

DENISON**Hydraulics****SERVICE LITERATURE**

PRESSURE COMPENSATOR HANDWHEEL CONTROL

These Controls Are For Use On The Following Denison Pumps:

OLD MODEL NO.	SERIES	NEW MODEL NO.
PA-072-566-L	600	PV06-007-51L-06
PA-072-566-R	600	PV06-007-51R-06
PA-202-576-L	700	PV07-020-51L-06
PA-202-576-R	700	PV07-020-51R-06
PA-352-586-L	800	PV08-035-51L-06
PA-352-586-R	800	PV08-035-51R-06

DESCRIPTION AND OPERATION

The operation of the handwheel pressure compensator type pump is really a combination of two of our pump controls. The handwheel adjustment limits the maximum amount of volume which can be delivered by the pumps, and the compensator automatically reduces the volume, once pressure has started to build up.

As the pressure increases in the system, the compensator valve shifts. The flow from the compensator valve is applied directly against a piston, pressing this against the hanger mechanism, reducing the angle of the cam plate. The greater the pressure, the greater distance the hanger is depressed, reducing the volume but maintaining pressure. The volume will continue to reduce until the bottom stop (located on opposite side of pump housing) is encountered. This minimum stop is used only when it is not desirable to go to "O" volume delivery. The adjustment which decides when the pump is to decrease its volume, is the knurled knob located on top of the pump housing. Always be certain that after adjustment the knurled locknut is hand tight. The minimum adjustment stop is adjusted in much the same manner.

DISASSEMBLY

To remove the controls from the pump the following procedure is recommended.

- A. If the controls are not located on top of the pump, drain the oil from the pump housing before dismantling parts of the control.
- B. Remove four bolts (12) from control cap (69), and body (14). The complete control assembly can then be removed.
- C. After removing screws (16), that are at the opposite side of the pump and in the minimum volume section, it is possible to remove cap (17). When cap (17) is removed, parts (18) through (26) can be easily removed from the pump.

D. In order to dismantle the assemblies just removed:

1. Take off lock nut (24), parts (18) and (25) will then drop out, making it possible to unscrew stop (19), from end cap (17).
2. To remove piston (23), roll pin (22) must first be removed, then springs (20) and (21) can be disassembled.
3. In order to remove the clevis (28), the end cap of the variable volume pump housing must be removed. (See drawing of variable volume pump.) By pushing hanger upwards, it is possible to reach the four screws (27). Removing these four screws will allow removal of clevis (28).

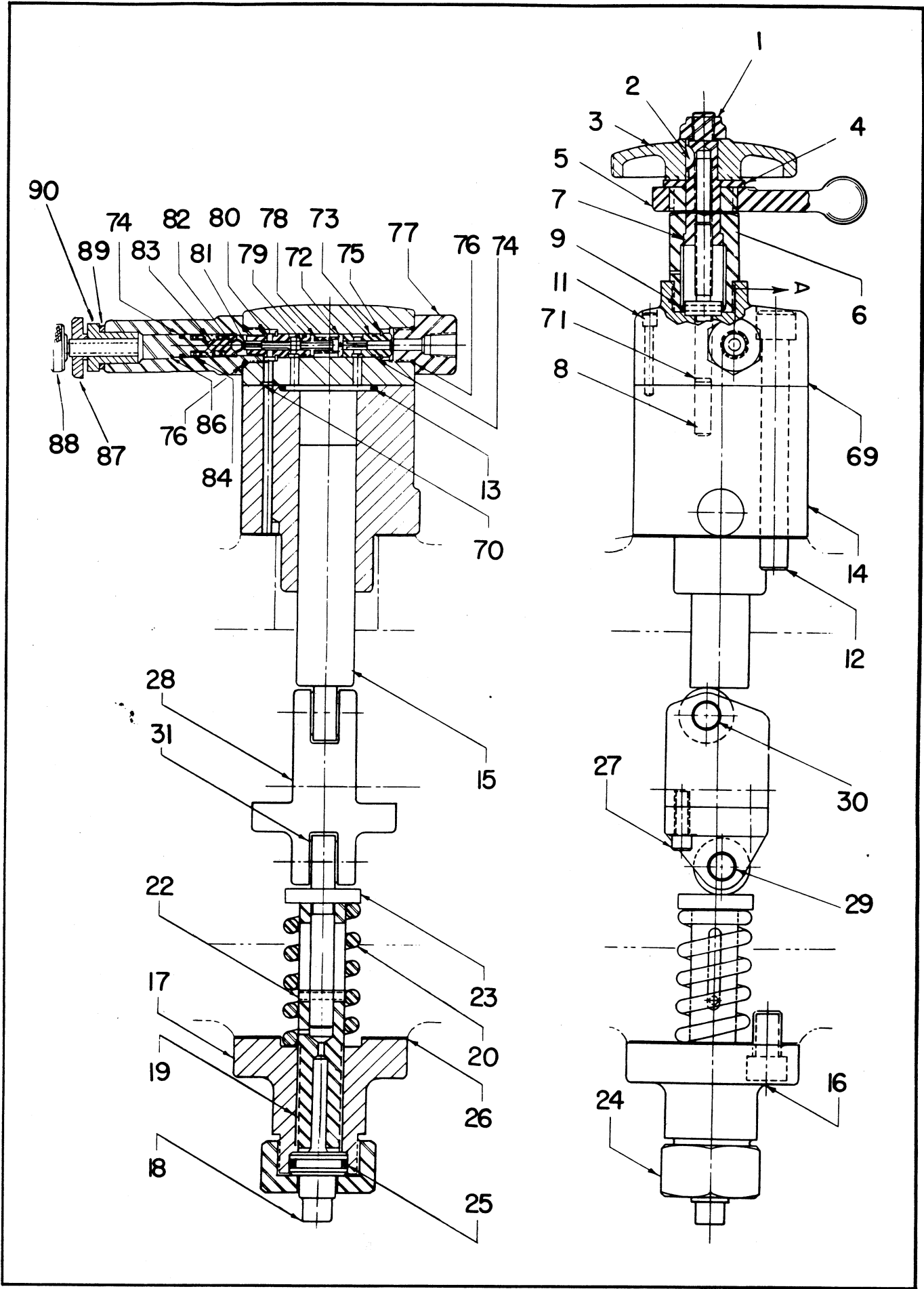
E. To disassemble handwheel portion of the control remove elastic stop nut (1), handwheel (3), washer (4), lock lever (5), housing (6), and piston (15). The two castings (69) and (14) will come apart automatically with the removal of screws (11).

F. To disassemble parts of the pressure compensating mechanism:

1. Remove adjustment housing and adjustment assembly by turning with a wrench on the hex base of the housing (85). Be careful during the removal that the steel ball (82) does not fall out.
2. Remove control sleeve (80) and piston (81) with pliers.
3. Next remove spring retainer (79), and spring (78) with pliers or by lifting out with a small brass rod.
4. On the other side of the control cap, remove spool stop (77), to remove control sleeve (73) and piston (72). These normally drop out easily by tapping housing on a block of wood.

PARTS LIST

REF. NO.	DESCRIPTION	600 SERIES	700 SERIES	800 SERIES	QTY
1 #	Elastic stop nut 1/2 - 13	331-20101	331-20101	331-20101	1
2 #	No. 3 Woodruff key	211-10003	211-10003	211-10003	1
3 #	Handwheel	035-14007	035-14007	035-14007	1
4 #	Washer	035-14076	035-14076	035-14076	1
5 #	Lever	035-14714	035-14714	035-14714	1
6 #	Housing	035-14090	035-14090	035-14090	1
7 #	Adjusting screw	035-18001	035-18001	035-18001	1
8 #	Stop	035-17914	035-17914	035-17914	1
9 #	Guide	035-14008	035-14008	035-14008	1
11	S.H.C. screw 10-24 x 1 1/2	-----	308-10200	308-10200	2
12	S.H.C. screw 7/16-14 x 4	308-18360	-----	-----	4
	S.H.C. screw 5/8-11 x 5	-----	308-24400	308-24400	4
13	"O" ring 70-6227-22 ARP-217	671-00217	-----	-----	1
	"O" ring 70-6230-3 ARP-225	-----	671-00225	671-00225	1
14	Control body assembly	515-02501	515-02247	515-02247	1
15	Control body piston	035-14190	035-14082	035-14082	1
16	S.H.C. screw 7/16-14 x 1	308-18160	-----	-----	4
	S.H.C. screw 5/8-11 x 1	-----	308-24160	308-24160	4
17 ▲	Stop body	035-14715	035-15070	035-15070	1
18 ▲	Tongue	035-14718	035-14751	035-14751	1
19 ▲	Stop	035-14719	035-15071	035-15071	1
20 ▲	Spring	035-22404	035-22413	035-22413	1
21 ▲	Spring	035-22322	-----	-----	1
22 ▲	Roll pin 3/16 inch dia.	325-12110	325-12150	325-12150	1
23 ▲	Piston	035-14717	035-15072	035-15072	1
24 ▲	Nut	035-14716	035-14752	035-14752	1
25 ▲	"O" ring 70-6227-15 ARP-210	671-00210	-----	-----	1
	"O" ring 70-6227-19 ARP-214	-----	671-00214	671-00214	1
26	Vellumoid gasket	035-12592	035-12279	035-12279	2
27	S.H.C. screw 5/16-18 x 1 (Nyllok)	308-14166	308-14166	308-14166	4
28 †	Clevis	035-15868	035-15821	035-15824	1
29 †	Dowel pin 5/8 x 3	324-24048	324-24048	324-24048	1
30 †	Dowel pin 5/8 x 1-3/8	324-24022	324-24022	324-24022	1
31 †	Clevis Roller	035-42011	035-42011	035-42011	2
69 *	Control cap	035-18000	035-17999	035-17999	1
70 *	"O" ring 70-6227-3 ARP-008	671-00008	671-00008	671-00008	1
71 *	"O" ring 70-6227-7 ARP-012	671-00012	671-00012	671-00012	1
72 *	Piston (large head)	035-13977	035-13977	035-13977	1
73 *	Control sleeve (1-1/16 inch long)	035-13982	035-13982	035-13982	1
74 *	"O" ring 70-6227-7 ARP-012	671-00012	671-00012	671-00012	3
75 *	Retaining ring Eaton No. 413	356-15885	356-15885	356-15885	2
76 *	"O" ring 70-6227-12 ARP-114	671-00114	671-00114	671-00114	2
77 *	Spool stop	035-12562	035-12562	035-12562	1
78 *	Spring	035-22051	035-22051	035-22051	1
79 *	Spring retainer	035-13976	035-13976	035-13976	1
80 *	Control sleeve (1-3/8 inch long)	035-13981	035-13981	035-13981	1
81 *	Control piston	035-45998	035-45998	035-45998	1
82 *	Steel ball 1/4 inch dia.	201-08001	201-08001	201-08001	1
83 *	Ball support	035-11697	035-11697	035-11697	1
84 *	Spring	035-12289	035-12289	035-12289	1
85 *	Adjustment housing	035-12555	035-12555	035-12555	1
86 *	Seal piston	035-11712	035-11712	035-11712	1
87 *	Lock nut	035-17116	035-17116	035-17116	1
88 *	Adjusting screw	035-17115	035-17115	035-17115	1
89 *	Washer Shakeproof No. 1228	348-10040	348-10040	348-10040	1
90 *	Retainer nut	035-17117	035-17177	035-17117	1
*	Compensator Cap Assembly	515-00049	515-00181	515-00181	1
▲	Minimum Stop Assembly	515-00050	515-00163	515-00163	1
†	Clevis Assembly	515-00043	515-00162	515-00249	1
#	Handwheel Assembly	515-01142	515-01142	515-01142	1



5. Inspect all parts carefully for dirt or wear and clean thoroughly in a solvent. Piston (72) and (81) should move freely without binding, but if too loose will cause the compensator control to have excess leakage.
6. The control sleeve (80) and piston (81) must fit correctly or the metering of oil through the control will be faulty.
7. Inspect all "O" rings and replace if necessary.
8. Before assembly carefully clean all parts as they are reassembled. Check snap rings to see that they are not broken or out of position.
9. After inspecting and cleaning, lubricate all internal parts with a heavy lubricating oil.

3. Check piston at this time by running wire through the opposite end of the cap through the control sleeve and moving the piston back and forth with the wire, checking if it moves freely and without binding.
4. Be sure "O" ring is in place on the spool stop (77), and replace the stop (77) in the control cap.
5. Turn the cap around, replace spring (78), the spring retainer (79), the control sleeve (80) and piston (81) as a unit, checking with the finger that all parts are located properly and that there is tension against the spring.
6. Place ball support (83), spring (84), and seal piston (86) in the body from the threaded end of the adjustment housing. Replace washer (89), nut retainer (90), adjustment screw (88) and lock nut (87).

REASSEMBLY

A. To reassemble minimum stop assembly proceed as follows:

1. Reassemble clevis (28) with screws (27). Replace end cap of variable volume pump housing (See variable volume pump manual attached).
2. Replace spring (20) and (21) (2 springs on 600 series only) on stop (19), assemble stop (19) to end cap (17).
3. Insert tongue (18) inside stop (19) check "O" ring (25) to be sure it is in position.
4. Replace lock nut (24) and tighten. Insert the complete assembly, making certain that piston (23) is in position.
5. Reassemble, making certain that screws (16) are tight.

B. To reassemble pressure compensator portion of control:

1. Replace bronze piston (72) and sleeve (73) so that piston head is opposite the end in which the snap ring is located.
2. Insert this assembly, piston head end in first into the bore of the cap on the side opposite the small tank drain outlet.

7. Check "O" ring on the adjustment housing and replace if necessary. The pressure compensator control mechanism is then ready to be threaded into the control cap.
8. Place "O" ring (70) in counterbore in cap (69).
9. Install "O" ring (13) in body (14) and attach completed cap assembly to (14) with screws (11).
10. Install piston (13) in body (14) and attach to hanger housing with screws (12) and tighten.

C. To reassemble handwheel to pump the following procedure is recommended:

1. Assemble parts (1) thru (9) and thread entire handwheel assembly into top of cap assembly.
2. Apply wrench to hex wall of housing (6) and tighten. Connect tube line to (77) and to outlet on the side of the pressure connection. Pump is now ready to operate.

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