

PISTON ACCUMULATOR INSTALLATION, OPERATION & CARE

The logo for Accumulators, Inc. features the company name in a bold, red, sans-serif font. The text is enclosed within a black, rounded rectangular border that has a stylized, mechanical appearance, resembling a piston or a valve component. A registered trademark symbol (®) is positioned to the upper right of the text.

Accumulators, Inc.®

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!**

- ⚠ 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.



WARNING



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DESCRIPTION

These installation, operation and care instructions apply to Accumulators, Inc. piston accumulators only.

Please see the label attached to the accumulator for the permissible operating pressure, temperature range, seal elastomer, thread size, and design approval.

For volume, weights, dimensions and other details see our catalog or visit our website at www.accumulators.com.

DELIVERY INSPECTION

Prior to delivery, Accumulators, Inc. accumulators undergo a careful inspection to ensure quality and safety. Upon receipt of the accumulator, please:

1. Inspect for damage sustained during transport. Make sure to check the gas valve and the hydraulic connection for any obvious impact damage.
2. Ensure that the details shown on the model code sticker correspond to the order details.
3. Verify that the test certificates (if required) are present and correspond to the factory number on the accumulator.
4. The protective cap on the gas valve is tightly closed.
5. The hydraulic connection has been closed off with a protective plug or plate.

INSTALLATION AND MOUNTING

Mounting position

Piston accumulators function with maximum efficiency and longevity when mounted vertically with the gas valve at the top. There must be sufficient clearance in order to mount and disconnect the charging and gauging apparatus to maintain the nitrogen pre-charge.

MOUNTING

In accordance with the recommendations of Accumulators, Inc., piston accumulators must be securely mounted and vibration free using approved Accumulators, Inc. clamps and brackets.

CONNECTION

The connection for the accumulator to the system must be stress free and torque free, and it must be possible to isolate the accumulator from the pressurized hydraulic system.

STARTUP AND SAFETY

STARTUP

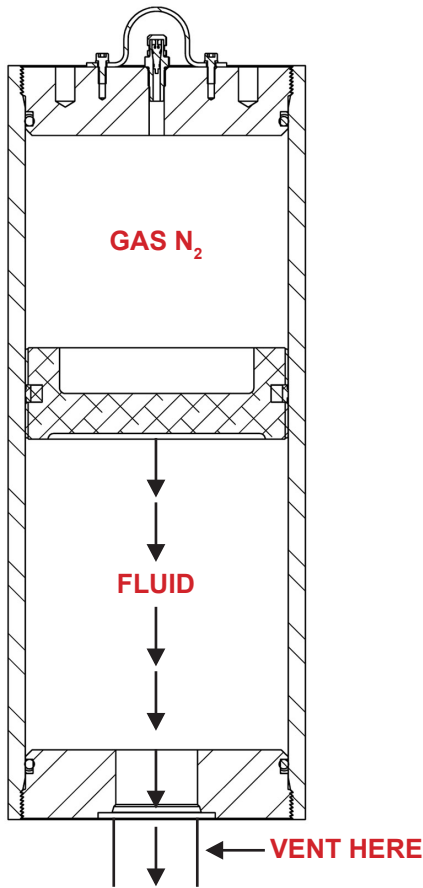
Prior to connecting the accumulator to the pressurized system, the pre-charge pressure should be rechecked (if the accumulator was pre-charged at Accumulators, Inc. the pressure level can be found on the pressure tag.)

The level of the pre-charge pressure generally depends on the following criteria:

- Type of system
- Minimum and maximum operating pressures
- Expected changes in operating temperature
- Intended function of the accumulator

VENTING

The accumulator must be vented on the oil side prior to commissioning.



Before beginning pre-charge:

NOTE: Most accumulators are shipped with minimal gas pressure. The user is responsible for determining the proper pre-charge level and ensuring that correct pressure is maintained at all times. Pre-charge should equal 30% to 80% of the maximum system pressure, depending on the function of the accumulator. Contact Accumulators, Inc. sales if you are unsure of the accumulator's function.

It is recommended that a genuine Accumulators, Inc. Charging and Gauging Assembly be used:

- 3000 psi: AI-CG3-3KT-SS (see photo C)
- 4000-6000 psi: AI-CG6-6KT-SS (see photo D)
- 10000 psi: AI-CG10-10KT-SS

For special applications, contact Accumulators, Inc.

PRECHARGING INSTRUCTIONS

If accumulator is not yet installed:

The accumulator is fully lubricated at the factory and shipped with piston at fluid end.

1. Remove the gas valve guard 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 A. 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 CCW so it is all the way out before attaching air chuck. Attach the air chuck to the accumulator gas valve by hand, tightening its swivel hex connection, see photo B. Tighten with a hand wrench if loose. Rotate T handle CW to open valve core.

3b. For 4000 psi and higher accumulators: Open the valve by turning its top 3/4" hex nut counter-clockwise. Make sure not to loosen the lower 3/4" hex nut.

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 open the valve. 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. Continue pre-charging to desired pressure by increasing gas flow slowly. Gas will adjust to ambient temperature following pre-charge. Recheck pressure after 15 minutes.

6a. For 3000 psi accumulators: Turn the air chuck "T" handle CCW until it stops, closing the valve core.

6b. For 4000 psi and higher: close the gas valve by turning its top 3/4" hex nut CW. IF NO GAS VALVE, consult factory.

6c. Open bleed valve to release trapped nitrogen.

7. Remove the charging assembly from the accumulator.

8a. 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 1-7. When pressure is constant, install valve cap and gas valve guard.

8b. Install the accumulator on the system. Check for leaks. Hydraulically pressurize the system, operate the accumulator, and re-check for leaks.

If accumulator already installed, turn off power to the system and make sure all fluid pressure is released prior to pre-charge.

Perform steps 1-8 of precharging instructions.

PRECHARGE MAINTENANCE

- For cycling applications, check the pre-charge weekly.
- For non-cycling applications, check monthly.
- Some gas will be lost over time due to permeation.
- Rapid loss may indicate a gas valve or seal problem.

Release system fluid pressure, not the gas pre-charge.

Perform steps 1-8 of precharging instructions.

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 pre-charge.

STORAGE AND PRESERVATION

Contact Accumulators, Inc. sales department for storage and preservation information. Store inside at room temperature and lubricate inside of cylinder with aerosol anti-corrosive applied through gas port.

DISASSEMBLY, INSPECTION AND ASSEMBLY

REMOVAL FROM SYSTEM

1. Turn off your system and **RELEASE ALL fluid pressure.**
2. Remove valve guard and valve cap from accumulator.
3. Install a genuine ACC INC approved charging and gauging assembly appropriate to the system pressure rating. Release gas pressure.

B. DISASSEMBLY

Further disassembly should be carried out in a suitable, clean area.

1. Clamp the piston accumulator to a work bench and remove the gas valve, adapters, and all accessories.
2. Unscrew the end caps on the gas and fluid side using appropriate spanner wrench or threaded rods positioned opposite each other. On large end caps, an extension rod can be used.
3. Push the piston out of the accumulator in the direction of the fluid side using a suitable plastic/wooden rod and rubber mallet—taking care not to dent cylinder threads.

TESTING AND CLEANING

A. Cylindrical shell:

1. Carefully clean the inside of the shell with a non-aggressive, non-abrasive cleaning agent, then dry with a lint free cloth. Check the inside of the shell for rough spots and grooves. If defects are found, Accumulators, Inc. can re-machine the cylindrical shell (within certain tolerances). Please contact us for details.
2. If any external or internal damage is found, the pressure vessel must be submitted to the manufacturer and, if applicable, the appropriate inspection authority for assessment.

B. End caps:

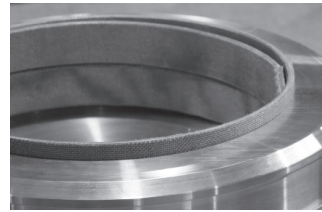
Carefully clean the end caps, checking for rust, thread dings, or other defects. Replace both 'O' and back up rings.

C. Piston:

Remove all seal and guide rings, clean the piston thoroughly and inspect for defects.

INSTALLING PISTON SEALS

Follow the detailed instructions below on how to install seals onto a conventional piston. Unitized pistons only require replacement of the central seal system.



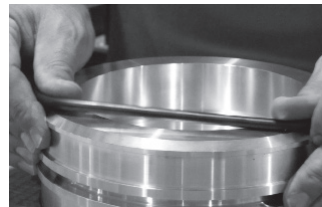
1. Place both wear bands into deeper piston counter-bore to preload shape before proceeding with seal installment.



2. Place the piston seal into a bath of water and begin to heat. This will allow the seal to expand for easier installment.



3. Heat the submerged seal to a temperature of about 200°F for 15 minutes.



4. Meanwhile, place O-ring energizer on top of the piston, making sure not to roll or twist it.

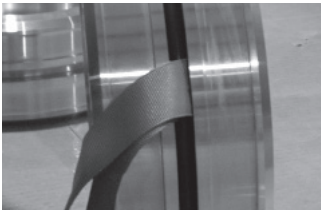


5. Loop a sturdy ribbon around the o-ring.

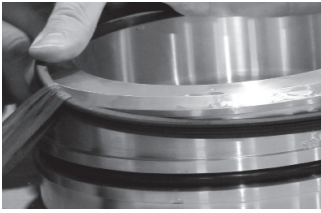


6. Pull the ribbon and stretch the o-ring, rolling the piston like a wheel to ensure correct installment of the o-ring into the center groove on the piston. This ensures the o-ring does not twist.

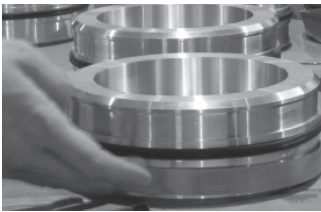




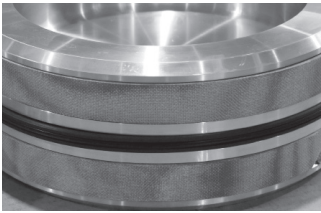
7. The o-ring should now be nestled into the piston's center groove. Pull the ribbon out, making sure to remove any fabric fibers.



8. Place the heated seal on top of the piston and loop the ribbon around the seal. Stretch the seal and roll the piston, shown in step 6, to secure the seal over the o-ring. Make sure not to twist the seal. A second technician could help.



9. Take the wear bands out of the piston counter-bore and wrap around to fit in the larger grooves.



10. The piston is now ready to be installed into the cylindrical shell.

PISTON ACCUMULATOR ASSEMBLY

A. Fit the piston seals as described in section **INSTALLING PISTON SEALS**.

B. Assemble the piston accumulator:

1. Lubricate the upper ends of the cylinder wall and wear bands on the piston with filtered operating fluid.

2. Lubricate installation sleeve. Load piston with deeper counter bore down into piston sleeve. Place loaded sleeve into shell fluid end (end opposite of vent hole).

3. Fully insert the piston into the tube using a plastic/wooden rod and a rubber mallet.

4. Grease 'O' & backup rings and install into respective end cap grooves.

5. Apply nickel-based anti seize onto lower half of the threads of CS end caps and PTFE based lubricant on SS caps.

6. Screw end caps into the shell with a spanner wrench or two bolts and a rod until they are level with the ends of the accumulator.

7. If not using accumulator immediately, apply aerosol anti-corrosive through open gas port.

8. Fit the gas valve and all adapters and other accessories.

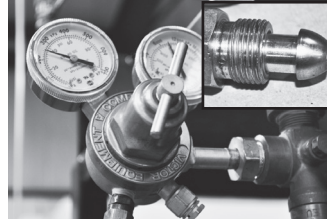
9. Connect the Accumulators, Inc. charging and gauging kit and charge the accumulator according to the **PRECHARGING INSTRUCTIONS** section.

10. Install valve cap and gas valve guard.

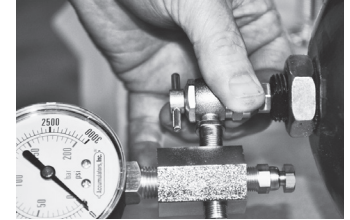
C. Reinstall the piston accumulator into the system and check for leaks.

ACCESSORIES AND STEPS

Item Description	ACC INC Part Number	Pressure
Basic Maintenance Kit	AI-TKIT-B	3000 psi
Standard 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	6000 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



A. Nitrogen source regulator attached with gland and nut



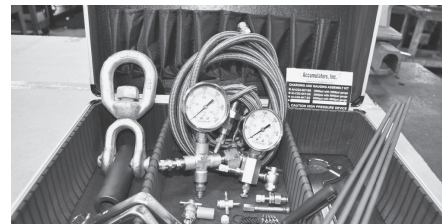
B. Attaching Air Chuck



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



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



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