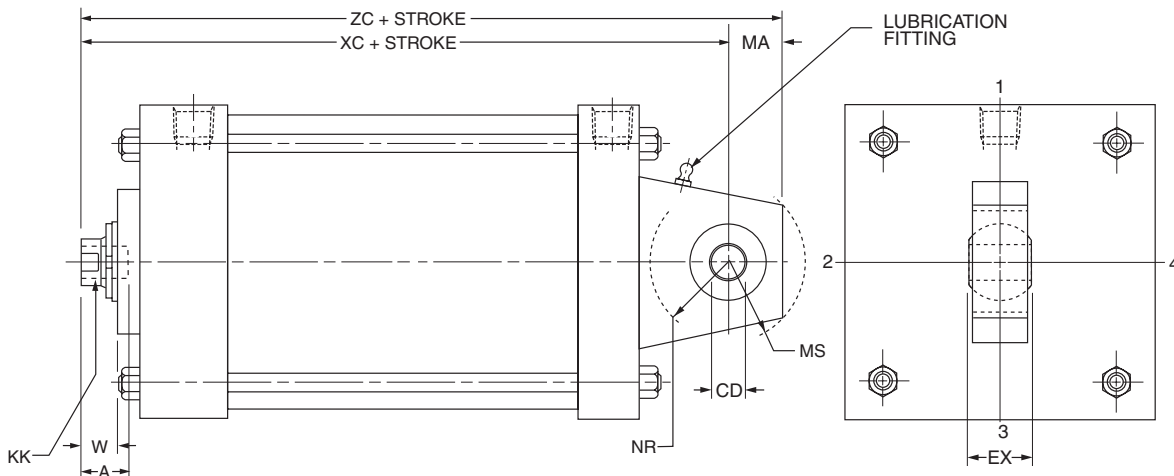
¹ Maximum operating pressure at 4:1 design factor is based on tensile strength of material. Pressure ratings are based on standard commercial bearing ratings.

² Dimension CD is hole diameter.

³ Threads listed are also for a spherical rod eye which match style 9 or style 7. The spherical rod eye pin diameter matches the cap pin and (if required) needs to be purchased separately; see NC-9 mounting accessories for detailed information.

Spherical Bearing Mount – Style MPU3

8" to 12" Bore Sizes



Bore	Rod Dia. MM	Thread		A	CD ²	EX	MA	MS	NR	W	Add Stroke		Max. Oper. PSI
		Style 3 KK ³	Style 7 KK ³								XC	ZC	
8	1 ³ / ₈	1-14	—	1 ⁵ / ₈	-0.0005 1.0000	7/8	1 ¹ / ₄	1 ¹¹ / ₁₆	1 ¹ / ₄	7/8	8 ¹ / ₄	9 ¹ / ₂	250
	5 ¹ / ₂	**	1-14	1 ⁵ / ₈						1 ¹ / ₂	8 ⁷ / ₈	10 ¹ / ₈	
	1 ³ / ₄	**	1-14	1 ⁵ / ₈						1 ¹ / ₈	8 ¹ / ₂	9 ³ / ₄	
	2	**	1-14	1 ⁵ / ₈						1 ¹ / ₄	8 ⁵ / ₈	9 ⁷ / ₈	
	2 ¹ / ₂	**	1-14	1 ⁵ / ₈						1 ¹ / ₂	8 ⁷ / ₈	10 ¹ / ₈	
	3	**	1-14	1 ⁵ / ₈						1 ¹ / ₂	8 ⁷ / ₈	10 ¹ / ₈	
	3 ¹ / ₂	**	1-14	1 ⁵ / ₈						1 ¹ / ₂	8 ⁷ / ₈	10 ¹ / ₈	
	4	**	1-14	1 ⁵ / ₈						1 ¹ / ₂	8 ⁷ / ₈	10 ¹ / ₈	
	4 ¹ / ₂	**	1-14	1 ⁵ / ₈						1 ¹ / ₂	8 ⁷ / ₈	10 ¹ / ₈	
5	**	1-14	1 ⁵ / ₈	1 ¹ / ₂	8 ⁷ / ₈	10 ¹ / ₈							
10	1 ³ / ₄	1 ¹ / ₄ -12	—	2	-0.0005 1.3750	1 ³ / ₁₆	1 ⁷ / ₈	2 ⁷ / ₁₆	1 ⁵ / ₈	1 ¹ / ₈	10 ³ / ₈	12 ¹ / ₄	250
	2	**	1 ¹ / ₄ -12	2						1 ¹ / ₄	10 ¹ / ₂	12 ³ / ₈	
	2 ¹ / ₂	**	1 ¹ / ₄ -12	2						1 ¹ / ₂	10 ³ / ₄	12 ⁵ / ₈	
	3	**	1 ¹ / ₄ -12	2						1 ¹ / ₂	10 ³ / ₄	12 ⁵ / ₈	
	3 ¹ / ₂	**	1 ¹ / ₄ -12	2						1 ¹ / ₂	10 ³ / ₄	12 ⁵ / ₈	
	4	**	1 ¹ / ₄ -12	2						1 ¹ / ₂	10 ³ / ₄	12 ⁵ / ₈	
	4 ¹ / ₂	**	1 ¹ / ₄ -12	2						1 ¹ / ₂	10 ³ / ₄	12 ⁵ / ₈	
	5	**	1 ¹ / ₄ -12	2						1 ¹ / ₂	10 ³ / ₄	12 ⁵ / ₈	
5 ¹ / ₂	**	1 ¹ / ₄ -12	2	1 ¹ / ₂	10 ³ / ₄	12 ⁵ / ₈							
12	2	1 ¹ / ₂ -12	—	2 ¹ / ₄	-0.0005 1.7500	1 ¹⁷ / ₃₂	2 ¹ / ₂	2 ⁷ / ₈	2 ¹ / ₁₆	1 ¹ / ₄	11 ¹ / ₈	13 ⁵ / ₈	250
	2 ¹ / ₂	**	1 ¹ / ₂ -12	2 ¹ / ₄						1 ¹ / ₂	11 ³ / ₈	13 ⁷ / ₈	
	3	**	1 ¹ / ₂ -12	2 ¹ / ₄						1 ¹ / ₂	11 ³ / ₈	13 ⁷ / ₈	
	3 ¹ / ₂	**	1 ¹ / ₂ -12	2 ¹ / ₄						1 ¹ / ₂	11 ³ / ₈	13 ⁷ / ₈	
	4	**	1 ¹ / ₂ -12	2 ¹ / ₄						1 ¹ / ₂	11 ³ / ₈	13 ⁷ / ₈	
	4 ¹ / ₂	**	1 ¹ / ₂ -12	2 ¹ / ₄						1 ¹ / ₂	11 ³ / ₈	13 ⁷ / ₈	
	5	**	1 ¹ / ₂ -12	2 ¹ / ₄						1 ¹ / ₂	11 ³ / ₈	13 ⁷ / ₈	
5 ¹ / ₂	**	1 ¹ / ₂ -12	2 ¹ / ₄	1 ¹ / ₂	11 ³ / ₈	13 ⁷ / ₈							

¹ Maximum operating pressure at 4:1 design factor is based on tensile strength of material. Pressure ratings are based on standard commercial bearing ratings.

² Dimension CD is hole diameter.

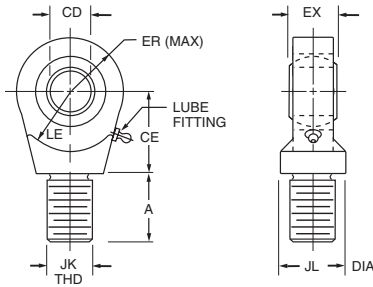
³ Threads listed are also for a spherical rod eye which match style 9 or style 7. The spherical rod eye pin diameter matches the cap pin and (if required) needs to be purchased separately; see NC-9 mounting accessories for detailed information.



Schrader Bellows offers a complete range of Cylinder Accessories to assure you of the greatest versatility in present or future cylinder applications. Accessories offered for the respective cylinder include the Rod Eye, Pivot Pin

and Clevis Bracket. To select the proper part number for any desired accessory refer to the charts below.

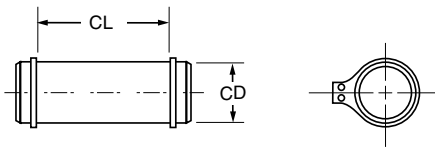
Spherical Rod Eye



Bore Sizes	Series NC-9	1 1/2, 2 & 2 1/2	3 1/4, 4 & 5	6 & 8	10	12
Rod Eye	Part No.	1322900000	1322910000	1322920000	1322930000	1322940000
	CD	.5000-.0005	.7500-.0005	1.0000-.0005	1.3750-.0005	1.7500-.0005
	A	1 1/16	1	1 1/2	2	2 1/8
	CE	7/8	1 1/4	1 7/8	2 1/8	2 1/2
	EX	7/16	2 1/32	7/8	1 3/16	1 17/32
	ER	1 3/16	1 1/8	1 1/4	1 11/16	2 1/16
	LE	3/4	1 1/16	1 7/16	1 7/8	2 1/8
	JK	7/16-20	3/4-16	1-14	1 1/4-12	1 1/2-12
	JL	7/8	1 5/16	1 1/2	2	2 1/4
	LOAD CAPACITY LBS.	2644	9441	16860	28562	43005

Order to fit Piston Rod Thread Size.

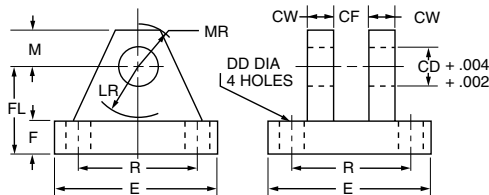
Pivot Pin



Bore Sizes	Series NC-9	1 1/2, 2 & 2 1/2	3 1/4, 4 & 5	6 & 8	10	12
Pivot Pin	Part No.	0839620000	0839630000	0839640000	0839650000	0839660000
	CD	.4997-.0004	.7497-.0005	.9997-.0005	1.3746-.0006	1.7496-.0006
	CL	1 9/16	2 1/32	2 1/2	3 5/16	4 7/32
	LOAD CAPACITY LBS.	8600	19300	34300	65000	105200

Pivot Pins are furnished with (2) Retainer Rings.

Clevis Bracket



Bore Sizes	Series NC-9	1 1/2, 2 & 2 1/2	3 1/4, 4 & 5	6 & 8	10	12
Clevis Bracket	Part No.	0839470000	0839480000	0839490000	0839500000	0839510000
	CD	1/2	3/4	1	1 3/8	1 3/4
	CF	7/16	2 1/32	7/8	1 3/16	1 17/32
	CW	1/2	5/8	3/4	1	1 1/4
	DD	1 3/32	1 7/32	1 7/32	2 1/32	2 9/32
	E	3	3 3/4	5 1/2	6 1/2	8 1/2
	F	1/2	5/8	3/4	7/8	1 1/4
	FL	1 1/2	2	2 1/2	3 1/2	4 1/2
	LR	1 5/16	1 3/8	1 11/16	2 7/16	2 7/8
	M	1/2	7/8	1	1 3/8	1 3/4
	MR	5/8	1	1 3/16	1 5/8	2 1/16
	R	2.05	2.76	4.10	4.95	6.58
	LOAD CAPACITY LBS.	5770	9450	14300	20322	37800

Order to fit Cap or Rod Eye.

To determine dimensions for a double rod cylinder, first refer to the desired single rod mounting style cylinder shown on preceding pages of this catalog. After selecting necessary dimensions from that drawing, return to this page and supplement the single rod dimensions with those shown on the drawing and dimension table below. Note that double rod cylinders have a head (Dim. G) at both ends and that dimension LD or LF replaces LG or LB. The double rod dimensions differ from, or are in addition to those for single rod cylinders shown on preceding pages and provide the information needed to completely dimension a double rod cylinder. On a double rod cylinder where the two rod ends are different, be sure to clearly state which rod end is to be assembled at which end.

Port position 1 is standard. If other than standard, specify position 2, 3, or 4 when viewed from one end only.

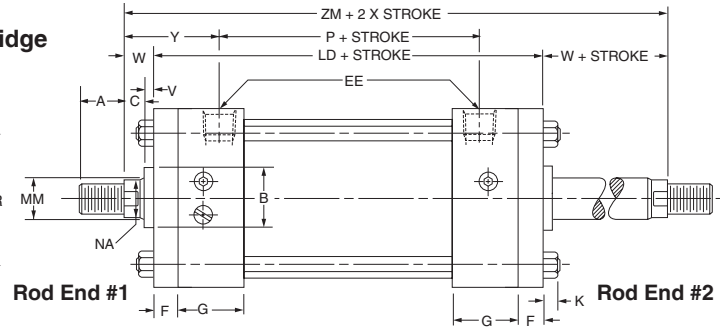
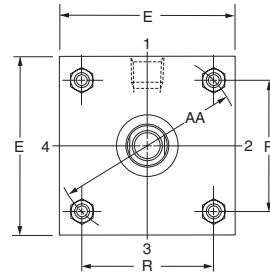
If only one end of these Double Rod Cylinders is to be cushioned, be sure to specify clearly which end this will be.

Specify XI dimension from rod end #1.

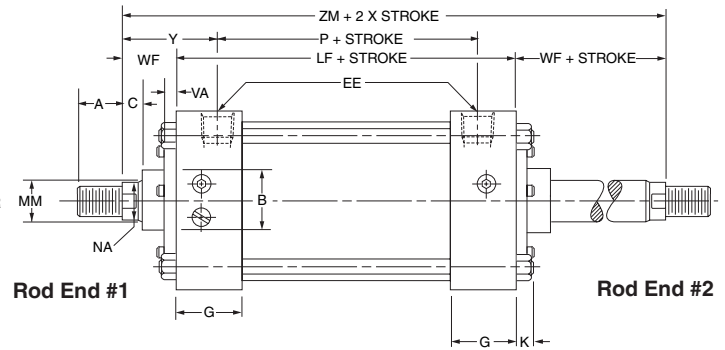
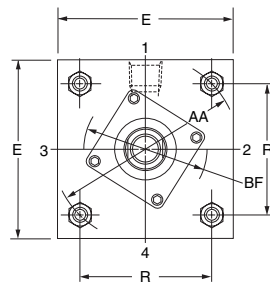
How to Use Double Rod Cylinder Dimension Drawings

1-1/2" to 6" Bores

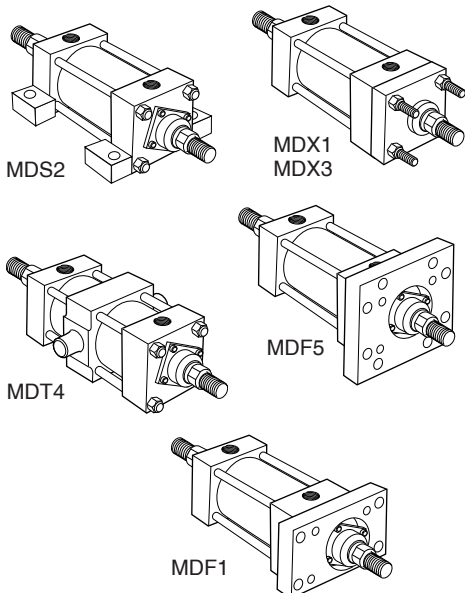
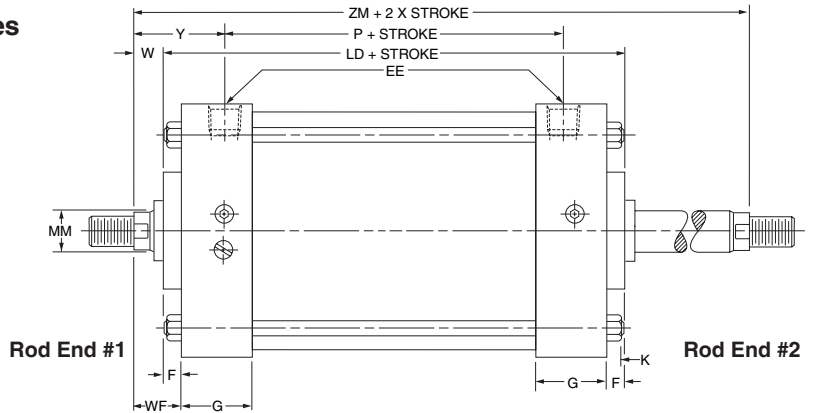
Tie Rod Retained Cartridge



**1-1/2" to 6" Bores
Removable Cartridge**



8" to 12" Bores



All dimensions are in inches and apply to standard rod sizes only. For alternate rod sizes, determine all envelope dimensions (within LD dim.) as described above and then use appropriate rod end dimensions for proper rod size from single rod cylinder.

Bore	Rod Dia. MM	Add Stroke			Add 2X Stroke
		LD	LF	SS	ZM
1 1/2	5/8	4 7/8	4 1/8	3 3/8	6 1/8
2	5/8	4 7/8	4 1/8	3 3/8	6 1/8
2 1/2	5/8	5	4 1/4	3 1/2	6 1/4
3 1/4	1	6	4 3/4	3 3/4	7 1/2
4	1	6	4 3/4	3 3/4	7 1/2
5	1	6 1/4	5	3 5/8	7 3/4
6	1 3/8	7	5 1/2	4 1/8	8 3/4
8	1 3/8	7 1/8	5 5/8	4 1/4	8 7/8
10	1 3/4	8 1/8	6 5/8	4 7/8	10 3/8
12	2	8 5/8	7 1/8	5 3/8	11 1/8
Replaces:		LB	LG	SS	—
On single rod mounting styles:		All Mtg. Styles		MS2	All Mtgs.

Alignment Coupler

See Table 1 for Part Numbers and Dimensions

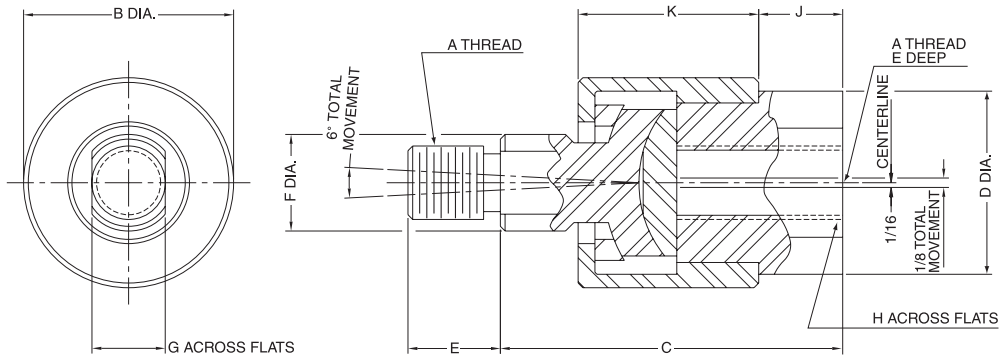


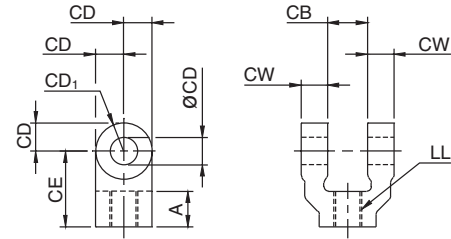
Table 1 — Part Numbers and Dimensions

Part No.	A	B	C	D	E	F	G	H	J	K	Max. Pull Load (lbs.)	Approx. Weight (lbs.)
1347570031	5/16-24	1 1/8	1 3/4	15/16	1/2	1/2	3/8	3/4	3/8	15/16	1200	.35
1347570038	3/8-24	1 1/8	1 3/4	15/16	1/2	1/2	3/8	3/4	3/8	15/16	2425	.35
1347570044	7/16-20	1 3/8	2	1 1/8	3/4	5/8	1/2	7/8	3/8	1 3/32	3250	.55
1347570050	1/2-20	1 3/8	2	1 1/8	3/4	5/8	1/2	7/8	3/8	1 3/32	4450	.55
1347570063	5/8-18	1 3/8	2	1 1/8	3/4	5/8	1/2	7/8	3/8	1 3/32	6800	.55
1347570075	3/4-16	2	2 5/16	1 5/8	1 1/8	15/16	3/4	1 5/16	7/16	1 9/32	9050	1.4
1347570088	7/8-14	2	2 5/16	1 5/8	1 1/8	15/16	3/4	1 5/16	7/16	1 9/32	14450	1.4
1347570100	1-14	3	3	2 3/8	1 5/8	1 7/16	1 1/4	1 7/8	3/4	1 25/32	19425	4.8
1347570125	1 1/4-12	3	3	2 3/8	1 5/8	1 7/16	1 1/4	1 7/8	3/4	1 25/32	30500	4.8
1337390125	1 1/4-12	3 1/2	4	2	2	1 1/2	1 1/4	1 11/16	3/4	2 1/2	30500	6.9
1337390150	1 1/2-12	4	4 3/8	2 1/4	2 1/4	1 3/4	1 1/2	1 15/16	7/8	2 3/4	45750	9.8
1337390175	1 3/4-12	4	4 3/8	2 1/4	2 1/4	1 3/4	1 1/2	1 15/16	7/8	2 3/4	58350	9.8
1337390188	1 7/8-12	5	5 5/8	3	3	2 1/4	1 15/16	2 5/8	1 3/8	3 3/8	67550	19.8

How to Order Linear Alignment Couplers — When ordering a cylinder with a threaded male rod end, specify the coupler of equal thread size by part number as listed in Table 1, i.e.; Piston Rod “KK” or “LL” dimension is 3/4" - 16", specify coupler part number 1347570075.

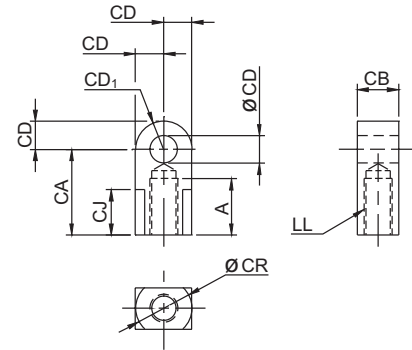
Rod Clevis — Order to Fit Thread Size of Piston Rod*

NC9 Part Number	Rod Dia.	Dimensions in Inches							Schrader Part Number
		Thread Size LL	A	CB	CD	CE	CW	CD1	
NC9-3402A	1	7/8-14	1 1/8	1 1/4	3/4	2 3/8	5/8	3/4	031970875
NC9-3404	1 3/8	1 1/4-12	2	2	1 3/8	4 1/8	1	1 1/4	031971250
NC9-3405	1 3/4	1 1/2-12	2 1/4	2 1/2	1 3/4	4 1/2	1 1/4	1 3/4	031971500
NC9-3405A	2	1 3/4-12	2 1/4	2 1/2	1 3/4	4 1/2	1 1/4	1 3/4	031971750
NC9-3406A	2 1/2	2 1/4-12	3	2 1/2	2	5 1/2	1 1/4	2	031977987



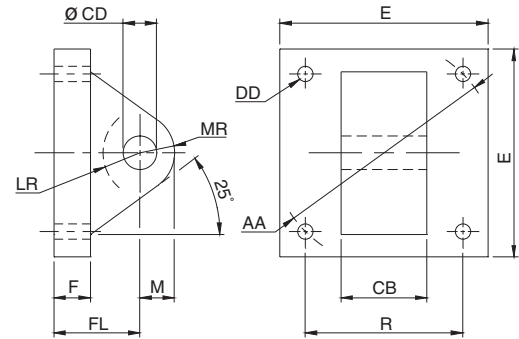
Rod Eye — Order to Fit Thread Size of Piston Rod*

NC9 Part Number	Rod Dia.	Dimensions in Inches								Schrader Part Number
		Thread Size LL	A	CA	CB	CD	CJ	CD1	CR	
NC9-3305A	1	7/8-14	1 1/8	2 1/16	1 1/4	3/4	3/4	3/4	1 1/2	031960875
NC9-3307	1 3/8	1 1/4-12	2	3 7/16	2	1 3/8	—	1 3/8	—	031961250
NC9-3308	1 3/4	1 1/2-12	2 1/4	4	2 1/2	1 3/4	—	1 3/4	—	031961500
NC9-3308A	2	1 3/4-12	2 1/4	4	2 1/2	1 3/4	—	1 3/4	—	031961750
NC9-3309A	2 1/2	2 1/4-12	3	5	2 1/2	2	—	2	—	031977999



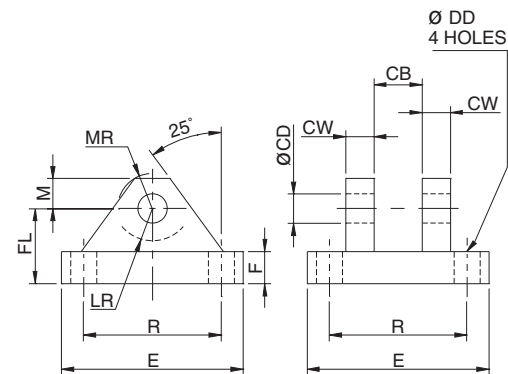
Eye Bracket — Order to Fit Pivot Pin Size (CD)*

NC9 Part Number	Dimensions in Inches										Schrader Bellows P/N
	CD	CB	AA	DD	E SQ.	F	FL	LR	R	MR	
NC9-3201	1/2	3/4	2.3	1 13/32	2 1/2	3/8	1 1/8	2 1/32	1.62	1/2	0691950000
NC9-3202	3/4	1 1/4	3.6	1 17/32	3 1/2	5/8	1 7/8	1 1/8	2.56	3/4	0691960000
NC9-3203	1	1 1/2	4.6	2 21/32	4 1/2	3/4	2 1/4	1 1/16	3.25	1	031951000
NC9-3210	1 3/8	2	5.4	2 21/32	5	7/8	3	1 5/8	3.82	1 3/8	0691980000
NC9-3212	1 3/4	2 1/2	7	2 15/16	6 1/2	7/8	3 3/8	1 7/8	4.95	1 3/4	0691990000
NC9-3213	2	2 1/2	8.1	2 11/16	7 1/2	1	3 1/2	2 1/8	5.73	2	031952000



Clevis Bracket for Rod Eye — Order to Fit Pivot Pin Size (CD)*

NC9 Part Number	Dimensions in Inches										Schrader Bellows P/N	
	CB	CD	CW	DD	E	F	FL	LR	M	MR		R
NC9-3204	3/4	1/2	1/2	1 13/32	3	3/8	1 1/8	9/16	1/2	1/2	2.05	031940500
NC9-3205	1 1/4	3/4	5/8	1 17/32	4 1/2	5/8	1 7/8	1 5/16	3/4	3/4	3.25	031940750
NC9-3206	1 1/2	1	3/4	2 1/32	5	3/4	2 1/4	1	1	1 3/16	3.82	031941000
NC9-3207	2	1 3/8	1	2 1/32	7 1/2	7/8	3	2	1 3/8	1 21/32	5.73	069208000
NC9-3208	2 1/2	1 3/4	1 1/4	2 29/32	9 1/2	7/8	3 5/8	2 3/4	1 3/4	2 25/32	7.50	069209000
NC9-3209	2 1/2	2	1 1/2	2 11/16	12 3/4	1	4 1/4	3 3/16	2 1/4	2 25/32	9.40	069210000



* Accessories listed on this page will attach current Ford specification rod thread and bore sizes. For sizes outside the current for specification see page 40 of Section A.

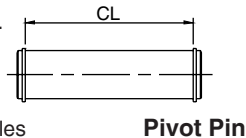
Pivot Pins and Jam Nuts

Sizes to fit current Ford specification cylinders

Pivot Pins with Retaining Rings

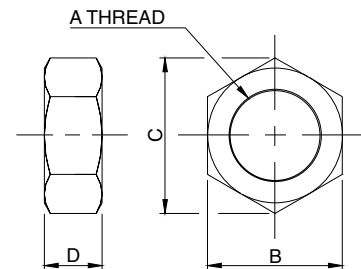
Ford Part Number	Dimensions in inches		Schrader Bellows P/N
	CD	CL	
NC9-3310	1/2	1 7/8	0683680000
NC9-3311	3/4	2 5/8	0683690000
NC9-3312	1	3 1/8	0683700000
NC9-3313	1 3/8	4 1/8	0683710000
NC9-3314	1 3/4	5 3/16	0683720000
NC9-3315	2	5 9/16	0683730000

1. Pivot Pins are furnished with Clevis Mounted Cylinders as standard.
2. Pivot Pins are furnished with (2) retaining rings.
3. Pivot Pins must be ordered as a separate item if to be used with Knuckles Rod Clevises or Clevis Brackets.



Jam Nut

Ford Part Number	Dimensions in inches				Schrader Bellows P/N
	Thd. A	B	C	D	
N/A	7/8-14	1 5/16	1 15/32	31/64	034451017
N/A	1 1/4-12	1 7/8	2 1/8	35/64	034451023
N/A	1 1/2-12	2 1/4	2 17/32	27/32	034451027
N/A	1 3/4-12	2 5/8	2 15/16	31/32	034451030
N/A	2 1/4-12	3 1/8	3 5/8	1 1/8	034451033



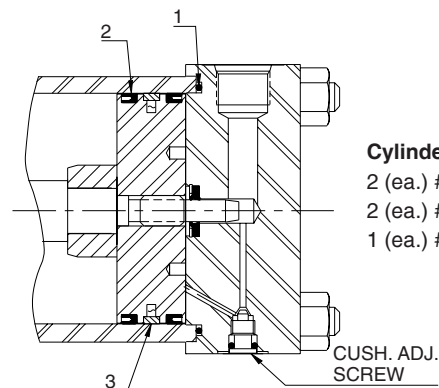
Cylinder Kits

For current Ford specification cylinders

Bore	Cylinder Seal Kit▲	Schrader Bellows Number▲▲
1 1/2	NC9-4201	190208003
2	NC9-4202	190408003
2 1/2	NC9-4203	190508003
3 1/4	NC9-4204	190708003
4	NC9-4205	190808003
5	NC9-4206	191008003
6	NC9-4207	191108003
8	NC9-4208	191308003
10	NC9-4209	191408003
12	NC9-4210	191508003

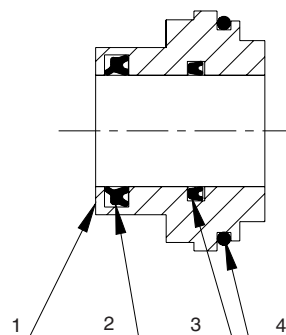
▲ Contain Items 1 through 3

▲▲ Contain Items 1 through 3 & Retaining Ring, Cushion Insert and Cushion Adj. Seal



Cartridge Assembly

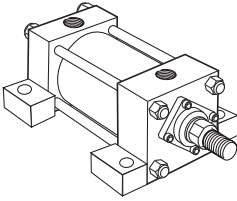
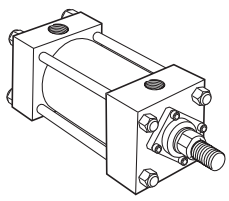
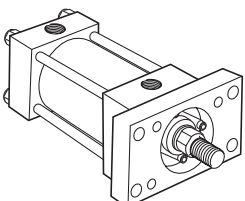
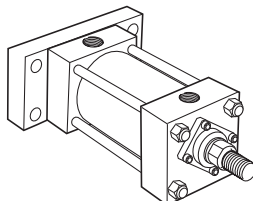
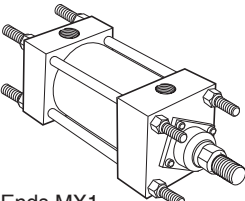
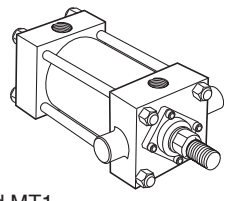
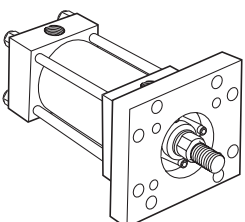
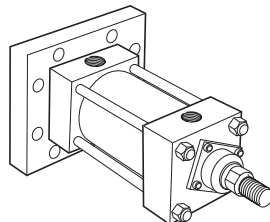
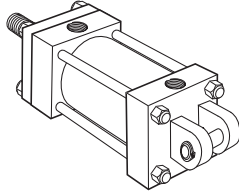
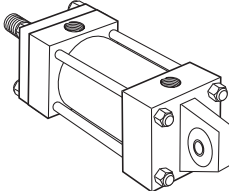
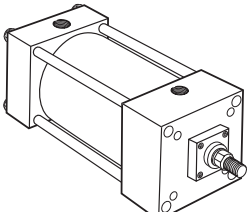
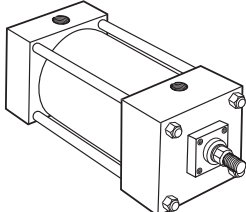
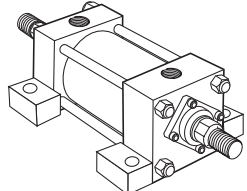
Bore	Rod	Cartridge Assembly	Schrader Bellows Number
1 1/2, 2	5/8	NC9-4001	190208014
2 1/2	5/8	NC9-4002	190518014
1 1/2, 2, 2 1/2	1	NC9-4003	190218014
3 1/4, 4, 5	1	NC9-4004	190718014
3 1/4, 4, 5	1 3/8	NC9-4005	190428014
2, 5, 6, 8	1 3/8	NC9-4006	191118014
2 1/2, 6, 8	1 3/4	—	190538014
3 1/4, 4, 5, 10	1 3/4	NC9-4007	191418014
3 1/4, 4, 5, 10	2	—	190738014
6, 8	2	NC9-4008	191518014
4, 8, 10, 12	2 1/2	NC9-4009	190848014



Cartridge Assembly Contains:

- 1 (ea.) #1 Rod Cartridge
- 1 (ea.) #2 Rod Wiper
- 1 (ea.) #3 Rod Seal
- 1 (ea.) #4 Rod Cartridge Seal

In line with our policy of continuing product improvement, specifications in this catalog are subject to change.

Mounting Styles and Ordering Notes																																																																																																																																																														
Available in all bore and rod combinations.		Available in all bore and rod combinations through 6" bore. 8"-12" bores supplied as Head Square (ME3) and Cap Square (ME4) mounts.																																																																																																																																																												
<p>Side Lug</p>  <p>MS2</p>	<p>Side Tap</p>  <p>MS4</p>	<p>Head Rectangular Flange</p>  <p>MF1</p>	<p>Cap Rectangular Flange</p>  <p>MF2</p>																																																																																																																																																											
<p>Tie Rods Extended</p>  <p>Both Ends MX1 Cap End MX2 Head End MX3</p>	<p>Trunnion Mounts</p>  <p>Head MT1 Cap MT2 Intermediate Fixed MT4</p>	<p>Head Square Flange</p>  <p>MF5</p>	<p>Cap Square Flange</p>  <p>MF6</p>																																																																																																																																																											
<p>Cap Fixed Clevis</p>  <p>MP1 Pivot Pin Included</p>	<p>Spherical Bearing</p>  <p>MPU3</p>	<p>Rod Bearing Cartridges</p> <p>R = Removable Cartridge T = Tie Rod Retained Cartridge</p> <p>*MF5, MF6, MF1, MF2 not available in these bore sizes. ME3 and ME4 available in 8-12" bore only.</p> <table border="1"> <thead> <tr> <th rowspan="2">Bore</th> <th rowspan="2">Rod Dia.</th> <th colspan="2">MX1 MX3 MX2 MS4 MS2 MF6 MF2 MT2 MT1 MT4</th> <th rowspan="2">MF1 MF5</th> <th rowspan="2">ME3 ME4</th> </tr> <tr> <th>MPU3</th> <th>MP1</th> </tr> </thead> <tbody> <tr> <td rowspan="2">1 1/2</td> <td>5/8</td> <td></td> <td>R</td> <td>T</td> <td rowspan="2">N/A</td> </tr> <tr> <td>1</td> <td></td> <td>T</td> <td>T</td> </tr> <tr> <td rowspan="2">2</td> <td>5/8</td> <td></td> <td>R</td> <td>R</td> <td rowspan="2">N/A</td> </tr> <tr> <td>1</td> <td></td> <td>R</td> <td>T</td> </tr> <tr> <td rowspan="2"></td> <td>1 3/8</td> <td></td> <td>T</td> <td>T</td> <td rowspan="2">N/A</td> </tr> <tr> <td>5/8</td> <td></td> <td>R</td> <td>R</td> </tr> <tr> <td rowspan="2">2 1/2</td> <td>1</td> <td></td> <td>R</td> <td>R</td> <td rowspan="2">N/A</td> </tr> <tr> <td>1 3/8</td> <td></td> <td>T</td> <td>T</td> </tr> <tr> <td rowspan="2"></td> <td>1 3/4</td> <td></td> <td>T</td> <td>T</td> <td rowspan="2">N/A</td> </tr> <tr> <td>5/8</td> <td></td> <td>R</td> <td>R</td> </tr> <tr> <td rowspan="2">3 1/4</td> <td>1</td> <td></td> <td>R</td> <td>R</td> <td rowspan="2">N/A</td> </tr> <tr> <td>1 3/8</td> <td></td> <td>R</td> <td>R</td> </tr> <tr> <td rowspan="2"></td> <td>1 3/4, 2</td> <td></td> <td>R</td> <td>T</td> <td rowspan="2">N/A</td> </tr> <tr> <td>5/8</td> <td></td> <td>R</td> <td>R</td> </tr> <tr> <td rowspan="2">4</td> <td>1, 1 3/8</td> <td></td> <td>R</td> <td>R</td> <td rowspan="2">N/A</td> </tr> <tr> <td>1 3/4, 2</td> <td></td> <td>R</td> <td>R</td> </tr> <tr> <td rowspan="2"></td> <td>2 1/2</td> <td></td> <td>R</td> <td>T</td> <td rowspan="2">N/A</td> </tr> <tr> <td>5/8</td> <td></td> <td>R</td> <td>R</td> </tr> <tr> <td rowspan="2">5</td> <td>1, 2</td> <td></td> <td>R</td> <td>R</td> <td rowspan="2">N/A</td> </tr> <tr> <td>2 1/2, 3</td> <td></td> <td>R</td> <td>T</td> </tr> <tr> <td rowspan="2"></td> <td>3 1/2</td> <td></td> <td>T</td> <td>T</td> <td rowspan="2">N/A</td> </tr> <tr> <td>5/8</td> <td></td> <td>R</td> <td>R</td> </tr> <tr> <td rowspan="2">6</td> <td>1 3/8 - 2 1/2</td> <td></td> <td>R</td> <td>R</td> <td rowspan="2">N/A</td> </tr> <tr> <td>3 - 4</td> <td></td> <td>T</td> <td>T</td> </tr> <tr> <td rowspan="2">8*</td> <td>1 3/8 - 4 1/2</td> <td></td> <td>R</td> <td>N/A</td> <td rowspan="2">R</td> </tr> <tr> <td>5, 5 1/2</td> <td></td> <td>R</td> <td>N/A</td> </tr> <tr> <td rowspan="2">10*</td> <td>1 3/4 - 5 1/2</td> <td></td> <td>R</td> <td>N/A</td> <td rowspan="2">R</td> </tr> <tr> <td>2 - 5 1/2</td> <td></td> <td>R</td> <td>N/A</td> </tr> <tr> <td rowspan="2">12*</td> <td>2 - 5 1/2</td> <td></td> <td>R</td> <td>N/A</td> <td rowspan="2">R</td> </tr> </tbody> </table>			Bore	Rod Dia.	MX1 MX3 MX2 MS4 MS2 MF6 MF2 MT2 MT1 MT4		MF1 MF5	ME3 ME4	MPU3	MP1	1 1/2	5/8		R	T	N/A	1		T	T	2	5/8		R	R	N/A	1		R	T		1 3/8		T	T	N/A	5/8		R	R	2 1/2	1		R	R	N/A	1 3/8		T	T		1 3/4		T	T	N/A	5/8		R	R	3 1/4	1		R	R	N/A	1 3/8		R	R		1 3/4, 2		R	T	N/A	5/8		R	R	4	1, 1 3/8		R	R	N/A	1 3/4, 2		R	R		2 1/2		R	T	N/A	5/8		R	R	5	1, 2		R	R	N/A	2 1/2, 3		R	T		3 1/2		T	T	N/A	5/8		R	R	6	1 3/8 - 2 1/2		R	R	N/A	3 - 4		T	T	8*	1 3/8 - 4 1/2		R	N/A	R	5, 5 1/2		R	N/A	10*	1 3/4 - 5 1/2		R	N/A	R	2 - 5 1/2		R	N/A	12*	2 - 5 1/2		R	N/A	R
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	<p>Head Square</p>  <p>ME3</p>	<p>Cap Square</p>  <p>ME4</p>																																																																																																																																																												
<p>Double End Construction</p>  <p>Available in all bore and rod combinations in the following mounting styles: MDS2, MDS4, MDX1, MDX3, MDT1, MDT4, and MDF1 (1"-6"). MDF5 (1"-6") and MDE3 (8"-12").</p>																																																																																																																																																														

A
 PA-2
 NC9
 Rod Lock

**How To Order
By Model Number**

NC-9 Pneumatic Cylinders can be specified by model number by using the tables shown at right.

Selections in bold type indicate current Ford standard.

1. Type

Select the Model Number Code which identifies single, double end.

2. Bore & Rod Diameter

Select the Model Number Code which identifies the desired bore size and rod diameter combination.

3. Mounting & Cushioning

Select the Model Number Code which identifies the desired mounting style and cushioning option.

4. Rod End Style

Select the Model Number Code which identifies the desired rod end thread style.

5. Seal Type

Complete the Model Number by selecting the type of seals desired.

6. Stroke Length

It is necessary to specify the stroke length desired following the Model Number. For example: FAA110851 with 6" stroke.

Specifying the Desired Trunnion Location

For cylinders with intermediate trunnion mounting, the dimension specified should be the distance from the piston rod reference point to the center-line of the pin.

The Example Would Identify:

A single end pneumatic cylinder, 1-1/2" bore size, 1" piston rod diameter, side lug mount, cushioned both ends, with automotive male rod thread, Buna N Seals, and a 6" stroke.

Optional Mounting Accessories

Specify separately the part number for desired optional mounting accessories.

1	Model Number
Type	Pneumatic Steel Tube
Single End with NPT port	FA
Double End with NPT port	FB
Single End with SAE port	NA
Double End with SAE port	NB

Model Number Example:

FA A11 08 5 1 S W/6"Stroke

2						
Bore Size	Rod Dia.	Model No. Code	Bore Size	Rod Dia.	Model No. Code	
1 1/2"	5/8" 1"	A10 A11	8"	1 3/8"	J12	
2"	5/8"	B10		1 3/4"	J13	
	1"	B11		2"	J14	
	1 3/8"	B12		2 1/2"	J15	
2 1/2"	5/8"	C10		3"	J16	
	1"	C11		3 1/2"	J17	
	1 3/8"	C12		4"	J18	
	1 3/4"	C13		4 1/2"	J19	
3 1/4"	1"	D11		5"	J41	
	1 3/8"	D12		5 1/2"	J42	
	1 3/4"	D13		10"	1 3/4"	K13
	2"	D14			2"	K14
4"	1"	E11	2 1/2"		K15	
	1 3/8"	E12	3"		K16	
	1 3/4"	E13	3 1/2"		K17	
5"	2"	E14	4"		K18	
	2 1/2"	E15	4 1/2"		K19	
	6"	1"	F11		5"	K41
		1 3/8"	F12		5 1/2"	K42
		1 3/4"	F13		12"	2"
2"		F14	2 1/2"			L15
2 1/2"	F15	3"	L16			
3"	F16	3 1/2"	L17			
3 1/2"	F17	4"	L18			
6"	1 3/8"	G12	4 1/2"	L19		
	1 3/4"	G13	5"	L41		
	2"	G14	5 1/2"	L42		
	2 1/2"	G15				
	3"	G16				

3	Model Number Code				
	NFPA Style	Non-Cush.	Cush. Head	Cush. Cap	Cush. Both
Mounting Style					
Side Lug	MS2	05	06	07	08
Side Tap	MS4	13	14	15	16
Head Rectangular Flange (1 1/2-6)	MF1	21	22	23	24
Cap Rectangular Flange (1 1/2-6)	MF2	25	26	27	28
Head Square Flange (1 1/2-6)	MF5	29	30	31	32
Cap Square Flange (1 1/2-6)	MF6	33	34	35	36
Head Square (8-14)	ME3	37	38	39	40
Cap Square (8-14)	ME4	41	42	43	44
Tie Rods Extended Both Ends	MX1	53	54	55	56
Tie Rods Extended Cap End	MX2	57	58	59	60
Tie Rods Extended Head End	MX3	61	62	63	64
Head Trunnion	MT1	69	70	71	72
Cap Trunnion	MT2	73	74	75	76
Intermediate Fixed Trunnion	MT4	77	78	79	80
Cap Fixed Clevis	MP1	81	82	83	84
Spherical Bearing	MPU3	89	90	91	92
NO MOUNT	MX0	93	94	95	96

4	Rod End Style	Model Number Code
	Small Male	2
	Short Female	3
	Intermediate Male	4
	Automotive Male	5
	Special Specify	0

5	Seal Type	Model Number Code
	Buna N Seals	1
	Fluorocarbon Seals	2

6	Special Features	S
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7	Specify Stroke Length	6.00"
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