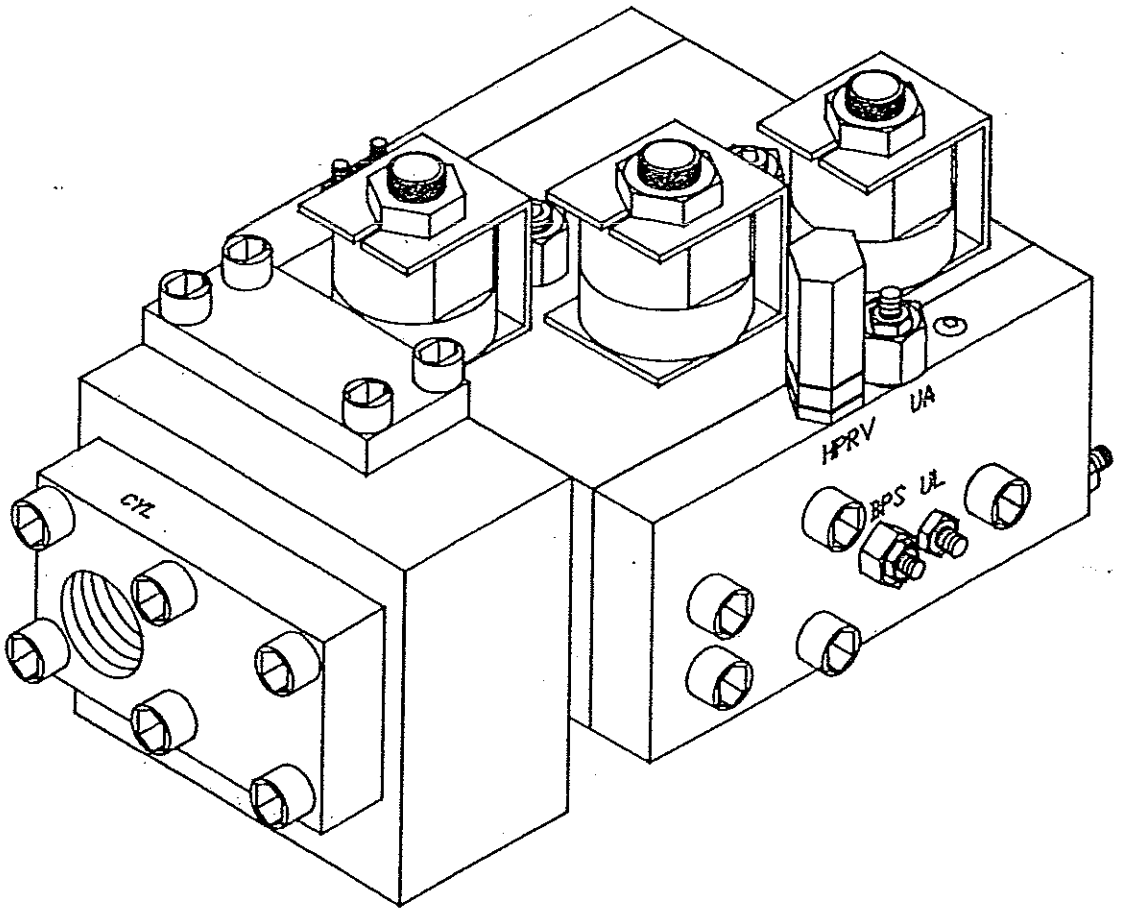
BULLETIN RL-2

SEPT 20, 1994

CEMCOLIFT
INCORPORATED



HYDRAULIC CONTROL VALVE
TYPE RV–100H

(WITH AUXILIARY DOWN SPEED COMPENSATOR)

CEMCOLIFT INC. • PO BOX 500 • HATFIELD, PA 19440
(215) 703-0358 • (800) 962-3626

This information is presented solely for the use of skilled hydraulic lift mechanics and is used at their own risk. CEMCO assumes no liability or expense arising from use of this product and the user is referred to our warranty.

WARNING

All elevator products sold by CEMCOLIFT, Inc., are designed and manufactured in accordance with ANSI A17.1 American Standard Safety Code for elevators and escalators, including but not limited to the ANSI/NFPA 70, ANSI/AWS D1.1 or AWS/D1.3.
All elevator products sold by CEMCOLIFT must be installed, serviced, maintained, and/or operated by skilled elevator technicians, with not less than five (5) years of successful experience with similar elevator installations.
All elevator products sold by CEMCOLIFT must be installed in accordance with the requirements of the ANSI A17.1 Code, except for more stringent requirements indicated or imposed by local governing jurisdiction.

IMPORTANT NOTE

Please read and understand manual carefully and follow all instructions during assembly of elevator equipment. Improper elevator operation and risk of injury could occur if you fail to do so.
The information presented herein is intended for use by persons having skill and experience in hydraulic elevator servicing and used at their own risk.
We assume no liability or expense due to injury, sickness, or death sustained by any person. We also assume no liability for damage or destruction of property arising from information herein.
Written procedures are intended to be general in nature. All users are cautioned to utilize every effort to work safely and in accordance with State and Federal OSHA Safety Regulations. Appropriate personal safety equipment should be used at all times.

WARRANTY

A. All new equipment and components are warranted for one year from date of purchase (shipment).

B. Extent of warranty is that equipment shall be free from defects in material and workmanship and shall conform to drawings and/or specifications pertaining thereto which have been issued by, or approved in writing by, the seller.

C. The warranty is conditioned on written notice to the seller within warranty period of the claimed defect.

D. Warranty is further conditioned upon reasonable opportunity afforded to the seller to test or inspect claimed defect.

E. Limit of responsibility of seller under warranty shall be to repair or replace defective item, at seller's option, including reasonable transportation charges.

F. Warranty does not cover damage or defect caused by, or occurring in, transit or shipment, improper installation, misuse, including exceeding rated capacities, exposure to or use in abnormal conditions of temperature, moisture, dirt, corrosive matter, etc.; lack of normal maintenance or repairs of tampering, repair or alterations by other than authorized representative of the seller.

G. No other warranties are made, expressed or implied, and seller shall not be liable beyond repair or replacement as above stated for any damages, direct or consequential, general or special.

CONTENTS

Due to a policy of continuous improvement, we reserve the right to alter or amend the product specifications detailed in this literature and as such it does not form part of any contract.

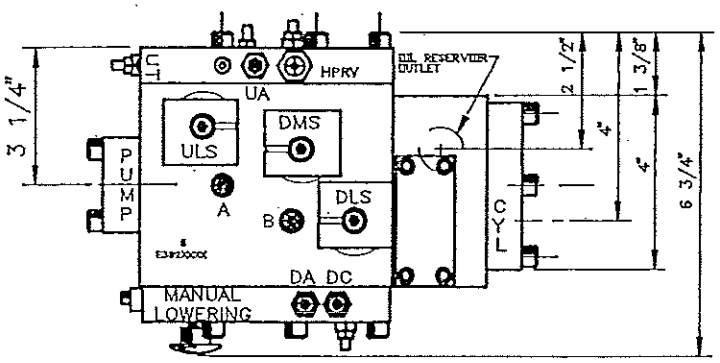
SECTION 1 INTRODUCTION

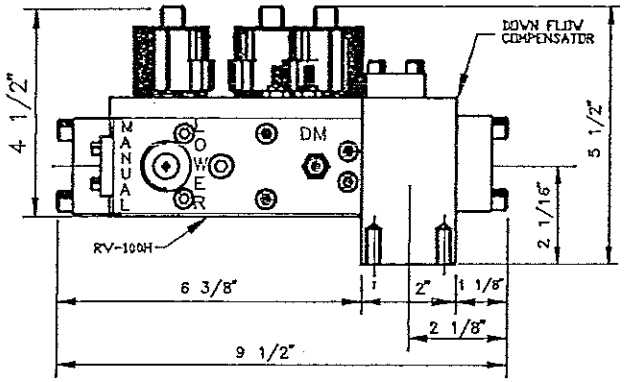
The **CEMCOLIFT RV–100H VALVE** performs all necessary functions for the operation of a hydraulic elevator in both directions of travel. The **RV–100H** has been specifically designed for the residential and the limited access elevator market. Since the operating parameters (as defined in ANSI A.17.1) restrict the speed and capacity, the **RV–100H** is designed to operate at its optimum between 3–15 gallons per minute. A plurality of adjustments will allow the user to have all the ride performance currently known in the hydraulic commercial elevator market. With an optional down speed regulation valve, the **RV–100H** is ideal for 1:2 roped hydraulic applications.

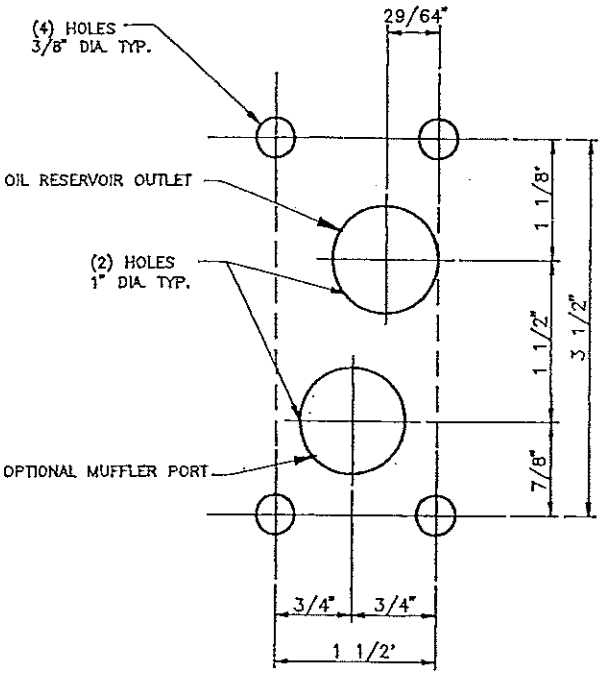
SECTION 2 FEATURES

- Normally open bypass valve allows pump motor to attain full r.p.m. before applying load to the system.
- Adjustments allow smooth up and down acceleration and deceleration.
- Up leveling speed is maintained regardless of load by interaction of check valve and bypass piston assuring stall proof accurate leveling.
- Pistons have o–ring seats for "leak–proof" operation.
- Adjustable pressure relief valve.
- Solenoid parts are interchangable.
- Coils are transfer molded having UL listed 18 gauge lead wires.
- Pressure return self–closing manual lowering.
- Non–adjustable ball check valve maintains minimum psi in the system to prevent slack cables during a manual lowering condition if an obstruction is encountered in the hoistway.
- Constant lowering speed is provided by an auxiliary, pressure compensated, flow control device. (optional for direct acting plunger)
- Connections to the pump and cylinder are flange mounted to allow fast removal and replacement of valve. This reduces labor by eliminating trouble shooting and repairs in the field.
- All inlet and outlet flanges are 3/4" NPT.
- Each valve is tested and preset to field conditions at the factory.
- External, easily removable input screens for both the up & down sections limit contamination within the valve.

SECTION 3 — EXTERIOR DIMENSIONS & VALVE MOUNTING







(D.F.C) MOUNTING HOLES TEMPLATE
(N.T.S.)

NOTE:

- Valve must be mounted with solenoids in the vertical position.
- Provide five (5) inches above solenoids for coil removal.

SECTION 4 — SPECIFICATIONS

Standard flow range	3–15 GPM
Operating pressure	150 MIN. – 1000 PSI. MAX.
Fluid	300 SSU. @ 100° F
Operating temperature	60° – 150° F
Line connections	
pump, jack port	3/4" NPT
tank port	1/2" NPT
Gauge ports	
pump	"A" port – 1/8" NPT
system pressure	"B" port – 1/8" NPT
Coil voltage	110 VAC *

Optional coil voltages include 110 VAC/12 VDC dual voltage, 220 VAC/12 VDC dual voltage, 220 VAC, 24 VDC, & 12 VDC.

SECTION 5 — COIL OPERATING SEQUENCE

ULS– UP LEVELING SOLENOID: For up full speed, energize ULS when the pump motor starts. De–energize ULS to run at up leveling speed (pump motor running). De–energize motor to stop.

DMS– DOWN MAIN SOLENOID: For down full speed, energize both DMS & DLS. De–energize DMS (DLS energized) to run at leveling speed. De–energize DLS to stop.

DLS–DOWN LEVELING SOLENOID: (see DMS). Energize alone for down leveling speed. De–energize to stop. (DMS de–energized)

		FAST	SLOW
UP	PUMP MOTOR	ON	ON
	ULS	ON	OFF

UP SEQUENCE

		FAST	SLOW
DOWN	DMS	ON	OFF
	DLS	ON	ON

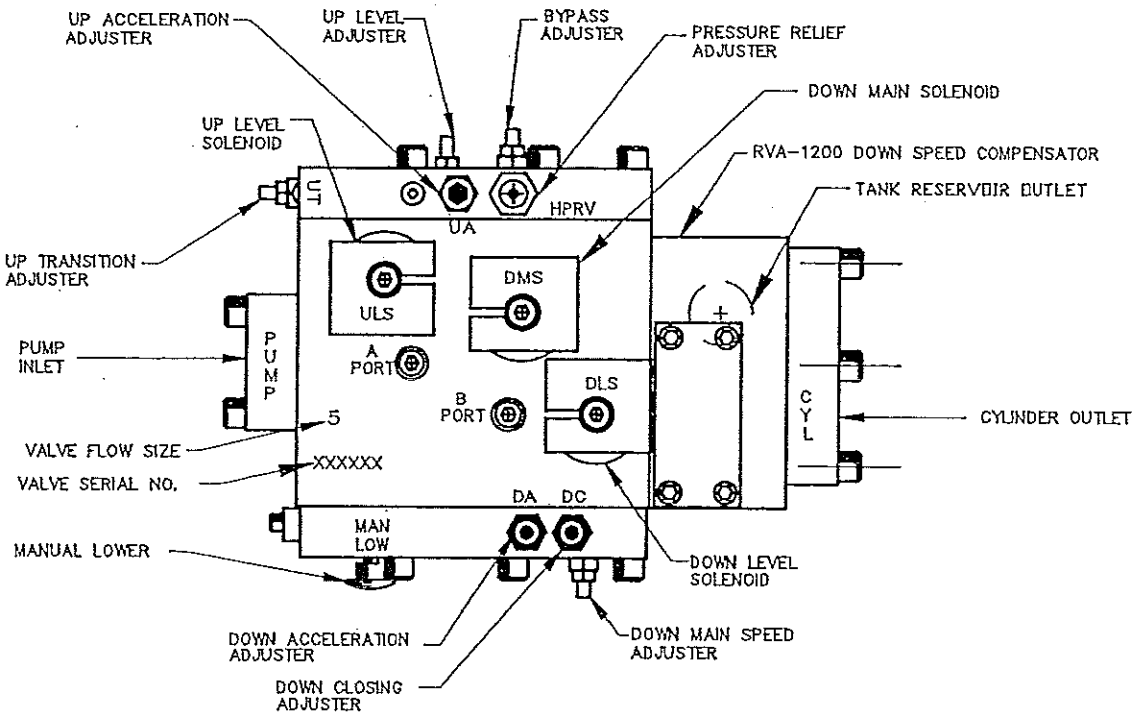
DOWN SEQUENCE

VALVE COIL SEQUENCE TABLES

CAR SPEED (f.p.m.)	25	50	75	100
SLOW DOWN (inches)	6"	12"	18"	24"

SLOW DOWN DISTANCE TABLE

SECTION 6 ADJUSTMENT FUNCTIONS



BP— BYPASS: Governs the maximum amount of oil that can be bypassed. CCW increases the amount of oil bypassed and CW decreases.

UA— UP ACCELERATION: Controls the up start or rate at which the elevator reaches high speed. CCW increases the rate (faster) and CW decreases the rate (slower). DO NOT DRAG OUT ACCELERATION

UT— UP TRANSITION: Controls the up deceleration or the rate that the elevator goes from high speed to slow. CCW increases the rate (faster) and CW decreases the rate (slower or longer). Valve & switches should be adjusted to maintain aproximately 3" of stabilized leveling with a smooth deceleration.

UL— UP LEVELING: Controls the up leveling speed. CCW decreases (slower) and CW increases (faster) the car up leveling speed. Leveling speed should be set for 9–12 F.P.M. (5 FT. in 20 seconds= 15 F.P.M.)

Note

Final adjustments are in the 1/8" of a turn range or less for optimum performance.

DM— DOWN MAIN SPEED AJUSTER: Controls the down high speed . CCW increases (faster) the down speed and decreases (slower) the down speed.

DC— DOWN CLOSING ADJUSTER: Controls the down transi or the rate that the elevator goes from high speed slow and the down stop. CCW will increase (faster shorter) the down transition and CW will decrease slower or longer) the down transition.

DA— DOWN ACCELERATION: Controls the down start or rat at which the elevator reaches high speed. CCW increases (faster) the rate and CW decreases (slower) the rate. Valve & switches should be adjusted to maintain aproximately 3" of stabilized leveling with a smooth deceleration.

ML— MANUAL LOWER: Manual lowering can be accomplish by pressing the ML button. Release button to stop.

Note

CW means to turn the device clockwise, or to the right, and CCW means to turn it counter clockwise, or to the left.

SECTION 7 — UP ADJUSTMENTS

PRE–SETTINGS:

BPS– Bypass: CCW to stop.
UA– Up acceleration: CW to stop.
UT– Up transition: CW stop, then CCW 6 turns
UL– Up leveling: CCW to stop.

ADJUSTMENTS

Preset all adjusters with empty car then adjust in sequence as listed below.

Note

Final adjustments are in the 1/8" of a turn range or less for optimum performance.

Note

CW means to turn the device clock–wise, or to the right, and CCW means to turn it counter–clockwise, or to the left.

BP– Bypass adjuster: With the car empty at a lower landing, disconnect the ULS solenoid. Call the car up (pump motor running). Turn BP clock–wise till car moves upward, then CCW till car stalls, plus 1/2 turn. Stop pump and re–connect ULS.

UA– Up acceleration adjuster: Turn UA clockwise until it stops. With the car empty at a lower landing, call the car up (pump motor and ULS energized). Turn UA counter–clockwise until car accelerates to a full speed within 1–2 seconds. Turn UA clockwise for slower (or longer) up start and CCW for faster (or shorter) up start. DO NOT DRAG OUT ACCELERATION

* **UT– Up transition adjuster:** With car empty at a lower landing call the car up and disconnect ULS (ULS de–energized). Turn UT CW until car moves upward, then turn UT CCW until car stalls.

UL– Up leveling speed adjuster: With the car empty at a lower landing call the car up and disconnect ULS (ULS de–energized). Turn UL CW until an up leveling speed or 9–12 FPM. is obtained. Turning UL CW will increase and turning UL CCW will decrease the up leveling speed. Reconnect the ULS coil.

* After adjusting UL, disconnect the ULS solenoid and observe the up transition. Turning UT CW will make the up transition slower (or longer) and turning UT CCW will make the up transition faster (or shorter).

HPRV– High pressure relief valve adjuster: After running the elevator with a full load, determine the full load running pressure. With the car at a lower landing, close the hand valve and call the car up. Adjust the relief pressure for no more than 125% of the full load running pressure. Turning HPRV CW will increase the pressure setting and CCW will decrease the pressure setting. Always seal the HPRV adjuster after setting.

Note

When locking adjusters use a wrench, and, holding the adjuster itself with a 3/32" allen key, lightly tighten the lock nut . Do not bear down. Always unlock the nut before turning the adjuster.

SECTION 8 — DOWN ADJUSTMENTS

PRE-SETTINGS:

DC– Down closing: CCW to stop, CW 4 turns
DA– Down acceleration: CCW to stop, CW 7 turns
DM– Down speed: CCW to stop.

ADJUSTMENTS

Preset all adjusters with empty car then adjust in sequence as listed below.

Note

Final adjustments are in the 1/8 of a turn range or less for optimum performance.

Note

CW means to turn the device clock-wise, or to the right, and CCW means to turn it counter-clockwise, or to the left.

DC– Down closing adjuster: With the car empty at an upper landing, call the car down (DMS & DLS energized). The car should descend in creeping speed. Turn the DC adjuster CW slowly until the car begins to descend at contract speed. Disconnect the DMS solenoid (DMS de-energized) and observe the down transition and down stop. Turning the DC adjuster CW will make the transition slower (or longer) with a soft stop. Turning the DC adjuster CCW will make the transition faster (or shorter) with a firm stop.

DM– Down speed adjuster: With the car empty running down, (DMS & DLS energized) turn the DM adjuster CW to obtain contract speed.

DA– Down acceleration adjuster: With the car empty at an upper landing, turn DA CW until it stops. Call car down (DMS & DLS energized) car will move down in a leveling speed. Turn DA CCW slowly until car accelerates. Turning DA CW will make the down acceleration rate slower (or longer) and turning DA CCW will make the down acceleration rate faster (or shorter).

Note

DC is an input and DA is an output. DC must be adjusted before adjusting DA. If, after setting DA, you re-adjust DC, it will have an affect on DA. Remember – if you open DC, open DA. If you close DC, close DA.

Note

When locking adjusters, use a wrench, and holding the adjuster itself with a 3/32" allen key, lightly tighten the lock nut . Do not bear down. Always unlock the nut before turning the adjuster.

SECTION 9 — TROUBLE SHOOTING

This information is presented solely for the use of skilled hydraulic lift mechanics and is used at their own risk. CEMCO assumes no liability or expense arising from use of this product and the user is referred to our warranty.

Before changing any part of adjustments, or removing any part of the valve, check to see if the controller is supplying the correct voltage at the proper time and interval to the valve coils. A malfunctioning hoistway switch is often disguised as a valve problem.

Note

The manual lowering valve is self-closing but there is a non-adjustable ball check assembly in series with it that maintains a minimum pressure in the system to prevent the driving machine's piston (plunger) from lowering whenever the lift cage is landed. This pressure is approximately 75 PSI therefore, whenever an operating section of the valve is to be removed or opened to atmosphere, the main-line hand valve should be closed first and either of the two lowering solenoid tubes should be turned CCW to open the lowering solenoid section to atmosphere, thereby releasing the trapped pressure from within releasing the valve.

WARNING

Before removing or disassembling any part of any hydraulic valve or component be absolutely certain that the system pressure has been removed or shut off by either landing the car or closing the mainline hand valve and relieving pressure on valve. Your life may depend on it!
Always disconnect the electrical power.

TROUBLE SHOOTING DOWN SECTION:

- **Lift will not lower at full speed**
  1. Check solenoid voltage and related circuitry
  2. Turn DM adjuster CCW.
  3. Turn DA adjuster CW.
  4. Turn DC CCW.
  5. Check pipe rupture valve setting
  6. Inspect/clean in body down input screen (#108)
  7. Inspect DMS solenoid for debris or damage
  8. Check valve and compensator for debris
  9. Check shoes and rails
  10. Check jack assembly for tight packing
- **Lift will not lower at creeping speed**
  1. Check DLS coil voltage
  2. Inspect DL piston orifice (item # 87) for location inside of DL piston (it must be in there)
  3. Inspect DLS solenoid for debris or damage

Lowering start abrupt

1. Turn DA adjuster CW (in)
2. Bleed jack assembly of air and inspect jack assembly for tight packing

- **Lowering start slow**
  1. Turn DA adjuster CCW (out)
  2. Inspect/clean down input screen (item #108)
  3. Inspect shoes and rails
- **Down transition abrupt**
  1. Turn DC adjuster CCW (in)
- **Down transition too slow**
  1. Turn DC adjuster CCW (out)
  2. Inspect DM solenoid assembly for debris/damage
- **Lower section leaks**

  The following areas are to be inspected if you are experiencing down leaks without physical evidence of external leakage:

  1. Both lowering solenoid assemblies (items # 97,15,16, 17,72,81,83)
  2. Manual lowering poppet seat (item #70) and poppet o-ring (item # 72)
  3. Check valve seal (item #64)
  4. Lower valve seal ring (item #110)

Trouble shooting up section:

- **Motor will not run**
  1. Check power supply and related controls

- **Motor runs but makes a hammering sound**
  1. Check motor rotation and/or oil level
  2. Inspect pump suction strainer for debris (Pump will be noisy if clogged)

- **Motor runs but car does not move**
  1. Check that the mainline hand valve is open
  2. Check high pressure relief valve setting
  3. Check hoistway for obstruction
  4. Check lowering valve piston position (item #59).
  5. Check oil level
  6. Inspect pump suction strainer for debris (Pump will be noisy if clogged)
  7. Turn UA adjuster CCW (out).
  8. Inspect up input screen for debris (item #108).

- **Motor runs but car will not go into full up speed.**
  1. Check up solenoid voltage
  2. Check high pressure relief valve setting
  3. Turn UA adjuster CCW (out).
  4. Check up solenoid armature (assembly #15 #16, #17)
  5. Inspect pump suction strainer for debris (Pump will be noisy if clogged)
  6. Inspect up input screen for debris (item #108).

- **Up start abrupt**
  1. Turn UA adjuster CW.(in)
  2. Set bypass adjuster full open CCW
  3. Check bypass piston assembly for free movement.
  4. Check bypass spring location. (Spring goes in first)
  5. Inspect recycle ball check for debris (Item #119 & #29)
  6. Inspect jack assembly packing
  7. Inspect guide shoes and rails

- **Up start or up speed slow**
  1. Turn UA adjuster CCW.(OUT)
  2. Check up leveling solenoid signal timing
  3. Check up solenoid coil voltage
  4. Check power supply at motor terminals
  5. Check up solenoid armature (Assembly #15, #16, #17)
  6. Clean and inspect up input screen (item #108)
  7. Inspect pump suction strainer for debris (Pump will be noisy if clogged)
  8. Inspect UA adjuster and valve for foreign materi

- **Up transition too long**
  1. Reset up transition UT adjuster CCW
  2. Inspect UT poppet (Item #11) for free movement in valve
  3. Check UT poppet spring (Item #12)
  4. Check ULS solenoid assembly (items # 97,15,16,17,72,81 & 83)

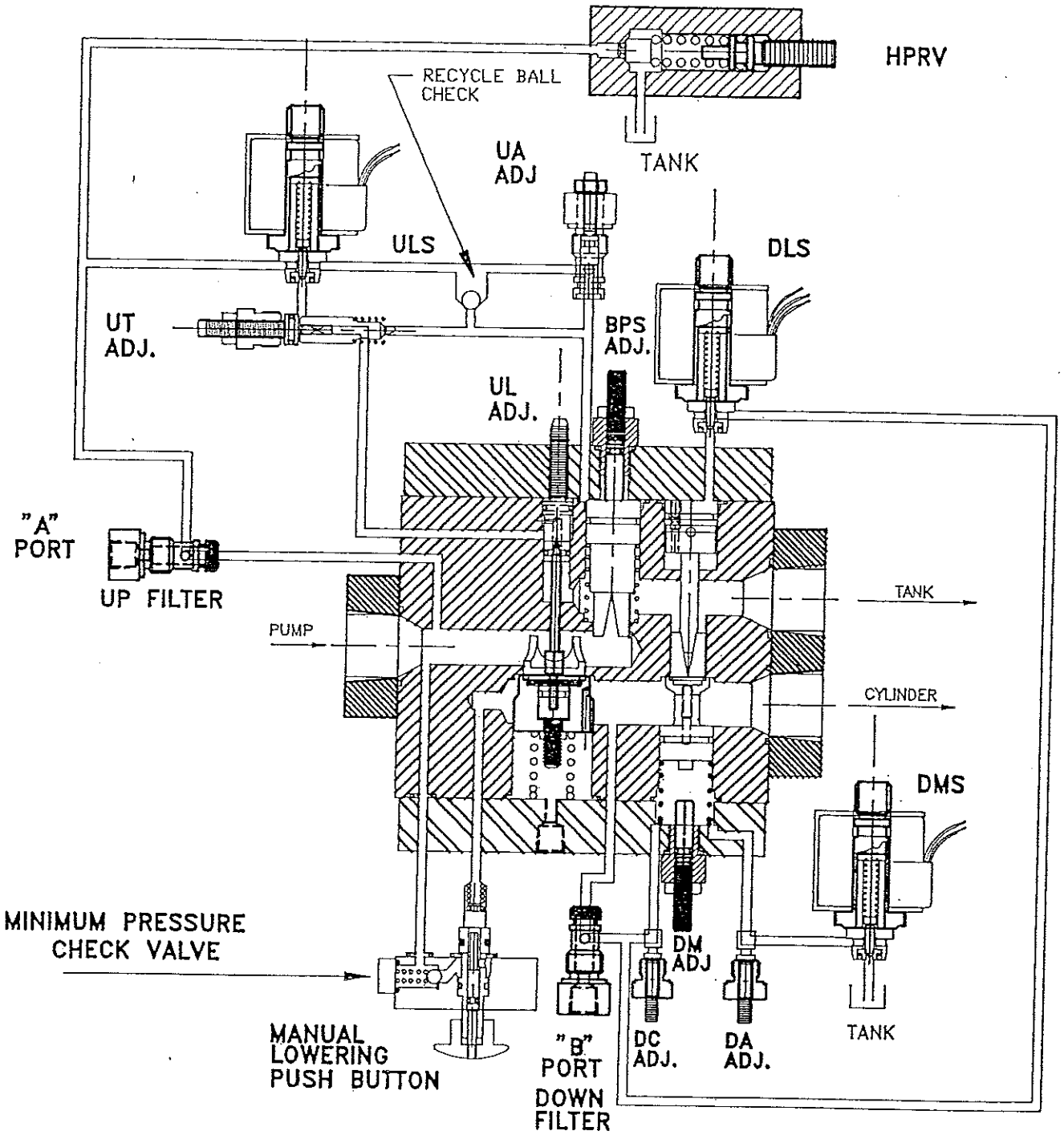
- **Up level or anti-creep stall**
  1. Turn UL adjuster CW. Car should move. If car does not, inspect o-ring (Item #18).
  2. Check HPRV Adjustment
  3. Inspect end of needle (Item #62) for damage.

- **Up stop abrupt and car drops slightly**
  1. Inspect check valve spring (Item #67) for breakage

- **Lift stalls with capacity load**
  1. Check power supply to motor
  2. Check high pressure relief valve setting
  3. Turn UA. counter-clockwise.

- **Lift moves through floor level at creeping speed**
  1. Inspect hoistway switches and control signals.

SECTION 10 RV-100H HYDRAULIC SCHEMATIC



STATIC
(FULL BYPASS)

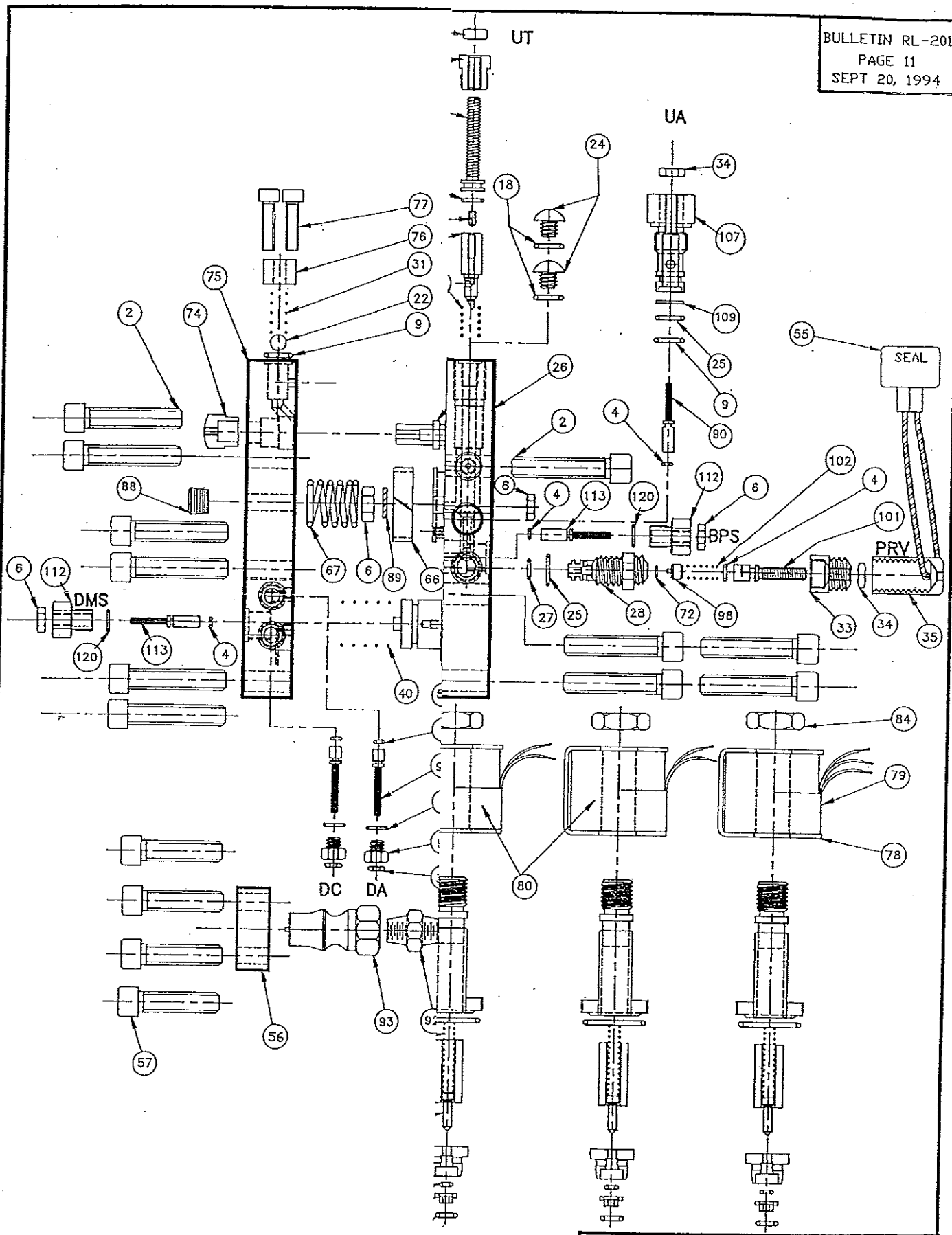
CEMCO LIFT

PARTS LIST

ITEM NO.	IDENTIFICATION	PART #	QTY.
1	BODY DETAIL RVH 3001	3001	1
2	5/16-18x1-1/4 SHCS	1016	15
3	INLET PLATE	1004	1
4	O-RING -006 (1/4)	1036	9
6	1/4-28 JAM NUT	1014	4
6A	1/4-56 JAM NUT	1014F	1
7	NUT-BODY RETAINER UT	1028F	1
8	ADJUSTER SCREW UT	1026F	1
9	O-RING -011 (7/16)	1019	11
10	U.T. ORIFICE	1054	1
11	POPPET-UT	1027	1
12	SPRING UT-POPPET	1025	1
15	SPRING,SOLENOID	1042	3
16	HAMMER	1043	3
17	NEEDLE, PILOT VALVE	1044	3
18	O-RING -010 (3/8)	1049	5
20	ADJUSTER-UL	1055	1
22	BALL- 1/4" DIA.	1527	1
24	1/4-28x1/4 LG BUTTON HEAD	1079	3
25	O-RING -012 (1/2)	1022	4
26	B-P CLOSURE	1002	1
27	O-RING -008 (5/16)	1045	3
28	BODY-PRESS. REL.	1035	1
29	BALL 1/8" DIA.	1056	1
31	SPRING-PRESSURE REL. DML.	1033	1
33	HOUSING PRESS. REL. (10-56)	1039F	1
34	JAM NUT (10-56)	1038F	4
35	CAP PRESS. REL.	1034	1
38	B-P PISTON-1 SLIT	1030C2A	1
38	B-P PISTON-3 SLITS	1030C2C	1
38	B-P PISTON-4 SLITS	1030C2D	1
40	SPRING DOWN PISTON	1007	1
41	6-32x1/2 SHCS	1024	1
42	O-RING -020 (1")	1047	7
44	BODY-COMPENSATOR	1200C	1
45	OUTLET PLATE	1005	1
46	5/16-18x2-1/2' SHCS	1017	6
47	6-32 NUT	1209	1
48	RETAINER	1207	1
49	FLAPPER	1208	1
50	COMPENSATOR PISTON .1875	1201B	1
50	COMPENSATOR PISTON .21875	1201C	1
50	COMPENSATOR PISTON .28125	1201D	1
51	COMPENSATOR SPRING	1203	1
52	COMPENSATOR SLEEVE 1 SLIT	1202A	1
52	COMPENSATOR SLEEVE 2 SLITS	1202D	1
53	CLOSURE	1205	1
55	TAG SEAL WIRE	1080	1
56	CAP	1206	1
57	5/16-18x1- SHCS	1015	4
58	DOWN PORT 1 SLIT	1023A	1
58	DOWN PORT 3 SLITS	1023C	1
	DOWN PORT 4 SLITS	1023D	1
	PISTON-LOWERING	1020	1
61	O-RING -026 (1-3/8)	1053	5

PARTS LIST

ITEM NO.	IDENTIFICATION	PART #	QTY
62	UP LEVEL NEEDLE	1011	1
63	CK PORT	1009	1
64	O-RING -115 (7/8)	1012	1
65	PISTON-CV	1008	1
66	WEAR RING	1010	1
67	SPRING CV	1013	1
68	SPRING-DML	1060	1
69	D.M.L. POPPET	1070	1
70	SEAT-DML POPPET	1062	1
71	PUSH ROD-DML	1063	1
72	O-RING -003 (11/64)	1068	6
73	BODY-DML	1064	1
74	PUSH BUTTON-DML	1065	1
75	DN-CK CLSR	1003	1
76	CLOSURE BLOCK-DML	1066	1
77	10-32x3/4 SHCS	1067	2
78	BRACKET-SOLENOID	1157	3
79	COIL-SOLENOID 110/60VAC/12VDC	2412	1
80	COIL-SOLENOID 110/60	2463	2
81	ORIFICE (BRASS)	1156	3
82	O-RING 009 (11/32)	1525	4
83	ORIFICE BODY	1155	3
84	SOLENOID NUT (1/2-20)	1536	3
86	D.L. PISTON	1058	1
87	D.L. ORIFICE	1069	1
88	1/8 PIPE PLUG	1072	3
89	LOCK WASHER	1078	1
90	ADJUSTER (10-56)	1075F	3
91	ADJ. BODY (10-56)	1076F	2
92	1/8 NPT (7/16 HEX)	1210	1
93	MALE DISCONNECT	1211	1
94	BUSHING COMPENSATOR	1204	1
95	6-32x3/4 LG. SHCS	1081	1
96	O-RING 015 (11/16)	1082	1
97	SOLENOID HOUSING, SGL.	1092	3
98	POPPET, PRV	1083	1
101	ADJUSTER, PRV (10-56)	1086F	1
102	PRV SPRING	1087	1
105	SCREEN 60 MESH	1090	2
106	SCREEN 100 MESH	1091	2
107	ADJUSTER BODY (10-56)	1302F	1
108	SCREEN INPUT	1303	2
109	WASHER #10	1093	1
110	110 O-RING (9/16)	1094	1
111	O-RING -007	1110	1
112	ADJUSTER BODY	1097	2
113	ADJUSTER	1098	2
115	SLEEVE 1103, CHECK VALVE	1103	1
116	SLEEVE 1104 BP/DOWN PISTON	1104	2
117	O-RING 2-018 (7/8")	1105	2
118	O-RING 2-024 (1 1/4")	1106	1
119	SPRING BALL CHECK	1107	1
120	O-RING 2-013 (9/16)	1108	3
121	B-P PISTON SPRING	1109	1
125	LOCKWASHER 6-32	1111	1



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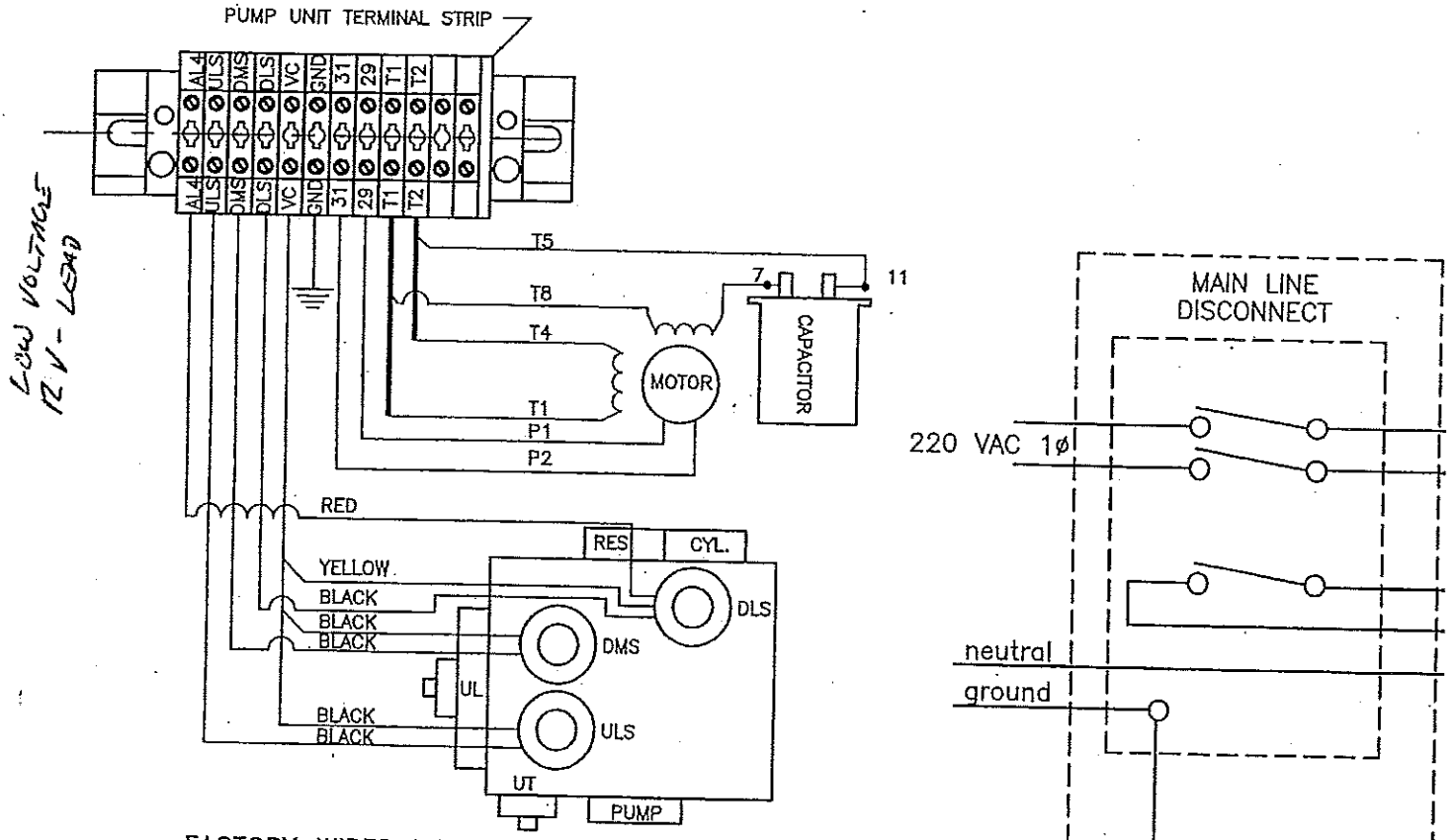
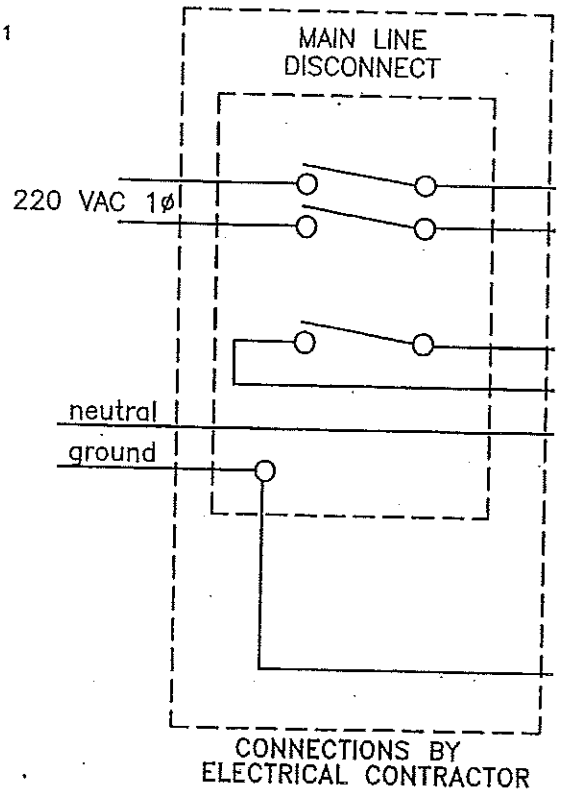
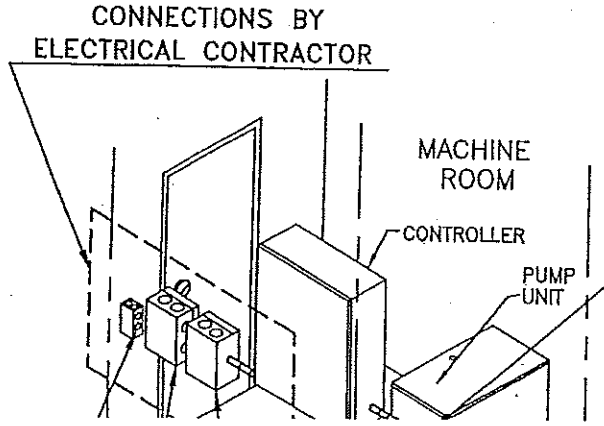


FACTORY WIRED MOTOR & VALVE CONNECTIONS



CONNECTIONS BY
ELECTRICAL CONTRACTOR



1" GREENFIELD MOUNTED TO PUMP UNIT & FACTORY WIRED TO PUMP UNIT TERMINAL BLOCK. (BY CEMCO)

110 VAC
1ø
BY OTHERS