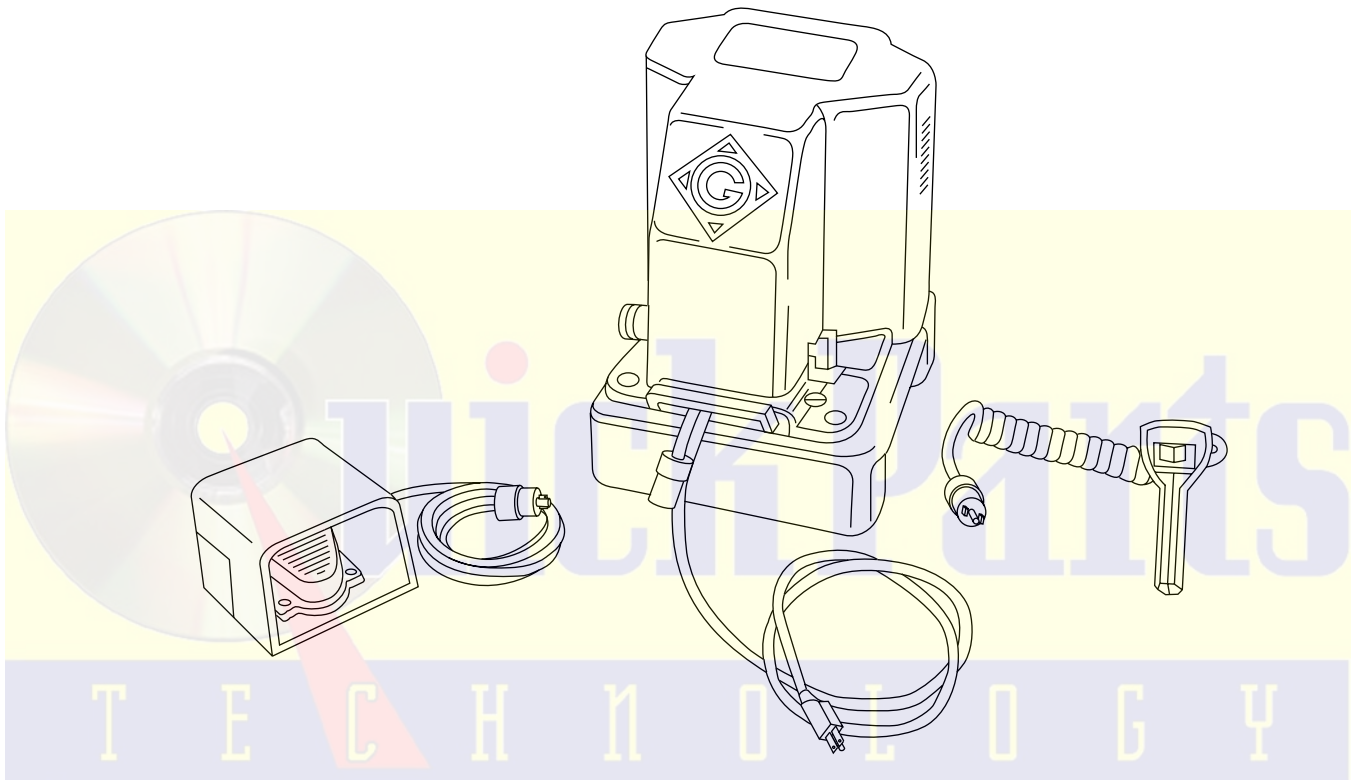


INSTRUCTION MANUAL



HYDRAULIC POWER PUMPS

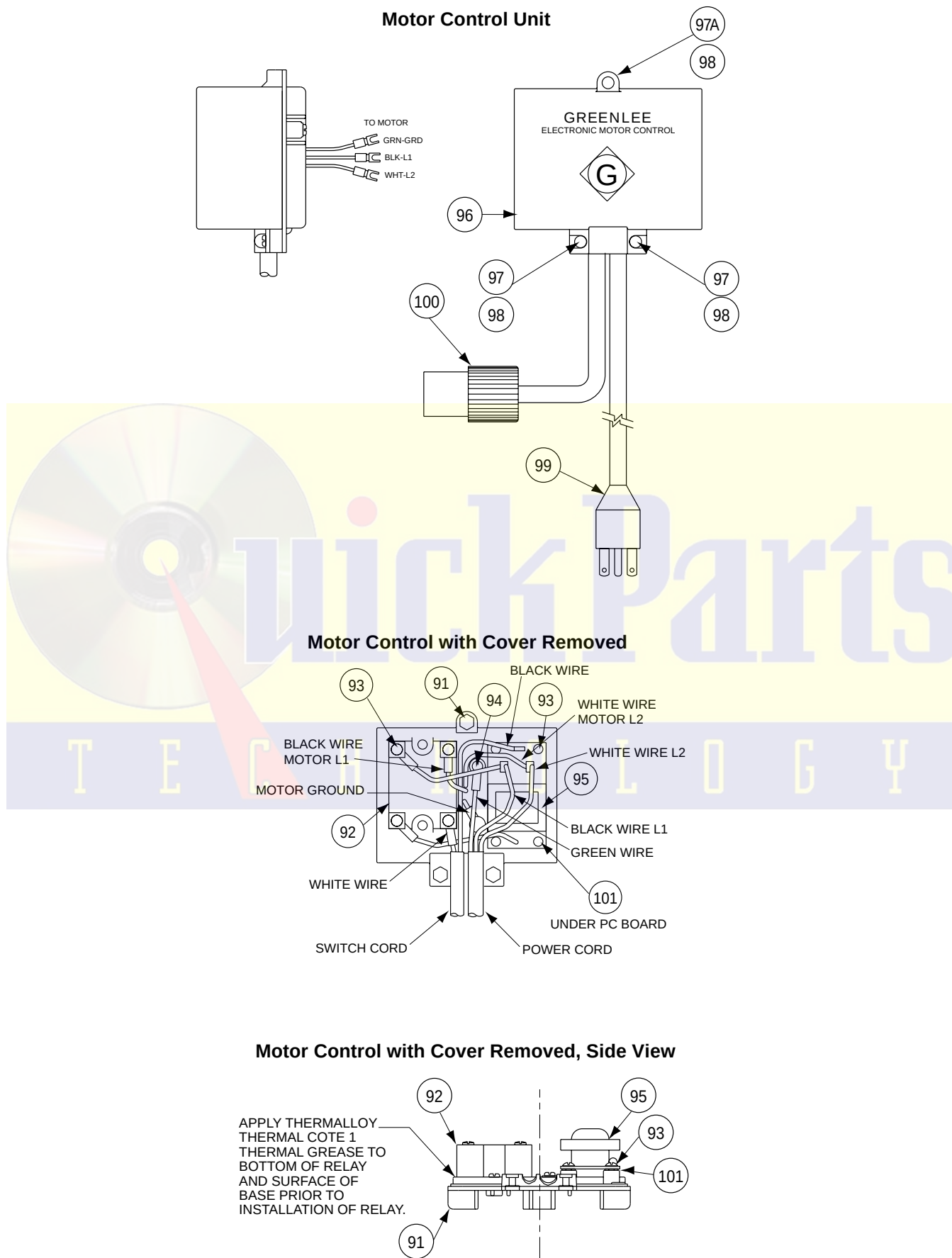
976-22 (SERIAL CODE YD)

980-22 (SERIAL CODE ABZ)



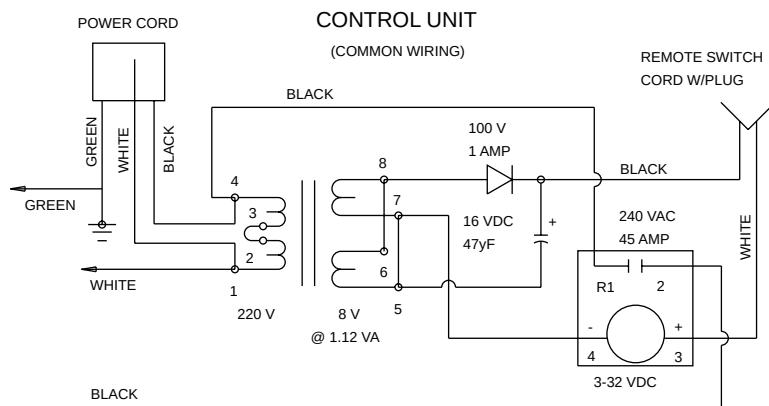
Read and understand all of the instructions and safety information in this manual before operating or servicing this tool.

Service

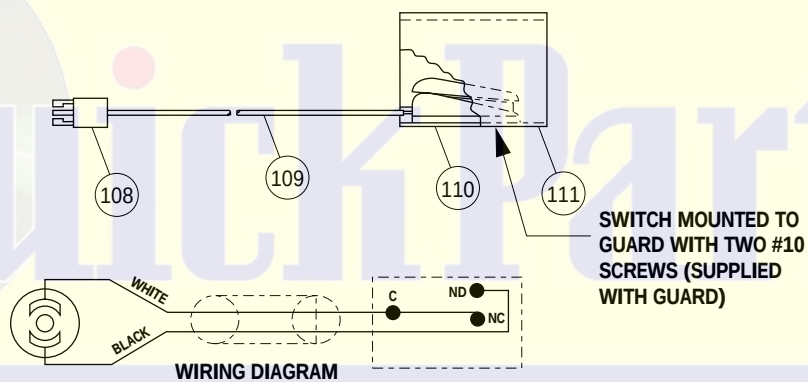


Service (cont'd)

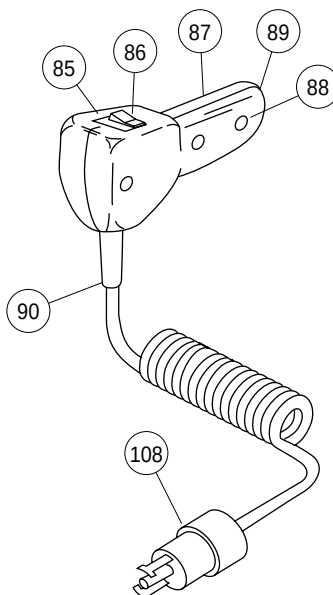
Motor Control, Schematic Diagram



Foot Switch

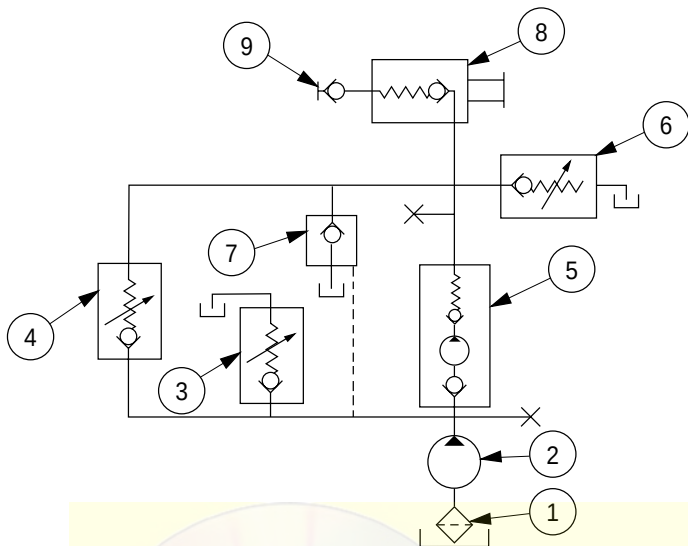


Pendant Switch



Service (cont'd)

Hydraulic Schematic



- ① Intake strainer, #50 mesh brass screen
- ② Low-pressure pump — 3.4 liters/min. (208 in³/min) at 3000 rpm (100%)
- ③ Low-pressure relief valve — 19 Bar (275 psi) located in pilot-operated valve ⑦ Piston
- ④ Low-pressure bypass check valve
- ⑤ High-pressure pump
976-22: .25 liters/min. (15 in³/min) at 2850 rpm (100%)
980-22: .73 liters/min. (45 in³/min)
- ⑥ High-pressure relief valve
717/690 Bar (10,400/10,000 psi)
- ⑦ Pilot-operated directional control valve
3 way, 2 position
- ⑧ Manually operated check valve
- ⑨ Female coupler half

Sealing Instructions for Assembly

Motor

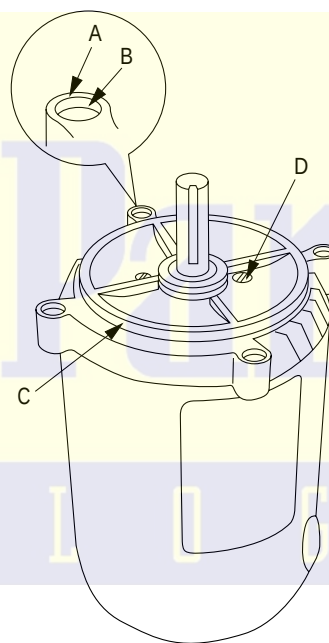
If the motor has been disassembled, seal with a 3 mm (1/8") bead of a silicone-based gasket/flange sealant, such as Loctite® 587 Ultra Blue®, as follows:

- (A) To the mounting surface around the threads (four locations)
- (B) To the chamfer (four locations)
- (C) Around the innermost machined circumference of the mounting surface

Apply a 1.5 mm (1/16") bead of an RTV-type silicone-based sealant, such as Dow Corning 732™ Multipurpose Sealant, as follows:

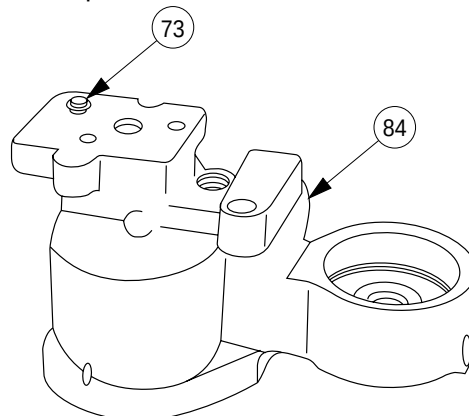
- (D) Around the motor bearing screws (two locations)

Assemble immediately.



Driv-Lok Pin

Seal the Driv-Lok pin (73) to the pump block (84) with a 1.5 mm (1/16") bead of an RTV-type silicone-based sealant, such as Dow Corning 732™ Multipurpose Sealant or equivalent.



Service (cont'd)

The following section and Figures describe pertinent details for refinishing ball seats and component re-assembly and adjustments.

Motor Face Seal

When reassembling the motor, refer to Figure A1 for the face seal seating dimension. Also, refer to this figure for setting the vertical position of counterweight (32).

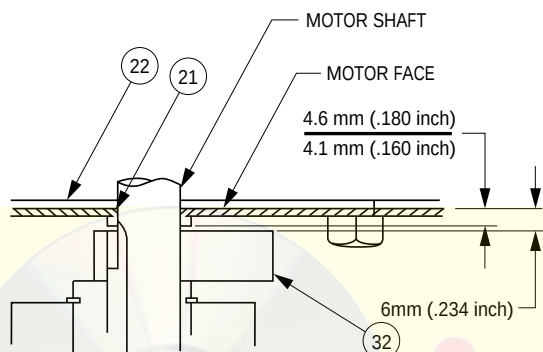


Figure A1 (8)

Manual Release / Automatic Release Valve Handle Setting

Refer to Figures A2 and A3. Thread in the shaft (62) until it just touches the check ball (55) (in its spring-loaded closed position). Slide collar (104) on the shaft. Position the handle (61) at the location "Position 1," (Figure A3), with the other surface of the handle flush with the end of the shaft. Lock in place. Rotate the handle to "Position 2," (Figure A3). Slide the collar toward the valve body until it contacts the 15.9 mm (5/8") diameter portion of the control shaft. Rotate the lock collar clockwise until it touches the stop pin, and lock in place.

When locking control handle and lock collar in place, torque set screws to 2.8 - 3.4 Newton-meters (25-30 inch-pounds).

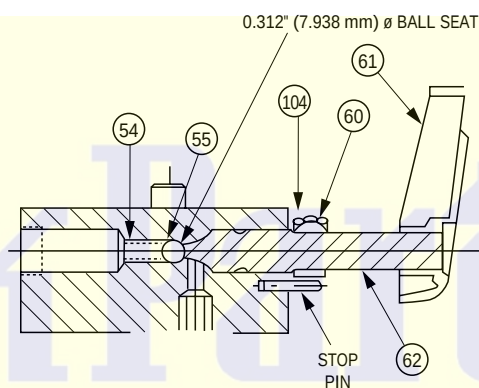


Figure A2 (8)

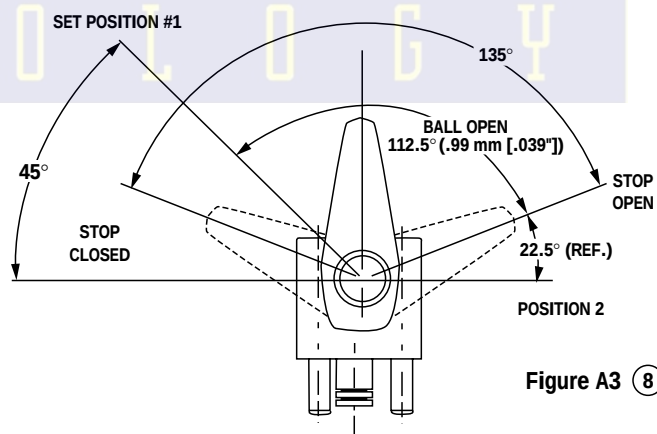


Figure A3 (8)

Service (cont'd)

Low Pressure Relief Setting

Refer to Figure A4. Lightly bottom the stem (44) on the ball (46). Then, back out the stem 3-1/2 turns. Tighten nut (43). The resulting pressure setting should be approximately 19.3 Bar (280 psi).

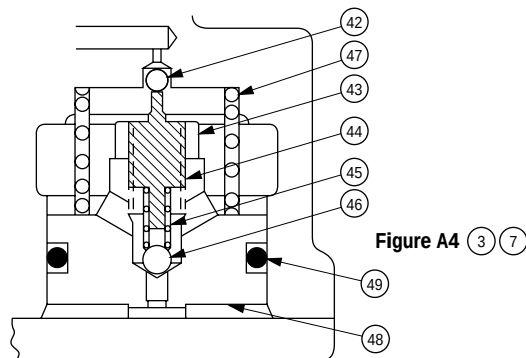


Figure A4 (3) (7)

Low-Pressure Bypass Check Pressure Adjustment

When properly set to the dimension shown in Figure A5, the high pressure stage operation of the pump will be delayed approximately one (1) second after the motor starts. This delay is created by the closing time of the pilot-operated valve.

Note: This dimension must be increased if ball seat depth is increased by more than .4 mm (1/64 inch).

Increasing the bypass pressure (CW rotation of adjusting screw—increase of set dimension) will shorten delay. If delay becomes too short, the motor will not restart when high pressure is held in the line. The motor should restart with a maximum required off time of 1/2 to 1 second.

Decreasing the bypass pressure (CCW rotation of adjusting screw) will increase delay. The pilot-operated valve will not close if pressure is set too low.

Changes in oil temperature (viscosity) will affect the amount of delay. The pumping delay will increase with rising oil temperature (thinner oil).

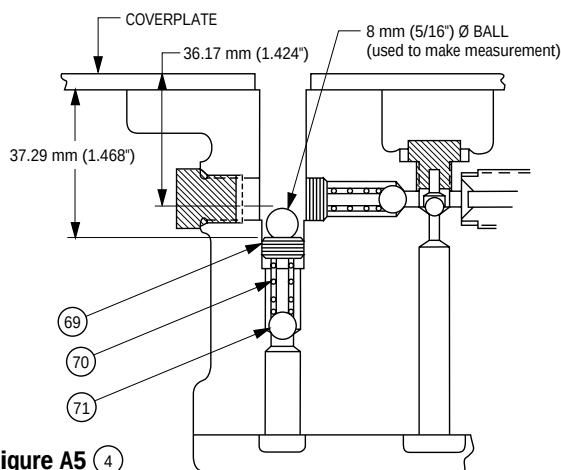


Figure A5 (4)

High-Pressure Inlet Check Ball Travel

The amount of allowable ball travel is critical to the optimum high pressure output (flow rate). Refer to Figure A5-1. Carefully and accurately measure (depth "mike") the "A" dimension (top of pump block to seated ball) and "B" dimension (top of pump block to head of plug—at center). Carefully and accurately set the "C" dimension (overall length of assembled plug and pin) of a new plug and pin equal to "A" minus "B" minus .305 ± .050 mm (.012 ± .002 inches).

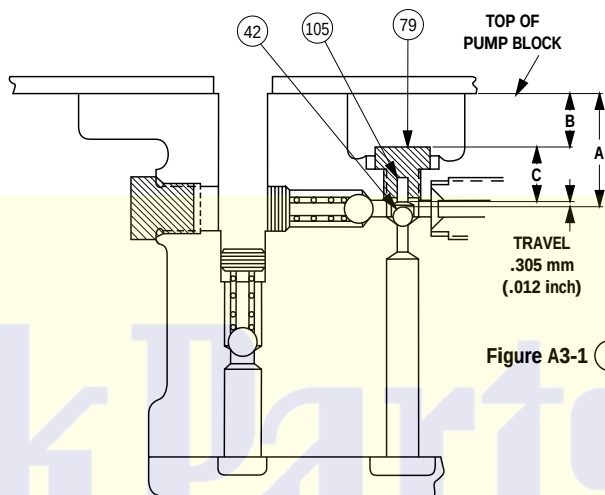


Figure A5-1 (5)

Low Pressure Pump Drive Pin

Assemble with cone point end in half-round keyway.

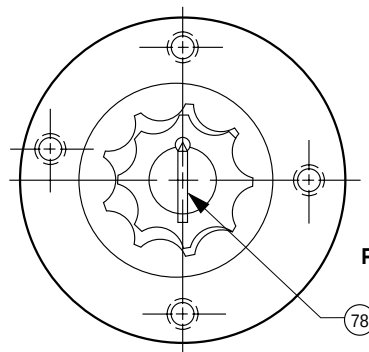


Figure A6

Service (cont'd)

Ball Seat Refinishing

Refer to Figures B2, B3, and B4 for the proper drill size to refinish the conical seat and finish ream size. These operations must be performed with the pump or valve block properly held and using a drill press. Only a very small amount of material should be removed.

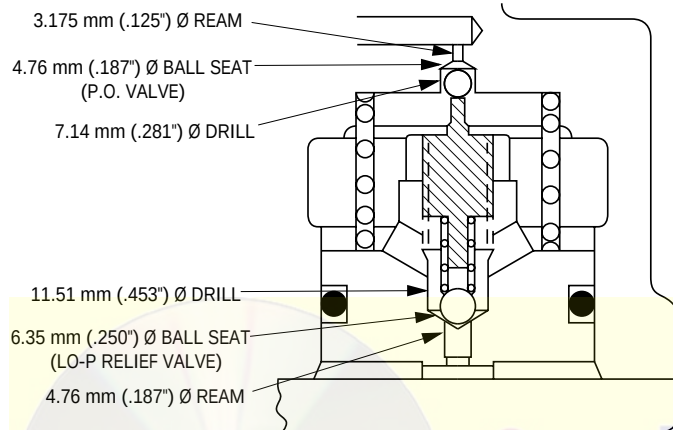


Figure B2 (3) (7)

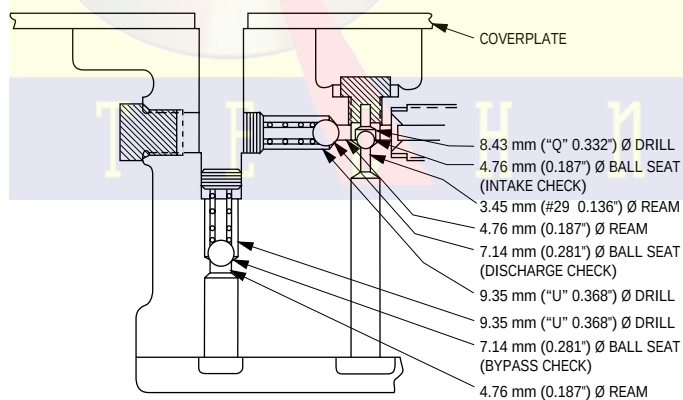


Figure B3 (4) (5)

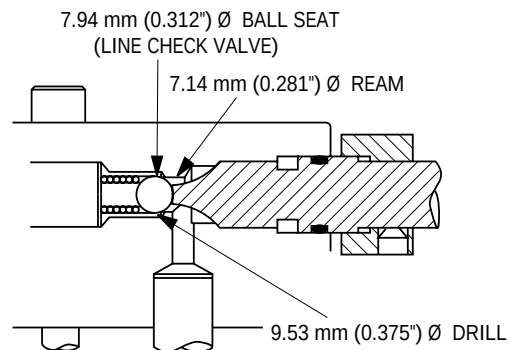
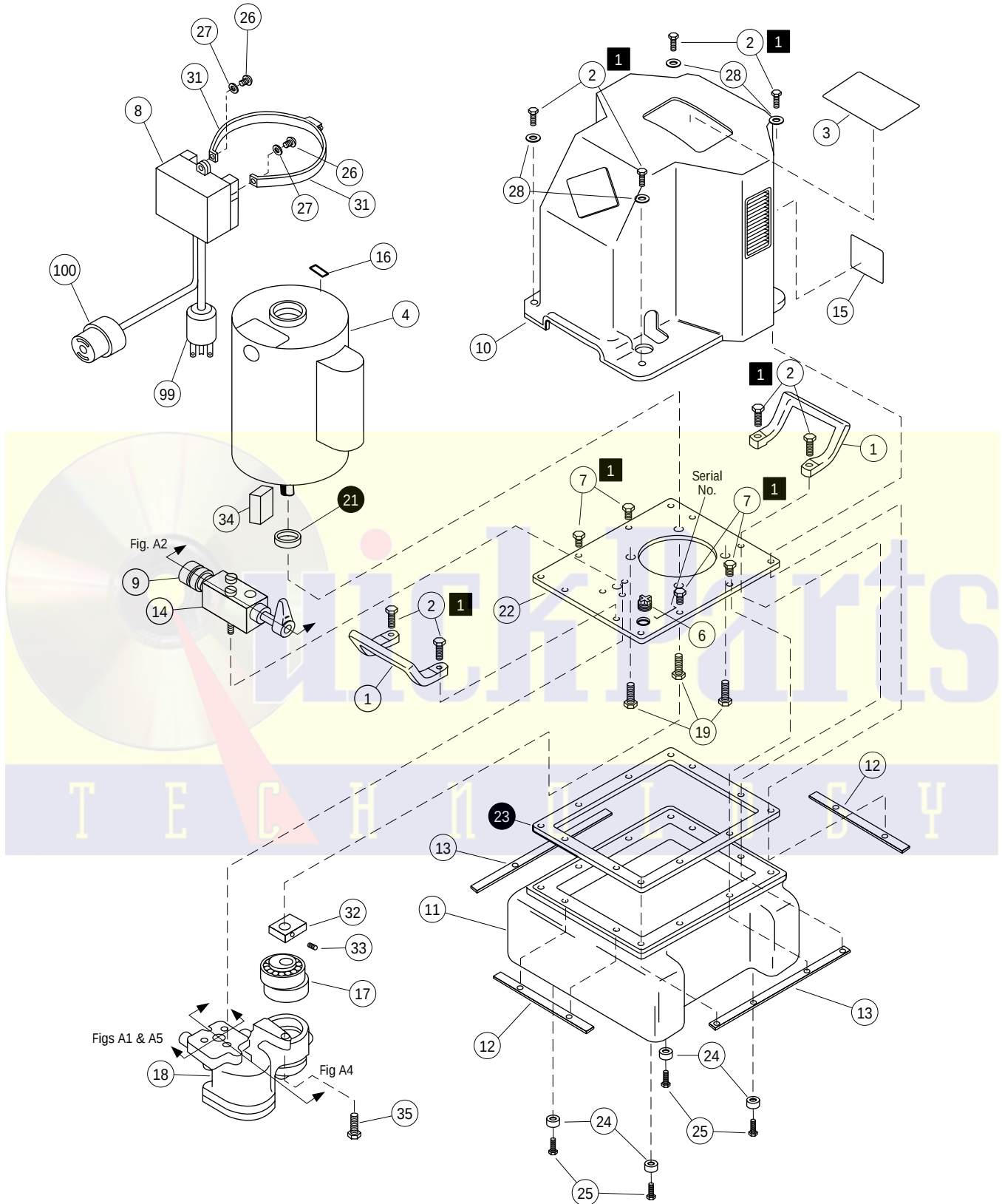
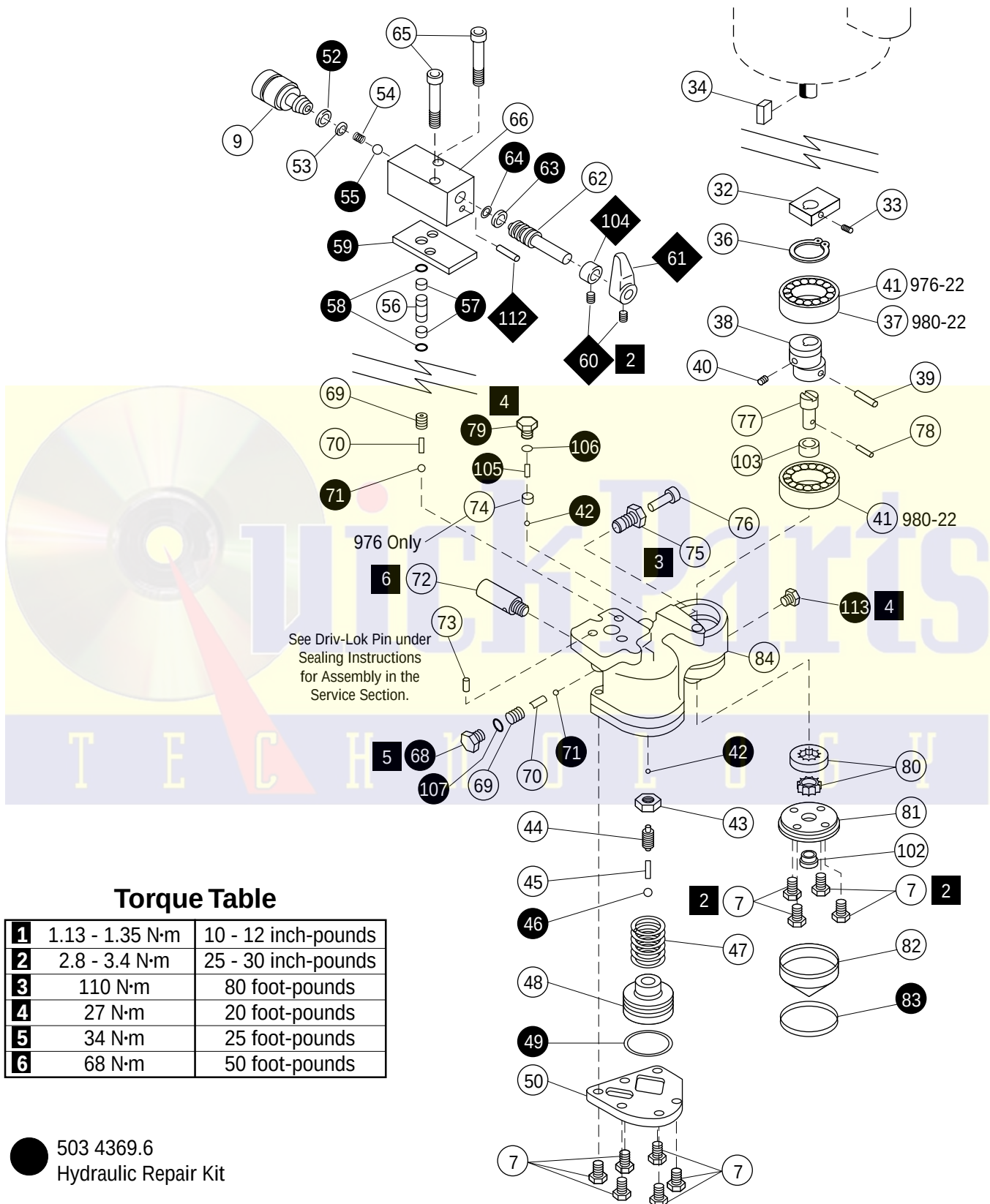


Figure B4 (8)

Exploded View



Exploded View—Pump Block



Torque Table

1	1.13 - 1.35 N·m	10 - 12 inch-pounds
2	2.8 - 3.4 N·m	25 - 30 inch-pounds
3	110 N·m	80 foot-pounds
4	27 N·m	20 foot-pounds
5	34 N·m	25 foot-pounds
6	68 N·m	50 foot-pounds

● 503 4369.6
Hydraulic Repair Kit

◆ 503 5464.7
Release Knob Retrofit Kit

Parts List

KEY	PART NO.	DESCRIPTION	QTY.
1	503 3518.9	Carrying Handle	2
2	905 3709.2	1/4–20 x 1-1/4" Hex Head Screw	8
3	503 4432.3	Decal, Identification 976-22	1
	503 6307.7	Decal, Identification and Specification 980-22	1
4	918 6353.8	Motor, 220 VAC, 1/2 HP (976-22)	1
	918 6444.5	Motor, 220 VAC, 1-1/2 HP (980-22)	1
6	503 2661.9	Fill-Vent Plug	1
7	905 0520.4	1/4–20 x 3/4" Hex Head Screw	14
8	503 4396.3	Motor Control Unit, (includes 91-101)	1
9	905 0807.6	Coupling	1
10	503 3488.3	Shroud	1
11	503 3490.5	Reservoir, 976-22	1
	503 3555.5	Reservoir, 980-22	1
12	503 3535.9	Short Retaining Strap	2
13	503 3536.7	Long Retaining Strap	2
14	503 3537.5	Release Valve Unit, (includes 52-66)	1
15	503 4398.0	I.D. Decal, Specifications and Warning 976-22 ...	1
	503 5491.4	I.D. Decal, Warning 980-22	1
16	501 5832.5	Arrow Decal	1
17		Eccentric Unit (see Exploded View—Pump Block) ..	1
18		Pump Block Unit (see Exploded View—Pump Block)	1
19	905 0530.1	Hex Hd. Cap Screw, 3/8–16 x 1.00"	3
*21	905 3682.7	Seal	1
22	503 3517.0	Cover Plate	1
*23	503 2627.9	Cover Plate Gasket	1
24	905 3829.3	Rubber Foot	4
25	905 1185.9	Screw, 1/4–20 x 1/2"	4
26	905 1460.2	Self-Tapping Screw 10 x 3/8"	2
27	905 3468.9	#10 Flat Washer	2
28	905 2339.3	1/4" Flat Washer	4
31	503 9896.2	Mounting Strap	1
32	503 3527.8	Counterweight	1
33	905 1269.3	Set Screw, 1/4–20 x 1/4"	1
34	501 4557.6	Motor Shaft Key, 3/16" x 1-3/8"	1
35	905 0533.6	Hex Hd. Cap Screw 3/8–16 x 1.50"	1
36	905 3707.6	Retaining Ring	1
37	905 3758.0	Ball Bearing #1206	1
38	503 3526.0	Eccentric Shaft	1
39	905 0699.5	Rollpin, 3/16" x 1"	1
40	905 0791.6	Set Screw, 10–32 x 1/4"	1
41	905 3704.1	Ball Bearing, #3206	1

Parts List (cont'd)

KEY	PART NO.	DESCRIPTION	QTY.
* 42	905 0678.2	Ball, 3/16"	2
43	905 0016.4	Jam Nut, 1/2–20	1
44	503 3520.0	Stem	1
45	502 2534.5	Spring	1
*46	905 0679.0	Ball, 1/4"	1
47	905 3701.7	Spring	1
48	503 3519.7	Auto Valve Piston	1
*49	905 0340.6	O-Ring, 1-5/8" x 2" x 3/16"	1
50	503 3521.9	Pump Block Cover	1
*52	905 3503.0	Retaining Ring	1
53	905 3468.9	Plain Flat Type "A" Washer	1
54	905 3510.3	Compression Spring	1
*55	905 0680.4	Ball, 5/16"	1
56	503 2622.8	Coupling	1
*57	905 1290.1	Back-up Ring, 3/8" x 1/2" x 1/16"	2
*58	905 0168.3	O-Ring, 3/8" x 1/2" x 1/16"	2
*59	503 2626.0	Gasket	1
+60	905 1269.3	Set Screw, 1/4–20 x .38"	2
+61	503 4796.9	Release Valve Knob	1
62	503 3541.3	Control Shaft	1
*63	905 3827.7	Back-up Ring, 1/2" x 5/8" x 1/16"	1
*64	905 0912.9	O-Ring, 1/2" x 5/8" x 1/16"	1
65	905 3496.4	Cap Screw, 5/16–18 x 2.50"	2
66	503 2623.6	Release Valve Body	1
*68	905 3698.3	O-Ring Plug (includes 107)	1
69	905 3712.2	Jam Screw, 7/16"	2
70	905 3702.5	Spring	2
*71	905 0436.4	Ball, 9/32"	2
72	500 6067.8	High Pressure Relief Valve	1
73	905 3706.8	Pin, Type "D" Driv-Lok 1/4" x 1/2"	1
74	503 4310.6	Insert, Cavity, (976-22 Only)	1
75	503 3531.6	High Pressure Bushing, 976-22	1
	503 3530.8	High Pressure Bushing, 980-22	1
76	503 3532.4	High Pressure Piston, 976-22	1
	503 3528.6	High Pressure Piston, 980-22	1
77	503 3525.1	Drive Shaft	1
78	503 2934.0	Drive Pin	1
*79	905 3699.1	O-Ring Plug, (includes 106)	1
80	905 3517.0	Gerotor	1
81	503 4197.9	Lower Gerotor Plate Unit (includes 102)	1
82	503 3524.3	Filter	1
*83	905 3766.1	O-Ring, 2-3/8" x 2-5/8" x 1/8"	1

Parts List (cont'd)

KEY	PART NO.	DESCRIPTION	QTY.
84	503 3533.2	Pump Block.....	1
85	503 2370.9	Faceplate Decal	1
86	918 6265.5	Switch	1
87	503 1902.7	Handle, Right Half	1
88	905 3441.7	Self-Tapping Screw, 6–20 x 5/8"	3
89	503 1901.9	Handle, Left Half	1
90	503 2362.8	Cord	1
91	503 3491.3	Motor Control Base	1
92	918 6292.2	Relay, 240 VAC/8 VDC — 45A	1
93	905 3840.4	Self-Tapping Screw, 6–32 x 5/16"	6
94	905 3695.9	Pan Head Type C Screw, 6–32 x 1/4"	2
95	503 4399.8	Transformer Unit	1
96	503 3492.1	Motor Control Cover	1
97	905 3580.4	Pan Head Mach. Screw, 6–32 x 5/8"	2
97A	905 4879.5	Pan Head Mach. Screw, 6–32 x 3/8"	1
98	905 0632.4	Hex Nut, 6–32	3
99	918 6845.9	96" Long Cord	1
100	918 6052.0	Female Twist Lock Cord Connector	1
101	905 3831.5	Nylon Spacer, .150" ID x 5/16" OD x .050"	4
102	905 3839.0	Bearings, Bronze	1
103	905 3320.8	Bearings, Bronze	1
+104	503 4886.8	Shaft Stop Collar	1
*105	905 3816.1	Pin, 1/8" x 1/4" Driv-Lok	1
*106	905 3878.1	O-Ring	1
*107	905 3880.3	O-Ring	1
108	918 6051.2	Plug, Twist Lock Male	1
109	918 6312.0	Cord, Foot Switch	1
110	918 6355.4	Switch, Foot	1
111	918 6356.2	Guard, Foot Switch	1
+112	905 0078.4	Roll Pin, 3/16" x 3/4"	1
113	905 0501.8	Plug Pipe 1/8" Skt. Hd.	1

* Parts included in Repair Kit No. 503 4369.6

+ Parts included in Release Knob Retrofit Kit 503 5464.7

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