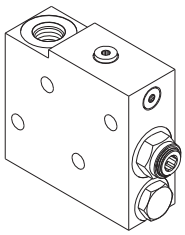

ACCUMULATOR CHARGING VALVE

Product Explanation, Operating Information, and Service Instructions

ACV-SMN-LS

PRODUCT EXPLANATION

The load sensing accumulator charging valve operates in a flow and pressure on demand system. The charging valve senses the pressure in the accumulator. If pressure in the accumulator is below a specified pressure range the charging valve sends a pressure signal to a pressure and flow compensated pump. The pump senses the pressure signal from the charging valve and responds by supplying flow to meet the demand from the charging valve. Pressure in the accumulator rises as the volume of oil increases in it. Flow rate to the pressure accumulator is constant. The charging valve stops sending the pressure signal when pressure in the accumulator reaches the high limit of the charging valve. The accumulator charging valve is connected to the hydraulic system in parallel to other load sensing valves. The highest demand for pressure determines the operating pressure of the system. A load sensing priority valve and fixed displacement pump may be used in place of the pressure and flow compensated pump.

The pressure limiting device of the hydraulic system limits pressure in the accumulator. The system must be designed to ensure there is sufficient available flow for all foreseeable operating conditions or has proper priority function to ensure safe operation.

OPERATING INFORMATION

End user must provide proper maintenance of the valve, should it become inoperable, by replacing the valve or servicing it with the proper repair kit. See TABLE 1 on page 3 for the proper repair kit number. Observe Service Instruction procedures on the following pages. See Warnings A, B, C and D below.

IMPORTANT INFORMATION

A **⚠ WARNING**

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

C **⚠ WARNING**

Pressure in the accumulators is limited by the system pressure limiting device. Adjustment outside of the allowable range may result in system damage or failure.

D **⚠ WARNING**

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

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NOTE

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

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. Disconnect fluid lines and electrical connections and remove accumulator charging valve from machine as recommended in the machine servicing instructions. Remove four o-rings (31) from the mounting face surface.
2. Remove the differential pressure switch from housing (8) by turning counter-clockwise on the differential pressure switch wrench flats. See Figure 1a.
3. Remove plug (1) from housing (8). Remove o-ring (2) from plug (1).
4. BEFORE moving screw (3), ACCURATELY MEASURE ITS DEPTH from the end of housing and record for reassembly purposes. Remove screw (3) from housing (8).
5. Remove spring (5), retainer (6) and ball (7) from housing (8). Be sure to keep ball (7) separate from ball (12) for reassembly purposes.
6. Remove pin (4) from screw (3) using a drive pin punch. **NOTE: Be careful not to damage threads of screw (3).**
7. Remove plug (9) from housing (8). Remove o-ring (2) from plug (9).
8. Remove spring (10), stop (11) and ball (12) from housing (8). Be sure to keep ball (12) separate from ball (7) for reassembly purposes.
9. Place housing (8) on a bench with plug (9) cavity end down. Spool (13) may or may not fall out at this point.
10. Using a 6.35-7.87 mm (0.25-0.31 inch) diameter wood or plastic dowel, carefully remove insert (14) and spool (13) from housing (8). Be careful not to scratch or mar valve seats on insert (14).
11. Remove spool (13) from insert (14). Remove o-rings (15 & 16) from insert (14).
12. Directional spring (20) is attached to screw assembly (19) by means of the small diameter end of spring (20) being snapped into a groove on the nose end of screw assembly (19). See Figure 1c. Remove nut (17) from screw assembly (19). Remove screw assembly (19)/ spring (20) from housing (8). Remove o-ring (18) from screw assembly (19) from nut (17) side of screw assembly. Remove shim (21), steel ball (22), seat (23), o-ring (2), orifice (24), orifice (25), screen (26) and washer (27) from housing (8).
13. Remove plug (28) from housing (8). Remove o-ring (29) from plug (28).
14. Remove plug (30) from housing (8). Remove o-ring (29) from plug (30).

NOTE

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

ASSEMBLY

(Refer to Figure 1)

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

1. Carefully wash the differential pressure switch with clean solvent and allow to dry. Inspect seals for damage or wear and replace as necessary. **NOTE: Seals for the differential pressure switch are not included in the repair kit.**
2. Position housing (8) with plug (9) cavity facing up. Install new o-rings (15 & 16) on insert (14) and install insert (14) in housing (8). Note direction of insert (14). Seat insert (14) using a 12.7 mm (0.50 in) diameter wood or plastic dowel.
3. Insert spool (13) into insert (14) in housing (8). Note the direction of insert (13), long shoulder end faces end plug (9). See Figure 1b.
4. Install ball (12) on insert (14) in housing (8). Install stop (11) over ball (12) and spring (10) over stop (11).
5. Install new o-ring (2) on plug (9). Carefully install plug (9) in housing (8). Be sure spring (10) is centered in plug (9). Torque plug (9) 47.5-54.2 N·m (35-40 lb·ft).
6. Position housing (8) with plug (1) cavity facing up. Install ball (7) in housing (8). Be sure ball is centered in bottom of hole. Install retainer (6) and spring (5) into housing (8).
7. Install new pin (4) in screw (3). Be sure pin (4) is aligned properly and is evenly driven into screw (3). **NOTE: Do not damage threads of screw (3).**
8. Thread screw (3) into housing (8) TO THE DEPTH RECORDED during disassembly.
9. Install new o-ring (2) on plug (1). Install plug (1) in housing (8). Torque plug (1) 47.5-54.2 N·m (35-40 lb·ft).
10. **Directional spring (20) is attached to screw assembly (19) by means of the small diameter end of spring (20) being snapped into a groove on the nose end of screw assembly (19). If necessary, reattach the small diameter of spring (20) into the groove on the nose end of screw assembly (19) using a slight twisting motion. See Figure 1c.** Install new o-ring (18) on screw assembly (19) from nut (17) side of screw assembly. Install washer (27), new screen (26), spacer (25), orifice (24), new o-ring (2), seat (23) and steel ball (22) in housing (8). Fully lubricate shim (21) with clean system fluid and install in housing (8) on end of seat (23). Install screw assembly (19)/spring (20) in housing (8). Torque screw assembly (19) 24.4-29.8 N·m (18-22 lb·ft). Then install nut (17) on screw assembly (19) and torque nut 43.4-51.5 N·m (32-38 lb·ft).
11. Install new o-rings (29) on plugs (28 & 30). Install plugs (28 & 30) in housing (8) and torque 13.6-19.0 N·m (10-14 lb·ft).
12. Reinstall the differential pressure switch in housing (8). Use the wrench flats on the differential pressure switch to torque as indicated in the machine servicing instructions.
13. Install four new o-rings (31) in the mounting surface o-ring pockets. See machine servicing instructions to properly reinstall accumulator charging valve. **NOTE: The mounting surface of the accumulator charging valve functions as a sealing surface. When reinstalling the valve on machine, be sure sealing surface is not damaged and is free of contamination which could interfere with the proper sealing function.**

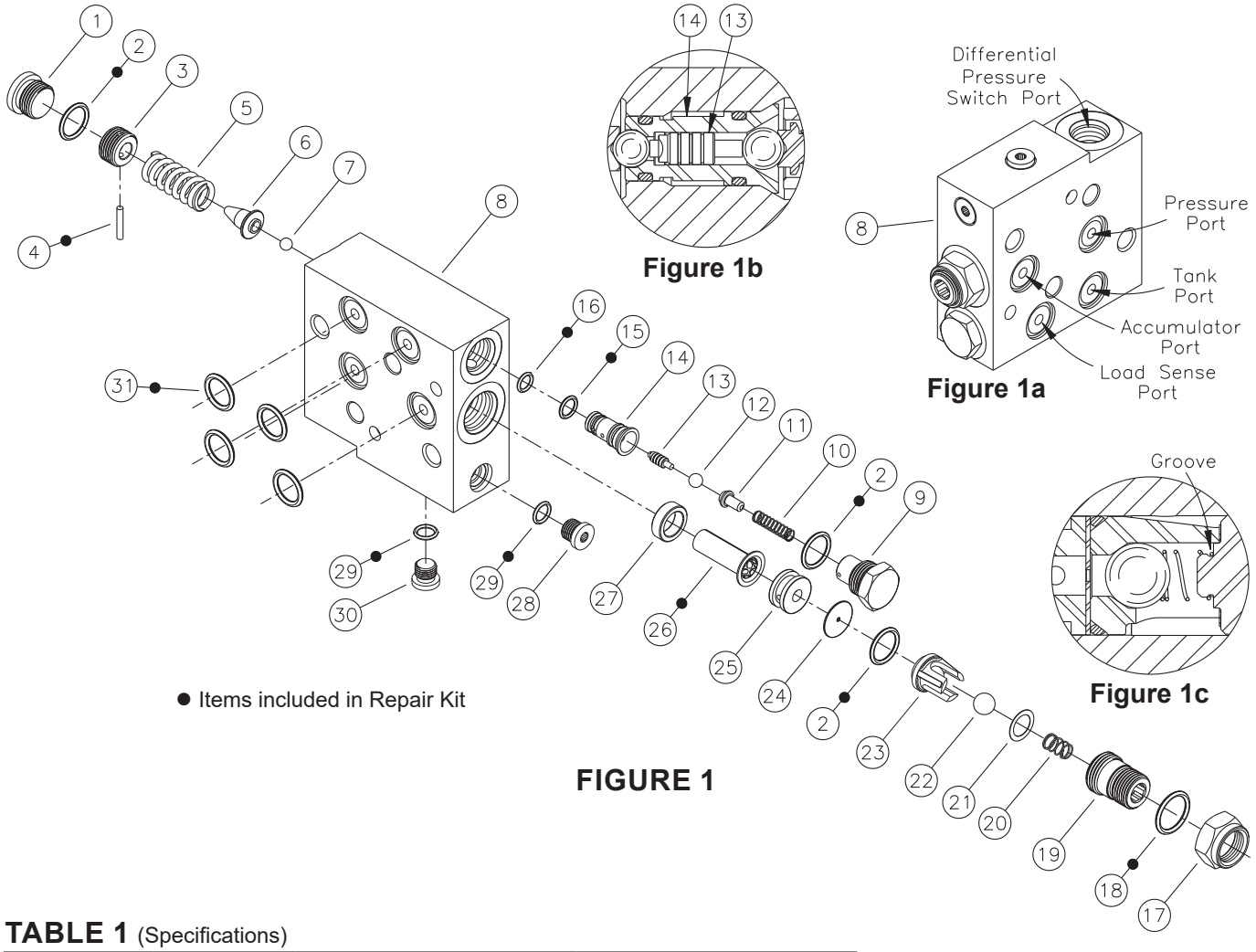

FIGURE 1

TABLE 1 (Specifications)

Model Number	Repair Number	Nominal High Limit (cut out)		Nominal Low Limit (cut out)	
		bar	(PSI)	bar	(PSI)
06-463-182	06-400-446	124.1 ± 3.5	(1800 ± 50)	88.7 ± 2.6	(1287 ± 38)

NOTE: If your product number is not listed, contact ZF Off-Highway Solutions Minnesota Inc. for information.

Accumulator Charging Valve Adjustment

(Refer to Figure 1)

1. 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, stop pump and remove plug (1) and turn screw (3) in 1/4 turn or less. Be sure to reinstall plug (1) before starting pump. Check the high limit specification (see Table 1). Repeat adjustment procedure until the high limit setting is met. This pressure can be checked correctly only if after each adjustment of screw (3) the accumulator pressure is reduced below the low limit setting and the system recharges the accumulator pressure to its high limit. **NOTE: Be sure to reinstall plug (1) before starting the pump.**
3. Torque plug (1) 47.5-54.2 N·m (35-40 lb·ft).

⚠ WARNING

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