

# Series "AD" Diaphragm Accumulators

## Maintenance Instructions

- .075 to 2.80 Liters
- Operating Pressures to 250 Bar
- Hydrin Diaphragms



### Installation

Keep the hydraulic port covered to keep out foreign material until ready to make the hydraulic connection. The accumulator should be rigidly mounted using appropriate mounting hardware, which is shown in the Accumulator Accessories section of this catalog. 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 Diaphragm Accumulators

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

If water pumped nitrogen is not available, oil-pumped nitrogen may be used. (C.G.A. standards: Nitrogen gas bottles for water pumped nitrogen has a right-hand valve thread which requires charging and gauging assembly 1486750000 for units up to 3600 PSI. Oil-pumped nitrogen requires a left-handed valve thread (use 8700430000).

If equipment other than the above listed is used, make sure it is compatible with the gas valve assembly. Nitrogen source and all components must be rated for a pressure at least as high 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 5 follow steps A through K. If accumulator has a gas valve as shown in Figure 6, skip steps A through J and follow steps AA through JJ. Before starting, lubricate the shell and bladder by placing a small amount of system fluid in the oil port and rotate the accumulator a few times.

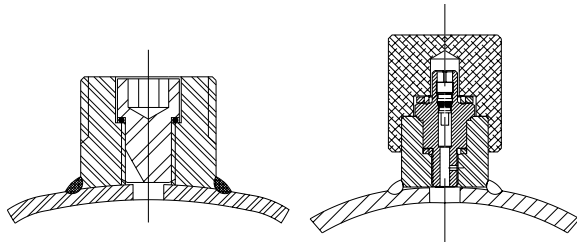


Figure 5

Figure 6

### Accumulator having gas valve as per Figure 5.

- (A) Remove protective cover. Refer to Figure 1.
- (B) Turn charging device “T” handle (2) all the way in (clockwise) before attaching charging assembly.
- (C) Close bleed valve (3).
- (D) Making sure not to loop or twist the hose, attach nut (4) to gas valve and tighten.
- (E) Attach swivel nut (5) to gas valve (6) and tighten.
- (F) Turn “T” handle (2) in counterclockwise motion until rotation stops.
- (G) Crack open nitrogen bottle valve and **slowly** fill accumulator until the button is seated on the fluid port opening, then the nitrogen supply may be fully opened. Shut off the nitrogen supply when the gauge indicates 110% of desired pre-charge.
- (H) Let the pre-charge set for 1 to 2 minutes. This will allow the gas temperature to stabilize. Slowly open bleed valve (3) until the proper pressure is reached, then close the bleed valve (3).
- (I) When finished pre-charging accumulator, turn the “T” handle (2) clockwise all the way, then open bleed valve (3) to bleed the residual pressure from the charging device.
- (J) Holding the “T” handle (2) to keep from turning, loosen nut (4), and remove the assembly from the accumulator.

- (K) Torque the Allen head screw to 14.5 ft-lb +3 (20 Nm +5).
- (L) Replace protective cap.

**Note:** For the most accurate results, use a gauge where the middle 1/3 of the gauge range encompasses the final precharge pressure.

**Note:** To ensure the most accuracy, use a temperature/precharge correction chart or program.

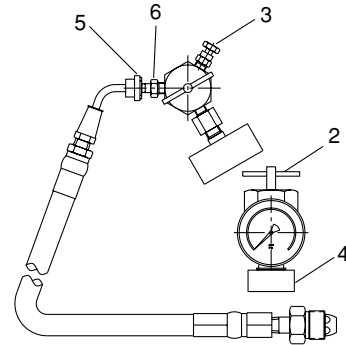


Figure 1

### Precharging Diaphragm Accumulator having gas valve as per Figure 6.

- (AA) Remove gas valve guard (A) and secondary seal (B) from the accumulator. Refer to Figure 2.
  - (BB) Torque the gas valve to 9 ft-lbs + 1 (11.5 Nm + 1.3).
  - (CC) On the charging device back the gas chuck (2) “T” handle all the way out (counterclockwise) before attaching the chuck to the Diaphragm accumulator.
  - (DD) Make sure the bleed valve (3) is closed and tight.
  - (EE) Making sure not to loop or twist the hose, attach the Swivel Connector (5) to the charging device gas valve (4) and tighten. (10-15 in lbs (11.5-17 cm kg))
  - (FF) Turn the “T” handle (2) clockwise all the way. This action will depress the valve core.
  - (GG) Crack open nitrogen bottle valve and slowly fill the accumulator until the button is seated on the fluid port opening, then the nitrogen supply may be fully opened. Shut off the nitrogen supply when gauge movement stops and indicates 110% of desired pre-charge level.
  - (HH) Let the pre-charge set for 1 to 2 minutes. This will allow the gas temperature to stabilize. Slowly open bleed valve (3) until the proper pressure is reached.
  - (II) When finished precharging, turn “T” handle (2) counterclockwise fully, then open the bleed valve (3) to release residual gas.
  - (JJ) Hold the gas valve from turning and remove the charging device.
  - (KK) Install secondary seal (B) and valve guard (A).
- Note:** For the most accurate results, use a gauge where the middle 1/3 of the gauge range encompasses the final precharge pressure.
- Note:** To ensure the most accuracy, use a temperature/precharge chart or program.

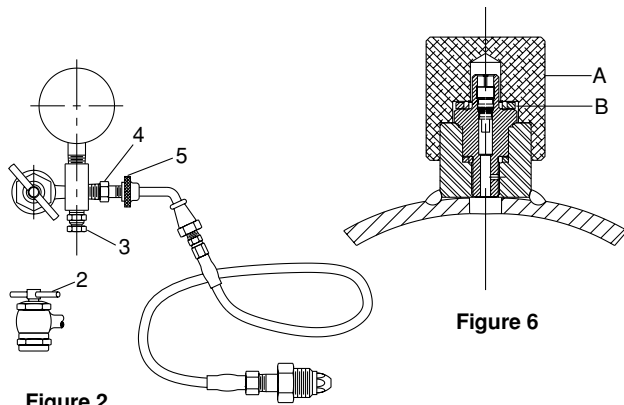


Figure 2

### Pre-charge Checking Procedure

For diaphragm units having a gas valve configured like Figure 5

**Caution:** Use this procedure only if the accumulator volume is equal to or more than 30 cubic inches in gas volume. For smaller volumes see the procedure for accumulators smaller than 30 cubic inch capacity.

Using appropriate valve in the hydraulic system, discharge all oil from accumulator and allow button to bottom against hydraulic port. Use precharge checking device P/N 1480240000 with proper gauge.

- (A) Remove protective cover from accumulator.
- (B) Refer to Figure 3. Turn the charging device “T” handle (2) all the way in (clockwise) attach charging and gauging head assembly by screwing mounting nut (4) to the gas end of the Diaphragm accumulator.
- (C) Close bleed valve (3).
- (D) Turn “T” handle (2) in counterclockwise motion until rotation stops.
- (E) When finished checking the precharge, turn “T” handle (2) clockwise all the way, then open bleed valve (3) to bleed all residual pressure from the charging device.
- (F) Hold “T” handle (2) to keep from turning, loosen nut (4), remove the assembly from the accumulator.
- (G) Torque the Allen head screw to 14.5 ft-lb + 3 (20 Nm + 9).
- (H) Replace protective cap.

**Note:** For the most accurate results, use a gauge where the middle 1/3 of the gauge range encompasses the final precharge pressure.

**Note:** To ensure the most accuracy, use a temperature/precharge chart or program.

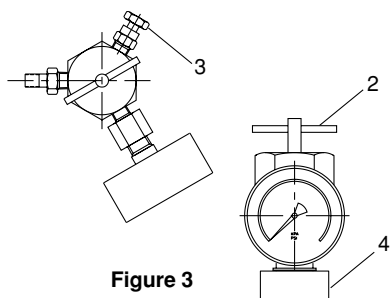


Figure 3

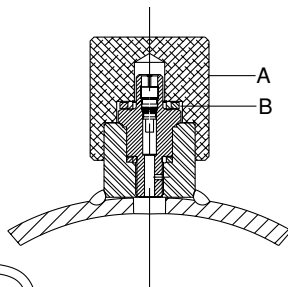


Figure 6

For diaphragm units having a gas valve configured like Figure 6

**Caution:** Use this procedure only if the accumulator volume is equal to or more than 30 cubic inches in gas volume. For smaller volumes see the procedure for accumulators smaller than 30 cu. in.

Using appropriate valve in the hydraulic system, discharge all oil from accumulator and allow button to bottom against hydraulic port. Use precharge checking device P/N 0851220000 with gauge.

- (A) Remove protective cover (A) and the secondary seal (B) from the Diaphragm accumulator. Check torque on the gas valve to be 9 ft-lbs (10.3 cm kg).
- (B) Refer to Figure 4. Back gas chuck “T” handle (2) all the way out (counter clockwise), attach charging and gauging head assembly by screwing the air chuck (2) to the valve stem of the Diaphragm accumulator and tighten (10-15 in lbs) (11.5-17 cm kg).
- (C) Close bleed valve (3).
- (D) Turn “T” handle (2) in clockwise motion.
- (E) When finished checking the precharge, turn “T” handle (2) counterclockwise all the way, then open bleed valve (3).
- (F) Using a wrench to prevent the gas valve assembly from rotating, remove the charging assembly from the accumulator.
- (G) Replace secondary seal (B) and protective cap (A).

**Note:** For the most accurate results, use a gauge where the middle 1/3 of the gauge range encompasses the final precharge pressure.

**Note:** To ensure the most accuracy, use a temperature/precharge chart or program.

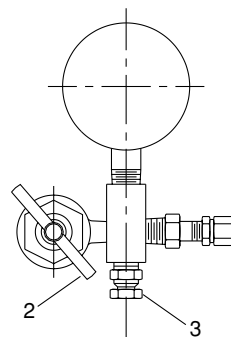


Figure 4

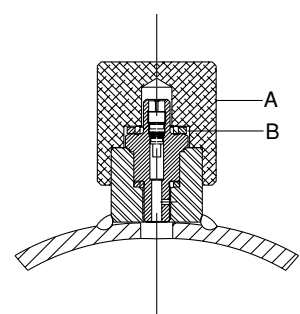


Figure 6

## To check the precharge on units having a gas volume of less than 30 cu in.

***It is recommended that the precharge be checked from the hydraulic port. Using this method will prevent the loss of gas volume necessary to get a precharge reading when using standard gas port mounted devices. This loss is attributable to the required gas volume filling the charging device thereby removing some volume from the accumulator. This removal causes a precharge drop due to the volume in the accumulator being so small.***

Using the setup shown below in Figure 7, take the following steps to check the precharge.

If you wish to take a less accurate reading you may use the previously described methods, but be sure to have a nitrogen supply available to replenish the gas that will be lost during the precharge check.

- (A) Connect the accumulator fluid port to the pump discharge line.
- (B) Ensure that all fittings are tight and leakproof.
- (C) Bring hydraulic pressure up until the precharge is exceeded. You will know the precharge is exceeded when the resistance decreases and the gauge rise quickens.
- (D) Stop pumping and allow the pressure to stabilize.
- (E) Slowly crack the needle valve open until you see a very slow drop in pressure on the gauge.
- (F) At the gauge reading where the slow descent stops and a rapid descent starts is the precharge pressure in the accumulator.
- (G) It is recommended to take multiple readings to ensure accuracy of the reading.

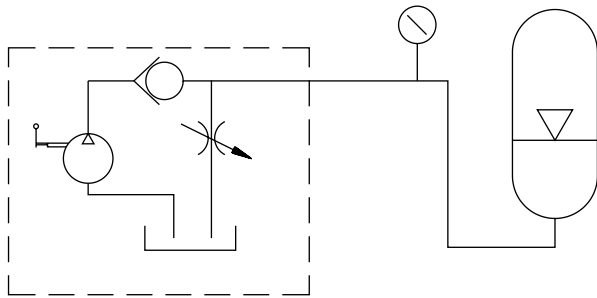


Figure 7

## Removal from Hydraulic System

Shut the equipment down and make certain that hydraulic not pressure at the accumulator is at zero.

**For accumulators having gas valve as shown in Figure 5,** attach gauging assembly as shown in Figure 3 following Steps A through D. Then, open bleed valve (3) until all gas pre-charge is relieved from accumulator. Then remove gauging assembly. The accumulator is now safe to remove from the system.

**For accumulators having gas valve as shown in Figure 6,** attach gauging assembly as shown in Figure 4 following Steps A through D. Then, open bleed valve (3) until all gas pre-charge is relieved from accumulator. Then remove gauging assembly. The accumulator is now safe to remove from the system.