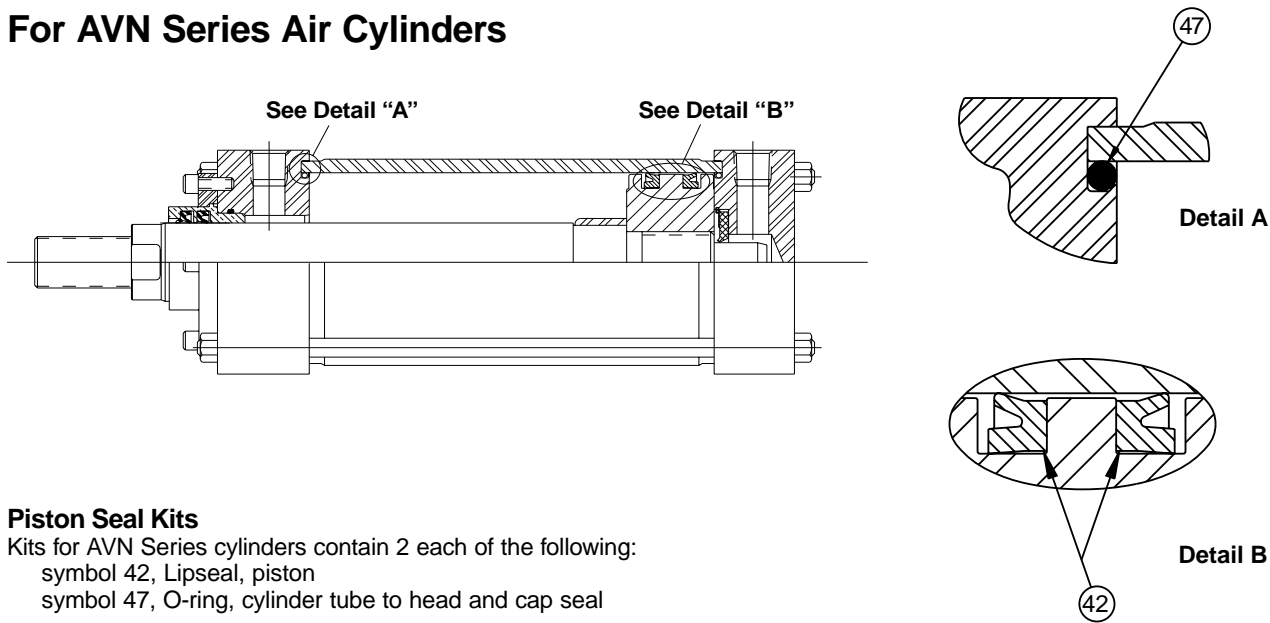


# Piston and Tube End Seals

## For AVN Series Air Cylinders



### Piston Seal Kits

Kits for AVN Series cylinders contain 2 each of the following:  
 symbol 42, Lipseal, piston  
 symbol 47, O-ring, cylinder tube to head and cap seal

### Cylinder Tube Seal Kits

Cylinder Tube kits for AVN Series Air Cylinders contain 2 each of:  
 symbol 47, O-rings

Service kits of expendable parts for fluid power cylinders are stocked in principal industrial locations across the U.S.A. and other countries.

For prompt delivery and complete information, contact your nearest distributor.

Standard Seals – Class 1 Service kits contain seals of Nitrile (Buna-N) elastomers. These seals are suitable for use when air is the operating medium.

The recommended operating temperature range for these seals is -10° F. to +165° F.

### Lube-A-Cyl...

is recommended for use in air cylinders during normal operation, and particularly when servicing and re-assembling cylinders. It is a multi-purpose lubricant in grease form, that provides lubrication without deteriorating effects on synthetic seals. Particularly recommended for use in low pressure air cylinders because of its special ability to adhere to metal surfaces. It produces a thin film which will not blow out with exhaust air. It provides piston, rod, and seal lubrication, and has excellent resistance to water and mechanical breakdown with temperature range of -10°F (-23°C) to +350°F (+177°C). Lube-A-Cyl is packaged in 4-oz. tubes, a sufficient quantity for an average size air cylinder. One application should last for a period of from 6 to 18 months, depending upon service. Order by part #0761630000.

### Piston Seal and Tube Seal Kits

Bore Size	Class 1 Service Buna-N	
	Tube Seal Kits (Contains: 2 Each Sym. #47)	Piston Lipseal Kits (Contains: 2 Each Sym. #42 & 47)
1½	AVN-ES100-150	AVN-KB100-150
2	AVN-ES100-200	AVN-KB100-200
2½	AVN-ES100-250	AVN-KB100-250
3¼	AVN-ES100-325	AVN-KB100-325
4	AVN-ES100-400	AVN-KB100-400
5	AVN-ES100-500	AVN-KB100-500
6	AVN-ES100-600	AVN-KB100-600
7	AVN-ES100-700	AVN-KB100-700
8	AVN-ES100-800	AVN-KB100-800
10	AVN-ES100-1000	AVN-KB100-1000

**⚠ 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.

**Servicing The Piston Seals**

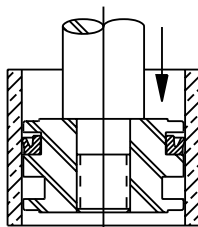
The piston is sealed and securely locked to the piston rod with anaerobic adhesive. This threaded connection should only be disassembled or reassembled by factory trained personnel.

Disassemble the cylinder completely, remove the old seals and clean all of the parts. The cylinder bore and the piston should then be examined for evidence of scoring. Replace all damaged parts. Lubricate the **entire** interior surface of the cylinder bore with a thin film of "Lube-A-Cyl" grease.

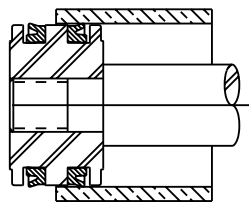
Install one piston seal in the groove nearest the rod. The two "lips" of this Lipseal should face toward the rod end of the piston.

Apply "Lube-A-Cyl" to the outside diameter of the piston and seal. Then insert the piston in the cylinder tube as shown in Figure 1. Next, turn the cylinder tube on its side and push the piston through the tube just far enough to expose the groove for the second seal (See Figure 2 below). Be careful not to move the piston too far so as to expose the first seal. If this is done, the "lip" of this Lipseal may slip past the cylinder tube and be damaged when the piston is pulled back into the cylinder tube. If the piston should move too far, pass the piston rod completely through the cylinder tube and again start the piston from the original end. Install the second lipseal in the exposed grooves as shown in Figure 2. Lubricate the same as the first seal and pull the piston into the cylinder tube. Proceed to assemble cylinder heads, tie rods and tie rod nuts as follows:

"O" rings (symbol 47) should be lightly coated with lubricant then worked into place by hand. Cylinder tube can then be assembled to the cap by rocking it down over the seal until the end of the cylinder body is in metal-to-metal contact with the cap. Install "O" ring (symbol 47) in head. Inspect the surface of the piston rod for scratches, burrs, dents or other damage. If the bushing or seals are damaged or worn, replace with the appropriate kit. Lubricate the bore of the bushing and the seals.



**Figure 1**



**Figure 2**

**Retainer Bolt Torque\***  
For Cylinders with Round or Small Square Bushing Retainer

Screw Size	Torque	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

Assemble the cylinder head, with bushing attached, over the rod and on to the cylinder tube. Rock gently into place until tube and head are in metal-to-metal contact. Ensure that retainer bolts are tightened to torque value listed below.

Tighten tie rod nuts evenly to the torques listed below.

With an intermediate trunnion mounted cylinder, care must be taken to prevent binding the cylinder tube when repositioning the trunnion collar. Proper reassembly of this type of cylinder is as follows:

After the piston seals have been inserted and the piston is in the tube, slip the trunnion collar over the tube to its approximate position.

Fit the cap with its seal onto the tube. Then "stud" into the trunnion collar the four tie rods that connect the cap to the trunnion collar. Bring up the four tie rod nuts at the cap. Distances from inner face of cap to finished face of trunnion collar should then be made equal at all four tie rods when all four tie rod nuts are in contact with the cap.

Finally, when the assembly is ready for final tightening, it may be necessary to adjust the tie rod nuts at the cap when torquing the tie rod nuts at the head in order to locate the trunnion collar in its final position.

**NOTE:** An extreme pressure lubricant (such as molybdenum disulphide) should be used on the tie rod threads and nut bearing faces to control friction and reduce tie rod twist. Tie rod twist can be eliminated by chalking a straight line on each tie rod before torquing, and backing off the nut after torquing so this line is straight again. This is particularly important on long-stroke cylinders.

**Tie Rod Torque\***

Cylinder Bore Size	AVN Series	
1 1/2"	5 ft.-lbs.	69 cm-kg
2" & 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
10"	150 ft.-lbs.	201 N-m

\*(-0%, +5% tolerance). When assembling the cylinder, be sure to torque the tie rods evenly.

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