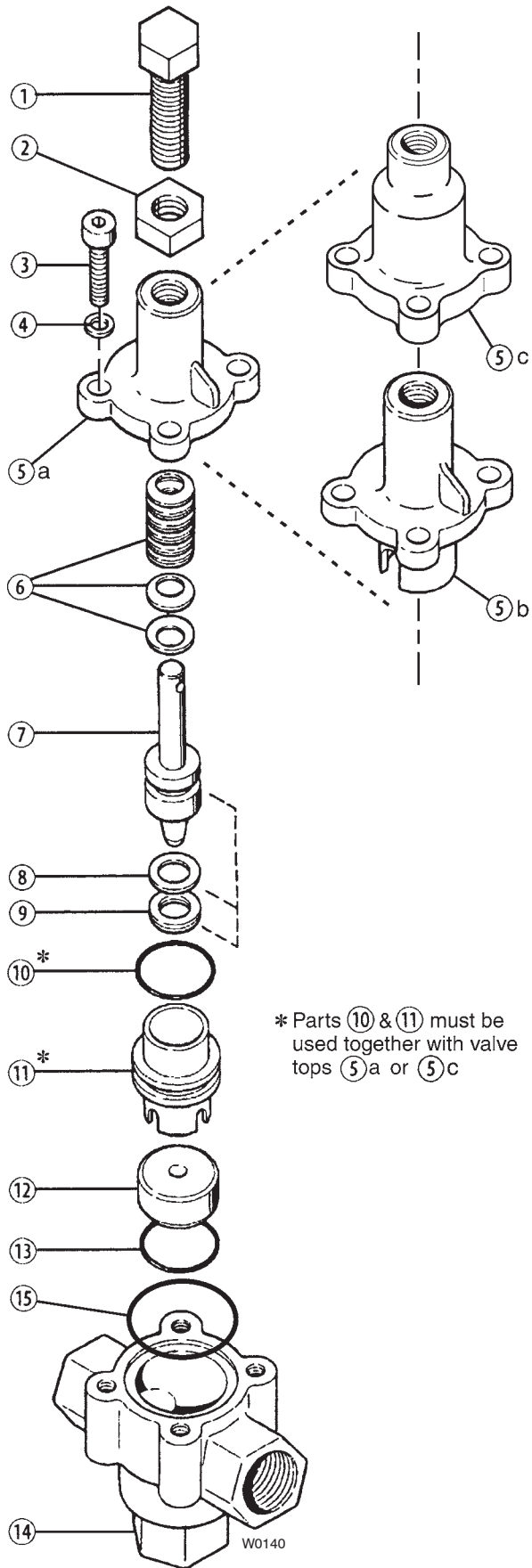


C22D Parts



* Parts ⑩ & ⑪ must be used together with valve tops ⑤a or ⑤c

C22-DA, C22-DB, and C22-DC

Brass Body

Ref. No.	Part Number	Description	Quantity/ Pump
1	C22-004-1005	Adjusting bolt, Pressure range A	1
	C22-004-1006	Adjusting bolt, Pressure range B, C....	1
2	C22-005-1000	Jam nut.....	1
3	C22-015-2004	Screw, Cap, M8 x 1.25 x 25 mm	4
4	C22-014-2000	Lockwasher	4
5a	C22-003-1002	Valve top, Unwetted	1
5b	C22-003-1000	Valve top, Brass	1
6	C22-018-3100	Spring disc, 20 x 10.2 x 1.2 mm.....**	
	C22-018-3101	Spring disc, 20 x 10.2 x 0.8 mm.....**	
	C22-018-3102	Spring disc, 20 x 10.2 x 1.5 mm.....**	
7	C22-023-1100	Plunger Assembly, 316 SST.....	1
	C22-023-1101	Plunger Assembly, SST, with tungsten carbide ball	1
	C22-023-1103	Plunger Assembly, 17-4 PH SST	1
	C22-023-1117	Plunger Assembly, Hastelloy C-276....	1
8	C22-013-2110	Seal, Back-up, Buna-N.....	1
	C22-013-2117	Seal, Back-up, UHMW polyethylene...	1
	C22-013-2118	Seal, back-up, PTFE	1
9	C22-012-2110	Seal, Buna-N.....	1
	C22-012-2111	Seal, Viton	1
	C22-012-2113	Seal, EPDM.....	1
	C22-012-2115	Seal, Urethane	1
10*	C22-011-2110	O-ring, Sleeve, Buna-N.....	1
	C22-011-2111	O-ring, Sleeve, Viton.....	1
	C22-011-2113	O-ring, Sleeve, EPDM.....	1
11*	C22-024-1010	Sleeve, 316 SST.....	1
	C22-024-1017	Sleeve, Hastelloy C-276.....	1
12	C22-006-1000	Seat, 316 SST	1
	C22-006-1001	Seat, 17-4 HT	1
	C22-006-1002	Seat, Tungsten carbide	1
	C22-006-1017	Seat, Hastelloy C-276	1
13	C22-010-2110	O-ring, Valve seat, Buna-N.....	1
	C22-010-2111	O-ring, Valve seat, Viton	1
	C22-010-2113	O-ring, Valve seat, EPDM.....	1
14	C22-002-1006	Valve body, Brass, BSPT	1
15	C22-011-2110	O-ring, Buna-N.....	1
	C22-011-2111	O-ring, Viton	1
	C22-011-2113	O-ring, EPDM.....	1
-	C22-022-2402	Nameplate, C22, blank (specify model & serial no.)	1
-	A01-115-3400	Grease, Regulator valve spring, 1/4 ounce.....	

** See page 5 for spring disc quantities and arrangements.

C22D Parts

C22-DA, C22-DB, and C22-DC

Stainless Steel Body Nickel Alloy Body

Ref. No.	Part Number	Description	Quantity/ Pump
1	C22-004-1005	Adjusting bolt, Pressure range A	1
	C22-004-1006	Adjusting bolt, Pressure range B, C	1
2	C22-005-1000	Jam nut	1
3	C22-015-2004	Screw, Cap, M8 x 1.25 x 25 mm	4
4	C22-014-2000	Lockwasher	4
5a	C22-003-1002	Valve top, Nonwetted	1
6	C22-018-3100	Spring disc, 20 x 10.2 x 1.2 mm	**
	C22-018-3101	Spring disc, 20 x 10.2 x 0.8 mm	**
	C22-018-3102	Spring disc, 20 x 10.2 x 1.5 mm	**
7	C22-023-1000	Plunger Assembly, 316 SST	1
	C22-023-1001	Plunger Assembly, SST, with tungsten carbide ball	1
	C22-023-1003	Plunger Assembly, 17-4 PH SST	1
	C22-023-1007	Plunger Assembly, Hastelloy C-276	1
8	C22-013-2110	Seal, Back-up, Buna-N	1
	C22-013-2117	Seal, Back-up, UHMW polyethylene	1
	C22-013-2118	Seal, Back-up, PTFE	1
9	C22-012-2110	Seal, Buna-N	1
	C22-012-2111	Seal, Viton	1
	C22-012-2113	Seal, EPDM	1
	C22-012-2115	Seal, Urethane	1
10*	C22-016-2110	O-ring, Sleeve, Buna-N	1
	C22-016-2111	O-ring, Sleeve, Viton	1
	C22-016-2113	O-ring, Sleeve, EPDM	1
11*	C22-024-1010	Sleeve, 316 SST	1
	C22-024-1017	Sleeve, Hastelloy C-276	1
12	C22-006-1000	Seat, 316 SST	1
	C22-006-1001	Seat, 17-4 HT	1
	C22-006-1002	Seat, Tungsten carbide	1
	C22-006-1017	Seat, Hastelloy C-276	1
13	C22-010-2110	O-ring, Valve seat, Buna-N	1
	C22-010-2111	O-ring, Valve seat, Viton	1
	C22-010-2113	O-ring, Valve seat, EPDM	1
14	C22-002-1004	Valve body, 316 SST, BSPT	1
	C22-002-1018	Valve body, Nickel alloy C series, BSPT	1
15	C22-011-2110	O-ring, Buna-N	1
	C22-011-2111	O-ring, Viton	1
	C22-011-2113	O-ring, EPDM	1
-	C22-022-2402	Nameplate, C22, blank (specify model & serial no.)	1
-	A01-115-3400	Grease, Regulator valve spring, 1/4 ounce	

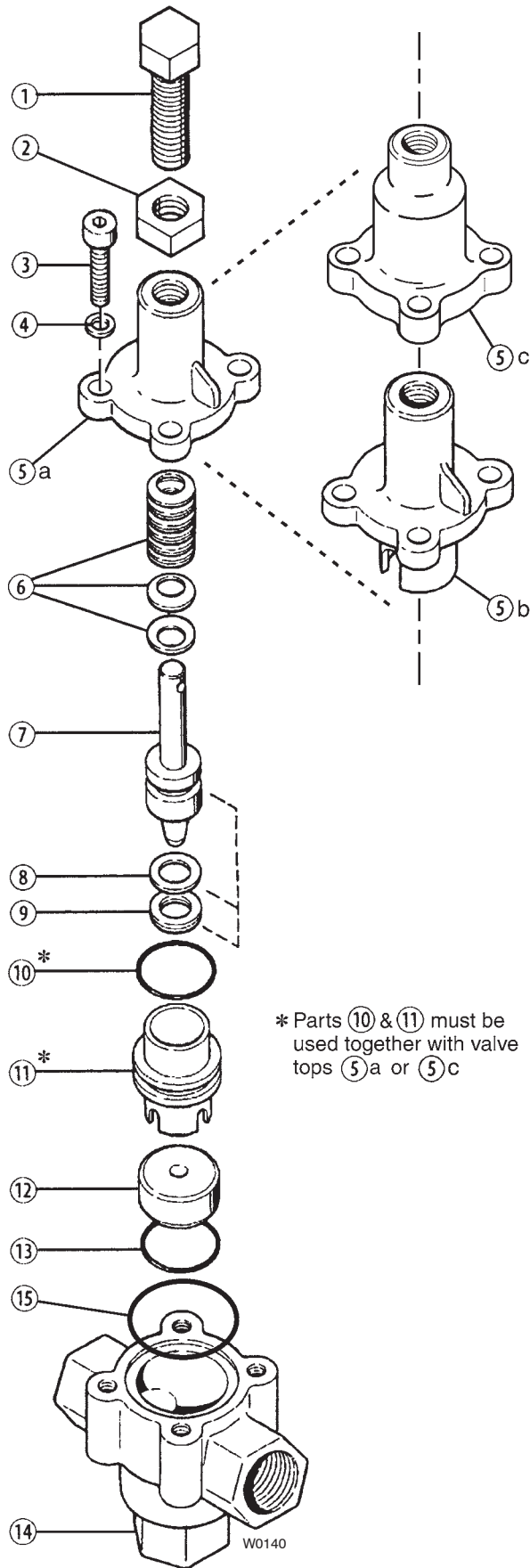
** See page 5 for spring disc quantities and arrangements.

C22-DE

Brass Body Stainless Steel Body Nickel Alloy Body

Ref. No.	Part Number	Description	Quantity/ Pump
1	C22-004-1008	Adjusting bolt, Pressure range E	1
2	C22-005-1000	Jam nut	1
3	C22-015-2014	Screw, Cap, M8 x 1.25 x 25 mm	4
4	C22-014-2000	Lockwasher	4
5c	C22-003-1003	Valve top, Non-wetted, 172 bar	1
6	C22-018-3102	Spring disc, 20 x 10.2 x 1.5 mm	21
7	C22-023-1000	Plunger Assembly, 316 SST	1
	C22-023-1003	Plunger Assembly, 17-4 PH SST	1
	C22-023-1007	Plunger Assembly, Hastelloy C-276	1
8	C22-013-2110	Seal, Back-up, Buna-N	1
	C22-013-2118	Seal, Back-up, PTFE	1
9	C22-012-2110	Seal, Buna-N	1
	C22-012-2111	Seal, Viton	1
10*	C22-016-2110	O-ring, Sleeve, Buna-N	1
	C22-016-2111	O-ring, Sleeve, Viton	1
11*	C22-024-1010	Sleeve, 316 SST	1
	C22-024-1017	Sleeve, Hastelloy C-276	1
12	C22-006-1000	Seat, 316 SST	1
	C22-006-1001	Seat, 17-4 HT	1
	C22-006-1017	Seat, Hastelloy C-276	1
13	C22-010-2110	O-ring, Valve seat, Buna-N	1
	C22-010-2111	O-ring, Valve seat, Viton	1
14	C22-002-1006	Valve body, Brass, BSPT	1
	C22-002-1004	Valve body, 316 SST, BSPT	1
	C22-002-1018	Valve body, Nickel alloy C series, BSPT	1
15	C22-011-2110	O-ring, Buna-N	1
	C22-011-2111	O-ring, Viton	1
-	C22-022-2402	Nameplate, C22, blank (specify model & serial no.)	1
-	A01-115-3400	Grease, Regulator valve spring, 1/4 ounce	

C23D Parts



* Parts ⑩ & ⑪ must be used together with valve tops ⑤a or ⑤c

C23-DA, C23-DB, and C23-DC

Brass Body

Ref. No.	Part Number	Description	Quantity/ Pump
1	C23-004-1005	Adjusting bolt, Pressure range A	1
	C23-004-1006	Adjusting bolt, Pressure range B	1
	C23-004-1007	Adjusting bolt, Pressure range C	1
2	C23-005-1000	Jam nut.....	1
3	G10-087-2010	Screw, Cap, M10 x 1.5 x 30 mm.....	4
4	G25-048-2010	Lockwasher, M10	4
5a	C23-003-1002	Valve top. Nonwetted	1
5b	C23-003-1000	Valve top, Brass	1
6	C23-018-3100	Spring disc, 28 x 12.2 x 1.5 mm.....**	
	C23-018-3101	Spring disc, 28 x 12.2 x 1.0 mm.....**	
7	C23-023-1100	Plunger Assembly, 316 SST.....	1
	C23-023-1101	Plunger Assembly, SST, with tungsten carbide ball	1
	C23-023-1103	Plunger Assembly, 17-4 PH SST	1
	C23-023-1117	Plunger Assembly, Hastelloy C-276....	1
8	C23-013-2110	Seal, Back-up, Buna-N.....	1
	C23-013-2117	Seal, Back-up, UHMW polyethylene...	1
	C23-013-2118	Seal, Back-up, PTFE.....	1
9	C23-012-2110	Seal, Buna-N.....	1
	C23-012-2111	Seal, Viton	1
	C23-012-2113	Seal, EPDM.....	1
	C23-012-2115	Seal, Urethane	1
10*	C23-016-2110	O-ring, Sleeve, Buna-N.....	1
	C23-016-2111	O-ring, Sleeve, Viton.....	1
	C23-016-2113	O-ring, Sleeve, EPDM.....	1
11*	C23-024-1010	Sleeve, 316 SST.....	1
	C23-024-1017	Sleeve, Hastelloy C-276.....	1
12	C23-006-1000	Seat, 316 SST	1
	C23-006-1001	Seat, 17-4 HT	1
	C23-006-1002	Seat, Tungsten carbide	1
	C23-006-1017	Seat, Hastelloy C-276	1
13	C23-010-2110	O-ring, Valve seat, Buna-N.....	1
	C23-010-2111	O-ring, Valve seat, Viton	1
	C23-010-2113	O-ring, Valve seat, EPDM.....	1
14	C23-002-1006	Valve body, Brass, BSPT	1
15	C23-011-2110	O-ring, Buna-N.....	1
	C23-011-2111	O-ring, Viton.....	1
	C23-011-2113	O-ring, EPDM.....	1
-	C23-022-2403	Nameplate, C23, blank (specify model & serial no.)	1
-	A01-115-3400	Grease, Regulator valve spring, 1/4 ounce	

** See page 5 for spring disc quantities and arrangements.

C23D Parts

C23-DA, C23-DB, C23-DC

Stainless Steel Body Nickel Alloy Body

Ref. No.	Part Number	Description	Quantity/ Pump
1	C23-004-1005	Adjusting bolt, Pressure range A	1
	C23-004-1006	Adjusting bolt, Pressure range B	1
	C23-004-1007	Adjusting bolt, Pressure range C	1
2	C23-005-1000	Jam nut	1
3	G10-087-2010	Screw, Cap, M10 x 1.5 x 30 mm	4
4	G25-048-2010	Lockwasher, M10	4
5a	C23-003-1002	Valve top, Nonwetted	1
6	C23-018-3100	Spring disc, 28 x 12.2 x 1.5 mm	**
	C23-018-3101	Spring disc, 28 x 12.2 x 1.0 mm	**
7	C23-023-1100	Plunger Assembly, 316 SST	1
	C23-023-1101	Plunger Assembly, SST, with tungsten carbide ball	1
	C23-023-1103	Plunger Assembly, 17-4 PH SST	1
7	C23-023-1117	Plunger Assembly, Hastelloy C-276	1
8	C23-013-2110	Seal, Back-up, Buna-N	1
	C23-013-2117	Seal, Back-up, UHMW polyethylene	1
	C23-013-2118	Seal, Back-up, PTFE	1
9	C23-012-2110	Seal, Buna-N	1
	C23-012-2111	Seal, Viton	1
	C23-012-2113	Seal, EPDM	1
	C23-012-2115	Seal, Urethane	1
10*	C23-011-2110	O-ring, Sleeve, Buna-N	1
	C23-011-2111	O-ring, Sleeve, Viton	1
	C23-011-2113	O-ring, Sleeve, EPDM	1
11*	C23-024-1010	Sleeve, 316 SST	1
	C23-024-1017	Sleeve, Hastelloy C-276	1
12	C23-006-1000	Seat, 316 SST	1
	C23-006-1001	Seat, 17-4 HT	1
	C23-006-1002	Seat, Tungsten carbide	1
	C23-006-1017	Seat, Hastelloy C-276	1
13	C23-010-2110	O-ring, Valve seat, Buna-N	1
	C23-010-2111	O-ring, Valve seat, Viton	1
	C23-010-2113	O-ring, Valve seat, EPDM	1
14	C23-002-1004	Valve body, 316 SST, BSPT	1
	C23-002-1018	Valve body, Nickel alloy C series, BSPT	1
15	C23-011-2110	O-ring, Buna-N	1
	C23-011-2111	O-ring, Viton	1
	C23-011-2113	O-ring, EPDM	1
-	C23-022-2403	Nameplate, C23, blank (specify model & serial no.)	1
-	A01-115-3400	Grease, Regulator valve spring, 1/4 ounce	

** See page 5 for spring disc quantities and arrangements.

C23-DE

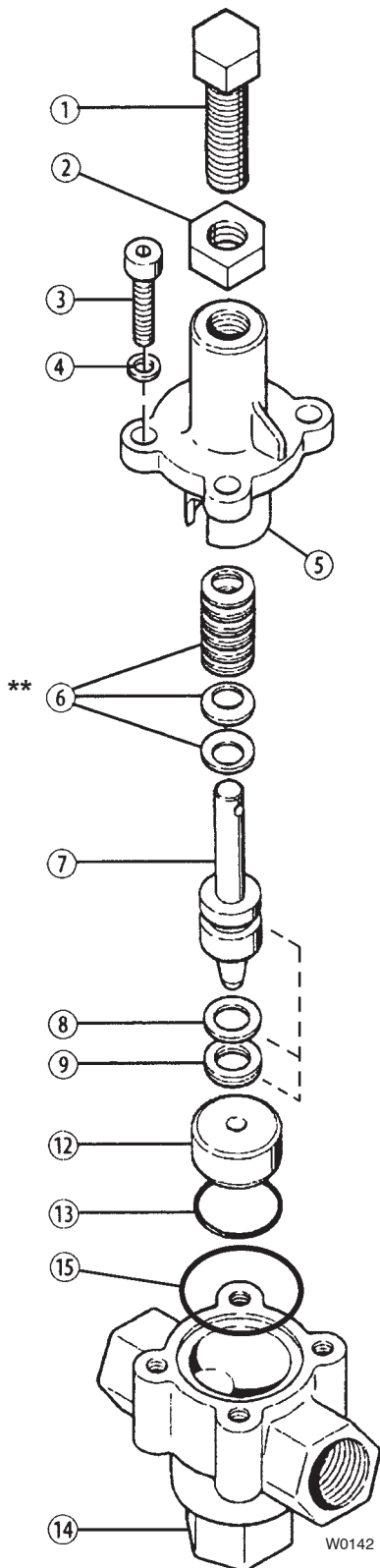
Brass Body Stainless Steel Body Nickel Alloy Body

Ref. No.	Part Number	Description	Quantity/ Pump
1	C23-004-1008	Adjusting bolt, Pressure range E	1
2	C23-005-1000	Jam nut	1
3	G03-068-2010	Screw, Cap, M10 x 1.5 x 40 mm	4
4	G25-048-2010	Lockwasher, M10	4
5c	C23-003-1003	Valve top, Brass, 172 bar	1
6	C23-018-3100	Spring disc, 28 x 12.2 x 1.5 mm	28
7	C23-023-1100	Plunger Assembly, 316 SST	1
	C23-023-1103	Plunger Assembly, 17-4 PH SST	1
	C23-023-1117	Plunger Assembly, Hastelloy C-276	1
8	C23-013-2110	Seal, Back-up, Buna-N	1
	C23-013-2118	Seal, Back-up, PTFE	1
9	C23-012-2110	Seal, Buna-N	1
	C23-012-2111	Seal, Viton	1
10*	C23-016-2110	O-ring, Sleeve, Buna-N	1
	C23-016-2111	O-ring, Sleeve, Viton	1
11*	C23-024-1010	Sleeve, 316 SST	1
	C23-024-1017	Sleeve, Hastelloy C-276	1
12	C23-006-1000	Seat, 316 SST	1
	C23-006-1001	Seat, 17-4 HT	1
	C23-006-1017	Seat, Hastelloy C-276	1
13	C23-010-2110	O-ring, Valve seat, Buna-N	1
	C23-010-2111	O-ring, Valve seat, Viton	1
14	C23-002-1006	Valve body, Brass, BSPT	1
	C23-002-1004	Valve body, 316 SST, BSPT	1
	C23-002-1018	Valve body, Nickel alloy C series, BSPT	1
15	C23-011-2110	O-ring, Buna-N	1
	C23-011-2111	O-ring, Viton	1
-	C23-022-2403	Nameplate, C23, blank (specify model & serial no.)	1
-	A01-115-3400	Grease, Regulator valve spring, 1/4 ounce	

C24D Parts

C24-DA, C24-DB, and C24-DC

Brass Body Stainless Steel Body Nickel Alloy Body



Ref. No.	Part Number	Description	Quantity/ Pump
1	C24-004-1005	Adjusting bolt, Pressure range A	1
	C24-004-1006	Adjusting bolt, Pressure range B	1
	C24-004-1007	Adjusting bolt, Pressure range C	1
2	C24-005-1000	Jam nut.....	1
3	G35-081-2010	Screw, Cap, M12 x 1.75 x 40 mm.....	4
4	G35-084-2010	Lockwasher, M12	4
5	C24-003-1000	Valve top, Brass	1
	C24-003-1001	Valve top, 316 SST	1
	C24-003-1002	Valve top, Nickel alloy C series	1
6	C24-018-3100	Spring disc, 35.5 x 18.3 x 2.0 mm.....**	
	C24-018-3102	Spring disc, 35.5 x 18.3 x 1.2 mm.....**	
7	C24-023-1100	Plunger Assembly, 316 SST.....	1
	C24-023-1101	Plunger Assembly, SST, with tungsten carbide ball	1
	C24-023-1102	Plunger Assembly, Hastelloy C-276....	1
	C24-023-1103	Plunger Assembly, 17-4 PH SST	1
8	C24-013-2110	Seal, Back-up, Buna-N.....	1
	C24-013-2118	Seal, Back-up, Viton.....	1
9	C24-012-2110	Seal, Buna-N.....	1
	C24-012-2111	Seal, Viton,	1
	C24-012-2113	Seal, EPDM.....	1
12	C24-006-1000	Seat, 316 SST	1
	C24-006-1001	Seat, 17-4 HT	1
	C24-006-1002	Seat, Tungsten carbide	1
	C24-006-1003	Seat, Hastelloy C-276	1
13	C23-010-2110	O-ring, Valve seat, Buna-N.....	1
	C23-010-2111	O-ring, Valve seat, Viton	1
	C23-010-2113	O-ring, Valve seat, EPDM.....	1
14	C24-002-1006	Valve body, Brass, BSPT	1
	C24-002-1007	Valve body, 316 SST, BSPT	1
	C24-002-1008	Valve body, Nickel alloy C series, BSPT.....	1
15	C24-011-2110	O-ring, Buna-N.....	1
	C24-011-2111	O-ring, Viton	1
	C24-011-2113	O-ring, EPDM.....	1
-	C24-022-2401	Nameplate, C24, blank (specify model & serial no.)	1
-	A01-115-3400	Grease, Regulator valve spring, 1/4 ounce.....	

** See page 5 for spring disc quantities and arrangements.

C22D/23D/24D Repair

The valve can generally be repaired in place, without removing it from the system.

When disassembling, note the number of spring discs and their arrangement. They must be reinstalled in the same arrangement (refer also to page 5 — note that they are stacked, either singly or in pairs, facing in alternate directions). When reassembling, apply liberal amounts of high-temperature regulator grease (Wanner #A01-115-3400) on the springs and around the plunger stem.

The seal (9) and back-up seal (8) must be replaced together; don't replace one without replacing the other.

C22D/23D/24D Troubleshooting

Excess Pressure Required to Bypass Fluid

- Regulating valve pressure not properly adjusted
- Not enough fluid being continuously bypassed
- Nozzles worn

Fluid Leaking from Hole in Valve Top

- Worn Seals

System Losing Pressure

- Nozzles worn
- Pump RPM reduced
- Regulating valve pressure not properly adjusted
- Worn pump components
- Worn regulating valve seat or plunger
- System drawing in air
- Too much fluid being bypassed

Pressure Spikes

- Minimum bypass of 10% not being maintained
- Nozzles worn
- Regulating valve pressure not properly adjusted