

# Series VL Air Cylinder/Valve Actuator

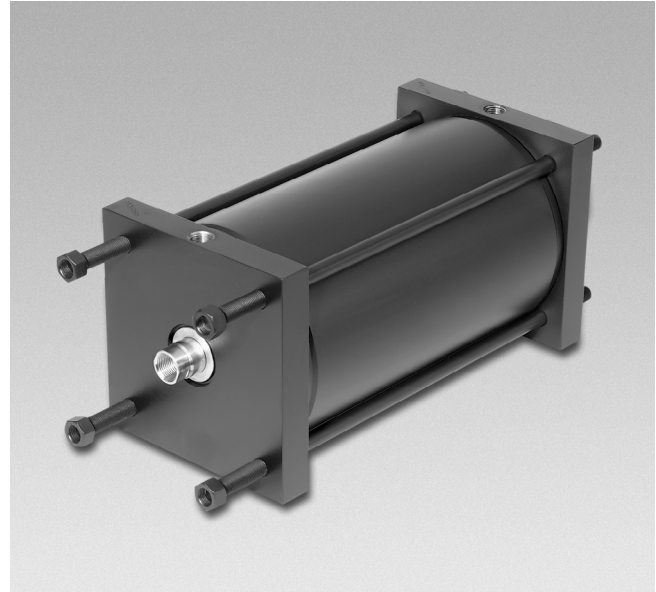
## Storage and Maintenance of Pneumatic Cylinders

### Storage

Occasionally, cylinders are delivered before a customer is ready to install them and must be stored for a period of time. When storage is required the following procedures are recommended:

1. Store the cylinders in an indoor area which has a dry, clean and non-corrosive atmosphere. Take care to protect the cylinder from both internal corrosion and external damage.
2. Whenever possible cylinders should be stored in a vertical position (piston rod up). This will minimize corrosion due to possible condensation which could occur inside the cylinder.

Port protector plugs should be left in the cylinder until the time of installation.



### Installation


1. Cleanliness is an important consideration; therefore cylinders are shipped with the ports plugged to protect them from contaminants entering the ports. These plugs should not be removed until the piping is ready to be installed. Before making the connection to the cylinder ports, piping should be thoroughly cleaned to remove all chips or burrs which might have resulted from threading or flaring operations.
2. Cylinders operating in an environment where air-drying materials are present such as fast-drying chemicals, paint, weld splatter, or other hazardous conditions such as excessive heat, should have shields installed to prevent damage to the piston rod and piston rod seals.
3. Proper alignment of the cylinder piston rod and its mating component on the machine should be checked in both the extended and retracted positions. Improper alignment will result in excessive rod bearing and/or cylinder bore wear.

**LUBRICATION** – For maximum cylinder life it is recommended that a proper sized in-line lubricator be used.

**PRE-LUBRICATED WEARING SURFACES** – Series VL air cylinders are factory pre-lubricated. Lube-A-Cyl applied to seals, piston, cylinder bore, piston rod and bearing surfaces provides lubrication for normal operation. Lube-A-Cyl has been field tested, and is recommended by Parker for air cylinders where lubrication should remain in the cylinder and not be expelled into the atmosphere.

When servicing the valve actuator air cylinder, it is recommended that a complete set of replacement seals be installed.

## Disassembly Of Cylinder

 **WARNING:** Some cylinders are manufactured with internal springs. A tag on the cylinder body normally warns if the cylinder has a spring. Special precautions must be exercised in disassembling these cylinders. Failure to follow this procedure can cause severe injury to personnel in the general area. All springs installed in these cylinders are always under compression, even when the piston is in an unloaded position. Always strictly follow the procedures described by Bulletin 0805-G-TSD-1 for the disassembly and re-assembly of cylinders containing springs.

### Replacing Piston Rod Bearings and/or Seals

All bore sizes except 2" and 2 1/2" bore units offer the ability to replace the piston rod bearing and/or seals without disassembling the cylinder. For these units, do the following:

- Step 1: Remove retaining ring from the front of the cylinder head.
- Step 2: Use two small screwdrivers to pry bearing from head.
- Step 3: Remove all seals from bearing.
- Step 4: Inspect bearing and piston rod for any excessive wear or damage. Any damaged or excessively worn parts should be replaced.
- Step 5: Clean all parts thoroughly.

### Installation Of Rod Seal

- Step 1: All parts must be clean and free of any contaminants.
- Step 2: Lubricate and install new o-ring into groove in the head.
- Step 3: \*Lubricate and install seals into bearing.
- Step 4: Slide bearing onto rod and press it into the head.
- Step 5: Install retaining ring into head.
- Step 6: Make sure retaining ring is properly seated in its groove.

\*This step is not necessary if replacing new bushing and seal assembly.

### Replacing Piston Seals, Piston Wear Bands or Piston Rod Seals

- Step 1: Record the tie rod extension length on the cylinder head.
- Step 2: Disassemble the cylinder on a bench by removing the four (4) cylinder tie rod nuts from the cap side of the cylinder.

- Step 3: Remove the cylinder head.
- Step 4: Remove the piston rod assembly from the cylinder body.
- Step 5: Remove the cylinder body.
- Step 6: Inspect the inside diameter of the cylinder body for evidence of scoring. (Light scratch marks will generally cause no difficulty).
- Step 7: Remove the front retaining ring from head.
- Step 8: Use two small screwdrivers to pry bearing from head or push bearing out from the opposite side.
- Step 9: Remove all seals and worn parts from cylinder, including: bearing o-ring, bearing seal, o-ring end seals, and rod wiper/lip seal. Also remove quad seal or lipseals from piston, and in bore sizes 16" and larger, remove piston wear ring.
- Step 10: Clean all parts thoroughly.
- Step 11: Inspect all parts; head, cap, piston and piston rod for any excessive wear or damage. Any damaged or excessively worn parts should be replaced.

### Re-Assembly Of Cylinder

- Step 1: All parts must be clean and free of any contaminants.
- Step 2: All seals, o-rings and other parts must be lubricated and ready before assembly begins.
- Step 3: Lubricate and install new o-rings into grooves on the head and cap.
- Step 4: Lubricate the inside diameter of the cylinder body and the outside diameter of the piston and/or piston wear ring with Lube-A-Cyl.
- Step 5: Install piston quad seal or lipseals into groove(s) of piston, then install piston wear ring on actuators 16" bore or larger. Use the following directions for lipseals:
  - a. Install one piston seal in the groove nearest to the rod (the two lips of the lipseal should face the rod end of the piston).
  - b. Lay cylinder body on its side, and push piston and rod assembly through barrel just far enough to expose groove for second seal.
  - c. Install the second piston seal.

*(continued)*

**Re-Assembly Of Cylinder** *(continued)*

- Step 6: Lubricate and install seals into bearing.
- Step 7: \*Lubricate and install rod wiper/lipseal into cylinder head.
- Step 8: Press bearing into head.
- Step 9: Install retaining ring into head.
- Step 10: Make sure retaining ring is properly seated in its groove.
- Step 11: Place cap on bench on top of a spacer block to allow tie rods to go through cap.
- Step 12: Place cylinder body and piston and rod assembly (as a unit) into cap.
- Step 13: Install head onto cylinder tube. Use caution when passing piston rod through head to avoid damage to bearing and rod wiper/lipseal. Also make sure tube end seal (47) stays in its groove and is not damaged or pinched.
- Step 14: Apply a thread lubricant to the tie rod threads on the cylinder cap side, and install tie rod nuts hand tight.

- Step 15: Check tie rod extension length on the cylinder head side; adjust it if necessary to the same length as measured during Step 1 of the disassembly procedure.
- Step 16: Apply torque, across corners, to tie rod nuts to the recommended torque values on the chart listed on the following page.

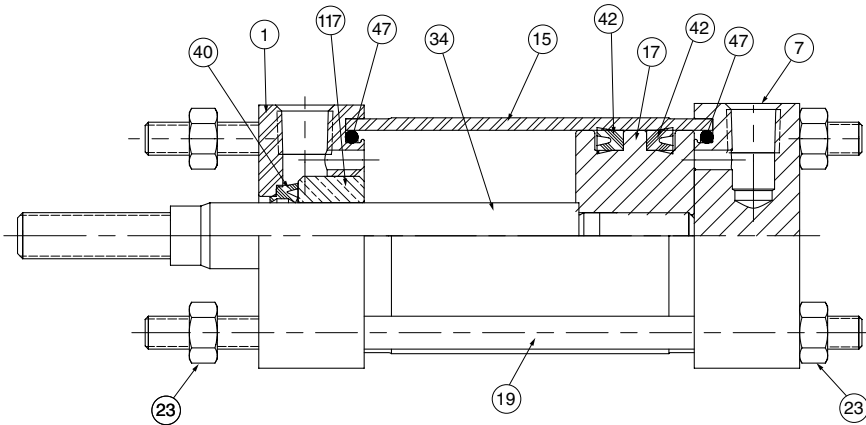
Service kits of expendable parts for fluid power cylinders are stocked in principal industrial locations across the U.S.A. and other countries. For prompt delivery and complete information, contact your nearest Cylinder Division distributor or office.

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

**Standard Seals** — Class 1 Service Kits are standard and contain Buna-N seals for standard fluid service. These seals are suitable for use on air service. The recommended operating temperature range for Class 1 seals is -10°F (-23°C) to +165°F (+74°C).

\*This step is only for cylinders without removable bearings.

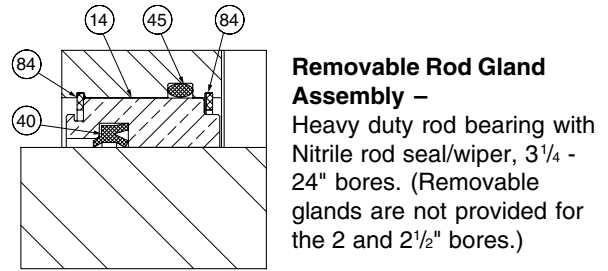
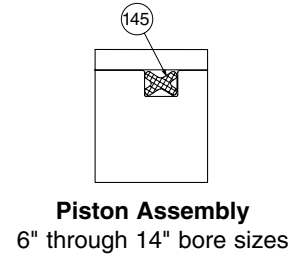
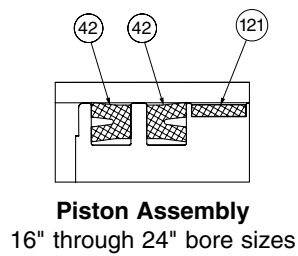
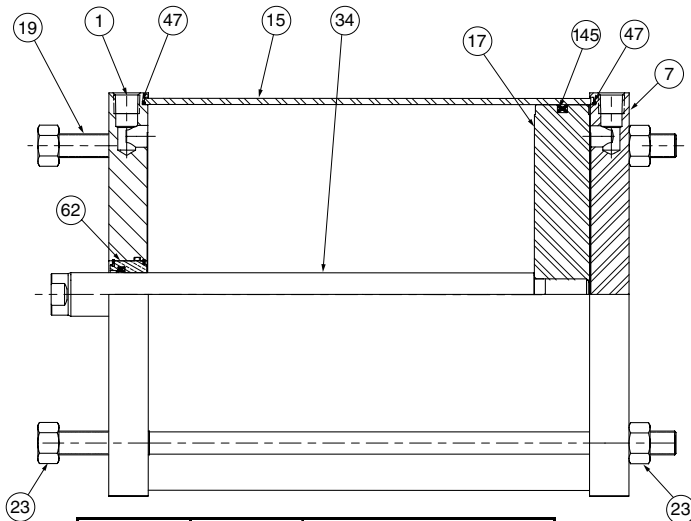
**Series VL Parts Listing – 2" and 2 1/2" Bore Sizes**



Item	Qty.	Description
1	1	Head
7	1	Cap
15	1	Cylinder Body
17	1	Piston Body
19	4	Tie Rod
23	8	Tie Rod Nut
34	1	Piston Rod
40	1	Rod Wiper/Lipseal
42	2	Piston Lipseal
47	2	Cylinder Body O-Ring
117	1	Rod Bearing

Valve Actuator Cylinder Kits are complete and consist of the following: 40 (1 ea.), 42 & 47 (2 ea.)				
Bore Size	Rod Dia.	Class 1 Seal Kit Nos. Containing Piston and Body Seals	Tie Rod Size (inches)	Tie Rod Not Torque* (ft. lbs./N-m)
2	5/8	PK0200VL01	5/16-24	11/15
2 1/2	5/8	PK0250VL01	5/16-24	11/15

**Series VL Parts Listing – 3 1/4" through 24" Bore Sizes**



Item	Qty.	Description
1	1	Head
7	1	Cap
14	1	Gland
15	1	Cylinder Body
17	1	Piston Body
19	4	Tie Rod
23	8	Tie Rod Nut
34	1	Piston Rod
40	1	Rod Wiper/Lipseal
42	2	Piston Lipseal
45	1	Gland O-ring
47	2	Cylinder Body O-Ring
62	1	Gland Assembly
84	2	Retaining Ring
121	1	Piston Wear Ring
145	1	Piston Quad Seal

**⚠ 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 failure and review the information concerning the product or system in the correct 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, design, availability and pricing are subject to change by the Company and its related companies at any time without notice.

**Valve Actuator Cylinder Repair Kits**

Bore Size	Rod Dia.	Class 1 Rod Gland Seal Kit Nos. Containing 14, 40 & 45 (1 ea.)	Class 1 Rod Seal Kit Nos. Containing 40 & 45 (1 ea.)	Class 1 Piston Seal Kit Nos. Containing 121† or 145‡ (1 ea.), 47 & 42†† (2 ea.)	Tie Rod Size (inches)	Tie Rod Nut Torque* (Steel Tube) (ft. lbs./N-m)
3 1/4	1"	RGVL000101	RKVL000101	PK0325VL01	3/8-24	25/34
4	1"	RGVL000101	RKVL000101	PK0400VL01	1/8-24	25/34
5	1"	RGVL000101	RKVL000101	PK0500VL01	1/2-20	60/81
6	1"	RGVL000101	RKVL000101	PK0600VL01	1/2-20	60/81
7	1"	RGVL000101	RKVL000101	PK0700VL01	5/8-18	90/122
8	1"	RGVL000101	RKVL000101	PK0800VL01	5/8-18	110/149
10	1"	RGVL000151	RKVL000151	PK1000VL01	3/4-16	148/201
12	1 3/8"	RGVL000131	RKVL000131	PK1200VL01	3/4-16	172/233
14	1 3/8"	RGVL000131	RKVL000131	PK1400VL01	7/8-14	275/373
16	1 3/4"	RGVL000171	RKVL000171	PK1600VL01	1-14	390/529
18	2"	RGVL000201	RKVL000201	PK1800VL01	1 1/8-12	540/732
20	2"	RGVL000201	RKVL000201	PK2000VL01	1 1/4-12	745/1010
22	3"	RGVL000301	RKVL000301	PK2200VL01	1 1/4-12	745/1010
24	3 1/2"	RGVL000351	RKVL000351	PK2400VL01	1 1/4-12	745/1010

\* Tolerance of -0%, +5%; when assembling the cylinder, be sure to torque the tie rods evenly.  
 † Symbol 121 required on 16" thru 24" bore size cylinders. ‡ Symbol 145 required only on 6" thru 14" bore size cylinders.  
 †† Symbol 42 required on 2" thru 5", and 16" thru 24" bore cylinders.