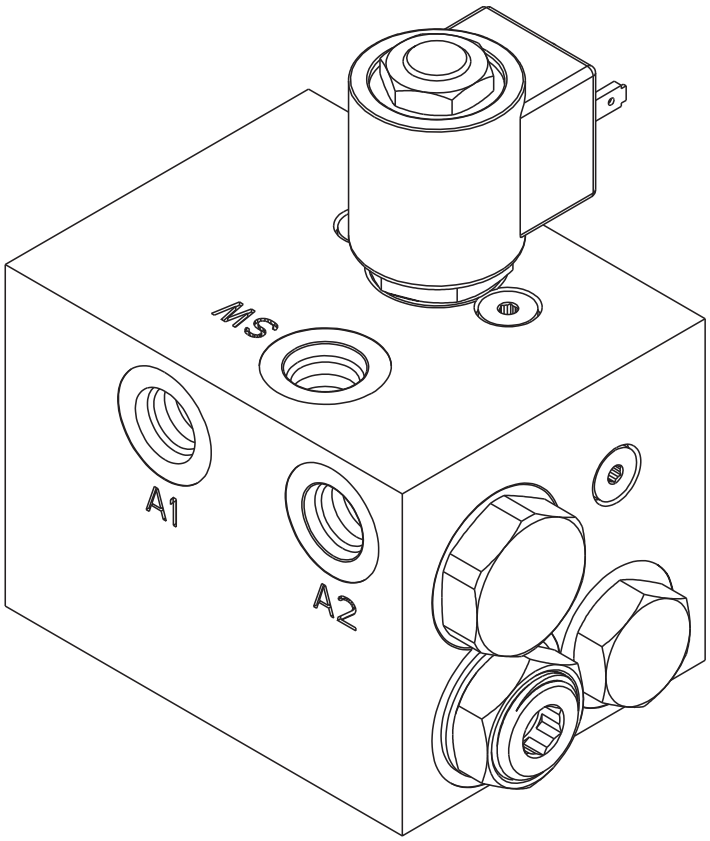
Unloading Dual Load Sense ACCUMULATOR CHARGING VALVE

Service Instructions



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Form No. 81-463-025 Revised 2016-07-18

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DISASSEMBLY

(Refer to Figure 1)

1. Remove plug (1) from housing (39). Remove o-ring (2) from plug (1)
2. Remove springs (3), poppets (4), and sleeve (6) from housing (39). **NOTE: Be careful not to scratch or mar sleeve (6) or housing bore.**
3. Remove o-rings (5 & 7) from sleeve (6).
4. Loosen nut (8) and remove screw assembly (9) from housing (39). Remove o-ring (10) from screw assembly (9).
5. Remove spring (3), poppet or ball (11), seat (12), o-ring (13), and washers (14 & 15) from housing (39).
6. BEFORE removing screw (29), ACCURATELY MEASURE ITS DEPTH from the end of housing and record for reassembly purposes. Remove screw (29) from housing (39).
7. Remove pin (30) from screw (29) using a drive pin punch. Be careful not to damage screw threads.
8. Remove spring (28), retainer (27), and ball (26) from housing (39).
9. Remove plug (16) from housing (39). Remove o-ring (13) from plug (16).
10. Remove spring (17), stop (18), and ball (19) from housing (39). For reassembly purposes, keep balls (19 & 26) separated in the order in which they are removed.
11. Using a 6.35-7.87 mm (0.25-0.31 in) diameter wood or plastic dowel, carefully remove insert (21) and spool (20) from housing (39). Insert (21) must be removed from plug (16) end of housing. **NOTE: Be careful not to scratch or mar valve seats on insert (21).**
12. Remove spool (20) from insert (21). Remove o-rings (22 & 24) and back-up rings (23 & 25) from insert (21). **NOTE: Not all models use back-up rings (23 & 25).**
13. To remove solenoid valve (31) from housing (39), loosen and remove the nut from the top of the coil. Separate the coil from the cartridge valve. Remove the cartridge valve from housing (39).
14. Carefully remove back-up rings (33 & 35) and o-rings (32, 34, & 36) from the cartridge valve.
15. Remove four plugs (37) from housing (39). Remove o-rings (38) from plugs (37).

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 THE ENTIRE ASSEMBLY PROCEDURE IS DONE USING CONTAMINATION FREE METHODS.

1. Install new o-rings (22 & 24) and new back-up rings (23 & 25) on insert (21). Note the order of the components. **NOTE: Not all models use back-up rings (23 & 25).**
2. Install insert (21) into housing (39). Note direction of assembly. Seat insert (21) with a 12.70 mm (0.50 in) diameter wood or plastic dowel. **NOTE: Be careful not to scratch or mar valve seats on insert (21).**
3. Install spool (20) into insert (21). Note direction of spool (20), long shoulder end of spool (20) is toward plug (16).
4. Install ball (19) on insert (21). Install stop (18) on ball (19). Install spring (17) over stop (18).
5. Install new o-ring (13) on plug (16). Carefully install plug (16) into housing (39) and torque 47.5-54.2 N·m (35-40 lb·ft).
6. Turn housing (39) so screw (29) cavity is vertically upward. Install ball (26) so it is centered on insert (21). Drop retainer (27) and spring (28) into housing (39).
7. Insert new pin (30) in screw (29). Be sure pin (30) is aligned properly and is evenly driven into screw (29). Do not damage screw threads.
8. Thread screw (29) into housing (39) to the depth recorded during disassembly.
9. Install new o-ring (10) on screw assembly (9).
10. Install washers (15 & 14), new o-ring (13), seat (12), new poppet (11) or reinstall existing ball (11), spring (3) and screw assembly (9) in housing (39). Torque screw assembly (9) 24.4-29.8 N·m (18-22 lb·ft). **NOTE: If your model uses a steel ball in place of poppet (11), the steel ball must be reinstalled during assembly procedure.**
11. Torque nut (8) 43.4-51.5 N·m (32-38 lb·ft).
12. Install new o-ring (5 & 7) on sleeve (6).
13. Install springs (3), new poppets (4) and sleeve (6) in housing (39) in the order shown in Figure 1. Note direction of poppets (4). **NOTE: Be careful not to scratch or mar sleeve (6) or housing bore.**
14. Install new o-ring (2) on plug (1). Install plug (1) in housing (39) and torque 54.2-61.0 N·m (40-45 lb·ft).
15. Install new o-rings (38) on four plugs (37). Install plugs (37) in housing (39) and torque 3.4-6.8 N·m (30-60 lb·in).
16. Carefully install new o-rings (32, 34, & 36) and back-up rings (33 & 35) on cartridge valve. Note the order of the components. Be sure back-up rings (33 & 35) are properly seated in the grooves.
17. Install cartridge valve in housing (39). Torque cartridge valve 20.3-27.1 N·m (15-20 lb·ft). Place the coil over the cartridge valve. Reinstall the top nut and torque 3.4-6.8 N·m (30-60 lb·in).

VALVE ADJUSTMENT

(Refer to Table 1)

1. Reinstall valve correctly. Tee an accurate pressure gauge into each accumulator line.
2. Start pump and allow approximately one minute for charging to start (pressure in gauge will read accumulator precharge plus). Make sure that solenoid valve (31) is not energized. If valve does not begin to charge, turn screw (29) in, stopping when gauge shows an increase in pressure. Check the high limit specifications and adjust screw (29) until the high limit setting is met. This pressure can be checked correctly only if after each adjustment of screw (29) the accumulator pressure is reduced below the low limit setting and the system recharges the accumulator pressure to its high limit.

NOTE

It may be necessary to reconnect the tank port line after each adjustment to prevent oil leakage from this port.

● Items included in Repair Kit

* Not used in all models

NOTE

Some models use a steel ball in place of poppet (11). Reinstall existing steel ball during assembly procedure. This steel ball is not included in repair kit.

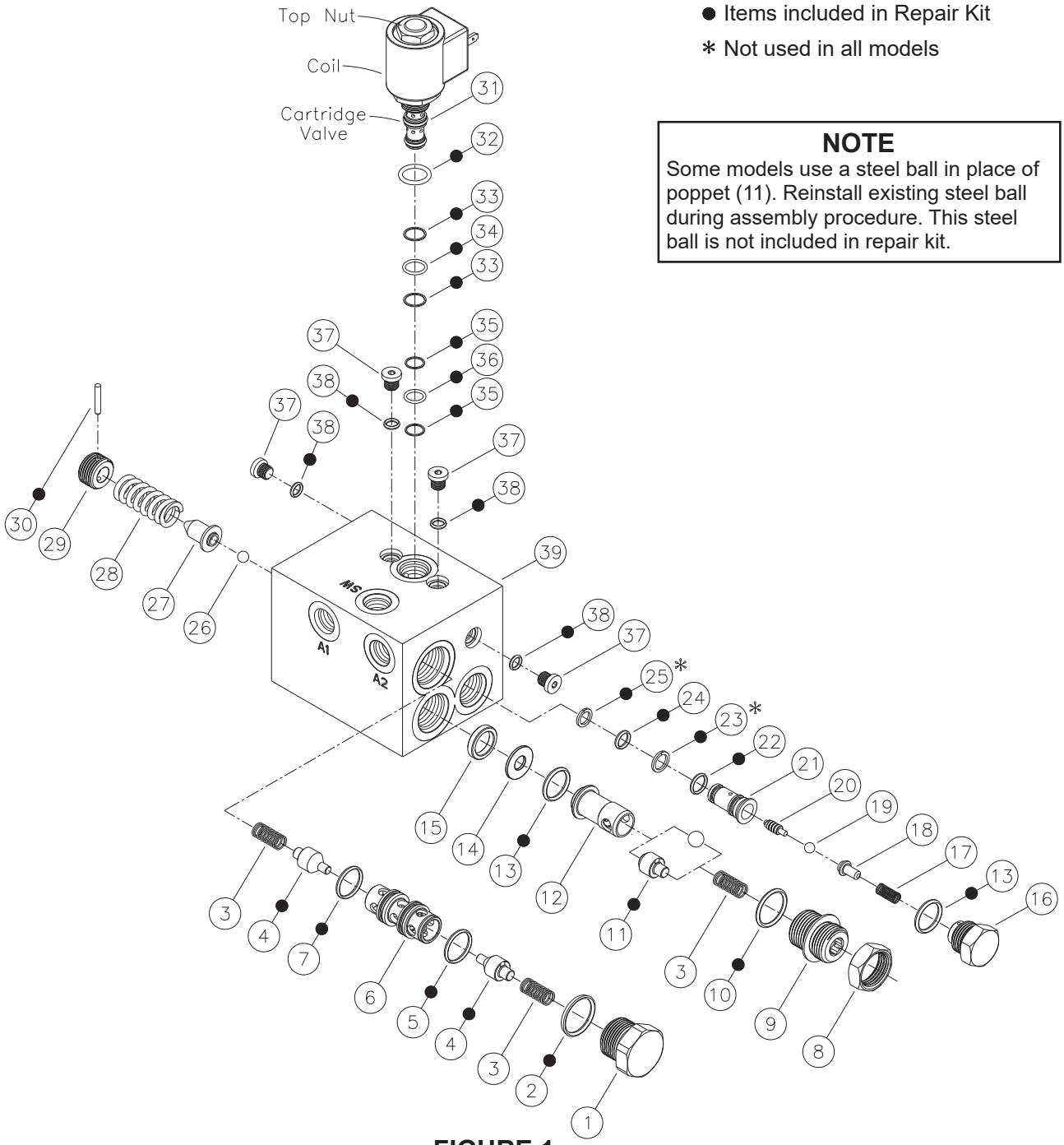

FIGURE 1

TABLE 1 (Specifications)

Model Number	Repair Kit Number	Nominal High Limit (cut out)		Nominal Low Limit (cut in)	
		bar	(PSI)	bar	(PSI)
06-463-132	06-400-214	165 ± 3.5	(2400 ± 50)	134 ± 3.5	(1950 ± 50)
06-463-134	06-400-214	172 ± 3.5	(2500 ± 50)	97 ± 3.5	(1400 ± 50)
06-463-140	06-400-214	160 ± 3.5	(2320 ± 50)	120 ± 3.5	(1740 ± 50)
06-463-142	06-400-214	128 ± 3.5	(1850 ± 50)	103 ± 3.5	(1500 ± 50)
06-463-146	06-400-214	128 ± 3.5	(1850 ± 50)	103 ± 3.5	(1500 ± 50)
06-463-150	06-400-214	160 ± 3.5	(2320 ± 50)	120 ± 3.5	(1740 ± 50)
06-463-192	06-400-214	160 ± 3.5	(2320 ± 50)	120 ± 3.5	(1740 ± 50)

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

SERVICE CHECKS FOR HYDRAULIC SYSTEMS

ACCUMULATOR CHARGING CYCLE REPEATS FREQUENTLY WHEN ACCUMULATOR IS NOT NORMALLY BEING DISCHARGED IN SERVICE

1. Leaking accumulator lines or fittings
1. **Check lines and fittings for leaks and correct**
2. Incorrect setting of accumulator gas charge
2. **Check accumulator gas charge**
3. Line to accumulator plugged
3. **Replace line**
4. Inoperative charging valve
4. **Replace charging valve**

ACCUMULATOR STARTS TO CHARGE BUT DOES NOT REACH HIGH LIMIT

1. No oil or low oil level in tank
1. **Check oil level**
2. Pump worn or inoperative and not delivering full flow or pressure
2. **Check pump**
3. Inoperative system relief valve (valve leaking or has low setting so full flow and pressure are not available)
3. **Check relief valve**
4. Inoperative charging valve
4. **Replace charging valve**

ACCUMULATOR CHARGING TIME TOO LONG

1. No oil or low oil level in tank
1. **Check oil level**
2. Relief valve setting too low
2. **Check valve setting**
3. Pump worn or inoperative and not delivering full flow or pressure
3. **Check pump**
4. Inoperative charging valve
4. **Replace charging valve**

ACCUMULATOR FAILS TO START CHARGING

1. Solenoid valve energized or malfunctioning
1. **Check for proper operation of solenoid valve**
2. No oil or low oil level in tank
2. **Check oil level**
3. Worn or inoperative pump
3. **Check pump pressure and flow**
4. Inoperative relief valve
4. **Replace charging valve**
5. Air in accumulator line
5. **Bleed accumulator line**
6. Inoperative charging valve
6. **Replace charging valve**

VERY RAPID CYCLING OF CHARGING VALVE

1. Incorrect setting of accumulator gas charge
1. **Check accumulator gas charge**
2. Inoperative charging valve
2. **Replace charging valve**

LACK OF ADEQUATE FLOW THROUGH VALVE

1. Inoperative pump
1. **Check pump pressure and delivery**
2. Inoperative relief valve
2. **Replace charging valve**
3. Blocked lines
3. **Replace lines**
4. Inoperative charging valve
4. **Replace charging valve**

SERVICE DIAGNOSIS

ACCUMULATOR CHARGING CYCLE REPEATS FREQUENTLY WHEN ACCUMULATOR IS NOT NORMALLY BEING DISCHARGED IN SERVICE

1. Poppet (11) leaking.
2. O-ring (13) leaking.
3. O-ring (22) leaking.
4. Ball (19) leaking.
5. Inoperative seat on insert (21).

ACCUMULATOR STARTS TO CHARGE BUT DOES NOT REACH HIGH LIMIT

1. O-ring (25) leaking.

ACCUMULATOR CHARGING TIME TOO LONG

1. Poppet (4 or 11) stuck, partially closed.
2. Seat (6) partially plugged.

ACCUMULATOR FAILS TO START CHARGING

1. Inadvertent activation or malfunction of solenoid valve (31).
2. Broken spring (28).

VERY RAPID CYCLING OF CHARGING VALVE

1. Insert (21) worn.
2. Poppets (4) stuck, partially closed.

ACCUMULATOR PRESSURES ARE NOT ISOLATED FROM ONE ANOTHER

1. O-rings (5 or 7) leaking.
2. Inoperative poppets (4).