

### **Accumulator Charging Valve**

#### **PRODUCT EXPLANATION**

The load sensing accumulator charging valve operates in a low and pressure on demand system. The charging valve senses the pressure in the accumulator(s). If pressure in one or both accumulators 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 accumulators rises as the volume of oil increases in them. Flow rate to the pressure accumulators is constant. The charging valve stops sending the pressure signal when pressure in the accumulators 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 accumulators. 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 valve, should it become inoperable, by replacing the valve or servicing it with the proper repair kit. See TABLE 1 for the proper repair kit number. Observe Service Instruction procedures on following pages. See Warnings below.

#### **IMPORTANT INFORMATION**



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



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

### **WARNING**

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



Do not exceed the high limit pressure setting indicated in TABLE 1 or system damage or failure may occur. NOTE: Locate the part number of the accumulator charging valve in your parts manual, and compare it to the part number in TABLE 1. Be sure you have the proper service instructions.

#### SERVICE INSTRUCTIONS

### 1 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 (1) from housing (10). Remove o-ring (2) from plug (1).

2. Remove plug (25) from housing (10). Remove o-ring (12) from plug (25).

3. BEFORE moving screw (24), ACCURATELY MEA-SURE ITS DEPTH from the end of housing (10) and record for reassembly purposes. Remove screw (24) from housing (10).

4. Remove spring (22), retainer (21), and ball (20). Be sure to keep ball (20) separate from ball (15) for reassembly.

5. Remove pin (23) from screw (24) using a drive pin punch.

#### NOTE: Be careful not to damage threads.

6. Remove plug (11) from housing (10). Remove o-ring (12) from plug (11).

7. Remove spring (13), stop (14), and ball (15) from housing (10).

8. Place housing (10) on a bench with plug (11) end down. Spool (16) may or may not fall out at this point.

9. Using a 6.4-7.9 mm (0.25-0.31 in) diameter wood or plastic dowel, carefully remove insert (17) and spool (16) from housing (10). Insert (17) must come out plug (11) side of housing (10).

### NOTE: Be careful not to scratch or mar valve seats on insert (17).

10. Remove spool (16) from insert (17). Remove o-rings (18 & 19) from insert (17).

11. Remove plug (34) from housing (10). Remove o-ring (33) from plug (34).

12. **Earlier Models**: Using a 1/4-20 UNC bolt, remove sleeve (32) and orifice (29) from housing (10). Remove poppet or steel ball (28), and spring (27) from housing (10). Remove o-ring (31) from sleeve (32) and o-ring (30) from orifice (29). **Later Models**: Remove sleeve (32) from housing (10). Using a 1/4-20 UNC bolt, remove orifice (29) from housing (10). Remove poppet or steel ball (28), and spring (27) from housing (10). Remove o-ring (30) from orifice (29).

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 allow to dry. Lubricate all rubber parts with clean system fluid prior to assembly. Be sure entire assembly procedure is done with contamination free methods.

1. Install new o-ring (2) on plug (1). Install plug (1) in housing (10) and torque 122.0-135.6 Nm (90-100 lb·ft).

2. Install new o-rings (18 & 19) on insert (17) and install in housing (10). Note direction of assembly. Seat insert (17) using a 12.7 mm (0 .50 in) diameter wood dowel.

3. Install spool (16) into insert (17) in housing (10). Note direction of spool (16), long shoulder end is toward end plug (11), see Figure 1a.

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4. Install ball (15) on insert (17) in housing (10). Install stop (14) on ball (15).

5. Install spring (13) over stop (14).

6. Install new o-ring (12) on plug (11) and install plug (11) in housing (10), centering spring (13). Torque plug (11)  $47.5-54.2 \text{ N}\cdot\text{m}$  (35-40 lb·ft).

7. Turn housing (10) so plug (25) end is vertically upward. Install ball (20), 6.35 mm (0.25 in) diameter. Be sure ball (20) is centered in bottom of hole in housing (10). Install retainer (21) and spring (22) into housing (10).

8. Insert new pin (23) in screw (24). Be sure pin (23) is aligned properly and is evenly driven into screw (24).

#### NOTE: Do not damage threads.

9. Thread screw (24) into housing (10) to the depth recorded during disassembly.

10. Install new o-ring (12) on plug (25) and install plug (25) in housing (10). Torque plug (25) 47.5-54.2 N·m (35-40 lb·ft).

11. Install new o-ring (30) on orifice (29).

12. Install spring (27), new poppet or steel ball (28), and orifice (29) in housing (10). Note order and direction of parts.

13. **Earlier Models**: Install new o-ring (31) on sleeve (32) and install sleeve (32) in housing (10). Note direction of sleeve (32). Install new o-ring (33) on plug (34). Install plug (34) into housing (10) and torque plug (34) 122.0-135.6 N·m (90-100 lb·ft).

Later Models: Install sleeve (32) in housing (10). Install new o-ring (33) on plug (34). Install plug (34) into housing (10) and torque plug (34) 122.0-135.6 N·m (90-100 lb·ft).

#### VALVE ADJUSTMENT

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, stop pump and remove end plug (25) and turn screw (24) approximately 1/4 turn clockwise. Reinstall end plug (25). Check the high limit specifications (see TABLE 1). Repeat as needed until the high limit setting is met. Pressure limits can be checked correctly only if after each adjustment of screw (24) 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 (25) before starting pump.

# **A WARNING**

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

3. Torque end plug (25) 47.5-54.2 N·m (35-40 lb ft).



Valve	Repair Kit Part Number	Nominal High Limit (cut out)		Nominal High Limit (cut in)	
Part Number		PSI	bar	PSI	bar
244182	251340	1550 ± 50	106.9 ± 3.5	1075 ± 50	74.1 ± 3.5
246929		2300 ± 50	158.6 ± 3.5	1700 ± 50	117.2 ± 3.5
251610		2700 ± 50	186.2 ± 3.5	2225 ± 50	153.4 ± 3.5

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SERVICE CHECKS FOR HYDRAULIC SYSTEMS					
Symptom	Possible Cause	Corrective Action			
Accumulator charging cycle	Leaking accumulator lines or fittings	Check lines and fittings for leaks and correct			
repeats frequently when accu- mulator is not normally being	Incorrect setting of accumulator gas charge	Check accumulator gas charge			
discharged in service	Line to accumulator plugged	Replace line			
	Inoperative charging valve	Replace charging valve			
	No oil or low oil level in tank	Check oil level			
	Pump worn or inoperative and not delivering full flow or pressure	Check pump			
Accumulator starts to charge but does not reach high limit	Inoperative system relief valve (valve leaking or has low setting so full flow and pressure are not avail- able)	Check relief valve			
	Inoperative charging valve	Replace charging valve			
	No oil or low oil level in tank	Check oil level			
Accumulator charging time	Relief valve setting too low	Check valve setting			
too long	Pump worn or inoperative and not delivering full flow or pressure	Check pump			
	Inoperative charging valve	Replace charging valve			
	No oil or low oil level in tank	Check oil level			
Accumulator fails to start	Worn or defective pump	Check pump pressure and flow			
charging	Inoperative relief valve	Check relief valve setting			
	Air in accumulator line	Bleed accumulator line			
	Inoperative charging valve	Replace charging valve			
Very rapid cycling of charging	Incorrect setting of accumulator gas charge	Check accumulator gas charge			
valve	Inoperative charging valve	Replace charging valve			
	Inoperative pump	Check pump pressure and delivery			
Lack of adequate flow through	Inoperative relief valve	Check relief valve setting			
valve	Blocked lines	Replace lines			
	Inoperative charging valve	Replace charging valve			

SERVICE DIAGNOSIS				
Symptom	Possible Cause			
	1. Poppet or ball (28) leaking			
	2. O-ring (30) leaking			
Repeats frequently when accumulators are	3. O-ring (18) leaking			
not normany being discharged in service	4. Ball (15) leaking			
	5. Inoperative seat on insert (17)			
Accumulators start to charge but do not	1. O-ring (19) leaking			
reach high limit	2. O-ring (31) leaking (earlier models only)			
Accumulator charging time too long	1. Poppet (28) stuck, partially closed			
	2. Orifice (29) partially plugged			
Accumulators fail to start charging	1. Broken spring (22)			
Accumulators fail to start charging	2. O-ring (19) leaking			
Very rapid cycling of charging valve	1. Insert (17) worn			