KNOWLEDGE BASE

Article Type: Instructions

Bladder Accumulators, Series "BA" Greer / Parker

Description:

Instructions on "How to" properly disassemble and repair Bottom and Top bladder accumulators. Clean and inspect, Pre-charging checking procedures for; the Greer / Parker Bladder hydraulic accumulators, 10Cu. In. through 40 Gallons, 3000 and 5000 psi Standard, Bottom and Conventional Top repairable. Parker reference catalog – 1630-8/USA

WARNING

Never work on, clean or service this unit, control panel or any machine or open or remove any protective cover, guard, grate, door, or maintenance panel until the power or energy sources has been turned off, locked out / tagged out, and all moving parts have come to a complete stop and or blocked to prevent movement. Machinery is dangerous – avoid personal injury and or death by following manufacture, Local, and OHSA safety procedures. Contact Columbia Machine for safety decals, guards, horns and beacons.

GREER
BLADDER PRODUCTS

Series "BA" Bladder Accumulators

- **10 Cu. In. through 40 Gallons**
- **3,000 and 5,000 psi Standard**
- **Bottom and Conventional Top Repairable**

Installation

Most accumulators shipped from the factory will have some amount of pre-charge. It may vary from 50 psi to several hundred psi.

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

The accumulator should be mounted within 25° of vertical. It should also 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.

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Hydraulic Accumulator Division
Rockford, IL 61115

Pre-Charging

Use only an inert gas such as nitrogen for pre-charging accumulator. If possible, use water pumped nitrogen (gas bottle will have a right-hand thread). Oil pumped nitrogen may be used, however, gas bottle will have left-hand thread.

It is recommended to use pre-charging and gauging assembly as shown in Figure 1 (Part #1445950000, right-hand thread; Part #1445960000, left-hand thread), and in Figure 2 Part #0871000000 for 1-15 gallon & Part #0871020000 for 10-150 cu. in. accumulator rated for 3,000 psi or less. For accumulators rated for 5,000 psi, as well as the 25-40 gallon, 3,000 psi accumulatorrs, use assembly shown in Figure 6 (Part #1449120000). If other equipment is used, make sure it is compatible with the gas valve assembly and nitrogen source. 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 8A or 8B, follow steps A through J and skip steps AA through HH. If accumulator has a gas valve as shown in Figure 9, skip steps A through J and follow steps AA through HH.

Accumulators having gas valve per Figure 8A or 8B

(A) Remove gas valve guard and if installed remove gas valve cap.

(B) Back gas chuck "T" handle all the way out (counterclockwise) before attaching charging assembly to accumulator gas valve.

(C) Close bleed valve.

(D) Making sure not to loop or twist the hose, attach swivel nut to gas valve and tighten (10-15 in. lb.) (11.5-17 cm kg).

NOTE: *For top repairable units having valves as shown in Figure 8B, a valve extension as shown in Figure 3 must be attached to the gas valve after removing valve cap.*

(E) Turn gas chuck "T" handle all the way down. This will depress core in gas valve.

(F) Crack open nitrogen bottle or regulator valve and **slowly** fill accumulator. **Caution:** if the pre-charge is not done slowly, the bladder may suffer permanent damage. Shut off when gauge indicates 100 PSI above desired pre-charge. (Note: it is recommended that pre-charge pressure be at least 25% of maximum system pressure.) Damage to bladder may occur if this ratio is not maintained or exceeded. For shock suppression applications, pre-charge is usually set at about 65% of system pressure. When the accumulator is used to supplement pump flow, auxiliary power supply or leakage compensation, pre-charge is usually set at approximately 80% of minimum system pressure.

(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 until desired pressure is reached (Figure 1). Do not reduce pre-charge by depressing valve core. High pressure may rupture rubber valve seat.

(H) When finished pre-charging accumulator, turn "T" handle all the way out on gas chuck (Figure 1), then open bleed valve.

(I) Hold gas valve from turning, loosen swivel nut, remove assembly.

(J) Install gas valve cap if part of assembly (10-15 in. lbs.) (11.5-17 cm kg) and valve guard.

Accumulators having gas valve per Figure 9

(AA) Remove gas valve guard and gas valve cap.

(BB) Close bleed valve and make sure not to loop or twist the hose, attach swivel nut to gas valve and tighten (10-15 in. lb.) (11.5-17 cm kg).

(CC) Hold gas valve at point "C" with one (1) wrench while unscrewing hex nut at point "D" with a second wrench. This will open the poppet inside the gas valve. Note that (4) turns will fully open the valve.

(DD) Crack open nitrogen bottle or regulator valve and **slowly** fill accumulator. **Caution:** if the pre-charge is not done slowly, the bladder may suffer permanent damage. Shut off when gauge indicates 100 PSI above desired pre-charge. (Note: it is recommended that pre-charge pressure be at least 25% of maximum system pressure.) Damage to bladder may occur if this ratio is not maintained or exceeded. For shock suppression applications, pre-charge is usually set at about 65% of system pressure. When the accumulator is used to supplement pump flow, auxiliary power supply or leakage compensation, pre-charge is usually set at approximately 80% of minimum system pressure.

(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, then slowly open bleed valve until desired pre-charge is reached (Figure 6).

(FF) With a wrench, tighten hex nut at point "D" to close internal poppet (10-15 in. lbs.) (11.5-17 cm kg).

(GG) Hold gas valve at point "C" with wrench and remove charging and gauging assembly.

(HH) When pre-charging has been completed, replace gas cap and tighten (10-15 in. lb.) (11.5-17 cm kg), install gas valve guard.

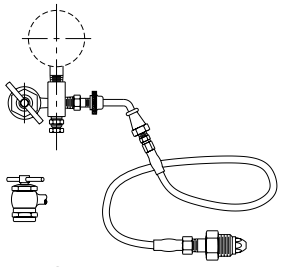

FIGURE 1
PART #144595 0000

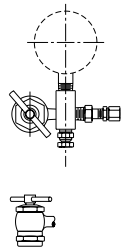

FIGURE 2
PART #085122 0000

CAN BE USED ON 3,000 PSI
BOTTOM REPAIRABLE BLADDER ACCUMULATORS

FIGURE 3
VALVE EXTENSION P.N. 085434 0000 FOR USE ON **CONVENTIONAL TOP REPAIRABLE UNITS** IN CONJUNCTION WITH FIGURES 1 OR 2

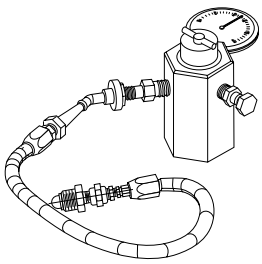

FIGURE 4
PART #087100 0000 (1-15 GAL.)
PART #087102 0000 (10-150 CU. IN.)

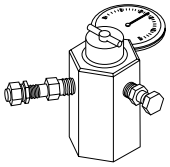

FIGURE 5
PART #087101 0000 (1-15 GAL.)
PART #087103 0000 (10-150 CU. IN.)

CAN BE USED ON BOTTOM AND TOP REPAIRABLE 3,000 PSI ACCUMULATORS

3000 PSI UNITS

Part Number	Charging and Gauging Assembly for 3000 PSI Bottom Repairable
144595 0000 (Std) (Right Hand)	Charging and Gauging Assembly consists of 10' charging hose with standard right-hand thread nitrogen fittings adapter incorporating gas valve bleeder valve and gas chuck (less gauge). For left-hand thread nitrogen bottle fitting specify part number 144596 0000.

Part Number	Charging and Gauging Assembly for 3000 PSI Bottom & Top Repairable
087102 0000 (10-150 cu. in.) 087100 0000 (1-15 gal.)	Charging and Gauging Assembly consists of 10' charging hose with standard right-hand thread nitrogen fittings adapter incorporating gas valve bleeder valve and gas chuck (less gauge).

Part Number	Gauging Assembly for 3000 PSI Bottom Repairable
085122 0000	Gauging device consisting of adapter incorporating gas valve bleeder valve and gas chuck including gauge.

Part Number	Gauging Assembly for 3000 PSI Top Repairable
087103 0000 (10-150 cu. in.) 087101 0000 (1 - 15 gal.)	Gauging device consisting of adapter incorporating gas valve bleeder valve and gas chuck (less gauge).

Part Number	Valve Extension for 3000 PSI
085434 0000	Contains extension and valve core.

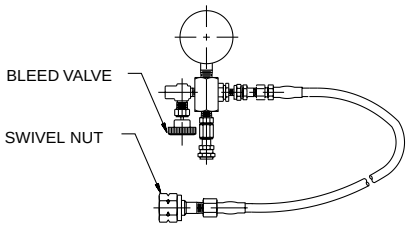

FIGURE 6
PART #144912 0000

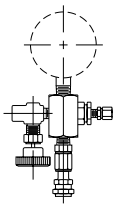

FIGURE 7
PART #144961 0000

25 - 40 GALLON 3000 PSI AND ALL 5000 PSI UNITS

Part Number	Charging and Gauging Assembly for 25-40 Gal. 3000 & 5000 PSI
144912 0000	Charging and Gauging Assembly consists of 10' charging hose with standard right-hand thread nitrogen fittings (1.035-14 NGO female) adapter incorporating gas valve bleeder valve and gas chuck (less gauge).

Part Number	Gauging Assembly for 5000 PSI
144961 0000	Gauging device consisting of adapter incorporating gas valve bleeder valve and gas chuck (less gauge).

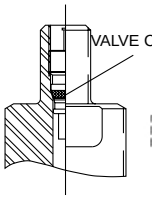

FIGURE 8A
3000 PSI VALVES

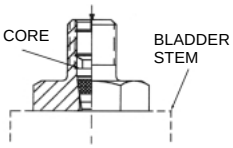

FIGURE 8B

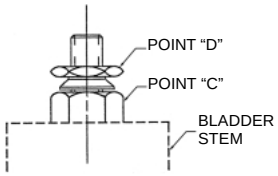

FIGURE 9
5000 PSI VALVES

Maintenance

Little maintenance is required for a bladder accumulator. If there is external leakage, tighten all connections. If leakage continues, remove accumulator from system and replace faulty components.

After original installation, check pre-charge once during first week to see that no leak has developed. Thereafter, check pre-charge monthly. Check pre-charge if the system is acting sluggish. If pre-charge is low, check gas valve for leakage and recharge.

If there is no gas in bladder and fluid appears at gas valve, unit must be removed and bladder replaced.

Pre-charge Checking Procedure

Using appropriate valve in the hydraulic system, discharge all oil from accumulator.

For accumulators rated for 3000 psi, either use gaging assembly in Figure 2 (Part #0851220000) or gaging assembly in Figure 5 (Part #0871010000) and follow Steps 1 through 7.

For accumulators rated for 5000 psi, use gaging assembly in Figure 5 (Part #1449610000) and follow steps 8 through 14.

3000 PSI RATED UNITS

(1) Remove gas valve guard and gas valve cap. (For top repairable unit connect valve extension Part #0854340000) as shown in Figure 3 and tighten with wrench.

(2) Close bleed valve and turn "T" handle all the way out.

(3a) Attach gauging assembly to gas valve or to gas valve extension and tighten swivel nut (10-15 in. lb.) (11.5-17 cm kg), when using gauging assembly in Figure 1.

(3b) Install gas valve o-ring on the gas valve, and attach gauging assembly to valve stem. Tighten assembly (25-30 in. lb.) (29-35 cm kg) when using gauging assembly in Figure 4.

(4) Turn "T" handle all the way down, which will depress core in gas valve and check pressure.

(5) To remove gauging assembly, turn "T" handle all the way out and then open bleeder valve.

(6) Hold gas valve from turning, loosen swivel nut and remove assembly.

(7) If necessary, remove valve extension, then install cap on gas valve (10-15 in. lb.) (11.5-17 cm kg) and valve guard.

25-40 GALLON 3000 PSI AND ALL 5000 PSI RATED UNITS

(8) Remove gas valve guard and gas valve cap.

(9) Close bleed valve.

(10) Attach gauging assembly to gas valve and tighten swivel nut (10-15 in. lb.) (11.5-17 cm kg).

(11) Referring to Figure 9, hold gas valve at point "C" with one (1) 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 poppet. Check pre-charge pressure.

(12) With wrench, tighten hex nut at point "D" to close internal poppet (10-15 in. lb.) (11.5-17 cm kg).

(13) Hold gas valve at point "C" with a wrench and remove swivel nut assembly.

(14) Replace cap on gas valve (10-15 in. lb.) (11.5-17 cm kg) and install gas valve guard.

Removal of Accumulator From Hydraulic System

Shut equipment down and make certain that hydraulic pressure at the accumulator is at zero.

Remove gas valve guard and gas valve cap.

3000 PSI RATED UNITS

Accumulators rated for 3000 psi will have a gas valve as shown in Figure 8A or 8B. For these units, attach gaging assembly (Part #0851220000) or (Part #0871030000)for 10 - 150 cubic inch, and (Part #0871010000) for 1 - 15 gallon.

Open bleed valve and release all the gas pressure. Detach gauging assembly and, using valve core removing tool (Part #5824410000), **remove valve core.**

Remove accumulator from hydraulic system.

25-40 GALLON 3000 PSI AND 5000 PSI RATED UNITS

Accumulators rated for 5000 psi will have a gas valve as shown in Figure 9. For these units, after removing valve cap, hold valve at point "C" with one (1) wrench while unscrewing hex nut at point "D" with a second wrench until gas begins to escape through the top of the valve. Wait until all the gas pressure has been released.

(Caution: Keep face away from gas valve as the high pressure nitrogen is discharging.)

Remove accumulator from hydraulic system.

Disassembly of Bottom Repairable Accumulators

Figure 1. Once the accumulator has been removed from the equipment, the accumulator body should be secured in a vise, preferably a chain vise. If a standard jaw vise is used, brass inserts should be used to protect the accumulator hydraulic port assembly from damage. Clamp on wrench flats only when using a jaw vise to prevent accumulator from turning.

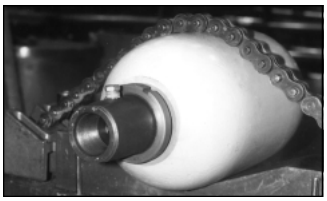
FIGURE 1

Figure 2. Remove bleeder plug on hydraulic port assembly. Using a spanner wrench, remove lock nut from the hydraulic port assembly; use an adjustable wrench on the flats located on the port assembly to prevent port assembly from rotating.

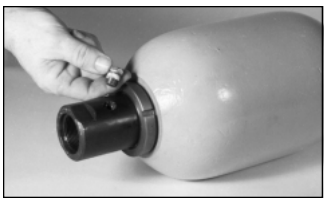
FIGURE 2

Figure 3. Remove spacer, then push the hydraulic port assembly into the shell prior to Step 4.


FIGURE 3

Figure 4. Insert hand into the accumulator shell and remove the o-ring backup, o-ring, metal backup. Seperate the anti-extrusion ring from the hydraulic port. Fold anti-extrusion ring to enable removal of anti-extrusion ring from shell.


FIGURE 4

Figure 5. Remove hydraulic port plug from accumulator shell.


FIGURE 5

Figure 6. Remove jam nut and nameplate from bladder valve stem. Secure valve stem from twisting with an appropriate wrench applied to the valve stem flats.


FIGURE 6

Figure 7. Fold bladder and pull out of accumulator shell. A slight twisting motion while pulling on the bladder reduces effort required to remove bladder from shell. If bladder is slippery, hold with a cloth.


FIGURE 7

Clean & Inspect

Cleaning: All metal parts should be cleaned with a cleaning agent. Seals and soft parts should be wiped clean.

Bladder: Inflate bladder to normal size. Wash bladder with a soap solution. If soap solution bubbles, discard bladder. After testing, deflate bladder immediately.

Hydraulic Port: Inspect assembly for damage; check the poppet plunger to see that it spins freely and functions properly.

In cases where the accumulator is used with water, check assembly for rust and/or defective plating. If rust is detected, clean with commercial rust remover. If parts are pitted, replace with new components. If protective plating is damaged, replace with new components.

Seals: Check anti-extrusion ring and soft seals for damage and wear; replace all worn or damaged seals with original equipment seals from the Hydraulic Accumulator Division.

Shell: After shell has been cleaned with a cleansing agent, check the inside and outside of shell. Special attention should be given to the area where the gas valve and hydraulic assembly pass through the shell. Any nicks or damages in this area could destroy the accumulator bladder or damge new seals. If this area is pitted consult factory.

Reassembly of Bottom Repairable Accumulators

1. After shell has been cleaned and inspected, replace accumulator shell in vise or on table.
2. Spray the inside of the accumulator shell with a liberal amount of clean system fluid to lubricate and cushion bladder. Make sure the entire internal of the shell is lubricated.
3. With all gas completely exhausted from bladder, collapse bladder and fold longitudinally in a compact roll.
4. **Figure 8.** Insert the bladder pull rod through the valve stem opening and through the shell fluid port; attach the bladder pull rod to the bladder valve stem.

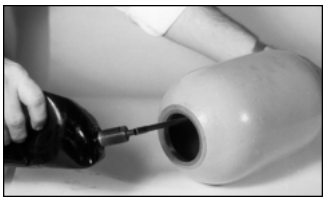
FIGURE 8

5. With one hand, pull the bladder pull rod while feeding the bladder into the shell with the other hand. Slight twisting of bladder will assist in this insertion.


FIGURE 9

6. **Figure 9.** Once the bladder valve stem has been pulled through the valve stem opening in the shell, position the nameplate over the valve stem and install the valve stem nut by hand. Once the valve stem nut is in place, remove the bladder pull rod.

Disassembly of Conventional Top-Repairable Accumulators

The conventional top-repairable accumulator uses a gas-end adapter which is retained in the shell with an anti-extrusic ring exactly like those used in port assemblies (see **Figure 10**).

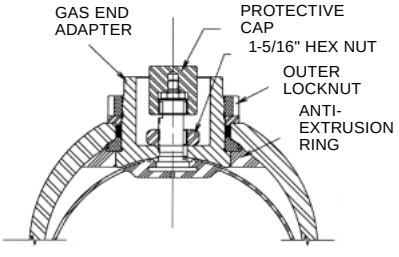

FIGURE 10

1. Make sure the gas is relieved from the accumulator. (See Removal of Accumulator from System).
2. Remove jam nut from bladder gas valve stem using a 1-5/16" socket wrench.

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3. Using a spanner wrench, remove outer lock nut on the gas end adapter.
4. Push the gas end adapter complete with the bladder into the shell.
5. Insert hand into accumulator, remove the o-ring back-up, o-ring and metal back-up. Separate the anti-extrusion ring from the gas end adapter.
6. Fold the anti-extrusion ring and remove from shell. See **Figure 4**.
7. Remove gas end adapter from shell.
8. Remove bladder from shell.

   NOTE: Conventional top repairable accumulators may be repaired by removing the bladder from either the hydraulic end or the gas end of the accumulator.

Clean & Inspect

Cleaning: All metal parts should be cleaned with a cleaning agent. Seals and soft parts should be wiped clean.

Bladder: Inflate bladder to normal size. Wash bladder with a soap solution. If soap solution bubbles, discard bladder. After testing, deflate bladder immediately.

Hydraulic Port: Inspect assembly for damage; check the poppet plunger to see that it spins freely and functions properly. In cases where the accumulator is used with water, check assembly for rust and/or defective plating. If rust is detected, clean with commercial rust remover. If parts are pitted, replace with new components. If protective plating is damaged, replace with new components.

Seals: Check anti-extrusion ring and soft seals for damage and wear; replace all worn or damaged seals with original equipment seals from the Accumulator Division.

Shell: After shell has been cleaned with a cleansing agent, check the inside and outside of shell. Special attention should be given to the area where the gas valve and hydraulic assembly pass through the shell. Any nicks or damages in this area could destroy the accumulator bladder or damage new seals. If these areas are pitted, consult factory.

Reassembly of Conventional Top-Repairable Accumulators

1. Spray the inside of the accumulator shell with a liberal amount of clean system hydraulic fluid to lubricate and cushion the bladder. Make sure the entire internal surface of the shell is lubricated.
2. With all air completely exhausted from bladder, collapse bladder and fold longitudinally in a compact roll.
3. Install the gas end adapter on the bladder and secure with jam nut.
4. Insert bladder into accumulator shell.
5. Insert gas end adapter.
6. Fold anti-extrusion ring and place inside accumulator.
7. Reaching inside the accumulator, insert the gas end adapter through the anti-extrusion ring and pull into place. The steel surface on anti-extrusion ring should face outward.
8. Holding the gas end adapter in place, fill accumulator with approximately 50 PSI nitrogen. This will hold the gas end adapter in place.
9. Install the metal backup, o-ring and o-ring backup.
10. Install the outer spacer.
11. Install the outer locknut.
12. Pre-charge accumulator. (See pre-charge instructions.)

Hydraulic Port Assembly Installation

1. Holding the hydraulic port assembly by the threaded end, insert the poppet end into the shell fluid port. Lay complete assembly in side shell.
2. **Figure 11.** Fold anti-extrusion ring to enable insertion into the shell. Once the anti-extrusion ring has cleared the fluid port opening, place the anti-extrusion ring on the poppet assembly with the steel collar facing toward the shell fluid port.

FIGURE 11

3. Pull the threaded end of the port assembly through the shell fluid port until it seats solidly into position on the shell fluid port opening.
4. **Figure 12.** With port assembly firmly in place, install valve core into the bladder stem. Slowly pressurize the bladder, using dry nitrogen with sufficient pressure (approximately 40-50 psi) to hold poppet assembly in place so both hands are free to continue with assembly.

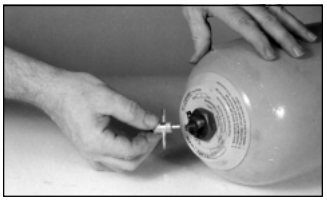

FIGURE 12

5. **Figure 13.** Install metal backup washer over poppet assembly and push into the shell fluid port to bottom it out on anti-extrusion ring.

FIGURE 13

6. Install o-ring over poppet assembly and push it into the shell fluid port until it has bottomed out against washer.

   CAUTION: *Do not twist o-ring.*
7. Install o-ring backup over poppet assembly and push until it bottoms against o-ring ($2^1/_2$-40 gallon size only).

FIGURE 14

8. Insert spacer with the smaller diameter of the shoulder facing the accumulator shell.
9. **Figure 14.** Install the lock-nut on the poppet assembly and tighten securely. This will squeeze the o-ring into position. Use appropriate wrench on flats of port assembly to insure the unit does not turn.
10. Thread bleeder plug into the poppet assembly.
11. Position accumulator so that fluid (same fluid as used in the system) can be poured into the accumulator (add approximately 10% of the accumulator capacity). This fluid will act as a cushion when the accumulator is pre-charged with gas.
12. Pre-charge accumulator to desired pressure. See pre-charge instructions. Install accumulator on machine.

Accumulator Parts Description

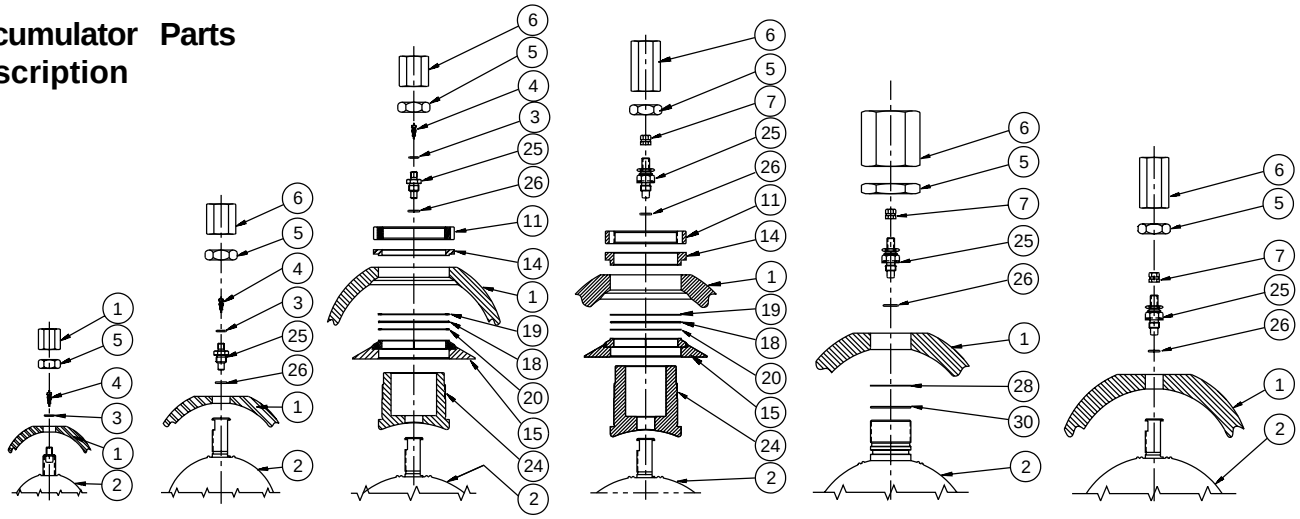

FIGURE A 3000 PSI 10 CI -150 CI | FIGURE B 3000 PSI 1 - 15 GALLON | FIGURE C 3000 PSI CONVENTIONAL TOP REPAIRABLE | FIGURE D 5000 PSI CONVENTIONAL TOP REPAIRABLE | FIGURE E 5000 PSI 2" VALVE STEM | FIGURE F 5000 PSI

Item No.	Description
1	Shell
2	Bladder
3	O-ring
4	Valve Core
5	Lock Nut (Jam)
6	Protective Cap
7	Valve Cap
11	Lock Nut Outer
14	Spacer
15	Anti-Extrusion Ring Ass'y.
18	O-ring
19	O-ring Back-up
20	O-ring Back-up Metal
24	Top Adapter
25	Gas Valve
26	O-ring (Gas Valve)
28	Back-up Washer (Stem)
30	O-ring (Stem)

Suggested Approximate Torque Values

Protective Cap	14 ft. lbs.
Lock Nut (Jam)	56 ft. lbs.
Valve Core	3-4 in. lbs.
Bleeder Plug	10 ft. lbs.
Lock Nut Outer (1 qt.)	73 ft. lbs.
Lock Nut Outer (1 gal.)	200 ft. lbs.
Lock Nut Outer (2 1/2 - 15 g.)	275 ft. lbs.
Gas Valve Cap	10-15 in. lbs.

Bladder Assembly Part Numbers

Accumulator Size	Seal Type - 01 Nitrile (NBR)	- 03 Hi Temp (NBR)	- 04 Hydrin	- 06 Butyl	- 08 EPR	- 28 Fluorocarbon
3000 PSI - Standard - Ref. Figures A,B & C. Contains Items 2,3,4,18,19,20,25 & 26*						
10 Cu. In.	702900	702901	702902	702903	702904	702906
1 Pt.	702914	702915	702916	702917	702918	702920
1 Qt.**	702928	702929	702930	702931	702932	702934
150 Cu. In.	702942	702943	702944	702945	702946	702948
1 Gal.***	702956	702957	702958	702959	702960	702962
2 1/2 Gal.	702970	702971	702972	702973	702974	702976
5 Gal.	702984	702985	702986	702987	702988	702990
10 Gal.	702998	702999	703000	703001	703002	703004
11 Gal.	703012	703013	703014	703015	703016	703018
15 Gal.	703026	703027	703028	703029	703030	703032
25 Gal.	703340	704007	704008	704009	703341	703342
40 Gal.	703346	704013	704014	704015	703347	703348
5000 PSI - Ref. Figure D and contains Items 2,7,25 & 26						
2 1/2 Gal.	0870445025	C.F.	0870465025	0870455025	0870475025	0870465025
5 Gal.	0870445050	C.F.	0870465050	0870455050	0870475050	0870465050
10 Gal.	0870445100	C.F.	0870465100	0870455100	0870475100	0870465100
15 Gal.	0870445150	C.F.	0870465150	0870455150	0870475150	0870465150
5000 PSI - 2" Valve Stem Ref. Figure E Contains Items 2,7,25,26,28 & 30						
NEW 1 Gal. 7/8" ∅Stem	8706135010	8706185010	8706175010	8706145010	8706145010	8706155010
1 Gal. 1" ∅Stem	704060	704061	704062	704063	704064	704066
2 1/2 Gal.	706000	706001	706002	706003	706004	706006
5 Gal.	706010	706011	706012	706013	706014	706016
10 Gal.	706020	706021	706022	706023	706024	706026
15 Gal.	707030	706031	706032	706033	706034	706036
5000 PSI - Ref. Figure F Contains Items 2,7,25 & 26						
2 1/2 Gal.	0850695025	0870435025	0856665025	0850705025	0851055025	0851045025
5 Gal.	0850695050	0870435050	0856665050	0850705050	0851055050	0851045050
10 Gal.	0850695100	0870435100	0856665100	0850705100	0851055100	0851045100
15 Gal.	0850695150	0870435150	0856665150	0850705150	0851055150	0851045150

*See page134 for items 18-20. C.F. = Consult Factory
**Contains items 2,3, & 4 as shown in Figure A. ***Contains items 2,3,4,18,19,25 & 26.

Gas Valve Assembly Part Numbers

Size	Pressure	Seal Type Buna-Nitrile -01	Butyl -06	Fluorocarbon -28	EPR -08	Hydrin -04
10 - 150 C.I.	3000 PSI	NA	NA	NA	NA	NA
1 - 15 Gal.†	3000 PSI	L074210001	L074210003	L074210005	L074210007	L074210009
25 - 40 Gal.▲	3000 PSI	L074400001	L074400003	L074400005	L074400007	L074400009
1 - 15 Gal.▲	5000 PSI	L074400001	L074400003	L074400005	L074400007	L074400009

† Contains items 3, 4, 25 & 26.
▲ Contains items 7, 25 & 26.

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Hydraulic Accumulator Division
Rockford, IL 61115

Accumulator Parts Description

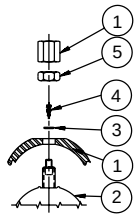

FIGURE A
3000 PSI
10 CI -150 CI

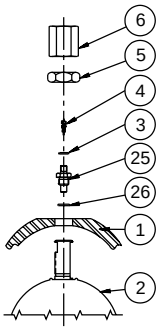

FIGURE B
3000 PSI
1-15 GALLON

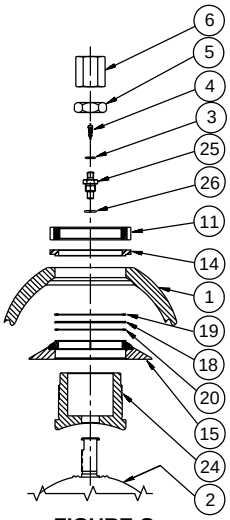

FIGURE C
3000 PSI
CONVENTIONAL
TOP REPAIRABLE

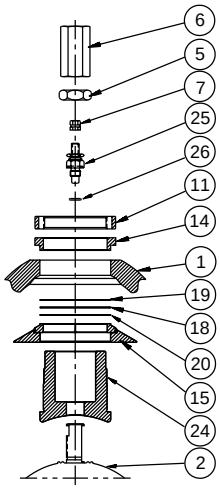

FIGURE D
5000 PSI
CONVENTIONAL
TOP REPAIRABLE

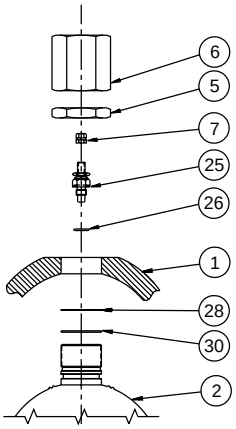

FIGURE E
5000 PSI
2" VALVE STEM

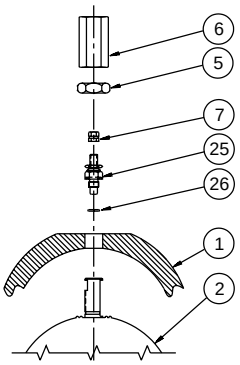

FIGURE F
5000 PSI

Item No.	Description
1	Shell
2	Bladder
3	O-ring
4	Valve Core
5	Lock Nut (Jam)
6	Protective Cap
7	Valve Cap
11	Lock Nut Outer
14	Spacer
15	Anti-Extrusion Ring Ass'y.
18	O-ring
19	O-ring Back-up
20	O-ring Back-up Metal
24	Top Adapter
25	Gas Valve
26	O-ring (Gas Valve)
28	Back-up Washer (Stem)
30	O-ring (Stem)

Suggested Approximate Torque Values

Protective Cap	14 ft. lbs.
Lock Nut (Jam)	56 ft. lbs.
Valve Core	3-4 in. lbs.
Bleeder Plug	10 ft. lbs.
Lock Nut Outer (1 qt.)	73 ft. lbs.
Lock Nut Outer (1 gal.)	200 ft. lbs.
Lock Nut Outer (2½-15 g.)	275 ft. lbs.
Gas Valve Cap	10-15 in. lbs.

Bladder Assembly Part Numbers

Accumulator Size	Seal Type				
	Buna	Butyl	Fluorocarbon	EPR	Low Temp. Nitrile
3000 PSI – Standard – Ref. Figures A, B & C. Contains items 2, 3, 4, 18, 19, 20, 25 & 26*					
10 C.I.	0850693CI0	0850703CI0	0851043CI0	0851053CI0	0856663C10
1 pt.	0850693001	0850703001	0851043001	0851053001	0856663001
1 qt.**	0850693002	0850703002	0851043002	0851053002	0856663002
150 C.I.	0850693006	0850703006	0851043006	0851053006	0856663006
1 Gal.***	0850693010	0850703010	0851043010	0851053010	0856663010
2½ Gal.	0850693025	0850703025	0851043025	0851053025	0856663025
5 Gal.	0850693050	0850703050	0851043050	0851053050	0856663050
10 Gal.	0850693100	0850703100	0851043100	0851053100	0856663100
11 Gal.	0850693110	0850703110	0851043110	0851053110	0856663110
15 Gal.	0850693150	0850703150	0851043150	0851053150	0856663150
25 Gal.	0850693250	0850703250	0851043250	0851053250	0856663250
40 Gal.	0850693400	0850703400	0851043400	0851053400	0856663400
5000 PSI—Ref. Figure D and contains items 2, 7, 25, & 26					
2½ Gal.	0870445025	0870455025	0870465025	0870475025	0870485025
5 Gal.	0870445050	0870455050	0870465050	0870475050	0870485050
10 Gal.	0870445100	0870455100	0870465100	0870475100	0870485100
15 Gal.	0870445150	0870455150	0870465150	0870467150	0870487150
5000 PSI — 2" Valve Stem Ref. Figure E Contains Items 2, 7, 25, 26, 28 & 30					
1 Gal.	0850695010	0850705010	0851045010	0851055010	0856665010
2½ Gal.	0861905025	0861915025	0861925025	0861935025	0861945025
5 Gal.	0861905050	0861915050	0861925050	0861935050	0861945050
10 Gal.	0861905100	0861915100	0861925100	0861935100	0861945100
15 Gal.	0861905150	0861915150	0861925150	0861935150	0861945150
5000 PSI — Ref. Figure F Contains Items 2, 7, 25 & 26					
2½ Gal.	0850695025	0850705025	0851045025	0851055025	0856665025
5 Gal.	0850695050	0850705050	0851045050	0851055050	0856665050
10 Gal.	0850695100	0850705100	0851045100	0851055100	0856665100
15 Gal.	0850695150	0850705150	0851045150	0851055150	0856665150

NOTE: Items shaded in gray will be phased out. * See following page for items 18-20.
**Contains items 2, 3 & 4 as shown in Figure A. ***Contains items 2, 3, 4, 18, 19, 25 & 26.

Gas Valve Assembly Part Numbers

Size	Pressure	Seal Type				
		Buna-Nitrile -01	Butyl -06	Fluorocarbon -28	EPR -08	Hydrin -04
10 - 150 C.I.	3000 PSI	NA	NA	NA	NA	NA
1 - 15 Gal.†	3000 PSI	L074210001	L074210003	L074210005	L074210007	L074210009
25 - 40 Gal.▲	3000 PSI	L074400001	L074400003	L074400005	L074400007	L074400009
1 - 15 Gal.▲	5000 PSI	L074400001	L074400003	L074400005	L074400007	L074400009

† Contains items 3, 4, 25 & 26.
▲ Contains items 7, 25 & 26.

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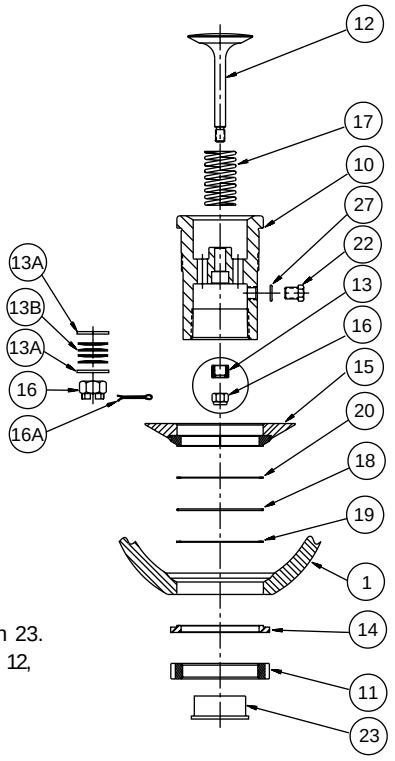
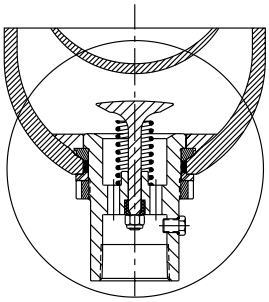
Accumulator Parts Description

Item No.	Description
1	Shell
8*	Oil Port Assembly
9**	Poppet & Plug Assembly
10	Oil Port (Machined)
11	Lock Nut Outer
12	Valve Poppet
13	Piston Poppet
13A ▲	Washers
13B ▲	Spring
14	Spacer
15	Anti-Extrusion Ring Assembly
16	Lock Nut
16A†	Cotter Pin
17	Spring Poppet
18	O-ring
19	O-ring Back-up
20	O-ring Back-up Metal
22***	Bleeder Plug
23	Dust Cap Oil Port
27	O-Ring (SAE Bleed Plug)





* Oil Port Assembly contains items 10 through 23.

** Port & Poppet Assembly contains items 10, 12, 13, 16, 17, 22 & 23.

*** Bleeder Plug for SAE straight thread port assemblies will also contain an o-ring (Item 22A).

▲ These parts are used for Hi-Flow and 25-40 Gal. Port Assembly only and in place of Item 13.

† This part is used for Hi-Flow and 25-40 Gal. Port Assemblies only in addition to Item 16.

Accumulator Accessories

Description	Part No.
Pull Rod (1 Qt-2 1/2 Gal)	085109 0250
Pull Rod (5 Gal)	085109 0500
Pull Rod (10- 11 Gal)	085109 1000
Pull Rod (15 Gal)	085109 1500
Core Repair Tool	542441 0000
Core Installation Tool	300987
Spanner Wrench	085110 0000

Accumulator Repair Tools

1. Bladder Pull Rods—(Bladder Type Accumulator) Pull Rods are available in single or multiple lengths for different size accumulators. The pull rods attach to the gas valve of the bladder for ease of assembly into shell during reassembly.
2. Core Tool—The core tool is used to remove and reinstall the valve core. It is also used to ream valve seat and repair threads.
3. Spanner Wrench—Fits all standard size bladder accumulators. Used to remove hydraulic poppet assembly from accumulator shell.

Oil Port Assembly Part Numbers

3000 PSI Accumulators		Seal Type					Port & Poppet Assemblies
Accumulator Size	Port	-01 Buna-Nitrile	-04 Hydrin	-06 Butyl	-08 EPR	-28 Fluorocarbon	
10 Cu. In.	3/4" NPT - Male	L076741*01	L076749*01	L076743*01	L076747*01	L076745*01	L076740*01
10 Cu. In.	SAE #8	L076741*02	L076749*02	L076743*02	L076747*02	L076745*02	L076740*02
1 Pt. - Qt.	3/4" NPT	L075031*01	L075039*01	L075033*01	L075037*01	L075035*01	L075030*01
1 Pt. - Qt.	SAE #12	L075031*02	L075039*02	L075033*02	L075037*02	L075035*02	L075030*02
150 Cu. In.	1" NPT	L074151*01	L074159*01	L074153*01	L074157*01	L074155*01	L074350*01
150 Cu. In.	SAE #16	L074151*02	L074159*02	L074153*02	L074157*02	L074155*02	L074350*02
1 Gal.	1 1/4" NPT	L074161*01	L074169*01	L074163*01	L074167*01	L074165*01	L074360*01
1 Gal.	SAE #20	L074161*02	L074169*02	L074163*02	L074167*02	L074165*02	L074360*02
1 Gal.	*1 1/4" SAE Split Flange	L074161*03	L074169*03	L074163*03	L074167*03	L074165*03	L074360*03
2 1/2 - 15 Gal.	2" NPT	L074171*01	L074179*01	L074173*01	L074177*01	L074175*01	L074370*01
2 1/2 - 15 Gal.	SAE #24	L074171*02	L074179*02	L074173*02	L074177*02	L074175*02	L074370*02
2 1/2 - 15 Gal.	*2" SAE Split Flange	L074171*03	L074179*03	L074173*03	L074177*03	L074175*03	L074370*03
2 1/2 - 15 Gal.	1 1/4" NPT	L074171*04	L074179*04	L074173*04	L074177*04	L074175*04	L074370*04
25 - 40 Gal.	3" NPT	L076761*01	L076769*01	L076763*01	L076767*01	L076765*01	L076760*01
2 1/2 - 15 Gal.	Hi Flow Straight Thread	L074221*01	L074229*01	L074223*01	L074227*01	L075225*01	L074410*01
2 1/2 - 15 Gal.	Hi Flow NPT (Male)	L074221*02	L074229*02	L074223*02	L074227*02	L075225*02	L074410*02

5000 PSI Accumulators		Seal Type					Port & Poppet Assemblies
Accumulator Size	Port	-01 Buna-Nitrile	-04 Hydrin	-06 Butyl	-08 EPR	-28 Fluorocarbon	
1 Gal.	1 1/4" NPT	L076781*01	L076789*01	L076783*01	L076787*01	L076785*01	L076770*01
1 Gal.	SAE #20	L076781*02	L076789*02	L076783*02	L076787*02	L076785*02	L076770*02
2 1/2 - 15 Gal.	2" NPT	L074181*01	L074189*01	L074183*01	L074187*01	L074185*01	L074420*01
2 1/2 - 15 Gal.	SAE #24	L074181*02	L074189*02	L074183*02	L074187*02	L074185*02	L074420*02
2 1/2 - 15 Gal.	1 1/2" SAE Split Flange	L074181*03	L074189*03	L074183*03	L074187*03	L074185*03	L074420*03

* = "0" (Std.) Oil Service * = "S" Water/Chem. Service