



Repair Parts Manual

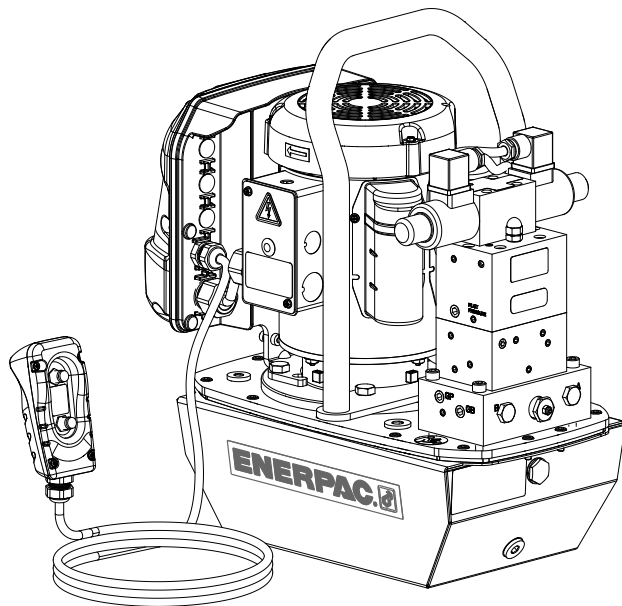
Electric Hydraulic Pumps ZE2-Series and ZW2-Series

Document Number: L4556

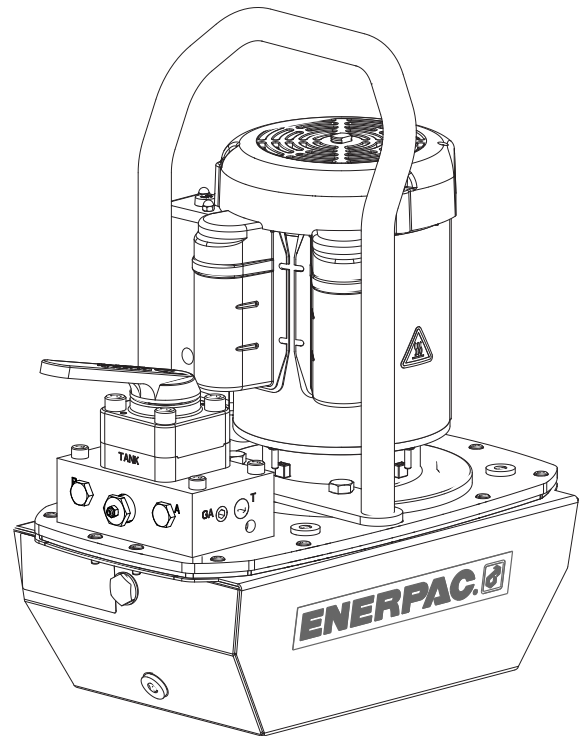
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Electric Valve Models

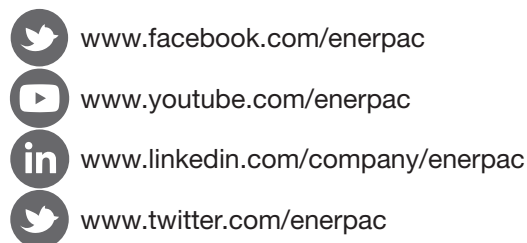


Manual Valve Models

⚠ WARNING Fully relieve hydraulic pressure, disconnect hydraulic hoses and unplug AC power cord from electrical outlet before beginning any inspection, maintenance or repair procedures. Failure to observe these precautions could result in death or serious personal injury. Appropriate shop safety procedures are to be followed during disassembly and reassembly to minimize any possibility of injury.

ABOUT US

Enerpac is a global market leader in high pressure hydraulic tools, controlled force products, portable machining, on-site services and solutions for precise positioning of heavy loads. As a leading innovator with over a 100 year legacy, Enerpac has helped move and maintain some of the largest structures on earth. When safety and precision matters, elite professionals in industries such as aerospace, infrastructure, manufacturing, mining, oil & gas and power generation rely on Enerpac for quality tools, services and solutions. For additional information, visit www.enerpac.com.

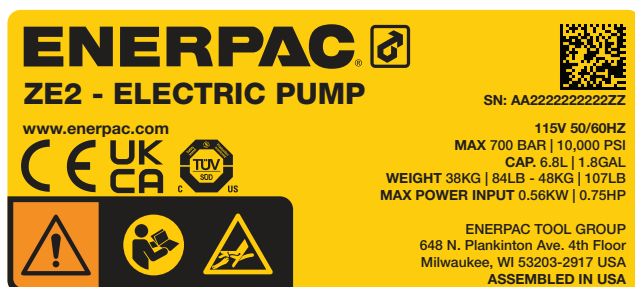


WARRANTY

Refer to the Enerpac Global Warranty document for terms and conditions of the product warranty. Such warranty information can be found at www.enerpac.com.

NAMEPLATE

Refer to the pump nameplate for the product model number, serial number and other applicable information.



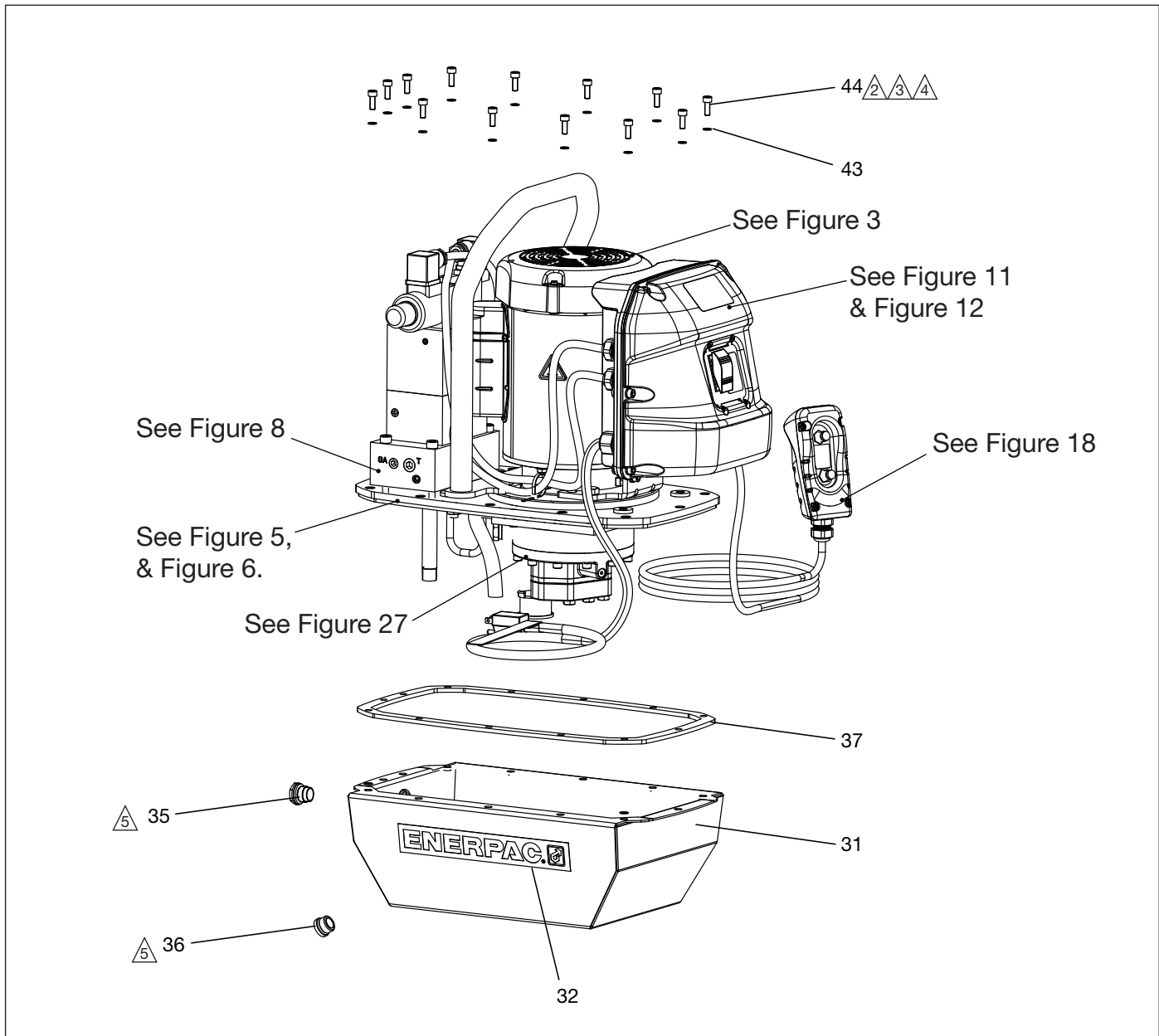
Note: Typical nameplates are shown above. Nameplate data will vary depending on pump model and configuration.

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Figure 1: Main Assembly - ZE and ZW Pumps with Electrical Enclosure



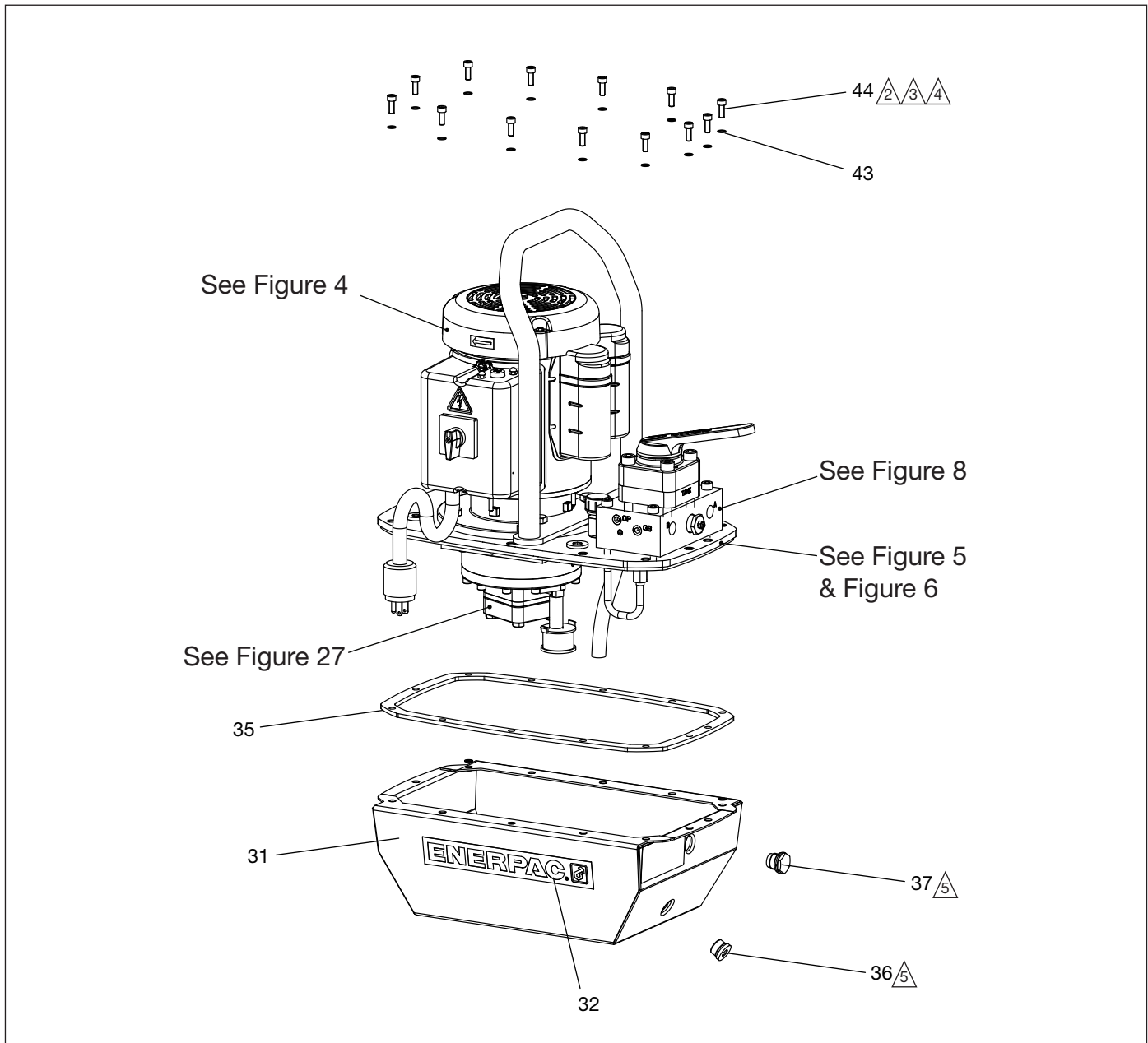
Notes:

- ② Apply Loctite #243 to threads.
- ③ Torque capscrews in a crossing pattern to ensure even sealing of gasket.
- ④ Torque to 60-75 in-lb [6.8 - 8.5 Nm].
- ⑤ Torque to 50-60 in-lb [5.6 - 6.8 Nm].

Parts List for Figure 1

Item	Description		Qty	Part Number
31	✱	Reservoir, 8L	1	DC9970025
32	◆	Decal, Reservoir	2	DD8977026
35	✱	Sight Glass	1	DC85900SR
36	✱	Oil Drain Plug, SAE #8 Magnet	1	DC8249006
37	✱	Reservoir Gasket	1	DC9551920
43		Copper Gasket	13	S3037
44		Socket Head Cap Screw, M8 x 12	13	CBE619028-1A
✱ Items included in Reservoir Kit, DC8136025SR.				
◆ Items included in Decal Kit, ZEDK.				

Figure 2: Main Assembly - ZE and ZW Series Pumps with Rotary Switch



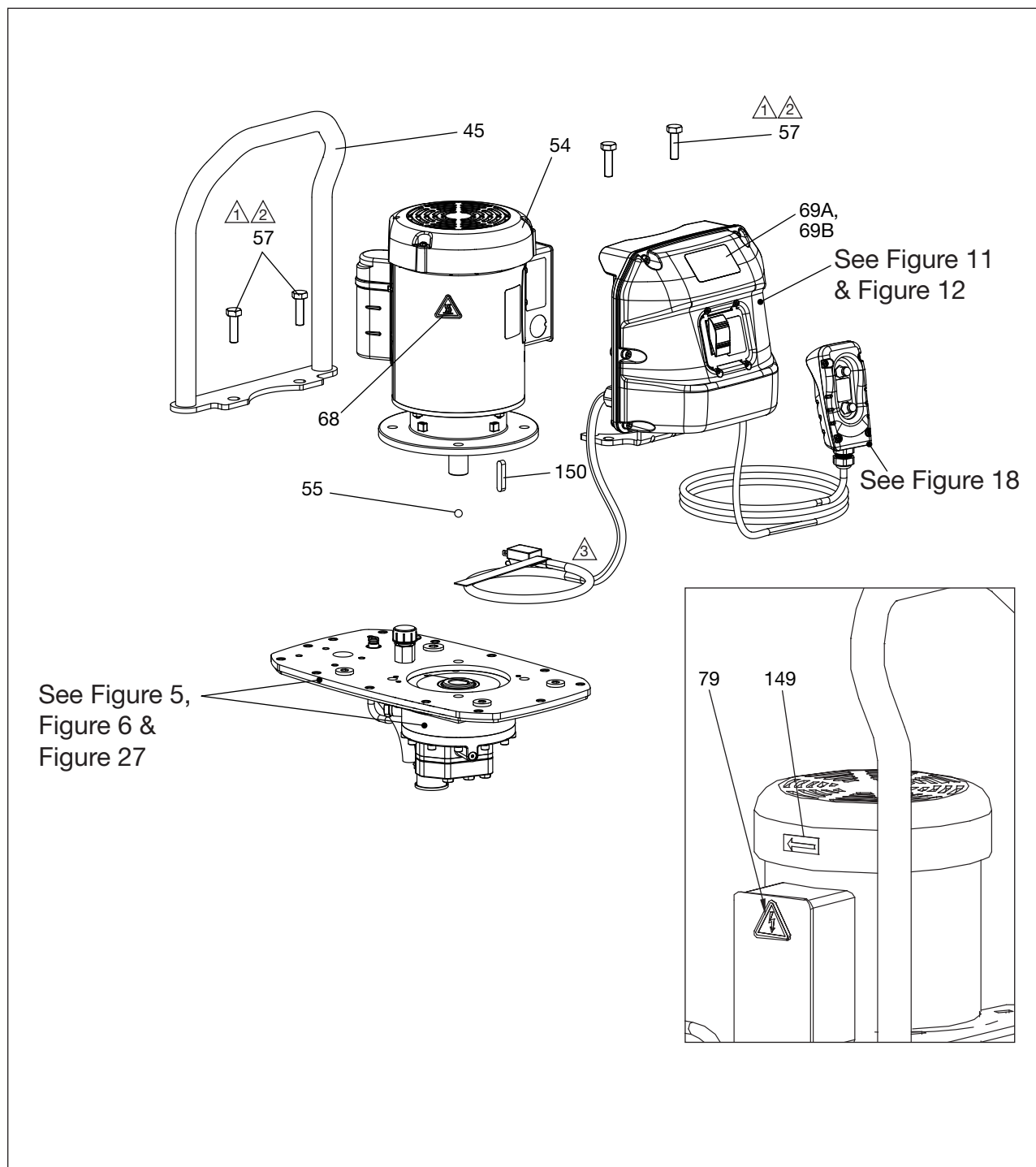
Notes:

-  Apply Loctite #243 to threads.
-  Torque capscrews in a crossing pattern to ensure even sealing of gasket.
-  Torque to 60-75 in-lb [6.8 - 8.5 Nm].
-  Torque to 50-60 in-lb [5.6 - 6.8 Nm].

Parts List for Figure 2

Item		Description	Qty	Part Number
31	✱	Reservoir, 8L	1	DC9970025
32	◆	Decal, Reservoir	2	DC8977026
35	✱	Sight Glass	1	DC85900SR
36	✱	Oil Drain Plug, SAE #8 Magnet	1	DC8249006
37	✱	Reservoir Gasket	1	DC9551920
43		Copper Gasket	13	S3037
44		Socket Head Cap Screw, M8 x 12	13	CBE619028-1A
✱ Items included in Reservoir Kit, DC8136025SR.				
◆ Items included in Decal Kit, ZEDK.				

Figure 3: Pump Components, Models with Electrical Enclosure



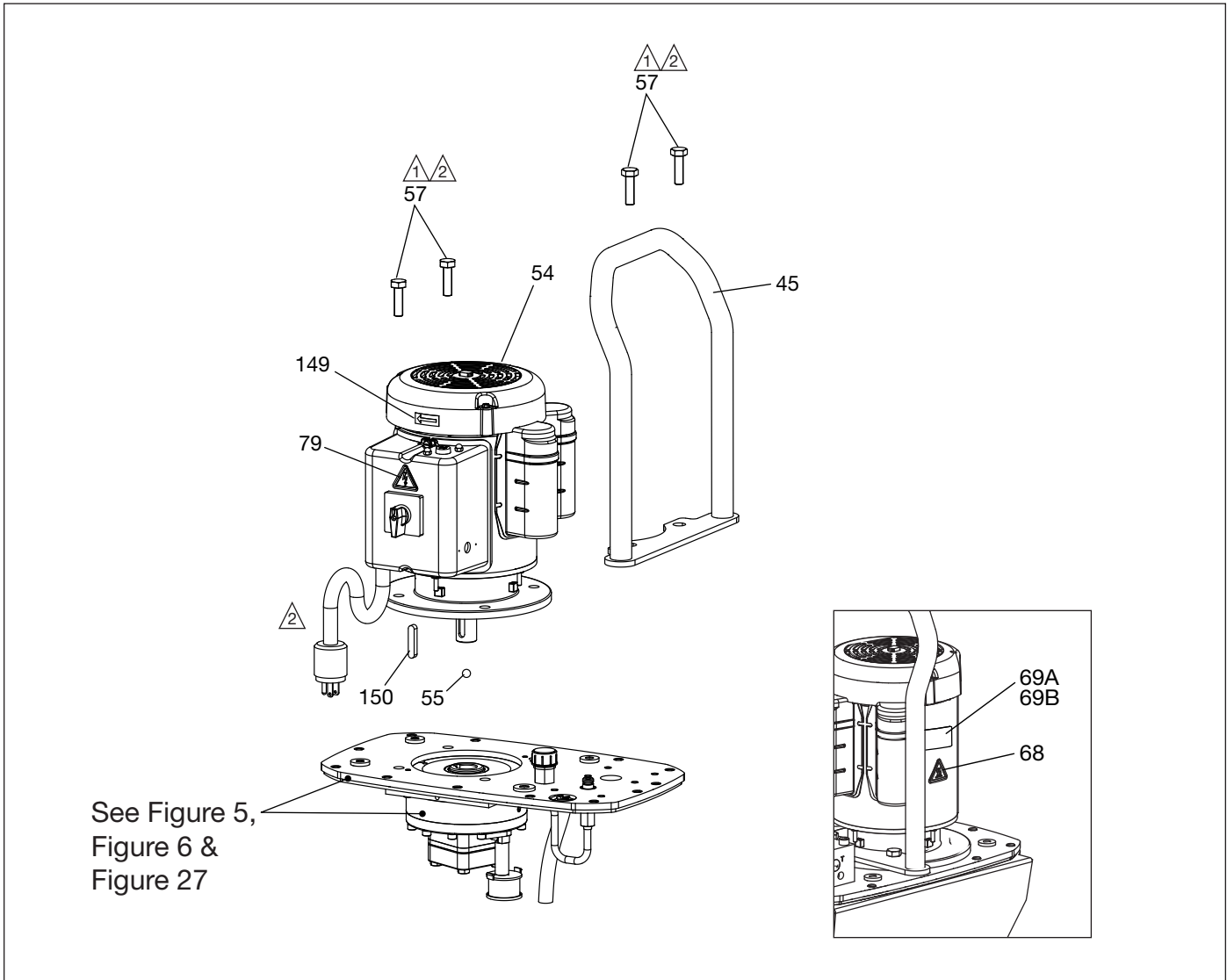
Notes:

- ① Torque to 20-25 ft-lb [27.1 - 33.9 Nm].
- ② Apply Loctite #243 to threads.
- ③ Power cord not included with motor (item 54) and must be ordered separately. See Figure 19 for power cord part numbers.

Parts List for Figure 3

Item		Description	Qty	Part Number
45		Carrying Handle	1	DC9467070
46		Strap, Velcro	1	DA7570217
54	⊙	Motor, Electric, 115/230V (no switch)	1	DD8676259
55		Rubber Ball, 3/8" Dia, 70 Duro	1	44968E
57		Motor Mounting Bolt	4	CBE1025046-1B
68	◆	Decal, Hot Surface	1	DC9921026
69A	◆	Decal, ZE2 Class	1	DD8966026
69B	◆	Decal, ZW2 Class	1	DD8967026
79	◆	Decal, High Voltage	1	DC9922026
149	◆	Decal, Clockwise Rotation	1	CJ193026
150	⊙	Motor Key, Hardened	1	DD4308251
⊙ Items included in Motor Kit, DD8676259SR.				
◆ Items included in Decal Kit, ZEDK.				

Figure 4: Pump Components, Models with Rotary Switch



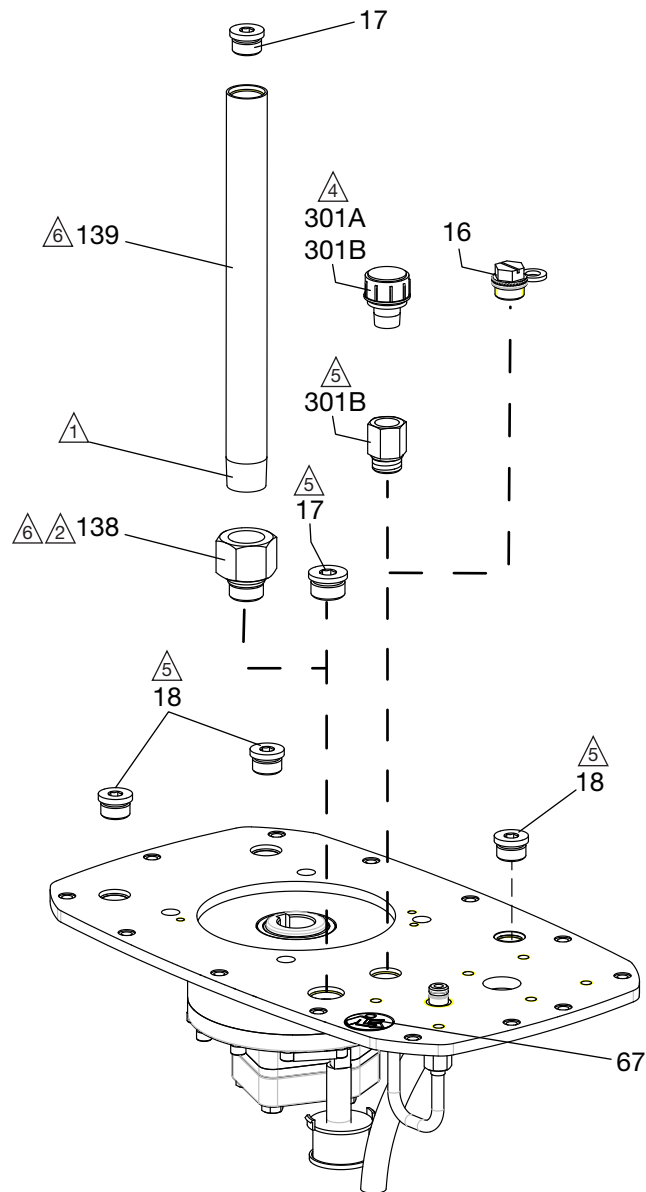
Notes:

- ⚠ Torque to 20-25 ft-lb [27.1 - 33.9 Nm].
- ② Apply Loctite #243 to threads.
- ③ Power cord not included with motor (item 54) and must be ordered separately. See Figure 19 for power cord part numbers.

Parts List for Figure 4

Item		Description	Qty	Part Number
16		Plug, Shipping	1	DD6321271
45		Carrying Handle	1	DC9467070
54	●	Motor, Electric, 115V/230V (w/rotary switch)	1	DD8701259
55		Rubber Ball, 3/8" Dia, 70 Duro	1	44968E
57		Motor Mounting Bolt	4	CBE1025046-1B
68	◆	Decal, Hot Surface	1	DC9921026
69	◆	Decal, ZE2 Class	1	DD8966026
	◆	Decal, ZW2 Class	1	DD8967026
79	◆	Decal, High Voltage	1	DC9922026
149	◆	CJ193026	1	Decal, Clockwise Rotation
150	●	DD4308251	1	Motor Key, Hardened
● Items included in Motor Kit, DD8701259SR.				
◆ Items included in Decal Kit, ZEDK.				

Figure 5: Coverplate and Pump Element Assembly, View A



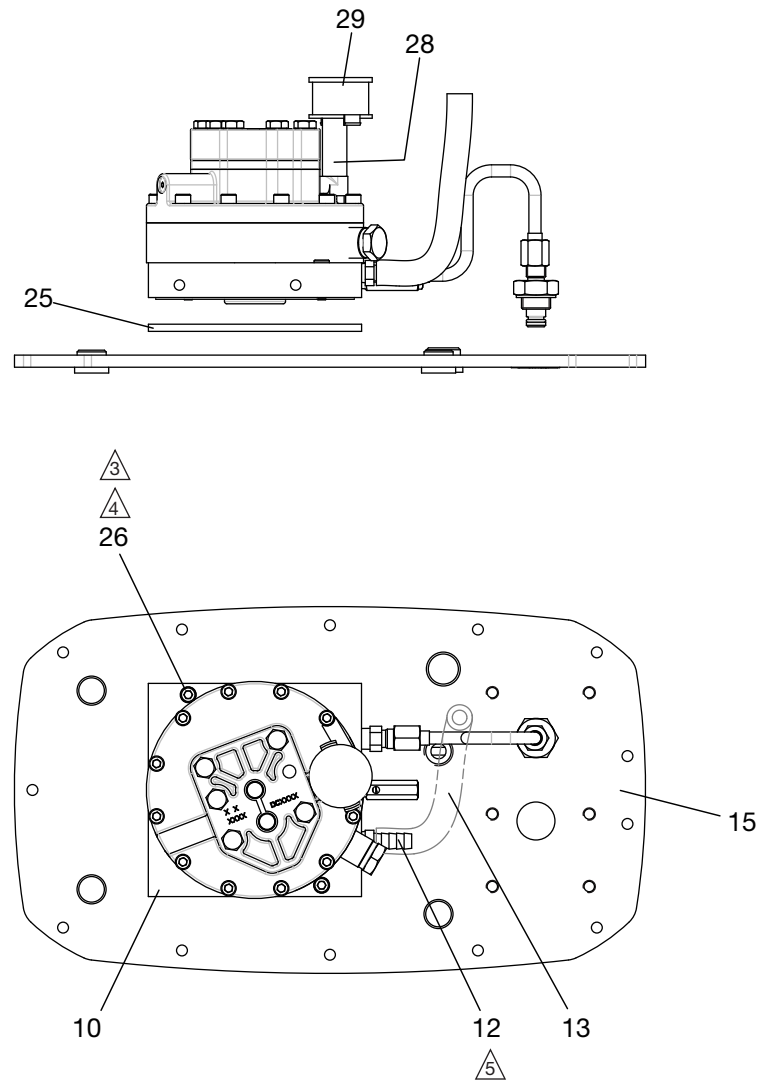
Notes:

- ① Apply Loctite 592 to threads.
- ② Hand tighten assembly. Then, torque to 30-35 ft-lb [41-47 Nm].
- ③ Loosen from assembly. Then, torque to 27-32 in-lb [3.0-3.5 Nm].
- ④ Torque to 5-7 in-lb [0.5-0.8 Nm].
- ⑤ Torque to 15-18 ft-lb [20-24 Nm].
- ⑥ Used only on ZW Series pumps.

Parts List for Figure 5

Item		Description	Qty	Part Number
16		Plug, Shipping	1	DD6321271
17		Plug, SAE #10	1	B1007006
18		Plug, Socket, SAE #8	3	B1006006
67	◆	Decal, Read Instructions	1	DC9920026
138		Adapter, SAE #10 M to 3/4 NPTF	1	DC9956038
139		Fill Pipe (extension)	1	DC9955268
301A		Breather Assembly (Standard)	1	DC825006
301B		Breather Assembly (Europe)	1	DC9558920
301C		Fitting, Adapter	1	F100096-38
◆ Items included in Decal Kit, ZEDK.				

Figure 6: Coverplate and Pump Element Assembly, View B



Notes:

△³ Apply Loctite #243 to threads.

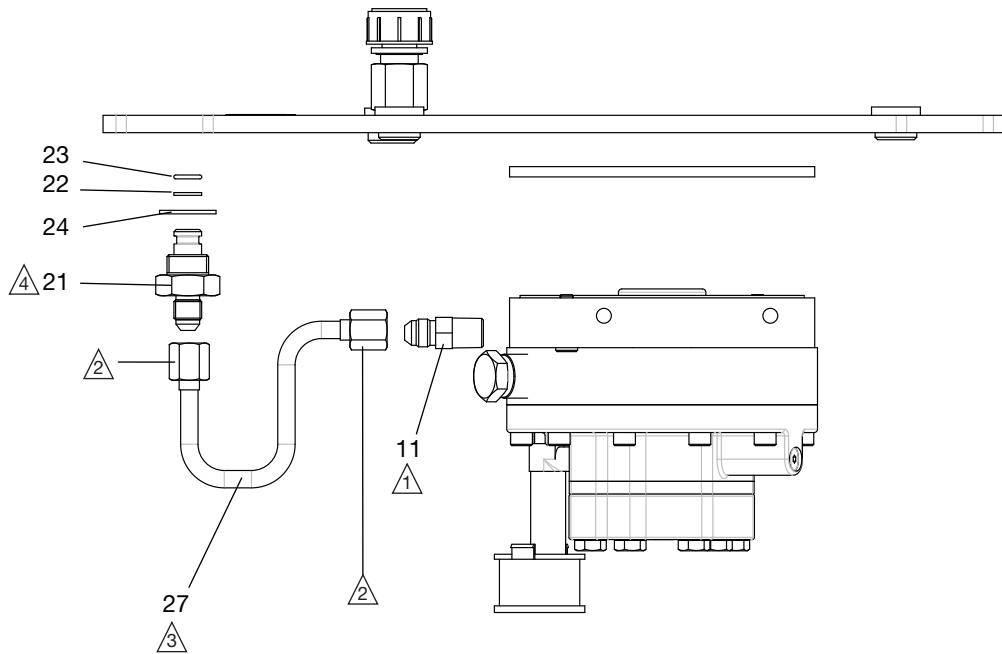
△⁴ Torque to 72-84 in-lb [8.1 - 9.5 Nm].

△⁵ Torque to 15-18 in-lb [8.1 - 9.5 Nm].

Parts List for Figure 6

Item	Description		Qty	Part Number
10		Pump Element	1	(See Figure 27 through Figure 33)
12		Fitting	1	F100097-16
13		Hose, Bypass 8 inch	1	DC9335646
15		Cover Plate, ZE	1	DC9451101-P01
25		Pump Gasket	1	DC9551920
26		SHCS, M6 x 20	2	CBE621028-1A
28		Tube, Intake	1	DC9600268
29		Filter, Intake	1	DC9178118
Item included in Pump Element Service Kit, DD8711900SR.				
Item included in Pump Element Service Kit, DD8869900SR.				
Item included in Pump Element Service Kit, DD8982900SR.				

Figure 7: Oil Pressure Tube Assembly



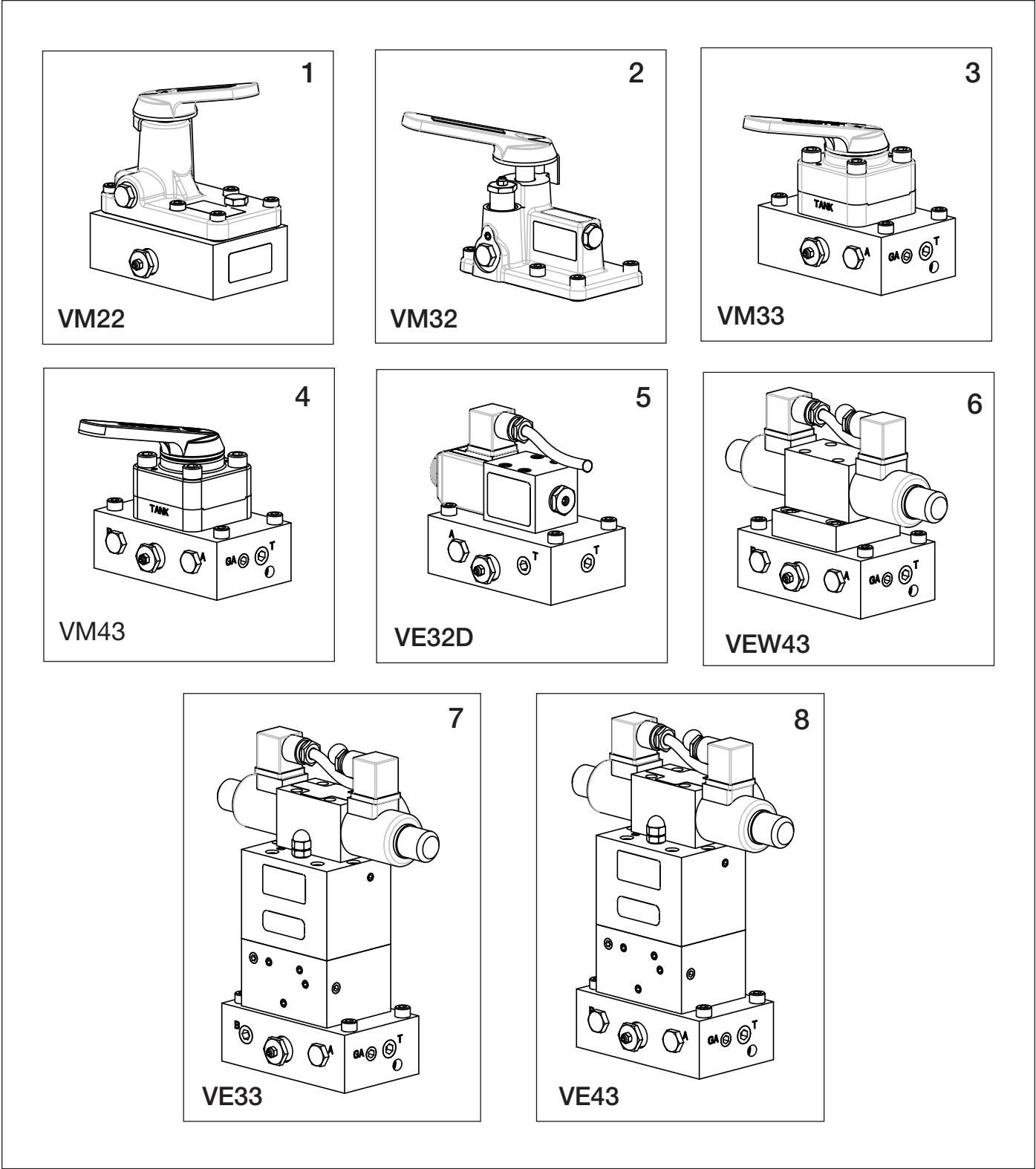
Notes:

- ① Torque to 32-39 in-lb [43 - 53 Nm].
- ② Torque to 20-22 in-lb [27 - 30 Nm].
- ③ Adjust bend on tubing as needed to align item 27.
- ④ Torque to 45-47 in-lb [61 - 64 Nm].

Parts List for Figure 7

Item	Description		Qty	Part Number
11		Connector, Flare	1	F100094-246
21		Connector, Tube/Fitting	1	DC9173690
22		Back Up, 0.375	1	B1012566
23		O-Ring, Round, 0.375	1	B1012803
24		Gasket, Copper	1	DC9271167
27		Tube Assembly, Steel	1	DC9663920

Figure 8: Control Valve Model Identification

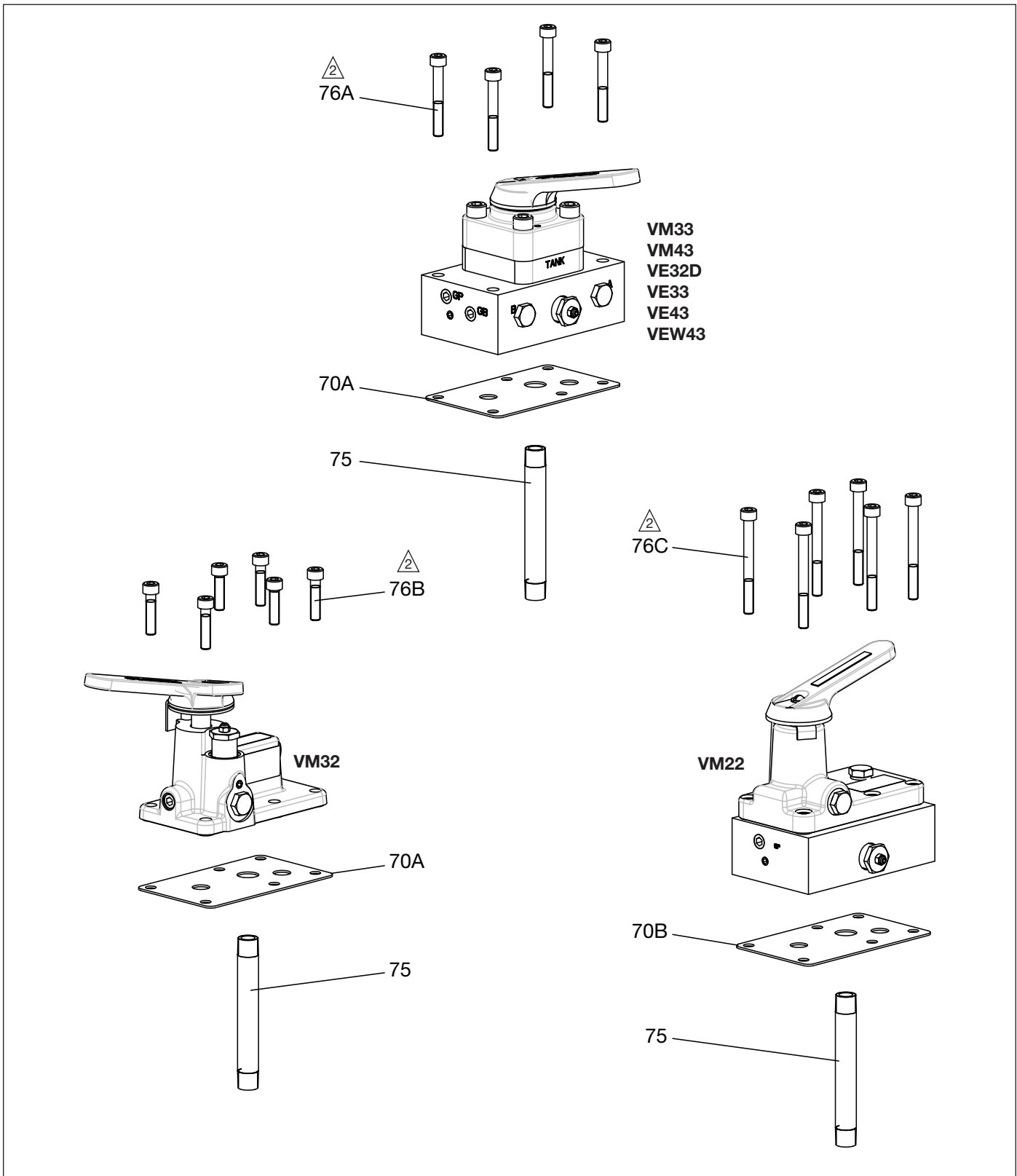


List of Control Valve Models - Figure 8

Item	Valve Model	Qty	Description
1	VM22	1	3-way, 2-position Manual Valve
2	VM32	1	3-way, 2-position Manual Valve
3	VM33	1	3-way, 3-position Tandem Center Manual Valve
4	VM43	1	4-way, 3-position Tandem Center Manual Valve
5	VE32D	1	3-way, 2-position Dump Valve
6	VEW43	1	3-way, 3-position Open Center Electric Solenoid Valve
7	VE33	1	4-way, 3-position Tandem Center Electric Solenoid Valve
8	VE43	2	4-way, 3-position Tandem Center Electric Solenoid Valve

Note: Refer to separate Enerpac repair parts manuals for control valve parts information.

Figure 9: Valve Gasket and Oil Drain Tube



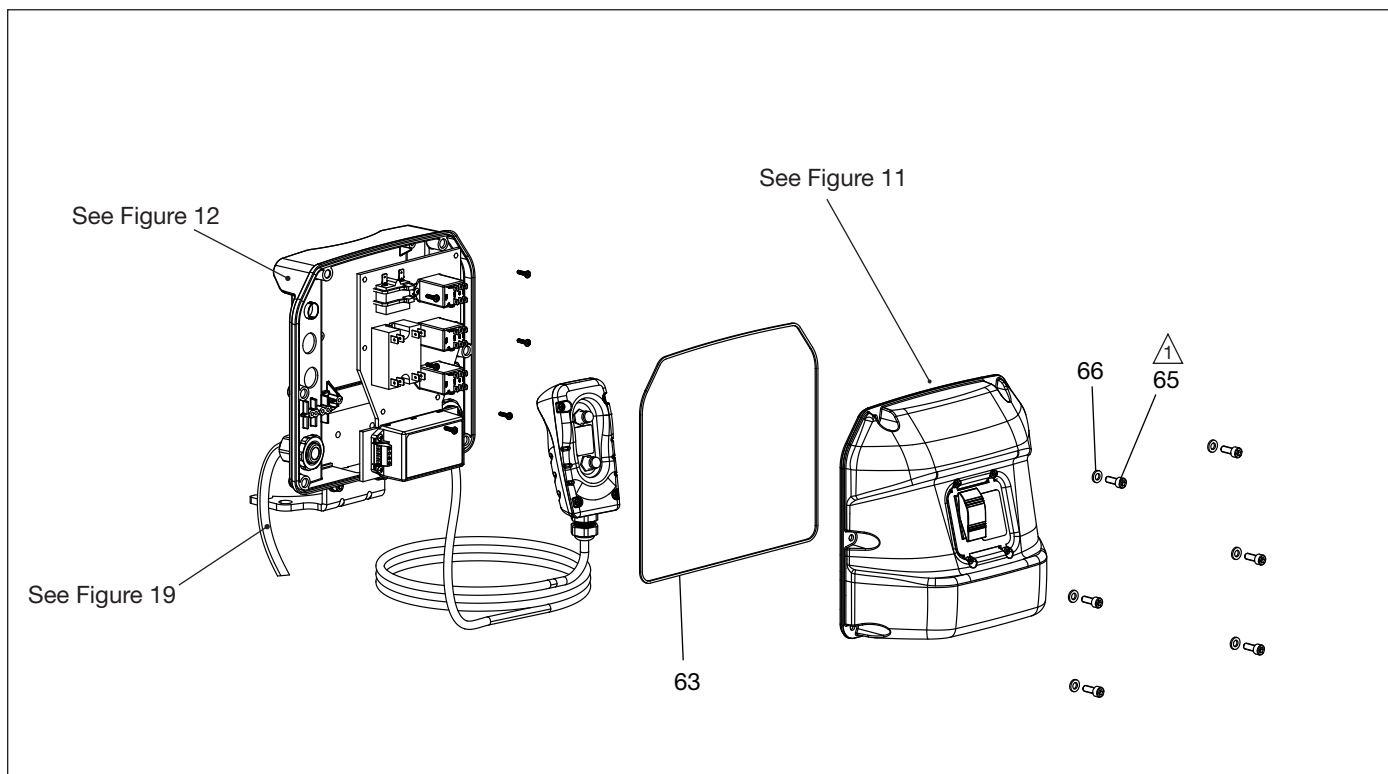
Notes:

△ Torque to 14-16 ft-lb [18.9 - 21.7 Nm].

Parts List for Figure 9

Item	Description		Qty	Part Number
70A		Valve Gasket	1	F786167
70B		Valve Gasket	1	DC9356037
75		Oil Return Tube	1	DC2749768
76A		SHCS M8 x 60	4	CBE837028-1A
76B		SHCS M8 x 30	6	CBE825028-1A
76C		SHCS M8 x 80	6	CBE843028-1A

Figure 10: Electrical Control Enclosure, Gasket and Hardware



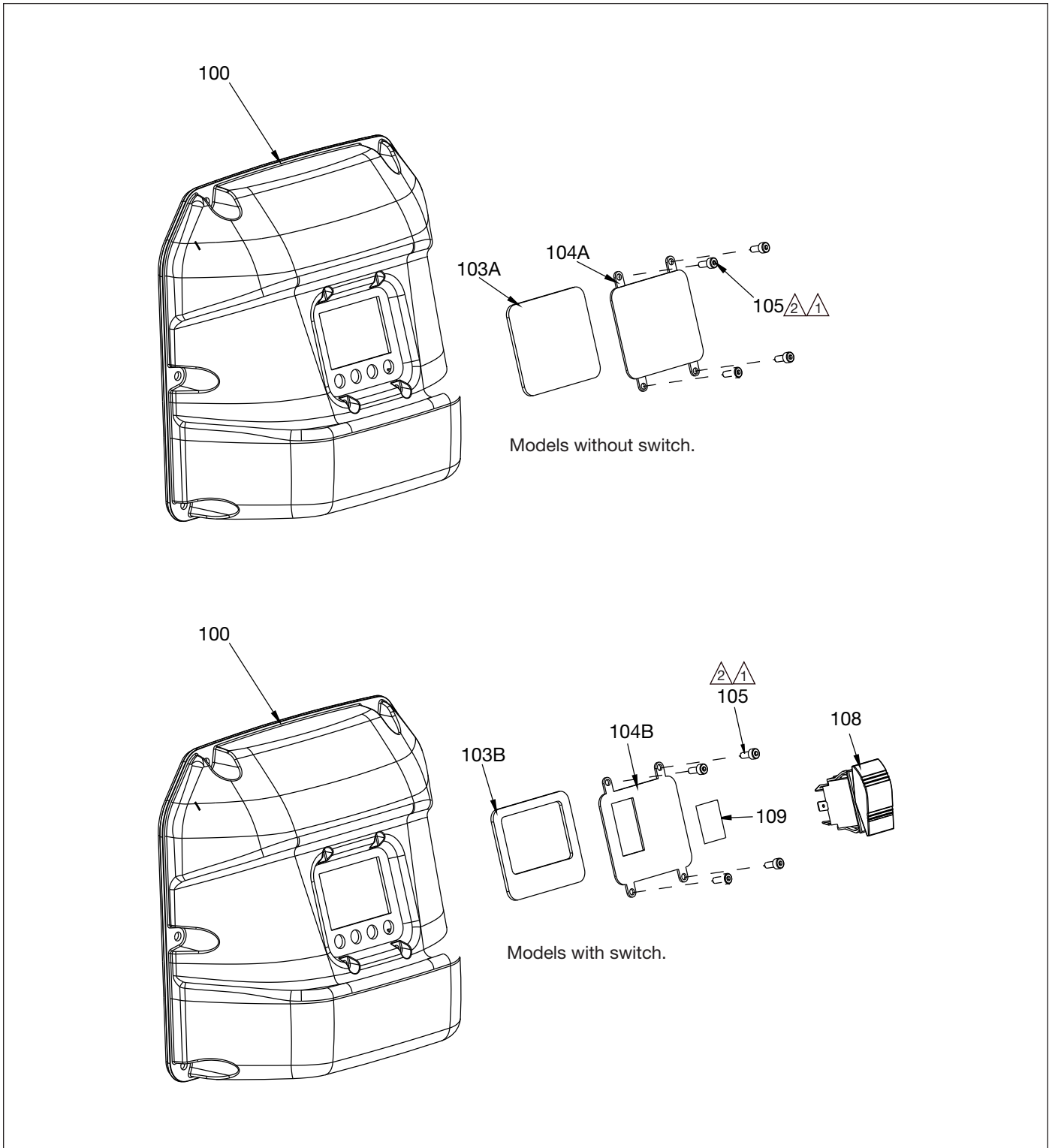
Notes:

 Torque to 4.0-4.5 in-lb [0.4 - 0.5 Nm].

Parts List for Figure 10

Item	Description		Qty	Part Number
63		Gasket	1	DC9936076
65		SHCS, M6 x 1 x 10	6	CBE615028-1A
66		Washer, 6 mm	6	DC9686900

Figure 11: Electrical Control Enclosure, Front



Notes:

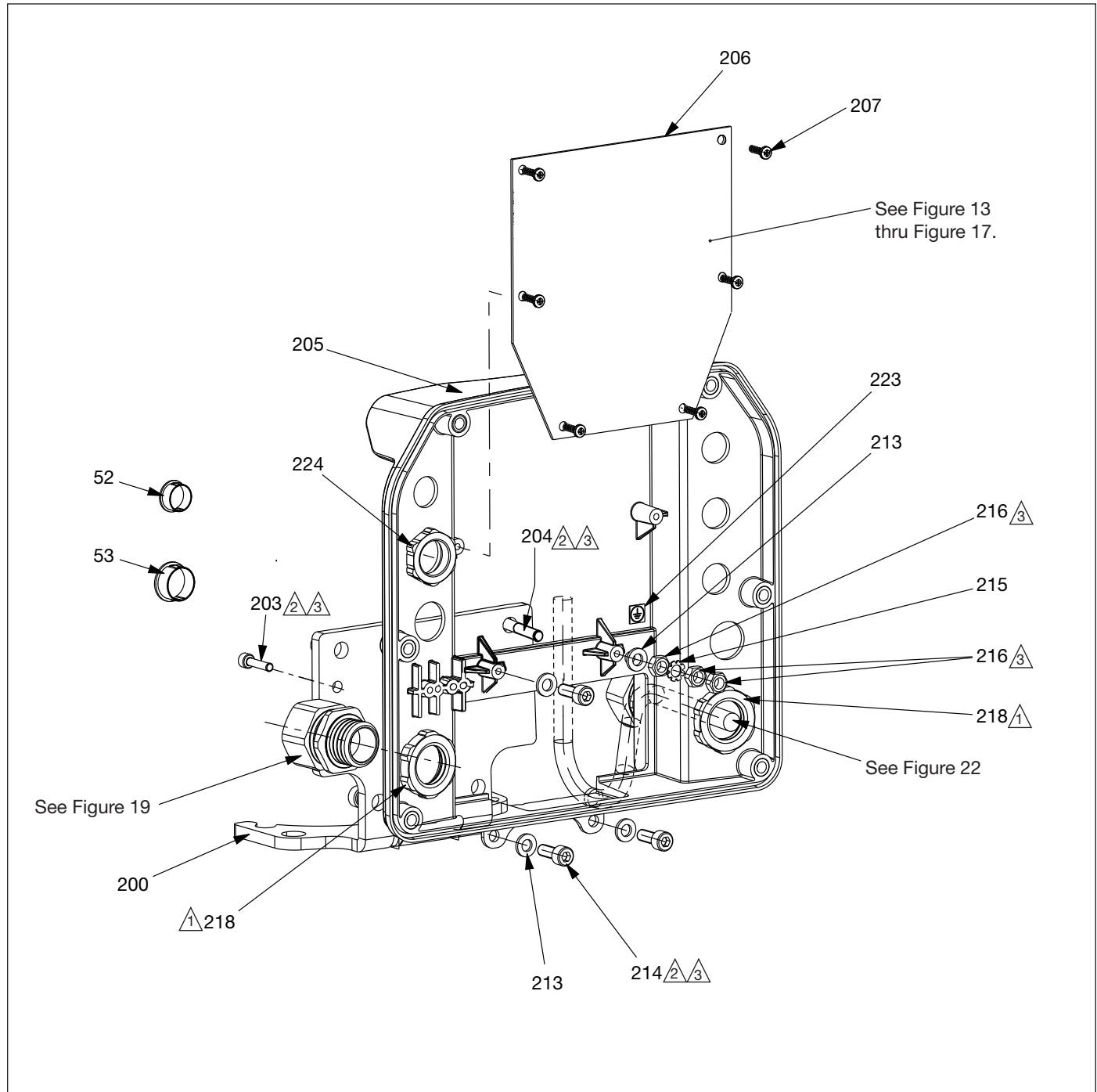
⚠ Apply Loctite 243 to threads.

⚡ Torque to 4.0-4.5 in-lb [0.4 - 0.5 Nm].

Parts List for Figure 11

Item	Description		Qty	Part Number
100		Enclosure Assembly, Front	1	DD8932424
103A		Gasket	1	DC8241037
103B		Gasket	1	DD8395037
104A		Overlay	1	DC8240026
104B		Plate, Switch Mount	1	DD8367101
105		Screws	4	CBE415028-1A
108		Switch, Rocker	1	E150002
109		Decal, Switch	1	DD8927026

Figure 12: Electrical Control Enclosure, Rear



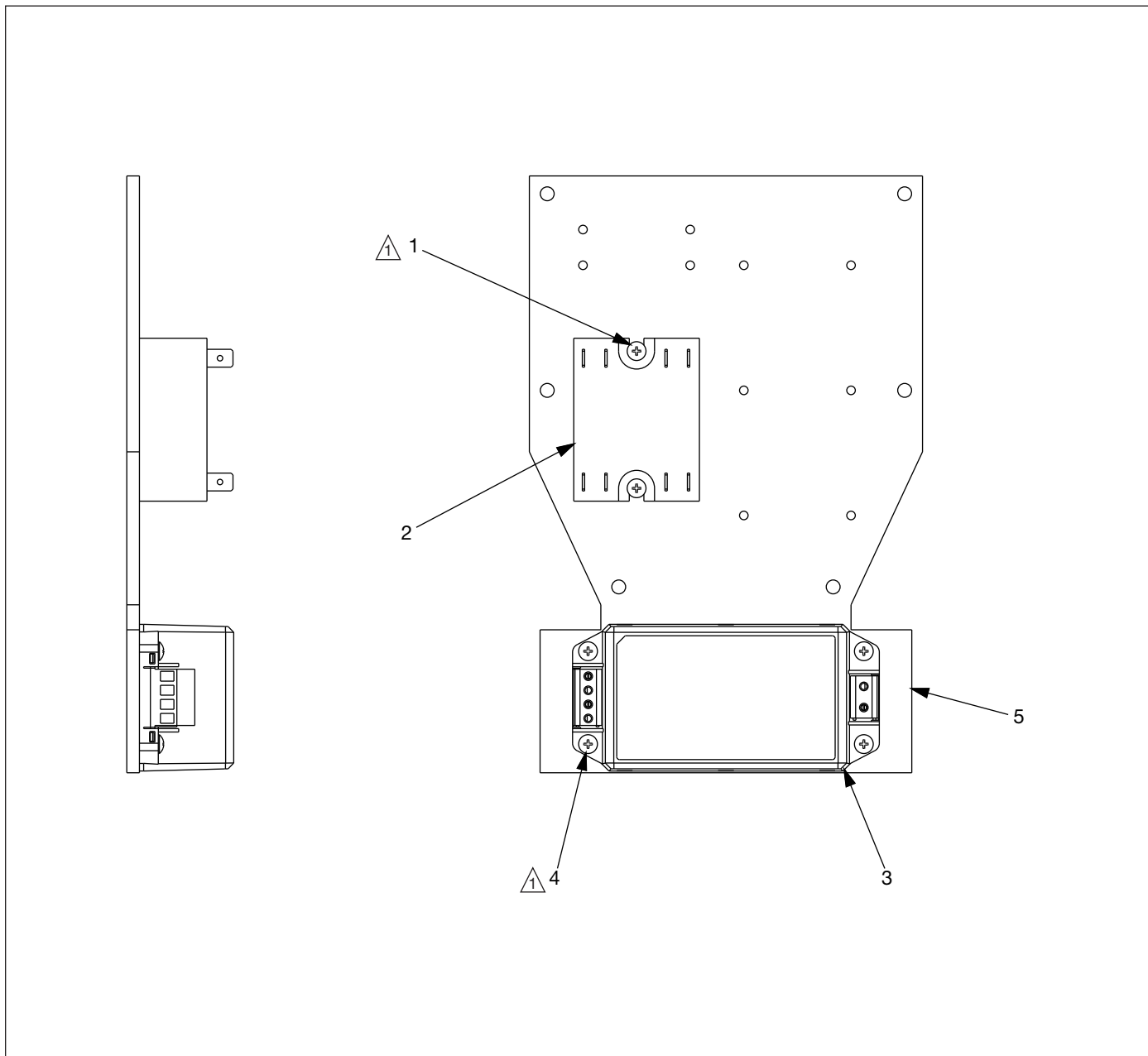
Notes:

- ① Torque to 63-69 in-lb [7.1-7.8 Nm].
- ② Apply Loctite 243 to threads.
- ③ Torque to 18-26 in-lb [2.0-2.9 Nm].

Parts List for Figure 12

Item	Description		Qty	Part Number
52		Dome Plug, 16 mm	A/R	DC9436009
53		Dome Plug, 20 mm	A/R	DC9437009
200		Bracket	1	DC9670101
203		SHCS, M4 x 0.7 x 16	2	CBE419028-1A
204		SHCS, M6 x 1 x 40	1	DC9936076
205		Front Enclosure Assembly	1	(See Figure 11)
206		Electrical Control Board	1	(See Figure 13 through Figure 17)
207		Screw Hi-Lo #8 x 1/2	6	DC9428008
213		Flat Washer, 6 mm	4	CAE1060108-1A
214		SHCS, M6 x 1 x 16	3	CBE619028-1A
215		6 mm Star Washer	1	CCE1060108-6A
216		Nut, 6 mm	3	CBE1060120-1D
218		Locking Nut, 25 mm	2	DC9683021
223		Decal, Ground	1	DC8119026
224		Locking Nut, 20 mm	A/R	DC9538021
A/R - As Required.				

Figure 13: Electrical Control Board, ZE2 & ZW2 Jog Pumps



Notes:

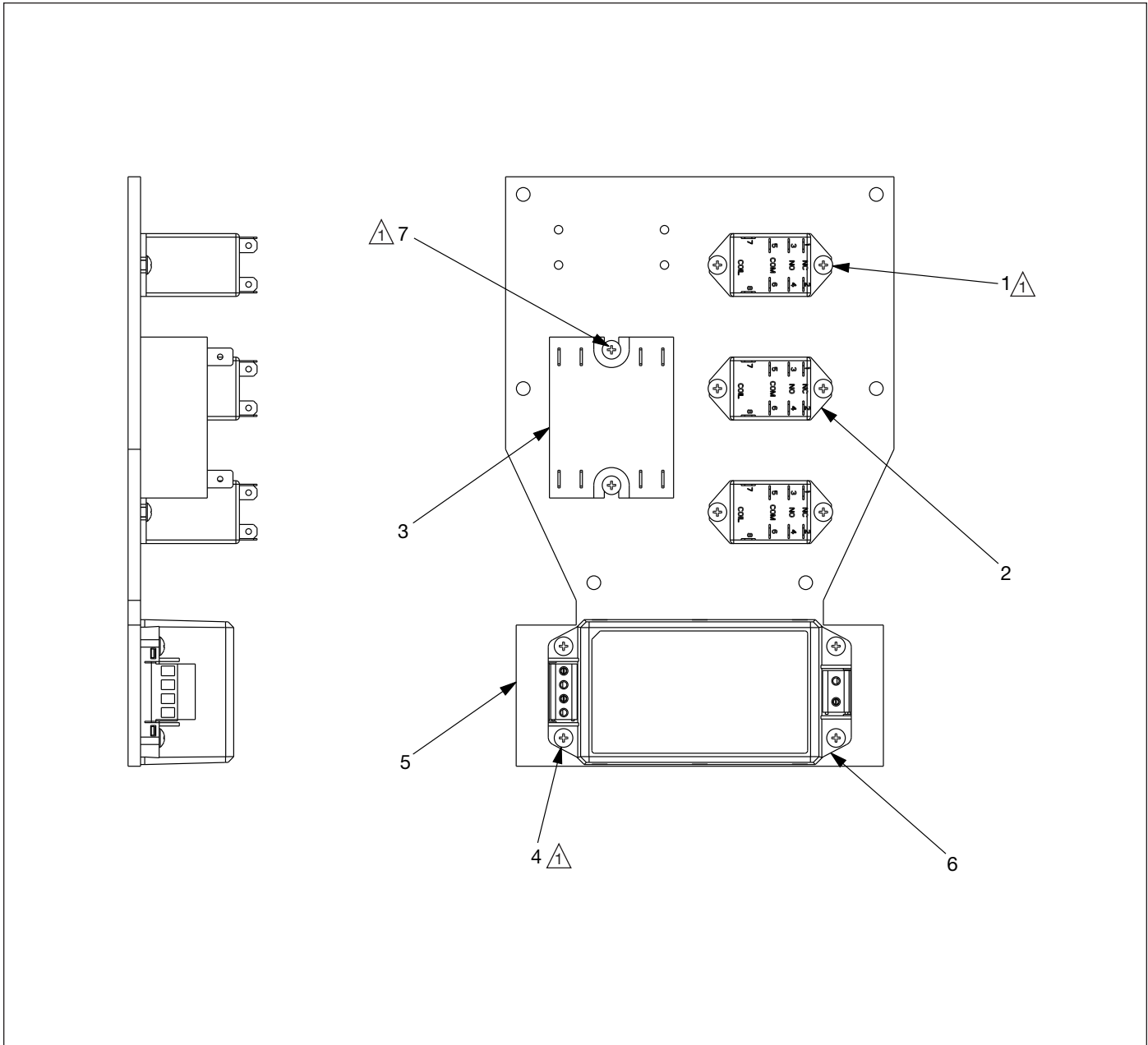
See Figure 36 for electrical schematic.

 Torque to 4-4.5 in-lb [0.4-0.5 Nm].

Parts List for Figure 13

Item	Description		Qty	Part Number
1	◆	Screw, Self Tapping, #6-32 x 0.31	2	- - -
2	◆	Relay, Solid State Dual Pole	1	DD5285389
3	◆	Power Module, AC/DC 60W, 2.5A	1	DD8745380
4	◆	Screw, Self Tapping, #6-32 x 0.5	4	- - -
5	◆	Bracket	1	- - -
◆ Included in Classic Electronics Board - Jog Service Kit, DD8878900SR.				

Figure 14: Electrical Control Board, ZE2 Solenoid Pumps



Notes:

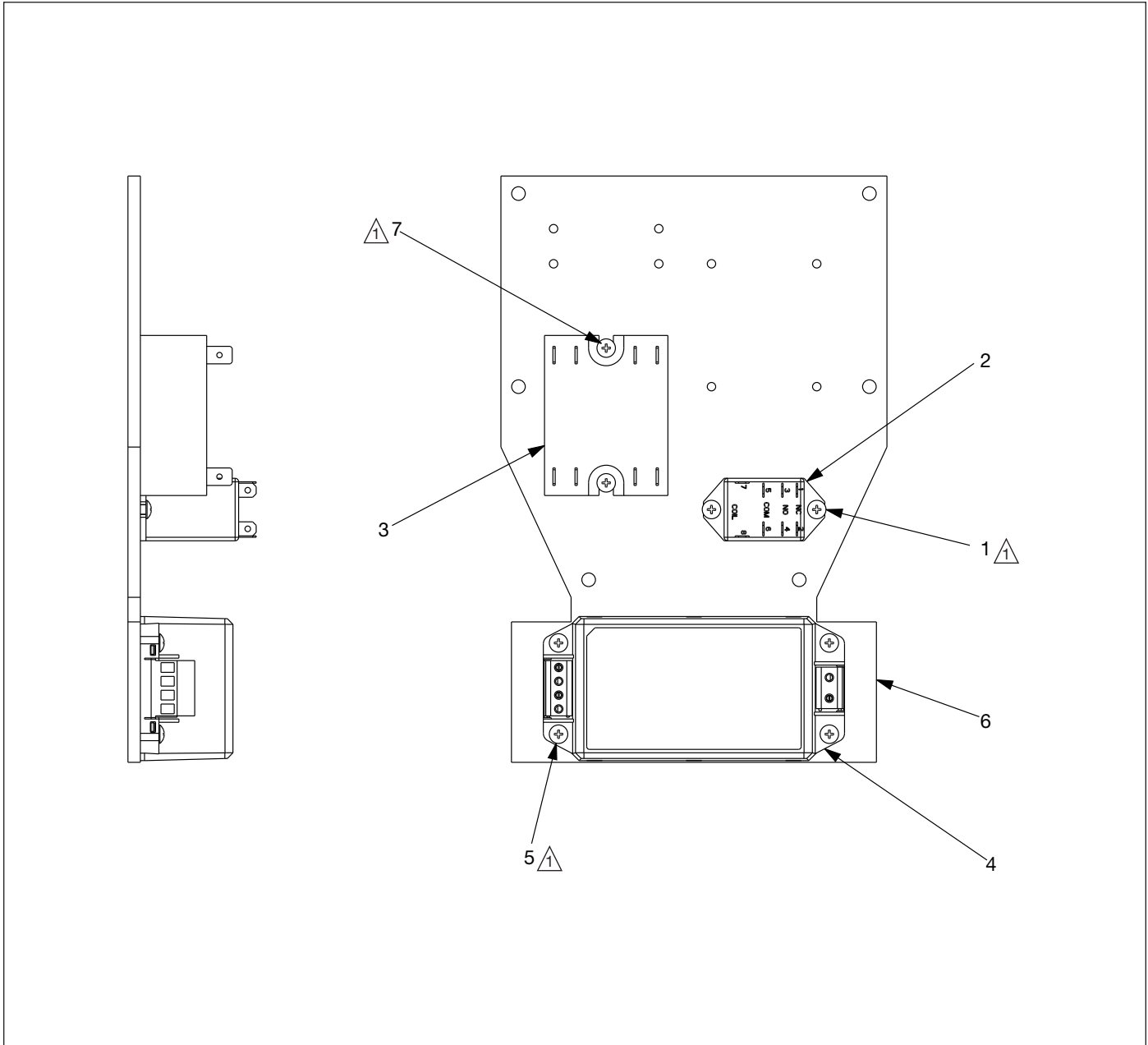
See Figure 37 for electrical schematic.

 Torque to 4-4.5 in-lb [0.4-0.5 Nm].

Parts List for Figure 14

Item	Description		Qty	Part Number
1		Screw, Self Tapping	6	DA3639028
2		Relay, LY2F 24VDC Coil, 14A DPDT	3	DD1342980
3		Relay, Solid State Dual Pole	1	DD5285389
4		Screw, Self Tapping, #6-32 x 0.5	4	- - -
5		Bracket	1	- - -
6		Power Module, AC/DC 60W, 2.5A	1	DD8745380
7		Screw, Self Tapping, #6-32 x 0.31	2	- - -
Included in Classic Electronics Board - VE43 Service Kit, DD8744900SR.				

Figure 15: Electrical Control Board, ZE2 & ZW2 Dump Pumps



Notes:

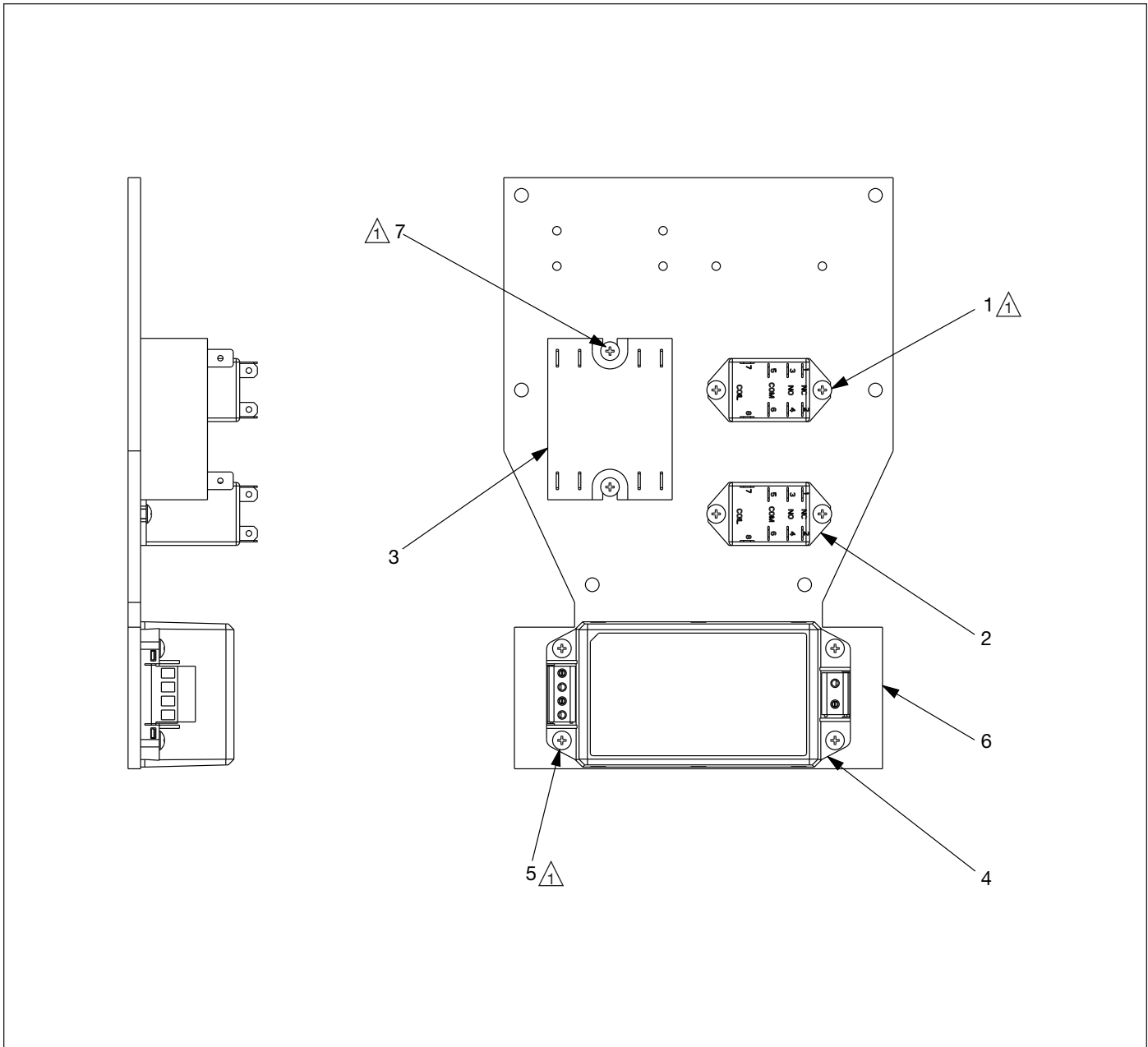
See Figure 38 for electrical schematic.

⚠ Torque to 4-4.5 in-lb [0.4-0.5 Nm].

Parts List for Figure 15

Item		Description	Qty	Part Number
1	■	Screw, Self Tapping	2	DA3639028
2	■	Relay, LY2F 24VDC Coil, 14A DPDT	3	DD1342980
3	■	Relay, Solid State Dual Pole	1	DD5285380
4	■	Power Module, AC/DC 60W, 2.5A	1	DD8745380
5	■	Screw, Self Tapping, #6-32 x 0.5	4	- - -
6	■	Bracket	1	- - -
7	■	Screw, Self Tapping, #6-32 x 0.31	2	- - -
■ Included in Classic Electronics Board - Dump Service Kit, DD8877900SR.				

Figure 16: Electrical Control Board, ZW2 Solenoid Pumps



Notes:

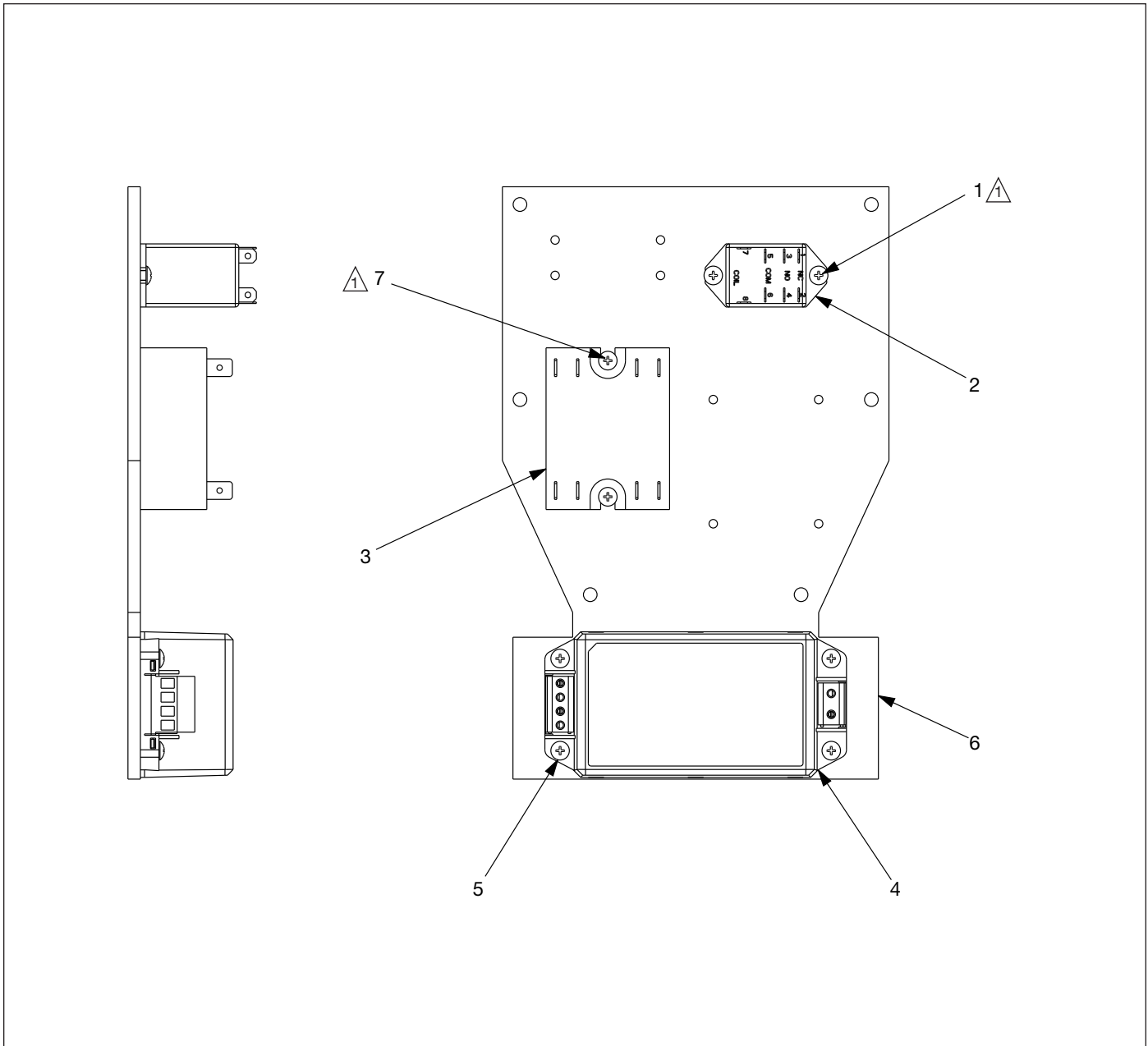
See Figure 39 for electrical schematic.

⚠ Torque to 4-4.5 in-lb [0.4-0.5 Nm].

Parts List for Figure 16

Item		Description	Qty	Part Number
1	☛	Screw, Self Tapping	4	DA3639028
2	☛	Relay, LY2F 24VDC Coil, 14A DPDT	2	DD1342980
3	☛	Relay, Solid State Dual Pole	1	DD5285380
4	☛	Power Module, AC/DC 60W, 2.5A	1	DD8745380
5	☛	Screw, Self Tapping #6-32 x 0.5	4	- - -
6	☛	Bracket	1	- - -
7	☛	Screw, Self Tapping, #6-32 x 0.31	2	- - -
☛ Included in Classic Electronics Board - VEW43 Service Kit, DD8884900SR.				

Figure 17: Electrical Control Board, Pumps with Pressure Switch



Notes:

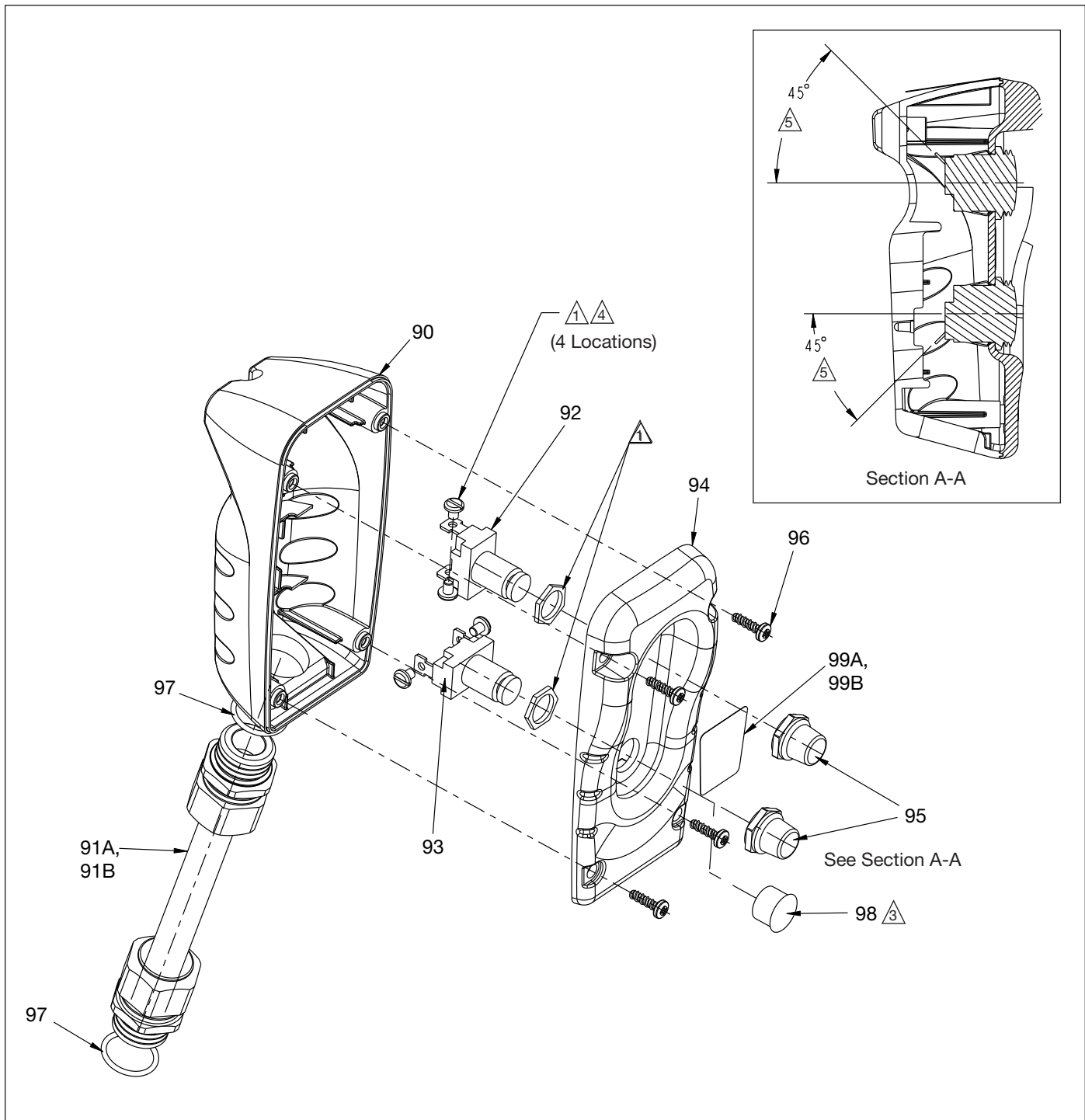
See Figure 40 for electrical schematic.

⚠ Torque to 4-4.5 in-lb [0.4-0.5 Nm].

Parts List for Figure 17

Item		Description	Qty	Part Number
1	■	Screw, Self Tapping	4	DA3639028
2	■	Relay, LY2F 24VDC Coil, 14A DPDT	1	DD1342980
3	■	Relay, Solid State Dual Pole	1	DD5285380
4	■	Power Module, AC/DC 60W, 2.5A	1	DD8745380
5		Screw, Self Tapping, #6-32 x 0.5	4	- - -
6		Bracket	1	- - -
7	■	Screw, Self Tapping, #6-32 x 0.31	2	- - -
■ Included in Classic Electronics Board, Pressure Switch Kit, DD8916900SR.				

Figure 18: Pendant and Cable Assembly



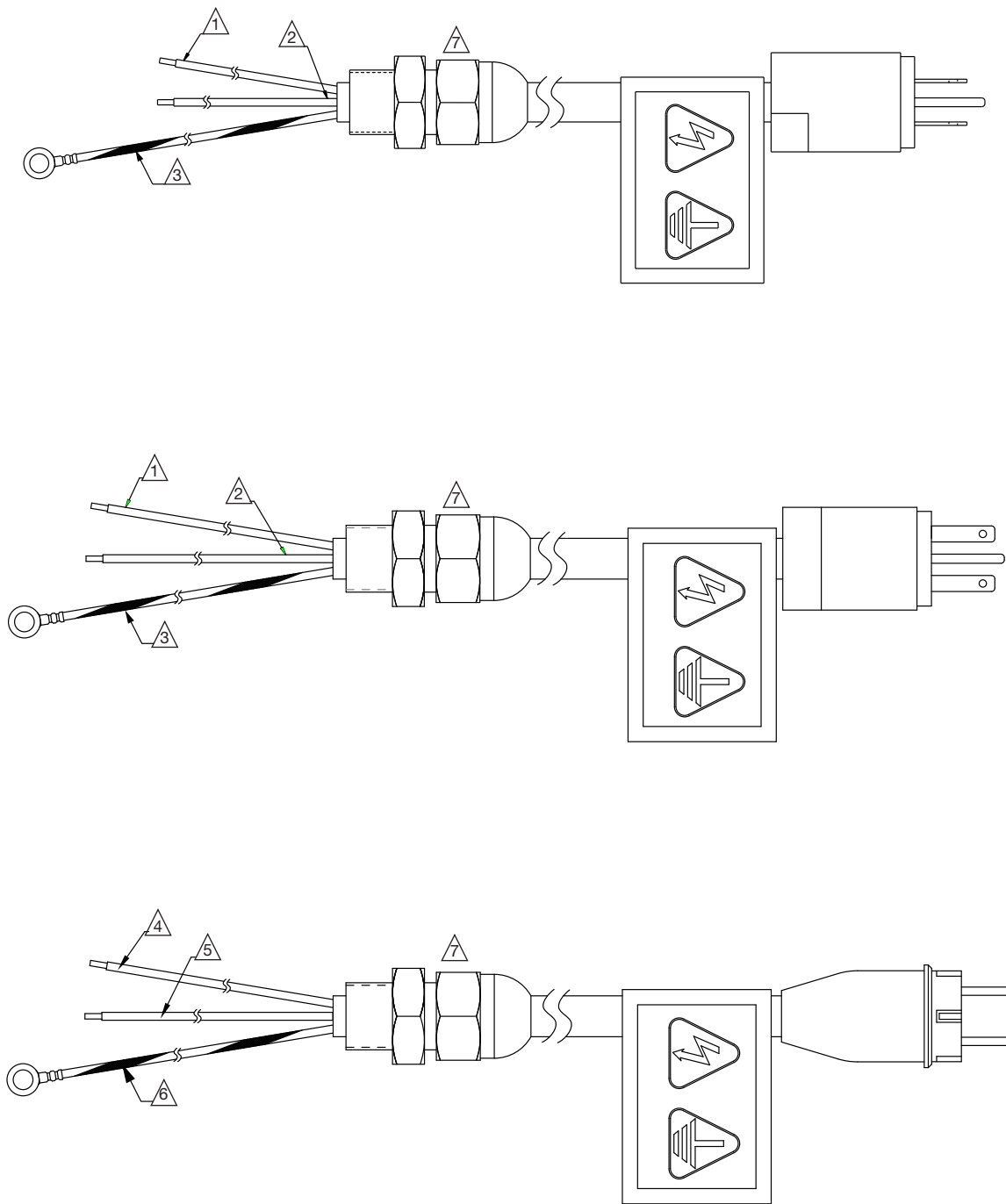
Notes:

- ① Included with switch.
- ③ Used only on 1 button pendant.
- ④ Torque to 5.0-5.5 in-lb [0.56 - 0.62 Nm].
- ⑤ Bend tab on switch 45 degrees.

Parts List for Figure 18

Item	Description		Qty	Part Numbers		
				1 Button Pendant	2 Button Pendant ZE2 (VE33/VE43)	2 Button Pendant ZW2 (VEW43)
90		Pendant Housing, Upper	1	DC8122424	DC8122424	DC8122424
91A		Cable Assembly, ZE2, 1 Button	1	DD8848960	- - -	- - -
91B		Cable Assembly, ZE2, 2 Button	1	- - -	DD8782960	- - -
91C		Cable Assembly, ZW2, 2 Button		- - -	- - -	DD8956960
92		Switch, Push Button, NO, Black	1	DC8282379	- - -	- - -
		Switch, Push Button, NO, Black	2	- - -	DC8282379	DC8282379
94		Pendant Housing, Lower	1	DC9425424	DC9425424	DC9425424
95		Boot, Push Button, Black	1	DC8284379	- - -	- - -
		Boot, Push Button, Black	2	- - -	DC8284379	DC8284379
96		Screw, Hi-Lo #8 x 1/2	4	DC9428008	DC9428008	DC9428008
97		O-Ring	2	B1223503	B1223503	B1223503
98		Plug	1	DC8228009	- - -	- - -
99A		Decal, ADV	1	DD8885026	- - -	- - -
99B		Decal, ADV/RET	1	- - -	DD8886026	DD8886026
Included in 1 Button Pendant Kit, ZE2P-1M. Used on ZE Series Jog Pumps and ZE and ZW Series dump pumps.						
Included in 2 Button Pendant Kit, ZE2P-2M. Used on ZE Series pumps equipped with VE33 and VE43 control valves.						
Included in 2 Button Pendant Kit, ZW2P-2M. Used on ZW Series pumps equipped with VEW43 control valve.						

Figure 19: Power Cords



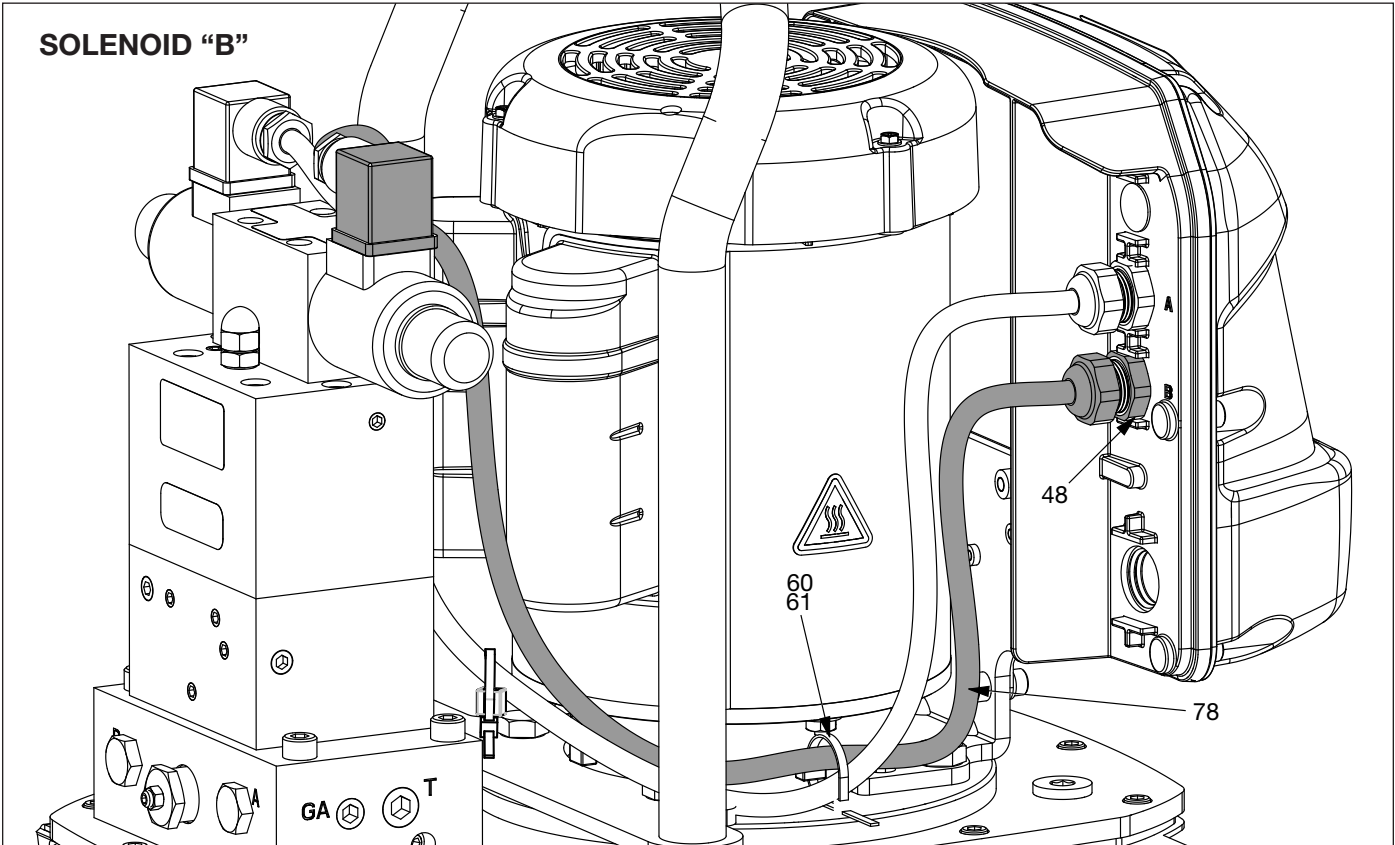
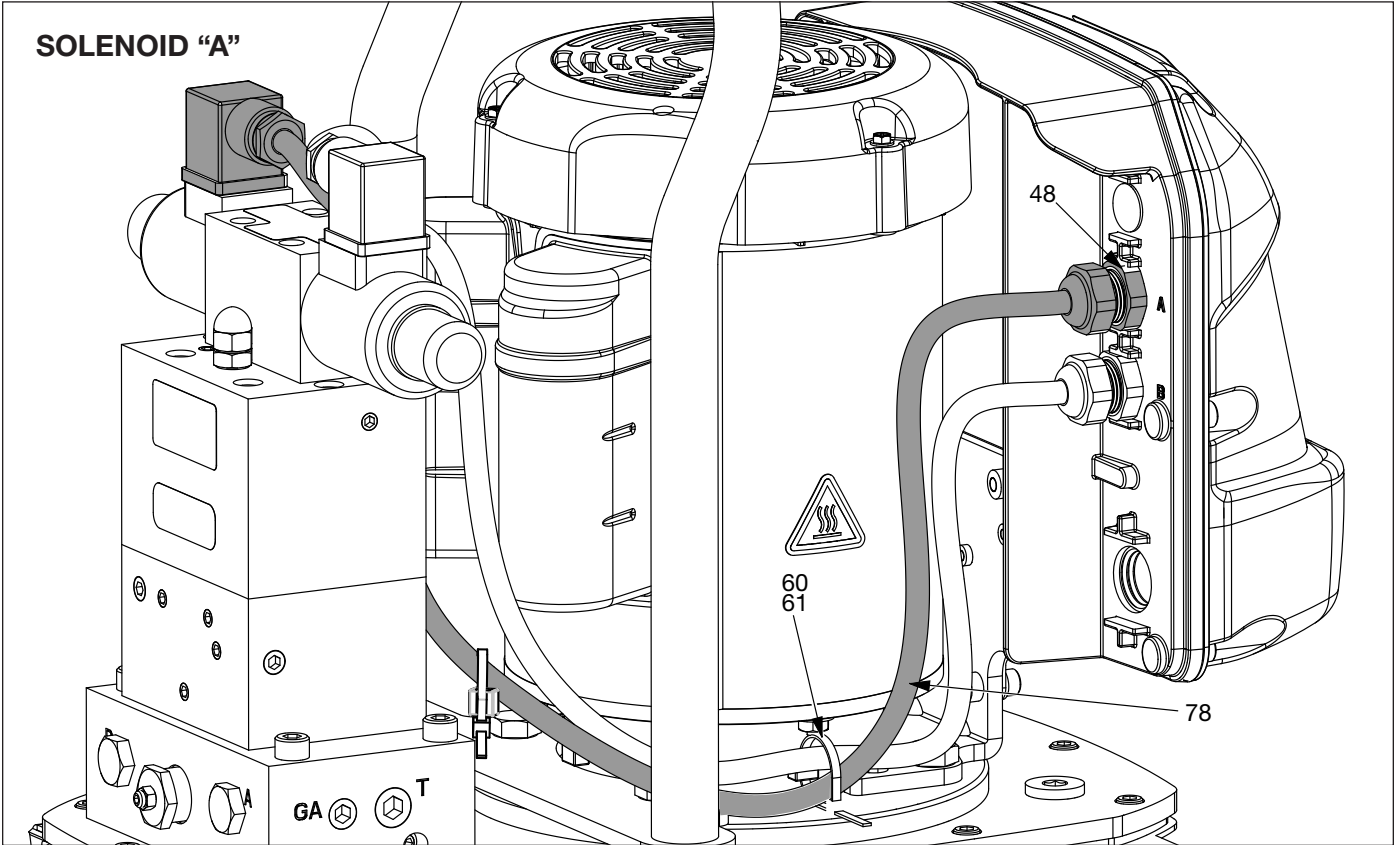
Notes:

- | | |
|-------------------------------|-------------------------------------|
| ① Black wire. | ⑤ Brown wire. |
| ② White wire. | ⑥ Green or green/yellow wire. |
| ③ Green or green/yellow wire. | ⑦ Strain relief included with cord. |
| ④ Blue wire | |

Parts List for Figure 19

Item	Description	Qty	Part Number
217A	Power Cord, 115V (US)	1	DC9736960
217B	Power Cord, 230V (US)	1	DC9737960
217C	Power Cord, 230V (CE)	1	DC9738960

Figure 20: Solenoid Cables and Components, VE33, VE43 and VEW43



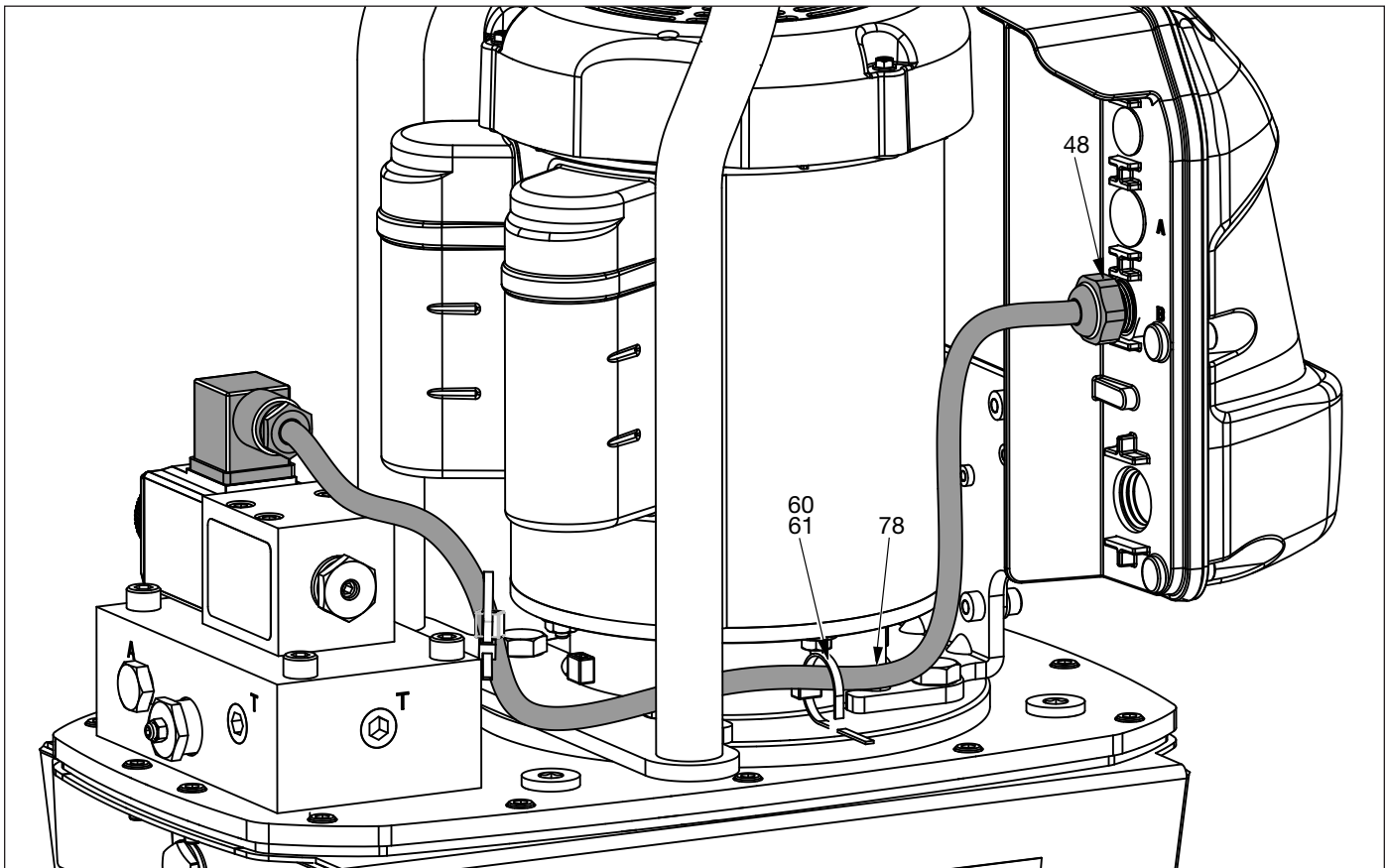
Parts List for Figure 20

Item	Description		Qty	Part Number
48	■	Lock Nut, 20 mm	1	DC9538021
60		Mount, Cable Tie	2	DC9741017
61		Cable Tie	1	DC9876647
78	■	Solenoid Cable	2	DD8780960
■ Included in Valve Cord Service Kit, DD8708960SR.				

Notes:

Route cables through A and B openings in electrical enclosure, as shown in Figure 20.
Item 48 located inside electrical enclosure.

Figure 21: Solenoid Cable and Components, VE32D



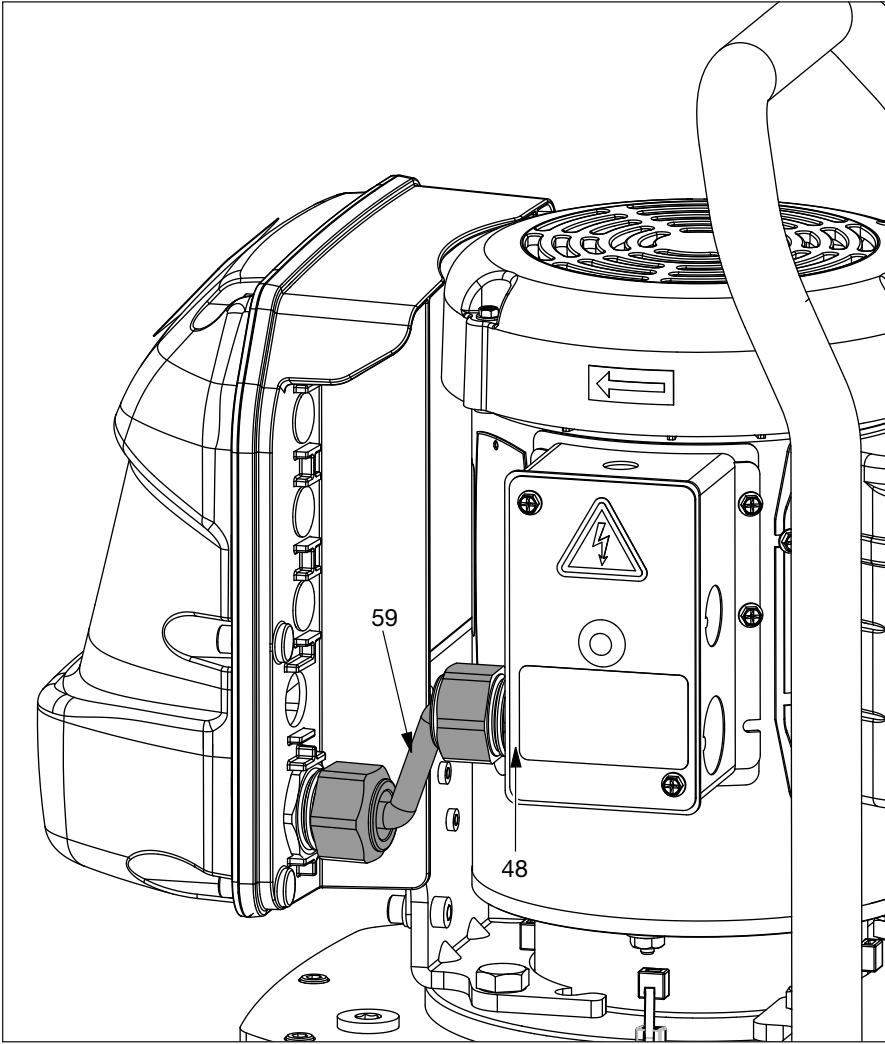
Notes:

Route cable through the “B” opening in electrical enclosure.
Item 48 located inside electrical enclosure.

Parts List for Figure 21

Item	Description		Qty	Part Number
48	■	Lock Nut, 20 mm	1	DC9538021
60		Mount, Cable Tie	2	DC9741017
61		Cable Tie	1	DC9876647
78	■	Solenoid Cable & Connector	1	DD8708960
■ Included in Valve Cord Service Kit, DD8708960SR.				

Figure 22: Motor Cable



Notes:

Used only on pumps equipped with electrical enclosure.

Not used on pumps with rotary motor switch.

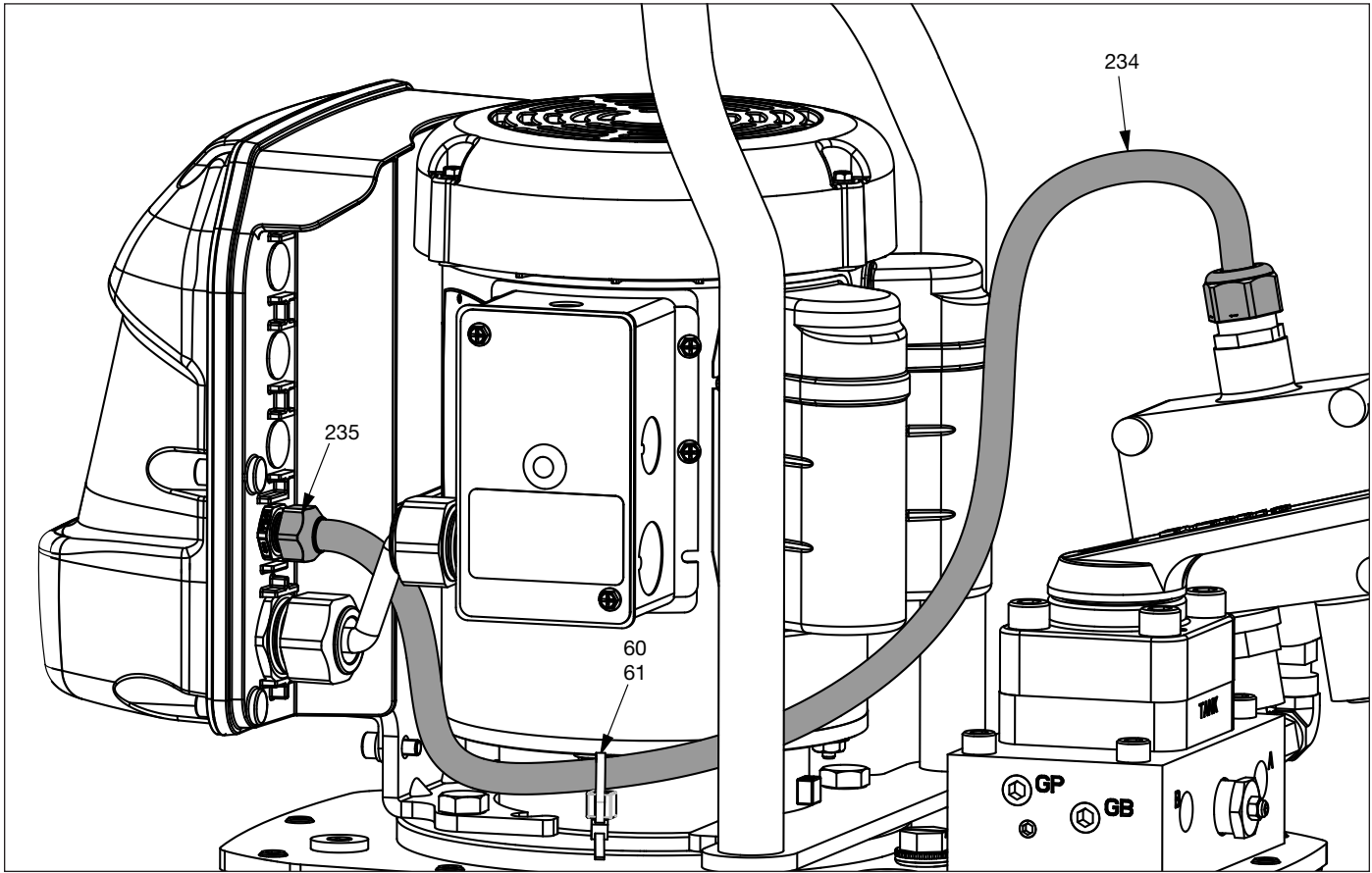
Route cable through hole in electrical enclosure as shown above.

Item 48 located inside motor junction box.

Parts List for Figure 22

Item	Description		Qty	Part Number
48		Lock Nut, 20 mm	1	DC9538021
59		Motor Cord, 1 PH	1	DC9990960

Figure 23: Pressure Switch Cable



Notes:

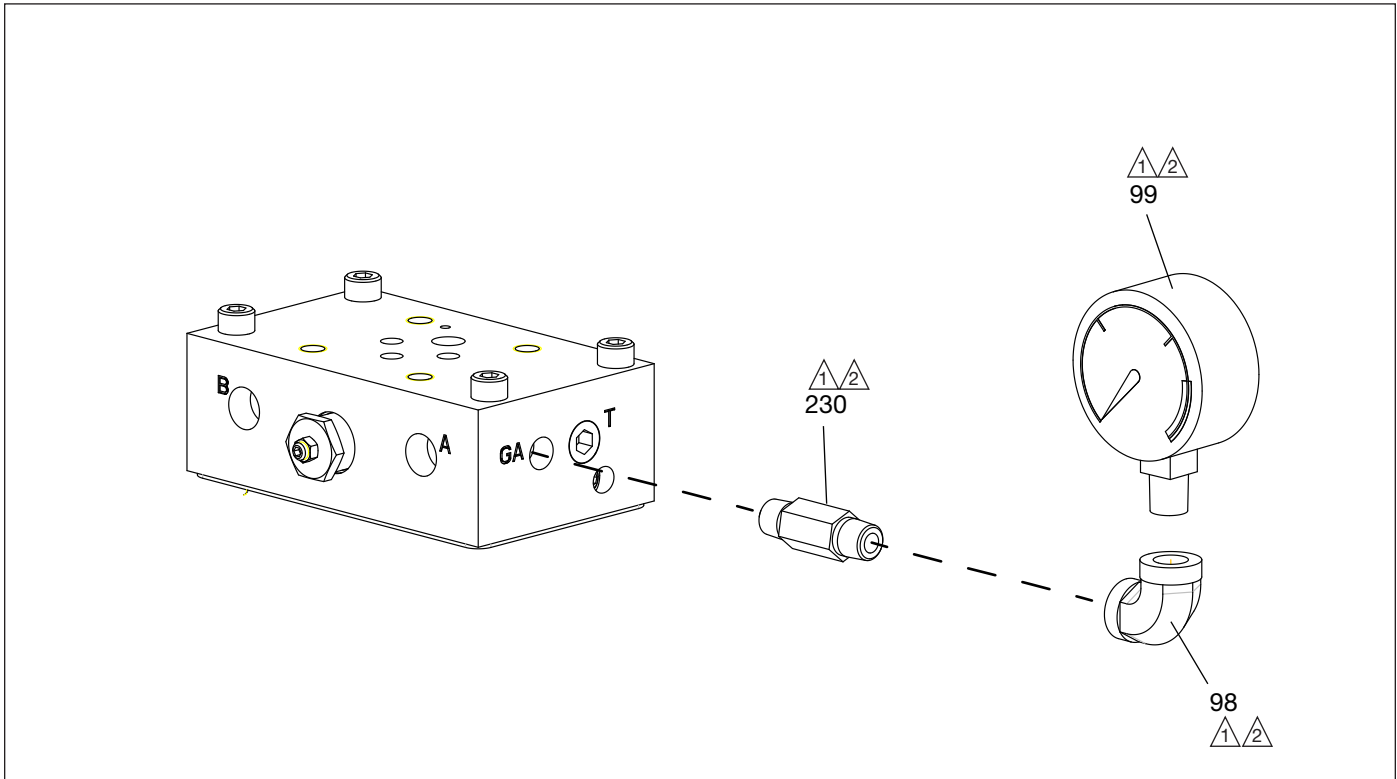
Used on all pumps equipped with pressure switch option.

Route cable through hole in electrical enclosure as shown above.

Parts List for Figure 23

Item	Description		Qty	Part Number
60		Mount, Cable Tie	2	DC9741017
61	★	Cable Tie	1	DC9876647
234	★	Cable, Pressure Switch	1	DD8881960
235	★	Nut, Locking, 16 mm	1	DC9537021
★ Included as part of Pressure Switch Kit, ZE2PS-E3.				

Figure 24: Pressure Gauge (optional accessory)



Notes:

Install gauge in GA port.

Refer to Figure 25 for models equipped with pressure switch.

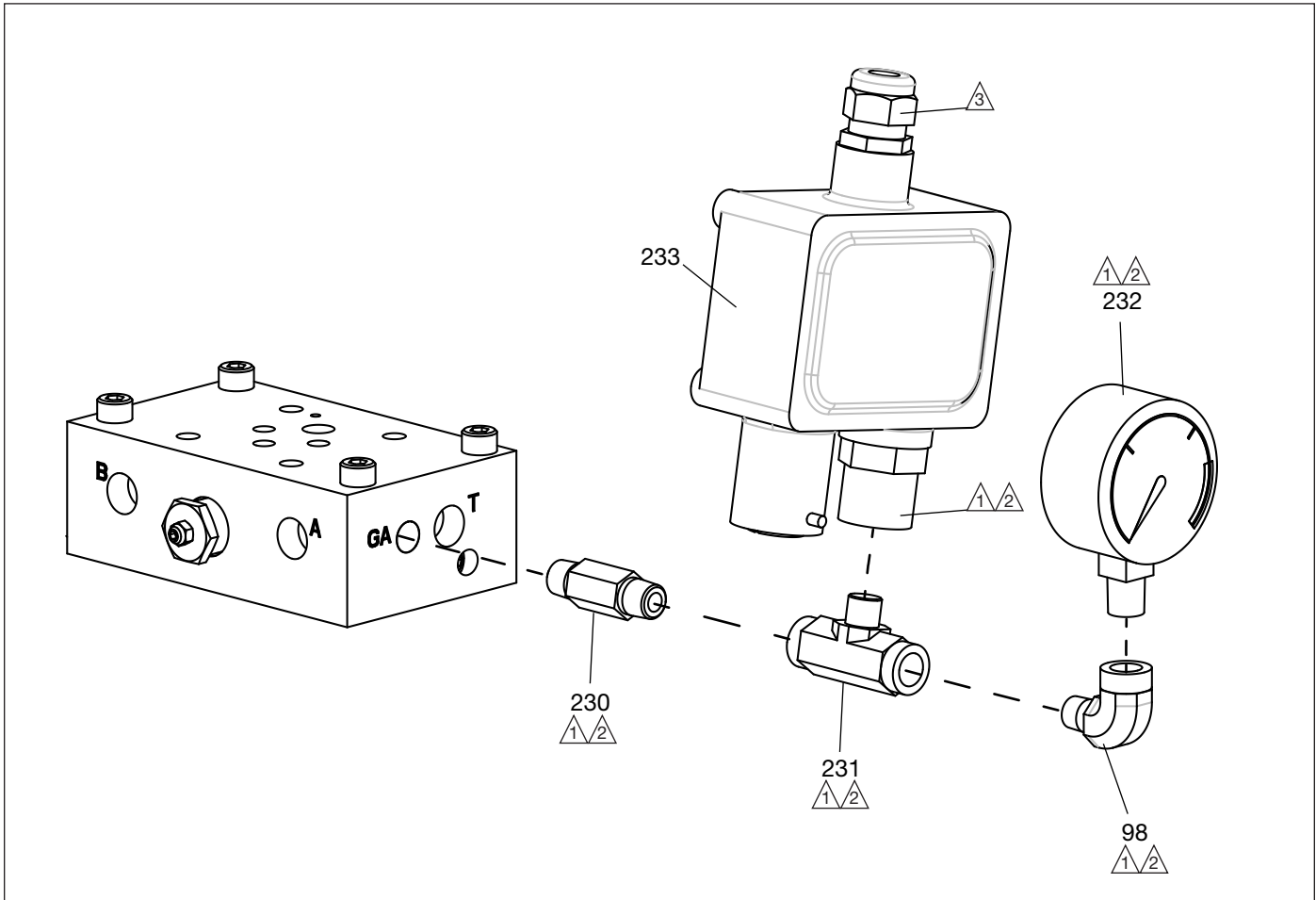
① Apply Teflon tape to all threaded fittings.

② Torque all fittings to 24-28 ft-lb [32-38 Nm].

Parts List for Figure 24

Item	Description		Qty	Part Number
98A		Fitting, Street Elbow	1	CK908291
230		Pipe, 1/4" NPTF x 2"	1	DC8055431
232		Gauge, Pressure	1	G2536L
Note: Order each part separately. Gauge components are not available in a kit.				

Figure 25: Pressure Switch and Gauge (optional accessory)



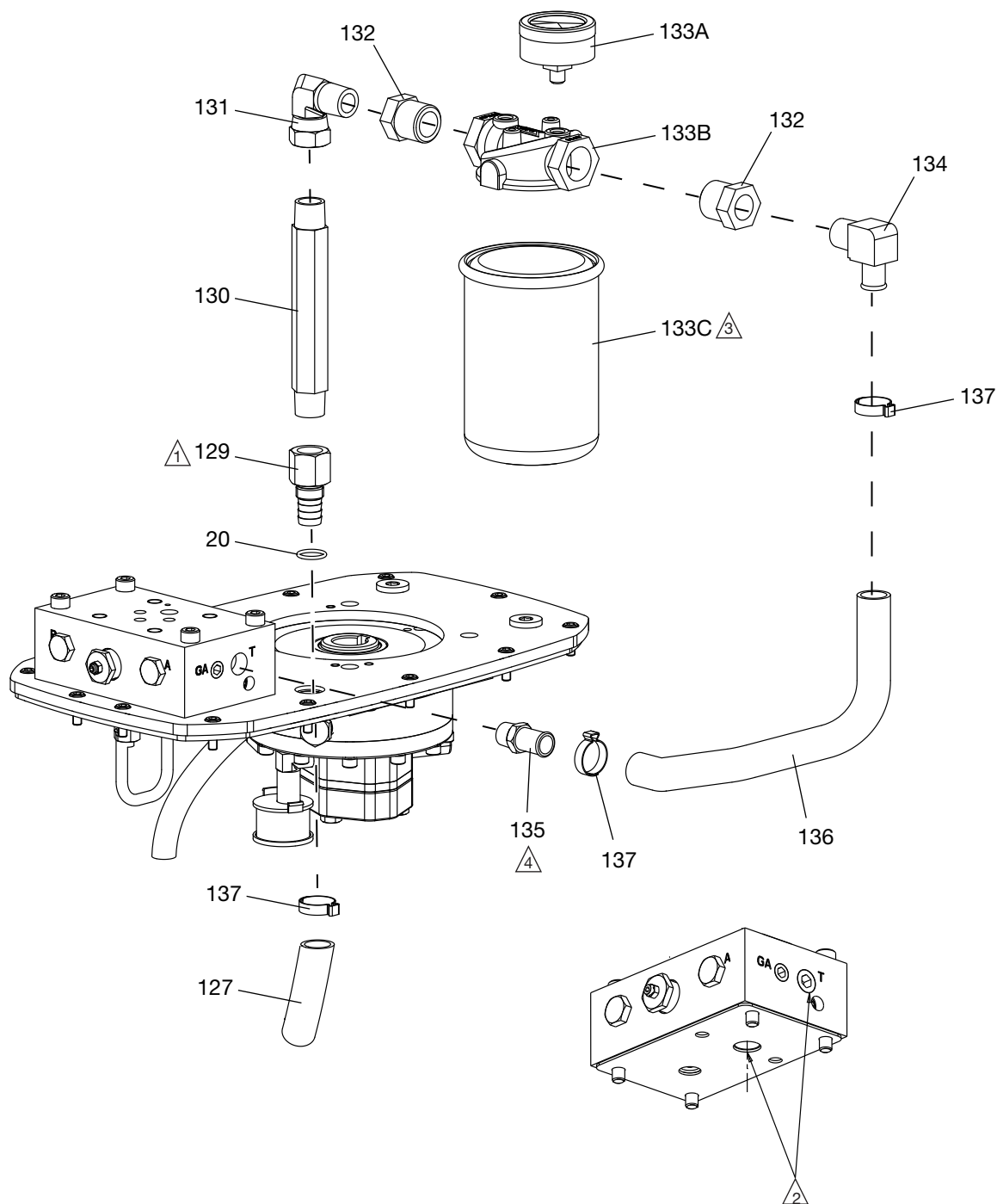
Notes:

- ① Apply Loctite 545 to all threaded fittings.
 - ② Torque all fittings to 24-28 ft-lb [32-38 Nm].
 - ③ Torque cable connection to 37-43 in-lb [4.1-4.7 Nm].
- See Figure 23 for electrical cable information.

Parts List for Figure 25

Item	Description		Qty	Part Number
98A	✱	Fitting, Elbow 90°	1	F100095-7
230	✱	Nipple, Pipe, 1/4 x 1/4 NPTF	1	CJ647096
231	✱	Branch Tee	1	F100095-35
232	✱	Gauge, Pressure	1	G2536L
233	✱	Pressure Switch	1	DA2271372
✱ Included as part of pressure switch kit, ZE2PS-E3.				

Figure 26: Oil Return Line Filter (optional accessory)



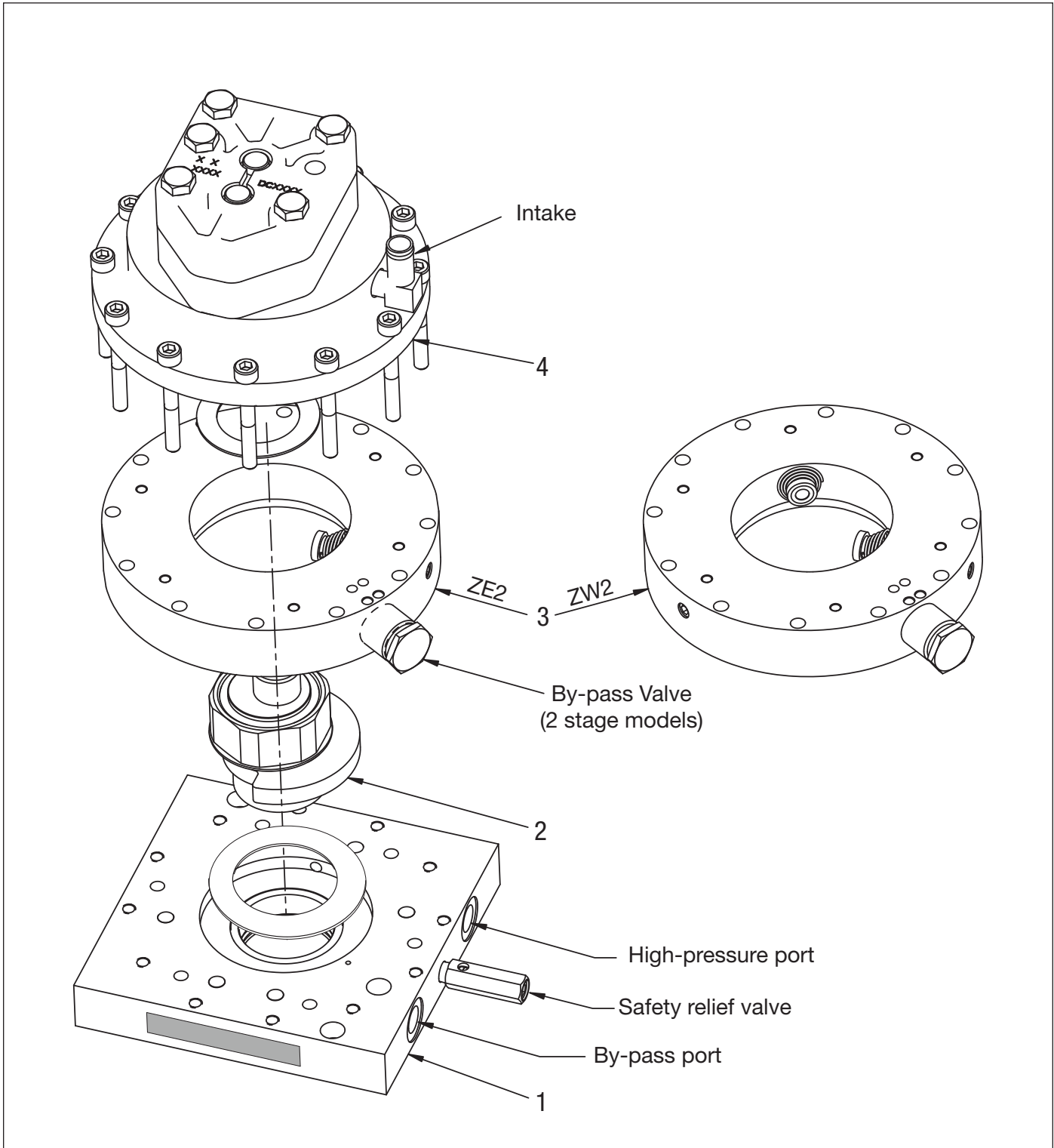
Notes:

- ① Torque to 45-47 ft-lb [61 - 64 Nm].
- ② Remove plug from "T" Port on side of valve and reinstall in bottom of valve.
- ③ Hand tighten filter element until snug. Then, tighten it an additional 1/4 turn with wrench.
- ④ Connect to "T" port on valve.

Parts List for Figure 26

Item		Description	Qty	Part Number
20	◆	O-Ring	1	B1908503
127	◆	G Hose, Return	1	DC8046646
129	◆	Adapter, 5/8" Hose	1	DC8035038
130	◆	Steel Pipe, 1/2	1	DC8120268
131	◆	Swivel Fitting, 90° Elbow, 1/2"	1	G2536L
132	◆	Reducer, 3/4" NPT to 1/2" NPT	2	F100095-50
133A	◆	Gauge, Filter Replace	1	DC3075223
133B	◆	Filter Head Assy (includes item 133A)	1	DC3077900
133C	◆	Filter Element - PF25	1	DC3076118
134	◆	Fitting, 90° 1/2" NPT to 5/8"	1	DC8036038
135	◆	Fitting, 5/8" Hose to 3/8" NPT	1	DC8184097
136	◆	Hose, 5/8", 10.5" Long	1	DC8188646
137	◆	Clamp, Hose	2	DC8038299
◆ Included in Return Line Oil Filter Kit, ZPF.				

Figure 27: Pump Element Assembly



Notes:

ZE2 models have one piston. ZW2 models have two pistons.

By-pass valve is functional only on 2 stage pumps.

Major Components List for Figure 27

Item	Description	Refer to:
1	Top Plate Assembly	Figure 28
2	Eccentric Assembly	Figure 29
3	Piston Ring Assembly (1 or 2 piston)	Figure 30
4	Gear Pump Assembly	Figure 31

Technical drawing of a mechanical assembly, showing a top view, a side view, and a cross-section A-A.

The top view shows a square plate with a central circular feature and several holes. A central hole is labeled with a triangle containing the number 1. A central tube is labeled with the number 3. A bolt is labeled with the number 4. A nut is labeled with the number 5. A side view shows the plate's profile with a central hole. A cross-section A-A shows the internal structure of the central hole.

The 3D exploded view shows the assembly of the plate (1), the central ring (2), the central tube (3), and the bolt (4) with the nut (5).

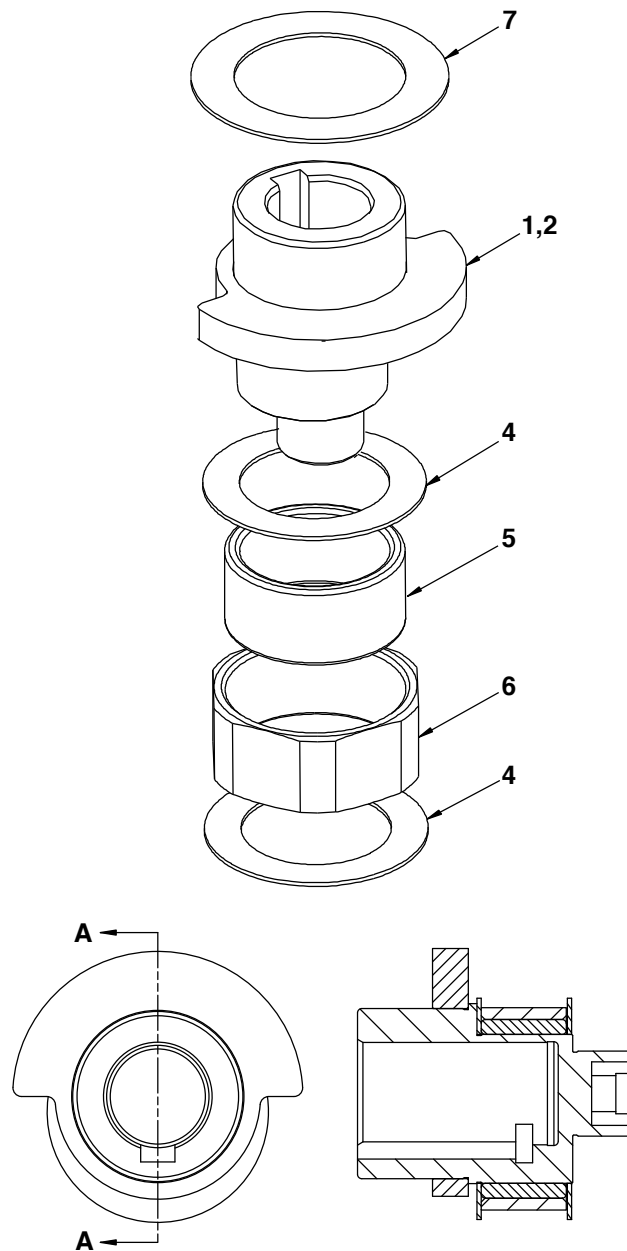
- ① ZW2 models only.
- ② Torque to 144-168 in-lb [16-19 Nm].
- ③ Torque to 17-19 ft-lb [23-26 Nm].
- ④ See Figure 33 for safety relief valve setting.

- ① ZW2 models only.
- ② Torque to 144-168 in-lb [16-19 Nm].
- ③ Torque to 17-19 ft-lb [23-26 Nm].
- ④ See Figure 33 for safety relief valve setting.

Parts List for Figure 28

Item	Description		Qty	Part Numbers	
				ZE Models	ZW Models
1	✿	Top Plate, 1 Piston	1	DD8677101	- - -
	⑨	Top Plate, 2 Piston	1	- - -	DC8351101
2	✿	Bearing, Needle	1	DC9026155	DC9026155
3	✿	Oil Lip Seal (Motor Shaft)	1	DC9027776	DC9027776
4	✿	Flush Plug, 1/16"	2	A1006245	A1006245
5	✿	Safety Pressure Relief Valve	1	DA5999900SR	DA5999900SR
Item included in Pump Element Service Kit, DD8711900SR.					
Item included in Pump Element Service Kit, DD8869900SR.					
Item included in Pump Element Service Kit, DD8982900SR.					
Item included in Top Plate Service Kit, DD8712900SR.					
⑨ Item included in Top Plate Service Kit, DC9281900SR.					
✿ Item included in Piston Ring Service Kit, DD1106900SR.					

Figure 29: Eccentric Assembly, Direct Drive



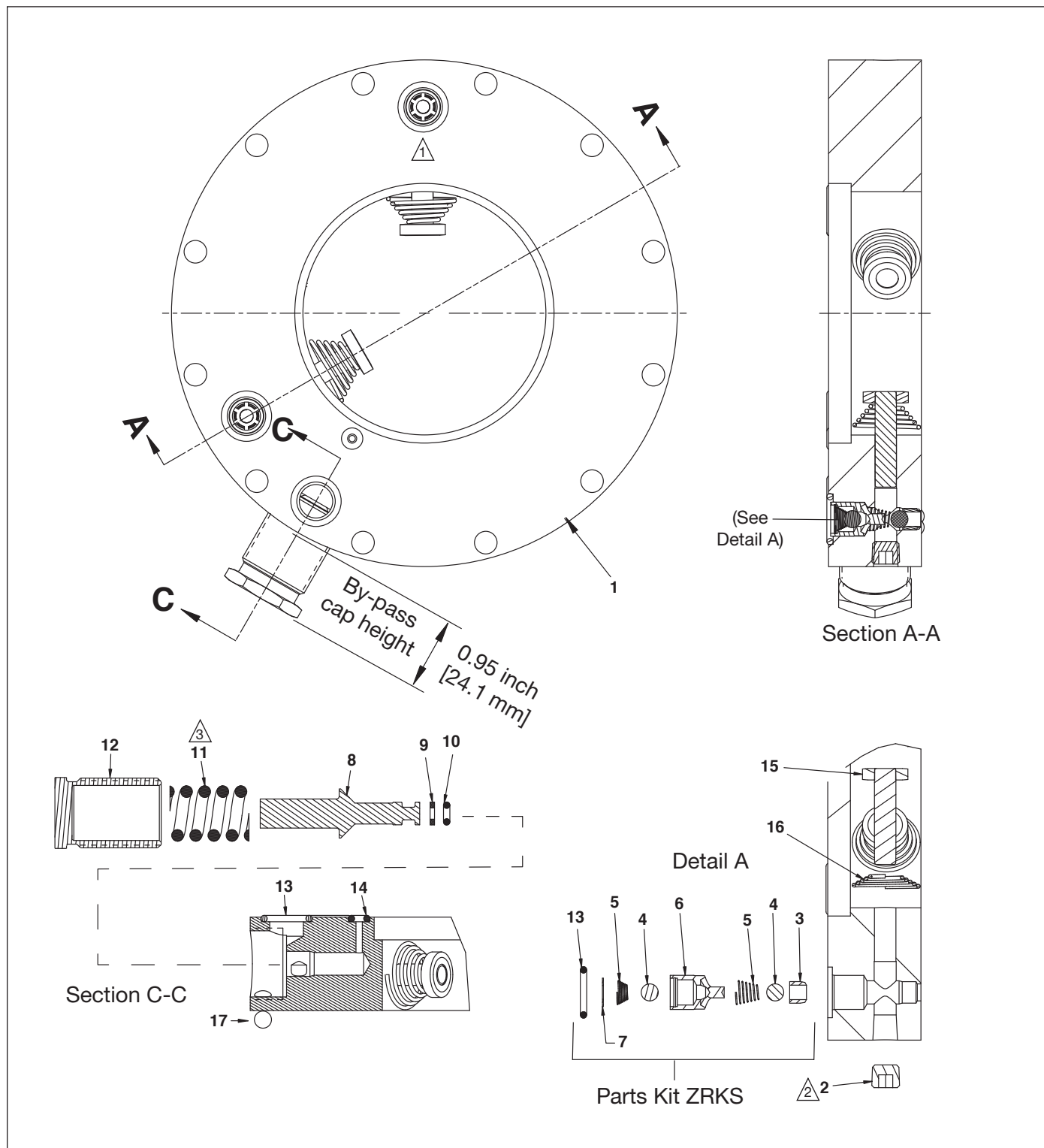
Note:

Locating washer (item 7) is larger in diameter than rings (item 4).
Be sure to install these parts in proper locations.

Parts List for Figure 29

Item	Description		Qty	Part Number
1	❖	Eccentric, Induction Motor	1	DC9214537
2	❖	Plate, Balance	1	DC9023101
4	❖	Ring	2	BSS4725D
5	❖	Bearing, Needle	1	DC4107155
6	❖	Hex Cam	1	DC4328350
7	❖	Locating Washer	1	DD1277108
Item included in Pump Element Service Kit, DD8711900SR.				
Item included in Pump Element Service Kit, DD8869900SR.				
Item included in Pump Element Service Kit, DD8982900SR.				
Item included in Pump Element Service Kit, DD8869900SR.				
Included as part of Eccentric Assembly Kit, DC9215900SR.				
❖ Item included in Piston Ring Service Kit, DD1106900SR.				

Figure 30: Piston Ring Assembly



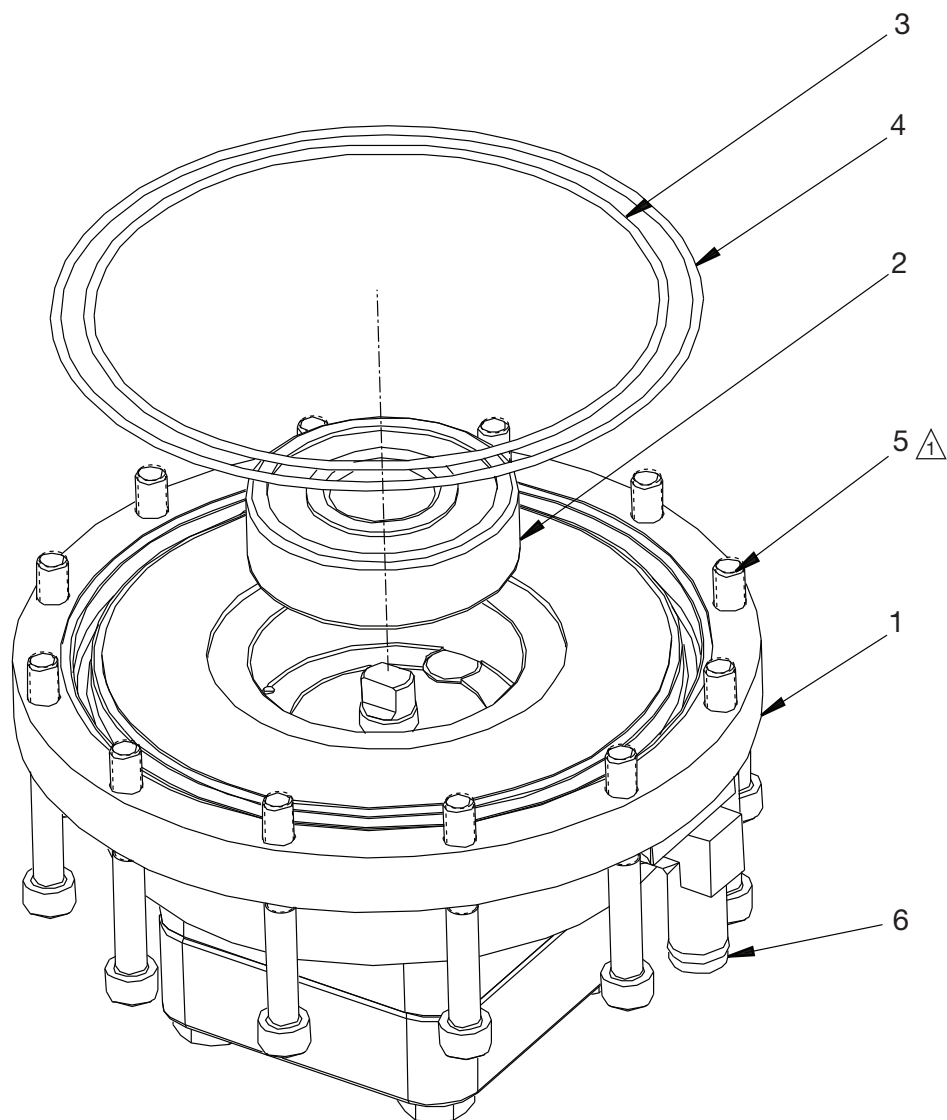
Notes:

- ① Piston in this location used only on ZW2 models.
- ② Torque to 144-168 ft-lb [16.3-19.0 Nm].
- ③ Spring (item 11) not used on 1 stage pumps.

Parts List for Figure 30

Item	Description		Qty.		Part Number
			ZE2 Models	ZW2 Models	
1	✿	Piston Ring, 1 Piston	1	- - -	DD8678101
		Piston Ring, 2 Piston	- - -	1	DC9294101
2	✿	Flush Plug, 1/16"	1	2	A1006245
3	✿	Seat, Piston Inlet	1	2	BSS5358D
4	✿	Ball, 0.188" Diameter	2	4	B1005016
5	✿	Spring	2	4	BSS5809D
6	✿	Seat, Piston Outlet	1	2	BSS5357D
7	✿	Retaining Ring	1	2	BSS5356D
8	✿	Piston, Bypass	1	1	DC9292051
9	✿	Washer, Backup	1	1	B1006564
10	✿	O-Ring, 0.25 OD	1	1	B1006803
11	✿	Spring, Bypass	1	1	DC394110
12	✿	End Cap, Bypass	1	1	DC8373020
13	✿	O-Ring, Viton, 0.56" OD	1	2	B1013203
14	✿	O-Ring, Viton	1	2	B1005203
15	✿	Piston Assembly	1	2	DC9244920
16	✿	Spring, Conical	1	2	BSS5509D
17	✿	Ball, Nylon 3/16"	2	2	DC9293016
Item included in Pump Element Service Kit, DD8711900SR.					
Item included in Piston Ring Service Kit, DD8713900SR.					
Item included in Pump Element Service Kit, DD8869900SR.					
Item included in Pump Element Service Kit, DD8982900SR.					
Item included in Piston Ring Service Kit, DD8989900SR.					
Item included in Piston Ring Service Kit, DD1492900SR.					
Item included in Piston Ring Service Kit, DD1106900SR.					
✿ Item included in Piston Ring Service Kit, DD1106900SR.					

Figure 31: Gear Pump Assembly



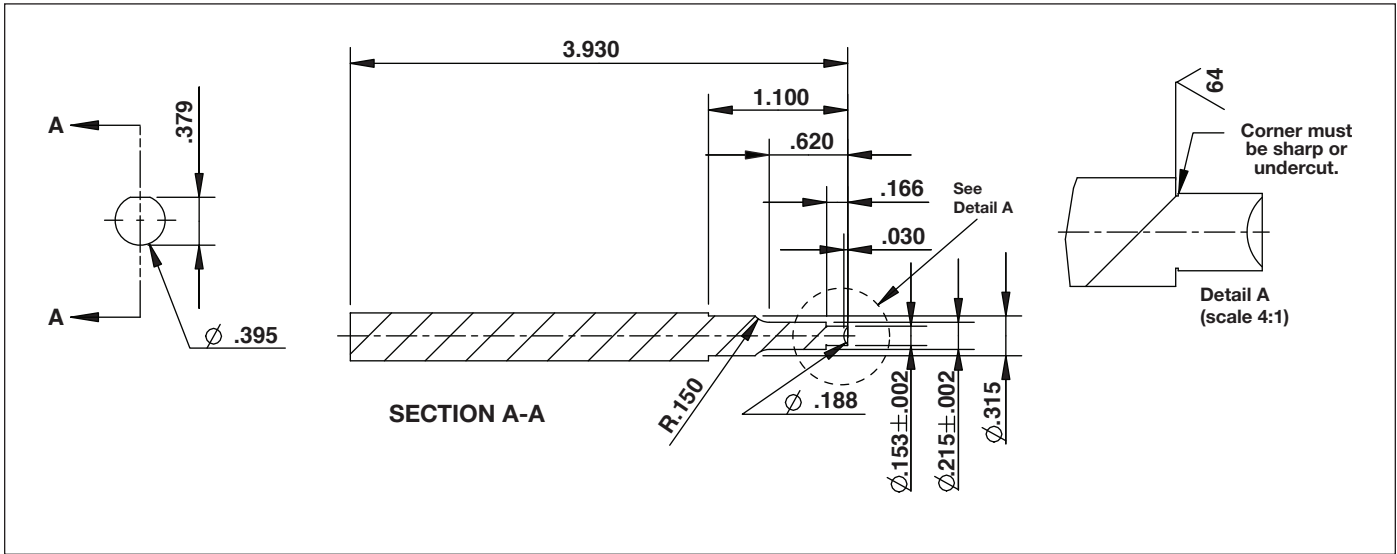
Notes:

△ Torque to 120-144 in-lb [13.5 - 16.0 Nm].

Parts List for Figure 31

Item	Description		Qty	Part Number
1	⑩ ♣	Gear Pump	1	DC9296920
2	⑩ ♣	Ball Bearing	1	DC9219155
3	⑩ ♣	O-Ring	1	B1400503
4	⑩ ♣	O-Ring	1	B1402503
5	⑩ ♣	SHCS, M6 x 1.0 x 50	12	CCA633028-1A
6		Intake Elbow	1	DC9642097
Item included in Pump Element Service Kit, DD8711900SR.				
Item included in Pump Element Service Kit, DD8869900SR.				
Item included in Pump Element Service Kit, DD8982900SR.				
⑩ Item included in Gear Pump Service Kit, DC9296920SR.				
♣ Item included in Piston Ring Service Kit, DD1106900SR.				

Figure 32: Fabrication Instructions - Seat Service Tool



Notes:

Fabricate tool as shown above.

Required to replace valve seats shown in Figure 30.

Figure 33: Pump Element Settings, ZE2 & ZW2

Pump Series		By-Pass Setting		By-Pass End Cap Height		Safety Relief Valve Setting	
		psi	bar	inch	mm	psi	bar
ZE2	1 Stage	(no by-pass)		0.95	24.1	10,650 -10,950	724-725
	2 Stage	1,225 - 1,275	84.5 - 87.9	0.95	24.1	10,650 -10,950	724-725
ZW2	1 Stage	(no by-pass)		0.95	24.1	5,500 -5,800	374-394
	2 Stage	1,225 - 1,275	84.5 - 87.9	0.95	24.1	5,500 -5,800	374-394

Figure 34: Pump Element Service Kits, ZE2

Pump Series		Service Kit Part Numbers			
		Pump Element Service Kit	Gear Pump Service Kit	Piston Ring Service Kit	Top Plate Service Kit
ZE2	1 Stage	DD8981900SR	DC9296920SR	DD8989900SR	DD8712900SR
	2 Stage	DD8711900SR	DC9296920SR	DD8713900SR	DD8712900SR

Figure 35: Pump Element Service Kits, ZW2

Pump Series		Service Kit Part Numbers			
		Pump Element Service Kit	Gear Pump Service Kit	Piston Ring Service Kit	Top Plate Service Kit
ZW2	1 Stage	DD8982900SR	DC9296920SR	DD1106900SR	DC9281900SR
	2 Stage	DD8869900SR	DC9296920SR	DD1492900SR	DC9281900SR

Figure 36: Electrical Schematic, ZE2 & ZW2 Jog Pumps

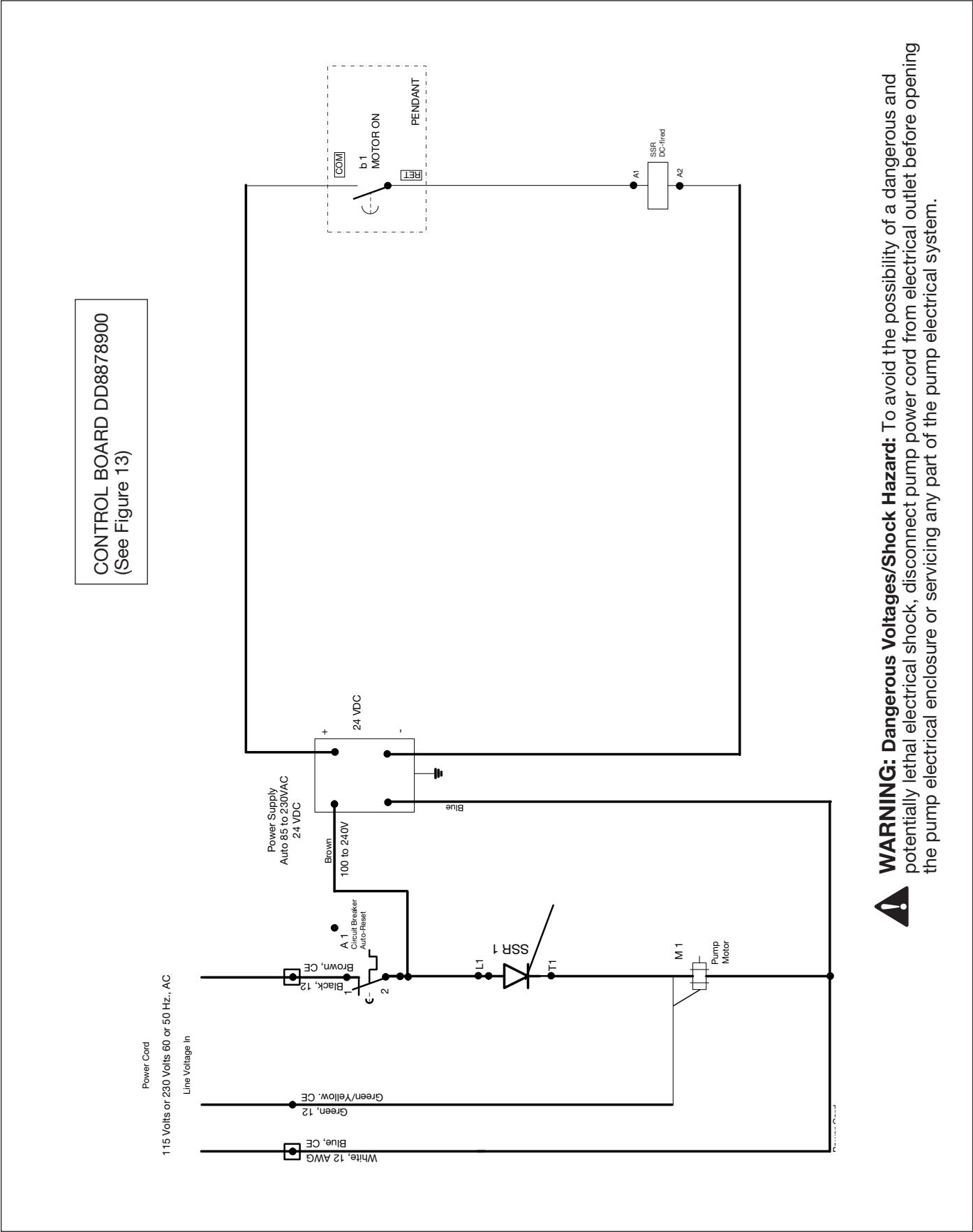
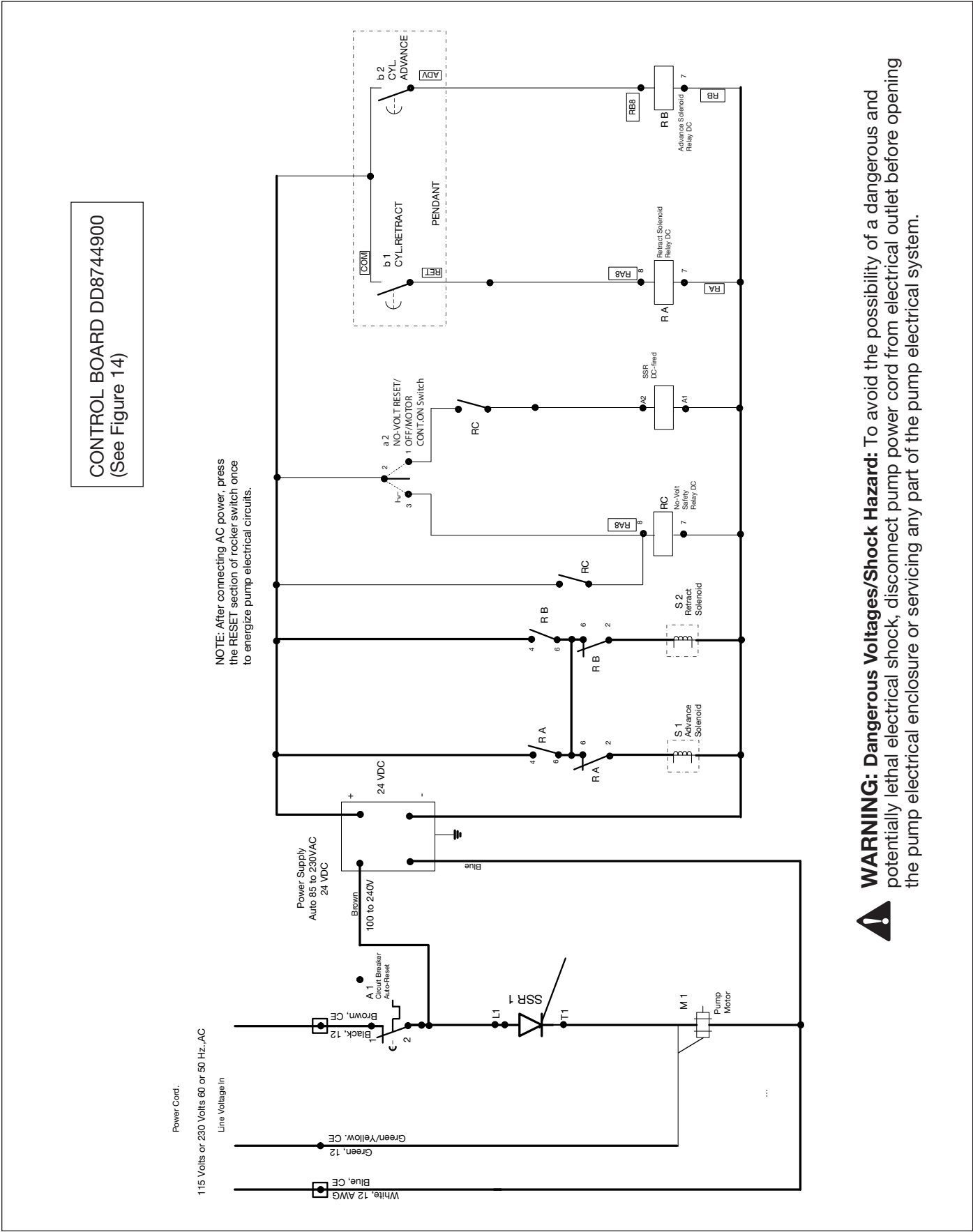


Figure 37: Electrical Schematic, ZE2 Solenoid Pumps



! WARNING: Dangerous Voltages/Shock Hazard: To avoid the possibility of a dangerous and potentially lethal electrical shock, disconnect pump power cord from electrical outlet before opening the pump electrical enclosure or servicing any part of the pump electrical system.

Figure 38: Electrical Schematic, ZE2 & ZW2 Dump Pumps

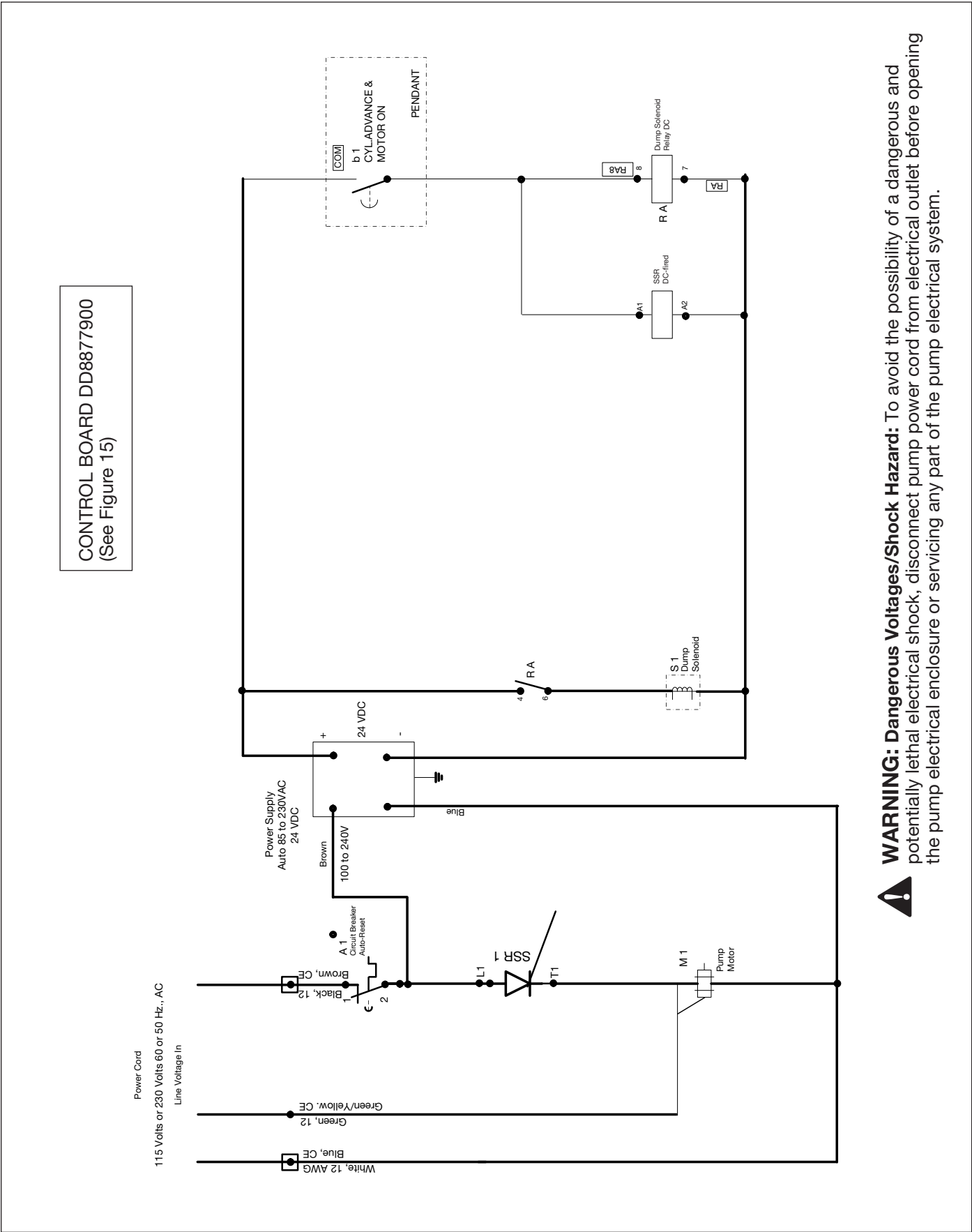
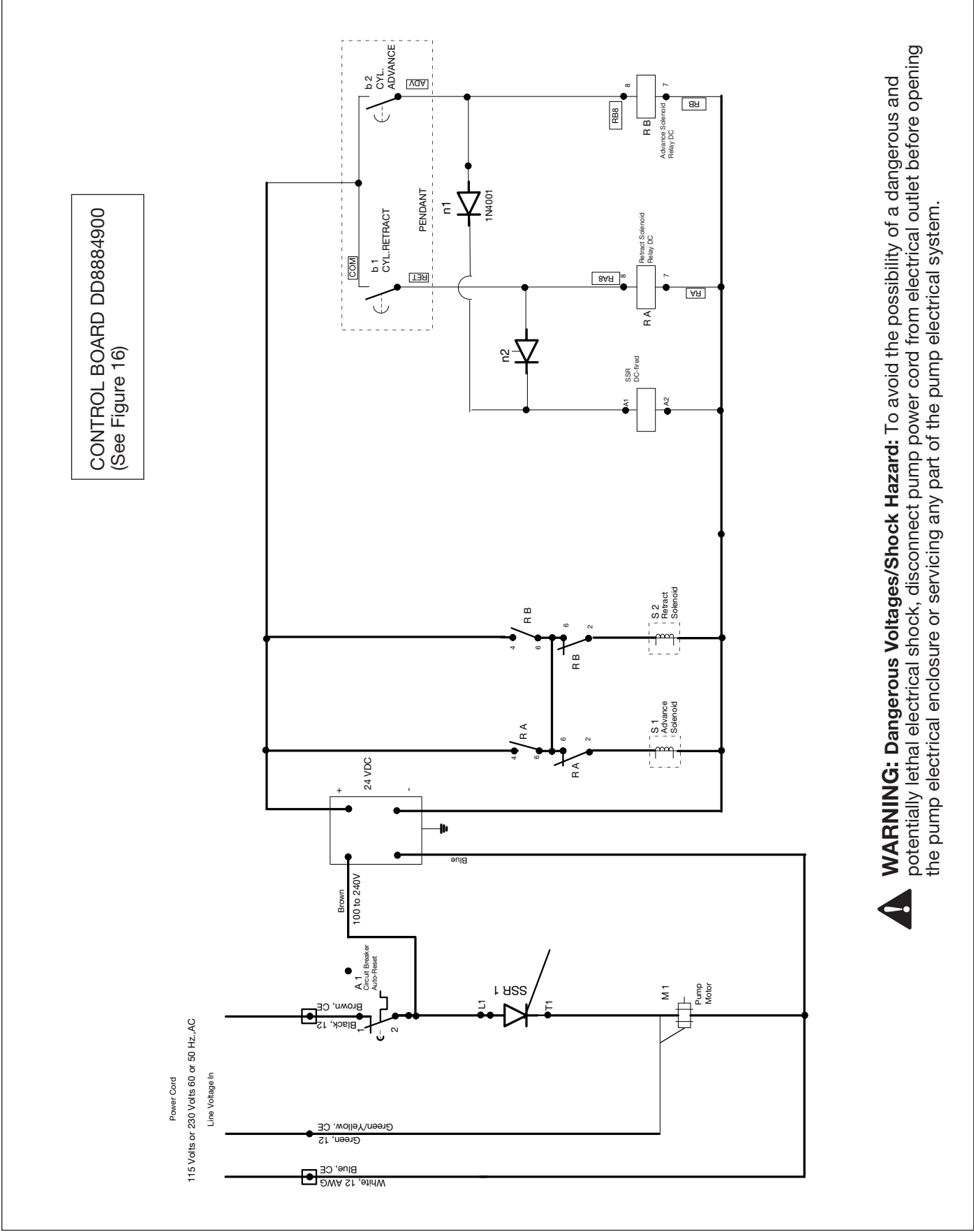


Figure 39: Electrical Schematic, ZW2 Solenoid Pumps



! WARNING: Dangerous Voltages/Shock Hazard: To avoid the possibility of a dangerous and potentially lethal electrical shock, disconnect pump power cord from electrical outlet before opening the pump electrical enclosure or servicing any part of the pump electrical system.

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 **WARNING: Dangerous Voltages/Shock Hazard:** To avoid the possibility of a dangerous and potentially lethal electrical shock, disconnect pump power cord from electrical outlet before opening the pump electrical enclosure or servicing any part of the pump electrical system.

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