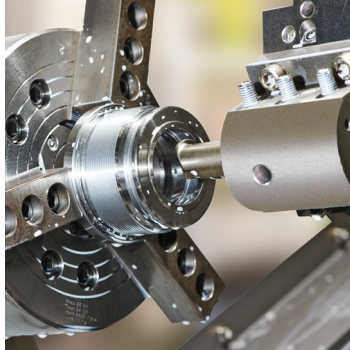
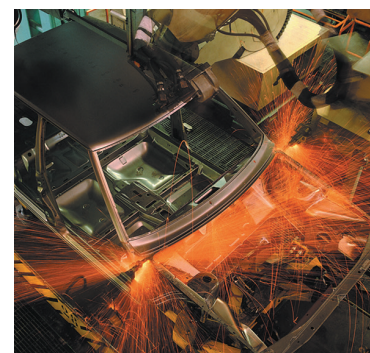




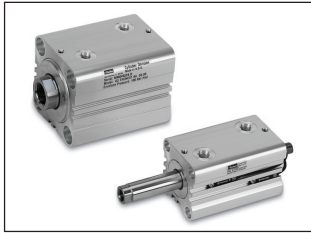
Heavy Duty Hydraulic Cylinders

Series 2H / 2HD / 2HB & 3H / 3HD / 3HB



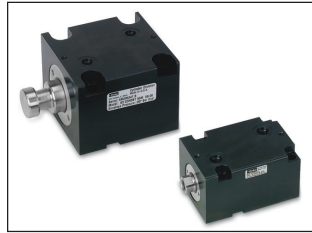
ENGINEERING YOUR SUCCESS.

Parker Hannifin's Hydraulic Actuator Division offers products that are designed to meet and exceed the most demanding application requirements. Our extensive hydraulic cylinder product line offers OEM's and End Users cylinder solutions that provide value through reduced maintenance, increased productivity, and long service life. Parker Cylinder's wide breadth of product encompasses NFPA, ISO, and Custom designed products in a multitude of configurations and sizes.



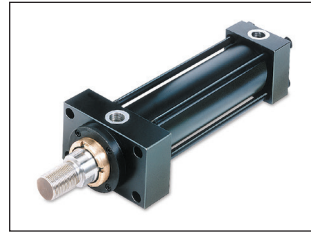
Series CHE

- 20 through 100mm Bore Sizes
- Stroke Lengths to 150mm
- Operating Pressure to 140 bar
- 4 Different Rod Ends Available



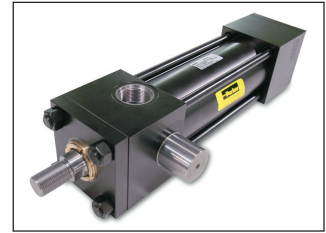
Series CHD

- 20 through 80mm Bore Sizes
- Stroke Lengths to 100mm
- Operating Pressure to 207 bar
- 4 Different Rod Ends Available



Series HMI

- Bore Sizes 25 through 200mm
- ISO 6020/2 Interchangeable
- 12 Standard Mounting Styles
- 210 Bar Hydraulic Service



Series VH

- 2.50" through 8.00" Bore Sizes
- 13 Standard Mounting Styles
- Larger Ports Than Standard
- 3,000 psi Hydraulic Service



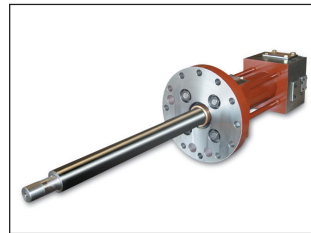
Series 3L

- Bore Sizes 1.00" through 8.00"
- Removable Rod Gland
- 15 Standard Mounting Styles
- 1,000 psi Nominal Hydraulic Service



WaveScale

- Bore Sizes 2.00" through 8.00"
- LDT Feedback
- Integrated Manifolds Available
- Protective Covers Available



Custom Cylinder

- Bore Sizes to 42.00"
- Stroke Lengths to 70'
- Operating Pressure to 10,000 psi
- Third Party Agency Approval



Cylinder Accessories

- Traditional Cylinder Attachments
- Alignment Aids
- Stainless Steel Attachments

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WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from the Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by provisions stated on a separate page of the document entitled 'Offer of Sale'.

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Parker Hannifin is a Fortune 250 global leader in motion and control technologies. For more than 100 years the company has engineered the success of its customers in a wide range of diversified industrial and aerospace markets. Learn more at www.parker.com or @parkerhannifin.

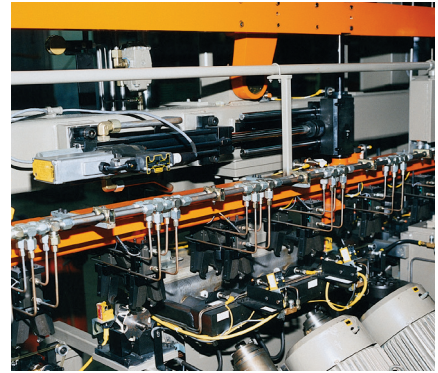
Parker is Engineering

Fluid Power and application expertise provide customers the opportunity to use us as an extension of their design teams. From new system design to improvements required for existing applications, Parker offers unparalleled engineering expertise. We'll help you develop cost saving, high performance solutions that provide value through increased productivity, improved machine efficiency, and reduced downtime.

Our design engineers utilize the highest quality materials and cutting edge manufacturing processes available to push the envelope for performance, value and reliability.

Parker components and systems are made to last. We offer complete system solutions for the following industries:

- Plastics
- Metal Forming
- Steel
- Press
- Off Shore Oil
- Forestry
- Mining
- Entertainment
- Flight Simulation
- Fatigue Testing
- Automation



Worldwide Supplier to Industrial Markets

Parker Hannifin is the world's leading supplier of motion and control technologies that include; motion control products, systems, and complete engineered solutions for industrial markets. Parker's broad and extensive breadth of product offer single source capability with limitless possibilities. Our industrial product solutions range from state of the art stand-alone components to complete engineered systems that are designed to provide value and efficiency to all of our customers. Each component and system is backed up with superior application expertise and technical support that you would expect from Parker Hannifin.

Manufacturing Locations



Corona, California

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Fax: (951) 280-3808 • Fax: (800) 869-9886



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Tel.: (541) 689-9111 • Fax: (541) 688-6771 • Fax: (800) 624-7996

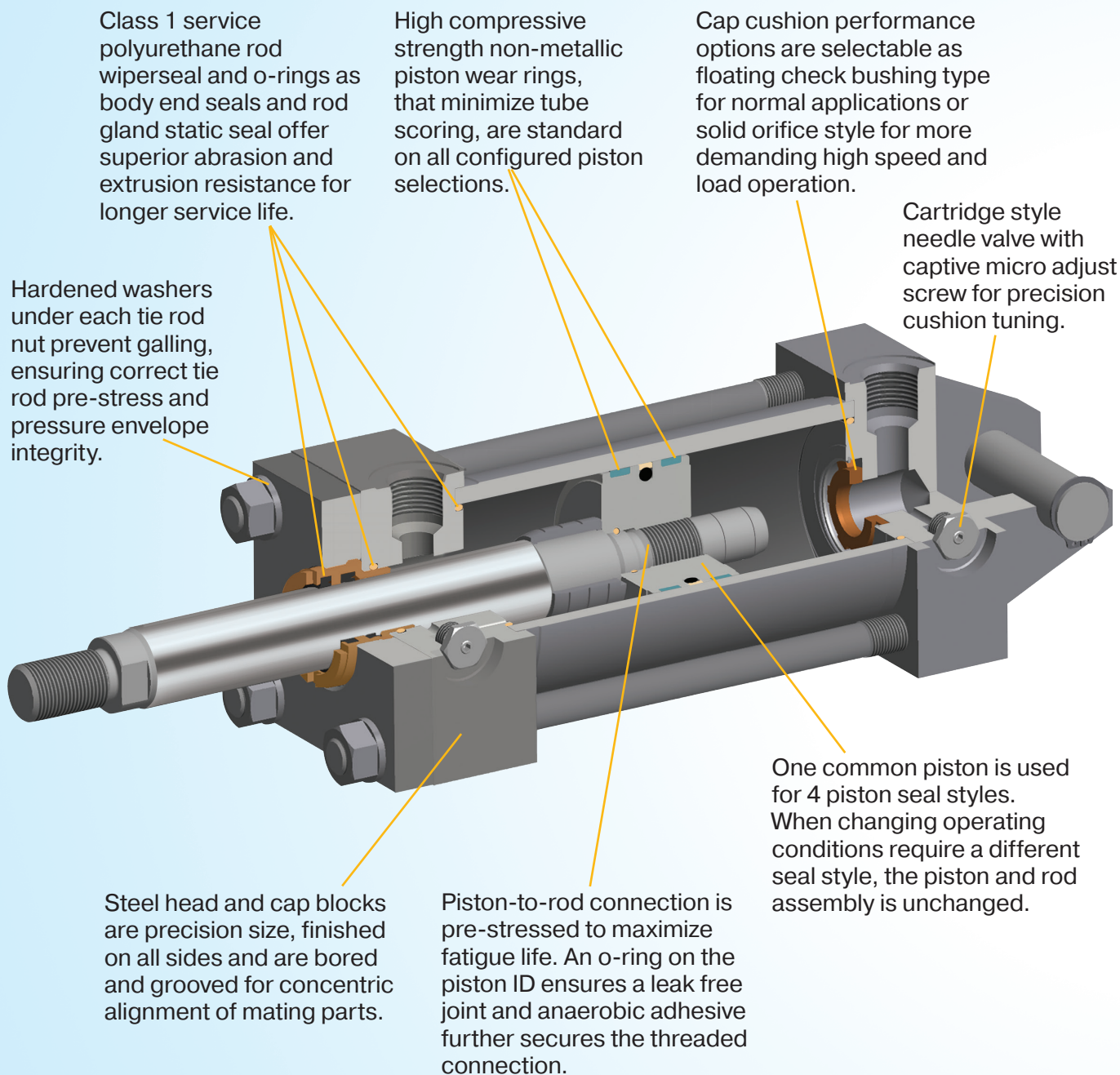


Plymouth, Michigan

900 Plymouth Road • Plymouth, MI 48170
Tel.: (734) 455-1700 • Fax: (734) 455-1007

Series 2H / 3H Design Improvements

Increase Reliability



One Common Platform – Three Construction Choices

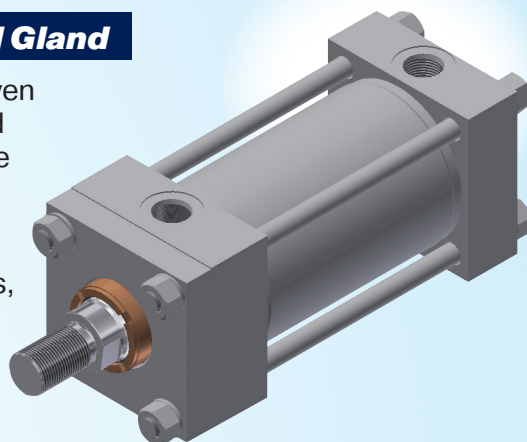
Configurable Gland, Tie Rod & Non-Tie Rod Styles are all available when you need them.

Series 2H & 3H Tie Rod Style with Threaded Jewel Gland

Traditional Parker threaded Jewel gland construction with proven TS2000 rod sealing system. Industrial cylinder standard tie rod construction ensures head and cap remain in contact with tube ends to ensure leak free performance.

Advantages

- ✓ Rod gland serviceable, using gland and spanner wrenches, without disturbing tie rod torque
- ✓ High strength tie rod material with rolled thread for added strength

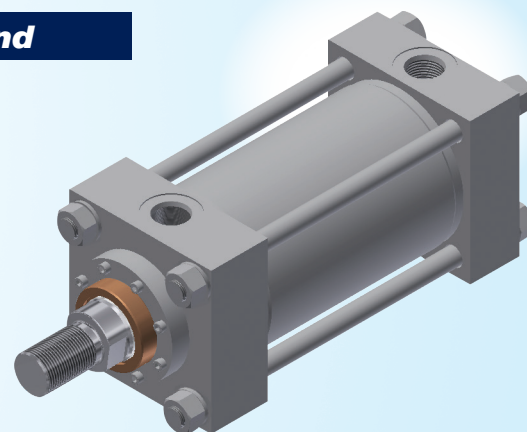


Series 2HD & 3HD Tie Rod Style with Bolt-On Gland

Bolt-on gland (see Gland Retention page for bore and mounting availability) with robust Tri-Lip rod sealing system. Industrial cylinder standard tie rod construction ensures head and cap remain in contact with tube ends to ensure leak free performance.

Advantages

- ✓ Rod gland serviceable, using a common hex wrench, without disturbing tie rod torque
- ✓ High strength tie rod material with rolled thread for added strength

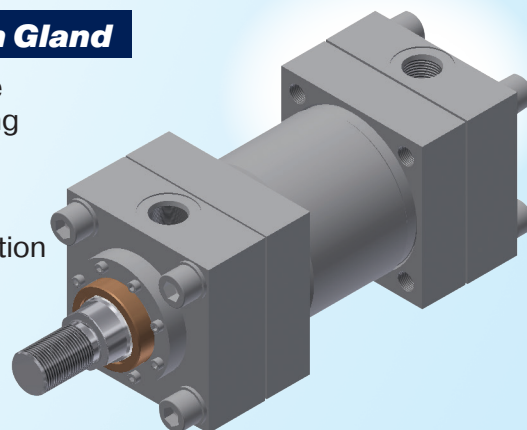


Series 2HB & 3HB Non-Tie Rod Style with Bolt-On Gland

Non-tie rod style with bolt-on gland (see Gland Retention page for bore and mounting availability) and robust Tri-Lip rod sealing system. Head and cap are bolted to threaded body flanges.

Advantages

- ✓ Improved fatigue life compared to welded flange construction
- ✓ Easier to service than tie rod styles in long strokes
- ✓ Clean appearance improves machine aesthetics
- ✓ Lower weight in long strokes



Piston Sealing Solutions for the Most Demanding Applications

Piston Seal Technology For The 21st Century

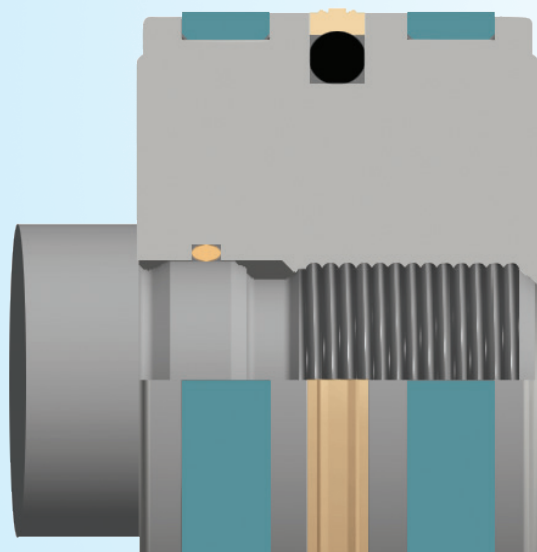
Parker's new universal piston seal design addresses the performance balance between low pressure sealability, low friction, extrusion resistance and seal life.

One piston style is used for all piston seal and wear ring configurations and will suit all application requirements. A common piston design permits field changing of seal configuration or seal and wear band material without replacing costly machined components when variations in application parameters occur, such as fluid, temperature or duty cycle.

All piston options include dual non-metallic wear rings to provide maximum stability and bearing area for protection against eccentric loads.

Parker WearGard™ wear rings are internally lubricated for reduced friction and formulated for heavy-duty load-bearing applications.

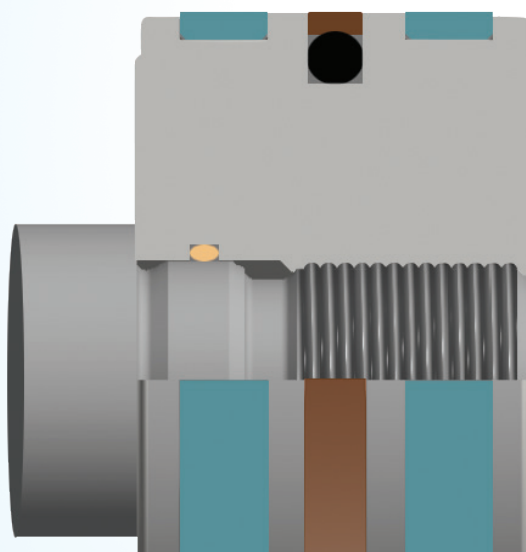
Parker HP Polyurethane Piston Seal



The Parker HP energized bi-directional piston seal improves upon the low friction and long wear of lipseals by including excellent low pressure sealing performance. Specially formulated polyurethane is long wearing and abrasion resistant with running friction comparable to lipseals. An o-ring energizer ensures virtually zero leakage in low pressure applications. Also, pressure trapping that can result with energized lipseals is not possible with a single energized seal.

Parker's HP piston seal is an excellent choice for most industrial applications operating with mineral based hydraulic oil and is available in Seal Classes 1 and 4.

Parker KP Filled PTFE Piston Seal



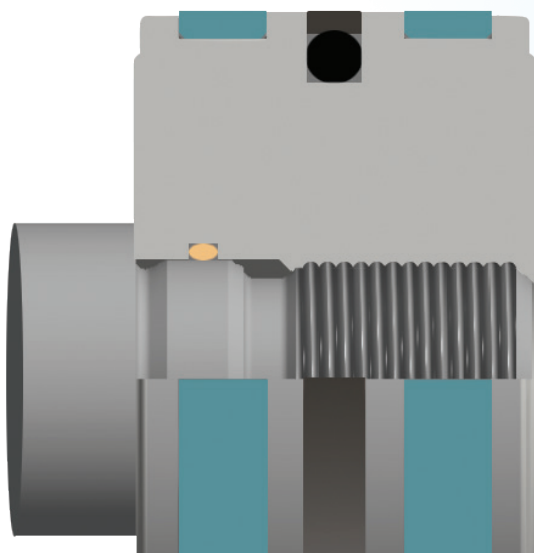
The Parker KP bronze filled PTFE seal ring material has low running friction for accurate positioning in closed loop servo applications.

When combined with a fluorocarbon energizing ring the Parker KP seal is rated for 400° F and will increase service intervals in high temperature applications when compared to fluorocarbon lipseals.

By combining the Parker KP seal with other energizer o-ring compounds and wear ring materials, the KP seal offers excellent service in all Seal Class environments.

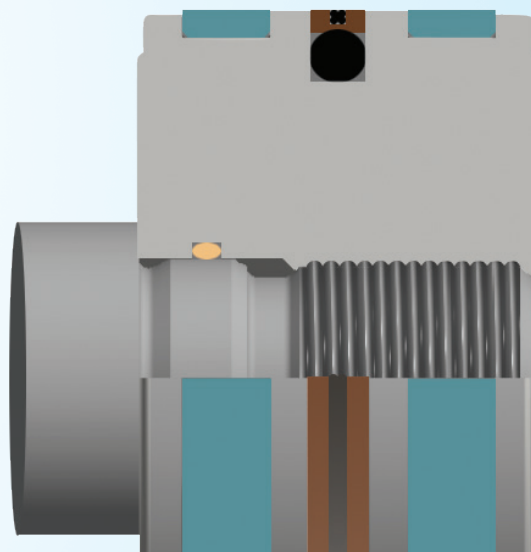
Selection Guide

Application Demand	HP Seal	KP Seal	RP Seal	WP Seal
Load Holding	Best	Good	Good	Best
Fluid Compatibility	Good	Best	Better	Better
Heat Resistance	Good (200° F Max.)	Best (400° F Max.)	Better (300° F Max.)	Better (250° F Max.)
Dynamic Friction	Best	Best	Good	Better
Breakaway Friction	Good	Best	Good	Better
Extrusion Resistance	Good	Better	Best	Good
Fluid Isolation	N/A	N/A	N/A	Best

Parker RP Thermoplastic Seal

The Parker RP step cut ring is made of self-lubricating, glass reinforced, thermoplastic and is o-ring energized. Unlike cast iron rings that bypass oil, the Parker RP seal provides drift free operation throughout the operating pressure range. This tough seal is fully extrusion resistant, even in the face of extreme pressure spikes, thus ensuring superior wear resistance in the most demanding applications.

Parker RP can operate up to 300° F and is compatible with Seal Classes 1, 2, 3, 4, 5 and 6.

Parker WP Mixed Media Seal

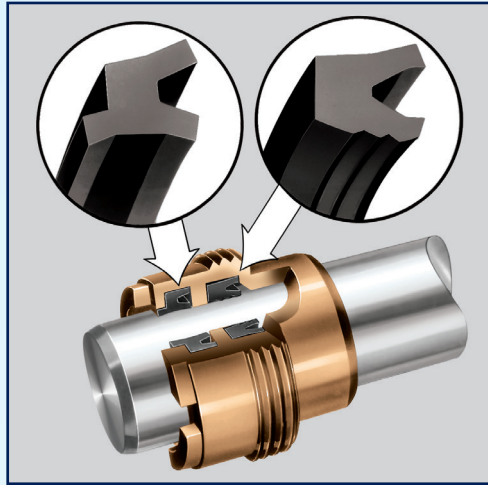
The Parker WP Mixed Media seal is designed for applications requiring different media on either side of the piston. This option is ideal when hydraulic oil is on one side of the piston and air is on the opposite side; and it can be equally effective when dissimilar fluids are on either side of the piston.

Superior low-friction bi-directional sealing is accomplished by combining an energized filled PTFE seal with a redundant elastomer seal. Energizer and redundant elastomer seal materials are available for compatibility with seal classes 1, 2, 3, 5 and 6. Note: WP piston seal groove is not universal in 1.50" bore.

Versatile Piston Rod Sealing Systems Deliver Dry Rod Performance

Parker offers the best performing and broadest selection of rod sealing options. Our TS2000 threaded Jewel Gland sealing system in Series 2H and Tri-lip Bolt-on Gland in Series 2HD / 2HB are proven anchors of the offering.

As the rod strokes out, its motion and friction dynamically flex the multi-sealing edges of the TS2000 (shown above) and the Tri-Lip rod seal to maintain their contact with the rod. This provides a cutting action to shear the oil from the rod, allowing the rod to pass out of the rod seal practically dry. Any oil film that remains on the rod is stopped by the inner lip of the Wiperseal and held between it and



the rod seal.

On the return stroke any dirt or foreign matter collected on the rod is wiped off by the leading edge, or outer lip of the Wiperseal. At the same time, any oil which may be trapped between the Wiperseal and the rod seal is returned into the cylinder. In other words, we have an automatic check valve that prevents any appreciable amount of oil to leak past the seals, and then returns any oil that has managed to wipe by the rod seal.

Both the TS2000 Jewel Gland and Tri-Lip glands are easily removed for service without loosening tie rods and disturbing the pressure envelope. Material options for both glands allow compatibility with

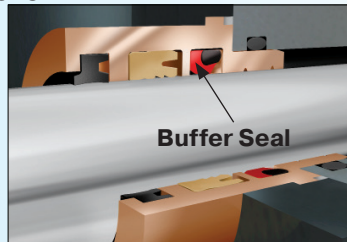
Buffer Seal Gland

The Parker Buffer Seal, installed ahead of the primary rod seal, protects the primary seal from the effects of pressure spikes. The result is increased primary rod seal and wiperseal performance life when in severe applications.

The Parker Buffer Seal is a unique design that allows trapped pressure back into the cylinder. When the rod extends from the cylinder the Buffer Seal is riding on a high compression sealing point to limit leakage. On the retract stroke the seal rocks forward to allow trapped fluid to pass under the seal and return to the system.

Buffer Seals are available with Series 2HD and 2HB Bolt-on gland sealing systems in 1.50" - 8.00" bores. They are available with Seal Classes 1, 2, 3, 4, 5 & 6. Selection of the Buffer Seal is with a code in the cylinder model number.

To accommodate the Buffer Seal, rod bushing length is extended 0.31" to 0.81", depending on rod diameter. See Buffer Seal Gland page 161 for piston rod extension details.

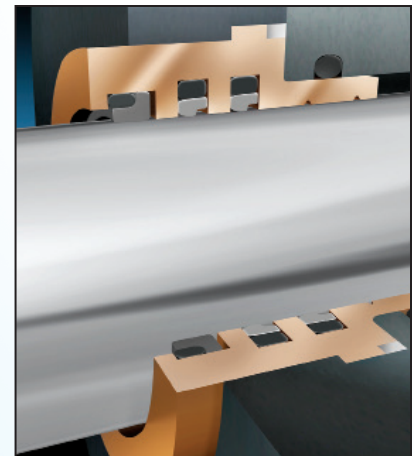


Low Friction Gland

The Parker Low Friction Gland is designed to minimize 'slip-stick' and 'chatter' in servo and 'dither' applications. Two unidirectional bronze filled PTFE primary rod seals and a bronze filled PTFE wiperseal minimize both breakaway and running friction.

Low Friction Rod Seals are available in both threaded Jewel Gland and Bolt-on gland styles for rod diameters 1.000" - 5.500" in 1.50" - 8.00" bores. They are offered with Seal Classes 1, 2, 3, 4, 5, 6 & 8. Selection of the Low Friction Gland is with a code in the cylinder model number.

See Piston & Gland Friction page for comparative seal friction data.



Section A

**Series 2H / 2HD / 2HB & 3H / 3HD / 3HB
Heavy Duty Hydraulic Cylinders**

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Application Checklist	4
Mounting Styles & Tips for Applying Them	5
2H & 3H Family Model Code / How To Order	6-7

The inside story on why Series 2H is your best choice in heavy duty hydraulic cylinders

Primary Seal – TS2000 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 urethane Wiperseal™ wipes clean any oil film adhering to the rod on the extend stroke and cleans the rod on the return stroke.

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.

Piston Rod Thread – Male rod end styles #4A and #8A are integral cut threads on the piston rod. Optional studded KK small male thread, for piston rod diameters 2.000" and smaller, is available by specifying rod end style #4H

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 .625" through 4.000" diameters. Larger diameters vary between 57,000 and 90,000 psi minimum material, depending on rod diameter.

Ports – SAE "O" ring ports are standard.

Optional Ports – NPTF ports are optional at no extra charge. Oversize NPTF and SAE ports are available at extra charge.

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

Steel Head – Precision finished on all sides; bored and grooved to provide concentricity for mating parts.

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

Parker's Exclusive Stepped floating cushions combine the best features of known cushion technology.

Deceleration devices or built-in "cushions" are optional and can be supplied at head end, cap end, or both ends without change in envelope or mounting dimensions. Parker cylinder cushions are a stepped design and combine the best features of known cushion technology.

Standard straight or tapered cushions have been used in industrial cylinders over a very broad range of applications. Parker research has found that both designs have their limitations.

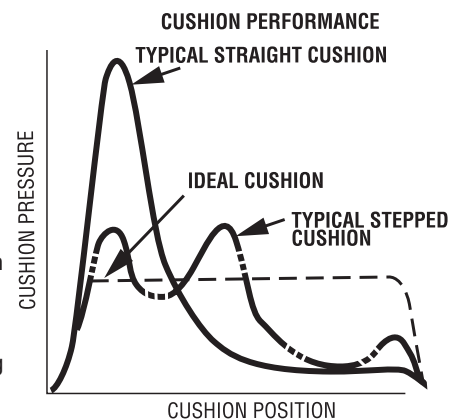
As a result, Parker has taken a new approach in cushioning of industrial hydraulic cylinders and for specific load and velocity conditions have been able to obtain deceleration curves that come very close to the ideal. The success lies in a stepped sleeve or spear concept where the steps are calculated to approximate theoretical orifice area curves.

In the cushion performance chart, pressure traces show the results of typical orifice flow conditions. Tests of a three-step sleeve or spear show three pressure pulses coinciding with

the steps. The deceleration cushion plunger curves shape comes very close to being theoretical, with the exception of the last $\frac{1}{2}$ inch of travel. This is a constant shape in order to have some flexibility in application. The stepped cushion design shows reduced pressure peaks for most load and speed conditions, with comparable reduction of objectionable stopping forces being transmitted to the load and the support structure.

All Parker Hannifin cushions are adjustable.

The Series 2H 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 strengths.



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Adjustable Floating Stepped Cushions – For maximum performance – economical and flexible for even the most demanding applications – provides superior performance in reducing shock. Cushions are optional and can be supplied at head end, cap end, or both ends without change in envelope or mounting dimensions.

Steel Cap – Precision finished on all sides; bored and grooved to provide concentricity for mating parts.

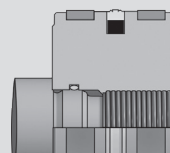
Cylinder Body – Heavy-wall steel tubing, honed to a micro finish bore.

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

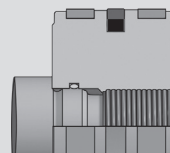
Problem Solving Piston Seal Options – Parker's new piston seal designs address the performance balance between low pressure seal ability, low friction, extrusion resistance and seal life.

One-Piece Nodular Iron Piston – Two non-metallic wear bands that minimize tube scoring are standard with all seal styles. Piston to rod connection is pre-stressed to maximize fatigue life. An o-ring on the piston ID ensures a leak free joint and anaerobic adhesive further secures the threaded connection.

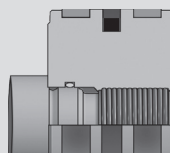
One Common Piston for 4 Seal Styles



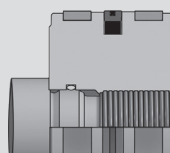
Standard HP style with polyurethane piston seal – excellent for most cycling and load holding applications.



Optional KP style with filled PTFE piston seal – low friction, high heat resistance for cycling and load holding service.



Optional RP style with thermoplastic piston seal – superior extrusion resistance to extreme pressure spikes with drift-free performance.



Optional WP style mixed media piston seal – low friction primary seal with redundant elastomer delivers superior performance with dissimilar media on either side of the piston.

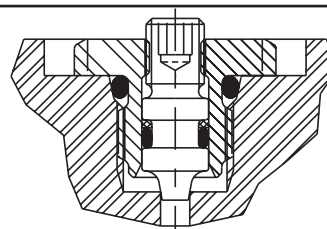
Application Demand	HP Seal	KP Seal	RP Seal	WP Seal
Load Holding	Best	Good	Good	Best
Fluid Compatibility	Good	Best	Better	Better
Heat Resistance	Good	Best	Better	Better
Dynamic Friction	Best	Best	Good	Better
Breakaway Friction	Good	Best	Good	Better
Extrusion Resistance	Good	Better	Best	Good
Fluid Isolation	N/A	N/A	N/A	Best

(1) When a cushion is specified at the head end:

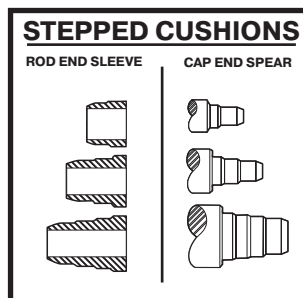
- A self-centering stepped sleeve is furnished on the piston rod assembly.
- A cartridge style needle valve is provided that is flush with the side of the head even when wide open. It is located on side number 2, in all mounting styles except D, DB, DD, DE, JJ, and HH. In these styles it is located on side number 3.
- All cylinder bores utilize a slotted sleeve as a check valve.

(2) When a cushion is specified at the cap end:

- A stepped cushion spear is provided on the piston rod.
- A "float check" self-centering bushing is provided in 1.50" - 6.00" bore cylinders, which incorporates a large flow check valve for fast "out-stroke" action. 7.00" bore and larger cylinders utilize a springless check valve located and identified in the same manner as the head end.
- A cartridge style 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, DD, DE, JJ, and HH. In these styles it is located on side number 3.



Cartridge Style Needle Valve



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Application Checklist

The following checklist should be 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 2H
 - 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**..... Pages 5 & 174
 - Determine the best mounting style for the application.
 - If your application requires a mounting style that is not exactly matched by one of our catalog offerings, we can supply the mounting you need. If the required mounting resembles one of our standards, specify that style, enter 'S' in the Special Modification field and provide a dimension drawing of your mount. Special mounting styles that do not resemble a standard style will be designated as style TX by the factory.
- 3. Cylinder Bore and Operating Pressure**Pages 164-165
 - Review the theoretical push and pull force for a given bore size to determine.
- 4. Piston Rod**..... Pages 176-178
 - 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** Pages VI and VII
 - Determine the best seal type for your application. All selections are high load style that include dual non-metallic wear bands straddling the piston seal.
 - **Parker HP** polyurethane piston seal can hold a load in position and is your best choice for general industrial applications utilizing mineral based fluids in Seal Classes 1 & 4.
 - **Parker KP** filled PTFE piston seal is our lowest friction and highest heat resistance (up to 400° F) offering that will hold a load in position and can withstand high load and is available in all Seal Classes.
 - **Parker RP** self-lubricating, reinforced, heat-stabilized thermoplastic piston seal has the highest resistance to extrusion in extreme pressure spike conditions, can hold a load in position and has long wear characteristics comparable to cast iron rings. RP seals are available in Seal Classes 1, 2, 3, 4 and 6.
 - **Parker WP** mixed-media piston seal is for applications requiring different media on either side of the piston and is ideal with hydraulic fluid on one side of the piston and compressed air on the opposite side. WP seals are available in Seal Classes 1, 2, 3, 5 and 6.
- 6. Cushioning**.....Pages 179-184
 - Determine if cushions are required to safely stop the load.
 - Determine whether optional solid cap cushion construction should be selected over standard floating cushion bushing style.
- 7. Ports** Pages 172-173
 - Select the best possible port size for a given speed requirement.
 - Select port position.
- 8. Piston rod and mounting accessories**..... Pages 132-139
 - Determine how you will attach the cylinder to the load.
- 9. Custom modifications**Pages 149-162

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Mounting Styles & Tips for Applying Them

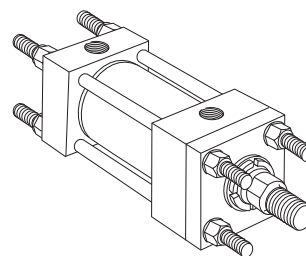
Extended Tie Rod Mountings – TB, TC, and TD

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



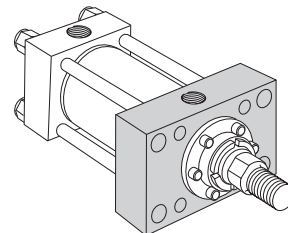
Flange Mountings – J, JB, JJ, H, HB, and HH

Application:

- Straight line force transfer
- Compression loads (push)
 - use H, HB or HH
- 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:

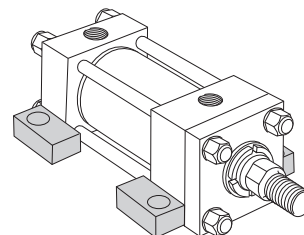
- Straight line force transfer
- Can be used in compression or tension loads
- Thrust key and secure mounting area are vital

Advantages:

- Ease of mounting

Recommendation:

- Styles F & C should have a minimum stroke at least equal to the bore diameter



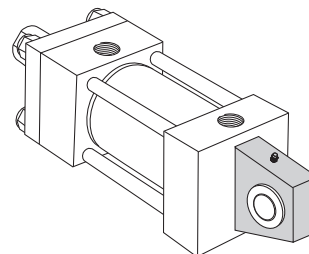
Pivot Mountings – BB, SB and SE

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 or SE mountings

Advantages:

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



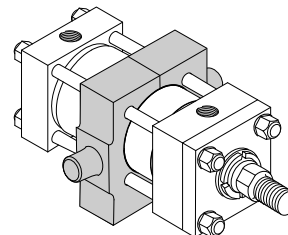
Trunnion Mountings – D, DB, DD and DE

Application:

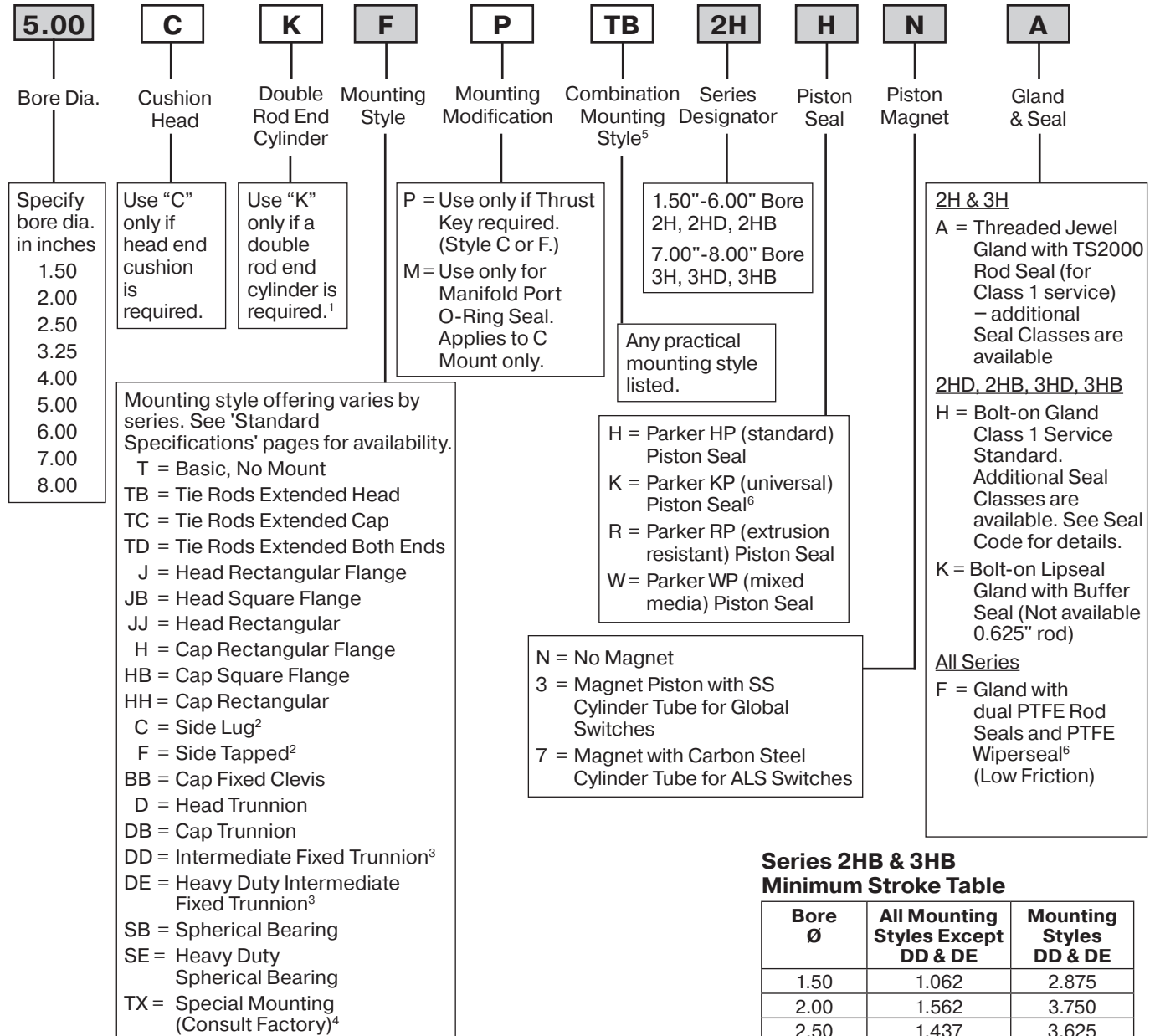
- Curved or arc line force transfer
- Can be used in compression or tension loads
- Compression loads – use DB or DD, DE mountings
- Tension loads – use D, DD or DE mountings

Advantages:

- Ease of mounting
- Design flexibility
- Self aligning



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2H & 3H Family 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:

4.00CKTD2HLT14A28AC10.000

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 Special mounting styles that do not resemble a standard catalog offering will be designated as style TX by the factory. See page 4 for instructions to enter a mounting that resembles a standard style.

⁵ 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.

⁶ Piston seal code K and Gland & Seal code F must be selected for Class 8 service. Dual PTFE rod seals with PTFE wiperseal not available for 0.625" rod.

Series 2HB & 3HB
Minimum Stroke Table

Bore Ø	All Mounting Styles Except DD & DE	Mounting Styles DD & DE
1.50	1.062	2.875
2.00	1.562	3.750
2.50	1.437	3.625
3.25	1.687	4.375
4.00	1.937	5.000
5.00	1.937	5.437
6.00	2.562	6.687
7.00	3.437	8.062
8.00	2.937	8.250

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2H & 3H Family Model Code

T	1	S	1	4	2	A	C	16.000
Port Type	Seals	Special Modification	Piston Rod Number ⁹	Piston Rod End	Piston Rod Alternate Thread ¹²	Piston Rod Threads	Cushion Cap	Stroke ⁸
1 = Standard Seals 2 = Water Base Fluid Seals 3 = EPR Seals 4 = Low Temperature Seals 5 = Fluorocarbon Seals 6 = High Water Content Fluid 8 = Energized PTFE Seals E = Fluorocarbon Seals – Piston Rod only N = High Temperature Rod Gland ⁷	1 2 3 4 5	Use only if special modifications are required: Oversize Ports Port Position Change Special Seals Stop Tube ⁸ Stroke Adjusters Tie Rod Supports Other			Use only for male thread two times longer than standard.	C = Standard Floating Cushion Bushing Design 1.50" - 6.00" Bore F = Solid Cap Orifice Design	Specify in inches	
T = SAE Straight Thread O-Ring (Std.) U = NPTF Ports (Dry Seal Pipe Thread) R = BSP Ports (Parallel Thread ISO 228) P = SAE 4-Bolt Flange Ports (3,000 psi) B = BSPT Ports (Taper Thread) G = Metric Thread Ports Y = Metric Thread Ports per ISO 6149 M = Used only for Manifold Port O-ring Seal. M option must be specified (Mounting Modification), applies to Mounting Style C only.			4 = Style 4 Small Male 4B = Style 4 Small Male with Buffer Seal Gland 7 = Style 7 Female Thread for Spherical Rod Eye for Piston Rod Codes larger than Code #1 (Style SB only) 7B = Style 7 Female Thread with Buffer Seal Gland 8 = Style 8 Intermediate Male 8B = Style 8 Intermediate Male with Buffer Seal Gland 9 = Style 9 Short Female ¹⁰ 9B = Style 9 Short Female ¹⁰ with Buffer Seal Gland 55 = Style 55 Rod End for Flange Coupling 55B = Style 55 Rod End with Buffer Seal Gland 3 = Style 3 Special (Specify) ¹¹ 3B = Style 3 Special (Specify) ¹¹ with Buffer Seal Gland					

Shaded boxes identify required model number fields.

⁷ Energized PTFE rod seals & wiperseal. All other cylinder seals are fluorocarbon. Not available for 0.625" rod.

⁸ 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

See tables on these pages for minimum allowable strokes for Series 2HB and Piston Rod End Styles 9 & 9B.

⁹ Refer to Rod buckling chart in Section H to assure rod number selected will not buckle under load.

¹⁰ Style 9 stroke restrictions may apply. See Style 9 Minimum Stroke Table for details.

¹¹ Provide dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

¹² Available only in combination with Style 4 or Style 8.

¹³ See Section G for detailed information regarding standard metric rod end thread sizes.

¹⁴ Must be specified for Piston Rod End Style 55.

Style 9 Minimum Stroke Table

Bore Ø	Rod Ø	Minimum Stroke	
		Style 9	Style 9B
1.50 - 4.00	All	None	None
5.00	2.000	None	None
	2.500	1.000	0.56
	3.000	1.375	1.94
	3.500	1.625	1.19
6.00	2.500	None	None
	3.000	1.375	0.94
	3.500	1.375	0.94
	4.000	2.000	1.56
7.00	3.000	1.250	0.81
	3.500	1.500	1.06
	4.000	1.500	1.06
	4.500	2.500	2.06
8.00	5.000	3.125	2.31
	3.500	1.500	1.06
	4.000	1.500	1.06
	4.500	2.375	1.94
	5.000	2.875	2.06
	5.500	3.625	2.81

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Notes

Overview
A

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Section B

Series 2H 1.50" - 6.00" / 3H 7.00" & 8.00" Bore Heavy Duty Hydraulic Cylinders

	2H 1.50" - 6.00" Bore	3H 7.00" & 8.00" Bore
Performance	10	10
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Rod End Styles and Dimensions	12-13	33
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JB Mount Dimensions	16	36
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BB Mount Dimensions	23	41
D Mount Dimensions	24	42
DB Mount Dimensions	25	43
DD Mount Dimensions	26	44
DE Mount Dimensions	27	45
Style SB Spherical Bearing Mounting	28	–
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Double Rod Cylinders	30	47

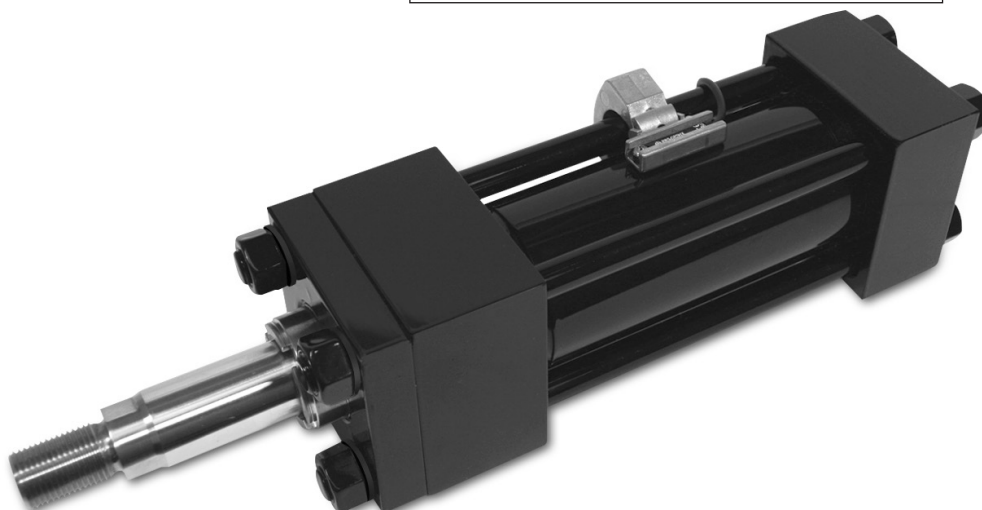
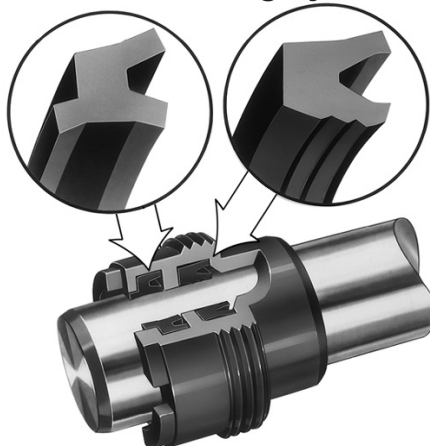
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Parker Series 2H 1.50"-6.00" and 3H 7.00" & 8.00" Bore Heavy Duty Hydraulic Cylinder

Series 2H 1.50"-6.00" and 3H 7.00" & 8.00" Bore cylinders set the standard for performance, durability, and trouble free operation. Parker's superior design, the use of high quality materials and stringent manufacturing practices provide all customers with long cylinder service life and reduced operating costs. Design features such as the "Jewel" rod gland, hard chrome plated piston rods, and stepped cushions provide increased machine productivity through reduced downtime, faster cycle times, and improved system efficiency. Every Parker cylinder is individually tested before leaving our plant to assure proper performance and leak free operation. All Parker Cylinder products carry an eighteen month warranty.

Select Parker Series 2H and 3H cylinders for your hydraulic cylinder requirements. Parker Series 2H and 3H will provide the value and performance you need for all of your industrial hydraulic application demands.

Parker "Jewel" Gland with TS2000 Sealing System



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Standard Specifications

- Heavy Duty Service – ANSI/(NFPA) T3.6.7R3 - 2009 Specifications and Mounting Dimension Standards
- Standard Construction – Square Head – Tie Rod Design
- Nominal Pressure – 3000 psi¹
- Standard Fluid – Hydraulic Oil
- Standard Temperature – -10°F to +165°F²
- Bore Diameters – 1.50" through 6.00" (Larger sizes available)

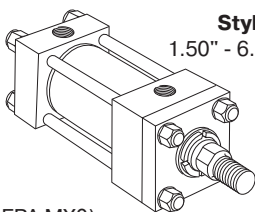
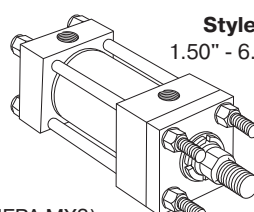
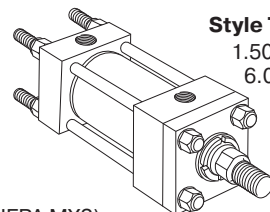
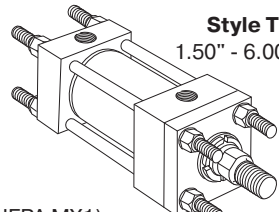
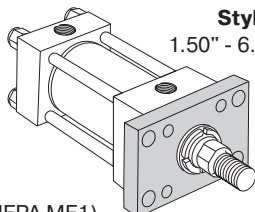
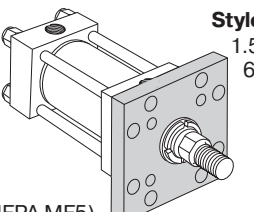
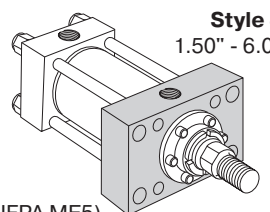
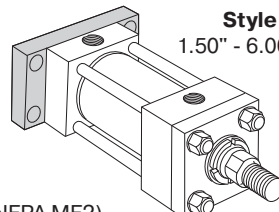
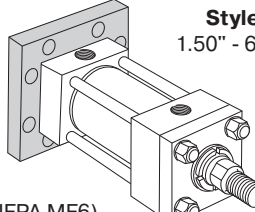
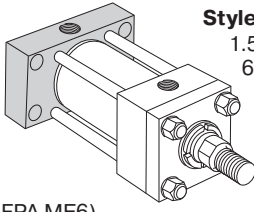
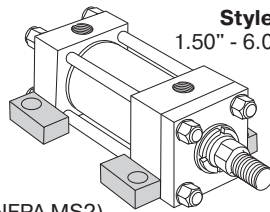
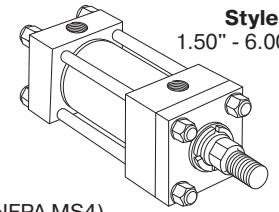
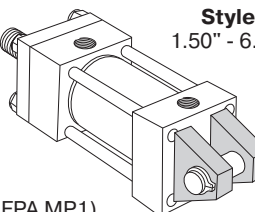
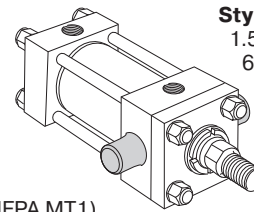
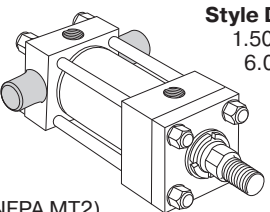
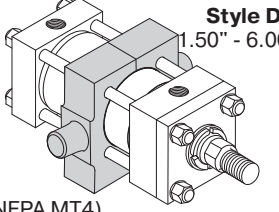
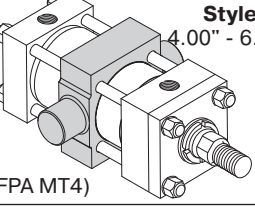
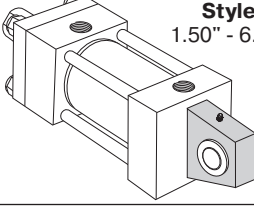
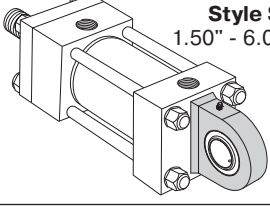
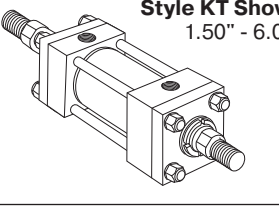
In line with our policy of continuing product improvement, specifications in this catalog are subject to change.

Note: Series 2H Hydraulic Cylinders fully meet ANSI/(NFPA) T3.6.7R3 - 2009 Specifications and Mounting Dimension Standards for Square Head Industrial Fluid Power Cylinders.

- Piston Rod Diameter – 0.625" through 4.000"
 - Mounting Styles – 19 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" design is standard at cap end.
 - Rod Ends – Four Standard Choices – Specials to Order
- ¹ If hydraulic operating pressure exceeds 3000 psi, send application data for engineering evaluation and recommendation. See Section H for actual design factors.
- ² See Section H for higher temperature service.

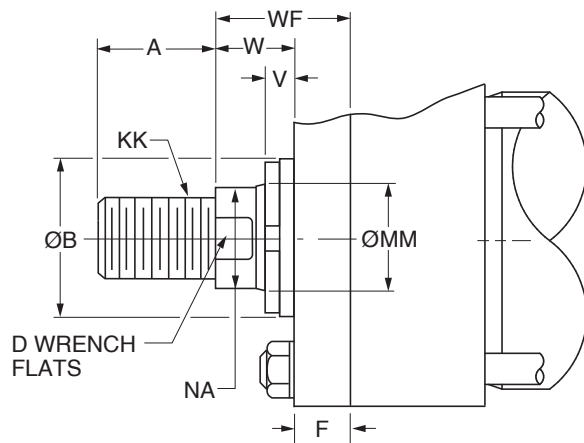
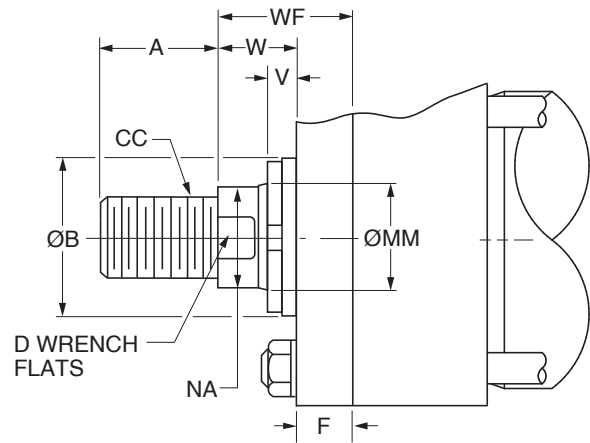
Available Mounting Styles

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

Basic Style T 1.50" - 6.00"  (NFPA MX0)	Tie Rods Extended Head End Style TB 1.50" - 6.00"  (NFPA MX3)	Tie Rods Extended Cap End Style TC 1.50" - 6.00"  (NFPA MX2)	Tie Rods Extended Both Ends Style TD 1.50" - 6.00"  (NFPA MX1)
Head Rectangular Flange Style J 1.50" - 6.00"  (NFPA MF1)	Head Square Flange Style JB 1.50" - 6.00"  (NFPA MF5)	Head Rectangular Style JJ 1.50" - 6.00"  (NFPA ME5)	Cap Rectangular Flange Style H 1.50" - 6.00"  (NFPA MF2)
Cap Square Flange Style HB 1.50" - 6.00"  (NFPA MF6)	Cap Rectangular Style HH 1.50" - 6.00"  (NFPA ME6)	Side Lug Style C 1.50" - 6.00"  (NFPA MS2)	Side Tapped Style F 1.50" - 6.00"  (NFPA MS4)
Cap Fixed Clevis Style BB 1.50" - 6.00"  (NFPA MP1)	Head Trunnion Style D 1.50" - 6.00"  (NFPA MT1)	Cap Trunnion Style DB 1.50" - 6.00"  (NFPA MT2)	Intermediate Fixed Trunnion Style DD 1.50" - 6.00"  (NFPA MT4)
HD Intermediate Fixed Trunnion Style DE 4.00" - 6.00"  (NFPA MT4)	Spherical Bearing Style SB 1.50" - 6.00" 	HD Spherical Bearing Style SE 1.50" - 6.00" 	Double Rod Cylinders Style KT Shown 1.50" - 6.00" 

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Rod End Dimensions**Thread Style 4 (NFPA Style SM)
Small Male****Thread Style 8 (NFPA Style IM)
Intermediate Male****Rod End Dimensions**

Bore Ø	Rod No.	MM Rod Ø	Thread		A	B Ø +.000 -.002	D	F	NA	V	W	WF
			Style 8 CC	Style 4 KK								
1.50	1 (Std.)	0.625	1/2-20	7/16-20	0.75	1.124	0.50	0.38	0.56	0.25	0.63	1.00
	2	1.000	7/8-14	3/4-16	1.13	1.499	0.88	0.38	0.94	0.50	1.00	1.38
2.00	1 (Std.)	1.000	7/8-14	3/4-16	1.13	1.499	0.88	0.63	0.94	0.25	0.75	1.38
	2	1.375	1 1/4-12	1-14	1.63	1.999	1.13	0.63	1.31	0.38	1.00	1.63
2.50	1 (Std.)	1.000	7/8-14	3/4-16	1.13	1.499	0.88	0.63	0.94	0.25	0.75	1.38
	2	1.750	1 1/2-12	1 1/4-12	2.00	2.374	1.50	0.63	1.69	0.50	1.25	1.88
	3	1.375	1 1/4-12	1-14	1.63	1.999	1.13	0.63	1.31	0.38	1.00	1.63
3.25	1 (Std.)	1.375	1 1/4-12	1-14	1.63	1.999	1.13	0.75	1.31	0.25	0.88	1.63
	2	2.000	1 3/4-12	1 1/2-12	2.25	2.624	1.69	0.75	1.94	0.38	1.25	2.00
	3	1.750	1 1/2-12	1 1/4-12	2.00	2.374	1.50	0.75	1.69	0.38	1.13	1.88
4.00	1 (Std.)	1.750	1 1/2-12	1 1/4-12	2.00	2.374	1.50	0.88	1.69	0.25	1.00	1.88
	2	2.500	2 1/4-12	1 7/8-12	3.00	3.124	2.06	0.88	2.38	0.38	1.38	2.25
	3	2.000	1 3/4-12	1 1/2-12	2.25	2.624	1.69	0.88	1.94	0.25	1.13	2.00
5.00	1 (Std.)	2.000	1 3/4-12	1 1/2-12	2.25	2.624	1.69	0.88	1.94	0.25	1.13	2.00
	2	3.500	3 1/4-12	2 1/2-12	3.50	4.249	3.00	0.88	3.38	0.38	1.38	2.25
	3	2.500	2 1/4-12	1 7/8-12	3.00	3.124	2.06	0.88	2.38	0.38	1.38	2.25
	4	3.000	2 3/4-12	2 1/4-12	3.50	3.749	2.63	0.88	2.88	0.38	1.38	2.25
6.00	1 (Std.)	2.500	2 1/4-12	1 7/8-12	3.00	3.124	2.06	1.00	2.38	0.25	1.25	2.25
	2	4.000	3 3/4-12	3-12	4.00	4.749	3.38	1.00	3.88	0.25	1.25	2.25
	3	3.000	2 3/4-12	2 1/4-12	3.50	3.749	2.63	1.00	2.88	0.25	1.25	2.25
	4	3.500	3 1/4-12	2 1/2-12	3.50	4.249	3.00	1.00	3.38	0.25	1.25	2.25

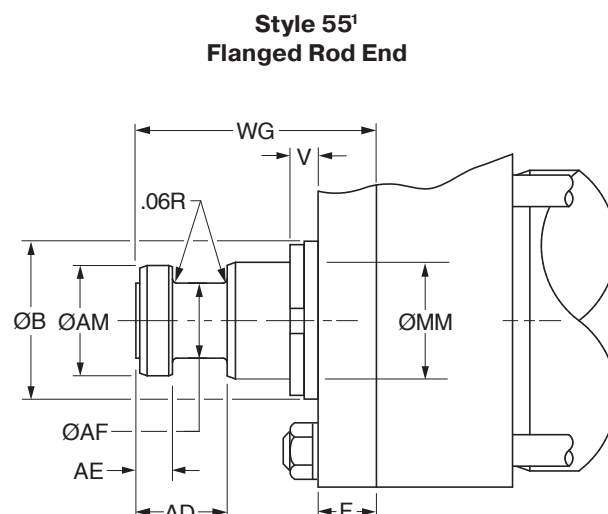
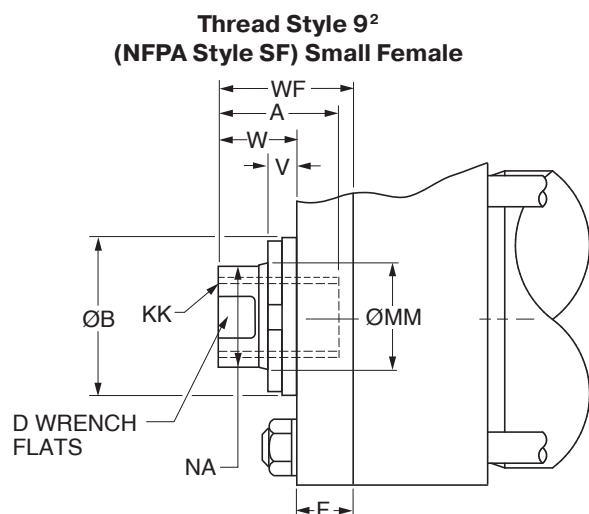
"Special" Thread Style 3

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

To order, specify "Style 3" and give desired dimensions for KK, A, W or WF.

If otherwise special, furnish dimensioned sketch.

⚠ PROP 65 WARNING **WARNING:** This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Piston Rod Ends**Heavy Duty Hydraulic Cylinders****Series 2H 1.50" - 6.00" Bore****Rod End Dimensions****Rod End Dimensions**

Bore Ø	Rod No.	MM Rod Ø	Thread	A	AD	AE +.001 -.001	AF Ø	AM Ø	B Ø +.000 -.002	D	F	NA	V	W	WF	WG
			Style 9 KK													
1.50	1 (Std.)	0.625	7/16-20	0.75	0.63	0.249	0.38	0.57	1.124	0.50	0.38	0.56	0.25	0.63	1.00	1.75
	2	1.000	3/4-16	1.13	0.94	0.374	0.69	0.95	1.499	0.88	0.38	0.94	0.50	1.00	1.38	2.38
2.00	1 (Std.)	1.000	3/4-16	1.13	0.94	0.374	0.69	0.95	1.499	0.88	0.63	0.94	0.25	0.75	1.38	2.38
	2	1.375	1-14	1.63	1.06	0.374	0.88	1.32	1.999	1.13	0.63	1.31	0.38	1.00	1.63	2.75
2.50	1 (Std.)	1.000	3/4-16	1.13	0.94	0.374	0.69	0.95	1.499	0.88	0.63	0.94	0.25	0.75	1.38	2.38
	2	1.750	1 1/4-12	2.00	1.31	0.499	1.13	1.70	2.374	1.50	0.63	1.69	0.50	1.25	1.88	3.13
	3	1.375	1-14	1.63	1.06	0.374	0.88	1.32	1.999	1.13	0.63	1.31	0.38	1.00	1.63	2.75
3.25	1 (Std.)	1.375	1-14	1.63	1.06	0.374	0.88	1.32	1.999	1.13	0.75	1.31	0.25	0.88	1.63	2.75
	2	2.000	1 1/2-12	2.25	1.69	0.624	1.38	1.95	2.624	1.69	0.75	1.94	0.38	1.25	2.00	3.75
	3	1.750	1 1/4-12	2.00	1.31	0.499	1.13	1.70	2.374	1.50	0.75	1.69	0.38	1.13	1.88	3.13
4.00	1 (Std.)	1.750	1 1/4-12	2.00	1.31	0.499	1.13	1.70	2.374	1.50	0.88	1.69	0.25	1.00	1.88	3.13
	2	2.500	1 7/8-12	3.00	1.94	0.749	1.75	2.45	3.124	2.06	0.88	2.38	0.38	1.38	2.25	4.50
	3	2.000	1 1/2-12	2.25	1.69	0.624	1.38	1.95	2.624	1.69	0.88	1.94	0.25	1.13	2.00	3.75
5.00	1 (Std.)	2.000	1 1/2-12	2.25	1.69	0.624	1.38	1.95	2.624	1.69	0.88	1.94	0.25	1.13	2.00	3.75
	2	3.500	2 1/2-12	3.50	2.69	0.999	2.50	3.45	4.249	3.00	0.88	3.38	0.38	1.38	2.25	5.63
	3	2.500	1 7/8-12	3.00	1.94	0.749	1.75	2.45	3.124	2.06	0.88	2.38	0.38	1.38	2.25	4.50
	4	3.000	2 1/4-12	3.50	2.44	0.874	2.25	2.95	3.749	2.63	0.88	2.88	0.38	1.38	2.25	4.88
6.00	1 (Std.)	2.500	1 7/8-12	3.00	1.94	0.749	1.75	2.45	3.124	2.06	1.00	2.38	0.25	1.25	2.25	4.50
	2	4.000	3-12	4.00	2.69	0.999	3.00	3.95	4.749	3.38	1.00	3.88	0.25	1.25	2.25	5.75
	3	3.000	2 1/4-12	3.50	2.44	0.874	2.25	2.95	3.749	2.63	1.00	2.88	0.25	1.25	2.25	4.88
	4	3.500	2 1/2-12	3.50	2.69	0.999	2.50	3.45	4.249	3.00	1.00	3.38	0.25	1.25	2.25	5.63

"Special" Thread Style 3

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

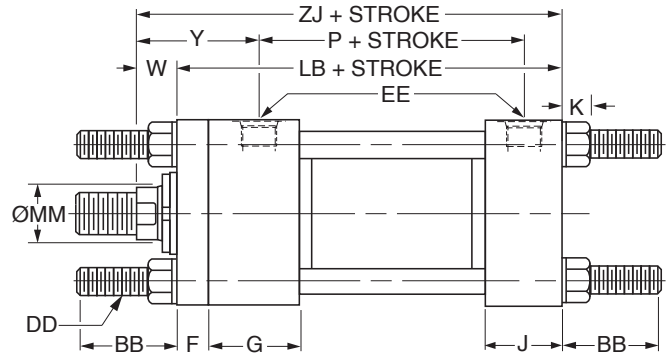
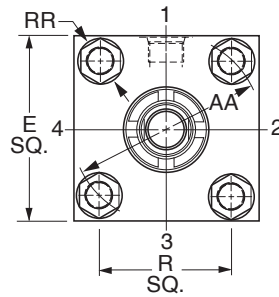
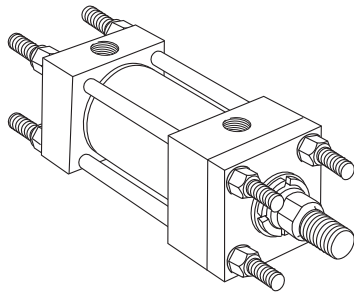
To order, specify "Style 3" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

¹ For special WG dimension, specify "Style 3" and give desired dimension for WG. For other changes, place "S" in the model code, and describe rod end with dimensioned sketch.

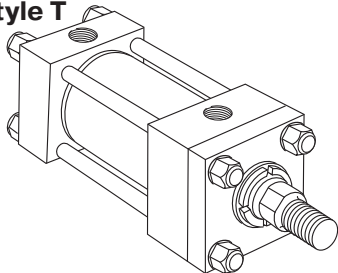
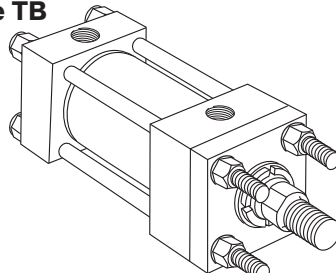
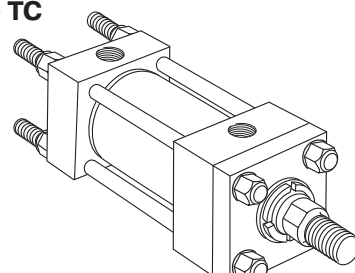
² Style 9 stroke restrictions may apply. See Style 9 Minimum Stroke Table on How to Order page for details.

⚠ PROP 65 WARNING WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



Mounting Information**Heavy Duty Hydraulic Cylinders
Series 2H 1.50" - 6.00" Bore****Tie Rods Extended Both Ends Mounting
Style TD
(NFPA Style MX1)****Style TD – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	AA	BB	DD	E	EE		F	G	J	K Max.	R	RR	W	Y	Add Stroke		
							NPTF ¹	SAE ²									LB	P	ZJ
1.50	1 (std.)	0.625	2.31	1.38	3/8-24	2.50	1/2	10	0.38	1.75	1.50	0.42	1.63	0.68	0.63	2.00	5.00	2.88	5.63
	2	1.000	2.31	1.38	3/8-24	2.50	1/2	10	0.38	1.75	1.50	0.42	1.63	0.68	1.00	2.38	5.00	2.88	6.00
2.00	1 (std.)	1.000	2.90	1.81	1/2-20	3.00	1/2	10	0.63	1.75	1.50	0.57	2.05	0.90	0.75	2.38	5.25	2.88	6.00
	2	1.375	2.90	1.81	1/2-20	3.00	1/2	10	0.63	1.75	1.50	0.57	2.05	0.90	1.00	2.63	5.25	2.88	6.25
2.50	1 (std.)	1.000	3.61	1.81	1/2-20	3.50	1/2	10	0.63	1.75	1.50	0.57	2.55	0.90	0.75	2.38	5.38	3.00	6.13
	2	1.750	3.61	1.81	1/2-20	3.50	1/2	10	0.63	1.75	1.50	0.57	2.55	0.90	1.25	2.88	5.38	3.00	6.63
	3	1.375	3.61	1.81	1/2-20	3.50	1/2	10	0.63	1.75	1.50	0.57	2.55	0.90	1.00	2.63	5.38	3.00	6.38
3.25	1 (std.)	1.375	4.60	2.31	5/8-18	4.50	3/4	12	0.75	2.00	1.75	0.68	3.25	1.11	0.88	2.75	6.25	3.50	7.13
	2	2.000	4.60	2.31	5/8-18	4.50	3/4	12	0.75	2.00	1.75	0.68	3.25	1.11	1.25	3.13	6.25	3.50	7.50
	3	1.750	4.60	2.31	5/8-18	4.50	3/4	12	0.75	2.00	1.75	0.68	3.25	1.11	1.13	3.00	6.25	3.50	7.38
4.00	1 (std.)	1.750	5.40	2.31	5/8-18	5.00	3/4	12	0.88	2.00	1.75	0.68	3.82	1.11	1.00	3.00	6.63	3.75	7.63
	2	2.500	5.40	2.31	5/8-18	5.00	3/4	12	0.88	2.00	1.75	0.68	3.82	1.11	1.38	3.38	6.63	3.75	8.00
	3	2.000	5.40	2.31	5/8-18	5.00	3/4	12	0.88	2.00	1.75	0.68	3.82	1.11	1.13	3.13	6.63	3.75	7.75
5.00	1 (std.)	2.000	7.00	3.19	7/8-14	6.50	3/4	12	0.88	2.00	1.75	0.94	4.95	1.55	1.13	3.13	7.13	4.25	8.25
	2	3.500	7.00	3.19	7/8-14	6.50	3/4	12	0.88	2.00	1.75	0.94	4.95	1.55	1.38	3.38	7.13	4.25	8.50
	3	2.500	7.00	3.19	7/8-14	6.50	3/4	12	0.88	2.00	1.75	0.94	4.95	1.55	1.38	3.38	7.13	4.25	8.50
	4	3.000	7.00	3.19	7/8-14	6.50	3/4	12	0.88	2.00	1.75	0.94	4.95	1.55	1.38	3.38	7.13	4.25	8.50
6.00	1 (std.)	2.500	8.10	3.63	1-14	7.50	1	16	1.00	2.25	2.25	1.05	5.73	1.77	1.25	3.50	8.38	4.88	9.63
	2	4.000	8.10	3.63	1-14	7.50	1	16	1.00	2.25	2.25	1.05	5.73	1.77	1.25	3.50	8.38	4.88	9.63
	3	3.000	8.10	3.63	1-14	7.50	1	16	1.00	2.25	2.25	1.05	5.73	1.77	1.25	3.50	8.38	4.88	9.63
	4	3.500	8.10	3.63	1-14	7.50	1	16	1.00	2.25	2.25	1.05	5.73	1.77	1.25	3.50	8.38	4.88	9.63

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style T****Style TB****Style TC**

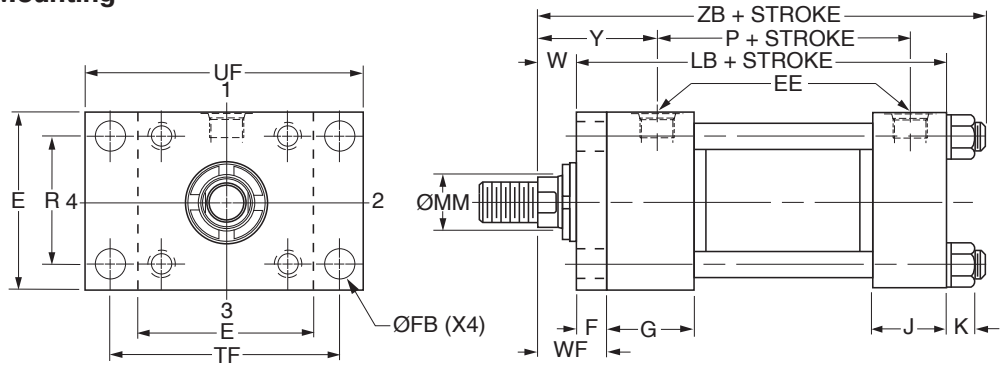
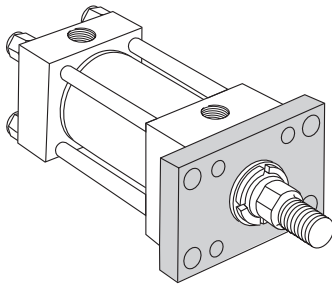
Dimensions for T, TB and TC Mount may be obtained from the above dimensional table.

⚠ PROP 65 WARNING WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Mounting Information**Heavy Duty Hydraulic Cylinders
Series 2H 1.50" - 6.00" Bore****Head Rectangular Flange Mounting**

Style J

(NFPA Style MF1)

**Style J – Dimensional and Mounting Data**

Bore Ø	E	EE		F	FB Ø	G	J	K Max.	R	TF	UF	Add Stroke	
		NPTF ¹	SAE ²									LB	P
1.50	2.50	1/2	10	0.38	0.44	1.75	1.50	0.42	1.63	3.44	4.25	5.00	2.88
2.00	3.00	1/2	10	0.63	0.56	1.75	1.50	0.57	2.05	4.13	5.13	5.25	2.88
2.50	3.50	1/2	10	0.63	0.56	1.75	1.50	0.57	2.55	4.63	5.63	5.38	3.00
3.25	4.50	3/4	12	0.75	0.69	2.00	1.75	0.68	3.25	5.88	7.13	6.25	3.50
4.00	5.00	3/4	12	0.88	0.69	2.00	1.75	0.68	3.82	6.38	7.63	6.63	3.75
5.00	6.50	3/4	12	0.88	0.94	2.00	1.75	0.94	4.95	8.19	9.75	7.13	4.25
6.00	7.50	1	16	1.00	1.06	2.25	2.25	1.05	5.73	9.44	11.25	8.38	4.88

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style J – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	W	WF	Y	Add Stroke
						ZB Max.
1.50	1 (std.)	0.625	0.63	1.00	2.00	6.29
	2	1.000	1.00	1.38	2.38	6.67
2.00	1 (std.)	1.000	0.75	1.38	2.38	6.81
	2	1.375	1.00	1.63	2.63	7.06
2.50	1 (std.)	1.000	0.75	1.38	2.38	6.93
	2	1.750	1.25	1.88	2.88	7.43
	3	1.375	1.00	1.63	2.63	7.18
3.25	1 (std.)	1.375	0.88	1.63	2.75	8.06
	2	2.000	1.25	2.00	3.13	8.43
	3	1.750	1.13	1.88	3.00	8.31
4.00	1 (std.)	1.750	1.00	1.88	3.00	8.56
	2	2.500	1.38	2.25	3.38	8.94
	3	2.000	1.13	2.00	3.13	8.68
5.00	1 (std.)	2.000	1.13	2.00	3.13	9.44
	2	3.500	1.38	2.25	3.38	9.69
	3	2.500	1.38	2.25	3.38	9.69
	4	3.000	1.38	2.25	3.38	9.69
6.00	1 (std.)	2.500	1.25	2.25	3.50	10.93
	2	4.000	1.25	2.25	3.50	10.93
	3	3.000	1.25	2.25	3.50	10.93
	4	3.500	1.25	2.25	3.50	10.93

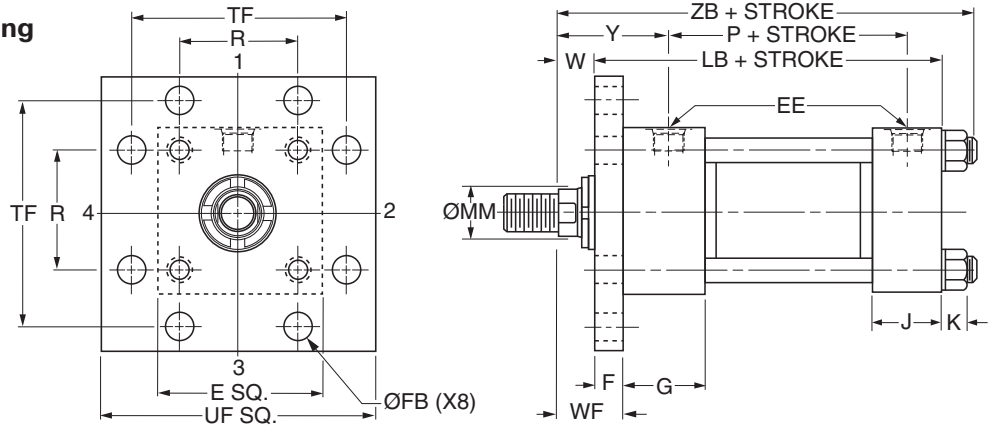
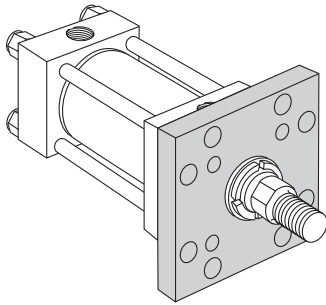
**Style J – Maximum Operating
Pressure / 2H**

Bore Ø	Maximum psi Push ³			
	Rod Code			
	1	2	3	4
1.50	1500	1000	-	-
2.00	2000	1200	-	-
2.50	2000	1100	1500	-
3.25	1800	1300	1400	-
4.00	1800	1300	1700	-
5.00	1300	800	1200	1000
6.00	1200	800	1000	900

³Maximum Pressure Rating – Push Application.

⚠ PROP 65 WARNING WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



Mounting Information**Heavy Duty Hydraulic Cylinders
Series 2H 1.50" - 6.00" Bore****Head Square Flange Mounting
Style JB
(NFPA Style MF5)****Style JB – Dimensional and Mounting Data**

Bore Ø	E	EE		F	FB Ø	G	J	K Max.	R	TF	UF	Add Stroke	
		NPTF ¹	SAE ²									LB	P
1.50	2.50	1/2	10	0.38	0.44	1.75	1.50	0.42	1.63	3.44	4.25	5.00	2.88
2.00	3.00	1/2	10	0.63	0.56	1.75	1.50	0.57	2.05	4.13	5.13	5.25	2.88
2.50	3.50	1/2	10	0.63	0.56	1.75	1.50	0.57	2.55	4.63	5.63	5.38	3.00
3.25	4.50	3/4	12	0.75	0.69	2.00	1.75	0.68	3.25	5.88	7.13	6.25	3.50
4.00	5.00	3/4	12	0.88	0.69	2.00	1.75	0.68	3.82	6.38	7.63	6.63	3.75
5.00	6.50	3/4	12	0.88	0.94	2.00	1.75	0.94	4.95	8.19	9.75	7.13	4.25
6.00	7.50	1	16	1.00	1.06	2.25	2.25	1.05	5.73	9.44	11.25	8.38	4.88

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style JB – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	W	WF	Y	Add Stroke
						ZB Max.
1.50	1 (std.)	0.625	0.63	1.00	2.00	6.29
	2	1.000	1.00	1.38	2.38	6.67
2.00	1 (std.)	1.000	0.75	1.38	2.38	6.81
	2	1.375	1.00	1.63	2.63	7.06
2.50	1 (std.)	1.000	0.75	1.38	2.38	6.93
	2	1.750	1.25	1.88	2.88	7.43
	3	1.375	1.00	1.63	2.63	7.18
3.25	1 (std.)	1.375	0.88	1.63	2.75	8.06
	2	2.000	1.25	2.00	3.13	8.43
	3	1.750	1.13	1.88	3.00	8.31
4.00	1 (std.)	1.750	1.00	1.88	3.00	8.56
	2	2.500	1.38	2.25	3.38	8.94
	3	2.000	1.13	2.00	3.13	8.68
5.00	1 (std.)	2.000	1.13	2.00	3.13	9.44
	2	3.500	1.38	2.25	3.38	9.69
	3	2.500	1.38	2.25	3.38	9.69
	4	3.000	1.38	2.25	3.38	9.69
6.00	1 (std.)	2.500	1.25	2.25	3.50	10.93
	2	4.000	1.25	2.25	3.50	10.93
	3	3.000	1.25	2.25	3.50	10.93
	4	3.500	1.25	2.25	3.50	10.93

**Style JB – Maximum Operating
Pressure / 2H**

Bore Ø	Maximum psi Push ³			
	Rod Code			
	1	2	3	4
1.50	3000	3000	-	-
2.00	3000	3000	-	-
2.50	3000	3000	3000	-
3.25	3000	3000	3000	-
4.00	3000	3000	3000	-
5.00	3000	3000	3000	3000
6.00	3000	2700	3000	2700

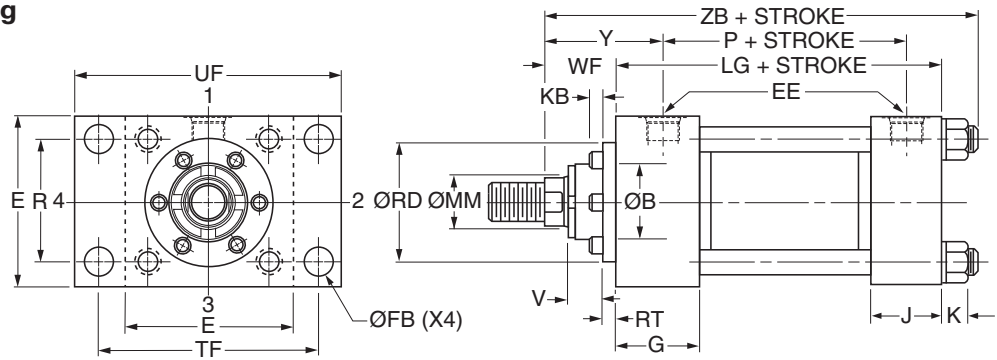
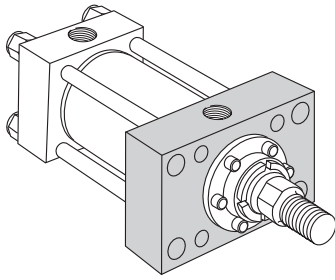
³Maximum Pressure Rating – Push Application.

⚠ PROP 65 WARNING WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Mounting Information**Heavy Duty Hydraulic Cylinders
Series 2H 1.50" - 6.00" Bore****Head Rectangular Mounting**

Style JJ

(NFPA Style ME5)

**Style JJ – Dimensional and Mounting Data**

Bore Ø	E	EE		FB Ø	G	J	K Max.	R	TF	UF	Add Stroke	
		NPTF ¹	SAE ²								LG	P
1.50	2.50	1/2	10	0.44	1.75	1.50	0.42	1.63	3.44	4.25	4.63	2.88
2.00	3.00	1/2	10	0.56	1.75	1.50	0.57	2.05	4.13	5.13	4.63	2.88
2.50	3.50	1/2	10	0.56	1.75	1.50	0.57	2.55	4.63	5.63	4.75	3.00
3.25	4.50	3/4	12	0.69	2.00	1.75	0.68	3.25	5.88	7.13	5.50	3.50
4.00	5.00	3/4	12	0.69	2.00	1.75	0.68	3.82	6.38	7.63	5.75	3.75
5.00	6.50	3/4	12	0.94	2.00	1.75	0.94	4.95	8.19	9.75	6.25	4.25
6.00	7.50	1	16	1.06	2.25	2.25	1.05	5.73	9.44	11.25	7.38	4.88

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style JJ – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	B Ø + .000 - .002	KB	RD Ø	RT	V	WF	Y	Add Stroke
										ZB Max
1.50	1 (std.)	0.625	1.124	0	1.94	0.38	0.25	1.00	2.00	6.29
	2	1.000	1.499	0	2.38	0.38	0.50	1.38	2.38	6.67
2.00	1 (std.)	1.000	1.499	0	2.38	0.38	0.50	1.38	2.38	6.81
	2	1.375	1.999	0.19	2.87	0.36	0.63	1.63	2.63	7.06
2.50	1 (std.)	1.000	1.499	0	2.38	0.38	0.50	1.38	2.38	6.93
	2	1.750	2.374	0.19	3.47	0.38	0.75	1.88	2.88	7.43
	3	1.375	1.999	0.19	2.87	0.36	0.63	1.63	2.63	7.18
3.25	1 (std.)	1.375	1.999	0.19	2.87	0.36	0.63	1.63	2.75	8.06
	2	2.000	2.624	0.13	3.72	0.63	0.50	2.00	3.13	8.43
	3	1.750	2.374	0.19	3.47	0.38	0.75	1.88	3.00	8.31
4.00	1 (std.)	1.750	2.374	0.19	3.47	0.38	0.75	1.88	3.00	8.56
	2	2.500	3.124	0.25	4.25	0.60	0.63	2.25	3.38	8.94
	3	2.000	2.624	0.13	3.72	0.63	0.50	2.00	3.13	8.68
5.00	1 (std.)	2.000	2.624	0.13	3.72	0.63	0.50	2.00	3.13	9.44
	2	3.500	4.249	0.25	5.76	0.63	0.63	2.25	3.38	9.69
	3	2.500	3.124	0.25	4.25	0.60	0.63	2.25	3.38	9.69
	4	3.000	3.749	0.22	5.26	0.63	0.63	2.25	3.38	9.69
6.00	1 (std.)	2.500	3.124	0.25	4.25	0.60	0.63	2.25	3.50	10.93
	2	4.000	4.749	0.16	6.31	0.75	0.50	2.25	3.50	10.93
	3	3.000	3.749	0.22	5.26	0.63	0.63	2.25	3.50	10.93
	4	3.500	4.249	0.25	5.76	0.63	0.63	2.25	3.50	10.93

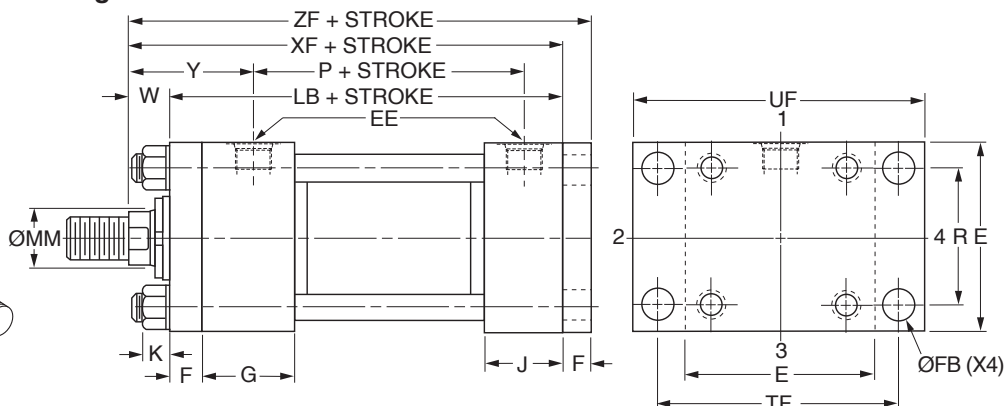
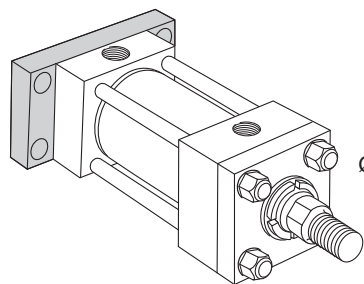
⚠ PROP 65 WARNING WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



Mounting Information**Heavy Duty Hydraulic Cylinders
Series 2H 1.50" - 6.00" Bore****Cap Rectangular Flange Mounting**

Style H

(NPTA Style MF2)

**Style H – Dimensional and Mounting Data**

Bore Ø	E	EE		F	FB Ø	G	J	K Max.	R	TF	UF	Add Stroke	
		NPTF ¹	SAE ²									LB	P
1.50	2.50	1/2	10	0.38	0.44	1.75	1.50	0.42	1.63	3.44	4.25	5.00	2.88
2.00	3.00	1/2	10	0.63	0.56	1.75	1.50	0.57	2.05	4.13	5.13	5.25	2.88
2.50	3.50	1/2	10	0.63	0.56	1.75	1.50	0.57	2.55	4.63	5.63	5.38	3.00
3.25	4.50	3/4	12	0.75	0.69	2.00	1.75	0.68	3.25	5.88	7.13	6.25	3.50
4.00	5.00	3/4	12	0.88	0.69	2.00	1.75	0.68	3.82	6.38	7.63	6.63	3.75
5.00	6.50	3/4	12	0.88	0.94	2.00	1.75	0.94	4.95	8.19	9.75	7.13	4.25
6.00	7.50	1	16	1.00	1.06	2.25	2.25	1.05	5.73	9.44	11.25	8.38	4.88

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style H – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	W	Y	Add Stroke	
					XF	ZF
1.50	1 (std.)	0.625	0.63	2.00	5.63	6.00
	2	1.000	1.00	2.38	6.00	6.38
2.00	1 (std.)	1.000	0.75	2.38	6.00	6.63
	2	1.375	1.00	2.63	6.25	6.88
2.50	1 (std.)	1.000	0.75	2.38	6.13	6.75
	2	1.750	1.25	2.88	6.63	7.25
	3	1.375	1.00	2.63	6.38	7.00
3.25	1 (std.)	1.375	0.88	2.75	7.13	7.88
	2	2.000	1.25	3.13	7.50	8.25
	3	1.750	1.13	3.00	7.38	8.13
4.00	1 (std.)	1.750	1.00	3.00	7.63	8.50
	2	2.500	1.38	3.38	8.00	8.88
	3	2.000	1.13	3.13	7.75	8.63
5.00	1 (std.)	2.000	1.13	3.13	8.25	9.13
	2	3.500	1.38	3.38	8.50	9.38
	3	2.500	1.38	3.38	8.50	9.38
	4	3.000	1.38	3.38	8.50	9.38
6.00	1 (std.)	2.500	1.25	3.50	9.63	10.63
	2	4.000	1.25	3.50	9.63	10.63
	3	3.000	1.25	3.50	9.63	10.63
	4	3.500	1.25	3.50	9.63	10.63

Style H – Maximum Operating Pressure / 2H

Bore Ø	Maximum psi Pull ³			
	Rod Code			
	1	2	3	4
1.50	2500	3000	-	-
2.00	3000	3000	-	-
2.50	3000	3000	3000	-
3.25	3000	3000	3000	-
4.00	3000	3000	3000	-
5.00	2000	3000	2000	2500
6.00	1800	2500	2000	2000

³Maximum pressure rating — pull application.

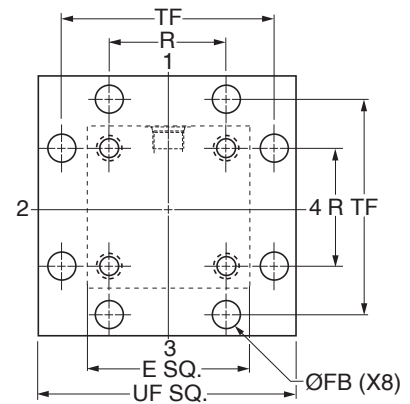
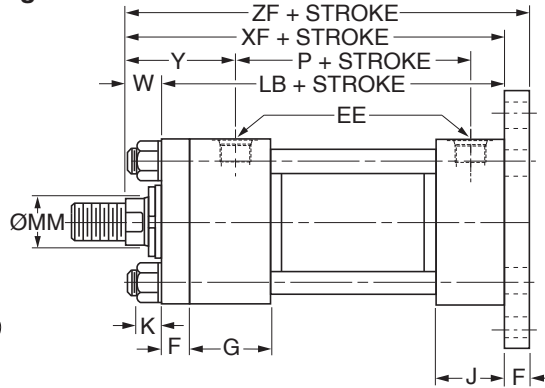
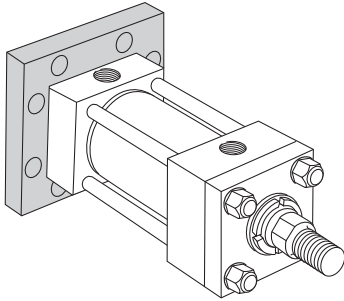
⚠ PROP 65 WARNING WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



Mounting Information**Heavy Duty Hydraulic Cylinders
Series 2H 1.50" - 6.00" Bore****Cap Square Flange Mounting**

Style HB

(NPTA Style MF6)

**Style HB – Dimensional and Mounting Data**

Bore Ø	E	EE		F	FB Ø	G	J	K Max.	R	TF	UF	Add Stroke	
		NPTF ¹	SAE ²									LB	P
1.50	2.50	1/2	10	0.38	0.44	1.75	1.50	0.42	1.63	3.44	4.25	5.00	2.88
2.00	3.00	1/2	10	0.63	0.56	1.75	1.50	0.57	2.05	4.13	5.13	5.25	2.88
2.50	3.50	1/2	10	0.63	0.56	1.75	1.50	0.57	2.55	4.63	5.63	5.38	3.00
3.25	4.50	3/4	12	0.75	0.69	2.00	1.75	0.68	3.25	5.88	7.13	6.25	3.50
4.00	5.00	3/4	12	0.88	0.69	2.00	1.75	0.68	3.82	6.38	7.63	6.63	3.75
5.00	6.50	3/4	12	0.88	0.94	2.00	1.75	0.94	4.95	8.19	9.75	7.13	4.25
6.00	7.50	1	16	1.00	1.06	2.25	2.25	1.05	5.73	9.44	11.25	8.38	4.88

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style HB – Dimensional and Mounting Data**

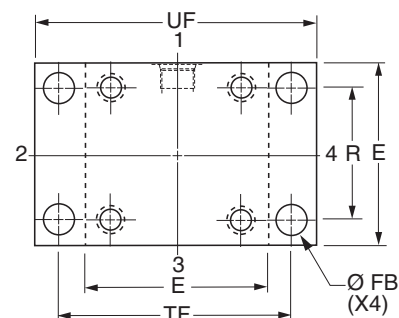
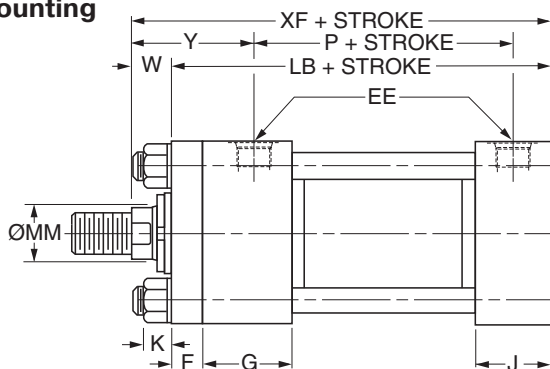
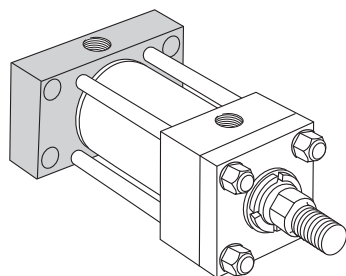
Bore Ø	Rod No.	MM Rod Ø	W	Y	Add Stroke	
					XF	ZF
1.50	1 (std.)	0.625	0.63	2.00	5.63	6.00
	2	1.000	1.00	2.38	6.00	6.38
2.00	1 (std.)	1.000	0.75	2.38	6.00	6.63
	2	1.375	1.00	2.63	6.25	6.88
2.50	1 (std.)	1.000	0.75	2.38	6.13	6.75
	2	1.750	1.25	2.88	6.63	7.25
	3	1.375	1.00	2.63	6.38	7.00
3.25	1 (std.)	1.375	0.88	2.75	7.13	7.88
	2	2.000	1.25	3.13	7.50	8.25
	3	1.750	1.13	3.00	7.38	8.13
4.00	1 (std.)	1.750	1.00	3.00	7.63	8.50
	2	2.500	1.38	3.38	8.00	8.88
	3	2.000	1.13	3.13	7.75	8.63
5.00	1 (std.)	2.000	1.13	3.13	8.25	9.13
	2	3.500	1.38	3.38	8.50	9.38
	3	2.500	1.38	3.38	8.50	9.38
	4	3.000	1.38	3.38	8.50	9.38
6.00	1 (std.)	2.500	1.25	3.50	9.63	10.63
	2	4.000	1.25	3.50	9.63	10.63
	3	3.000	1.25	3.50	9.63	10.63
	4	3.500	1.25	3.50	9.63	10.63

**WARNING:** This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Mounting Information**Heavy Duty Hydraulic Cylinders****Series 2H 1.50" - 6.00" Bore****Cap Rectangular Flange Mounting**

Style HH

(NPTA Style ME6)

**Style HH – Dimensional and Mounting Data**

Bore Ø	E	EE		F	FB Ø	G	J	K Max.	R	TF	UF	Add Stroke	
		NPTF ¹	SAE ²									LB	P
1.50	2.50	1/2	10	0.38	0.44	1.75	1.50	0.42	1.63	3.44	4.25	5.00	2.88
2.00	3.00	1/2	10	0.63	0.56	1.75	1.50	0.57	2.05	4.13	5.13	5.25	2.88
2.50	3.50	1/2	10	0.63	0.56	1.75	1.50	0.57	2.55	4.63	5.63	5.38	3.00
3.25	4.50	3/4	12	0.75	0.69	2.00	1.75	0.68	3.25	5.88	7.13	6.25	3.50
4.00	5.00	3/4	12	0.88	0.69	2.00	1.75	0.68	3.82	6.38	7.63	6.63	3.75
5.00	6.50	3/4	12	0.88	0.94	2.00	1.75	0.94	4.95	8.19	9.75	7.13	4.25
6.00	7.50	1	16	1.00	1.06	2.25	2.25	1.05	5.73	9.44	11.25	8.38	4.88

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style HH – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	W	Y	Add Stroke
					XF
1.50	1 (std.)	0.625	0.63	2.00	5.63
	2	1.000	1.00	2.38	6.00
2.00	1 (std.)	1.000	0.75	2.38	6.00
	2	1.375	1.00	2.63	6.25
2.50	1 (std.)	1.000	0.75	2.38	6.13
	2	1.750	1.25	2.88	6.63
	3	1.375	1.00	2.63	6.38
3.25	1 (std.)	1.375	0.88	2.75	7.13
	2	2.000	1.25	3.13	7.50
	3	1.750	1.13	3.00	7.38
4.00	1 (std.)	1.750	1.00	3.00	7.63
	2	2.500	1.38	3.38	8.00
	3	2.000	1.13	3.13	7.75
5.00	1 (std.)	2.000	1.13	3.13	8.25
	2	3.500	1.38	3.38	8.50
	3	2.500	1.38	3.38	8.50
	4	3.000	1.38	3.38	8.50
6.00	1 (std.)	2.500	1.25	3.50	9.63
	2	4.000	1.25	3.50	9.63
	3	3.000	1.25	3.50	9.63
	4	3.500	1.25	3.50	9.63

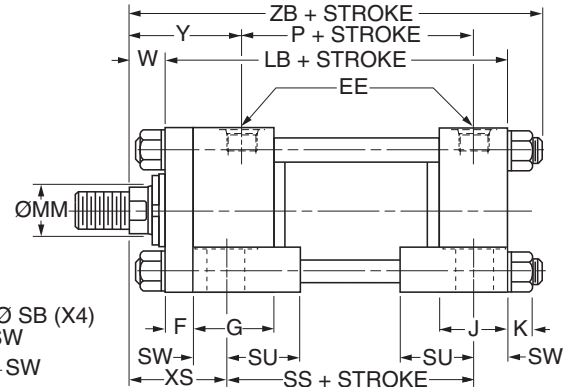
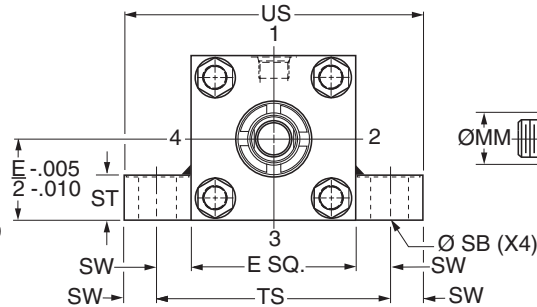
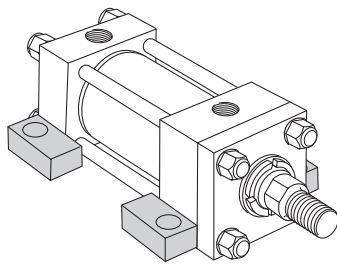
⚠ PROP 65 WARNING **WARNING:** This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



Mounting Information**Heavy Duty Hydraulic Cylinders
Series 2H 1.50" - 6.00" Bore****Side Lug Mounting**

Style C

(NFPA Style MS2)

**Style C – Dimensional and Mounting Data**

Bore Ø	E	EE		F	G	J	K Max.	SB ³ Ø	ST	SU	SW	TS	US	Add Stroke		
		NPTF ¹	SAE ²											LB	P	SS
1.50	2.50	1/2	10	0.38	1.75	1.50	0.42	0.44	0.50	0.94	0.38	3.25	4.00	5.00	2.88	3.88
2.00	3.00	1/2	10	0.63	1.75	1.50	0.57	0.56	0.75	1.25	0.50	4.00	5.00	5.25	2.88	3.63
2.50	3.50	1/2	10	0.63	1.75	1.50	0.57	0.81	1.00	1.56	0.69	4.88	6.25	5.38	3.00	3.38
3.25	4.50	3/4	12	0.75	2.00	1.75	0.68	0.81	1.00	1.56	0.69	5.88	7.25	6.25	3.50	4.13
4.00	5.00	3/4	12	0.88	2.00	1.75	0.68	1.06	1.25	2.00	0.88	6.75	8.50	6.63	3.75	4.00
5.00	6.50	3/4	12	0.88	2.00	1.75	0.94	1.06	1.25	2.00	0.88	8.25	10.00	7.13	4.25	4.50
6.00	7.50	1	16	1.00	2.25	2.25	1.05	1.31	1.50	2.50	1.13	9.75	12.00	8.38	4.88	5.13

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.³Upper surface spot faced for socket head screws.**Style C – Dimensional and Mounting Data**

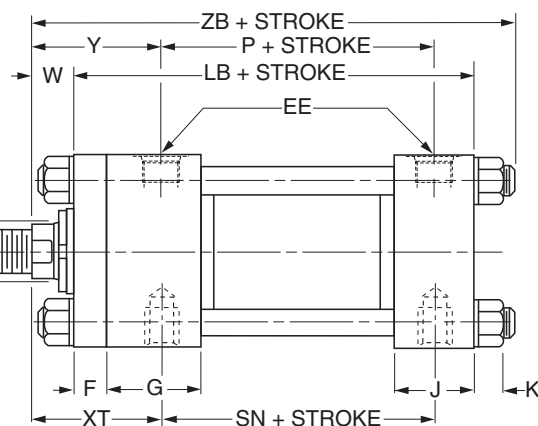
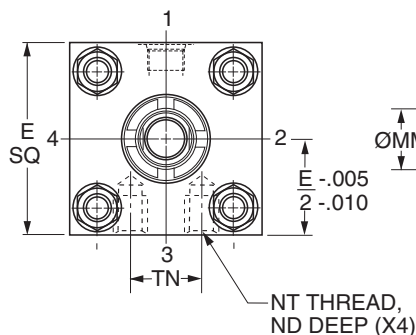
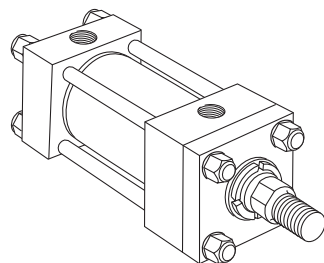
Bore Ø	Rod No.	MM Rod Ø	W	XS	Y	Add Stroke
						ZB Max.
1.50	1 (std.)	0.625	0.63	1.38	2.00	6.29
	2	1.000	1.00	1.75	2.38	6.67
2.00	1 (std.)	1.000	0.75	1.88	2.38	6.81
	2	1.375	1.00	2.13	2.63	7.06
2.50	1 (std.)	1.000	0.75	2.06	2.38	6.93
	2	1.750	1.25	2.56	2.88	7.43
	3	1.375	1.00	2.31	2.63	7.18
3.25	1 (std.)	1.375	0.88	2.31	2.75	8.06
	2	2.000	1.25	2.69	3.13	8.43
	3	1.750	1.13	2.56	3.00	8.31
4.00	1 (std.)	1.750	1.00	2.75	3.00	8.56
	2	2.500	1.38	3.13	3.38	8.94
	3	2.000	1.13	2.88	3.13	8.68
5.00	1 (std.)	2.000	1.13	2.88	3.13	9.44
	2	3.500	1.38	3.13	3.38	9.69
	3	2.500	1.38	3.13	3.38	9.69
	4	3.000	1.38	3.13	3.38	9.69
6.00	1 (std.)	2.500	1.25	3.38	3.50	10.93
	2	4.000	1.25	3.38	3.50	10.93
	3	3.000	1.25	3.38	3.50	10.93
	4	3.500	1.25	3.38	3.50	10.93

**WARNING:** This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Mounting Information**Heavy Duty Hydraulic Cylinders****Series 2H 1.50" - 6.00" Bore****Side Tapped Mounting**

Style F

(NFPA Style MS4)

**Style F – Dimensional and Mounting Data**

Bore Ø	E	EE		F	G	J	K Max.	ND	NT	TN	Add Stroke		
		NPTF ¹	SAE ²								LB	P	SN
1.50	2.50	1/2	10	0.38	1.75	1.50	0.42	0.38	3/8-16	0.75	5.00	2.88	2.88
2.00	3.00	1/2	10	0.63	1.75	1.50	0.57	0.44	1/2-13	0.94	5.25	2.88	2.88
2.50	3.50	1/2	10	0.63	1.75	1.50	0.57	0.50	5/8-11	1.31	5.38	3.00	3.00
3.25	4.50	3/4	12	0.75	2.00	1.75	0.68	0.69	3/4-10	1.50	6.25	3.50	3.50
4.00	5.00	3/4	12	0.88	2.00	1.75	0.68	0.69	1-8	2.06	6.63	3.75	3.75
5.00	6.50	3/4	12	0.88	2.00	1.75	0.94	1.00	1-8	2.94	7.13	4.25	4.25
6.00	7.50	1	16	1.00	2.25	2.25	1.05	1.25	1 1/4-7	3.31	8.38	4.88	5.13

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style F – Dimensional and Mounting Data**

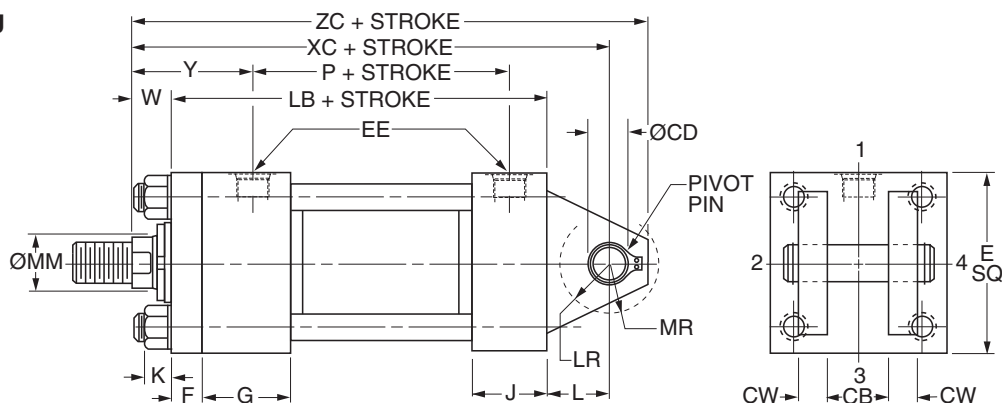
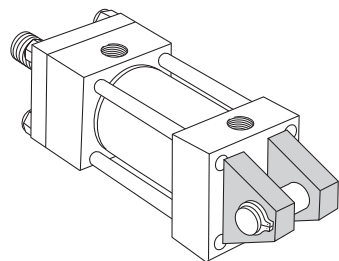
Bore Ø	Rod No.	MM Rod Ø	W	XT	Y	Add Stroke
						ZB Max.
1.50	1 (std.)	0.625	0.63	2.00	2.00	6.29
	2	1.000	1.00	2.38	2.38	6.67
2.00	1 (std.)	1.000	0.75	2.38	2.38	6.81
	2	1.375	1.00	2.63	2.63	7.06
2.50	1 (std.)	1.000	0.75	2.38	2.38	6.93
	2	1.750	1.25	2.88	2.88	7.43
	3	1.375	1.00	2.63	2.63	7.18
3.25	1 (std.)	1.375	0.88	2.75	2.75	8.06
	2	2.000	1.25	3.13	3.13	8.43
	3	1.750	1.13	3.00	3.00	8.31
4.00	1 (std.)	1.750	1.00	3.00	3.00	8.56
	2	2.500	1.38	3.38	3.38	8.94
	3	2.000	1.13	3.13	3.13	8.68
5.00	1 (std.)	2.000	1.13	3.13	3.13	9.44
	2	3.500	1.38	3.38	3.38	9.69
	3	2.500	1.38	3.38	3.38	9.69
	4	3.000	1.38	3.38	3.38	9.69
6.00	1 (std.)	2.500	1.25	3.50	3.50	10.93
	2	4.000	1.25	3.50	3.50	10.93
	3	3.000	1.25	3.50	3.50	10.93
	4	3.500	1.25	3.50	3.50	10.93

**PROP 65 WARNING** WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Mounting Information**Heavy Duty Hydraulic Cylinders
Series 2H 1.50" - 6.00" Bore****Cap Fixed Clevis Mounting**

Style BB

(NFPA Style MP1)

**Style BB – Dimensional and Mounting Data**

Bore Ø	E	EE		CB	CD ³ Ø +.000 -.002	CW	F	G	J	K Max.	L	LR	MR	Add Stroke	
		NPTF ¹	SAE ²											LB	P
1.50	2.50	1/2	10	0.75	.501	0.50	0.38	1.75	1.50	0.42	0.75	0.56	0.63	5.00	2.88
2.00	3.00	1/2	10	1.25	.751	0.63	0.63	1.75	1.50	0.57	1.25	1.00	0.94	5.25	2.88
2.50	3.50	1/2	10	1.25	.751	0.63	0.63	1.75	1.50	0.57	1.25	0.94	0.94	5.38	3.00
3.25	4.50	3/4	12	1.50	1.001	0.75	0.75	2.00	1.75	0.68	1.50	1.25	1.19	6.25	3.50
4.00	5.00	3/4	12	2.00	1.376	1.00	0.88	2.00	1.75	0.68	2.13	1.75	1.63	6.63	3.75
5.00	6.50	3/4	12	2.50	1.751	1.25	0.88	2.00	1.75	0.94	2.25	2.06	2.13	7.13	4.25
6.00	7.50	1	16	2.50	2.001	1.25	1.00	2.25	2.25	1.05	2.50	2.31	2.38	8.38	4.88

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.³Diameter CD is Pin Diameter.**Style BB – Dimensional and Mounting Data**

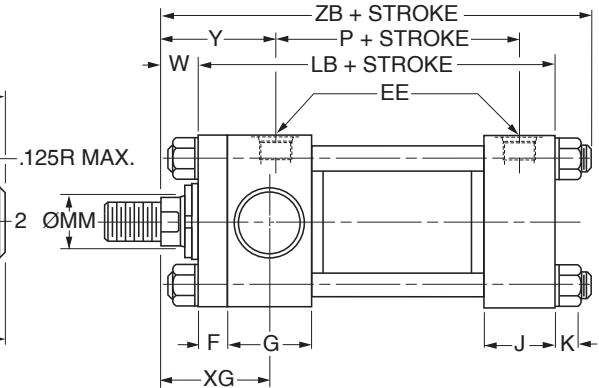
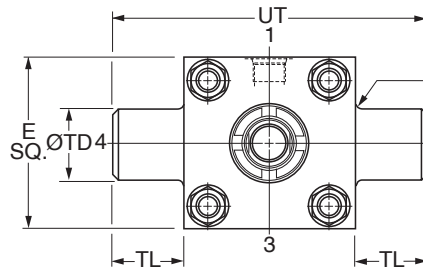
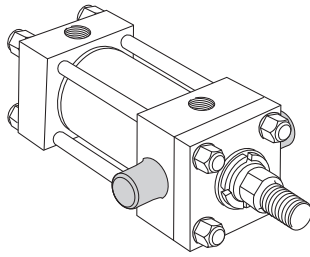
Bore Ø	Rod No.	MM Rod Ø	W	Y	Add Stroke	
					XC	ZC
1.50	1 (std.)	0.625	0.63	2.00	6.38	6.88
	2	1.000	1.00	2.38	6.75	7.25
2.00	1 (std.)	1.000	0.75	2.38	7.25	8.00
	2	1.375	1.00	2.63	7.50	8.25
2.50	1 (std.)	1.000	0.75	2.38	7.38	8.13
	2	1.750	1.25	2.88	7.88	8.63
	3	1.375	1.00	2.63	7.63	8.38
3.25	1 (std.)	1.375	0.88	2.75	8.63	9.63
	2	2.000	1.25	3.13	9.00	10.00
	3	1.750	1.13	3.00	8.88	9.88
4.00	1 (std.)	1.750	1.00	3.00	9.75	11.13
	2	2.500	1.38	3.38	10.13	11.50
	3	2.000	1.13	3.13	9.88	11.25
5.00	1 (std.)	2.000	1.13	3.13	10.50	12.25
	2	3.500	1.38	3.38	10.75	12.50
	3	2.500	1.38	3.38	10.75	12.50
	4	3.000	1.38	3.38	10.75	12.50
6.00	1 (std.)	2.500	1.25	3.50	12.13	14.13
	2	4.000	1.25	3.50	12.13	14.13
	3	3.000	1.25	3.50	12.13	14.13
	4	3.500	1.25	3.50	12.13	14.13

**PROP 65 WARNING** WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Mounting Information**Heavy Duty Hydraulic Cylinders
Series 2H 1.50" - 6.00" Bore****Head Trunnion Mounting**

Style D

(NFPA Style MT1)

**Style D – Dimensional and Mounting Data**

Bore Ø	E	EE		F	G	J	K Max.	TD Ø +.000 -.001	TL	UT	Add Stroke	
		NPTF ¹	SAE ²								LB	P
1.50	2.50	1/2	10	0.38	1.75	1.50	0.42	1.000	1.00	4.50	5.00	2.88
2.00	3.00	1/2	10	0.63	1.75	1.50	0.57	1.375	1.38	5.75	5.25	2.88
2.50	3.50	1/2	10	0.63	1.75	1.50	0.57	1.375	1.38	6.25	5.38	3.00
3.25	4.50	3/4	12	0.75	2.00	1.75	0.68	1.750	1.75	8.00	6.25	3.50
4.00	5.00	3/4	12	0.88	2.00	1.75	0.68	1.750	1.75	8.50	6.63	3.75
5.00	6.50	3/4	12	0.88	2.00	1.75	0.94	1.750	1.75	10.00	7.13	4.25
6.00	7.50	1	16	1.00	2.25	2.25	1.05	2.000	2.00	11.50	8.38	4.88

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style D – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	W	XG	Y	Add Stroke
						ZB Max.
1.50	1 (std.)	0.625	0.63	1.88	2.00	6.29
	2	1.000	1.00	2.25	2.38	6.67
2.00	1 (std.)	1.000	0.75	2.25	2.38	6.81
	2	1.375	1.00	2.50	2.63	7.06
2.50	1 (std.)	1.000	0.75	2.25	2.38	6.93
	2	1.750	1.25	2.75	2.88	7.43
	3	1.375	1.00	2.50	2.63	7.18
3.25	1 (std.)	1.375	0.88	2.63	2.75	8.06
	2	2.000	1.25	3.00	3.13	8.43
	3	1.750	1.13	2.88	3.00	8.31
4.00	1 (std.)	1.750	1.00	2.88	3.00	8.56
	2	2.500	1.38	3.25	3.38	8.94
	3	2.000	1.13	3.00	3.13	8.68
5.00	1 (std.)	2.000	1.13	3.00	3.13	9.44
	2	3.500	1.38	3.25	3.38	9.69
	3	2.500	1.38	3.25	3.38	9.69
	4	3.000	1.38	3.25	3.38	9.69
6.00	1 (std.)	2.500	1.25	3.38	3.50	10.93
	2	4.000	1.25	3.38	3.50	10.93
	3	3.000	1.25	3.38	3.50	10.93
	4	3.500	1.25	3.38	3.50	10.93

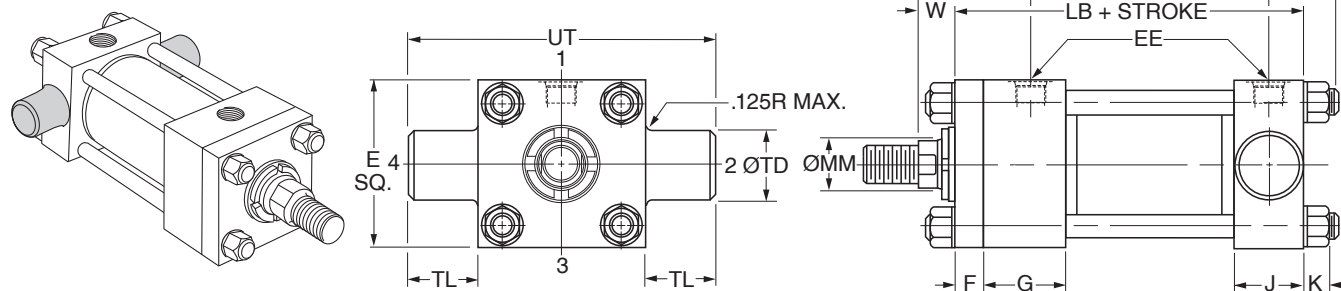
⚠ PROP 65 WARNING WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



Mounting Information**Series 2H 1.50" - 6.00" Bore****Cap Trunnion Mounting**

Style DB

(NFPA Style MT2)

**Style DB – Dimensional and Mounting Data**

Bore Ø	E	EE		F	G	J	K Max.	TD Ø +.000 -.001	TL	UT	Add Stroke	
		NPTF ¹	SAE ²								LB	P
1.50	2.50	1/2	10	0.38	1.75	1.50	0.42	1.000	1.00	4.50	5.00	2.88
2.00	3.00	1/2	10	0.63	1.75	1.50	0.57	1.375	1.38	5.75	5.25	2.88
2.50	3.50	1/2	10	0.63	1.75	1.50	0.57	1.375	1.38	6.25	5.38	3.00
3.25	4.50	3/4	12	0.75	2.00	1.75	0.68	1.750	1.75	8.00	6.25	3.50
4.00	5.00	3/4	12	0.88	2.00	1.75	0.68	1.750	1.75	8.50	6.63	3.75
5.00	6.50	3/4	12	0.88	2.00	1.75	0.94	1.750	1.75	10.00	7.13	4.25
6.00	7.50	1	16	1.00	2.25	2.25	1.05	2.000	2.00	11.50	8.38	4.88

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style DB – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	W	Y	Add Stroke	
					XJ	ZB Max.
1.50	1 (std.)	0.625	0.63	2.00	4.88	6.29
	2	1.000	1.00	2.38	5.25	6.67
2.00	1 (std.)	1.000	0.75	2.38	5.25	6.81
	2	1.375	1.00	2.63	5.50	7.06
2.50	1 (std.)	1.000	0.75	2.38	5.38	6.93
	2	1.750	1.25	2.88	5.88	7.43
	3	1.375	1.00	2.63	5.63	7.18
3.25	1 (std.)	1.375	0.88	2.75	6.25	8.06
	2	2.000	1.25	3.13	6.63	8.43
	3	1.750	1.13	3.00	6.50	8.31
4.00	1 (std.)	1.750	1.00	3.00	6.75	8.56
	2	2.500	1.38	3.38	7.13	8.94
	3	2.000	1.13	3.13	6.88	8.68
5.00	1 (std.)	2.000	1.13	3.13	7.38	9.44
	2	3.500	1.38	3.38	7.63	9.69
	3	2.500	1.38	3.38	7.63	9.69
	4	3.000	1.38	3.38	7.63	9.69
6.00	1 (std.)	2.500	1.25	3.50	8.38	10.93
	2	4.000	1.25	3.50	8.38	10.93
	3	3.000	1.25	3.50	8.38	10.93
	4	3.500	1.25	3.50	8.38	10.93

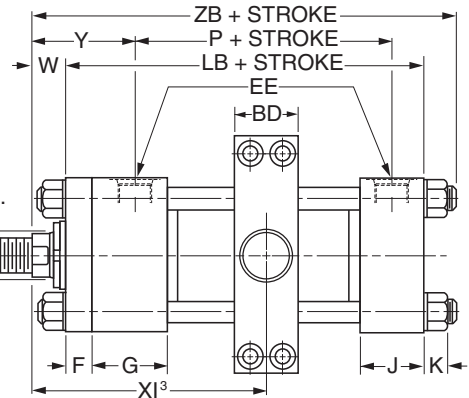
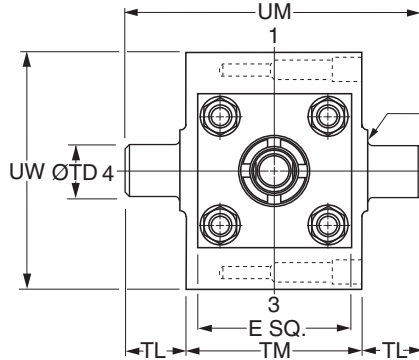
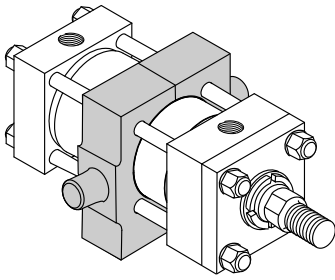
⚠ PROP 65 WARNING WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



Mounting Information**Heavy Duty Hydraulic Cylinders
Series 2H 1.50" - 6.00" Bore****Intermediate Fixed Trunnion Mounting**

Style DD

(NFPA Style MT4)

**Style DD – Dimensional and Mounting Data**

Bore Ø	BD	E	EE		F	G	J	K Max.	TD Ø +0.000 -0.001	TL	TM	UM	UW	Add Stroke	
			NPTF ¹	SAE ²										LB	P
1.50	1.25	2.50	1/2	10	0.38	1.75	1.50	0.42	1.000	1.00	3.00	5.00	3.38	5.00	2.88
2.00	1.50	3.00	1/2	10	0.63	1.75	1.50	0.57	1.375	1.38	3.50	6.25	4.13	5.25	2.88
2.50	1.50	3.50	1/2	10	0.63	1.75	1.50	0.57	1.375	1.38	4.00	6.75	4.63	5.38	3.00
3.25	2.00	4.50	3/4	12	0.75	2.00	1.75	0.68	1.750	1.75	5.00	8.50	5.81	6.25	3.50
4.00	2.00	5.00	3/4	12	0.88	2.00	1.75	0.68	1.750	1.75	5.50	9.00	6.38	6.63	3.75
5.00	2.00	6.50	3/4	12	0.88	2.00	1.75	0.94	1.750	1.75	7.00	10.50	7.75	7.13	4.25
6.00	3.00	7.50	1	16	1.00	2.25	2.25	1.05	2.000	2.00	8.50	12.50	10.38	8.38	4.88

Style DD – Dimensional and Mounting Data

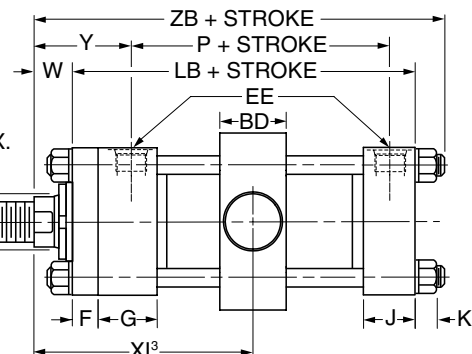
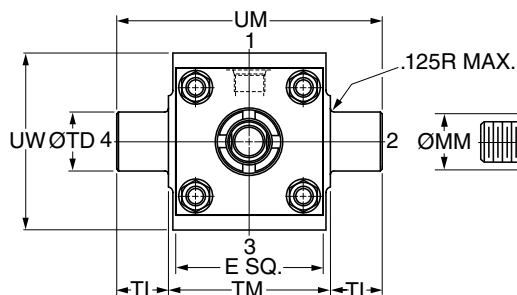
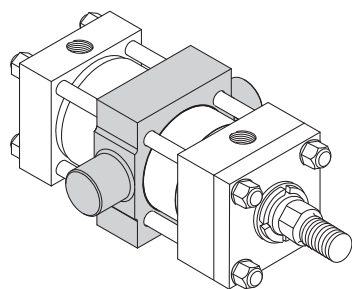
Bore Ø	Rod No.	MM Rod Ø	W	Y	Minimum XI ³		Style DD Min. Stroke	Add Stroke		
					Styles 4, 8 & 9	Style 55		Maximum XI ⁴		ZB Max
								Styles 4, 8 & 9	Style 55	
1.50	1 (std.)	0.625	0.63	2.00	3.44	4.19	0	3.44	4.19	6.29
	2	1.000	1.00	2.38	3.81	4.81	0	3.81	4.81	6.67
2.00	1 (std.)	1.000	0.75	2.38	3.94	4.94	0.25	3.69	4.69	6.81
	2	1.375	1.00	2.63	4.19	5.31	0.25	3.94	5.06	7.06
2.50	1 (std.)	1.000	0.75	2.38	3.94	4.94	0.13	3.81	4.81	6.93
	2	1.750	1.25	2.88	4.44	5.69	0.13	4.31	5.56	7.43
	3	1.375	1.00	2.63	4.19	5.31	0.13	4.06	5.19	7.18
3.25	1 (std.)	1.375	0.88	2.75	4.69	5.81	0.38	4.31	5.44	8.06
	2	2.000	1.25	3.13	5.06	6.81	0.38	4.69	6.44	8.43
	3	1.750	1.13	3.00	4.94	6.19	0.38	4.56	5.81	8.31
4.00	1 (std.)	1.750	1.00	3.00	4.94	6.19	0.13	4.81	6.06	8.56
	2	2.500	1.38	3.38	5.31	7.56	0.13	5.19	7.44	8.94
	3	2.000	1.13	3.13	5.06	6.81	0.13	4.94	6.69	8.68
5.00	1 (std.)	2.000	1.13	3.13	5.06	6.81	0	5.44	7.19	9.44
	2	3.500	1.38	3.38	5.31	8.69	0	5.69	9.06	9.69
	3	2.500	1.38	3.38	5.31	7.56	0	5.69	7.94	9.69
	4	3.000	1.38	3.38	5.31	7.94	0	5.69	8.31	9.69
6.00	1 (std.)	2.500	1.25	3.50	6.06	8.31	0.25	5.81	8.06	10.93
	2	4.000	1.25	3.50	6.06	9.56	0.25	5.81	9.31	10.93
	3	3.000	1.25	3.50	6.06	8.69	0.25	5.81	8.44	10.93
	4	3.500	1.25	3.50	6.06	9.44	0.25	5.81	9.19	10.93

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.³Dimension XI to be specified by customer. Reference point for rod end Style 55 is end of piston rod.⁴Dimensions shown are valid for standard W and WG dimension.**WARNING:** This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Heavy Duty Intermediate Fixed Trunnion Mounting

Style DE

(NFPA Style MT4)

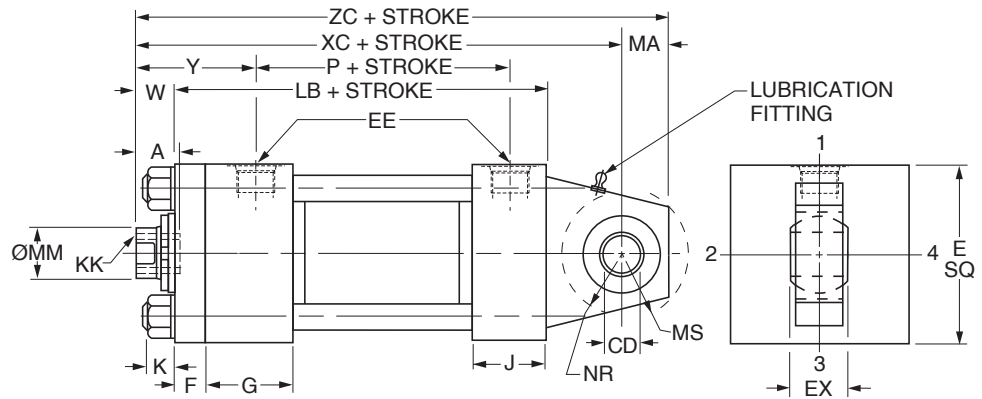
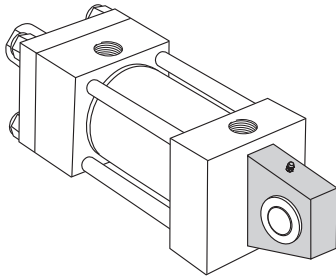
**Style DE – Dimensional and Mounting Data**

Bore Ø	BD	E	EE		F	G	J	K Max.	TD Ø +.000 -.001	TL	TM	UM	UW	Add Stroke	
			NPTF ¹	SAE ²										LB	P
4.00	2.25	5.00	3/4	12	0.88	2.00	1.75	0.68	2.000	1.75	5.50	9.00	6.00	6.63	3.75
5.00	2.75	6.50	3/4	12	0.88	2.00	1.75	0.94	2.500	1.75	7.00	10.50	7.50	7.13	4.25
6.00	3.25	7.50	1	16	1.00	2.25	2.25	1.05	3.000	2.00	8.50	12.50	9.50	8.38	4.88

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style DE – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	W	Y	Minimum XI ³		Style DE Minimum Stroke	Add Stroke		
					Styles 4, 8 & 9	Style 55		Maximum XI ⁴		ZB Max
								Styles 4, 8 & 9	Style 55	
4.00	1 (std.)	1.750	1.00	3.00	5.06	6.31	0.38	4.69	5.94	8.56
	2	2.500	1.38	3.38	5.44	7.69	0.38	5.06	7.31	8.94
	3	2.000	1.13	3.13	5.19	6.94	0.38	4.81	6.56	8.68
5.00	1 (std.)	2.000	1.13	3.13	5.44	7.19	0.38	5.06	6.81	9.44
	2	3.500	1.38	3.38	5.69	9.06	0.38	5.31	8.69	9.69
	3	2.500	1.38	3.38	5.69	7.94	0.38	5.31	7.56	9.69
	4	3.000	1.38	3.38	5.69	8.31	0.38	5.31	7.94	9.69
6.00	1 (std.)	2.500	1.25	3.50	6.19	8.44	0.50	5.69	7.94	10.93
	2	4.000	1.25	3.50	6.19	9.69	0.50	5.69	9.19	10.93
	3	3.000	1.25	3.50	6.19	8.81	0.50	5.69	8.31	10.93
	4	3.500	1.25	3.50	6.19	9.56	0.50	5.69	9.06	10.93

³Dimension XI to be specified by customer. Reference point for rod end Style 55 is end of piston rod.⁴Dimensions shown are valid for standard W and WG dimension.**WARNING:** This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Mounting Information**Heavy Duty Hydraulic Cylinders
Series 2H 1.50" - 6.00" Bore****Spherical Bearing Mounting
Style SB****Style SB – Dimensional and Mounting Data**

Bore Ø	A	CD ¹ Ø +0.0000 -0.0005	E	EE		EX	F	G	J	K Max.	MA	MS	NR	Add Stroke		Maximum Operating psi ²
				NPTF	SAE									LB	P	
1.50	0.75	0.5000	2.50	1/2	10	0.44	0.38	1.75	1.50	0.42	0.75	0.94	0.63	5.00	2.88	1500
2.00	1.13	0.7500	3.00	1/2	10	0.66	0.63	1.75	1.50	0.57	1.00	1.38	1.00	5.25	2.88	2200
2.50	1.13	0.7500	3.50	1/2	10	0.66	0.63	1.75	1.50	0.57	1.00	1.38	1.00	5.38	3.00	1450
3.25	1.63	1.0000	4.50	3/4	12	0.88	0.75	2.00	1.75	0.68	1.25	1.69	1.25	6.25	3.50	1500
4.00	2.00	1.3750	5.00	3/4	12	1.19	0.88	2.00	1.75	0.68	1.88	2.44	1.63	6.63	3.75	1850
5.00	2.25	1.7500	6.50	3/4	12	1.53	0.88	2.00	1.75	0.94	2.50	2.88	2.06	7.13	4.25	2000
6.00	3.00	2.0000	7.50	1	16	1.75	1.00	2.25	2.25	1.05 ³	2.50	3.31	2.38	8.38	4.88	1800

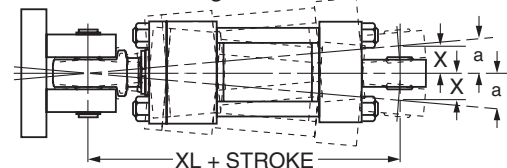
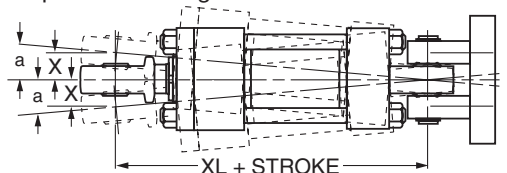
¹ Diameter CD is hole diameter.² Maximum operating pressure at 4:1 design factor is based on tensile strength of material. Pressure ratings are based on standard bearing ratings.³ 6.00" bore is constructed with tie rod nuts on both ends.**Style SB – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	Thread		W	Y	Add Stroke		
			Style 9 KK ⁴	Style 7 KK ⁴			XC	XL	ZC
1.50	1 (std.)	0.625	7/16-20	—	0.63	2.00	6.38	7.25	7.13
	2	1.000	—	7/16-20	1.00	2.38	6.75	7.63	7.50
2.00	1 (std.)	1.000	3/4-16	—	0.75	2.38	7.25	8.50	8.25
	2	1.375	—	3/4-16	1.00	2.63	7.50	8.75	8.50
2.50	1 (std.)	1.000	3/4-16	—	0.75	2.38	7.38	8.63	8.38
	2	1.750	—	3/4-16	1.25	2.88	7.88	9.13	8.88
	3	1.375	—	3/4-16	1.00	2.63	7.63	8.88	8.63
3.25	1 (std.)	1.375	1-14	—	0.88	2.75	8.63	10.50	9.88
	2	2.000	—	1-14	1.25	3.13	9.00	10.88	10.25
	3	1.750	—	1-14	1.13	3.00	8.88	10.75	10.13
4.00	1 (std.)	1.750	1 1/4-12	—	1.00	3.00	9.75	11.88	11.63
	2	2.500	—	1 1/4-12	1.38	3.38	10.13	12.25	12.00
	3	2.000	—	1 1/4-12	1.13	3.13	9.88	12.00	11.75
5.00	1 (std.)	2.000	1 1/2-12	—	1.13	3.13	10.50	13.00	13.00
	2	3.500	—	1 1/2-12	1.38	3.38	10.75	13.25	13.25
	3	2.500	—	1 1/2-12	1.38	3.38	10.75	13.25	13.25
6.00	1 (std.)	2.500	1 7/8-12	—	1.25	3.50	12.13	14.88	14.63
	2	4.000	—	1 7/8-12	1.25	3.50	12.13	14.88	14.63
	3	3.000	—	1 7/8-12	1.25	3.50	12.13	14.88	14.63
	4	3.500	—	1 7/8-12	1.25	3.50	12.13	14.88	14.63

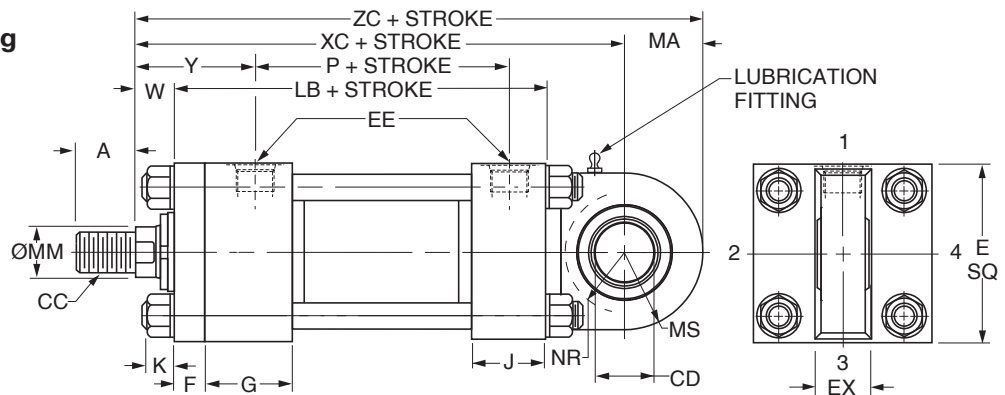
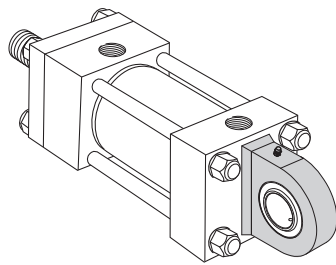
⁴ Style 9 and Style 7 threads listed are for a spherical rod eye (sold separately) with pin diameter that matches the cap pin.**Style SB – Recommended maximum swivel
angle on each side of the cylinder centerline.**

Bore Ø	Head End Mounted		Cap End Mounted	
	Angle a	Tan. of a	Angle a	Tan. of a
1.50	2.00°	.035	2.00°	.035
2.00	2.50°	.044	4.50°	.079
2.50	2.50°	.044	4.50°	.079
3.25	3.00°	.052	3.00°	.052
4.00	2.50°	.044	3.00°	.052
5.00	3.00°	.052	3.00°	.052
6.00	3.00°	.052	3.00°	.052

Note: Dimension X is the maximum off center mounting of the cylinder. To determine dimension X for various stroke lengths multiply the distance between pivot pin holes by tangent of angle a. For extended position use X = XL + 2X stroke.

Mounting Information**Head End Mounting****Cap End Mounting**

⚠ PROP 65 WARNING WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Mounting Information**Heavy Duty Hydraulic Cylinders
Series 2H 1.50" - 6.00" Bore****Spherical Bearing Mounting
Style SE****Style SE – Dimensional and Mounting Data**

Bore Ø	A	CD ¹ Ø	E	EE		EX	F	G	J	K Max.	MA	MS	NR	Add Stroke	
				NPTF	SAE									LB	P
1.50	0.75	0.7500 ^{-0.0005}	2.50	1/2	10	0.66	0.38	1.75	1.50	0.42	1.00	1.00	0.75	5.00	2.88
2.00	1.13	1.0000 ^{-0.0005}	3.00	1/2	10	0.88	0.63	1.75	1.50	0.57	1.25	1.25	1.00	5.25	2.88
2.50	1.13	1.2500 ^{-0.0005}	3.50	1/2	10	1.09	0.63	1.75	1.50	0.57	1.50	1.50	1.31	5.38	3.00
3.25	1.63	1.5000 ^{-0.0005}	4.50	3/4	12	1.31	0.75	2.00	1.75	0.68	2.00	2.00	1.75	6.25	3.50
4.00	2.00	2.0000 ^{-0.0005}	5.00	3/4	12	1.75	0.88	2.00	1.75	0.68	2.25	2.25	2.13	6.63	3.75
5.00	2.25	2.5000 ^{-0.0006}	6.50	3/4	12	2.19	0.88	2.00	1.75	0.94	3.00	3.00	2.75	7.13	4.25
6.00	3.00	3.0000 ^{-0.0006}	7.50	1	16	2.63	1.00	2.25	2.25	1.05	3.50	3.50	3.13	8.38	4.88

¹ Diameter CD is hole diameter. ² Maximum operating pressure at 4:1 design factor is based on tensile strength of material.

Pressure ratings are based on standard bearing ratings.

Style SE – Dimensional and Mounting Data

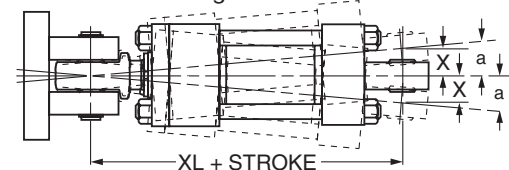
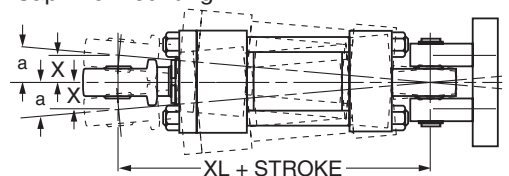
Bore Ø	Rod No.	MM Rod Ø	Thread Style 8 CC ³	A	W	Y	Add Stroke		
							XC	XL	ZC
1.50	1 (std.)	0.625	1/2-20	0.75	0.63	2.00	6.88	9.01	7.88
	2	1.000	³	³	1.00	2.38	7.25	9.38	8.25
2.00	1 (std.)	1.000	7/8-14	1.13	0.75	2.38	7.56	10.56	8.81
	2	1.375	³	³	1.00	2.63	7.81	10.81	9.06
2.50	1 (std.)	1.000	7/8-14	1.13	0.75	2.38	7.75	10.75	9.25
	2	1.750	³	³	1.25	2.88	8.25	11.25	9.75
	3	1.375	³	³	1.00	2.63	8.00	11.00	9.50
3.25	1 (std.)	1.375	1 1/4-12	1.63	0.88	2.75	9.25	13.38	11.25
	2	2.000	³	³	1.25	3.13	9.63	13.75	11.63
	3	1.750	³	³	1.13	3.00	9.50	13.63	11.50
4.00	1 (std.)	1.750	1 1/2-12	2.00	1.00	3.00	10.13	15.13	12.38
	2	2.500	³	³	1.38	3.38	10.50	15.50	12.75
	3	2.000	³	³	1.13	3.13	10.25	15.25	12.50
5.00	1 (std.)	2.000	1 3/4-12	2.25	1.13	3.13	11.50	17.25	14.50
	2	3.500	³	³	1.38	3.38	11.75	17.50	14.75
	3	2.500	³	³	1.38	3.38	11.75	17.50	14.75
6.00	1 (std.)	2.500	2 1/4-12	3.00	1.25	3.50	13.38	20.38	16.88
	2	4.000	³	³	1.25	3.50	13.38	20.38	16.88
	3	3.000	³	³	1.25	3.50	13.38	20.38	16.88
	4	3.500	³	³	1.25	3.50	13.38	20.38	16.88

³To match pin diameter in rod eye and cap, when an oversize rod is required, specify rod end style '3', 'CC' thread and 'A' thread length for the standard rod diameter (Rod No. 1 for the bore), and 'W' for the oversize rod. Order the rod eye and clevis bracket for the required bore size from the tables on the Style SE Spherical Bearing Accessories page.

**Style SE – Recommended maximum swivel
angle on each side of the cylinder centerline.**

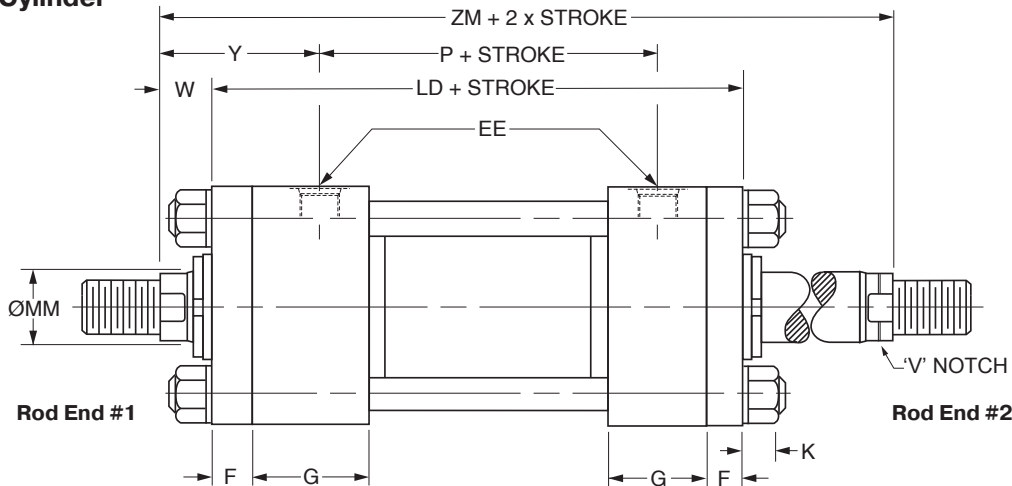
Bore Ø	Head End Mounted		Cap End Mounted	
	Angle a	Tan. of a	Angle a	Tan. of a
1.50	2.50°	0.044	3.00°	0.052
2.00	3.00°	0.052	3.00°	0.052
2.50	3.00°	0.052	3.00°	0.052
3.25	3.00°	0.052	2.75°	0.048
4.00	3.00°	0.052	3.00°	0.052
5.00	3.00°	0.052	3.00°	0.052
6.00	3.00°	0.052	3.00°	0.052

Note: Dimension X is the maximum off center mounting of the cylinder. To determine dimension X for various stroke lengths multiply the distance between pivot pin holes by tangent of angle a. For extended position use $X = XL + 2X \text{ stroke}$.

Mounting Information**Head End Mounting****Cap End Mounting**

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Double Rod Cylinder
Style K



Double Rod End Mounting Styles

See Mounting Groups page in Section H for guidance on double rod end cylinder mounting style selection.

Mounting Styles for Single Rod Models	Mounting Styles for Corresponding Double Rod Models ¹		Dimensions Shown on This Page Supplement Dimensions on 1.50" - 6.00" Bore Pages Listed Below
	Load Connected To Rod On Cylinder Mounting End	Load Connected To Rod Opposite Cylinder Mounting End	
T	KT	KT	14
TB	KTB	KTC	14
TD	KTD	KTD	14
J	KJ	KH	15
JB	KJB	KHB	16
JJ	KJJ	KHH	17
C	KC	KC	21
F	KF	KF	22
D	KD	KDB	24
DD	KDD ²	KDD ²	26
DE	KDE ²	KDE ²	27

¹ Connect load to piston rod without "V" notch. If only one end of the Double Rod Cylinder is to be cushioned, be sure to clearly specify which end this will be.

² Specify XI dimension for Styles DD & DE from #1 rod end (without "V" notch).

How to Use Double Rod Cylinder Dimension Drawings

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. (See table above.) After selecting necessary dimensions from that drawing, return to this page supplement the single rod dimensions with those shown on drawing at right and dimension table below. Note that double rod cylinders have a head (Dim. G) at both ends and that dimension LD replaces LB. The double rod dimensions differ from, or are in addition to those for single

Bore Ø	Rod No.	MM Rod Ø	Add Stroke			Add 2X Stroke
			LD	SNK	SSK	
1.50	1 (std.)	0.625	5.63	2.88	4.13	6.88
	2	1.000	5.63	2.88	4.13	7.63
2.00	1 (std.)	1.000	6.13	2.88	3.88	7.63
	2	1.375	6.13	2.88	3.88	8.13
2.50	1 (std.)	1.000	6.25	3.00	3.63	7.75
	2	1.750	6.25	3.00	3.63	8.75
	3	1.375	6.25	3.00	3.63	8.25
3.25	1 (std.)	1.375	7.25	3.50	4.38	9.00
	2	2.000	7.25	3.50	4.38	9.75
	3	1.750	7.25	3.50	4.38	9.50
4.00	1 (std.)	1.750	7.75	3.75	4.25	9.75
	2	2.500	7.75	3.75	4.25	10.50
	3	2.000	7.75	3.75	4.25	10.00
5.00	1 (std.)	2.000	8.25	4.25	4.75	10.50
	2	3.500	8.25	4.25	4.75	11.00
	3	2.500	8.25	4.25	4.75	11.00
	4	3.000	8.25	4.25	4.75	11.00
6.00	1 (std.)	2.500	9.38	4.88	5.13	11.88
	2	4.000	9.38	4.88	5.13	11.88
	3	3.000	9.38	4.88	5.13	11.88
	4	3.500	9.38	4.88	5.13	11.88
Replaces On single rod mounting styles:			LB	SN	SS	—
			All Mtg. Styles	F	C	All Mtg. Styles

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 pos. 2, 3 or 4 when viewed from rod end #1 only. See port position information in Section H.

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Notes

B
Series 2H 1.50" - 6.00" Bore

 **PROP 65 WARNING** **WARNING:** This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



Standard Specifications

- Heavy Duty Service — ANSI/(NFPA) T3.6.7R3 - 2009 Specifications and Mounting Dimension Standards
- Standard Construction — Square Head – Tie Rod Design
- Nominal Pressure — 3000 psi¹
- Standard Fluid — Hydraulic Oil
- Standard Temperature — -10°F to +165°F²
- Piston Rod Diameter — 3.000" through 5.500"

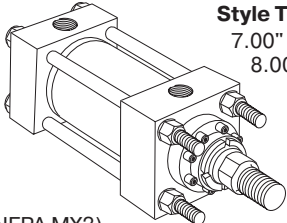
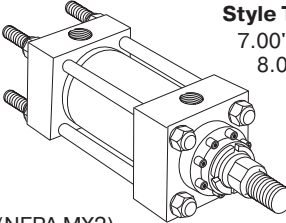
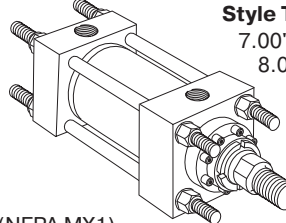
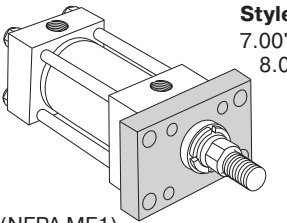
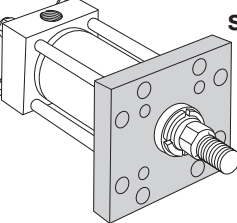
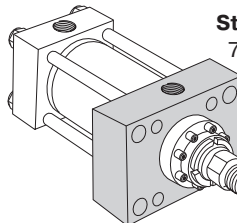
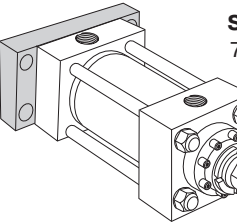
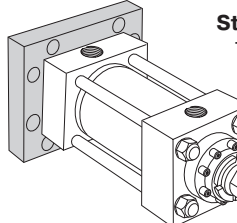
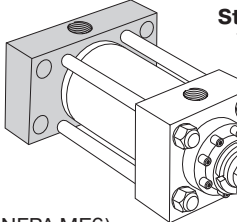
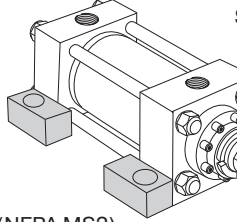
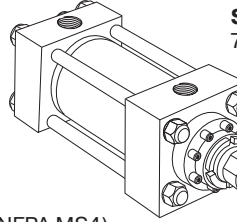
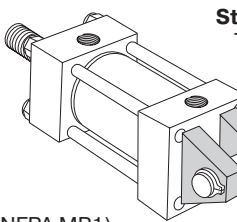
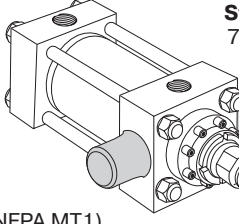
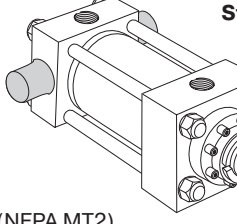
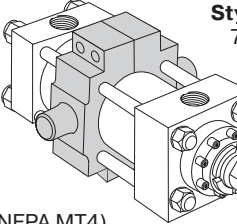
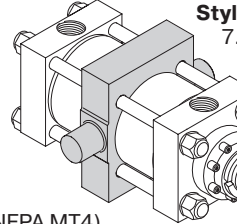
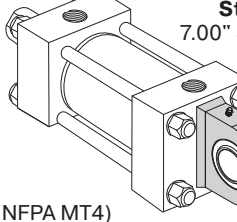
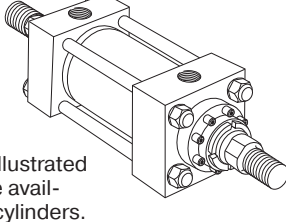
In line with our policy of continuing product improvement, specifications in this catalog are subject to change.

- Mounting Styles — 17 standard styles at various application ratings
- Strokes — Available in any practical stroke length
- Cushions — Optional at either end or both ends of stroke
- Rod Ends — Four Standard Choices — specials to order

¹ If hydraulic operating pressure exceeds 3000 psi, send application data for engineering evaluation and recommendation. See Section H for actual design factors.

² See Section H for higher temperature service.

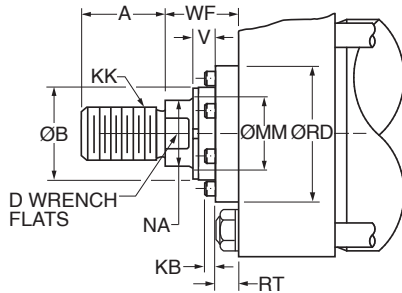
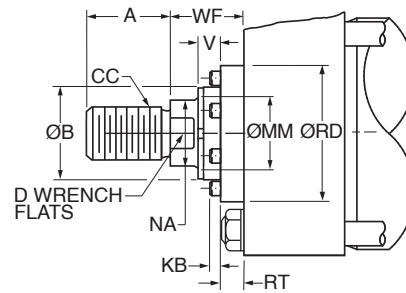
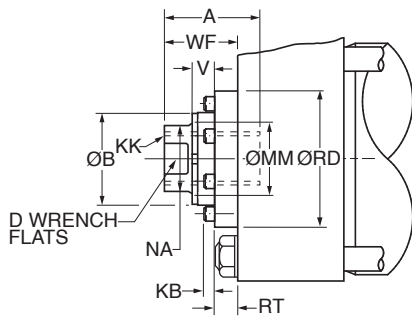
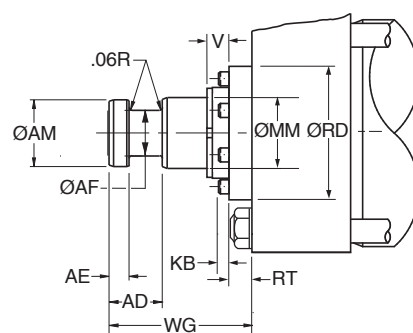
Available Mounting Styles

 Style TB 7.00" & 8.00" (NFPA MX3)	 Style TC 7.00" & 8.00" (NFPA MX2)	 Style TD 7.00" & 8.00" (NFPA MX1)	 Style J 7.00" & 8.00" (NFPA MF1)
 Style JB 7.00" & 8.00" (NFPA MF5)	 Style JJ 7.00" & 8.00" (NFPA ME5)	 Style H 7.00" & 8.00" (NFPA MF2)	 Style HB 7.00" & 8.00" (NFPA MF6)
 Style HH 7.00" & 8.00" (NFPA ME6)	 Style C 7.00" & 8.00" (NFPA MS2)	 Style F 7.00" & 8.00" (NFPA MS4)	 Style BB 7.00" & 8.00" (NFPA MP1)
 Style D 7.00" & 8.00" (NFPA MT1)	 Style DB 7.00" & 8.00" (NFPA MT2)	 Style DD 7.00" & 8.00" (NFPA MT4)	 Style DE¹ 7.00" & 8.00" (NFPA MT4)
 Style SE 7.00" & 8.00" (NFPA MT4)	Double Rod Cylinders Style KT Shown  Most of the above illustrated mounting styles are available in double rod cylinders.		

¹Style DE Mount conforms to NFPA MT4 dimensional standard.
NOTE: Series 3H Hydraulic Cylinders fully meet ANSI/(NFPA) T3.6.7R3-2009 Specifications and Mounting Dimension Standards for Square Head Industrial Fluidpower Cylinders.



WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Rod End Dimensions – 7.00" & 8.00" Bore**Thread Style 4 (NFPA Style SM)
Small Male****Thread Style 8 (NFPA Style IM)
Intermediate Male****Thread Style 9² (NFPA Style SF)
Small Female****Thread Style 55¹****Rod End Dimensions – 7.00" & 8.00" Bore**

Bore Ø	Rod No.	MM Rod Ø	Thread		Rod Extensions and Pilot Dimensions								
			Style 8 CC	Style 4 & 9 KK	A	B Ø +.000 -.002	D	KB	NA	V	RD Ø	RT	WF
7.00	1 (std.)	3.000	2 3/4-12	2 1/4-12	3.50	3.749	2.63	0.220	2.88	0.63	5.26	0.63	2.25
	2	5.000	4 3/4-12	3 1/2-12	5.00	5.749	-. ³	0.000	4.88	0.34	7.25	0.91	2.25
	3	3.500	3 1/4-12	2 1/2-12	3.50	4.249	3.00	0.250	3.38	0.63	5.76	0.63	2.25
	4	4.000	3 3/4-12	3-12	4.00	4.749	3.38	0.160	3.88	0.50	6.31	0.75	2.25
	5	4.500	4 1/4-12	3 1/4-12	4.50	5.249	-. ³	0.160	4.38	0.50	6.94	0.75	2.25
8.00	1 (std.)	3.500	3 1/4-12	2 1/2-12	3.50	4.249	3.00	0.250	3.38	0.63	5.76	0.63	2.25
	2	5.500	5 1/4-12	4-12	5.50	6.249	-. ³	0.000	5.38	0.34	7.94	0.91	2.25
	3	4.000	3 3/4-12	3-12	4.00	4.749	3.38	0.160	3.88	0.50	6.31	0.75	2.25
	4	4.500	4 1/4-12	3 1/4-12	4.50	5.249	-. ³	0.160	4.38	0.50	6.94	0.75	2.25
	5	5.000	4 3/4-12	3 1/2-12	5.00	5.749	-. ³	0.000	4.88	0.34	7.25	0.91	2.25

“Special” Thread Style 3

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

To order, specify “Style 3” and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

¹ For special WG dimension, specify “Style 3” and give desired dimension for WG. For other changes, place “S” in the model code, and describe rod end with dimensioned sketch.

² Style 9 stroke restrictions may apply. See Style 9 Minimum Stroke Table on How to Order page for details.

³ These piston rod numbers will have 4 spanner wrench holes instead of wrench flats. See rod drawings on page 117 for dimensions.

Style 55 Rod End

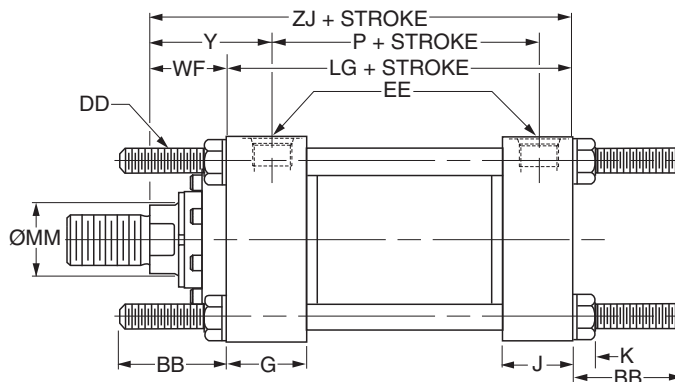
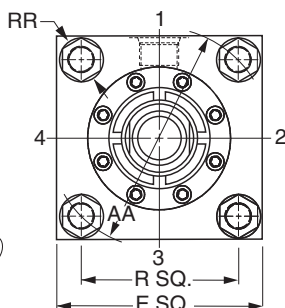
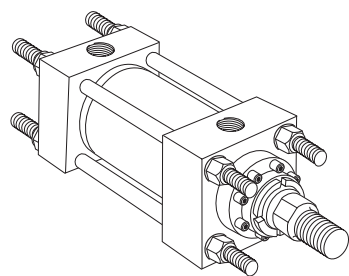
MM Rod Ø	AD	AE +.001 -.001	AF Ø	AM Ø	WG ¹
3.000	2.44	0.874	2.25	2.95	4.88
3.500	2.69	0.999	2.50	3.45	5.63
4.000	2.69	0.999	3.00	3.95	5.75
4.500	3.19	1.499	3.50	4.45	6.50
5.000	3.19	1.499	3.88	4.95	6.63
5.500	3.94	1.874	4.38	5.45	7.50

⚠ PROP 65 WARNING WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Mounting Information**Heavy Duty Hydraulic Cylinders
Series 3H 7.00" & 8.00" Bore****Tie Rods Extended Both Ends**

Style TD

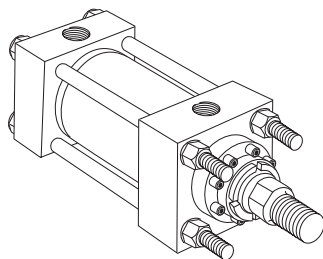
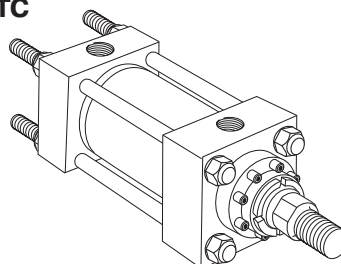
(NFPA Style MX1)



Basic Mounting (T) — NFPA MX0 — Not shown is no tie rod extended and can be supplied upon request.

Style TD – Dimensional and Mounting Data

Bore Ø	Rod No.	MM Rod Ø	AA	BB	DD	E	EE		G	J	K Max.	R	RR	WF	Y	Add Stroke		
							NPTF ¹	SAE ²								LG	P	ZJ
7.00	1 (std.)	3.000	9.31	4.13	1 1/8-12	8.50	1 1/4	20	2.75	2.75	1.16	6.58	1.90	2.25	3.69	8.50	5.63	10.75
	2	5.000	9.31	4.13	1 1/8-12	8.50	1 1/4	20	2.75	2.75	1.16	6.58	1.90	2.25	3.69	8.50	5.63	10.75
	3	3.500	9.31	4.13	1 1/8-12	8.50	1 1/4	20	2.75	2.75	1.16	6.58	1.90	2.25	3.69	8.50	5.63	10.75
	4	4.000	9.31	4.13	1 1/8-12	8.50	1 1/4	20	2.75	2.75	1.16	6.58	1.90	2.25	3.69	8.50	5.63	10.75
	5	4.500	9.31	4.13	1 1/8-12	8.50	1 1/4	20	2.75	2.75	1.16	6.58	1.90	2.25	3.69	8.50	5.63	10.75
8.00	1 (std.)	3.500	10.61	4.50	1 1/4-12	9.50	1 1/2	24	3.00	3.00	1.28	7.50	2.19	2.25	3.81	9.50	6.38	11.75
	2	5.500	10.61	4.50	1 1/4-12	9.50	1 1/2	24	3.00	3.00	1.28	7.50	2.19	2.25	3.81	9.50	6.38	11.75
	3	4.000	10.61	4.50	1 1/4-12	9.50	1 1/2	24	3.00	3.00	1.28	7.50	2.19	2.25	3.81	9.50	6.38	11.75
	4	4.500	10.61	4.50	1 1/4-12	9.50	1 1/2	24	3.00	3.00	1.28	7.50	2.19	2.25	3.81	9.50	6.38	11.75
	5	5.000	10.61	4.50	1 1/4-12	9.50	1 1/2	24	3.00	3.00	1.28	7.50	2.19	2.25	3.81	9.50	6.38	11.75

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style TB****Style TC**

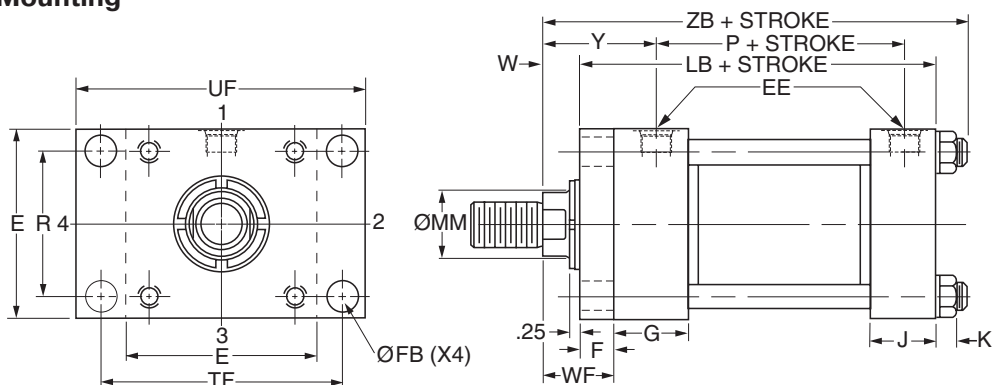
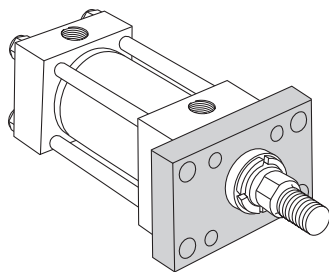
Dimensions for TB and TC Mount may be obtained from the above dimensional table.

⚠ PROP 65 WARNING **WARNING:** This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Mounting Information**Heavy Duty Hydraulic Cylinders
Series 3H 7.00" & 8.00" Bore****Head Rectangular Flange Mounting**

Style J

(NFPA Style MF1)

**Style J – Dimensional and Mounting Data**

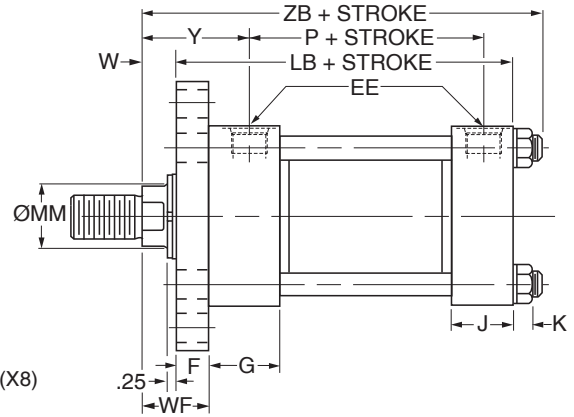
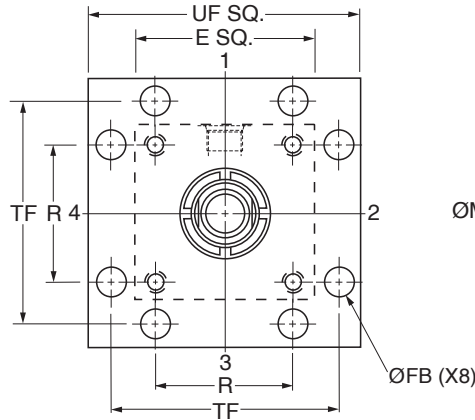
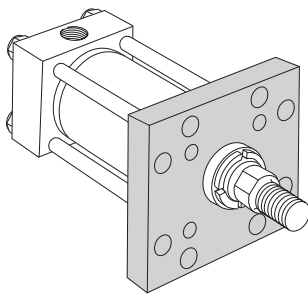
For pressures exceeding those shown use mounting styles JB or JJ.

Bore Ø	Rod No.	MM Rod Ø	E	EE		F	FB Ø	G	J	K Max.	R	TF	UF	W	WF	Y	Add Stroke		
				NPTF ¹	SAE ²												LB	P	ZB Max.
7.00	1 (std.)	3.000	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	1.25	2.25	3.69	9.50	5.63	12.16
	2	5.000	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	1.25	2.25	3.69	9.50	5.63	12.16
	3	3.500	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	1.25	2.25	3.69	9.50	5.63	12.16
	4	4.000	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	1.25	2.25	3.69	9.50	5.63	12.16
	5	4.500	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	1.25	2.25	3.69	9.50	5.63	12.16
8.00	1 (std.)	3.500	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	1.25	2.25	3.81	10.50	6.38	13.28
	2	5.500	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	1.25	2.25	3.81	10.50	6.38	13.28
	3	4.000	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	1.25	2.25	3.81	10.50	6.38	13.28
	4	4.500	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	1.25	2.25	3.81	10.50	6.38	13.28
	5	5.000	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	1.25	2.25	3.81	10.50	6.38	13.28

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style J – Maximum Operating Pressure / 3H**

Bore Ø	Max. psi Push ³				
	Rod Code				
	1	2	3	4	5
7.00	1400	800	1200	1100	1000
8.00	1100	800	1000	1000	800

³Maximum pressure rating – push application.**WARNING:** This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Mounting Information**Heavy Duty Hydraulic Cylinders
Series 3H 7.00" & 8.00" Bore****Head Square Flange Mounting**Style JB
(NFPA Style MF5)**Style JB – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	E	EE		F	FB Ø	G	J	K Max.	R	TF	UF	W	WF	Y	Add Stroke		
				NPTF ¹	SAE ²												LB	P	ZB Max.
7.00	1 (std.)	3.000	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	1.25	2.25	3.69	9.50	5.63	12.16
	2	5.000	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	1.25	2.25	3.69	9.50	5.63	12.16
	3	3.500	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	1.25	2.25	3.69	9.50	5.63	12.16
	4	4.000	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	1.25	2.25	3.69	9.50	5.63	12.16
	5	4.500	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	1.25	2.25	3.69	9.50	5.63	12.16
8.00	1 (std.)	3.500	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	1.25	2.25	3.81	10.50	6.38	13.28
	2	5.500	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	1.25	2.25	3.81	10.50	6.38	13.28
	3	4.000	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	1.25	2.25	3.81	10.50	6.38	13.28
	4	4.500	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	1.25	2.25	3.81	10.50	6.38	13.28
	5	5.000	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	1.25	2.25	3.81	10.50	6.38	13.28

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style JB – Maximum Operating Pressure / 3H**

Bore Ø	Max. psi Push ³				
	Rod Code				
	1	2	3	4	5
7.00	3000	2700	3000	3000	3000
8.00	3000	2300	2500	2500	2500

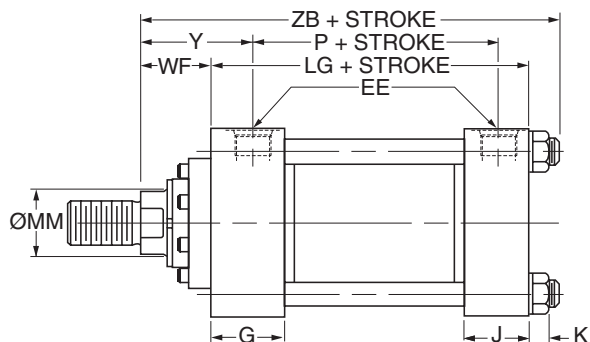
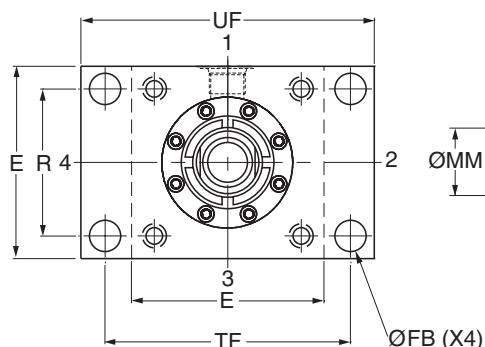
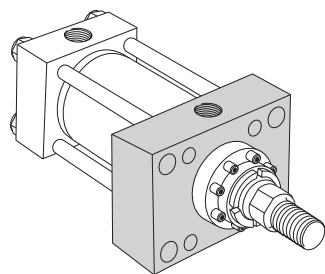
³Maximum pressure rating – push application.

⚠ PROP 65 WARNING WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



Head Rectangular Mounting

Style JJ
(NFPA Style ME5)



Style JJ – Dimensional and Mounting Data

Bore Ø	Rod No.	MM Rod Ø	E	EE		FB Ø	G	J	K Max.	R	TF	UF	WF	Y	Add Stroke		
				NPTF ¹	SAE ²										LG	P	ZB Max.
7.00	1 (std.)	3.000	8.50	1 1/4	20	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	12.16
	2	5.000	8.50	1 1/4	20	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	12.16
	3	3.500	8.50	1 1/4	20	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	12.16
	4	4.000	8.50	1 1/4	20	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	12.16
	5	4.500	8.50	1 1/4	20	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	12.16
8.00	1 (std.)	3.500	9.50	1 1/2	24	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	13.28
	2	5.500	9.50	1 1/2	24	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	13.28
	3	4.000	9.50	1 1/2	24	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	13.28
	4	4.500	9.50	1 1/2	24	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	13.28
	5	5.000	9.50	1 1/2	24	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	13.28

¹NPTF ports are available at no extra charge.

²SAE straight thread ports are standard and are indicated by port number.

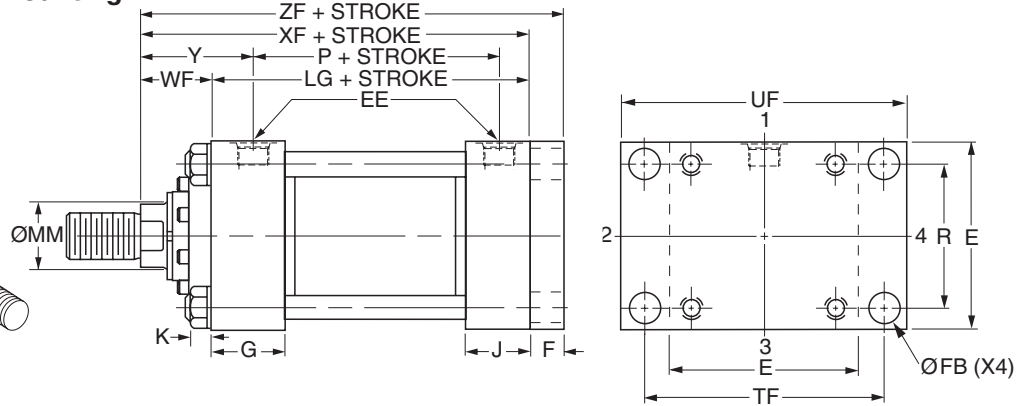
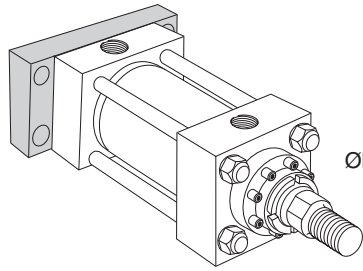
⚠ PROP 65 WARNING WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



Mounting Information**Heavy Duty Hydraulic Cylinders
Series 3H 7.00" & 8.00" Bore****Cap Rectangular Flange Mounting**

Style H

(NFPA Style MF2)

**Style H – Dimensional and Mounting Data**

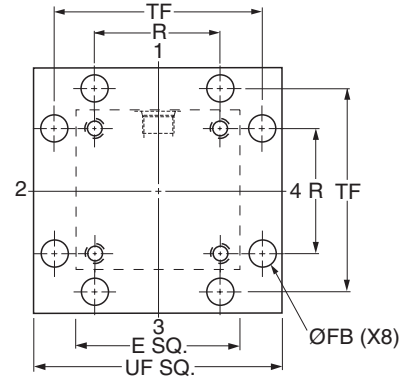
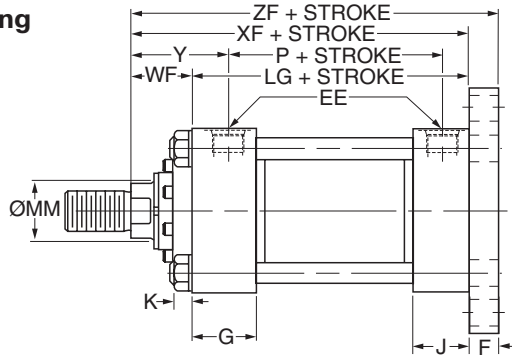
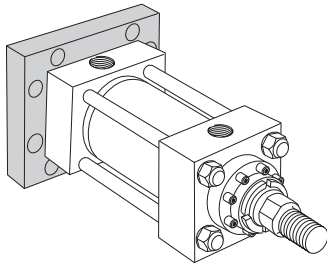
Bore Ø	Rod No.	MM Rod Ø	E	EE		F	FB Ø	G	J	K Max.	R	TF	UF	WF	Y	Add Stroke			
				NPTF ¹	SAE ²											LG	P	XF	ZF
7.00	1 (std.)	3.000	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	10.75	11.75
	2	5.000	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	10.75	11.75
	3	3.500	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	10.75	11.75
	4	4.000	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	10.75	11.75
	5	4.500	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	10.75	11.75
8.00	1 (std.)	3.500	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	11.75	12.75
	2	5.500	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	11.75	12.75
	3	4.000	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	11.75	12.75
	4	4.500	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	11.75	12.75
	5	5.000	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	11.75	12.75

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style H – Maximum Operating Pressure / 3H**

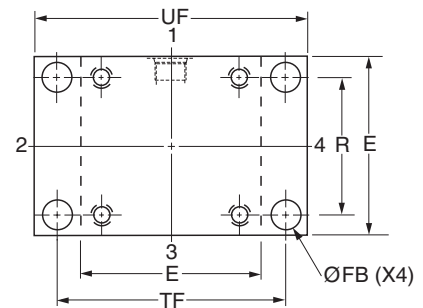
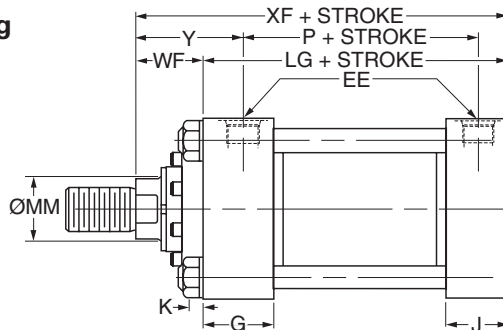
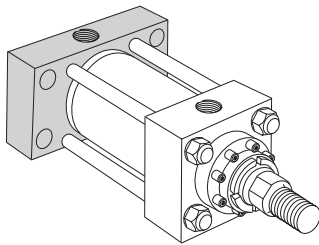
Bore Ø	Max. psi Pull ³				
	Rod Code				
	1	2	3	4	5
7.00	2000	3000	2000	2500	2800
8.00	1700	2500	1700	1800	2200

³Maximum pressure rating – pull application.

⚠ PROP 65 WARNING **WARNING:** This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Mounting Information**Heavy Duty Hydraulic Cylinders
Series 3H 7.00" & 8.00" Bore****Cap Square Flange Mounting
Style HB
(NFPA Style MF6)****Style HB – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	E	EE		F	FB Ø	G	J	K Max.	R	TF	UF	WF	Y	Add Stroke			
				NPTF ¹	SAE ²											LG	P	XF	ZF
7.00	1 (std.)	3.000	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	10.75	11.75
	2	5.000	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	10.75	11.75
	3	3.500	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	10.75	11.75
	4	4.000	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	10.75	11.75
	5	4.500	8.50	1 1/4	20	1.00	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	10.75	11.75
8.00	1 (std.)	3.500	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	11.75	12.75
	2	5.500	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	11.75	12.75
	3	4.000	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	11.75	12.75
	4	4.500	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	11.75	12.75
	5	5.000	9.50	1 1/2	24	1.00	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	11.75	12.75

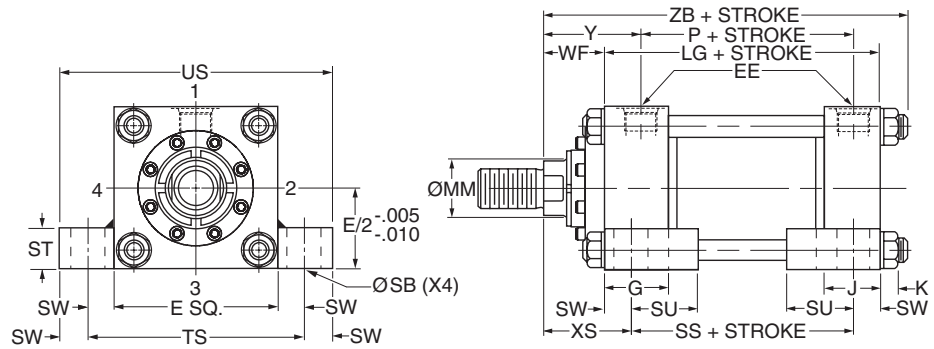
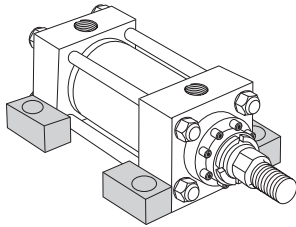
¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Cap Rectangular Mounting
Style HH
(NFPA Style ME6)****Style HH – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	E	EE		FB Ø	G	J	K Max.	R	TF	UF	WF	Y	Add Stroke		
				NPTF ¹	SAE ²										LG	P	XF
7.00	1 (std.)	3.000	8.50	1 1/4	20	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	10.75
	2	5.000	8.50	1 1/4	20	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	10.75
	3	3.500	8.50	1 1/4	20	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	10.75
	4	4.000	8.50	1 1/4	20	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	10.75
	5	4.500	8.50	1 1/4	20	1.19	2.75	2.75	1.16	6.58	10.63	12.63	2.25	3.69	8.50	5.63	10.75
8.00	1 (std.)	3.500	9.50	1 1/2	24	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	11.75
	2	5.500	9.50	1 1/2	24	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	11.75
	3	4.000	9.50	1 1/2	24	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	11.75
	4	4.500	9.50	1 1/2	24	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	11.75
	5	5.000	9.50	1 1/2	24	1.31	3.00	3.00	1.28	7.50	11.81	14.00	2.25	3.81	9.50	6.38	11.75

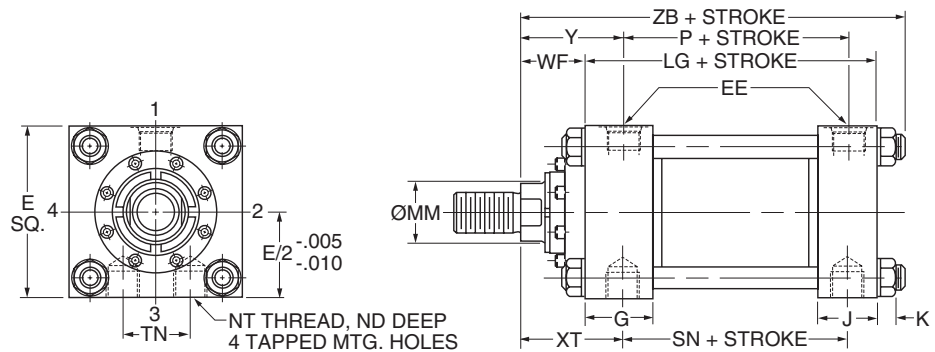
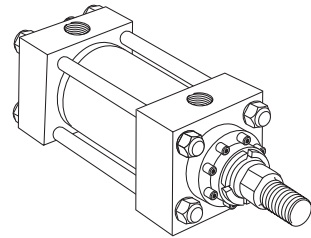
¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.

⚠ PROP 65 WARNING WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



Mounting Information**Heavy Duty Hydraulic Cylinders
Series 3H 7.00" & 8.00" Bore****Side Lug Mounting
Style C
(NFPA Style MS2)****Style C – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	E	EE		G	J	K Max.	SB Ø	ST	SU	SW	TS	US	WF	XS	Y	Add Stroke			
				NPTF ¹	SAE ²													LG	P	SS	ZB Max.
7.00	1 (std.)	3.000	8.50	1 1/4	20	2.75	2.75	1.16	1.56	1.75	2.88	1.38	11.25	14.00	2.25	3.63	3.69	8.50	5.63	5.75	12.16
	2	5.000	8.50	1 1/4	20	2.75	2.75	1.16	1.56	1.75	2.88	1.38	11.25	14.00	2.25	3.63	3.69	8.50	5.63	5.75	12.16
	3	3.500	8.50	1 1/4	20	2.75	2.75	1.16	1.56	1.75	2.88	1.38	11.25	14.00	2.25	3.63	3.69	8.50	5.63	5.75	12.16
	4	4.000	8.50	1 1/4	20	2.75	2.75	1.16	1.56	1.75	2.88	1.38	11.25	14.00	2.25	3.63	3.69	8.50	5.63	5.75	12.16
	5	4.500	8.50	1 1/4	20	2.75	2.75	1.16	1.56	1.75	2.88	1.38	11.25	14.00	2.25	3.63	3.69	8.50	5.63	5.75	12.16
8.00	1 (std.)	3.500	9.50	1 1/2	24	3.00	3.00	1.28	1.56	1.75	2.88	1.38	12.25	15.00	2.25	3.63	3.81	9.50	6.38	6.75	13.28
	2	5.500	9.50	1 1/2	24	3.00	3.00	1.28	1.56	1.75	2.88	1.38	12.25	15.00	2.25	3.63	3.81	9.50	6.38	6.75	13.28
	3	4.000	9.50	1 1/2	24	3.00	3.00	1.28	1.56	1.75	2.88	1.38	12.25	15.00	2.25	3.63	3.81	9.50	6.38	6.75	13.28
	4	4.500	9.50	1 1/2	24	3.00	3.00	1.28	1.56	1.75	2.88	1.38	12.25	15.00	2.25	3.63	3.81	9.50	6.38	6.75	13.28
	5	5.000	9.50	1 1/2	24	3.00	3.00	1.28	1.56	1.75	2.88	1.38	12.25	15.00	2.25	3.63	3.81	9.50	6.38	6.75	13.28

¹NPTF ports are available at no extra charge. ²SAE straight thread ports are standard and are indicated by port number.**Side Tapped Mounting
Style F
(NFPA Style MS4)****Style F – Dimensional and Mounting Data**

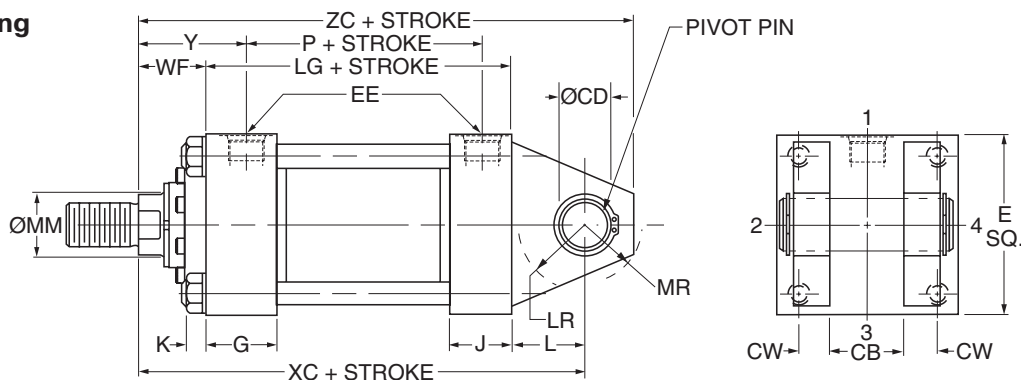
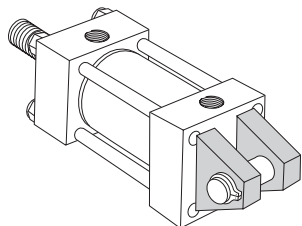
Bore Ø	Rod No.	MM Rod Ø	E	EE		G	J	K Max.	ND	NT	TN	WF	XT	Y	Add Stroke			
				NPTF ¹	SAE ²										LG	P	SN	ZB Max.
7.00	1 (std.)	3.000	8.50	1 1/4	20	2.75	2.75	1.16	1.13	1 1/2-6	3.75	2.25	3.81	3.69	8.50	5.63	5.88	12.16
	2	5.000	8.50	1 1/4	20	2.75	2.75	1.16	1.13	1 1/2-6	3.75	2.25	3.81	3.69	8.50	5.63	5.88	12.16
	3	3.500	8.50	1 1/4	20	2.75	2.75	1.16	1.13	1 1/2-6	3.75	2.25	3.81	3.69	8.50	5.63	5.88	12.16
	4	4.000	8.50	1 1/4	20	2.75	2.75	1.16	1.13	1 1/2-6	3.75	2.25	3.81	3.69	8.50	5.63	5.88	12.16
	5	4.500	8.50	1 1/4	20	2.75	2.75	1.16	1.13	1 1/2-6	3.75	2.25	3.81	3.69	8.50	5.63	5.88	12.16
8.00	1 (std.)	3.500	9.50	1 1/2	24	3.00	3.00	1.28	1.50	1 1/2-6	4.25	2.25	3.94	3.81	9.50	6.38	6.63	13.28
	2	5.500	9.50	1 1/2	24	3.00	3.00	1.28	1.50	1 1/2-6	4.25	2.25	3.94	3.81	9.50	6.38	6.63	13.28
	3	4.000	9.50	1 1/2	24	3.00	3.00	1.28	1.50	1 1/2-6	4.25	2.25	3.94	3.81	9.50	6.38	6.63	13.28
	4	4.500	9.50	1 1/2	24	3.00	3.00	1.28	1.50	1 1/2-6	4.25	2.25	3.94	3.81	9.50	6.38	6.63	13.28
	5	5.000	9.50	1 1/2	24	3.00	3.00	1.28	1.50	1 1/2-6	4.25	2.25	3.94	3.81	9.50	6.38	6.63	13.28

¹NPTF ports are available at no extra charge. ²SAE straight thread ports are standard and are indicated by port number.

Mounting Information**Heavy Duty Hydraulic Cylinders
Series 3H 7.00" & 8.00" Bore****Cap Fixed Clevis Mounting**

Style BB

(NFPA Style MP1)

**Style BB – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	CB	CD ³ Ø +.000 -.002	CW	E	EE		G	J	K Max.	L	LR	MR
							NPTF ¹	SAE ²						
7.00	1 (std.)	3.000	3.00	2.501	1.50	8.50	1 1/4	20	2.75	2.75	1.16	3.00	2.75	2.88
	2	5.000	3.00	2.501	1.50	8.50	1 1/4	20	2.75	2.75	1.16	3.00	2.75	2.88
	3	3.500	3.00	2.501	1.50	8.50	1 1/4	20	2.75	2.75	1.16	3.00	2.75	2.88
	4	4.000	3.00	2.501	1.50	8.50	1 1/4	20	2.75	2.75	1.16	3.00	2.75	2.88
	5	4.500	3.00	2.501	1.50	8.50	1 1/4	20	2.75	2.75	1.16	3.00	2.75	2.88
8.00	1 (std.)	3.500	3.00	3.001	1.50	9.50	1 1/2	24	3.00	3.00	1.28	3.25	3.25	3.13
	2	5.500	3.00	3.001	1.50	9.50	1 1/2	24	3.00	3.00	1.28	3.25	3.25	3.13
	3	4.000	3.00	3.001	1.50	9.50	1 1/2	24	3.00	3.00	1.28	3.25	3.25	3.13
	4	4.500	3.00	3.001	1.50	9.50	1 1/2	24	3.00	3.00	1.28	3.25	3.25	3.13
	5	5.000	3.00	3.001	1.50	9.50	1 1/2	24	3.00	3.00	1.28	3.25	3.25	3.13

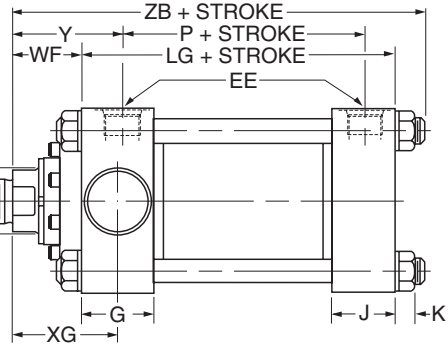
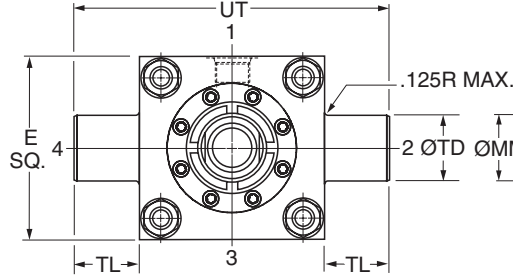
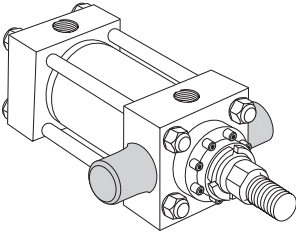
¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.³Diameter CD is pin diameter.**Style BB – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	WF	Y	Add Stroke			
					LG	P	XC	ZC
7.00	1 (std.)	3.000	2.25	3.69	8.50	5.63	13.75	16.25
	2	5.000	2.25	3.69	8.50	5.63	13.75	16.25
	3	3.500	2.25	3.69	8.50	5.63	13.75	16.25
	4	4.000	2.25	3.69	8.50	5.63	13.75	16.25
	5	4.500	2.25	3.69	8.50	5.63	13.75	16.25
8.00	1 (std.)	3.500	2.25	3.81	9.50	6.38	15.00	17.75
	2	5.500	2.25	3.81	9.50	6.38	15.00	17.75
	3	4.000	2.25	3.81	9.50	6.38	15.00	17.75
	4	4.500	2.25	3.81	9.50	6.38	15.00	17.75
	5	5.000	2.25	3.81	9.50	6.38	15.00	17.75



WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Head Trunnion Mounting
Style D
(NFA Style MT1)



Style D – Dimensional and Mounting Data

Bore Ø	Rod No.	MM Rod Ø	E	EE		G	J	K Max.	TD Ø +.000 -.002	TL	UT	WF	Y	XG
				NPTF ¹	SAE ²									
7.00	1 (std.)	3.000	8.50	1 1/4	20	2.75	2.75	1.16	2.500	2.50	13.50	2.25	3.69	3.63
	2	5.000	8.50	1 1/4	20	2.75	2.75	1.16	2.500	2.50	13.50	2.25	3.69	3.63
	3	3.500	8.50	1 1/4	20	2.75	2.75	1.16	2.500	2.50	13.50	2.25	3.69	3.63
	4	4.000	8.50	1 1/4	20	2.75	2.75	1.16	2.500	2.50	13.50	2.25	3.69	3.63
	5	4.500	8.50	1 1/4	20	2.75	2.75	1.16	2.500	2.50	13.50	2.25	3.69	3.63
8.00	1 (std.)	3.500	9.50	1 1/2	24	3.00	3.00	1.28	3.000	3.00	15.50	2.25	3.81	3.75
	2	5.500	9.50	1 1/2	24	3.00	3.00	1.28	3.000	3.00	15.50	2.25	3.81	3.75
	3	4.000	9.50	1 1/2	24	3.00	3.00	1.28	3.000	3.00	15.50	2.25	3.81	3.75
	4	4.500	9.50	1 1/2	24	3.00	3.00	1.28	3.000	3.00	15.50	2.25	3.81	3.75
	5	5.000	9.50	1 1/2	24	3.00	3.00	1.28	3.000	3.00	15.50	2.25	3.81	3.75

¹NPTF ports are available at no extra charge.

²SAE straight thread ports are standard and are indicated by port number.

Style D – Dimensional and Mounting Data

Bore Ø	Rod No.	MM Rod Ø	Add Stroke		
			LG	P	ZB Max.
7.00	1 (std.)	3.000	8.50	5.63	12.16
	2	5.000	8.50	5.63	12.16
	3	3.500	8.50	5.63	12.16
	4	4.000	8.50	5.63	12.16
	5	4.500	8.50	5.63	12.16
8.00	1 (std.)	3.500	9.50	6.38	13.28
	2	5.500	9.50	6.38	13.28
	3	4.000	9.50	6.38	13.28
	4	4.500	9.50	6.38	13.28
	5	5.000	9.50	6.38	13.28

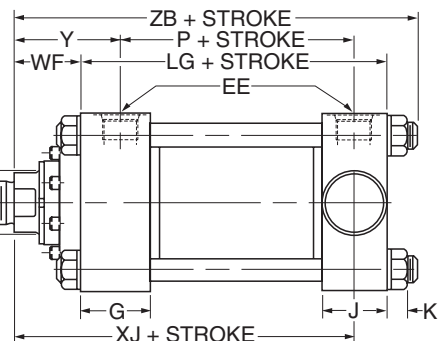
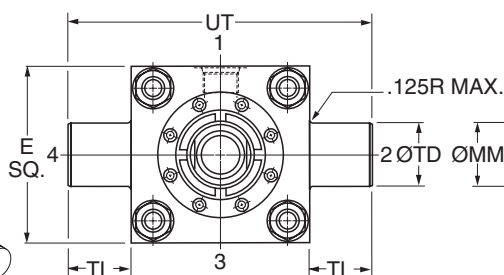
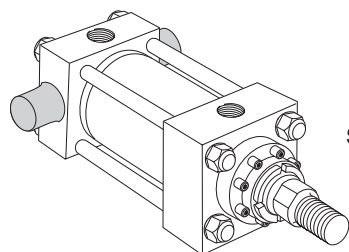
⚠ PROP 65 WARNING WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



Mounting Information**Heavy Duty Hydraulic Cylinders
Series 3H 7.00" & 8.00" Bore****Cap Trunnion Mounting**

Style DB

(NFPA Style MT2)

**Style DB – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	E	EE		G	J	K Max.	TD Ø +.000 -.002	TL	UT	WF	Y
				NPTF ¹	SAE ²								
7.00	1 (std.)	3.000	8.50	1 1/4	20	2.75	2.75	1.16	2.500	2.50	13.50	2.25	3.69
	2	5.000	8.50	1 1/4	20	2.75	2.75	1.16	2.500	2.50	13.50	2.25	3.69
	3	3.500	8.50	1 1/4	20	2.75	2.75	1.16	2.500	2.50	13.50	2.25	3.69
	4	4.000	8.50	1 1/4	20	2.75	2.75	1.16	2.500	2.50	13.50	2.25	3.69
	5	4.500	8.50	1 1/4	20	2.75	2.75	1.16	2.500	2.50	13.50	2.25	3.69
8.00	1 (std.)	3.500	9.50	1 1/2	24	3.00	3.00	1.28	3.000	3.00	15.50	2.25	3.81
	2	5.500	9.50	1 1/2	24	3.00	3.00	1.28	3.000	3.00	15.50	2.25	3.81
	3	4.000	9.50	1 1/2	24	3.00	3.00	1.28	3.000	3.00	15.50	2.25	3.81
	4	4.500	9.50	1 1/2	24	3.00	3.00	1.28	3.000	3.00	15.50	2.25	3.81
	5	5.000	9.50	1 1/2	24	3.00	3.00	1.28	3.000	3.00	15.50	2.25	3.81

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style DB – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	Add Stroke			
			LG	P	XJ	ZB Max
7.00	1 (std.)	3.000	8.50	5.63	9.38	12.16
	2	5.000	8.50	5.63	9.38	12.16
	3	3.500	8.50	5.63	9.38	12.16
	4	4.000	8.50	5.63	9.38	12.16
	5	4.500	8.50	5.63	9.38	12.16
8.00	1 (std.)	3.500	9.50	6.38	10.25	13.28
	2	5.500	9.50	6.38	10.25	13.28
	3	4.000	9.50	6.38	10.25	13.28
	4	4.500	9.50	6.38	10.25	13.28
	5	5.000	9.50	6.38	10.25	13.28

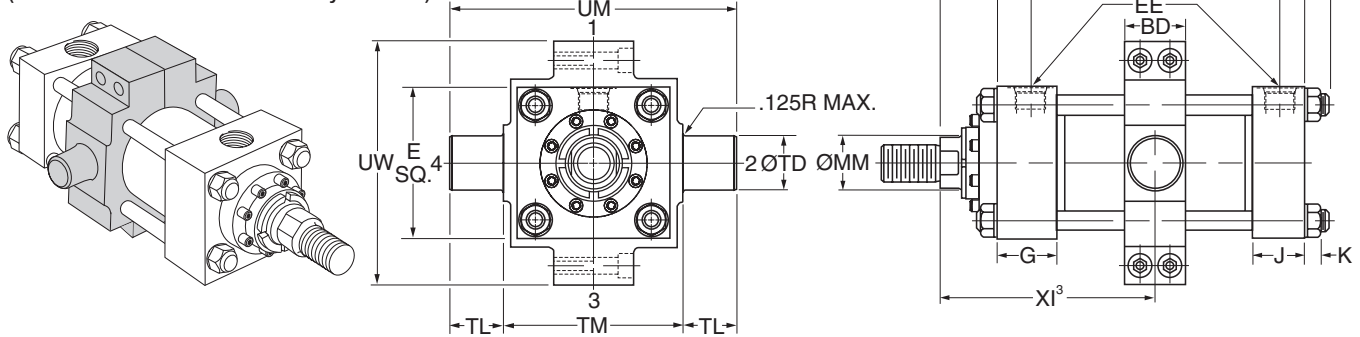


WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Mounting Information**Heavy Duty Hydraulic Cylinders
Series 3H 7.00" & 8.00" Bore****Intermediate Fixed Trunnion Mounting**

Style DD

(NFPA Former Standard Style MT4)

**Style DD – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	BD	E	EE		G	J	K Max.	TD Ø +.000 -.002	TL	TM	UM	UW	WF	Y
					NPTF ¹	SAE ²										
7.00	1 (std.)	3.000	3.00	8.50	1 1/4	20	2.75	2.75	1.16	2.500	2.50	9.75	14.75	11.50	2.25	3.69
	2	5.000	3.00	8.50	1 1/4	20	2.75	2.75	1.16	2.500	2.50	9.75	14.75	11.50	2.25	3.69
	3	3.500	3.00	8.50	1 1/4	20	2.75	2.75	1.16	2.500	2.50	9.75	14.75	11.50	2.25	3.69
	4	4.000	3.00	8.50	1 1/4	20	2.75	2.75	1.16	2.500	2.50	9.75	14.75	11.50	2.25	3.69
	5	4.500	3.00	8.50	1 1/4	20	2.75	2.75	1.16	2.500	2.50	9.75	14.75	11.50	2.25	3.69
8.00	1 (std.)	3.500	3.50	9.50	1 1/2	24	3.00	3.00	1.28	3.000	3.00	11.00	17.00	13.38	2.25	3.81
	2	5.500	3.50	9.50	1 1/2	24	3.00	3.00	1.28	3.000	3.00	11.00	17.00	13.38	2.25	3.81
	3	4.000	3.50	9.50	1 1/2	24	3.00	3.00	1.28	3.000	3.00	11.00	17.00	13.38	2.25	3.81
	4	4.500	3.50	9.50	1 1/2	24	3.00	3.00	1.28	3.000	3.00	11.00	17.00	13.38	2.25	3.81
	5	5.000	3.50	9.50	1 1/2	24	3.00	3.00	1.28	3.000	3.00	11.00	17.00	13.38	2.25	3.81

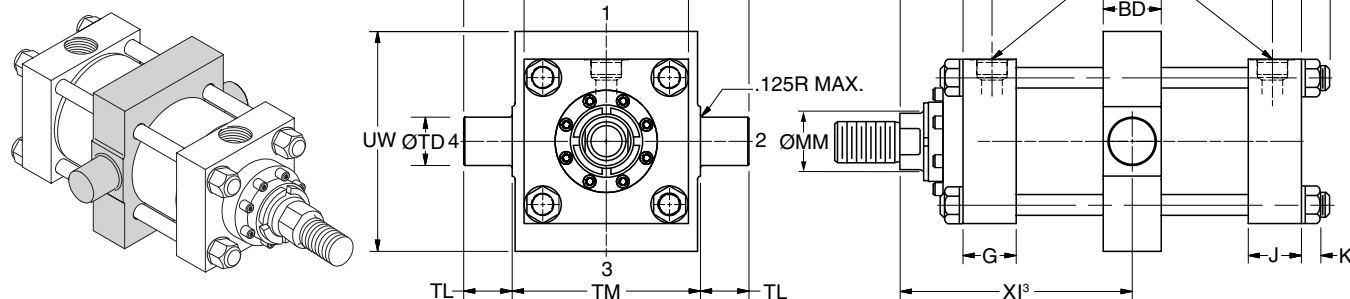
¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.**Style DD – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	Style DD Minimum Stroke	Minimum XI ³		Add Stroke				
				Styles 4, 8 & 9	Style 55	LG	P	Maximum XI ⁴		ZB Max.
								Styles 4, 8 & 9	Style 55	
7.00	1 (std.)	3.000	0.13	6.56	9.19	8.50	5.63	6.44	9.06	12.16
	2	5.000	0.13	6.56	10.94	8.50	5.63	6.44	10.81	12.16
	3	3.500	0.13	6.56	9.94	8.50	5.63	6.44	9.81	12.16
	4	4.000	0.13	6.56	10.06	8.50	5.63	6.44	9.94	12.16
	5	4.500	0.13	6.56	10.81	8.50	5.63	6.44	10.69	12.16
8.00	1 (std.)	3.500	0.13	7.06	10.44	9.50	6.38	6.94	10.31	13.28
	2	5.500	0.13	7.06	12.31	9.50	6.38	6.94	12.19	13.28
	3	4.000	0.13	7.06	10.56	9.50	6.38	6.94	10.44	13.28
	4	4.500	0.13	7.06	11.31	9.50	6.38	6.94	11.19	13.28
	5	5.000	0.13	7.06	11.44	9.50	6.38	6.94	11.31	13.28

³Dimension XI to be specified by customer. Reference point for rod end Style 55 is end of piston rod.⁴Dimensions shown are valid for standard WF and WG dimension.

⚠ PROP 65 WARNING WARNING: This product can expose you to chemicals including **Lead and Lead Compounds** which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



Mounting Information**Heavy Duty Hydraulic Cylinders
Series 3H 7.00" & 8.00" Bore****Heavy Duty Intermediate Fixed
Trunnion Mounting**Style DE
(NFPA Current Standard Style MT4)**Style DE – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	BD	E	EE		G	J	K Max.	TD Ø +.000 -.002	TL	TM	UM	UW	WF	Y
					NPTF¹	SAE²										
7.00	1 (std.)	3.000	4.000	8.50	1 1/4	20	2.75	2.75	1.16	3.500	2.50	9.75	14.75	11.38	2.25	3.69
	2	5.000	4.000	8.50	1 1/4	20	2.75	2.75	1.16	3.500	2.50	9.75	14.75	11.38	2.25	3.69
	3	3.500	4.000	8.50	1 1/4	20	2.75	2.75	1.16	3.500	2.50	9.75	14.75	11.38	2.25	3.69
	4	4.000	4.000	8.50	1 1/4	20	2.75	2.75	1.16	3.500	2.50	9.75	14.75	11.38	2.25	3.69
	5	4.500	4.000	8.50	1 1/4	20	2.75	2.75	1.16	3.500	2.50	9.75	14.75	11.38	2.25	3.69
8.00	1 (std.)	3.500	4.500	9.50	1 1/2	24	3.00	3.00	1.28	4.000	3.00	11.00	17.00	12.00	2.25	3.81
	2	5.500	4.500	9.50	1 1/2	24	3.00	3.00	1.28	4.000	3.00	11.00	17.00	12.00	2.25	3.81
	3	4.000	4.500	9.50	1 1/2	24	3.00	3.00	1.28	4.000	3.00	11.00	17.00	12.00	2.25	3.81
	4	4.500	4.500	9.50	1 1/2	24	3.00	3.00	1.28	4.000	3.00	11.00	17.00	12.00	2.25	3.81
	5	5.000	4.500	9.50	1 1/2	24	3.00	3.00	1.28	4.000	3.00	11.00	17.00	12.00	2.25	3.81

¹NPTF ports are available at no extra charge.

²SAE straight thread ports are standard and are indicated by port number.

Style DE – Dimensional and Mounting Data

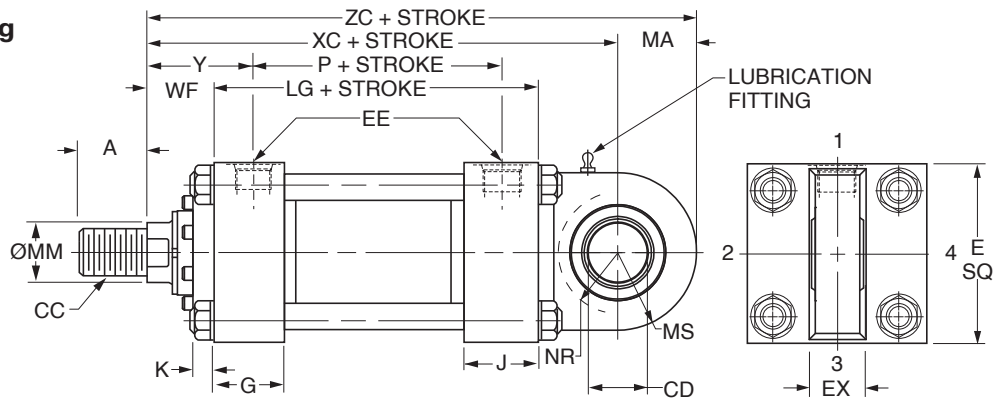
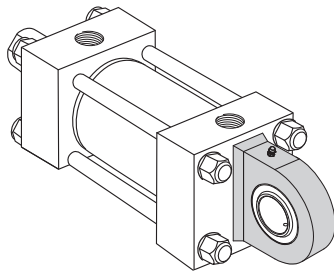
Bore Ø	Rod No.	MM Rod Ø	Style DE Minimum Stroke	Minimum XI³		Add Stroke				
				Styles 4, 8 & 9	Style 55	LG	P	Maximum XI⁴		ZB Max.
								Styles 4, 8 & 9	Style 55	
7.00	1 (std.)	3.000	1.13	7.06	9.69	8.50	5.63	5.94	8.56	12.16
	2	5.000	1.13	7.06	11.44	8.50	5.63	5.94	10.31	12.16
	3	3.500	1.13	7.06	10.44	8.50	5.63	5.94	9.31	12.16
	4	4.000	1.13	7.06	10.56	8.50	5.63	5.94	9.44	12.16
	5	4.500	1.13	7.06	11.31	8.50	5.63	5.94	10.19	12.16
8.00	1 (std.)	3.500	1.13	7.56	10.94	9.50	6.38	6.44	9.81	13.28
	2	5.500	1.13	7.56	12.81	9.50	6.38	6.44	11.69	13.28
	3	4.000	1.13	7.56	11.06	9.50	6.38	6.44	9.94	13.28
	4	4.500	1.13	7.56	11.81	9.50	6.38	6.44	10.69	13.28
	5	5.000	1.13	7.56	11.94	9.50	6.38	6.44	10.81	13.28

³Dimension XI to be specified by customer. Reference point for rod end Style 55 is end of piston rod.

⁴Dimensions shown are valid for standard WF and WG dimension.

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Mounting Information**Heavy Duty Hydraulic Cylinders
Series 3H 7.00" & 8.00" Bore****Spherical Bearing Mounting
Style SE****Style SE – Dimensional and Mounting Data**

Bore Ø	Rod No.	MM Rod Ø	A	CD ³ Ø +0.0000 -0.0008	E	EX	EE		G	J	K Max.	MS	MA	NR	WF	Y
							NPTF ¹	SAE ²								
7.00	1 (std.)	3.000	3.50	3.5000	8.50	3.06	1 1/4	20	2.75	2.75	1.16	4.00	4.00	3.68	2.25	3.69
	2	5.000	3.50	3.5000	8.50	3.06	1 1/4	20	2.75	2.75	1.16	4.00	4.00	3.68	2.25	3.69
	3	3.500	3.50	3.5000	8.50	3.06	1 1/4	20	2.75	2.75	1.16	4.00	4.00	3.68	2.25	3.69
	4	4.000	3.50	3.5000	8.50	3.06	1 1/4	20	2.75	2.75	1.16	4.00	4.00	3.68	2.25	3.69
	5	4.500	3.50	3.5000	8.50	3.06	1 1/4	20	2.75	2.75	1.16	4.00	4.00	3.68	2.25	3.69
8.00	1 (std.)	3.500	3.50	4.0000	9.50	3.50	1 1/2	24	3.00	3.00	1.28	4.50	4.50	4.13	2.25	3.81
	2	5.500	3.50	4.0000	9.50	3.50	1 1/2	24	3.00	3.00	1.28	4.50	4.50	4.13	2.25	3.81
	3	4.000	3.50	4.0000	9.50	3.50	1 1/2	24	3.00	3.00	1.28	4.50	4.50	4.13	2.25	3.81
	4	4.500	3.50	4.0000	9.50	3.50	1 1/2	24	3.00	3.00	1.28	4.50	4.50	4.13	2.25	3.81
	5	5.000	3.50	4.0000	9.50	3.50	1 1/2	24	3.00	3.00	1.28	4.50	4.50	4.13	2.25	3.81

¹NPTF ports are available at no extra charge.²SAE straight thread ports are standard and are indicated by port number.³Dimension CD is pin diameter.**Style SE – Dimensional and Mounting Data**

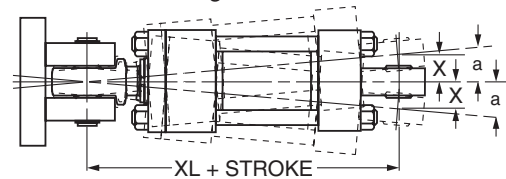
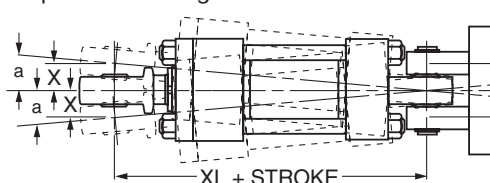
Bore Ø	Rod No.	MM Rod Ø	Thread Style 8 CC ⁴	A	Add Stroke				
					LG	P	XC	XL	ZC
7.00	1 (std.)	3.000	2 3/4-12	3.50	8.50	5.63	15.25	23.25	19.25
	2	5.000	4	4	8.50	5.63	15.25	23.25	19.25
	3	3.500	4	4	8.50	5.63	15.25	23.25	19.25
	4	4.000	4	4	8.50	5.63	15.25	23.25	19.25
	5	4.500	4	4	8.50	5.63	15.25	23.25	19.25
8.00	1 (std.)	3.500	3 1/4-12	3.50	9.50	6.38	16.75	25.25	21.25
	2	5.500	4	4	9.50	6.38	16.75	25.25	21.25
	3	4.000	4	4	9.50	6.38	16.75	25.25	21.25
	4	4.500	4	4	9.50	6.38	16.75	25.25	21.25
	5	5.000	4	4	9.50	6.38	16.75	25.25	21.25

⁴To match pin diameter in rod eye and cap, when an oversize rod is required, specify rod end style '3', 'CC' thread and 'A' thread length for the standard rod diameter (Rod No. 1 for the bore), and 'WF' for the oversize rod. Order the rod eye and clevis bracket for the required bore size from the tables on the Style SE Spherical Bearing Accessories page.

Style SE – Recommended maximum swivel angle on each side of the cylinder centerline.

Bore Ø	Head End Mounted		Cap End Mounted	
	Angle a	Tan. of a	Angle a	Tan. of a
7.00	3.00°	0.052	3.00°	0.052
8.00	3.00°	0.052	3.00°	0.052

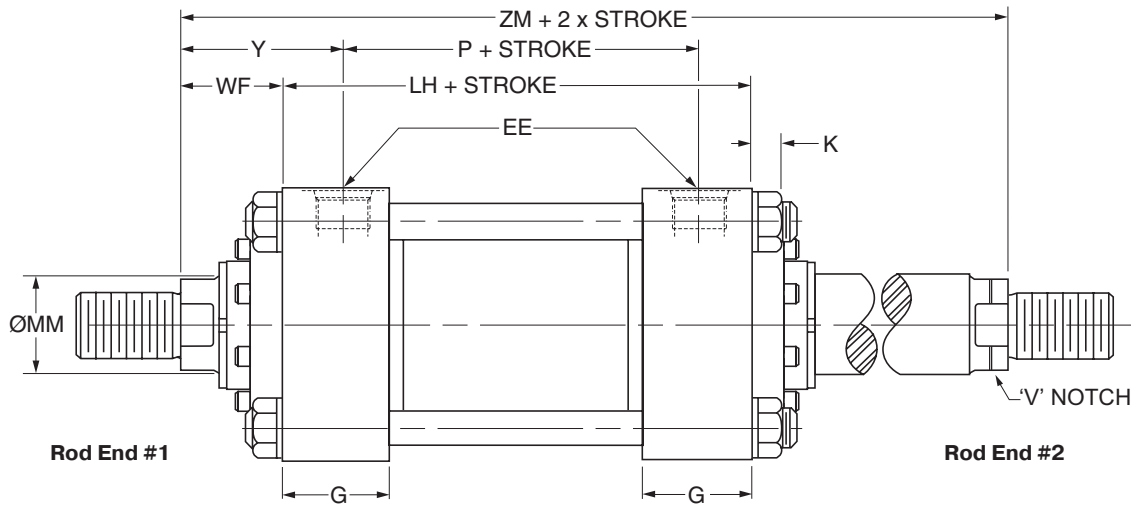
Note: Dimension X is the maximum off center mounting of the cylinder. To determine dimension X for various stroke lengths multiply the distance between pivot pin holes by tangent of angle a. For extended position use $X = XL + 2X \text{ stroke}$.

Mounting Information**Head End Mounting****Cap End Mounting**

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Double Rod Cylinder
Style K



Double Rod End Mounting Styles

See Mounting Groups page in Section H for guidance on double rod end cylinder mounting style selection.

Mounting Styles for Single Rod Models	Mounting Styles for Corresponding Double Rod Models ¹		Dimensions Shown on This Page Supplement Dimensions on 7.00" - 8.00" Bore Pages Listed Below
	Load Connected To Rod On Cylinder Mounting End	Load Connected To Rod Opposite Cylinder Mounting End	
TB	KTB	KTC	34
TD	KTD	KTD	34
J	KJ	KH	35
JB	KJB	KHB	36
JJ	KJJ	KHH	37
C	KC	KC	40
F	KF	KF	40
D	KD	KDB	42
DD	KDD ²	KDD ²	44
DE	KDE ²	KDE ²	45

¹ Connect load to piston rod without 'V' notch. If only one end of the Double Rod Cylinder is to be cushioned, be sure to clearly specify which end this will be.

² Specify XI dimension for Styles DD & DE from #1 rod end (without 'V' notch).

How to Use Double Rod Cylinder Dimension Drawings

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. (See table above.) After selecting necessary dimensions from that drawing, return to this page supplement the single rod dimensions with those shown on drawing at right and dimension table below. Note that double rod cylinders have a head (Dim. G) at both ends and that dimension LH replaces LG. The double rod

Bore $\varnothing$	Rod No.	MM Rod $\varnothing$	WF	Add Stroke			Add 2X Stroke
				LH	SNK	SSK	
7.00	1 (std.)	3.00	2.25	8.50	5.38	5.75	13.00
	2	5.00	2.25	8.50	5.38	5.75	13.00
	3	3.50	2.25	8.50	5.38	5.75	13.00
	4	4.00	2.25	8.50	5.38	5.75	13.00
	5	4.50	2.25	8.50	5.38	5.75	13.00
8.00	1 (std.)	3.50	2.25	9.50	6.13	6.75	14.00
	2	5.50	2.25	9.50	6.13	6.75	14.00
	3	4.00	2.25	9.50	6.13	6.75	14.00
	4	4.50	2.25	9.50	6.13	6.75	14.00
	5	5.00	2.25	9.50	6.13	6.75	14.00
Replaces On single rod mounting styles:				LG	SN	SS	—
				All Mtg. Styles	F	C	All Mtg. Styles

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 pos. 2, 3 or 4 when viewed from rod end #1 only. See port position information in Section H.

Notes

B
Series 3H 7.00" & 8.00"
Bore

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