The medium-duty hydraulic cylinder with a proven record of performance.

Parker Series 3L cylinders provide value through proven reliability, efficient performance, and quality that you expect from every Parker Industrial Cylinder Division product line. Each Series 3L cylinder incorporates design features one would not expect to see in a 1,000 psi nominally rated cylinder. These features include the “Jewel” rod gland, adjustable floating cushions, case hardened piston rod assemblies, and high strength tie rods with rolled threads instead of cut threads. Each and every Parker cylinder is hand built and tested before it leaves our facility to ensure leak and trouble free operation. At Parker, we place a high emphasis on quality and design to ensure value and productivity for all of our customers. Make the Parker Series 3L your choice for medium duty hydraulic cylinders today and for the future.

Standard Specifications

- Medium Duty Service – ANSI/(NFPA) T3.6.7R2 - 1996 Specifications and Mounting Dimension Standards
- Standard Construction – Square Head – Tie Rod Design
- Nominal Pressure – 1000 psi Dependent on Bore Size[1]
- Standard Fluid – Hydraulic Oil
- Standard Temperature – -10°F to +165°F[2]
- Bore Sizes – 1.00" through 8.00"
- Piston Rod Diameter – 0.500" through 5.500"
- Mounting Styles – 15 standard styles at various application ratings
- Strokes – Available in any practical stroke length
- Cushions – Optional at either end or both ends of stroke. "Float Check" at cap end.
- Rod Ends – Four Standard Choices – Specials to Order

Note: Series 3L Hydraulic Cylinders fully meet ANSI/(NFPA) T3.6.7R2 - 1996 Specifications and Mounting Dimensions for Square Head Industrial Fluid Power Cylinders.

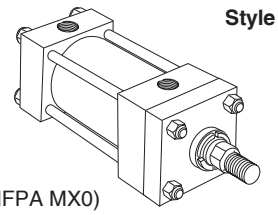
In line with our policy of continuing product improvement, specifications in this catalog are subject to change.

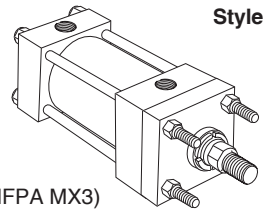
[1] See Section D to determine maximum pressure rating by bore and rod combination.

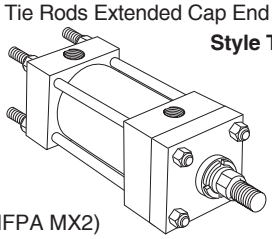
[2] See Section D – Fluids/Temperature/Pressure Ratings for information regarding higher temperature service.

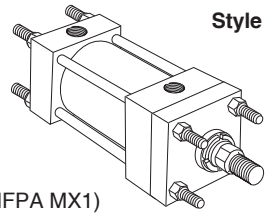
A

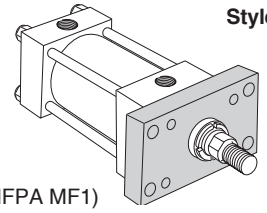
Available Mounting Styles

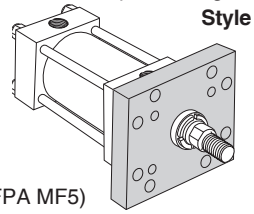
Basic
Style T

(NFPA MX0)

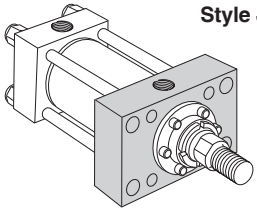
Tie Rods Extended Head End
Style TB

(NFPA MX3)

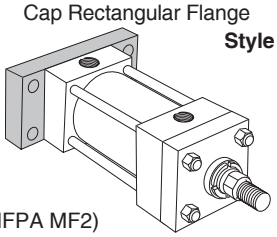
Tie Rods Extended Cap End
Style TC

(NFPA MX2)

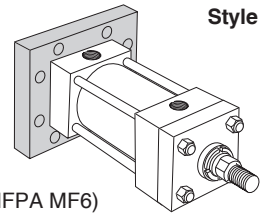
Tie Rods Extended Both Ends
Style TD

(NFPA MX1)

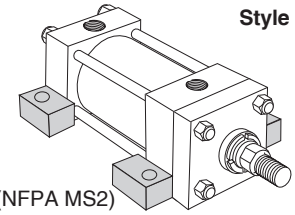
Head Rectangular Flange
Style J

(NFPA MF1)

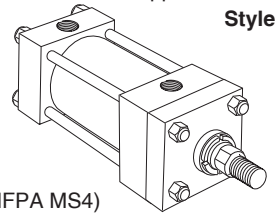
Head Square Flange
Style JB

(NFPA MF5)

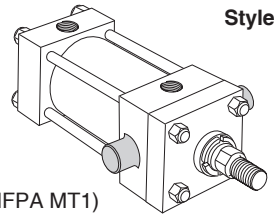
Head Rectangular
Style JJ[3]

(NFPA MF2)

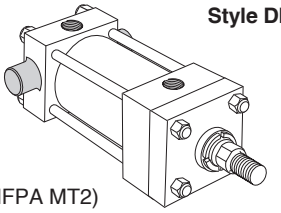
Cap Rectangular Flange
Style H

(NFPA MF2)

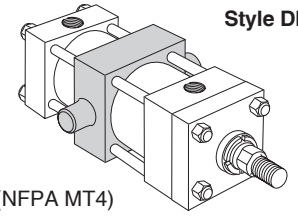
Cap Square Flange
Style HB

(NFPA MF6)

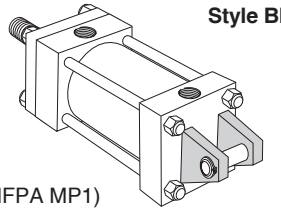
Side Lug
Style C

(NFPA MS2)

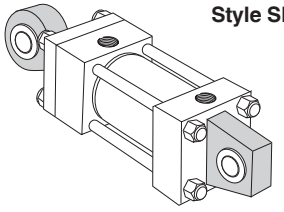
Side Tapped
Style F

(NFPA MS4)

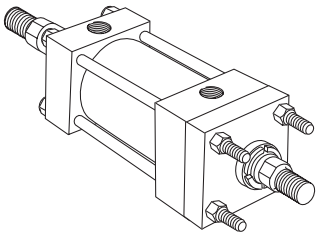
Head Trunnion
Style D

(NFPA MT1)

Cap Trunnion
Style DB

(NFPA MT2)

Intermediate Fixed Trunnion
Style DD

(NFPA MT4)

Cap Fixed Clevis
Style BB

(NFPA MP1)

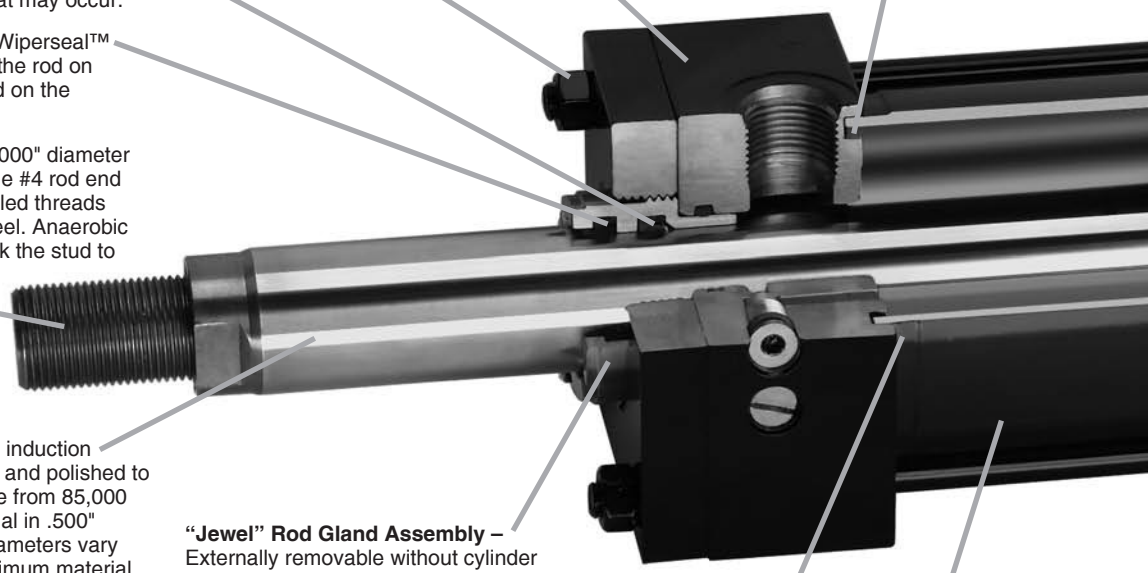
Spherical Bearing
Style SB


Double Rod Cylinders
Style KTB Shown


[3] Parker Style JJ mount for the Series 3L is a non-NFPA mount.

Most of the above illustrated mounting styles are available in double rod cylinders.

The inside story on why Series 3L is your best choice in medium duty hydraulic cylinders



Primary Seal – TS-2000 Rod Seal is a proven leakproof design – completely self-compensating and self-relieving to withstand variations and conform to mechanical deflection that may occur.

Secondary Seal – Double-Service Wiperseal™ wipes clean any oil film adhering to the rod on the extend stroke and cleans the rod on the return stroke.

Piston Rod Stud – Furnished on 2.000" diameter rods and smaller when standard style #4 rod end threads are required. Studs have rolled threads and are made from high strength steel. Anaerobic adhesive is used to permanently lock the stud to the piston rod.

Piston Rod – Medium carbon steel, induction case-hardened, hard chrome-plated and polished to 10 RMS finish. Piston rods are made from 85,000 to 100,000 psi minimum yield material in .500" through 4.000" diameters. Larger diameters vary between 57,000 and 90,000 psi minimum material, depending on rod diameter. The piston thread equals the catalog style #4 rod end thread for each rod diameter to assure proper piston-to-rod thread strength. Two wrench flats are provided for rod end attachment.

Alloy Steel Tie Rod Nuts

Steel Head – Bored and grooved to provide concentricity for mating parts.

End Seals – Pressure-actuated cylinder body-to-head and cap o-rings.

"Jewel" Rod Gland Assembly – Externally removable without cylinder disassembly. Long bearing surface is inboard of the seals, assuring positive lubrication from within the cylinder. An o-ring is used as a seal between gland and head, and also serves as a prevailing torque-type lock.

Align-A-Groove – A $^{3}/_{16}$" wide surface machined at each end of the cylinder body. Makes precise mounting quick and easy.

The Cylinder Body – Heavy-wall steel tubing, honed to a micro finish bore.

Adjustable floating cushions

Cushions are optional and can be supplied at head end, cap end, or both ends without change in envelope or mounting dimensions. All Parker cushions are adjustable.

The Series 3L cylinder design incorporates the longest cushion sleeve and cushion spear that can be provided in the standard envelope without decreasing the rod bearing and piston bearing lengths.

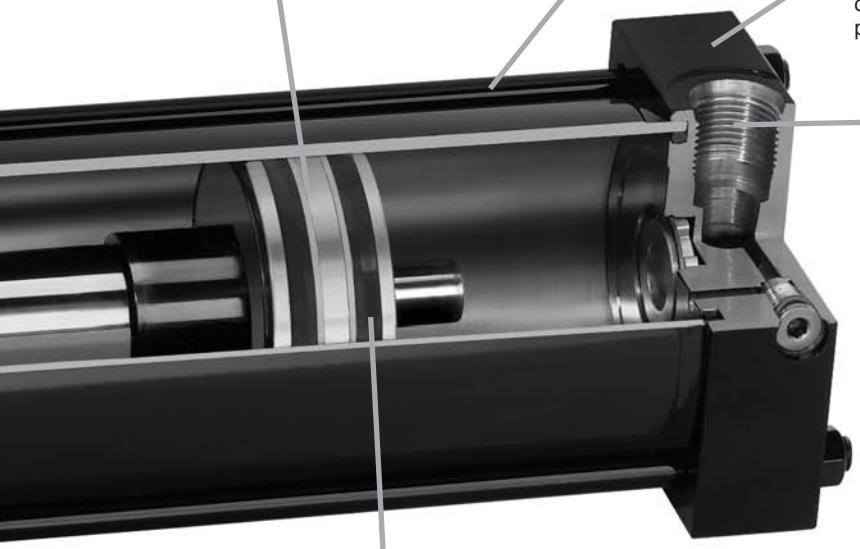
(1) When a cushion is specified at the head end:
   a. A self-centering sleeve is furnished on the piston rod assembly.
   b. A needle valve is provided that is flush with the side of the head when wide open. It may be identified by the fact that it is socket keyed. It is located on side number 2, in all mounting styles except D, DB and DD. In these styles it is located on side number 3.
   c. On 3.25" bores and larger, a springless check valve is provided that is also flush with the side of the head and is mounted adjacent to the needle valve except on certain bores of mounting style C where it is mounted opposite the needle valve. It may be identified by the fact that it is slotted.
   d. The check and needle valves are interchangeable in the head.
   e. 1.00" - 2.50" bore 3L's utilize a slotted sleeve design in place of the check valve.

(2) When a cushion is specified at the cap end:
   a. A cushion spear is provided on the piston rod assembly.
   b. A "float check" self-centering bushing is provided which incorporates a large flow check valve for fast "out-stroke" action.
   c. A socket-keyed needle valve is provided that is flush with the side of the cap when wide open. It is located on side number 2 in all mounting styles except D, DB, and DD. In these styles it is located on side number 3.

One-Piece Nodular Iron Piston – The wide piston surface contacting cylinder bore reduces bearing loads. Anaerobic adhesive is used to permanently lock and seal the piston to the rod.

High Strength Tie Rods – Made from 100,000 psi minimum yield steel with rolled threads for added strength.

Steel Cap – Bored and grooved to provide concentricity for mating parts.



Ports – NPTF ports are standard.

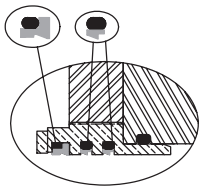
Lipseal™ Piston
Zero leakage under static conditions. Seals are self-compensating to conform to variations in pressure, mechanical deflection, and wear. Back-up washers prevent extrusion.

Optional Ports

Ports – SAE "O" ring ports are optional at no extra charge. Oversize NPTF and SAE ports are available at extra charge.

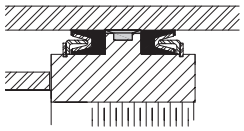
Seals – Buna-N (Nitrile) seals are standard.

Fluorocarbon Seals – Optional at extra charge.



Optional High Temperature Gland – Dual filled PTFE rod seals and filled PTFE wiper seal are energized with fluorocarbon o-rings to maintain consistent contact with the piston rod. Excellent sealing performance produce dry rod on extend stroke with rod scraping to clean rod on retract. Combine with Spring Loaded PTFE Piston Seals for cylinder heat resistance to 400° F. See class 8 seal specification on Operating Fluids and Temperature Range page.

Optional Spring Loaded PTFE Piston Seals
Filled PTFE piston Lipseals utilize an internal stainless steel spring to energize both the dynamic and static sealing lips to optimize seal performance throughout the operating temperature range. Non-metallic piston wear ring reduces possibility of damaging piston which can score expensive tubing. Combine with High Temperature Gland for cylinder heat resistance to 400° F. See class 8 seal specification on Operating Fluids and Temperature Range page.



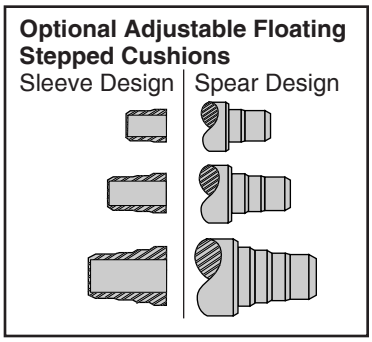
Cushion Length

Bore Ø	Rod Ø[1]	Rod Number	Cushion Length	
			Head[1]	Cap
1.00	0.500	1	0.88	0.75
	0.625	2	0.88	0.75
1.50	0.625	1	0.88	0.81
	1.000	2	0.88	0.81
2.00	0.625	1	0.88	0.81
	1.375	2	0.88	0.81
2.50	1.000	1	0.88	0.81
	1.750	2	0.88	0.81
3.25	1.000	1	1.13	1.00
	2.000	2	0.81	1.00
4.00	1.375	1	1.13	1.00
	2.500	2	0.81	1.00
5.00	1.750	1	1.13	1.00
	3.500	2	0.81	1.00
6.00	1.750	1	1.38	1.25
	4.000	2	1.06	1.25
8.00	2.000	1	1.06	1.25
	5.500	2	0.94	1.25

[1] Head end cushions for rod diameters not listed have cushion lengths within the limits shown.

Adjustable Stepped Floating Cushions – Optional at extra charge. For faster cycle time and increased productivity – for maximum performance – economical and flexible for even the most demanding applications – reduces shock and machine noise – lower maintenance costs – can be supplied at head, cap or both ends.

Optional Adjustable Floating Stepped Cushions



Application Checklist

The following checklist should used to select the best possible cylinder for a given application. Additional information can be referenced in the following pages to help assist in this process. In the event that you have additional questions or concerns, or if more information is required, please contact your local Parker distributor or our customer service representatives for assistance.

1. **Establish the system requirements** ..... **Series 3L**
   - How heavy is the load to be moved?
   - What is the nominal operating pressure of the system?
   - How far does the load have to move?
   - What is the speed at which the load will move?
   - What is the fluid type and the temperature to which the cylinder will be exposed?

2. **Mounting Style** ..... Page 7
   - Determine the best mounting style for the application.

3. **Cylinder Bore and Operating Pressure** ..... Page 62
   - Review the theoretical push and pull force for a given bore size to determine.

4. **Piston Rod** ..... Page 71
   - Determine what rod size will be required to avoid buckling.
   - Determine if a single or double rod cylinder is required.
   - Determine the rod end style and rod end thread.
   - Will stop tubing be required?

5. **Piston Seals** ..... Page 5
   - Determine the best seal type for your application.
   - Select the proper seal type and configuration for the application.
   - Select the proper seal to assure fluid and temperature compatibility.

6. **Cushioning** ..... Page 74
   - Determine if cushions are required to safely stop the load.

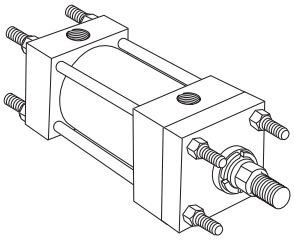
7. **Ports** ..... Page 67
   - Select the best possible port size for a given speed requirement.
   - Select port position.

8. **Piston rod and mounting accessories** ..... Page 42
   - Determine how you will attach the cylinder to the load.

9. **Optional accessories and modifications** ..... Page 41

Mounting Styles & Tips for Applying Them

Extended Tie Rod Mountings – TB, TC and TD



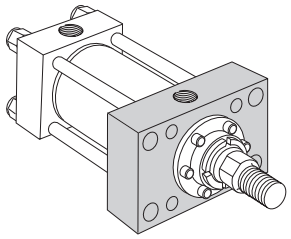
Application:

- Straight line force transfer
- Compression loads (push) – use TC or TD
- Tension loads (pull) – use TB or TD

Advantages:

- Ease of mounting in tight spaces
- Force is transferred along the centerline of the cylinder

Flange Mountings – J, JB, JJ, H and HB



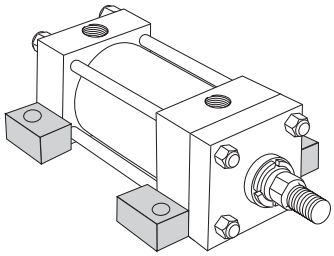
Application:

- Straight line force transfer
- Compression loads (push) – use H or HB
- Tension loads (pull) – use J, JB, or JJ

Advantages:

- Rigid base mounting due to large flange area
- Force is transferred along the centerline of the cylinder

Side Tap Mounting – F / Side Lug Mounting – C



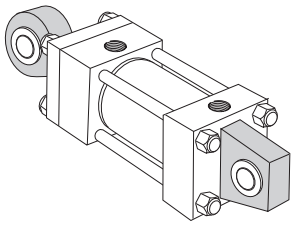
Application:

- Straight line force transfer
- Can be used in compression or tension loads
- Thrust key and secure mounting area are vital

Advantages:

- Ease of mounting

Pivot Mountings – BB and SB



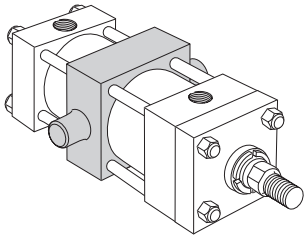
Application:

- Curved or arc line force transfer
- Can be used in compression or tension loads
- Movement in a simple arc – use BB mountings
- Movement in a compound arc – use SB mountings

Advantages:

- Ease of mounting
- Design flexibility
- Self aligning (SB)

Trunnion Mountings – D, DB and DD



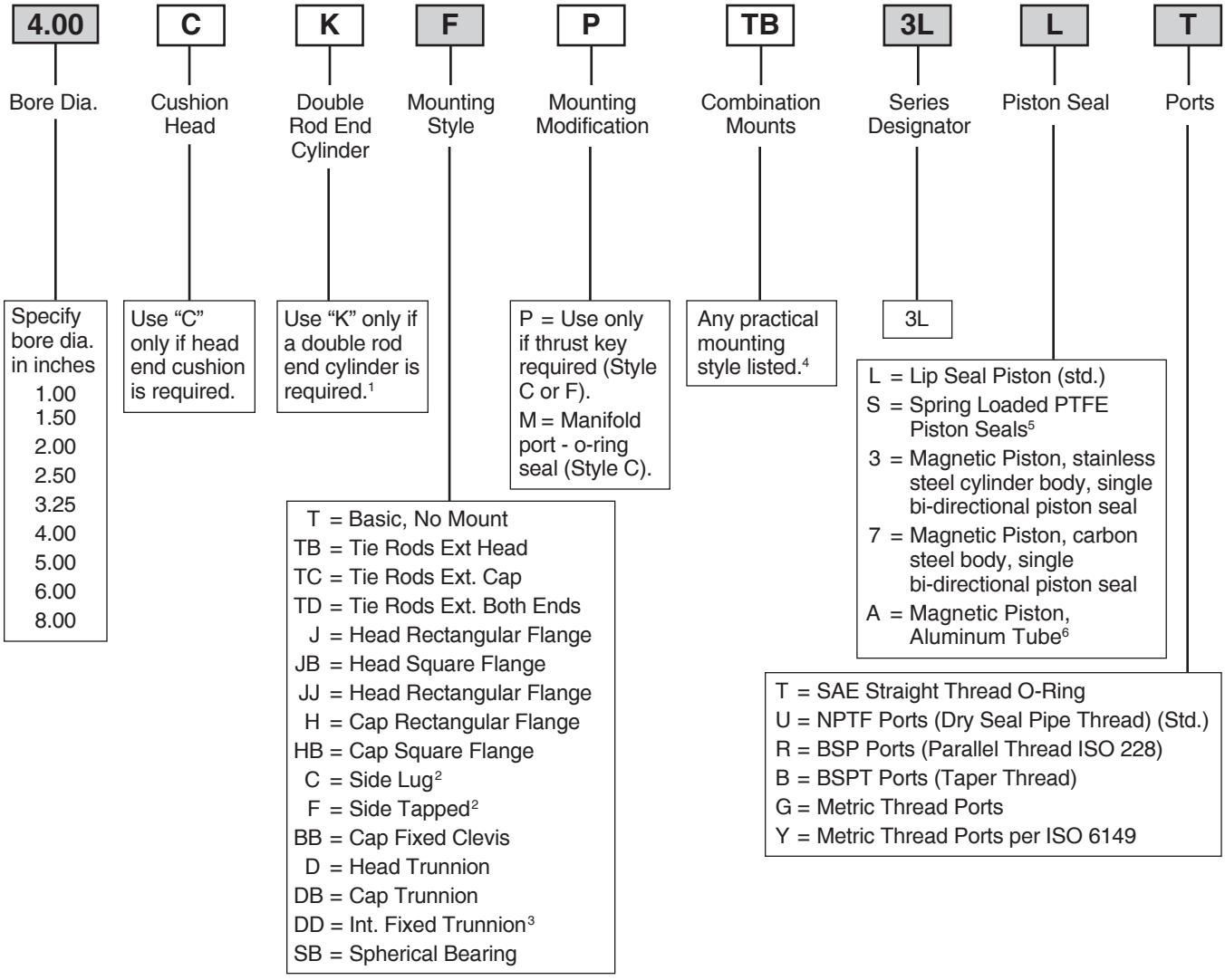
Application:

- Curved or arc line force transfer
- Can be used in compression or tension loads
- Compression loads – use DB or DD mountings
- Tension loads – use D or DD mountings

Advantages:

- Ease of mounting
- Design flexibility
- Self aligning

3L Model Code



Shaded boxes identify required model number fields.

[1] Available mounting styles for K Type cylinders are located at the end of Section A. When ordering a double rod end cylinder, the piston rod number and piston rod end threads are to be specified for both rod ends.

The model number should be created as viewing the primary rod end on the left hand side.

Example: K Type Cylinder:
4.00CKTD3LT14A28AC10.000

[2] Mounting Styles C and F should have a minimum stroke length equal to or greater than their bore size.

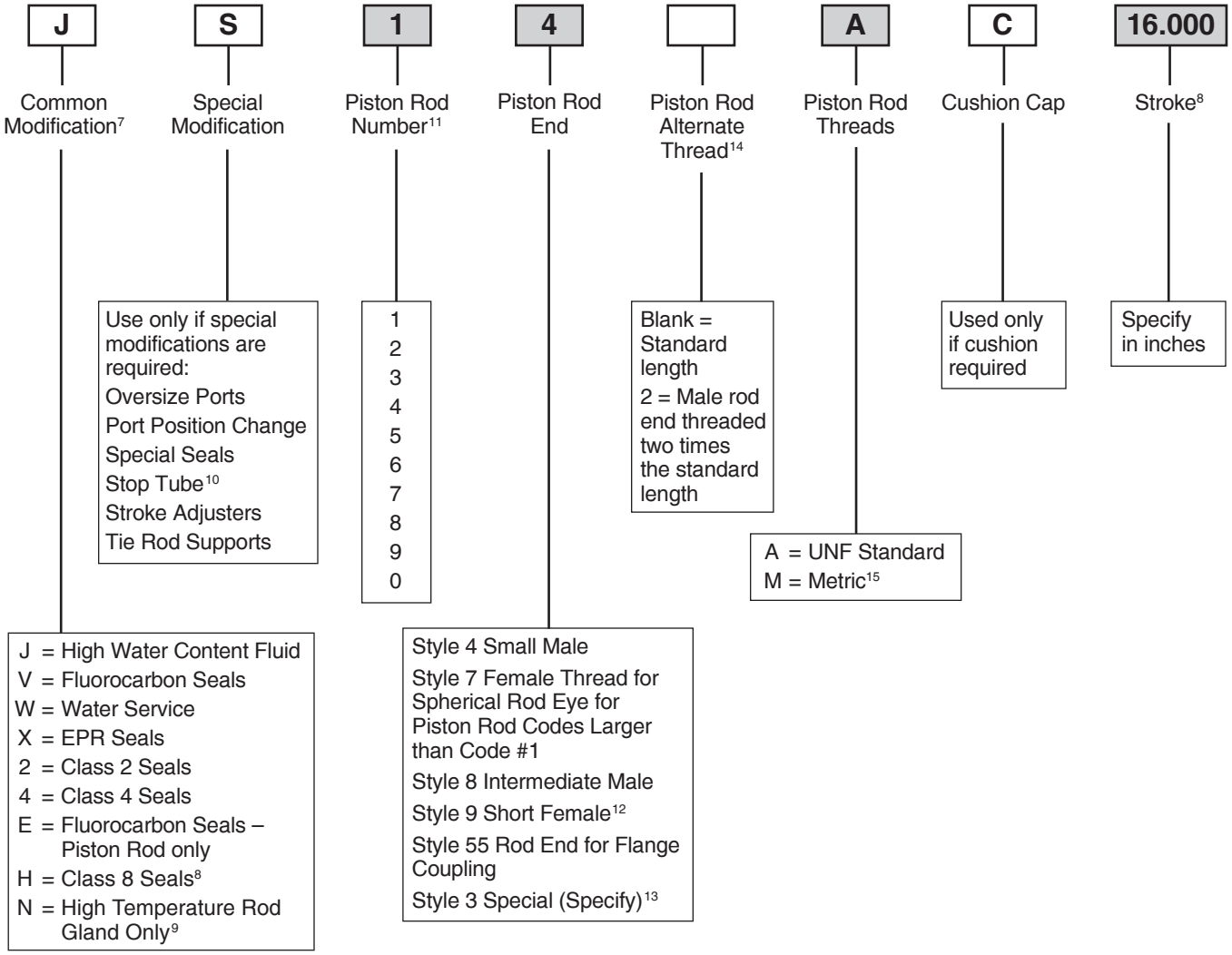
[3] Specify XI dimension.

[4] In general, the model numbers as read left to right corresponding to the cylinder as viewed from left to right with the primary end at the left. The second or subsequent mountings are mountings called out as they appear in the assembly moving away from the rod end. Except when tie rod extension mountings are part of a combination, all combinations should have a "S" (Special) in the model code and a note in the body of the order clarifying the mounting arrangement. The "P", as used to define a thrust key is not considered to be a mounting. However it is located at the primary end.

[5] Spring loaded PTFE piston seals are not available in 1.50", 2.00" and 2.50" bore with Code 2 rod.

[6] See 3L pressure rating table on Introduction page III for aluminum tube option associated with magnetic piston.

3L Model Code



Shaded boxes identify required model number fields.

[7] See common modifications Section C for additional options.

[8] Cast iron piston ring seals will be supplied in 1.50", 2.00" and 2.50" bores with Code 2 rod when Class 8 seals are specified.

[9] Energized PTFE rod seals & wiper seal. All other seals are fluorocarbon.

[10] S = Stop Tube. Specify: stop tube length, net stroke and gross stroke. Gross stroke = stop tube length + net stroke. Gross stroke to be placed in the model number field.

Example:

2.000 inches long stop tube
+14.000 inches net stroke
16.000 inches gross stroke

[11] Refer to Rod buckling chart in Section D to assure rod number selected will not buckle under load.

[12] Style 9 stroke restrictions may apply. See Style 9 Minimum Stroke Table for details.

[13] Provide dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

[14] Available only in combination with rod end Style 4 or Style 8.

[15] See Section C for detailed information regarding standard metric rod end thread sizes.

Style 9 Minimum Stroke Table

Bore Ø	Rod Ø	Minimum Stroke
1.00 - 4.00	All	None
5.00	2.000	None
	2.500	1.000
	3.000	1.375
	3.500	1.625
6.00	2.500	None
	3.000	1.375
	3.500	1.375
	4.000	2.000
8.00	3.500	1.500
	4.000	1.500
	5.000	2.875
	5.500	3.625