

DUAL ACCUMULATOR CHARGING VALVE with RELIEF VALVE

Product Explanation, Operating Information, and Service Instructions

PRODUCT EXPLANATION

The accumulator charging valve is designed for installation in an open center hydraulic system between the pump and the downstream secondary hydraulic devices. The accumulator charging valve supplies oil on demand to the accumulators from the open center circuit and isolates the pressure at each of its accumulator ports from one another. Accumulator charging is accomplished at a preset rate (GPM) and is relatively constant within the preset pressure limits.

The flow to the downstream secondary hydraulic devices will be reduced fractionally for a short time while the accumulators are charging. This does not noticeably affect the operation of these components. Full system pressure is available to the downstream secondary hydraulic devices at all times provided oil delivery and pressure from the pump is not impeded.

The accumulator charging valve incorporates a full flow relief valve to limit the maximum pressure in the hydraulic system.

The accumulator charging flow rate, upper and lower accumulator pressure limits and relief valve setting are set at the time of manufacture.

OPERATING INFORMATION

End user must provide proper maintenance of valve, should it become inoperable, by replacing the valve or servicing it with the proper repair kit. See TABLE 1 for proper repair kit number. Observe Service Instruction procedures on following pages. See Warnings A, B, C, and D.

IMPORTANT INFORMATION

A **⚠ WARNING**

Due to allowable operating temperature of accumulator charging valve avoid contact or burn injury may occur.

C **⚠ WARNING**

Relief valve is preset at the factory. DO NOT READJUST or system damage or failure may occur.

B **⚠ WARNING**

Be sure system energy is relieved from accumulator charging valve before removing from machine. See machine operating instructions for procedures to relieve system energy.

D **⚠ WARNING**

Do not exceed the high limit pressure setting indicated in TABLE 1 or system damage or failure may occur.

NOTE

Locate the part number on the accumulator charging valve and compare it to the part number in TABLE 1. Be sure you have the proper service instructions and repair kit.

SERVICE INSTRUCTIONS

⚠ WARNING

Be sure system energy is relieved from accumulator charging valve before removing from machine. See machine operating instructions for procedures to relieve system energy.

Disassembly

(Refer to Figure 1)

1. Remove plug (7) from housing (15). Remove o-ring (2) from plug (7). **NOTE: Plug (7) is under spring tension.**
2. Remove spring (5) and rod (6) from housing (15).
3. Remove plug (1) from housing (15) and remove o-ring (2) from plug (1).
4. Remove spool (3) from housing through plug (7) side ONLY. Remove seal (4) from spool (3).
5. **Directional spring (27) is attached to screw assembly (26) by means of the small diameter end of spring (27) being snapped in a groove on the nose end of screw assembly (26). See Figure 1a.** Remove nut (24) and remove screw assembly (26)/spring (27) from housing (15). Remove o-ring (25) from screw assembly (26) from nut (24) side of screw assembly. Remove steel ball (28), seat (29), o-ring (9), washer (30), and screen (31) from housing (15).
6. Remove plug (8) from housing (15) and remove o-ring (9) from plug (8).
7. BEFORE moving screw (10), ACCURATELY MEASURE ITS DEPTH from the end of housing and record for reassembly purposes. Remove screw (10) from housing (15).
8. Remove spring (12), retainer (13), and ball (14). Be sure to keep ball (13) separate from ball (20) for reassembling.
9. Remove pin (11) from screw (10) using a drive pin punch. Be careful not to damage threads on screw (10).
10. Remove plug (23) from housing (15). Remove o-ring (9) from plug (23).
11. Remove spring (22), stop (21), and ball (20) from housing (15).
12. Place housing on a bench with plug (23) end down. Spool (19) may or may not fall out at this point.
13. Using a 6.35-7.87 mm (0.25-0.31 in) diameter wood or plastic dowel, carefully remove insert (18) and spool (19) from housing (15). Insert (18) must come out plug (23) end of housing (15). Be careful not to scratch or mar valve seats on insert (18).
14. Remove spool (19) from insert (18). Remove o-rings (16 & 17) from insert (18).
15. Remove plug (32) from housing (15). Remove o-ring (33) from plug (32).
16. Remove spring (34), two poppets (35), sleeve (37), and spring (39) from housing (15). Remove o-rings (36 & 38) from sleeve (37). **NOTE: Be careful not to scratch or mar housing bore or sleeve.**
17. Remove relief valve (40) from housing (15).

⚠ WARNING

Relief valve is preset at the factory. DO NOT READJUST or system damage or failure may occur.

18. Remove o-ring (43), back-up ring (42), and o-ring (41) from relief valve (40).

Assembly

(Refer to Figure 1)

NOTE

Observe torque specifications as indicated in assembly procedures or system damage or failure may occur.

WASH ALL PARTS WITH CLEAN SOLVENT AND ALLOW TO DRY. LUBRICATE ALL RUBBER PARTS WITH CLEAN SYSTEM FLUID PRIOR TO ASSEMBLY. BE SURE ENTIRE ASSEMBLY PROCEDURE IS DONE USING CONTAMINATION FREE METHODS.

1. Install new o-ring (2) on plug (1). Install plug (1) into housing (15) and torque 122.0-135.6 N·m (90-100 lb·ft).
2. Install new seal (4) on spool (3). Be sure seal (4) does not twist in groove.
3. Lubricate spool (3) with clean system fluid and install in housing (15). Note direction of spool (3).
4. Install spring (5) and rod (6) into housing (15).
5. Install new o-ring (2) on plug (7). Install plug (7) in housing (15) and torque 122.0-135.6 N·m (90-100 lb·ft).
6. Install new o-rings (16 & 17) on insert (18) and place into housing (15). Note direction of assembly. Seat insert (18) with 12.7 mm (0.50 in) diameter wood dowel.
7. Install spool (19) into insert (18) in housing (15). Note direction of spool, long shoulder end faces end plug (23). See Figure 1b.
8. Install ball (20) on insert (19) in housing (15). Install stop (21) over ball (20) and spring (22) over stop (21).
9. Install new o-ring (9) on plug (23). Carefully install plug (23) in housing (15), centering spring (22). Torque 47.5-54.2 N·m (35-40 lb·ft).
10. Turn housing (15) so plug (1) is vertically upward. Install ball (14) in housing (15). Be sure ball (14) is centered in bottom of hole. Install retainer (13) and spring (12) into housing (15).
11. Insert new pin (11) in screw (10). Be sure pin (11) is aligned properly and is evenly driven into screw (10). Do not damage threads on screw (10).
12. Thread screw (10) into housing (15) TO THE DEPTH RECORDED during disassembly.
13. Install new o-ring (9) on plug (8). Install plug (8) in housing (15) and torque 47.5-54.2 N·m (35-40 lb·ft).
14. **Directional spring (27) is attached to screw assembly (26) by means of the small diameter end of spring (27) being snapped into a groove on the nose end of screw assembly (26). If necessary, reattach the small diameter of spring (27) into the groove on the nose end of screw assembly (26) using a slight twisting motion. See Figure 1a.** Install new o-ring (25) on screw assembly (26) from nut (24) side of screw assembly. Install new screen (31), washer (30), new o-ring (9), seat (29), and steel ball (28) in housing (15). Install screw assembly (26)/spring (27) in housing (15). Torque screw assembly (26) 24.4-29.8 N·m (18-22 lb·ft). Then install nut (24) on screw assembly (26) and torque nut 43.4-51.5 N·m (32-38 lb·ft).
15. Install new o-rings (36 & 38) on sleeve (37). Install spring (39), two new poppets (35), sleeve (37), and spring (34) into housing (15).
16. Install new o-ring (33) on plug (32). Install plug (32) in housing (15) and torque 67.8-81.3 N·m (50-60 lb·ft).
17. Install new o-ring (41), new back-up ring (42) and new o-ring (43) on relief valve (40). Note location of o-rings and back-up ring.

⚠ WARNING

Relief valve is preset at the factory. DO NOT READJUST or system damage or failure may occur.

18. Install relief valve (40) in housing (15) and torque 63.7-71.9 N·m (47-53 lb·ft).

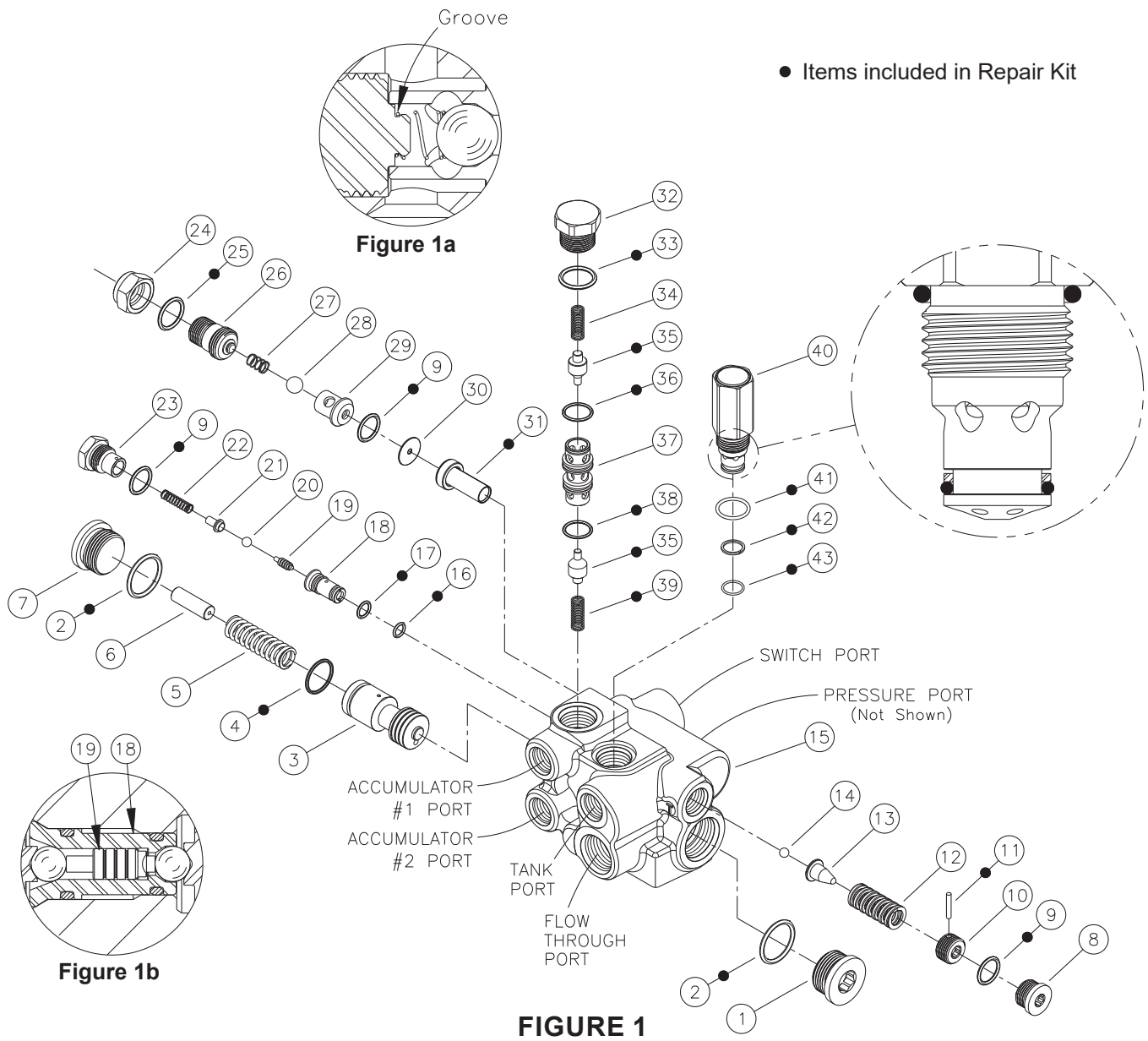


TABLE 1 (Specifications)

Caterpillar Part Number	Repair Kit Number	Accumulator High Limit (cut out)		Accumulator Low Limit (cut in)	
		bar	(PSI)	bar	(PSI)
492-0969	493-0551	180.0 ± 3.4	(2610 ± 50)	150.0 ± 3.4	(2175 ± 50)

Accumulator Charging Valve Adjustment

(Refer to Figure 1)

1. See machine servicing instructions to properly reinstall accumulator charging valve. Tee an accurate pressure gauge on an accumulator line.
2. Start pump and allow approximately one minute for charging to start (pressure in gauge will read accumulator precharge plus). If valve does not begin to charge remove end plug (8) and turn screw (10) in, stopping when gauge shows an increase in pressure. Check the high limit specifications (see TABLE 1) and adjust screw (10) until the high limit setting is met. Reinstall end plug (8). This pressure can be checked correctly only if after each adjustment of screw (10) the accumulator pressure is reduced below the low limit setting and the system

recharges the accumulator pressure to its high limit. Repeat process until high pressure setting is accurately adjusted. **NOTE: Be sure to reinstall plug (8) before starting pump.**

⚠ WARNING

Do not exceed the high limit pressure setting indicated in TABLE 1 or system damage or failure may occur.

3. Torque end plug (8) 47.5-54.2 N·m (35-40 lb·ft).

