



**BLADDER INSTALLATION,
OPERATION & CARE
FOR BLADDER ACCUMULATORS**



www.accumulators.com

The user is the sole responsible party to ensure proper selection, installation, operation and maintenance of these products and to follow all safety procedures. Please see accumulators.com for detailed instructions and warranty information, as well as our terms and conditions of sale. Contact the Acc Inc sales department with any questions.

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For more detailed instructions, please visit our website at: www.accumulators.com

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WARNING



**⚠ READ ALL WARNINGS BEFORE PROCEEDING WITH INSTRUCTIONS!
FAILURE TO FOLLOW INSTRUCTIONS WILL VOID YOUR WARRANTY!**

- ⚠ For 2,000 thru 10,000-psi Bladder Accumulators. For charging other pressure vessels, contact us.
- ⚠ High Pressure Gas in Dangerous!
- ⚠ Only a qualified service technician should perform a precharge.
- ⚠ Never use oxygen or shop air!
- ⚠ Precharge with industrial grade dry nitrogen (N₂) gas or better only!
- ⚠ Do not operate an accumulator without a proper nitrogen gas precharge.
- ⚠ Release all system hydraulic and pneumatic pressure before attempting any maintenance or service.
- ⚠ Use only genuine ACC INC approved charging and gauging equipment for precharging and pressure check.
- ⚠ Wear proper eye protection, steel-toed shoes, and take proper safety precautions before attempting any maintenance or service.
- ⚠ Slowly increase initial precharge pressure to approximately 35 psig until the bladder is fully inflated. Precharge to a minimum of 30% of maximum available working pressure. Only introduce high pressure to the desired psig after the bladder has fully inflated and the poppet has closed.



WARNING



NOTE: All bladders are shipped from the factory with no precharge. Most accumulators are shipped with just minimal pressure. It is solely the responsibility of the user to determine the proper precharge level and to ensure that suitable pressure is maintained at all times. In general, precharge should equal 30% to 80% of the maximum system pressure, depending on the application.

DO NOT BEND OR FOLD THE BLADDER! THIS CAN CAUSE THE BLADDER TO BURST.

BLADDER REPLACEMENT- BOTTOM REPAIRABLE REMOVAL

1. Turn off your system (equipment), release all fluid pressure.
 2. Remove protective cap and valve cap from accumulator.
 3. Install genuine ACC INC approved charging and gauging assembly appropriate to the system pressure rating on gas valve stem by attaching the air chuck to the bladder gas valve by hand tightening its swivel hex connection, *see photo 1*. For all top-repairable models use a TR Valve Extension (AI-TR-015).
- A. For 3000 psi accumulators. Turn the air chuck " T " handle clockwise until it stops. This opens the valve core.
- B. For 4000 psi and higher accumulators. Open the valve by turning its top (small) hex nut, counter-clockwise. The use of a second wrench to hold the chuck in-place is recommended (AI-515), *see photo 2*.
1. Bleed off all nitrogen gas by opening up the bleed valve located on the charging head completely. (For 4000 psi or higher accumulators, the gas valve must also be opened).
 2. Remove the gauging device from gas valve stem.
 3. Release any remaining gas pressure from accumulator. (For a 3000 psi accumulator, remove the valve core from gas stem using core tool. For 4000 psi or higher accumulators, open the gas valve fully, then remove gas valve).
 4. Remove accumulator from system, then remove the hex jam nut and nameplate from the gas end. Remove the lock nut from bottom of unit using an Accumulators, Inc. approved spanner wrench and remove the spacer and rings.
 5. Push the plug and poppet assembly into the accumulator and through the Anti-Extrusion ring, remove AE ring by tri-folding it and pulling it through the hole.
 6. Remove the plug and poppet assembly.
 7. Pull the old bladder out of the bottom of the accumulator.

TOP REPAIRABLE REMOVAL

- A. Option 1 (preferred method): removing through the bottom (fluid) end:

1. Follow all procedures above. DO NOT remove the TR adapter at the gas end.
- B. Option 2: Removing the bladder from the top without removing the accumulator from the system:
 1. Follow steps 1-7 in the BLADDER REPLACEMENT-REMOVAL section above.
 2. DO NOT remove the accumulator from the system.
 3. Remove the TR adapter lock nut at top end of unity using an Accumulators, Inc. approved spanner wrench (AI-505) then remove the spacer and rings.
 4. Push the TR adapter into the accumulator and through the AE ring. Remove the AE ring by folding it ½ and pulling it through the hole.
 5. Pull the TR adapter and bladder out of the accumulator.
 6. Remove the hex jam nut from the bladder stem. Separate the bladder from the TR adapter.

BLADDER REPLACEMENT- INSTALLATION

1. Remove the valve core on a 3000-psi supplied bladder OR remove the gas valve supplied on a 4000 psi or higher accumulator from the new bladder. Squeeze all the air out by rolling the bladder like a tube of toothpaste.
2. Replace the valve core or gas valve. Unfold bladder completely.
3. Reinstall the valve core or gas valve and unroll the bladder.
4. Lubricate all surfaces of the bladder and shell liberally with system fluid to prevent sticking.
5. Attach a bladder pull rod to the bladder by carefully threading the female end to the male end of the gas-valve. Insert the rod through the accumulator bottom and pull it through the top hole. Do not allow the bladder to bind or kink. Make sure the gas valve and gas stem are sticking out completely at the top end hole.
6. Remove the pull rod.
7. Attach the nameplate and hex nut to the exposed gas valve stem. Hand tighten.
8. Push the plug and poppet assembly with threads facing out, followed by the anti-extrusion ring flat side facing the bladder into the accumulator.
9. Pull the plug and poppet assembly back through the anti-extrusion ring. Seat ring in hole, metal side down.
10. Install a NEW metal back up ring (AI-S-412), o-ring (be careful not to pinch the o-ring), rubber back up ring (AI-S-411), spacer, and lock nut (hand tighten). Precharge the accumulator (see instructions below).
11. Hand tighten the hex jam nut making sure the gas valve stem DOES NOT rotate or that the bladder twists, *see photo 3*. The use of two (2) wrenches is recommended. Tighten locknut on fluid end to maximum torque.

TOP REPAIRABLE INSTALLATION

A. If using Option 1 (the preferred method) through the bottom, follow steps 1-10 above in the BLADDER REPLACEMENT-INSTALLATION section.

B. If using Option 2 (through the top), follow steps below:

1. Follow steps 1-3 in the BLADDER REPLACEMENT-INSTALLATION section.
2. Attach a bladder pull rod to the bladder, carefully threading it to the gas valve. Push the bladder down through the open top end hole. DO NOT allow the bladder to bind or kink.
3. Push bladder stem into the accumulator.
4. Install the TR adapter by placing it outside the rod and pushing it into the accumulator.
5. Place an AE ring over the rod and drop it into the accumulator by folding it 1/3rd.
6. Pull the bladder stem through the AE ring and TR adapter and pull the entire assembly out of the accumulator making sure to seat the AE, bladder and TR adapter.
7. Attach the hex jam nut following steps 9-10 in the BLADDER REPLACEMENT-INSTALLATION section.

PRECHARGING INSTRUCTIONS

If the accumulator is already installed on a system:

A. Pump or pour a small amount of system fluid (10% of accumulator capacity) into the accumulator, at low pressure.

B. Turn off all power to the system and make sure all fluid pressure is released prior to precharge.

OR

If accumulator is not yet installed:

NOTE: Accumulators should be installed as soon as possible after receipt. If the accumulator will be kept in storage longer than 30 days, contact us for instructions.

A. The accumulator will normally be fully lubricated at the factory and charged with a minimal precharge to close the poppet valve.

If the poppet is open (indicated by a fluid leak at the fluid end, if the accumulator has been exposed to heat, or stored longer than 90 days), manually install fluid to 10% of the accumulator volume. See commissioning instructions shipped with the accumulator for more information.

1. Remove the protective cap and valve cap. DO NOT REMOVE THE GAS VALVE.
2. Attach the gland and nut portion of the charging assembly (AI-CG3-3KT-SS for 3000 psi accumulators, AI-CG6-6KT-SS for 4000 psi and higher) to a dry nitrogen gas bottle and tighten securely, *see photo 4*. NOTE: If the gland and nut do not fit, the wrong gas or wrong pressure is being used.
- 3a. For 3000 psi accumulators: Rotate "T" handle counter clockwise so it is all the way out before attaching air chuck, opening the valve core. Attach the air chuck to the bladder accumulator gas valve by hand, tightening its swivel hex connection, *see photo 1*. Tighten with a hand wrench if loose. For top-repairable models, use a TR Valve Extension (AI-TR-015). Connect the swivel connector to the tank valve located on the charging head assembly and tighten.
- 3b. For 4000 psi and higher accumulators: Open the valve by turning its top hex nut counter-clockwise, making sure not to twist the bladder, *see photo 3*.
- 4a. If using a nitrogen gas regulator, temporarily set it to 35 psig and open the nitrogen gas valve, then set the regulator to the desired psig level.
- 4b. If you are not using a nitrogen gas regulator, care should be taken to slowly "crack" the valve open. The use of a nitrogen gas regulator is strongly recommended since the valve can be opened fully using a regulator set to 35 psig.
5. Begin precharge slowly (35 psig) using dry nitrogen gas, until the bladder is fully inflated. (Full inflation is indicated by the sound of the poppet closing).
6. Continue precharging to desired pressure by increasing gas flow slowly. Gas will adjust to ambient temperature following precharge. Recheck pressure after 15 minutes.
- 7a. For 3000 psi accumulators: Turn the air chuck "T" handle counter-

clockwise until it stops. This closes the valve core.

For 4000 psi and higher: close the valve by turning its top hex nut clockwise.

Remove the charging assembly from the accumulator. Check for gas leakage. (The use of gas leak detection fluid or soapy water is recommended). Put the valve cap on if pressure stays constant after 30 minutes. If not, repeat steps 1-11. When pressure is constant, install protective cap. Tighten hex jam nut firmly.

Install the protective cap and Accumulators, Inc. nameplate and hand tighten.

If not previously installed, install the accumulator on the system. Check for fluid leakage.

Pressurize system and operate. Precharge to minimum of 30% of operating pressure.

PRECHARGE MAINTENANCE

- For cycling applications, check the precharge weekly.
 - For non-cycling applications, check monthly.
 - Some gas will be lost over time due to premeance.
 - A more rapid loss may indicate a gas valve or bladder problem.
1. Release system fluid pressure, not the gas precharge.
 2. Remove gas protective cap and valve cap. DO NOT REMOVE THE GAS VALVE.
 3. Install Accumulators, Inc. approved gauging device on the gas valve stem.
 4. For 3000 psi accumulators: Screw down air chuck "T" handle and check pressure.
 5. For 4000 psi and higher: Open gas valve top hex fitting keeping bottom hex tight, *see photo 2*. Check gas pressure.
 6. Add additional dry nitrogen gas if necessary using the above procedures, steps 5-12, 14.
 7. To release excess nitrogen gas (if any), open the bleed valve located at the bottom of the gauging device until desired pressure is achieved. Recheck the gas precharge.

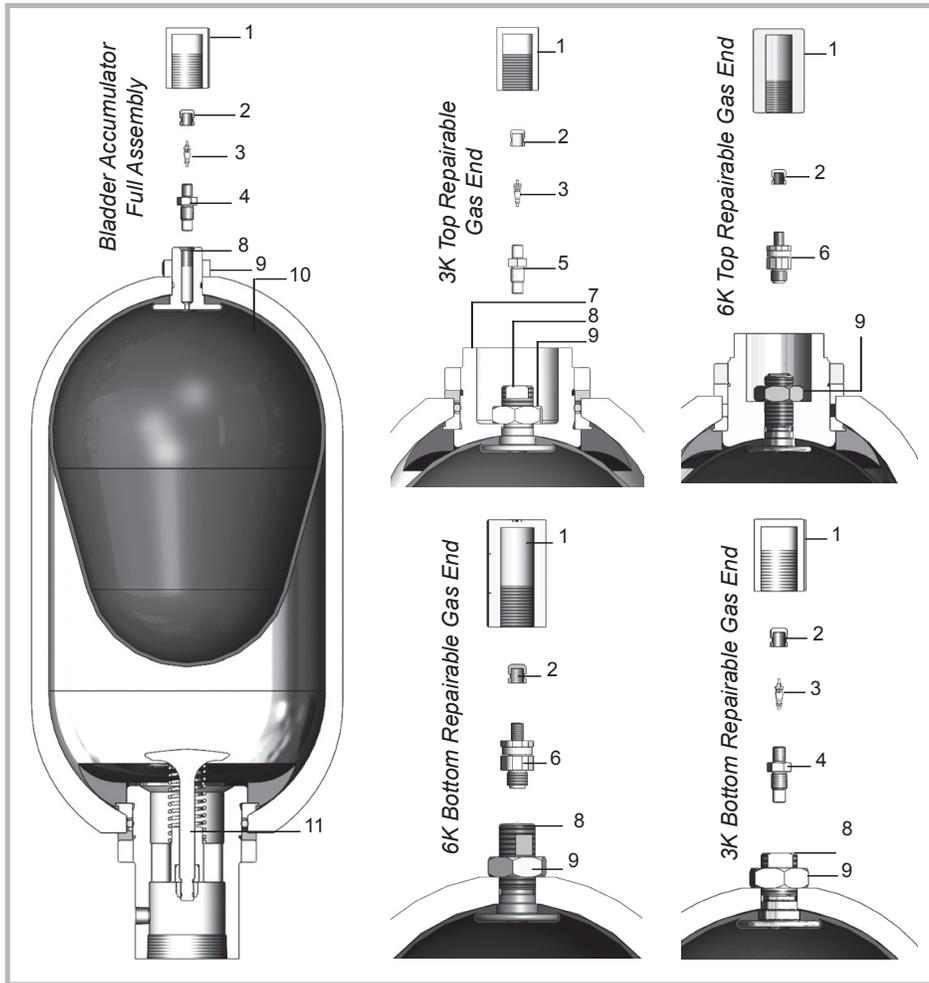
BLADDER SPECIAL ORDERS

Accumulators, Inc. manufactures a wide range of special accumulators and bladders that can be adapted to most customer applications. Bladders can be made with many different types of gas valves and with a wide range of materials and at many pressure ranges. Many elastomers are available.

RECOMMENDED ACCESSORIES

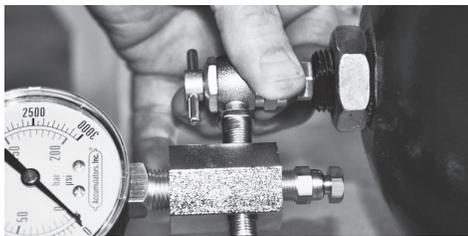
ITEM DESCRIPTION	ACC INC PART NUMBER	PRESSURE
Basic 3kpsi Maintenance Kit	AI-TKIT-B	3000 psi
Standard 3kpsi Maintenance Kit	AI-TKIT	3000 psi
Deluxe 3kpsi & 6kpsi Maintenance Kit	AI-TKIT-1	3000-6600 psi
High-Pressure 6kpsi Maintenance Kit	AI-KIT-6	6600 psi
Charging & Gauging 3kpsi Kit 3000 psig gauge	AI-CG3-3KT-SS	3000 psi
Charging & Gauging 3kpsi Kit 6600 psig gauge	AI-CG3-6KT-SS	3000 psi
Charging & Gauging 6kpsi Kit 6600 psig gauge	AI-CG6-6KT-SS	3000-6600 psi
Bladder Pull Rod	AI-501 (1 Quart, 1 gallon),	All
	AI-502 (2.5 gal, 5 gal),	
	AI-503 (10 gal, 11 gal),	
	AI-504 (15 gal)	
TR6 Gas Valve Wrench (Top Repairable)	AI-515 (2 pc set)	6600 psi
Regulators	AI-CG3-029	3000 psi
	AI-CG3-030	3000 psi
	AI-CG3-031	3000 psi
	AI-CG3-032	3000 psi
	AI-CG6-033	6600 psi
Valve Core Tool	AI-506	3000 psi
Spanner Wrench	AI-505	All
Lifting Hook Assembly	AI-511	3000-6600 psi
Charging valve extension	AI-TR-015	3000-6600 psi

DRAWINGS

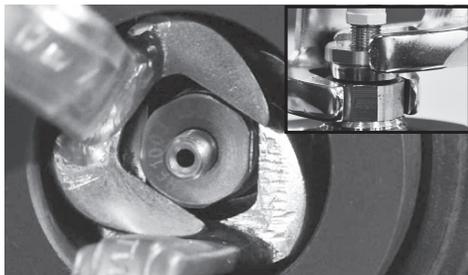


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|-------------------------------|-----------------------------|------------------------------|
| 1. Protective Cap | 5. 3K Gas Valve with O-Ring | 9. Hex Jam Nut |
| 2. Valve Cap | 6. 6K Gas Valve with O-Ring | 10. Bladder |
| 3. Valve Core | 7. Transfer Barrier Adapter | 11. Plug and Poppet Assembly |
| 4. Gas Valve Body with O-Ring | 8. Bladder Valve Stem | |

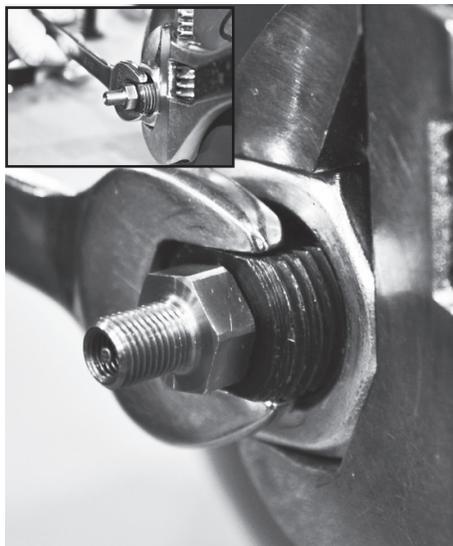
STEPS



Attaching Air Chuck

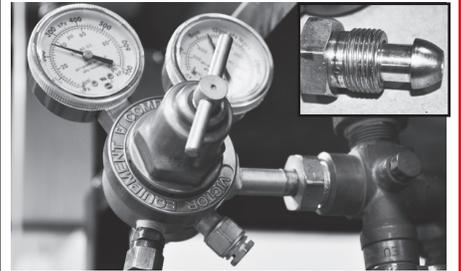


Servicing TR model with special wrenches



Tightening hex jam nut, making sure not to twist the bladder.

ACCESSORIES



Nitrogen source regulator attached with gland and nut



AI-CG3-3KT-SS
(3000 psi Charging Assembly)



AI-CG6-6KT-SS
(6000 psi Charging Assembly)



AI-505 (Spanner Wrench)



AI-TKIT-1
Deluxe 3kpsi & 6kpsi Maintenance Kit