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Maintenance Instructions For

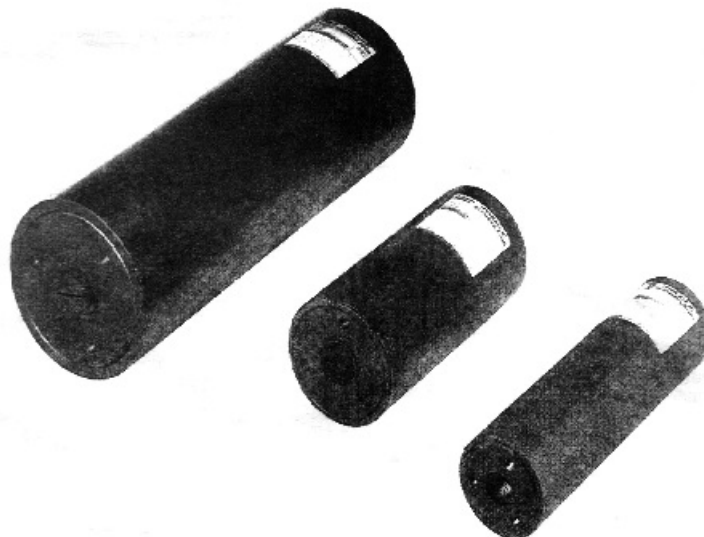
Hydraulic Piston Accumulators

Installation

Most accumulators shipped from the factory will not be pre-charged. However, in some cases they will be shipped with some amount of nitrogen charge, the value of which will be stamped on the nameplate.

Keep the hydraulic port covered to keep out foreign material until ready to make the hydraulic connections.

The accumulator can be mounted in any orientation. However, it should be rigidly mounted using any combination of the mounting holes provided at the hydraulic cap or proper clamps. The hydraulic circuit, which contains a connection to the accumulator should be designed so that it automatically discharges all hydraulic fluid from the accumulator when the equipment is turned off.



PRE-CHARGING

Use an Inert gas such as nitrogen for pre-charging accumulators.

If water pumped nitrogen is not available, oil-pumped nitrogen may be used.

Nitrogen source and all components must be rated for a pressure at least as high as the as the nitrogen source. It is strongly recommended that the nitrogen bottle used have a high pressure regulator.

Make sure nitrogen supply is shut off. Attach hose to nitrogen bottle. If accumulator has a gas valve as shown in figure 2 follow steps A through J and skip steps AA through HH. If accumulator has a gas valve as shown in figure 3, skip steps A through J and follow steps AA through HH.

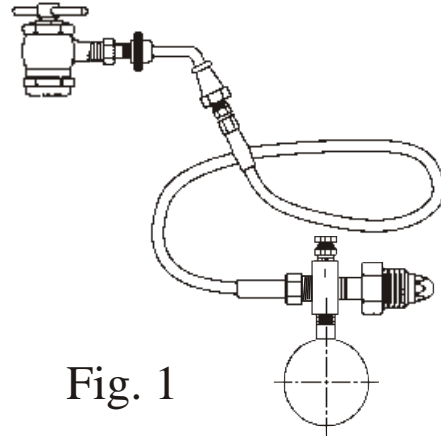


Fig. 1

Accumulator having gas valve as per figure 2.

- (A) Remove the gas valve guard and gas valve cap.
- (B) Turn tee handle on the nitrogen charging chuck all the way in the counterclockwise direction. Attach the appropriate nitrogen charging chuck to the nitrogen charging valve.
- (C) Close the bleed valve.
- (D) Making sure not to loop or twist the hose, attach swivel nut to gas valve and tighten (10-15 in. Lb.).
- (E) Turn gas chuck "T" handle all the way down. This will depress core in gas valve.
- (F) Crack open nitrogen bottle valve and **slowly** fill accumulator. Shut off when gage indicates desired pre-charge.
- (G) Let the pre-charge set for 10 to 15 minutes. This will allow the gas temperature to stabilize. If the desired pre-charge is exceeded, close nitrogen bottle valve, then slowly open bleed valve. Do not reduce pre-charge by depressing valve core with a foreign object. High pressure may rupture rubber valve seat.
- (H) When finished pre-charging accumulator, turn "T" handle all the way out on gas chuck, then open bleed valve.
- (I) Hold gas valve to keep from turning, loosen swivel nut, remove assembly.
- (J) Replace gas valve cap (10-15 in. Lbs.) and valve guard.

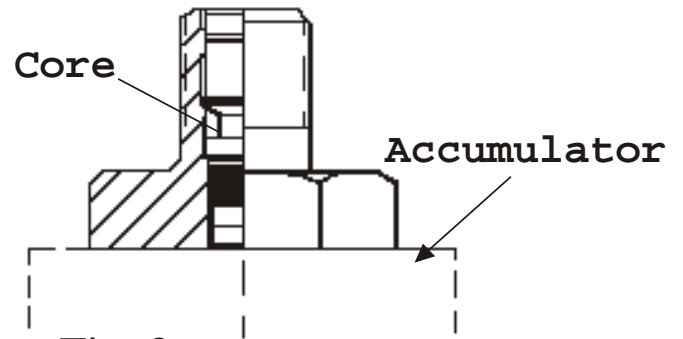


Fig. 2

Accumulator having gas valve as per Figure 3.

- (AA) Remove gas valve guard and gas valve cap.
- (BB) Close bleed valve and, making sure not to loop or twist the hose, attach swivel nut to gas valve and tighten (10-15 in. Lb.).
- (CC) Hold gas valve at point "C" with one wrench while unscrewing hex nut at point "D" with a second wrench. This will open the poppet inside the gas valve. Note: four (4) turns will fully open the valve.
- (DD) Crack open nitrogen bottle valve and **slowly** fill accumulator. Close nitrogen bottle valve when gage indicates desired pre-charge.
- (EE) Let the pre-charge set for 10 to 15 minutes. This will allow the gas temperature to stabilize. If the desired pre-charge is exceeded, close nitrogen bottle valve, slowly open bleed valve until desired pressure is reached (Figure 3).
- (FF) With a wrench, tighten hex nut at point "D" to close internal poppet (5-8 ft. Lbs.).
- (GG) Hold gas valve at point "C" with wrench and remove swivel nut assembly.
- (HH) When pre-charging has been completed, replace gas cap and tighten (10-15 in. Lb.), install gas valve guard.

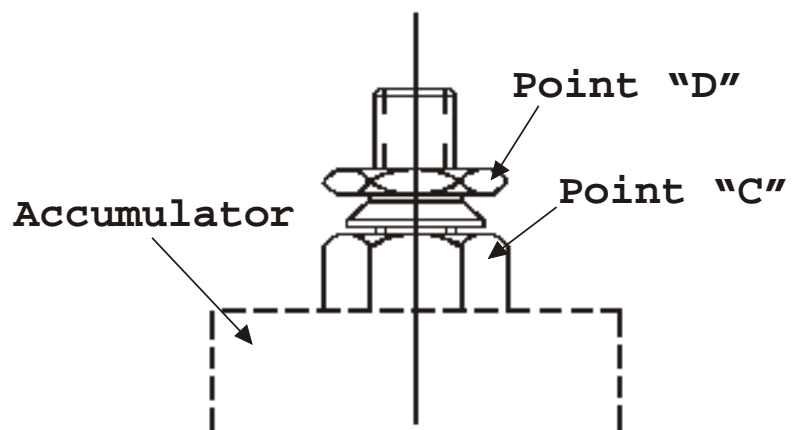


Fig. 3

Maintenance

Repair kits (See Parts List) are available for all accumulator models. When ordering repair kits, state complete model number from nameplate. Also specify fluid and temperature at which used.

Occasional replacement of v-o-ring seal on the piston is generally the only maintenance required. Replacement of other seals on end caps and gas valve is recommended (see Kit Numbers).

Periodic checking of pre-charge pressure will detect whether v-o-ring wear is sufficient to begin reducing sealing performance. If pre-charge is low, also check for gas valve and/or end seal leakage. Allowing for temperature difference, if any, from time of its pressure checking, pre-charge pressure will rise if oil gathers in the gas side and will fall if gas leaks into the oil side or out past gas end seals. It is suggested that a check be made a week after installation, and thereafter once a month.

Pre-charge Check Procedure

Using appropriate valve in the hydraulic system, discharge all oil from accumulator and allow piston to bottom against hydraulic end cap.

For accumulators rated for 3000 psi or less, use assembly RC-0185 as shown in Figure 1.

Accumulators having gas valve as per Figure 2.

1. Remove gas valve guard and gas valve cap.
2. Back gas chuck "T" handle all the way out (counterclockwise) before attaching charging assembly to accumulator gas valve.
3. Close bleed valve.
4. Attach swivel nut to gas valve and tighten (10-15 in. lbs.).
5. Turn gas chuck "T" handle all the way down. This will depress core in gas valve and check pressure.
6. To remove gaging assembly turn "T" handle all the way out on gas chuck (Figure 1), then open bleed valve.
7. Hold gas valve from turning, loosen swivel nut, remove assembly.
8. Replace gas valve cap (10-15 in. lbs.) and valve guard.

Accumulators having gas valve as per Figure 3.

1. Remove gas valve guard and gas valve cap.
2. Close bleed valve.
3. Attach swivel nut to gas valve and tighten (10-15 in. lbs.).
4. Hold gas valve at point "C" with one wrench while unscrewing hex nut at point "D" with a second wrench. This will open the poppet inside the gas valve. Turn 2-3 times and read pre-charge.
5. With a wrench, tighten hex nut at point "D" to close internal poppet (5-8 ft. lbs.).
6. Hold gas valve at point "C" with a wrench and remove swivel nut assembly.
7. Replace gas cap and tighten (10-15 in. Lbs.), and install gas valve guard.

Remove from Hydraulic System

Shut equipment down and make certain that hydraulic pressure at the accumulator is at zero. At this point the piston will be bottomed at the hydraulic end.

For accumulators having gas valve as shown in Figure 5, attach gaging assembly as shown in Figure 2 following Steps 1 through 5. Then, open bleed valve until all gas pre-charge is relieved from accumulator. Then remove gaging assembly and gas valve.

For accumulators having gas valve as shown in Figure 6, remove gas valve guard and gas valve cap. Then hold valve at point "C" with one (1) wrench while unscrewing hex nut at point "D" with a second wrench. Wait until all gas pre-charge is relieved from the accumulator and then remove gas valve.

Remove accumulator from hydraulic system. Threaded holes in hydraulic cap may be used as a means of attachment for lifting, or use a sling around the body.

Disassembly of Accumulator

Lay the accumulator horizontal and hold down with a strap wrench or in a vise. Some accumulators may have both end caps threaded into the body and some units may only have the gas cap threaded into the body. IN BOTH CASES ALWAYS REMOVE THE GAS CAP FIRST (end cap which contained gas valve). To remove cap or caps, install three (3) pins into the holes in the cap, then, using a long bar working against the pins, unthread the cap from the body. Remove o-rings and back-up rings from end cap.

Remove piston by pushing from hydraulic end with a bar. NEVER TRY TO REMOVE PISTON BY APPLYING COMPRESSED AIR AT OPPOSITE END. To remove v-o-ring from piston, lift seal with small smooth screw driver or similar tool, moving the tool around the piston several times while using the other hand to work ring off the piston.

Cleaning

Thoroughly clean metal parts in solvent and dry with compressed air. Clean bore of body with a clean, lint-free cloth soaked in clean solvent. Bore must be clean of any visible particles or particles detectable by touch.

Inspection

Inspect piston for cracks, burrs around o-ring grooves, or damage. Examine body bore, using a light, for scratches or scoring. Inspect end caps for damaged threads or burrs on o-ring grooves.

Repair and Replacement

Minor nicks, scratches or light scoring of the body bore can be removed by using crocus cloth. Dress bore until all apparent imperfections have been removed. Replace teflon wear rings, v-o-ringss, o-rings and their respective back up washers if the original assembly contained them.

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Reassembly

Coat all internal parts with clean hydraulic fluid before reassembly.

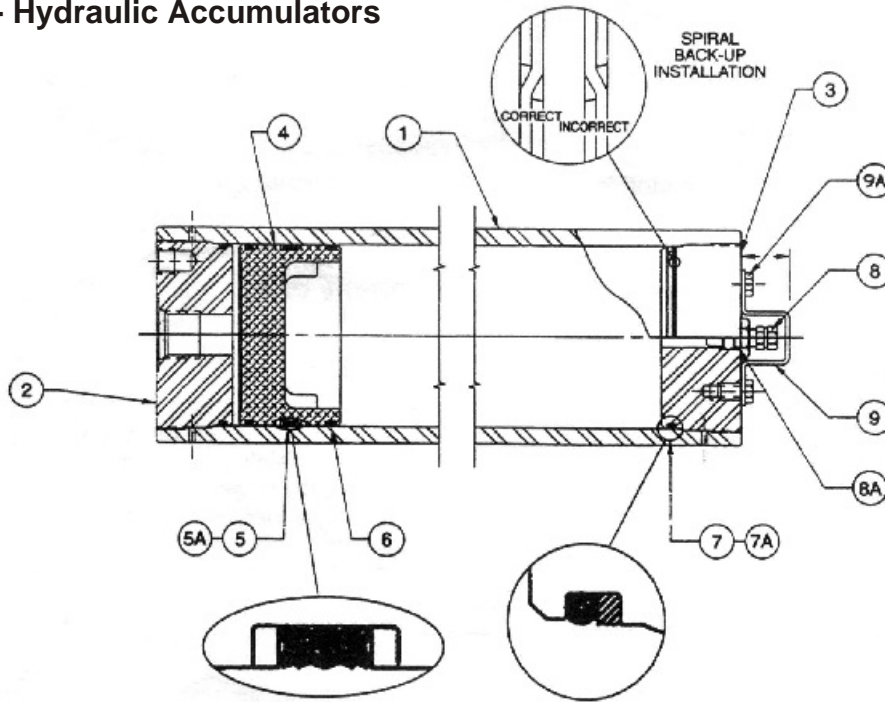
With new v-o-ring and Teflon rings on piston, install piston, hollow side toward gas end, in bore of body. Do not let v-o-ring drag on threads. Piston must go into bore exactly square and very slowly. (V-o-ring will compress as it rides up the chamfer if done slowly, but may be damaged if forced quickly.) Piston will fit snug. Use hammer and wood block to tap piston into place until all of piston is 2 inches below beginning of honed bore. Keep force against piston while tapping v-o-ring through the bore chamfer, otherwise piston will bounce back, damaging the o-ring. Cover port opening to keep out dirt.

Install new back-up ring first, then a new o-ring on threaded end cap or caps and install into body bore. Care should be exercised not to drag o-ring over threads. End cap will stop against chamfer leading into honed bore (extreme tightness not required -- o-ring sealing is not dependent upon cap tightness). Cap should be flush with or above the end of accumulator body within 1/32" to 3/32".

Install gas valve after replacing the o-ring.

Remount accumulator and connect to hydraulic system. Pre-charge accumulator using procedure outlined on page 2 (where space is a problem it may be necessary to pre-charge accumulator before connecting it to the hydraulic system).

Parts List - Hydraulic Accumulators



| Item | Part Description | |
|-------|--------------------------|--|
| 1* | Body | * Some units may have these two components welded together |
| 2* | Hydraulic Cap | |
| 3 | Gas Cap | ** Not used on 2", 3", 4" and 5-3/4" bore 3000 PSI units |
| 4 | Piston | |
| 5 | V-O-Ring | ** Not used on 2" bore units |
| 5A*** | V-O-Ring Back-Up Washers | ▲ A.S.M.E. Units, 7", 9" and 12" bore sizes, units rated above 3000 PSI will have valve per Figure 6 on page 2 (Part No. 6124330000). Other units will have gas valve per Figure 5 on page 2 (Part No. L074710000) which will contain gas valve core Part No. 5822220000. Use tool (Part No. 5824410000) to remove and replace new core. |
| 6 | Teflon Ring (Piston) | |
| 7** | O-Ring | |
| 7A** | O-Ring Back-Up Washer | |
| 8▲ | Gas Valve | |
| 8A | Gas Valve O-Ring | |
| 9 | Gas Valve Guard | |
| 9A | Screw | |

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 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.

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3000 PSI Seal Kit Numbers (Includes items 5, 5A, 6, 7, 7A, 8A)

| Material | Bore Size | | | | | | |
|----------------------|------------|------------|------------|------------|------------|------------|------------|
| | 2" | 3" | 4" | 5-3/4" | 7" | 9" | 12" |
| (Standard) Buna-N | 592850K000 | 3865894000 | 592851K000 | 6660254000 | 656100K000 | 716017K000 | 816126K000 |
| Viton | 592850E000 | 386589E000 | 592851E000 | 666025E000 | 656100E000 | 716017E000 | 816126E000 |
| EPR | 592850D000 | 386589D000 | 592851D000 | 666025D000 | 656100D000 | 716017D000 | 816126D000 |
| Carboxylated Nitrile | 592850L000 | 386589L000 | 592851L000 | 666025L000 | 656100L000 | 716017L000 | 816126L000 |
| Low Temp Nitrile | 592850Q000 | 386589Q000 | 592851Q000 | 666025Q000 | 656100Q000 | 716017Q000 | 816126Q000 |

5000 PSI Seal Kit Numbers (Includes items 5, 5A, 6, 7, 7A, 8A)

| Material | Bore Size | | | | | |
|----------------------|------------|------------|------------|------------|------------|------------|
| | 2" | 4" | 5-3/4" | 7" | 9" | 12" |
| (Standard) Buna-N | 086669K000 | 086670K000 | 086671K000 | 086686K000 | 086687K000 | 086688K000 |
| Viton | 086669E000 | 086670E000 | 086671E000 | 086686E000 | 086687E000 | 086688E000 |
| EPR | 086669D000 | 086670D000 | 086671D000 | 086686D000 | 086687D000 | 086688D000 |
| Carboxylated Nitrile | 086669J000 | 086670J000 | 086671J000 | 086686J000 | 086687J000 | 086688J000 |
| Low Temp Nitrile | 086669Q000 | 086670Q000 | 086671Q000 | 086686Q000 | 086687Q000 | 086688Q000 |

Service Bulletin Supplement For Hydraulic Piston Accumulators

Design Improvements on 2", 3", 4" & 6" Bore Piston Accumulators - Back-Up Washers Added Effective February 1, 1997, all Piston Accumulators will have two V-O-Ring Back Up Washers (Item 5A) and two End Cap O-Ring Back Up Washers (Item 7A). All Seal Kits have been changed to reflect the design improvement and will now include all four back up washers. During disassembly, it is recommended that the piston and end caps be examined for these back up washers should be discarded. Older designs do not allow for the use of these back up washers. Failure to follow these instructions can cause property damage and/or personal injury or death. The following charge outlines the changes by Bore Size and Pressure Rating:

| 3000 PSI | | | Accumulator Identification | | |
|-----------|--|-----------------------------------|----------------------------------|----------------------|--|
| Bore Size | V O-Ring Back Up Washer (Item 5A) | End Seal Back Up Washer (Item 7A) | Model Number | Serial Number | Use or discard Back Up Washers |
| 2" | Added 2/1/97 | Added 2/1/97 | A2A---A- A2J---A- A2N---D- | Less Than BB200000 | Discard Items 5A & 7A <i>Use all other Seals Supplied</i> |
| | | | A2N---D- | Larger Than BB200000 | Use all Seals Supplied in Kit |
| 3" | Added 2/1/97 | Added 2/1/97 | A3A---A- A3J---A- A3N---D- | Less Than BB200000 | Discard Items 5A & 7A <i>Use all other Seals Supplied</i> |
| | | | A3N---D- | Larger Than BB200000 | Use all Seals Supplied in Kit |
| 4" | No Change Included w/ Standard Design | Added 2/1/97 | A4A---A- A4J---A- A4N---D- | Less Than BB200000 | Discard Item 7A <i>Use all other Seals Supplied</i> |
| | | | A4N---D- | Larger Than BB200000 | Use all Seals Supplied in Kit |
| 6" | No Change Included w/ Standard Design | Added 2/1/97 | A6R---B- A6J---B- A6N---D- | Less Than BB200000 | Discard Item 7A <i>Use all other Seals Supplied</i> |
| | | | A6N---D- | Larger Than BB200000 | Use all Seals Supplied in Kit |
| 7" - 12" | No Change Included w/Standard Design | | Use all Seals Supplied in Kit | | |
| 5000 PSI | | | Accumulator Identification | | |
| Bore Size | V O-Ring Back Up Washer (Item 5A) | End Seal Back Up Washer (Item 7A) | Model Number | Serial Number | Use or discard Back Up Washers |
| 7" - 12" | No Change Included w/Standard Design | | Use all Seals Supplied in Kit | | |

| | |
|---|--|
| <p>Old style with out Back Up Washers</p> | <p>Item 5A V O-Ring Back Up Washer</p> |
| <p>New style with Back Up Washers</p> <p>Item 7A Item 5A</p> | <p>Item 7A End Cap Back Up Washer</p> |

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