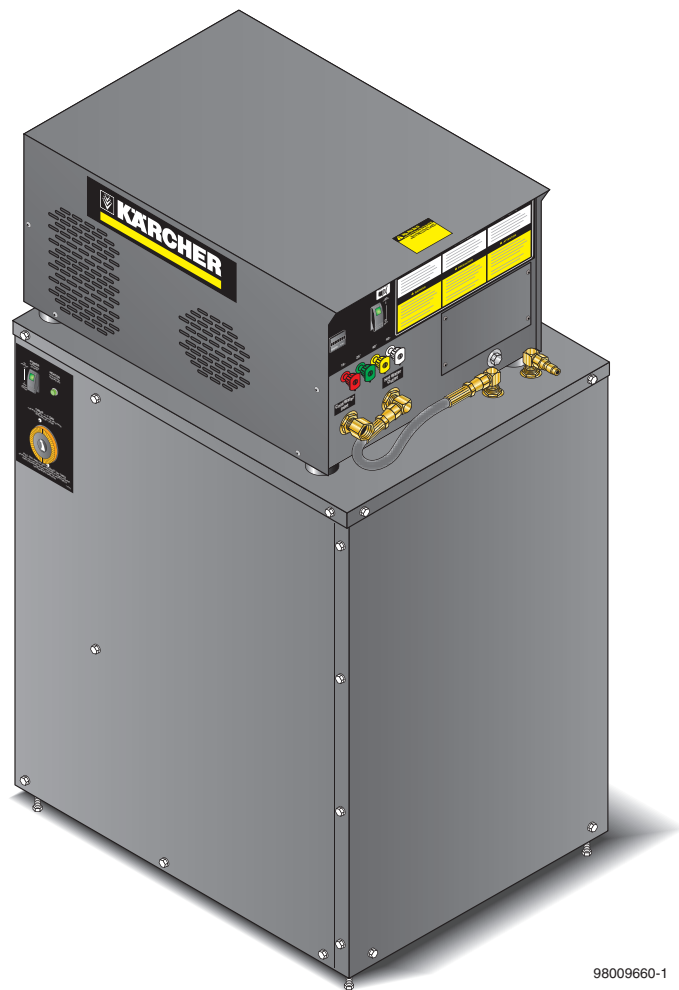




KÄRCHER®

SERVICE MANUAL



98009660-1

MODEL #
HDS 4.0/20 E Ec
HDS 4.0/30 E Ec

ORDER #
1.109-075.0
1.109-076.0

To locate your local Kärcher Shark Commercial Pressure Washer Dealer nearest you,
visit www.karchercommercial.com

9.800-966.0-A

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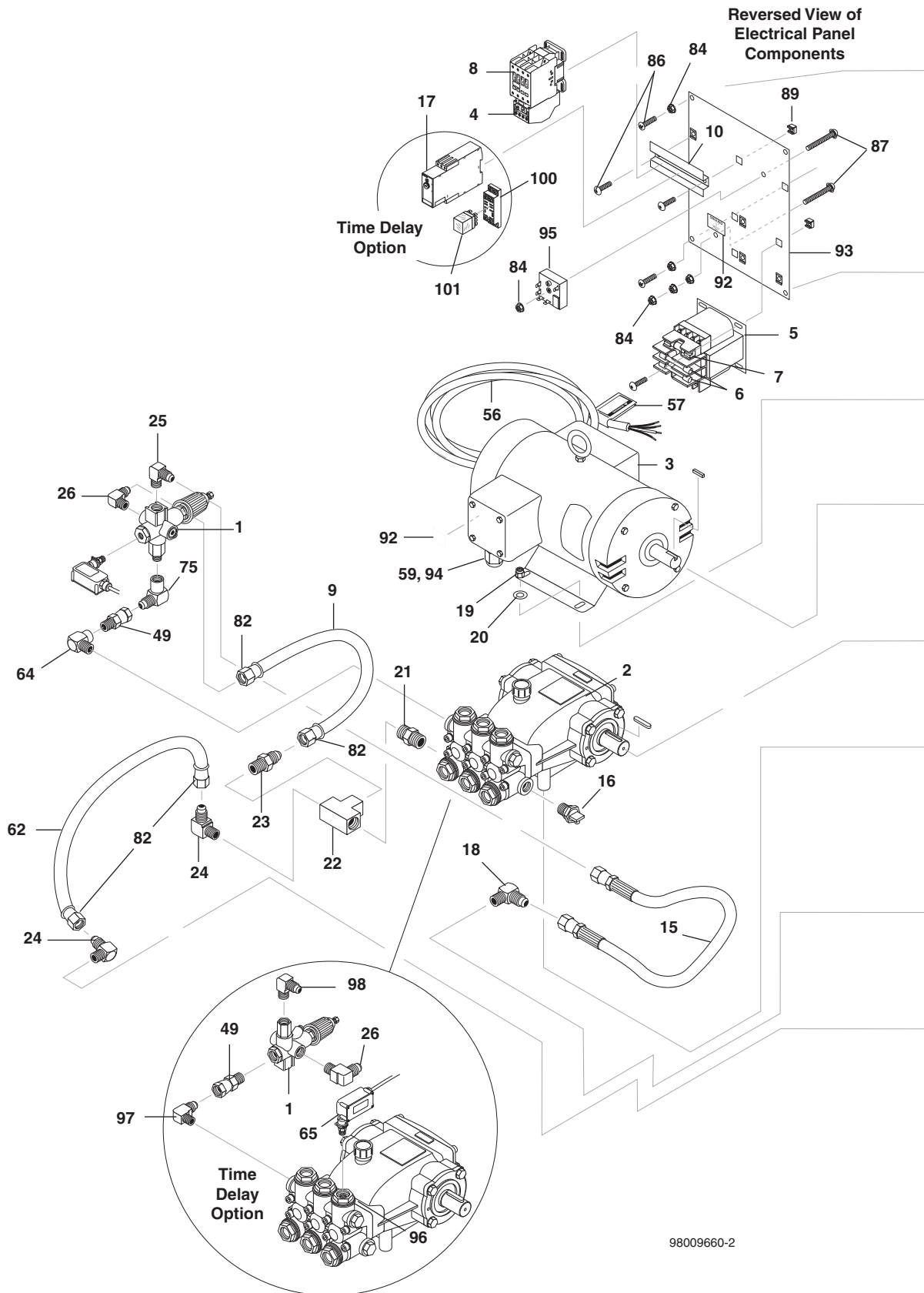
Model Number _____

Serial Number _____

Date of Purchase _____

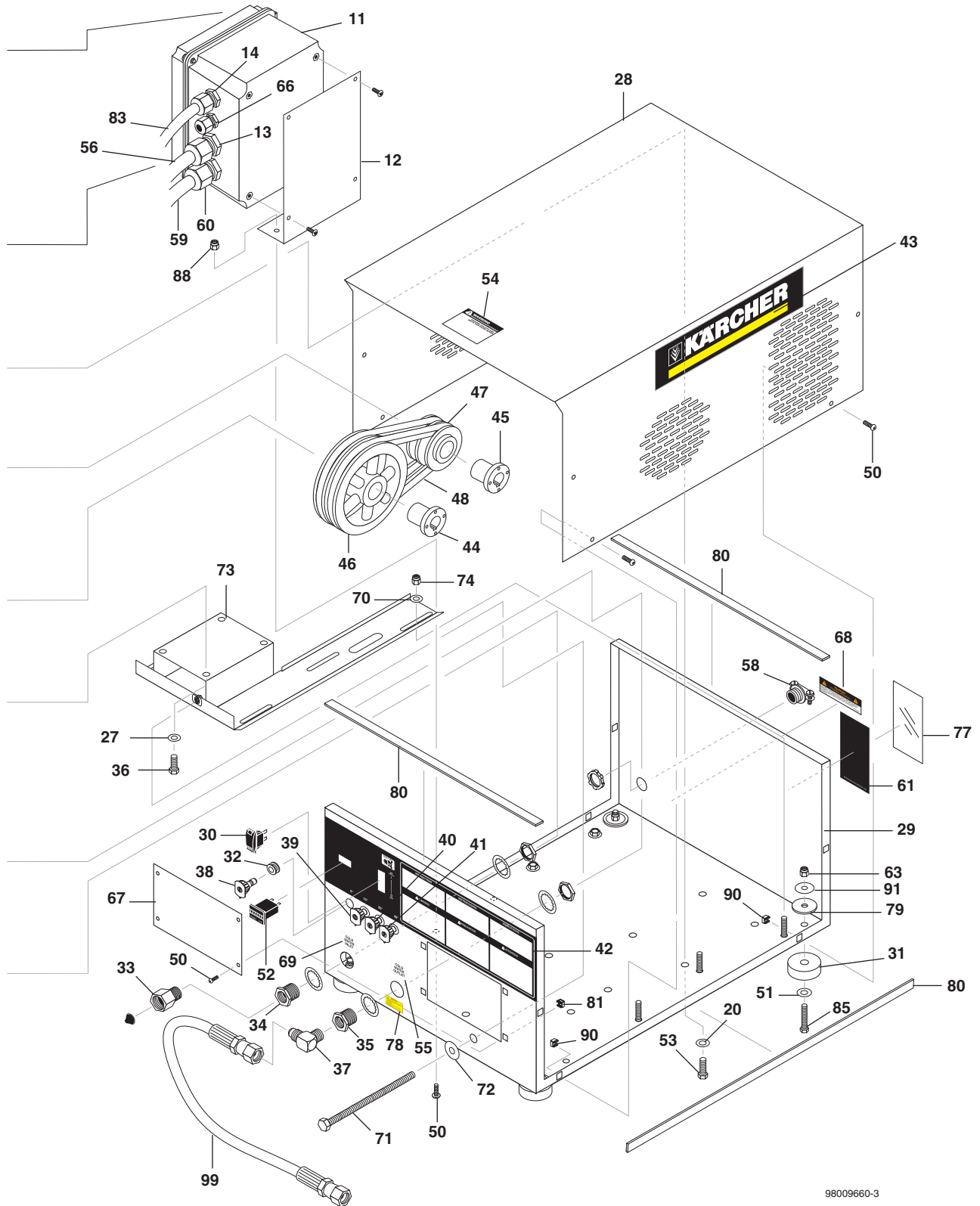
The model and serial numbers will be found on a decal attached to the pressure washer. You should record both serial number and date of purchase and keep in a safe place for future reference.

EXPLODED VIEW - LEFT SIDE



98009660-2

EXPLODED VIEW - RIGHT SIDE



98009660-3

EXPLODED VIEW PARTS LIST

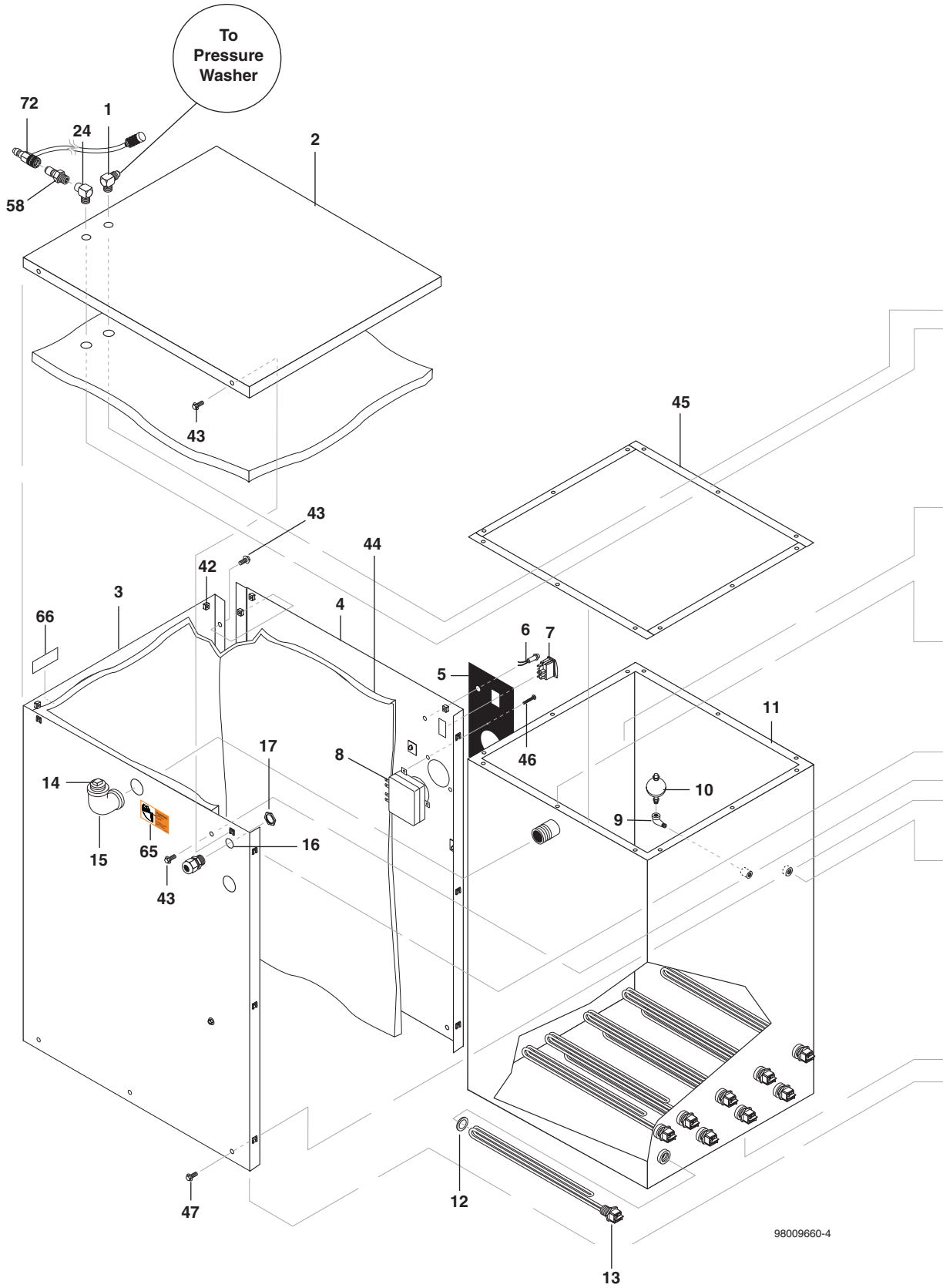
ITEM	PART NO.	DESCRIPTION	QTY	ITEM	PART NO.	DESCRIPTION	QTY
1	9.802-362.0	Unloader, PA 8GPM@3650 PSI, VB8 W/Switch	1	35	8.706-998.0	Connector, 3/8" Anchor	1
	8.750-299.0	Unloader,VRT3, 8 GPM @ 4500 PSI, (Time Delay Option)	1	36	9.804-058.0	Bolt, Pump Mounting	4
2	Pump, See Specification Pages			37	9.802-039.0	Elbow, 1/2" JIC x 3/8" 90° MPT	1
3	Motor, See Specification Pages			38	8.712-345.0	Nozzle, SAQCMEG 0004 Red (HDS 4.0/30)	1
4	Overload, See Specification Pages				8.712-361.0	Nozzle, SAQCMEG 0006 Red (HDS 4.0/20)	1
5	Transformer, See Specification Pages			39	8.712-346.0	Nozzle, SAQCMEG 1504 Yellow (HDS 4.0/30)	1
6	Fuse, See Specification Pages				8.712-362.0	Nozzle, SAQCMEG 1506 Yellow (HDS 4.0/20)	1
7	Fuse, See Specification Page 28-29			40	8.712-347.0	Nozzle, SAQCMEG 2504 Green (HDS 4.0/30)	1
8	Contactor, See Specification Pages				8.712-363.0	Nozzle, SAQCMEG 2506 Green (HDS 4.0/20)	1
9	9.802-259.0	Hose, 1/2" Push On	18"	41	8.712-348.0	Nozzle, SAQCMEG 4004, White (HDS 4.0/30)	1
10	9.802-457.0	Din Rail, 35mm	4"		8.712-364.0	Nozzle, SAQCMEG 4006, White (HDS 4.0/20)	1
		(Time Delay Option)	6"	42	9.800-064.0	Label Kärcher Control Panel CT 1	
11	9.802-476.0	Box, Plastic, 10" x 8" x 6" w/Lid	1	43	8.932-985.0	Label Kärcher Stripe 17"	2
12	9.803-038.0	Bracket, Support for Elec Box	1	44	Bushing, See Specification Pages		
13	9.802-518.0	Strain Relief, 3/4" LQ Tite	1	45	Bushing, See Specification Pages		
	9.802-526.0	▲ Locknut, 3/4"	1	46	Pulley, See Specification Pages		
14	9.802-515.0	Strain Relief, Strt, LQ Tite, Med	1	47	Pulley, See Specification Pages		
	9.802-524.0	▲ Locknut, 1/2" Conduit	1	48	Belt, See Specification Pages		
15	8.918-423.0	Hose, 3/8" x 22", 2 Wire, Pressure Loop	1	49	9.802-048.0	Swivel, 1/2" JIC Fem, 3/8" Male	1
16	9.803-670.0	Pump Protector, 1/2, 190°	1	50	9.802-765.0	Screw, 1/4"x1/2" BH SOC ES	14
17	8.751-306.0	Timer, Multi-Function (Time Delay Option)	1	51	9.802-817.0	Washer, 3/8" x 1" Steel	4
18	9.802-039.0	Elbow, 1/2" JIC, 3/8", 90°	1	52	9.802-283.0	Hour Meter	1
19	9.802-779.0	Nut, 3/8" ESNA	4	53	9.802-720.0	Bolt, 3/8" x 1", NC HH	4
20	9.802-807.0	Washer, 3/8", SAE, Flat	8	54	8.932-965.0	Label, Warning, Exposed Pulley	1
21	8.706-797.0	Nipple, 1/2" Hex	1	55	8.932-970.0	Label, Cold Water Outlet	1
22	8.706-844.0	Tee, 1/2" Female, Pipe	1	56	9.802-429.0	Service Cord 12/4	10 ft.
23	9.802-128.0	Nipple, 1/2" JIC x 1/2" MPT Pipe	1	57	8.932-969.0	Label, GFCI	1
24	9.802-131.0	Elbow, 1/2" JIC x 1/2", 90°	2	58	9.802-522.0	Strain Relief 1"	1
25	9.802-039.0	Elbow, 1/2" JIC x 3/8" Steel	1	59	9.802-429.0	Service Cord 12/4	40"
26	9.802-129.0	Elbow, 1/2" x JIC x 3/8", Brass	1	60	9.802-518.0	Strain Relief, Strt, LQ Tite 3234 Large	1
27	9.802-807.0	Washer, 3/8 Flat	4		9.802-526.0	▲ Locknut, 3/4"	1
28	9.802-879.0	Cover, Kärcher	1	61	9.800-013.0	Label, Intended For Indoor Use	1
29	9.802-875.0	Base, Kärcher	1	62	9.802-259.0	Hose, 1/2" Push-on	12"
30	9.802-451.0	Switch, Rocker, Carling w/Green Lens	1	63	9.802-779.0	Nut, 3/8" ESNA NC	4
	9.802-452.0	Switch, Rocker, Red Face (Time Delay Only)	1	64	8.706-207.0	Elbow, 3/8" Street	1
31	9.802-066.0	Pad, Soft Rubber, 50 Duro	4	65	8.716-125.0	Switch, Pressure (Time Delay Option)	1
32	9.802-064.0	Grommet, Rubber, Nozzle Holder	4	66	9.802-514.0	Strain Relief, 1/2"	1
33	9.802-146.0	Swivel, 1/2" MP x 3/4" GHF w/Strainer	1		9.802-524.0	▲ Locknut, 1/2"	1
34	8.707-000.0	Connector, 1/2" Anchor	1				

EXPLODED VIEW PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
67	9.803-081.0	Cover, Access Hole	1
68	9.800-016.0	Label, Disconnect power supply	1
69	9.800-020.0	Label, Cold Water Inlet	1
70	8.718-980.0	Washer, 5/16" Flat	4
71	9.802-738.0	Bolt, 1/2" x 8" NC HH	1
72	9.802-800.0	Washer, 1/2" Flat	1
73	9.803-100.0	Slider, Pump	1
74	9.802-776.0	Nut, 5/16" ESNA	4
75	9.802-042.0	Elbow, 1/2" JIC x 3/8" Female, 90 DGR	1
76	8.706-294.0	Bushing, 1/2" x 3/8" Steel	1
77	9.800-034.0	Clear Lexan	1
78	9.800-049.0	Detergent label	1
79	9.802-067.0	Bumper Pad	4
80	9.802-073.0	Weather Stripping	7 ft.
81	9.802-074.0	Nut, 1/4" Square	4
82	9.802-151.0	Swivel, 1/2" JIC Fem. Push-On	4
83	9.802-424.0	Cord, 16-4 Service	30"
84	9.802-695.0	Nut, 10/32" Keps	7
85	9.802-723.0	Bolt, 3/8" x 1-1/2" NC HH	4
86	9.802-759.0	Screw, 10/32" x 1/2" Black	10
87	9.802-762.0	Screw, 10/32" x 1-1/4"	1
88	9.802-773.0	Nut, 1/4" ESNA NC	2
89	9.802-791.0	Cage Nut, 10/32" x 16 Gauge	6
90	9.802-794.0	Cage Nut, 1/4" x 12 Gauge	8
91	9.802-811.0	Washer, 3/8" x 1-1/2" Fender	4
92	9.800-040.0	Label, Ground	2
93	9.803-032.0	Standoff, Electrical Box	1
94	9.802-520.0	Strain Relief, 3/4" (075.0)	1
	9.802-522.0	Strain Relief, 1" (076.0)	1
95	9.802-472.0	Timer, Solid State, 120V 5-60 Min. Adjust.	1
96	8.707-264.0	Plug, 3/8" Gas Tap (Time Delay Option)	1
97	9.802-039.0	Elbow, 1/2 JIC x 1/2 MPT (Time Delay)	1
98	9.802-042.0	Elbow, 1/2 JIC x 3/8 Fem (Time Delay)	1
99	8.918-422.0	Hose, 3/8 x 20"	1
100	9.802-467.0	Base, Relay (Time Delay Option)	1
101	9.802-468.0	Relay, 120V (Time Delay Option)	1

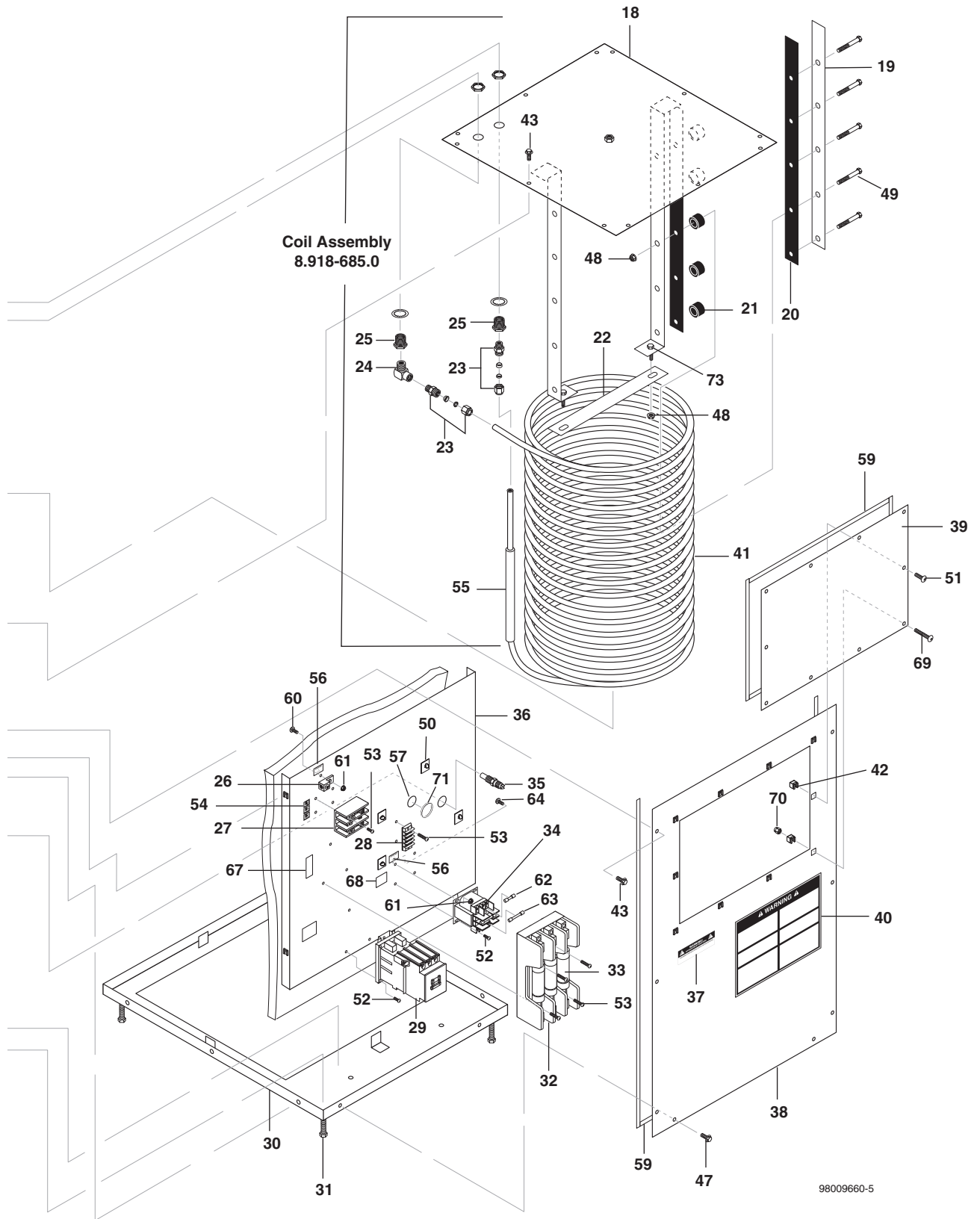
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CABINET EXPLODED VIEW - LEFT SIDE



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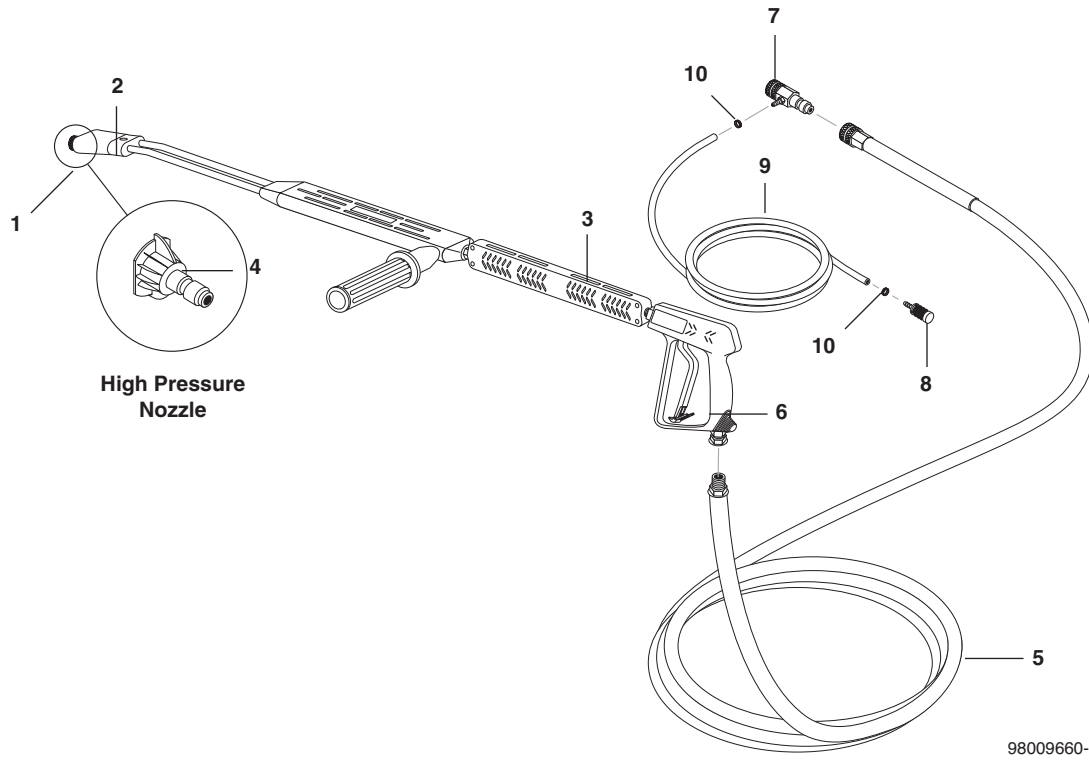
CABINET EXPLODED VIEW - RIGHT SIDE



CABINET PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY	ITEM	PART NO.	DESCRIPTION	QTY
1	9.802-039.0	Elbow, 1/2" JIC x 3/8" MPT	1	37	9.800-016.0	Label, Disconnect Power Supply	1
2	8.913-216.0	Lid, Top Cover	1	38	8.913-215.0	Plate, Back Cover	1
3	8.913-218.0	Outer Wrap, Fill Side	1	39	8.913-217.0	Plate, Electrical Access	1
4	8.913-219.0	Outer Wrap, Power Side	1	40	8.940-047.0	Label, Warning	1
5	8.940-048.0	Label, Heating Unit Power	1	41	8.912.251.0	Coil, 1/2" O.D. SS Tubing	1
6	9.802-455.0	Light, Green 125V	1	42	9.802-793.0	Nut, Cage 1/4" x 16 Ga	30
7	9.802-451.0	Switch, Rocker Carling w/Green Lens	1	43	9.802-754.0	Screw, 1/4" x 1/2" HH NC Whiz Lock	32
8	8.716-254.0	Timer, 7 Day Pin, 120V, 20A PB873MKZ	1	44	8.717-480.0	Insulation, 1" x 24" x 48" Fiberglass, Foil One Side	4
9	8.706-161.0	Elbow, 1/4" Street, 90° Galv	1	45	8.706-569.0	Gasket, Neop	8 ft
10	8.716-633.0	Switch, Limit w/Clamp	1	46	8.718-755.0	Screw, 8/32" x 1-1/2", SS Phil PH	2
11	8.913-211.0	Tank Assembly	1	47	9.806-551.0	Screw, 5/16" x 3/4" Whiz	10
12	8.716-650.0	Gasket, 6000W Heater, 2500 Series	9	48	9.802-778.0	Nut, Whiz Loc, 5/16 Flange	12
13	8.716-645.0	Heater, 4500W 480V #055994-091	9	49	9.802-716.0	Bolt, 5/16" x 2" NC HH	10
14	8.913-222.0	Plug, 1.5" Pipe, Black	1	50	8.716-533.0	Clamp, Tie Wrap Adhesive	9
15	8.913-221.0	Elbow, 1-1/2" Female, Black 90°	1	51	9.802-765.0	Screw, 1/4" x 1/2" BH SOC CS	9
16	9.802-518.0	Strain Relief, Large	1	52	8.718-937.0	Screw, #8 x 3/4" Phillips, Zinc, HEK	7
17	9.802-526.0	Locknut, 3/4" 8465	1	53	8.718-936.0	Screw, #8 x 1/2" Phillips, Zinc, TEK	10
18	8.913-212.0	Tank Assembly Lid	1	54	8.940-007.0	Label, Incoming Line	1
19	8.913-213.0	Bracket, Coil	2	55	9.802-259.0	Hose, 1/2" Push-on	1 ft.
20	8.706-542.0	Pad, 1/4" Rubber, Coil	4	56	9.800-040.0	Label, Ground Symbol	3
21	8.711-785.0	Hose, 3/8" x 1/2" Push-on	10	57	9.802-103.0	Bushing, Snap 5/8	1
22	8.913-214.0	Bracket, Coil Spacer	1	58	9.802-171.0	Nipple, 1/2" Hex Steel	1
23	8.706-322.0	Tube Fitting, Parker 8MSC6N-316 1/2" SS A-Lok	2	59	9.802-073.0	Weatherstrip, 1/8" x 1/2"	10 ft.
24	8.706-207.0	Elbow, 3/8" Street	2	60	8.718-803.0	Screw, 10/32" x 3/4" BHSOC	1
25	8.706-998.0	Connector, 3/8" Anchor	2	61	9.802-695.0	Nut, 10/32" Keps	3
26	8.716-461.0	Terminal, Grounding Lug, 1/0-6 Copper Wire	1	62	9.802-464.0	Fuse, Paper Bass 8/10 250V	1
27	8.716-122.0	Block, Power Distr, 3 Pol, GO63133	1	63	8.713-081.0	Fuse, Class R1/2 Amp	2
28	9.802-491.0	Block, Terminal, 4 Pole	1	64	9.802-759.0	Screw, 10/32" x 1/2" BH SOC	1
29	8.724-284.0	Contact, 120V	1	65	8.724-513.0	Label, Fill Elbow	1
30	8.913-210.0	Tank Base Assembly	1	66	9.800-021.0	Label, Hot Water Outlet	1
31	8.718-696.0	Bolt, 1/2" x 3" NC, SS	4	67	8.915-607.0	Label, Class RD5, 50 Amp	1
32	8.716-225.0	Holder, Fuse Block, Buss R60060-3CR	1	68	8.915-610.0	Label, XFMR Primary/Secondary Fuses	1
33	8.730-762.0	Fuse, Buss FRS-R-50, 600V 50 Amp	3	69	9.802-770.0	Screw, 1/4" x 1", BH SOC CS	1
34	8.716-883.0	Transformer, 208/230/460V-24/115V, .050KVA	1	70	9.802-773.0	Nut, 1/4" ESNA, NC	1
35	8.712-179.0	Switch TH HI 84°C NC 1/2 x 1/2 SP	1	71	9.802-065.0	Grommet, 1-5/16" Rubber	1
36	9.813-220.0	Electrical Panel	1	72	9.802-225.0	Detergent Injector Assy, Non-Adj. #3	1
				73	9.802-710.0	Bolt 5/16" x 1"	2

HOSE & SPRAY GUN ASSEMBLY AND PARTS LIST



HOSE & SPRAY GUN ASSEMBLY AND PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY	ITEM	PART NO.	DESCRIPTION	QTY
1	9.802-165.0	Coupler, 1/4" Male	1	6	8.710-384.0	Gun, ST-1500, 5000 PSI 10.4 GPM	1
	9.802-096.0	▲ Quick Coupler O-Ring, Small	1	7	9.802-216.0	Detergent Injector, Non-Adjust 3-5 GPM	1
2	9.802-286.0	Nozzle Only, 1/8", Soap	1	8	8.707-057.0	Strainer, 1/4" Hose Barb	1
3	8.711-293.0	Wand, SS, VP, AL344 w/Coupler & Soap Nozzle	1	9	9.802-251.0	Tube, 1/4" x 1/2" Clear Vinyl	6 ft.
4	See Nozzles, Page 18			10	9.802-210.0	Clamp, Hose, UNI .46 - .54	2
5	8.917-057.0	Hose, 3/8" x 50', 1 Wire,	1				

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SPECIFICATIONS

Model#	HP	Motor	Pump	Pump Pulley	Pump Pulley Description	Motor Pulley	Motor Pulley Description	Pump Bushing Description
1.109-075.0	6 hp	8.751-004.0	8.751-189.0	9.802-374.0	2AK74H	9.802-373.0	2AK56H	24 mm
1.109-076.0	7.5 hp	8.751-014.0	8.751-189.0	8.715-592.0	2BK80H	8.715-583.0	2BK50H	24 mm

SPECIFICATIONS

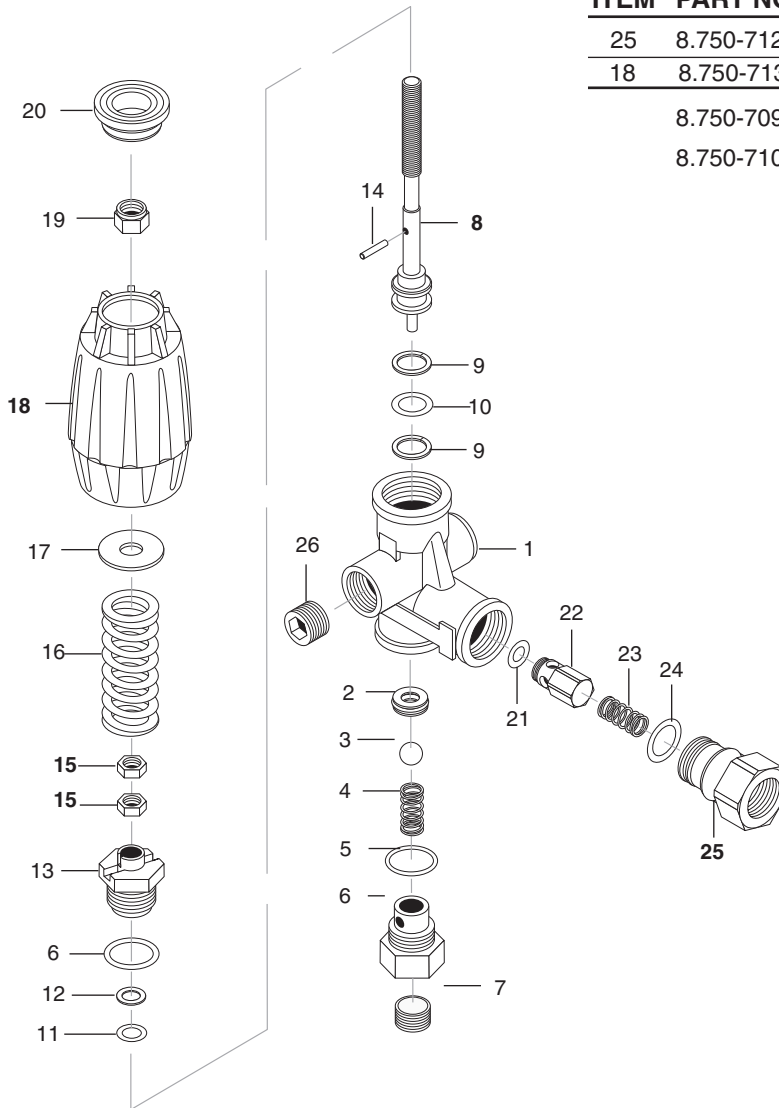
Model#	Pump Bushings	Motor Bushing	Motor Bushing#	Belt	Belt#	Contactactor	Overload Fuse	Primary Fuse	Secondary	Transformer
075.0	9.802-402.0	H x 1-1/8"	9.802-400.0	AX42	9.802-411.0	8.724-268.0	8.724-312.0	9.802-462.0(2)	9.802-463.0(1)	9.802-551.0
076.0	9.802-402.0	H x 1-3/8"	9.802-401.0	BX43	9.802-420.0	8.724-268.0	8.724-312.0	9.802-462.0(2)	9.802-463.0(1)	9.802-551.0

VRT3 UNLOADER EXPLODED VIEW AND PARTS LIST

8.750-297.0, 8 GPM, 2320 PSI

8.750-298.0, 8 GPM, 3630 PSI

8.750-299.0, 8 GPM, 4500 PSI



ITEM	PART NO.	DESCRIPTION	QTY
25	8.750-712.0	Outlet Fitting	1
18	8.750-713.0	Knob, Unloader	1
	8.750-709.0	Repair Kit, VRT3, 2320/3630 PSI	
	8.750-710.0	Repair Kit, VRT3, 4500 PSI	
		(Kit Items: 1, 4, 8-12, 16, 21-22)	

Unloader Adjustment Procedures

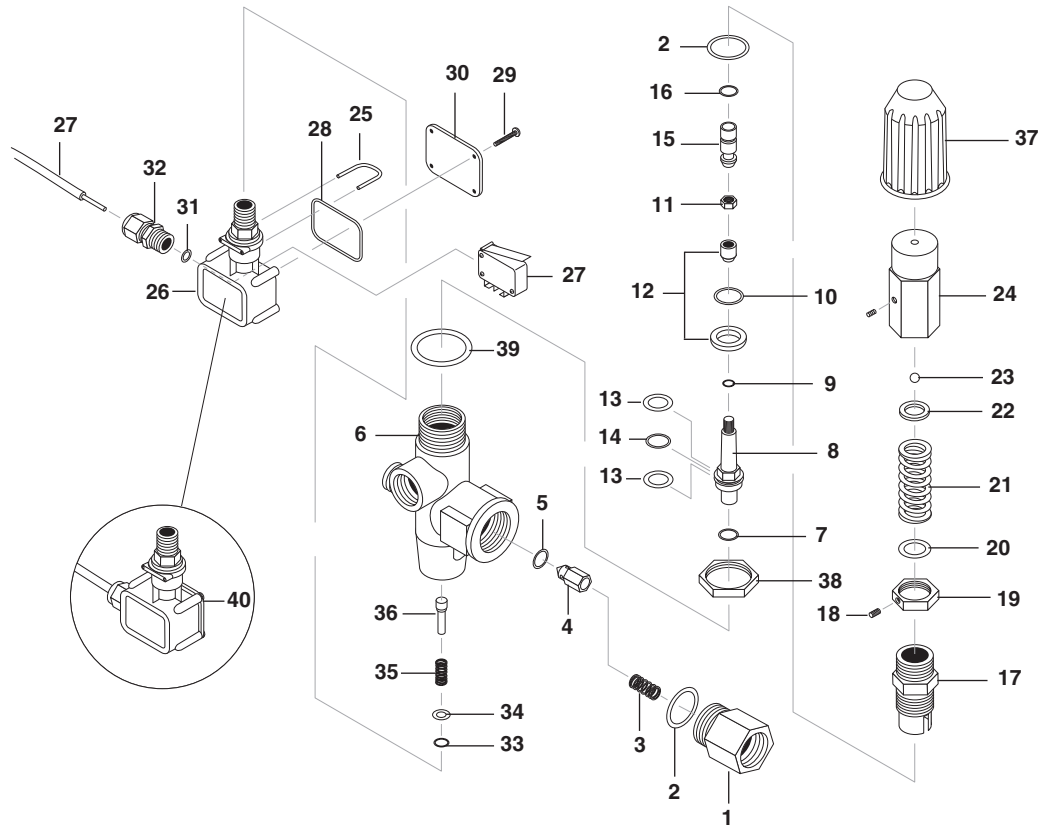
1. Remove lock nut (Item 19).
2. Remove adjustment knob (Item 18).
3. Loosen the two (2) nuts (Item 15), move them upward on stem (Item 8) until you see 4 or more threads below the nut.
4. Re-attach adjusting knob (Item 18).
5. Start machine. Open the trigger of the spray gun. Increase pressure by turning adjustment knob (Item 18) clockwise until pressure is at the desired operating pressure.
6. Remove the adjustment knob (Item 18), tighten the lower nut (Item 15) tightly against the upper nut (Item 15). Re-attach adjustment knob (Item 18) and screw down until contact is made with the nuts (Items 15). Screw down lock nut (Item 19) onto the stem (Item 8) until the threads cut into the nylon insert of the lock nut (Item 19).

*If adjustment knob (Item 18) **DOES NOT** make contact with upper nut (Items 15), remove adjusting knob (Item 18), re-adjust (raise) nuts (Items 15) on stem (Item 8) and re-attach adjustment knob (Item 18), then repeat step #6.

If adjustment knob (Item 18) **DOES make contact with upper nut; release the trigger of the spray gun and watch the pressure gauge for the pressure increase ("spike"). This "spike" **SHOULD NOT** exceed 500 psi above the operating pressure. If "spike" pressure exceeds the 500 psi limit, remove the adjusting knob (Item 18) and re-adjust (lower) the nuts (Items 15) on the stem (Item 8). Re-attach the adjusting knob (Item 18), then repeat step #6.

VB8 UNLOADER VALVE EXPLODED VIEW & PARTS LIST

9.802-362.0
8GPM@3650 PSI

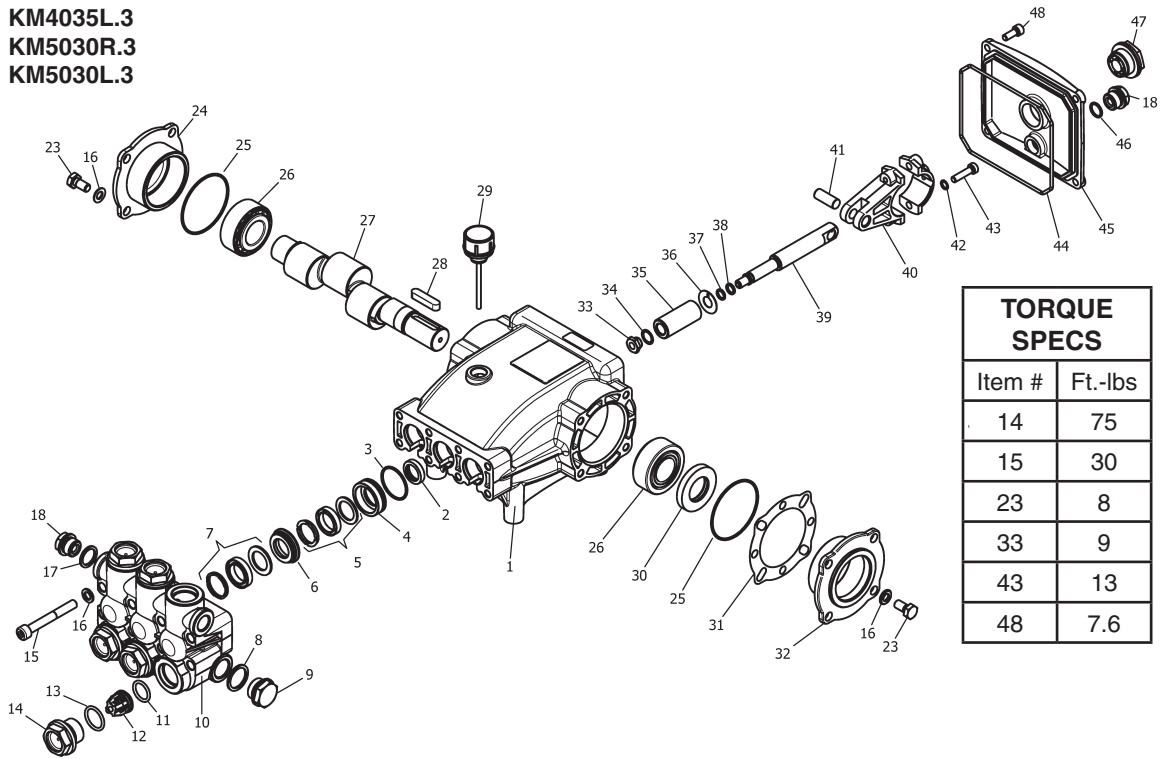


ITEM	PART NO.	DESCRIPTION	QTY
1	8.705-749.0	3/8 Bsp F Outlet Fitting	1
2	8.704-218.0*	O-ring 1.78 x 18.77 mm	2
3		Spring	1
4		Check Valve	1
5	8.704-230.0*	O-ring 3 x 6 mm	1
6		VB8 Brass Body	1
7		O-Ring 2,.62 x 7.6 mm	1
8		Piston	1
9		O-ring 1 x 4 mm	1
10	9.804-550.0*	O-ring 1.78 x 15.6 mm	1
11		M 6 Nut	1
12		VB8/9 Seat+Shutter	1
13		Back Ring 11.4 x 15.9 mm	2
14		O-ring 2.62 x 10.77 mm	1
15		Spring Guide	1
16		O-ring 2.62 x 5.23 mm	1
17		Piston Housing	1
18		M 4 x 4 mm Dowel	1
19		M 22 Nut	1
20		Washer 9 x 15 mm	1
21	8.932-987.0	3.2 x 33 mm Spring	1

ITEM	PART NO.	DESCRIPTION	QTY
22		Upper Frame	1
23		1/4" Ball	1
24		Brass Cap	1
25		Sst Clip	1
26		Plastic Housing	1
27		El.Cable + Micro Switch	1
28		O-Ring 2.62 x 28.25 mm	1
29		2.5 x 12 mm Screw	2
30		Cover	1
31		O-ring 2.62 x 6.02 mm	1
32		Black Nut-40 Bar	1
33		O-ring 1.78 x 3.68 mm	1
34		Sst Washer 4 x 8 mm	1
35		Spring	1
36		PR 5 Pin	1
37		Plastic Handle (60.1290.00)	1
38		Washer D. 30 mm (60.1290.00)	1
39		M 30 Nut (60.1290.00)	1
40	8.705-930.0	PR 5 Pl.Housing Kit	1

KM.3 SERIES PUMP EXPLODED VIEW

- 8.751-186.0 KM3540R.3
- 8.751-187.0 KM4030R.3
- 8.751-188.0 KM4030L.3
- 8.751-189.0 KM4035R.3
- 8.751-190.0 KM4035L.3
- 8.751-191.0 KM5030R.3
- 8.751-192.0 KM5030L.3



KM.3 SERIES PUMP EXPLODED VIEW PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY	ITEM	PART NO.	DESCRIPTION	QTY
1	8.751-216.0	Crankcase	1	23	9.802-944.0	Screw, Hex, 8mm x18mm	8
2*	See Kits Below	Plunger Oil Seal	3	24	8.717-210.0	Closed Bearing Housing	1
3*	See Kits Below	O-Ring Ø1.78 x 31.47	3	25	9.803-192.0	O-Ring Ø1.78 x 60.05	2
4*	See Kits Below	Pressure Ring	3	26	8.933-011.0	Tapered Roller Bearing	2
5*	See Kits Below	U-Seal	3	27	8.751-222.0	Crankshaft (5030,3540)	1
6*	See Kits Below	Intermediate Ring	3		8.751-223.0	Crankshaft (4030, 4035)	1
7*	See Kits Below	U-Seal	3	28	9.803-167.0	Crankshaft Key	1
8	9.803-199.0	Washer, Copper	1	29	9.802-921.0	Oil Dip Stick	1
9	9.802-926.0	Plug, Brass 1/2	1	30	9.803-140.0	Crankshaft Seal	1
10	8.751-218.0	Manifold Head	1	31	9.803-178.0	Shim	2
11*	See Kits Below	O-Ring Ø2.62 x 17.13	6	32	8.717-209.0	Bearing Housing	1
12*	See Kits Below	Valve Assembly	6	33*	See Kits Below	Plunger Nut, M8	3
13*	See Kits Below	O-Ring Ø2.62 x 20.29	6	34*	See Kits Below	Copper Spacer	3
14	9.802-928.0	Valve Plug	6	35*	See Kits Below	Plunger (4035)	3
15	9.802-938.0	Manifold Stud Bolt	8		See Kits Below	Plunger (4030, 5030)	3
16	9.802-884.0	Washer	16		See Kits Below	Plunger (3540)	3
17	9.803-198.0	Copper Washer 3/8	1				
18	9.802-925.0	Brass Plug 3/8	1				

KM.3 SERIES PUMP EXPLODED VIEW PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
36*	See Kits Below	Copper Spacer	3
37*	See Kits Below	O-Ring Ø1.78 x 7.66	3
38*	See Kits Below	Teflon Ring	3
39	8.751-224.0	Plunger Rod	3
40	9.803-158.0	Connecting Rod	3
41	8.751-228.0	Connecting Rod Pin	3
42	9.803-218.0	Spring Washer	6
43	9.803-238.0	Connecting Rod Screw	6
44	8.933-016.0	O-Ring, Ø2.62 x 126.67	1
45	8.751-229.0	Crankcase Cover	1
46	9.803-197.0	O-Ring, Ø1.78 x 14	1
47	9.803-202.0	Sight Glass 3/4	1
48	9.802-939.0	Cover Screw	5

* Available in kit (See below)

REPAIR KIT NO.	8.725-360.0	8.725-362.0	8.725-358.0	8.725-361.0	8.725-363.0	8.725-359.0
KIT DESCRIPTION	Plunger Seal 4035 18mm	Plunger Seal 4030 5030 20mm	Plunger Seal 3540 15mm	Complete Seal Packing 4035 18mm	Complete Seal Packing 4030 5030 20mm	Complete Seal Packing 3540 15mm
ITEM NUMBERS INCLUDED	3, 5, 7	3, 5, 7	3, 5, 7	3, 4, 5, 6, 7	3, 4, 5, 6, 7	3, 4, 5, 6, 7
NO. OF CYLINDERS KIT WILL SERVICE	3	3	3	1	1	1

REPAIR KIT NO.	8.751-237.0	8.751-238.0	8.933-023.0	9.802-603.0	9.802-609.0
KIT DESCRIPTION	Plunger 4035 18mm	Plunger 4030 5030 20mm	Plunger 3540 15mm	Complete Valve	Plunger Oil Seals
ITEM NUMBERS INCLUDED	33, 34, 35, 36, 37, 38	33, 34, 35, 36, 37, 38	33, 34, 35, 36, 37, 38	11, 12, 13	2
NO. OF CYLINDERS KIT WILL SERVICE	1	1	1	6	3

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
LOW OPERATING PRESSURE	Faulty pressure gauge	Install new gauge.
	Insufficient water supply	Use larger garden hose; clean filter washer at water inlet.
	Old, worn or incorrect spray nozzle	Match nozzle number to machine and/or replace with new nozzle.
	Plumbing or hose leak	Check plumbing system for leaks. Retape leaks with teflon tape.
	Faulty or mis-adjusted unloader valve (where applicable)	Adjust unloader for proper pressure. Install repair kit when needed.
	Worn packing in pump	Install new packing kit.
	Fouled or dirty inlet or discharge valves in pump	Clean inlet and discharge valves.
	Worn inlet or discharge valves	Replace with valve kit.
	Leaking pressure control valve (where applicable)	Rebuild or replace as needed.
FLUCTUATING PRESSURE	Valves worn	Check and replace if necessary.
	Blockage in valve	Check and clean out if necessary.
	Pump sucking air	Check water supply and suction line for air seepage at joints.
	Worn piston packing	Check and replace if necessary.
PRESSURE LOW AFTER PERIOD OF NORMAL USE	Nozzle worn	Check and replace if necessary.
	Inlet or discharge valves blocked or worn	Check and clean or replace if necessary.
	Unloader valve seat worn	Check and replace if necessary.
PUMP NOISY	Air in suction line	Check water supply connections on suction line.
	Broken or weak inlet or discharge valve springs	Check and replace if necessary.
	Foreign matter in valves	Check and clean if necessary.
	Worn bearings	Check and replace if necessary.
PRESENCE OF WATER IN PUMP OIL	Water sprayed at machine	Change oil. Direct spray away from machine.
	High humidity in air	Check and change oil twice as often.
	Piston packing worn. Oil seal worn	Check and replace if necessary.

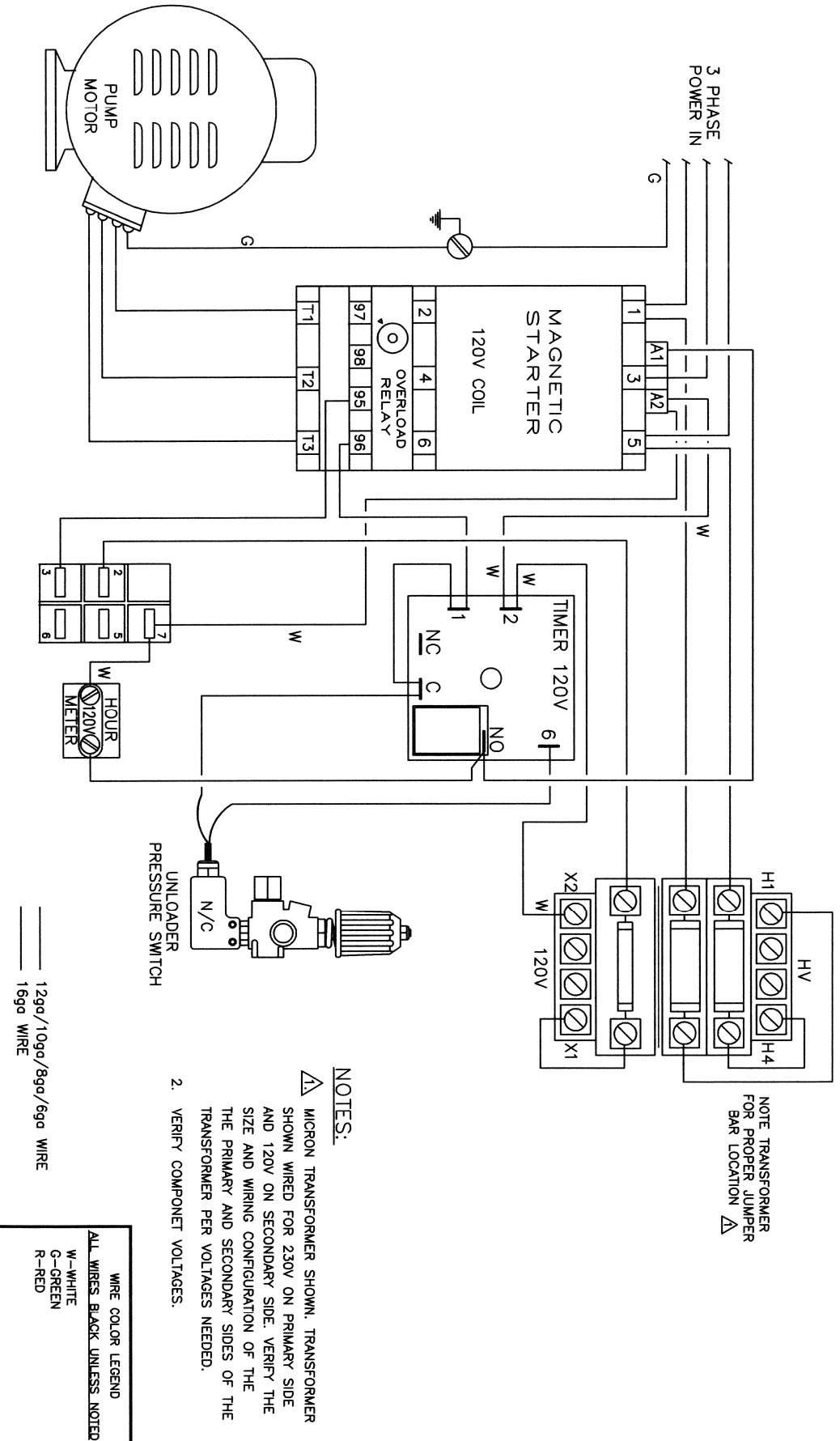
TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
OIL SQUIRTS OUT OF OIL CAP ON PUMP	Pump overfilled with oil	Maintain oil level at red dot on sight glass at rear of pump or at top of notch on dipstick (where applicable).
WATER DRIPPING FROM UNDER PUMP	Piston packing worn	Check and replace if necessary.
	O-Ring plunger retainer worn	Check and replace if necessary.
	Cracked piston	Check and replace if necessary.
OIL DRIPPING	Oil seal worn	Check and replace if necessary.
EXCESSIVE VIBRATION IN DELIVERY LINE	Irregular functioning of the valves	Check and replace if necessary.
SYSTEM WILL NOT START	Power, water, auto switch not on	Check and turn on.
	Motor overload tripped	Check and reset.
	Control fuse blown (2 or 3 amp)	Check and replace.
	Pressure switch faulty	Check, clean or replace.
	Timer faulty	Check and replace.
SYSTEM WILL NOT STOP	Water leak in discharge line	Repair water leak.
	Pressure switch faulty	Disconnect at timer. If unit stops, replace pressure switch.
	Timer resistor faulty	Replace timer.
SYSTEM STOPS AFTER APPROXIMATELY 10 SECONDS AND THEN RESTARTS	Faulty pressure switch	Check and replace.
	Leak in system	Fix leak.
WATER IS NOT HOT	Tank water low	Check for leaks and fill.
	Temperature or level controls faulty	Check and replace.
MOTOR "HUMS" BUT DOES NOT TURN	Electric motor single phasing	Check for blown fuse or loose power line connections.
PUMP RUNNING NORMALLY BUT LOW WATER PRESSURE	Air leak in inlet	Check water supply and possibility of air entering water connections.
	Faulty pressure unloader	Bypass pressure unloader by wiring spray gun open. If good PSI, turn machine off and replace regulator. DO NOT RELEASE SPRAY GUN WHILE BYPASSING UNLOADER.

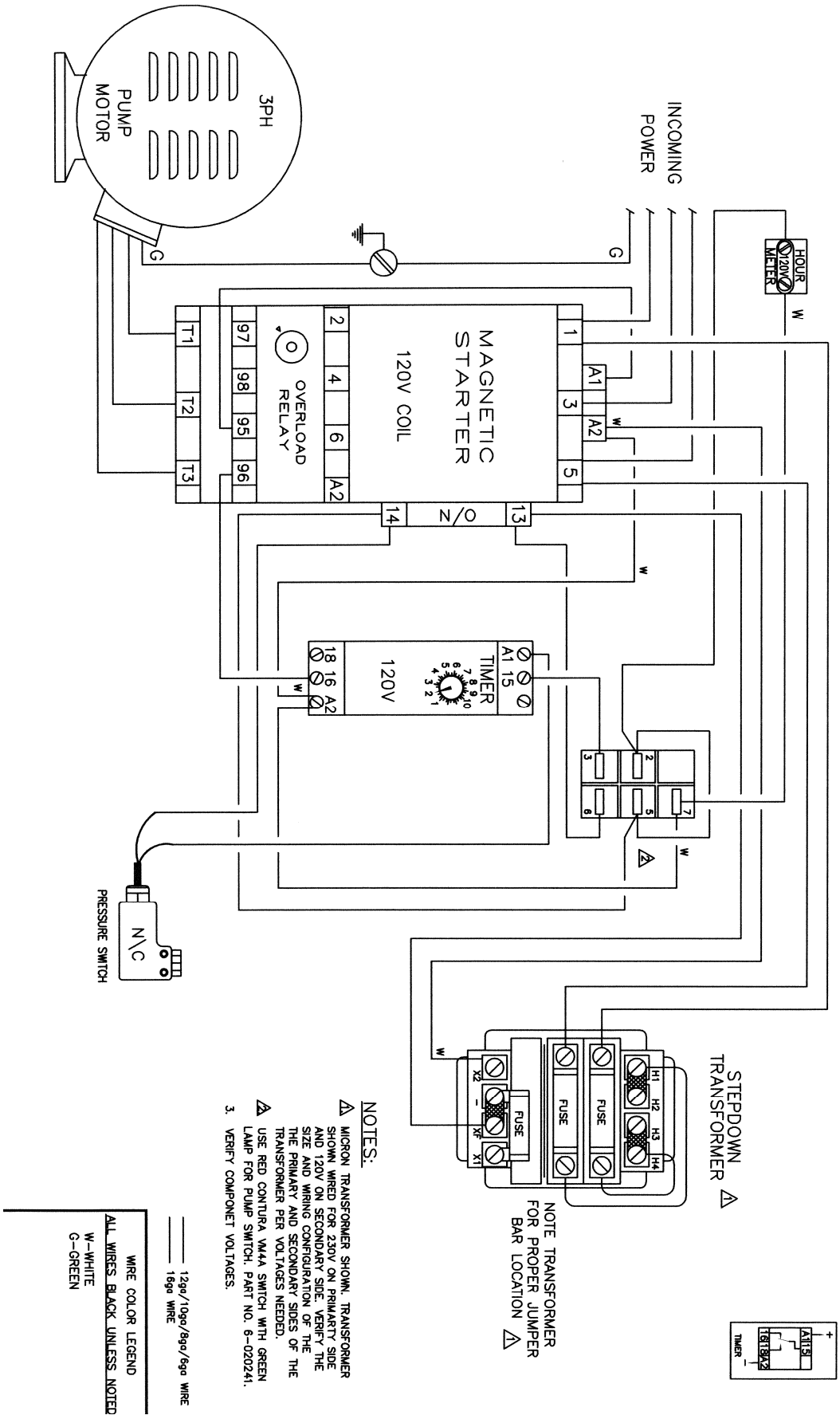
TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
WATER ESCAPING FROM FILL PIPE ON HEAT EXCHANGER	Cold water added to heat exchanger	Will stop once at operating temperature.
	Ruptured coil or leaking	Check, repair or replace fittings.
UNLOADER DOES NOT GO INTO BYPASS OR WILL CYCLE ITSELF	Spray gun or hose is leaking to atmosphere	Check and repair all leaks.
	Check plunger either did not move or did not seal	Remove discharge port. Clean and inspect the check plunger. Replace the o-ring if needed.
	Actuator O-ring failure	Remove actuator plunger assembly and inspect O-ring and back-up rings. Replace if necessary.
SPIKES TOO HIGH	Slow moving actuator; this may be caused by bad O-rings either on the plunger or inside the actuator fitting	Remove the actuator assembly to inspect the O-ring and back-up rings. The actuator assembly will have to be disassembled to inspect and/or replace the O-rings in the actuator fitting.
	Spring tension	Adjustment should stop when pressure is no longer affected by further compression of the spring.
	Hose length	Hose length can affect the amount of spike pressure. Long lengths of hose may cause high spike pressures.
SYSTEM WON'T COME UP TO PRESSURE	Water is leaking between ball and seat	Disassemble inlet fitting and check for contaminates or worn parts. Clean or replace as needed.
	O-rings on actuator plunger are bad	Remove actuator assembly and inspect O-ring and back-up rings. Replace if necessary.
	Locknut may be improperly set	Readjust locknut. NOTE: The locknut is inside the spring on models that have the stem exposed above the spring.
	Tip/GPM combination is incorrect	Check actual GPM on unrestricted pump and size tip accordingly.
	Tip worn- the GPM may be greater than expected with a worn tip	Replace tip.
	Bad gauge - the pressure may be higher than the gauge shows	Replace gauge.

WIRING DIAGRAM - WITH AUTO START/STOP



WIRING DIAGRAM - WITH TIME DELAY SHUTDOWN OPTION





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