

Bushing Seal Kits

(Bushings & Rod Seals)

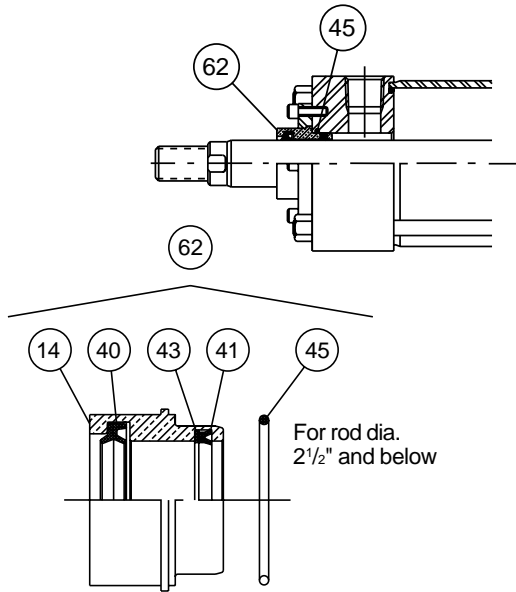
For JV Series Hydraulic Cylinders

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 Company, 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.

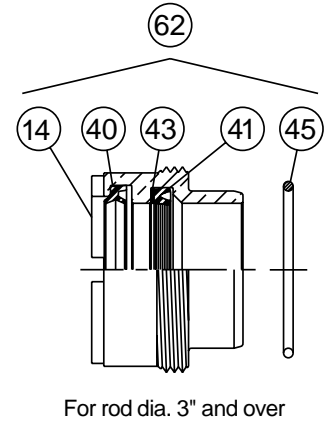
The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by the Company and its related companies at any time without notice.



BUSHING KIT
 (symbol 62) contains 1 each of the following:
 symbol 14, bushing
 symbol 40, rod wiper
 symbol 41, rod seal
 symbol 43, back-up washer for rod seal†
 symbol 45, O-ring, bushing to head seal.

ROD SEAL KIT
 Contains 1 each of the following:
 symbol 40, rod wiper
 symbol 41, rod seal
 symbol 43, backup washer for rod seal†
 symbol 45, O-ring, bushing to head seal.

†Required only for 1/2" dia. rod and for Class 5 service, 3" dia. rod and larger.



Service kits of expendable parts for air and hydraulic cylinders are stocked in principal industrial locations across the U.S.A. and other countries. For prompt delivery and complete information, contact your nearest Miller distributor.

Service kits of expendable parts for fluid power cylinders are available for either Class 1 or Class 5 fluid service.

Standard Seals — Class 1 Service Kits are standard, and contain polyurethane seals. Class 1 Service Kits are suitable for use when air and hydraulic (mineral type) oil are the operating media.

The recommended operating temperature range for Class 1 seals is -10°F (-23°C) to +165°F (+74°C).

Fluorocarbon Seals — Class 5 Service Kits contain fluorocarbon seals and are especially suited for elevated temperature service or for some fire resistant fluids (for specific fluids not listed in the latest Miller JV Catalog, consult factory). Fluorocarbon seals (Class 5) should be used for high temperature service within a temperature range of -10°F (-23°C) to

+250°F (+121°C). Fluorocarbon seals may be operated to +400°F (+204°C) with limited service life. For temperatures above +250°F (+121°C) the cylinder must be manufactured with a non-studded piston rod end thread and a pinned piston to rod connection.

Warning — The piston rod stud and the piston rod to piston threaded connections are secured with an anaerobic adhesive which is temperature sensitive. Cylinders specified with fluorocarbon seals are assembled with anaerobic adhesive having a maximum operating temperature rating of +250°F (+121°C). Cylinders specified with all other seal compounds are assembled with anaerobic adhesive having a maximum operating temperature rating of +165°F (+74°C). These temperature limitations are necessary to prevent the possible loosening of the threaded connections. Cylinders originally manufactured with Class 1 seals (Buna-N) that will be exposed to ambient temperatures above +165°F (+74°C) must be modified for higher temperature service. Contact the factory immediately and arrange for the piston to rod and the stud to piston rod connections to be properly reassembled to withstand the higher temperature service.

Rod Dia.	JV Series Cylinders — Class 1		Rod Dia.	JV Series Cylinders — Class 5	
	Bushing (Symbol 62) Kits	Rod Seal Kits		Bushing (Symbol 62) Kits	Rod Seal Kits
	Contains Symbols 14, 40, 41, 43* & 45	Contains Symbols 40, 41, 43* & 45		Contains Symbols 14, 40, 41, 43* & 45	Contains Symbols 40, 41, 43* & 45
1/2	JV-KR100-50	JV-KR300-50	1/2	JV-KR200-50	JV-KR400-50
5/8	JV-KR100-63	JV-KR300-63	5/8	JV-KR200-63	JV-KR400-63
1	JV-KR100-100	JV-KR300-100	1	JV-KR200-100	JV-KR400-100
1 1/8	JV-KR100-138	JV-KR300-138	1 1/8	JV-KR200-138	JV-KR400-138
1 3/4	JV-KR100-175	JV-KR300-175	1 3/4	JV-KR200-175	JV-KR400-175
2	JV-KR100-200	JV-KR300-200	2	JV-KR200-200	JV-KR400-200
2 1/2	JV-KR100-250	JV-KR300-250	2 1/2	JV-KR200-250	JV-KR400-250
3	JV-KR100-300	JV-KR300-300	3	JV-KR200-300	JV-KR400-300
3 1/2	JV-KR100-350	JV-KR300-350	3 1/2	JV-KR200-350	JV-KR400-350
4	JV-KR100-400	JV-KR300-400	4	JV-KR200-400	JV-KR400-400
4 1/2	JV-KR100-450	JV-KR300-450	4 1/2	JV-KR200-450	JV-KR400-450
5	JV-KR100-500	JV-KR300-500	5	JV-KR200-500	JV-KR400-500
5 1/2	JV-KR100-550	JV-KR300-550	5 1/2	JV-KR200-550	JV-KR400-550

*Required only for 1/2" diameter rod and Class 5 service 3" diameter rod and larger.

How To Replace Cylinder Rod Bushing & Rod Seals

Fluid leakage around piston rod at the bushing area will normally indicate a need to replace bushing seals. First, remove cylinder from machine to which it is mounted or, if this is not feasible, disconnect the piston rod from rod clevis, rod eye or machine member to which it is fastened.

A threaded bushing is used on rod diameters of 3" and above. It is threaded into the bushing retainer plate, and is removable without disturbing the tie rod torque.

To remove the bushing:

- a) Inspect the piston rod to make sure it is free of burrs or other displaced metal which would prevent sliding the bushing off the rod.
- b) Cylinders with rod diameter of 1/2" to 2 1/2" feature a bolted bushing which is easily removed by loosening (4) socket head cap screws.
- c) Cylinders with rod diameter of 3" and over utilize a threaded rod bushing which is removed by unscrewing it from the bushing retainer plate (right hand thread). See chart for bushing wrench.
- d) Slide the bushing off the piston rod and remove the seals. Thoroughly clean the bushing and seal grooves. Inspect bushing bore for wear. If bore is worn, replace using bushing kit containing seals for proper class fluid.
- e) If bushing is not worn, replace seals only, using rod seal kit containing seals for proper class service. Lubricate bushing seal grooves and all new seals. Install wiper, Sym. 40, in groove closest to end of bushing. For 1/2" diameter rod, and for Class 5 service 3" diameter rods and above, slightly collapse back-up washer, Sym. 43, and install in seal groove. Make sure it is flat against the wall of groove. Install rod seal, Sym. 41, in seal groove. Lips of seal should point toward the long bearing side of bushing.
- f) An O-ring, Sym. 45, is supplied with each bushing cartridge kit. It serves as a seal between the bushing and the head. This O-ring is a static seal and does not normally require replacement. The original O-ring may be left in place, unless it is known to be leaking (fluid flow around bushing O.D.).

Installation

Before installing a new bushing, inspect the surface of the piston rod for scratches, burrs, dents or other damage. A damaged piston rod surface will result in premature rod seal failure.

Lubricate the bore of the bushing, the O.D. of the bushing which fits into the cylinder head and the seals. Slide bushings which have no threads (2 1/2" or smaller) over the end of the piston rod and seat it firmly against the cylinder head. Replace the retainer and tighten bushing bolts securely and evenly to the force listed in chart.

For cylinders with full square retainers, lubricate the bore of the bushing and the seals and slide the bushing over the piston rod. Thread the bushing into the retainer and torque firmly to the face of the head. For the cylinders in which the retainer was removed, lubricate the bore of the bushing and the seals. Thread the bushing into the retainer making sure the thread does not protrude past the retainer face which mates with the cylinder head. Slide the bushing and retainer over the piston rod. Torque the retainer bolts to the torque specified in the table below. Lastly, torque the bushing firmly to the face of the head.

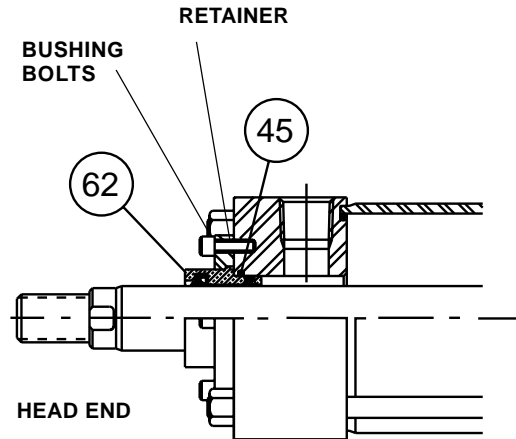
Retainer Bolt Torque

For Cylinders with Round or Small Square Bushing Retainer

Screw Size	Torque*	
#10	15 in.-lbs.	17 cm-kg
1/4"	60 in.-lbs.	69 cm-kg
5/16"	10 ft.-lbs.	14 N-m
3/8"	20 ft.-lbs.	27 N-m
7/16"	35 ft.-lbs.	48 N-m

*(-0%, +5% tolerance)

THE SEALS ARE PRESSURE ACTUATED, SO NO FURTHER ADJUSTMENTS ARE NECESSARY.



When replacing a bushing on a rod which is threaded to the full diameter or so shaped that it could damage the seals, a slight rotary motion of the bushing will help prevent damage. In addition, because full-diameter threads are usually supplied with the crest of the threads slightly truncated, a piece of shim stock or other thin, tough material can be wrapped around the threads to help protect the bushing seals when they are being passed over the threads.

Bushing Wrenches

Bushing design makes bushing replacement only a minute's work...and the Bushing Wrench Set makes it even simpler. A specially designed face-type bushing wrench with flared lugs slips into an exact, sure fit on the bushing, while a self-locking spanner wrench grips the bushing wrench securely. No fumbling for adjustment — no accidental scoring of the piston rod, the job is done quickly...easily...safely.

You can order the Bushing Wrench to fit the piston rod size used in your cylinder. Six different bushing wrench sizes and two different spanners are available. When ordering additional bushing wrenches, you may not require additional spanners provided your original spanner fits the bushing wrenches you have and the additional sizes you are ordering. See chart below.

Rod Dia.	Bushing Wrench	Spanner Wrench
3	069596 0000	011677 0000
3 1/2	069597 0000	011677 0000
4	069598 0000	011678 0000
4 1/2	083877 0000	011678 0000
5	069599 0000	011678 0000
5 1/2	069600 0000	011678 0000

JV Series

Cylinder Bore Size	Tie Rod Nut Torque*	
1"	2 ft.-lbs.	41 cm-kg
1 1/2"	5 ft.-lbs.	69 cm-kg
2"	11 ft.-lbs.	15 N-m
2 1/2"	11 ft.-lbs.	15 N-m
3 1/4"	25 ft.-lbs.	34 N-m
4"	25 ft.-lbs.	34 N-m
5"	60 ft.-lbs.	81 N-m
6"	60 ft.-lbs.	81 N-m
8"	110 ft.-lbs.	149 N-m

*(-0%, +5% tolerance) When assembling the cylinder, be sure to torque the tie rods evenly using MoS2 thread and nut bearing surface lubricant.

Cylinder Division (USA)
 800 N. York Road
 Bensenville, IL 60106
 (630) 766-3400

Cylinder Division (Canada)
 1214 Kamato
 Mississauga, Ontario,
 Canada L4W 1Y1
 (905) 625-2780

