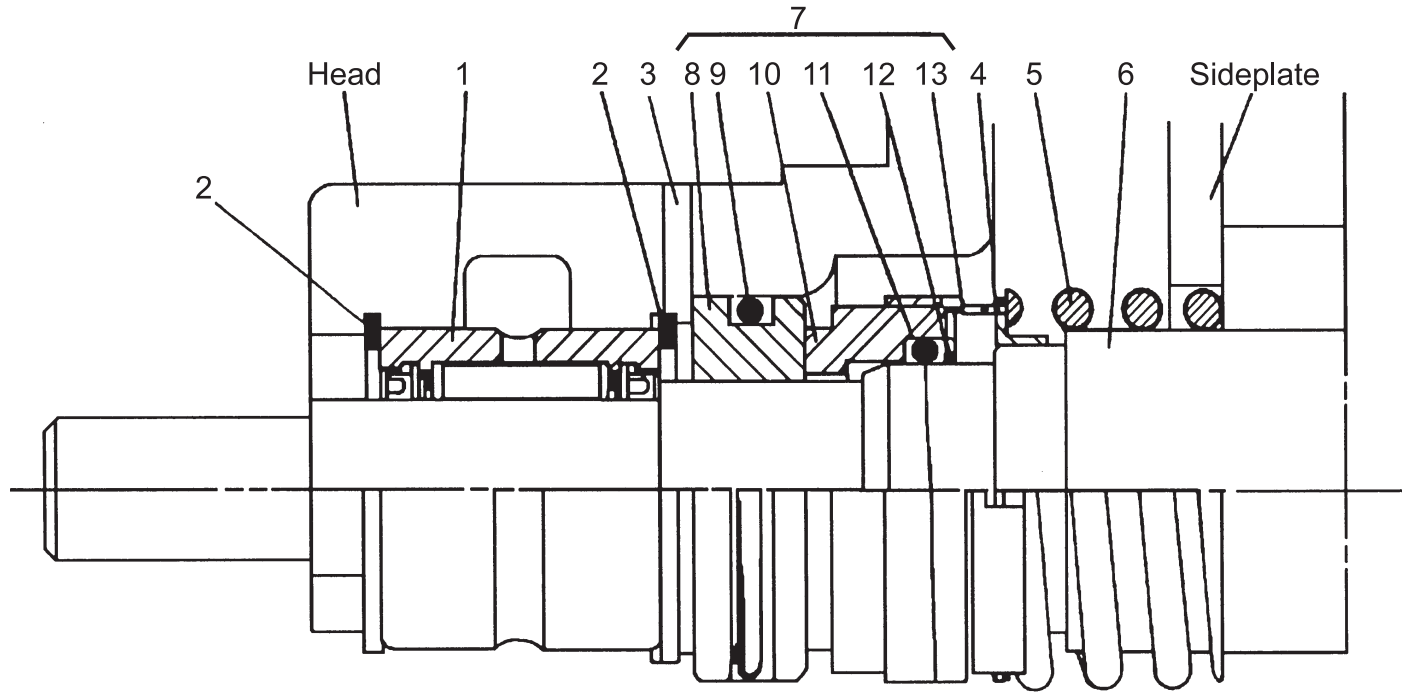


# Appendix E—Parts Details for Seal Assembly (2296 Series)

Models D51 and F51



Ref No.	Part No.	Description	Qty.
1.	2471	Roller bearing	1
2.	5000-112	Retainer ring	1
3.	2595	Seat location pin	1
4.	2735	Drive band (with 2492-X)	1
5.	3471	Spring (with 2492-X)	1
6.	2492-X	Rotor and shaft assembly	1
7.	2296-X_6 <sup>a, b</sup>	Seal	1
	2296-1X_6 <sup>a, b</sup>	Seal Assembly	1
8.	Not sold separately <sup>c</sup>	Silicon carbide seal seat	1
9.	Not sold separately <sup>c</sup>	Seat O-ring	1
10.	Not sold separately <sup>c</sup>	Rotor	1
11.	Not sold separately <sup>c</sup>	O-ring	1
12.	Not sold separately <sup>c</sup>	Disc	1
13.	Not sold separately <sup>c</sup>	Retainer	1

Material Code	
A	Buna-N
B	Neoprene <sup>®d</sup>



**CAUTION:** Always relieve pressure in the unit before attempting any repairs.

<sup>a</sup> \_ denotes material code. See material code chart for details.

<sup>b</sup> Seal assembly includes the seal and a 2-154\_<sup>a</sup> case O-ring.

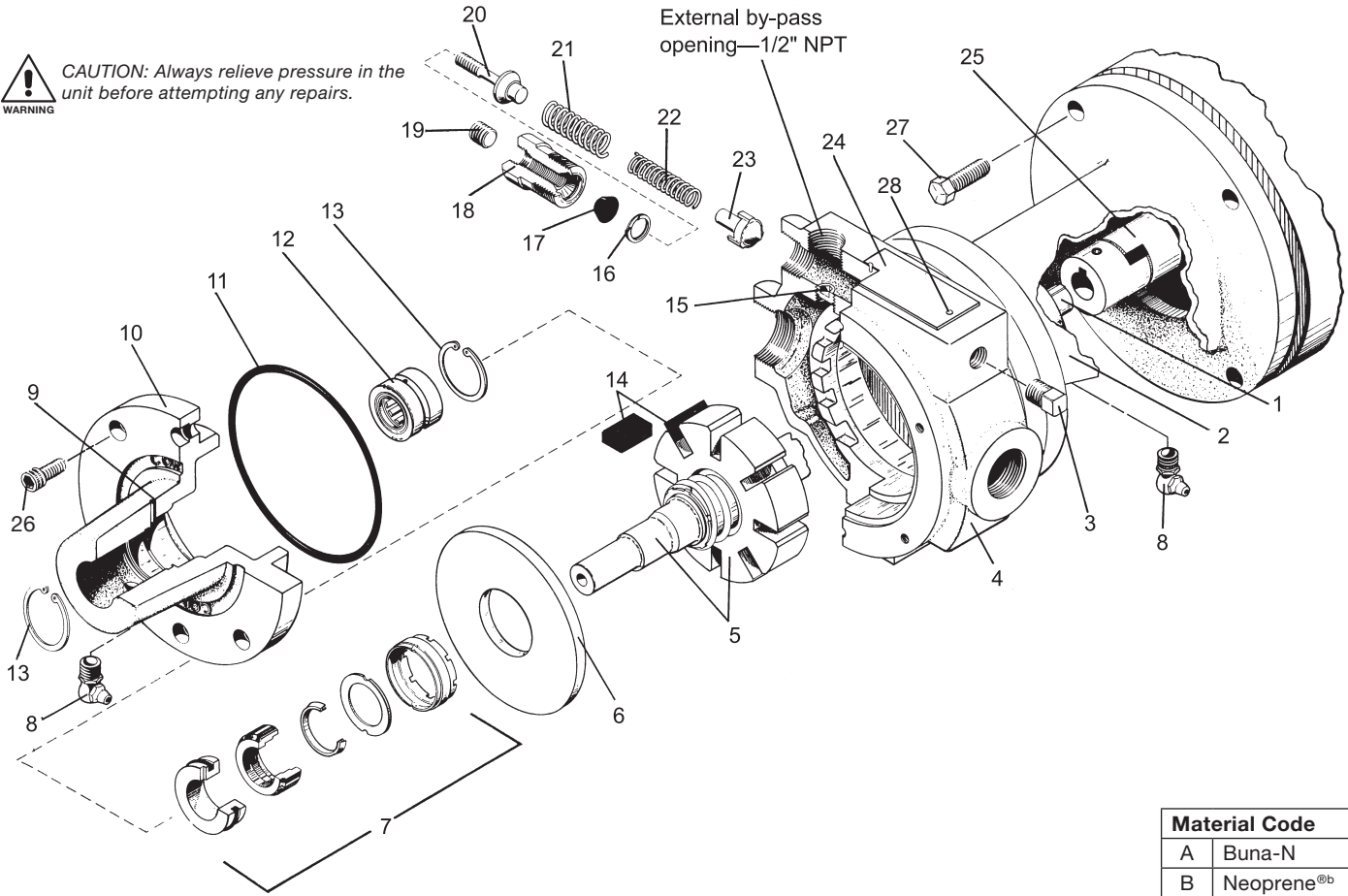
<sup>c</sup> Not sold separately. These items are included in both the seal and the seal assembly.

<sup>d</sup> Registered trademark of the DuPont company.

# Appendix E—Parts Details for Model D51 (Direct Mount)



**CAUTION:** Always relieve pressure in the unit before attempting any repairs.



Material Code	
A	Buna-N
B	Neoprene <sup>®b</sup>

Ref No.	Part No.	Description	Qty.
1.	2592	Key—1/8" sq. x 9/16"	1
2.	2510	Mounting bracket	1
3.	3442	Pipe plug—1/4" NPT	1
4.	2468	Case	1
5.	2492-X	Rotor and shaft assembly	1
6.	2491	Sideplate	2
7.	2296-1X_6 <sup>a</sup>	Seal assembly	2
8.	2604	Elbow grease zerk—1/8" NPT	2
	2159	Lubricap #2 (not shown)	2
9.	2595	Seat location pin	2
10.	2472	Head	2
11.	2-154 <sup>a</sup>	Case O-ring	2
12.	2471 <sup>d</sup>	Roller bearing	2
13.	5000-112	Retainer ring	4
14.	2451-2	Carbon vane	8
15.	2590 <sup>c</sup>	Flush plug—1/8" NPT	1
16.	2760-53	Retainer ring	1
17.	2589	Stem seal	1
18.	2585	Relief valve plug	1
19.	2590	Flush plug—1/8" NPT	1
20.	2584-X	Adjusting stem assembly	1
21.	2587 <sup>c</sup>	Outer relief valve spring	1
22.	2586 <sup>c</sup>	Inner relief valve spring	1
23.	2588	Relief valve	1
24.	2591	Nameplate	1
25.	2593-1	Coupling with spider	1
	2774	Coupling spider only	1

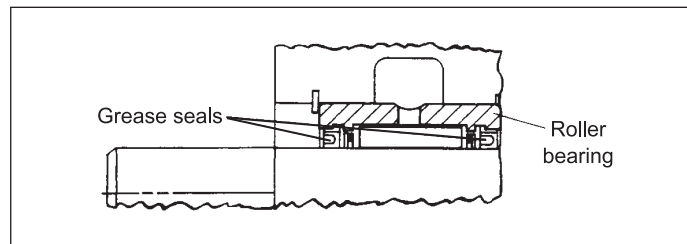
Ref No.	Part No.	Description	Qty.
26.	7002-025NC062A	Bolt socket head	9
27.	7001-037NC100A	Bolt hex head	4
28.	7012-006SF019E	Nameplate screw	2

<sup>a</sup> \_ denotes material code. See material chart for details.

<sup>b</sup> Registered trademark of the DuPont company.

<sup>c</sup> The pump relief valve is installed at the factory to operate as an external bypass through the 1/2" NPT hole back to the storage tank. To change from this external configuration to an internal relief valve, remove relief valve plug 2585 and relief valve springs 2586 and 2587. Then remove flush seal plug 2590 and plug the 1/2" NPT opening. Replace the relief valve plug and springs. In this case a separate external bypass valve must be used in the piping between the pump discharge and the storage tank. Set the internal valve at a pressure slightly above the setting on the external valve. Use only the outer relief valve spring 2587 for units with 1/3 hp motors. Use both springs for 1/2 hp motors and larger. Always replace the flush seal plug 2590 that screws into the relief valve plug 2585 after any relief valve adjustment.

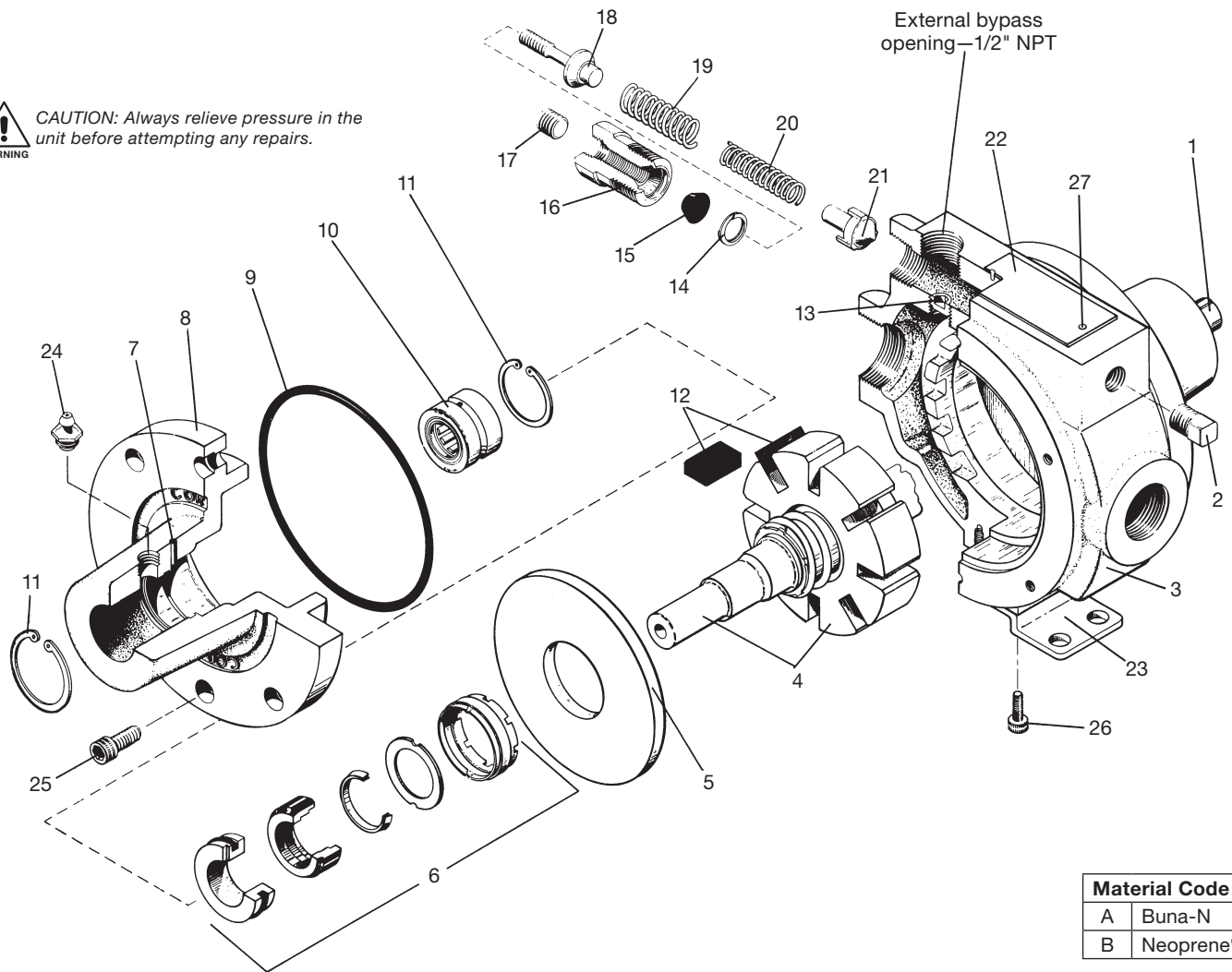
<sup>d</sup> Bearing replacement: Install roller bearing 2471 with open side of grease seals toward outside of pump as shown below.



# Appendix E—Parts Details for Model F51 (Frame Mount)



**CAUTION:** Always relieve pressure in the unit before attempting any repairs.



Material Code	
A	Buna-N
B	Neoprene <sup>®b</sup>

Ref No.	Part No.	Description	Qty.
1.	2592	Key—1/8" sq. x 9/16"	1
2.	3442	Pipe plug—1/4" NPT	1
3.	2468-1	Case	1
4.	2492-X	Rotor and shaft assembly	1
5.	2491	Sideplate	2
6.	2296-1X_6 <sup>a</sup>	Seal assembly	2
7.	2595	Seat location pin	2
8.	2472	Head	2
9.	2-154_ <sup>a</sup>	Case O-ring	2
10.	2471 <sup>d</sup>	Roller bearing	2
11.	5000-112	Retainer ring	4
12.	2451-2	Carbon vane	8
13.	2590 <sup>c</sup>	Flush plug—1/8" NPT	1
14.	2760-53	Retainer ring	1
15.	2589	Stem seal	1
16.	2585	Relief valve plug	1
17.	2590	Flush plug—1/8" NPT	1
18.	2584-X	Adjusting stem assembly	1
19.	2587 <sup>c</sup>	Outer relief valve spring	1
20.	2586 <sup>c</sup>	Inner relief valve spring	1
21.	2588	Relief valve	1
22.	2591	Nameplate	1
23.	2594	Base	1
24.	2158	Grease zerk—1/8" NPT	2
	2159	Lubricap #2 (not shown)	2

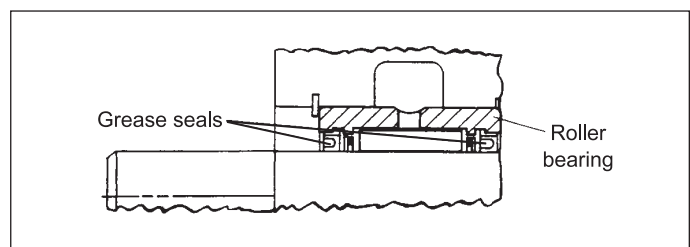
Ref No.	Part No.	Description	Qty.
25.	7002-025NC062A	Bolt socket head	12
26.	7002-010NC050A	Bolt socket head	3
27.	7012-006SF019E	Nameplate screw	2

<sup>a</sup> \_ denotes material code. See material chart for details.

<sup>b</sup> Registered trademark of the DuPont company.

<sup>c</sup> The pump relief valve is installed at the factory to operate as an external bypass through the 1/2" NPT hole back to the storage tank. To change from this external configuration to an internal relief valve, remove relief valve plug 2585 and relief valve springs 2586 and 2587. Then remove flush seal plug 2590 and plug the 1/2" NPT opening. Replace the relief valve plug and springs. In this case a separate external bypass valve must be used in the piping between the pump discharge and the storage tank. Set the internal valve at a pressure slightly above the setting on the external valve. Use only the outer relief valve spring 2587 for units with 1/3 hp motors. Use both springs for 1/2 hp motors and larger. Always replace the flush seal plug 2590 that screws into the relief valve plug 2585 after any relief valve adjustment.

<sup>d</sup> Bearing replacement: Install roller bearing 2471 with open side of grease seals toward outside of pump as shown below.

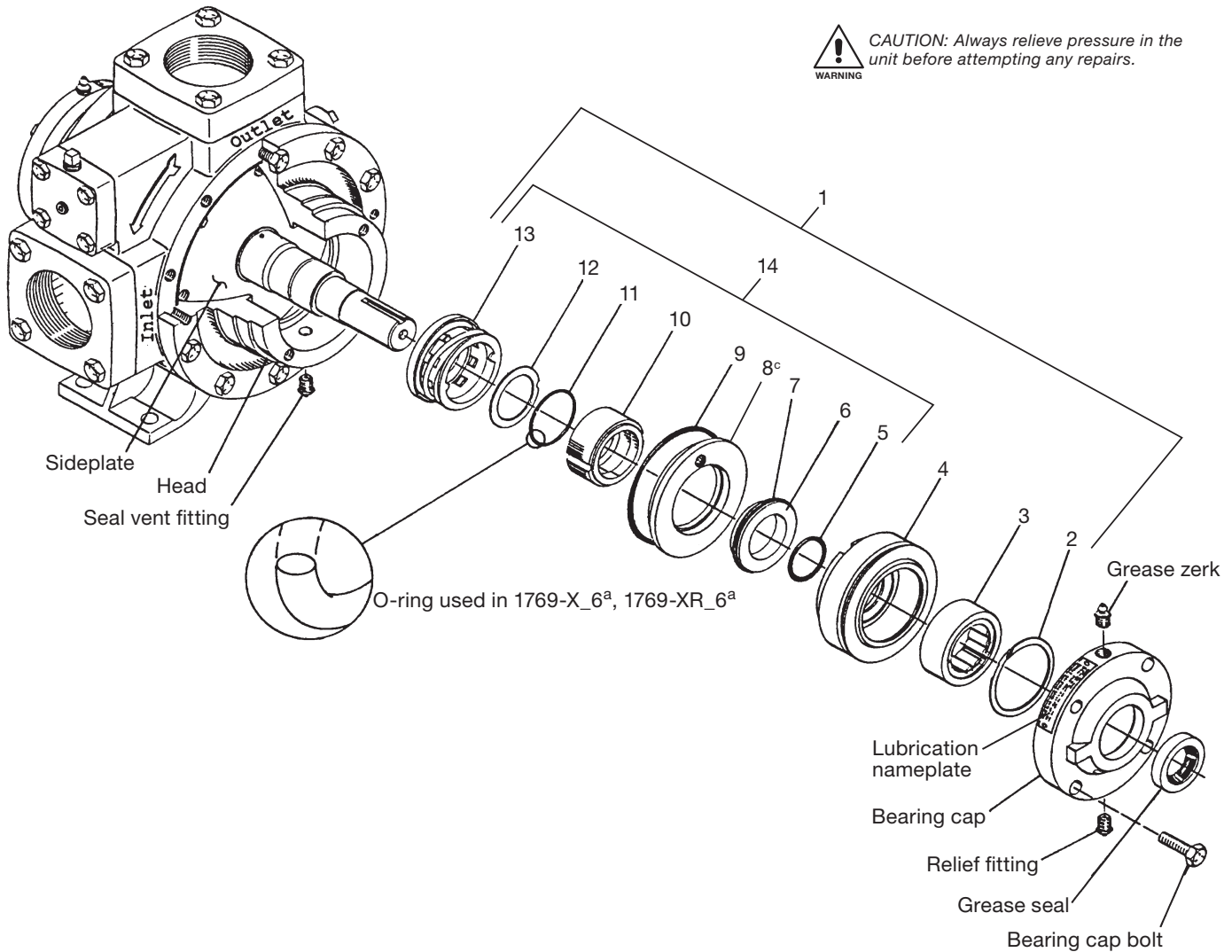


# Appendix E—Parts Details for Seal Assembly (1769 Series)

All Models 521 and 1021



CAUTION: Always relieve pressure in the unit before attempting any repairs.



Ref No.	Part No.	Description	Qty.
1.	1769-X_6 <sup>a</sup>	Complete seal assembly	1
2.	2760-244	Retainer ring	1
3.	2754-X	Roller bearing, complete	1
	2754	Bearing outer race	1
	2755	Bearing inner race	1
4.	1769	Bearing housing	1
5.	2-128 <sup>a</sup>	Shaft O-ring	1
6.	Not sold separately <sup>d</sup>	Seal seat	1
7.	2-227 <sup>a</sup>	Seat O-ring	1
8.	1822 <sup>c</sup>	Seat adapter plate	1
9.	2-240 <sup>a</sup>	Adapter plate O-ring	1
10.	Not sold separately <sup>d</sup>	Carbon seal	1
11.	2-223 <sup>a</sup>	Rotor O-ring	1
12.	Not sold separately <sup>d</sup>	Disc	1
13.	Not sold separately <sup>d</sup>	Retainer assembly	1
14.	1769-XR_6 <sup>a</sup>	Field replacement seal assembly	1

Material Code	
A	Buna-N
B	Neoprene <sup>®b</sup>

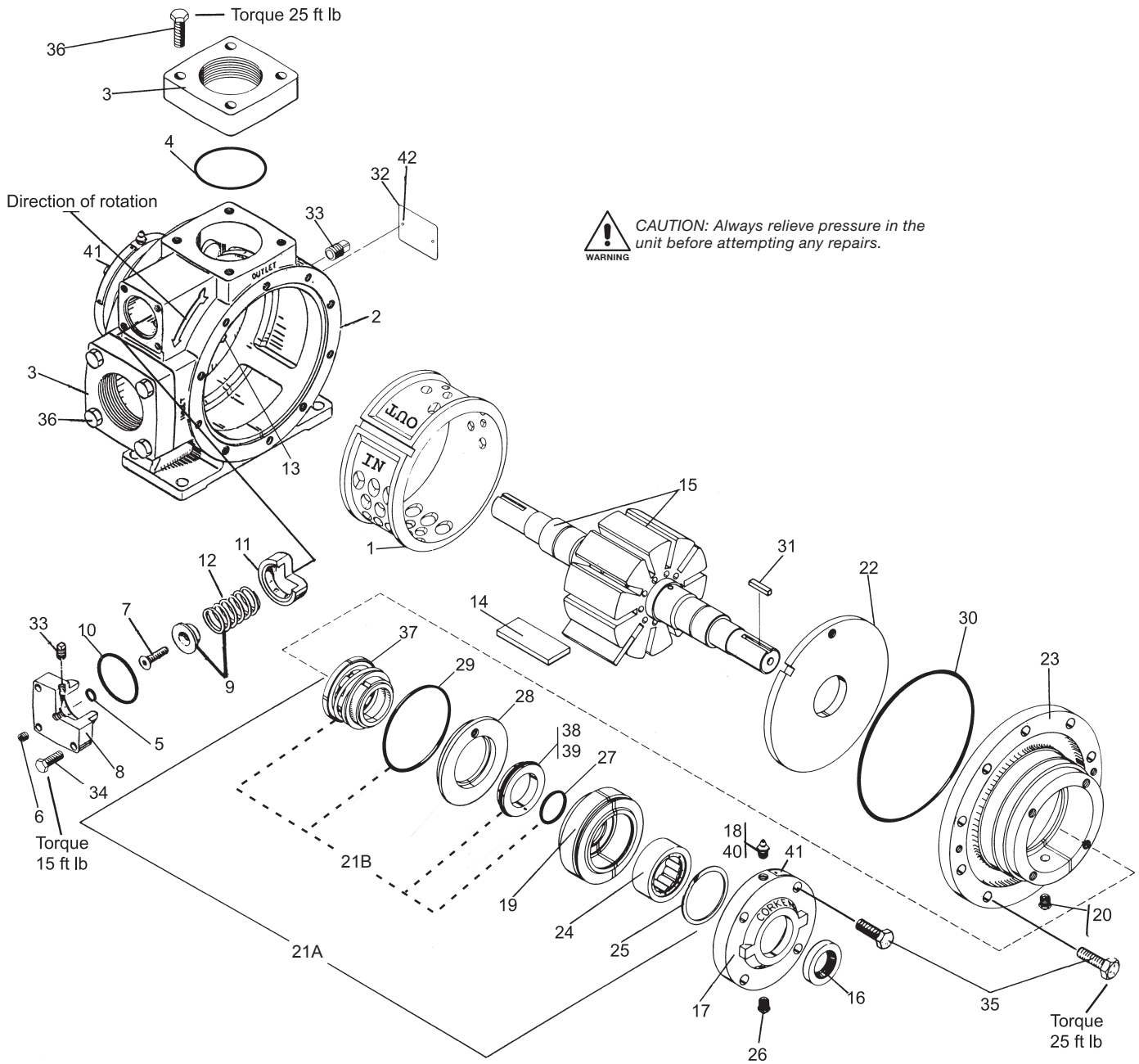
<sup>a</sup> \_ denotes material code. See material code chart for details.

<sup>b</sup> Registered trademark of the DuPont company.

<sup>c</sup> Not included in field replacement seal assembly.

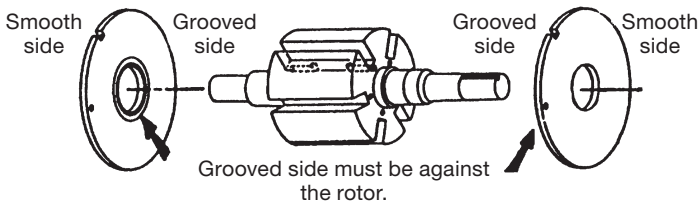
<sup>d</sup> Not sold separately. Available with 1769-X\_6<sup>a</sup> and 1769-XR\_6<sup>a</sup> only.

# Appendix E—Parts Details for Models 521 and 1021



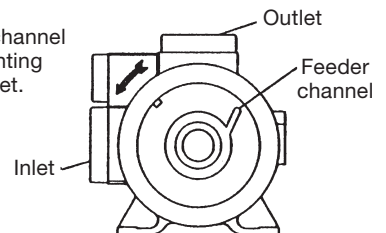
## Sideplate Replacement Instructions

### Model 521



### Model 1021

Install with feeder channel against rotor pointing toward the outlet.



## Appendix E—Parts Details for Models 521 and 1021

Ref No.	Part No.	Description	Qty.
1.	1162-2	Cam (521)	1
	1201-2	Cam (1021)	1
2.	2832	Case (521)	1
	2841	Case (1021)	1
3.	1172-2.5	Flange—2-1/2" standard (521)	1
	1172-2	Flange—2" standard (521)	1
	1172-1.5	Flange—1/2" NPT, optional (521)	1
	1172-15S	Flange—1/2" Weld, optional (521)	1
	1172-2	Flange—2" NPT, optional (521)	1
	1172-2S	Flange—2" Weld, optional (521)	1
	1172-2.5	Flange—2-1/2" NPT, optional (521)	1
	1172-2.5S	Flange—2-1/2" Weld, optional (521)	1
	1206-34	Flange—3" standard (1021)	2
	1206-3S	Flange—3" Weld, optional (1021)	2
	1206-4	Flange—4" NPT, optional (1021)	2
	1206-4S	Flange—4" Weld, optional (1021)	2
	4.	2-234 <sub>a</sub>	Flange O-ring (521)
2-245 <sub>a</sub>		Flange O-ring-3" (1021)	2
2-249 <sub>a</sub>		Flange O-ring-4" (1021)	2
5.	2-112 <sub>a</sub>	Adjusting screw O-ring	1
6.	2590	Flush plug—1/8" NPT	1
7.	2252	Relief valve adjusting screw	1
8.	1174	Valve cap (521)	1
	1207	Valve cap (1021)	1
9.	1242-X	Relief valve spring and guide (521)	1
	1227	Relief valve spring guide (1021)	1
10.	2-224 <sub>a</sub>	Relief valve cap O-ring (521)	1
	2-228 <sub>a</sub>	Relief valve cap O-ring (1021)	1
11.	1241	Relief valve (521)	1
	1224	Relief valve (1021)	1
12.	1242	Relief valve spring (521)	1
	1226	Relief valve spring (1021)	1
13.	1170	Cam key (521)	1
	1309	Cam key (1021)	1
14.	1168-7	Blade (521)	10
	1308-9	Blade (1021)	10
15.	1166-1X1R	Rotor and shaft assembly (521)	1
	1208-1X1R	Rotor and shaft assembly (1021)	1
16.	1358	Grease seal	2
17.	1164-1	Bearing cap	2
18.	2158	Grease zerk—1/8" NPT	2
19.	1769	Bearing housing	2
20.	1343	Seal vent relief fitting—1/8" NPT	2

Ref No.	Part No.	Description	Qty.
21A.	1769-X <sub>6</sub> <sup>a</sup>	Complete seal assembly kit. Includes bearing housing, seat adapter plate, bearings, retainer rings, seal, and O-rings.	2
21B.	1769-XR <sub>6</sub> <sup>a</sup>	Seal assembly field replacement kit. Includes only the seal and O-rings.	2
22.	1163-2 <sup>d</sup>	Sideplate (521)	2
	1209-1 <sup>d</sup>	Sideplate (1021)	2
23.	1161-4	Head (521)	2
	1205-4	Head (1021)	2
24.	2754-X	Roller bearing—complete	2
	2755	Bearing inner race	2
	2754	Bearing outer race	2
25.	2760-244	Retainer ring	2
26.	1343	Grease relief fitting—1/8" NPT	2
27.	2-128A	Shaft O-ring (Buna-N only)	2
28.	1882	Seat adapter plate	2
29.	2-240 <sub>a</sub>	Adapter plate O-ring	2
30.	2-261 <sub>a</sub>	Case O-ring (521)	2
	2-268 <sub>a</sub>	Case O-ring (1021)	2
31.	2270	Key—1/4"	2
32.	2949	Nameplate	1
33.	3442	Plug—1/4" NPT	1
34.	7001-031NC125A	Hex head bolt—5/16-18x1-1/4 (521)	4
	7001-037NC125A	Hex head bolt—3/8-16x1-1/4 (1021)	4
35.	7001-037NC125A	Hex head bolt—3/8-16x1-1/4 (521)	28
	7001-037NC125A	Hex head bolt—3/8-16x1-1/4 (1021)	32
36.	7001-037NC150A	Hex head bolt—3/8-16x1-1/2	8
37.	Not sold separately <sup>b</sup>	Retainer	2
38.	Not sold separately <sup>b</sup>	Seal seat	2
39.	2-227 <sub>a</sub>	Seal seat O-ring	2
40.	2159	Lubricap #2	2
41.	1359	Lubrication instruction tag	2
42.	7003-004DR0198	Round head plated drive screw—4 x 3/16	2

Material Code	
A	Buna-N
B	Neoprene <sup>®c</sup>
D	Viton <sup>®c</sup>
E	PTFE

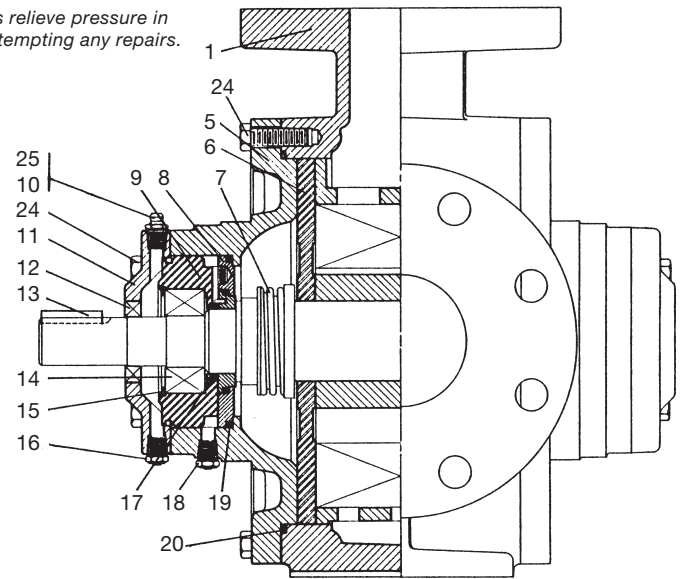
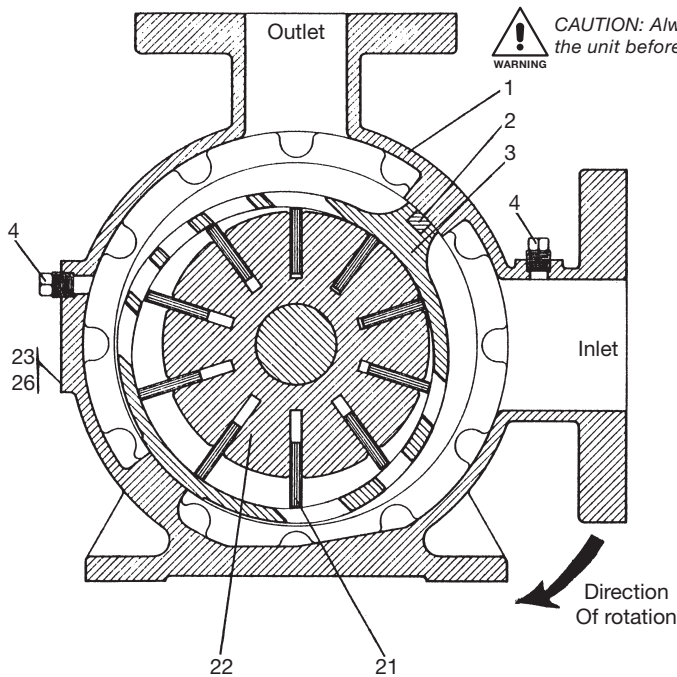
<sup>a</sup> \_ denotes material code. See material code chart for details.

<sup>b</sup> Not sold separately. Available with 1769-X<sub>6</sub><sup>a</sup>, and 1769-XR<sub>6</sub><sup>a</sup> only.

<sup>c</sup> Registered trademark of the DuPont company.

<sup>d</sup> See sideplate replacement instructions.

# Appendix E—Parts Details for Model F1021



Ref No.	Part No.	Description	Qty.
1.	2433	Case	1
2.	1309	Cam key	1
3.	1201-2	Cam	1
4.	3442	Plug—1/8" NPT	2
5.	1205-4	Head	2
6.	1209-1 <sup>d</sup>	Sideplate	2
7.	1769-X <sub>6</sub> <sup>a</sup>	Complete seal assembly kit. Includes bearing housing, seat adapter plate, bearings, retainer rings, seal, and O-rings.	2
	1769-XR <sub>6</sub> <sup>a</sup>	Seal assembly field replacement kit. Includes only the seal and O-rings.	2
8.	1822	Seat adapter plate	2
9.	1769	Bearing house	1
10.	2158	Grease zerk—1/8" NPT	1
11.	1164-1	Bearing cap	2
12.	1358	Grease seal	1
13.	2270	Key—1/4"	1
14.	2754-X	Roller bearing—complete	2
	2755	Bearing inner race	2
	2754	Bearing outer race	2
15.	2760-244	Retainer ring	1
16.	1343	Grease relief fitting—1/8" NPT	2
17.	2-128A	Shaft O-ring (Buna-N only)	1
18.	1343	Seal vent relief fitting—1/8" NPT	1
19.	2-240 <sup>a</sup>	Adapter plate O-ring	1
20.	2-268 <sup>a</sup>	Case O-ring	2

Ref No.	Part No.	Description	Qty.
21.	1308-9	Vane	10
22.	1208-1X1R	Rotor and shaft assembly with 2755	1
23.	2649	Nameplate	1
24.	7001-037NC125A	Hex head bolt—3/8-16x1-1/4"	32
25.	2159	Lubricap #2	2
26.	7012-006SF019E	Round head drive screw—6-32x3/16	6

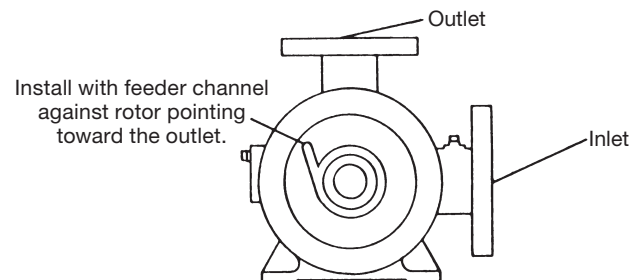
Material Code	
A	Buna-N
B	Neoprene <sup>®b</sup>

<sup>a</sup> \_ denotes material code. See material code chart for details.

<sup>b</sup> Registered trademark of the DuPont company.

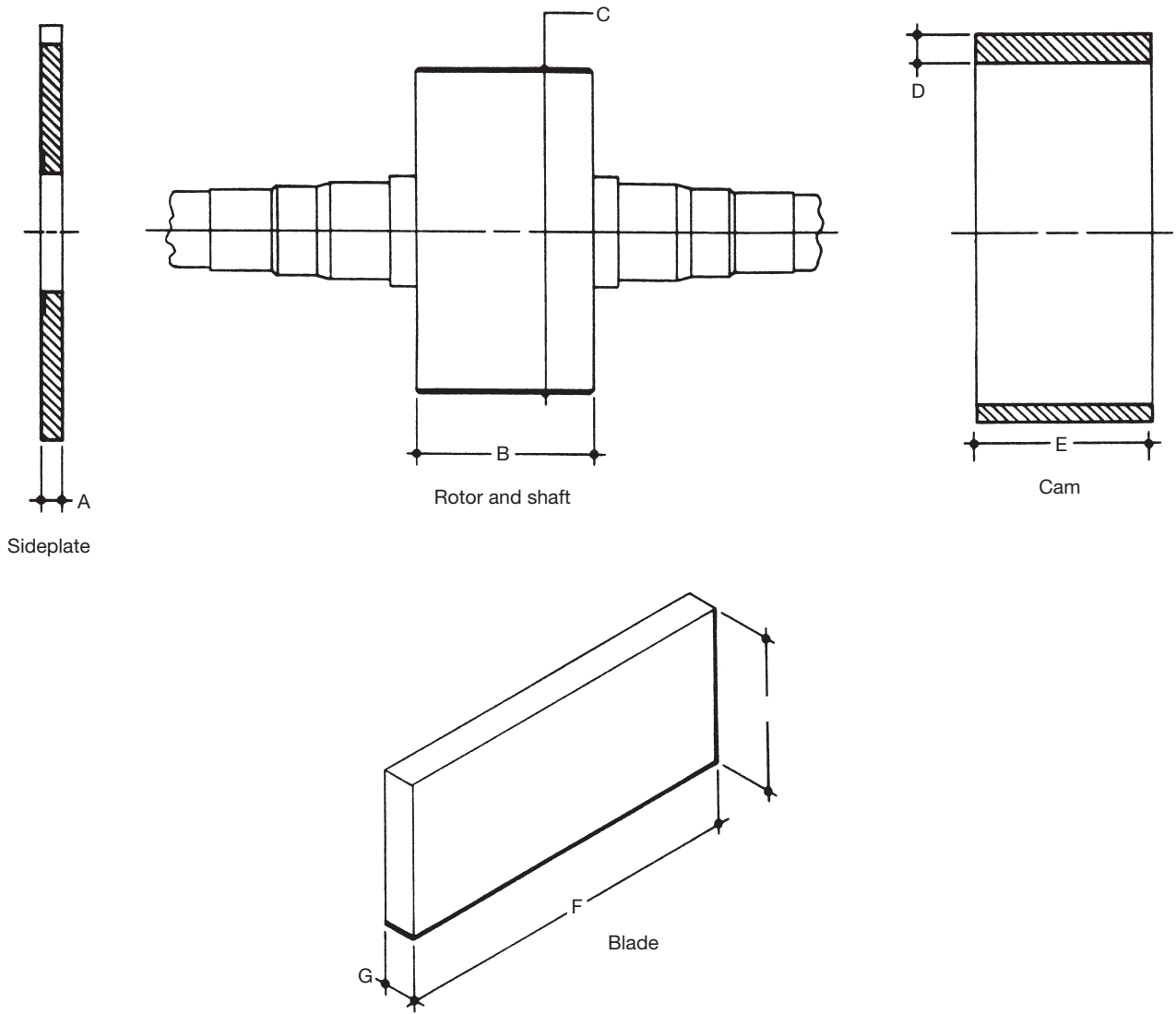
<sup>c</sup> See sideplate replacement instructions.

## Sideplate Replacement Instructions



# Appendix E—Parts Details for Rotor, Blade, Sideplate, and Cam

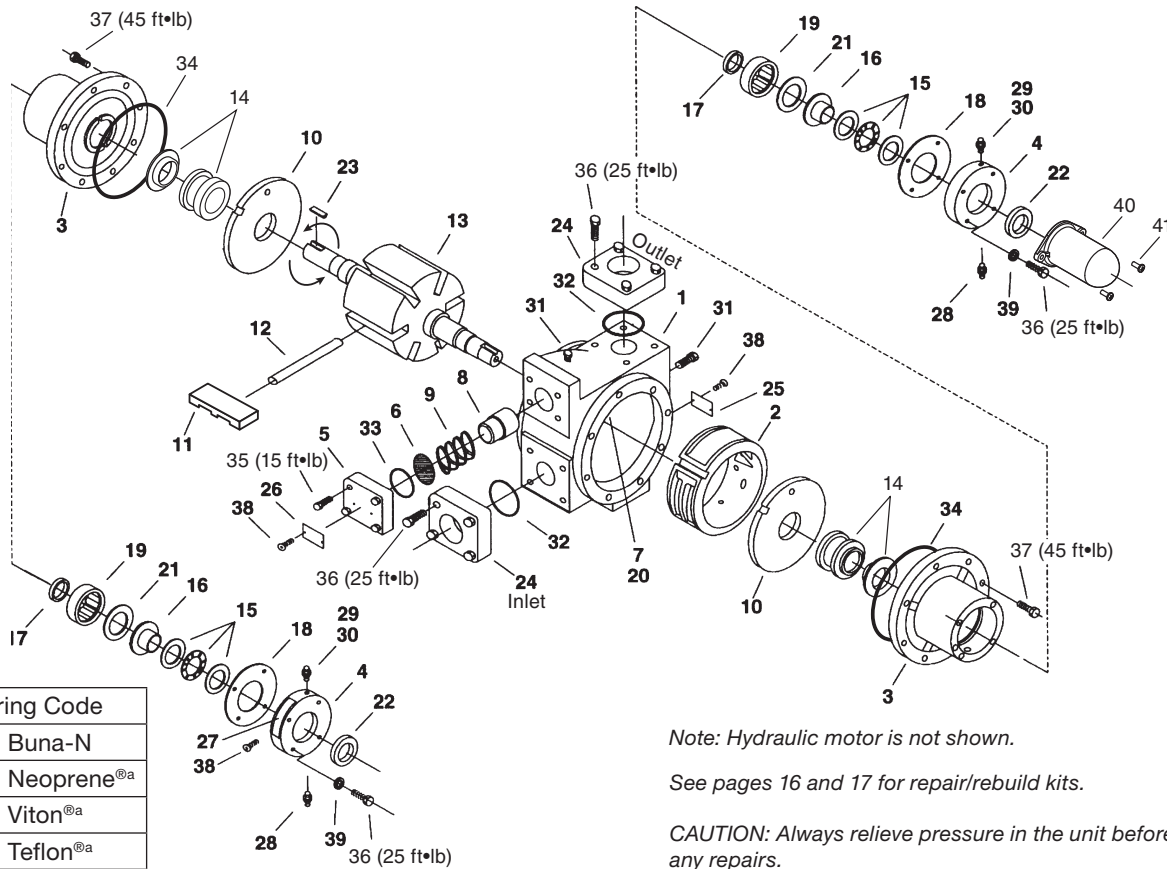
## New Part Interface Dimensions



Model	A (min)	B (max)	C (max)	D (max)	E (min)	F (max)	G (max)	H (nominal)
500	0.373	2.992	5.449	0.750	3.000	2.994	0.230	1.323
1000	0.435	3.993	6.249	1.123	4.002	3.997	0.230	1.500
1500	0.435	6.243	6.125	1.184	6.253	6.229	0.549	1.635



# Appendix E—Parts Details for Models Z/ZH/ZX/ZXH2000



O-ring Code	
A	Buna-N
B	Neoprene <sup>®a</sup>
D	Viton <sup>®a</sup>
E	Teflon <sup>®a</sup>

Note: Hydraulic motor is not shown.

See pages 16 and 17 for repair/rebuild kits.

CAUTION: Always relieve pressure in the unit before attempting any repairs.

Ref. No.	Part No.	Description	Qty
1.	4413	Case	1
2.	4414	Cam	1
3.	4416	Head	2
4.	4417	Bearing cap	2
5.	1174-3	Relief valve cap	1
6.	4282	Shim (Z2000, ZH2000)	1
		Shim (ZX2000, ZXH2000)	3
7.	4424	Cam key	1
8.	4425	Relief valve	1
9.	4426	Relief valve spring (Z2000, ZH2000)	1
	1240	Relief valve spring (ZX2000, ZXH2000)	1
10.	4427	Sideplate	2
11.	4428 <sup>b</sup>	Vane	6
12.	4262-X	Vane driver	3
13.	4430-X2R	Rotor—shaft assembly	1
14.	4431-X_2 <sup>c</sup>	Mech seal assy—cast iron	2
	4431-X_6 <sup>c</sup>	Mech seal assy—silicon carbide	2
15.	4432	Thrust bearing assembly	2
16.	4435	Bearing race mounting ring	2
17.	4438	Grease seal	2
18.	4439	Bearing cap shim (.002) red	As req.
	4439-1	Bearing cap shim (.010) brown	
	4439-2	Bearing cap shim (.020) yellow	
19.	2754-X	Roller bearing	2
20.	3253	Cam key pin	2

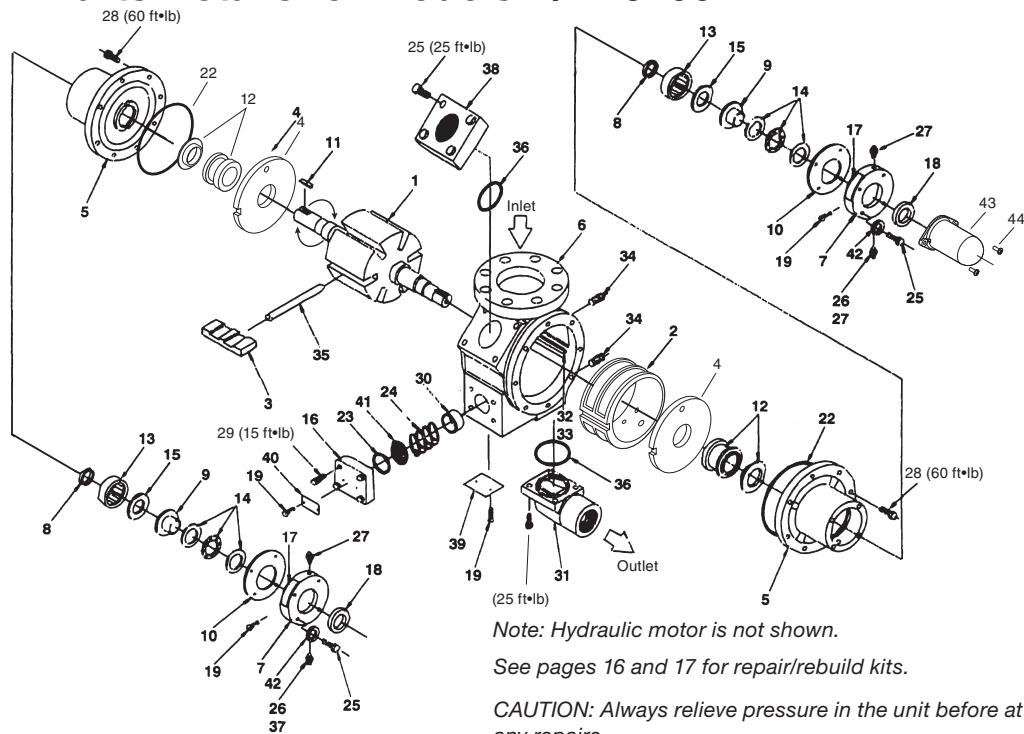
Ref. No.	Part No.	Description	Qty
21.	2760-244	Retainer ring	2
22.	4441	Grease seal	2
23.	2270	Shaft key—1/4" x 1-9/16"	2
24.	4479-2	Flange—2" NPT	2
	4479-2S	Flange—2" welded	
25.	2649	Nameplate	1
26.	4248	Relief valve nameplate (Z2000, ZH2000)	1
	4248-1	Relief valve nameplate (ZX2000, ZXH2000)	1
27.	1359	Lubrication instruction plate	2
28.	1343	1/8" NPT relief fitting	2
29.	2158	1/8" NPT grease zerk	2
30.	2159	Lubricap	2
31.	3442	1/4" NPT pipe plug	2
32.	2-231_ <sup>c</sup>	O-ring—flange	2
33.	2-224_ <sup>c</sup>	O-ring—relief valve cap	1
34.	2-261_ <sup>c</sup>	O-ring—case	2
35.	7001-031-NC125A	Bolt—hexagon head	4
36.	7001-037-NC150A	Bolt—hexagon head	16
37.	7001-043-NC125A	Bolt—hexagon head	16
38.	7012-006-SF025E	Screw	8
39.	7206-037A	Lockwasher	8
40.	4985	Shaft protector	1
41.	7012-010SF050E	Screw	2

<sup>a</sup>Registered trademark of the DuPont company.

<sup>b</sup>Slots in vanes must face TOWARDS the direction of rotation.

<sup>c</sup>\_ denotes O-ring code. See chart above.

# Appendix E—Parts Details for Models Z/ZH3200



O-ring Code	
A	Buna-N
B	Neoprene <sup>®a</sup>
D	Viton <sup>®a</sup>
E	Teflon <sup>®a</sup>

Note: Hydraulic motor is not shown.

See pages 16 and 17 for repair/rebuild kits.

CAUTION: Always relieve pressure in the unit before attempting any repairs.

Ref. No.	Part No.	Description	Qty
1.	4495-X2R	Rotor shaft assembly	1
2.	4242	Cam	1
3.	4232 <sup>c</sup>	Vane	6
4.	4231	Sideplate	2
5.	4488	Head	2
6.	4239	Case	1
7.	4417	Bearing cap	2
8.	4438	Grease seal	2
9.	4435	Mounting ring	2
10.	4439	Bearing shim (.002) red	As req.
	4439-1	Bearing shim (.010) brown	
	4439-2	Bearing shim (.020) yellow	
11.	2270	Shaft key	2
12.	4431-X_2 <sup>b</sup>	Mechanical seal assembly—cast iron	2
	4431-X_6 <sup>b</sup>	Mechanical seal assembly—silicon carbide	2
13.	2754	Bearing outer race	2
14.	4432	Thrust bearing assembly	2
15.	2760-244	Retainer ring	2
16.	1174-2	Relief valve cap	1
17.	1359	Lubrication instruction plate	2
18.	4441	Grease seal	2
19.	7012-006SF019E	Screw	8
20.	—	Not shown	—
21.	—	Not shown	—
22.	2-262_ <sup>b</sup>	O-ring—case	2
23.	2-224_ <sup>b</sup>	O-ring—relief valve cap	1
24.	1240	Relief valve spring	1

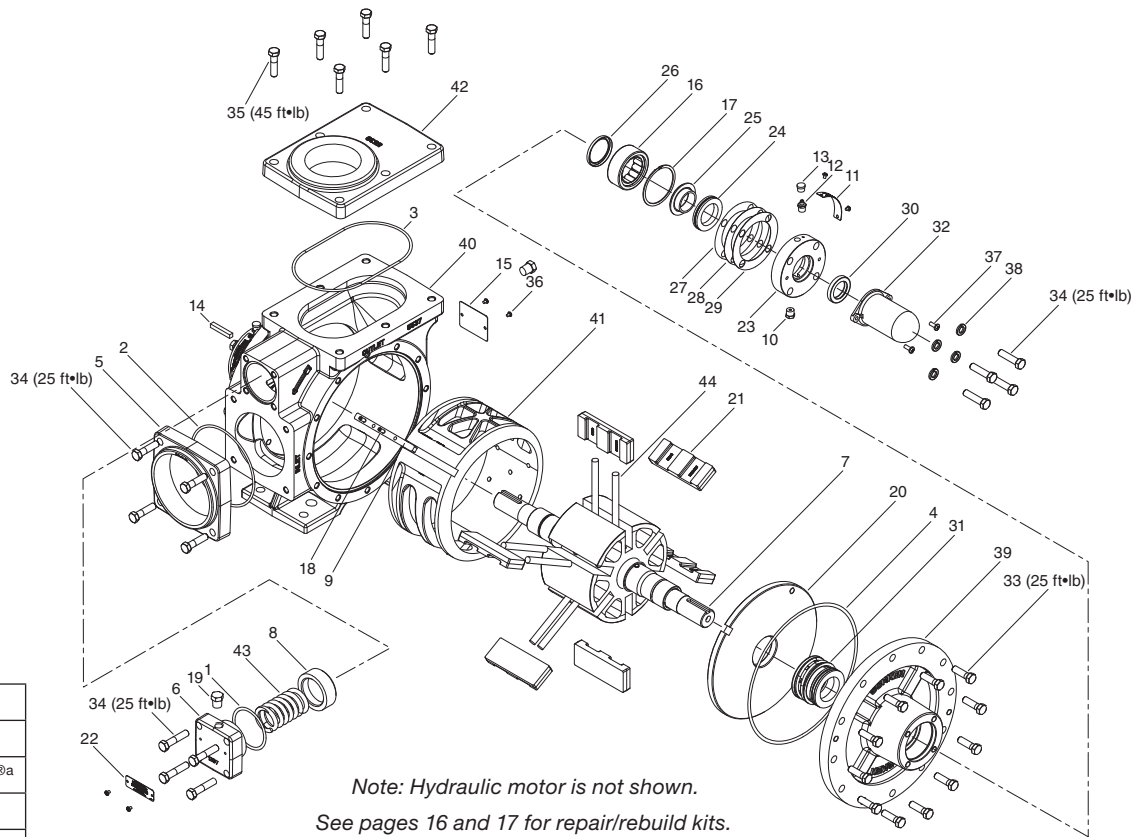
Ref. No.	Part No.	Description	Qty
25.	7001-037NC150A	Bolt—3/8-16 x 1-1/2" hex head	16
26.	2158	1/8" NPT grease zerk	2
27.	1343	1/8" NPT relief fitting	2
28.	7001-050NC150A	Bolt—1/2-13 x 1-1/2" hex head	16
29.	7001-031NC125A	Bolt—5/16-16 x 1-1/4" hex head	4
30.	1241	Relief valve	1
31.	1172-1.5	Outlet flange—1.5" NPT	1
	1172-1.5S	Outlet flange—1.5" WF	1
	1172-2	Outlet flange—2" NPT	1
	1172-2S	Outlet flange—2" WF	1
	1947	Outlet flange—1.5" NPT ell	1
	4243	Outlet flange—2" NPT ell	1
32.	4241	Cam key	1
	3253	Cam key pin	1
33.	3442	1/4" NPT pipe plug	1
34.	4262-X	Vane driver	3
35.	2-234_ <sup>b</sup>	O-ring—flange	1
36.	2159	Lubricap	2
37.	1172-1.5	Aux. inlet flange—1.5" NPT	1
	1172-15S	Aux. inlet flange—1.5" WF	1
	1172-2	Aux. inlet flange—2" NPT	1
	1172-2S	Aux. inlet flange—2" WF	1
	1920-3	Aux. inlet flange—blind	1
	4243	Aux. inlet flange—2" NPT ell	1
38.	2649	Nameplate	1
39.	4248	Relief valve nameplate	1
40.	4282	Relief valve shim	As req.
41.	7206-037A	3/8" lockwasher	8
42.	4985	Shaft protector	1
43.	7012-010SF050E	Screw	2
44.			

<sup>a</sup>Registered trademark of the DuPont company.

<sup>b</sup>\_ denotes O-ring code. See chart above.

<sup>c</sup>Slots in vanes must face TOWARDS the direction of rotation

# Appendix E—Parts Details for Models Z3500



O-ring Code	
A	Buna-N
B	Neoprene <sup>®a</sup>
D	Viton <sup>®a</sup>
E	Teflon <sup>®a</sup>

Ref. No.	Part No.	Description	Qty
1.	2-228 <sup>b</sup>	O-ring	1
2.	2-245 <sup>b</sup>	O-ring	1
3.	2-259 <sup>b</sup>	O-ring	1
4.	2-268 <sup>b</sup>	O-ring	2
5.	1206-3	Inlet flange—3" NPT	1
	1206-4	Inlet flange—4" NPT	1
	1206-3S	Inlet flange—3" WF	1
	1206-4S	Inlet flange—4" WF	1
6.	1207-2	Relief valve cap	1
7.	1208-1X6R	Rotor shaft assembly	1
8.	1224	Relief valve	1
9.	1309	Cam key	1
10.	1343	Grease relief fitting	2
11.	1359	Lubrication plate	2
12.	2158	Grease zerk	2
13.	2159	Lubricap	2
14.	2270	Shaft key—1/4"	1
15.	2649	Nameplate	1
16.	2754-X	Roller bearing	2
17.	2760-244	Retainer ring	2
18.	3253	Cam key pin	2
19.	3442	Pipe plug—1/4" NPT	2
20.	3935	Sideplate	2
21.	3936 <sup>c</sup>	Vane	6
22.	4248	Relief valve warning tag	1

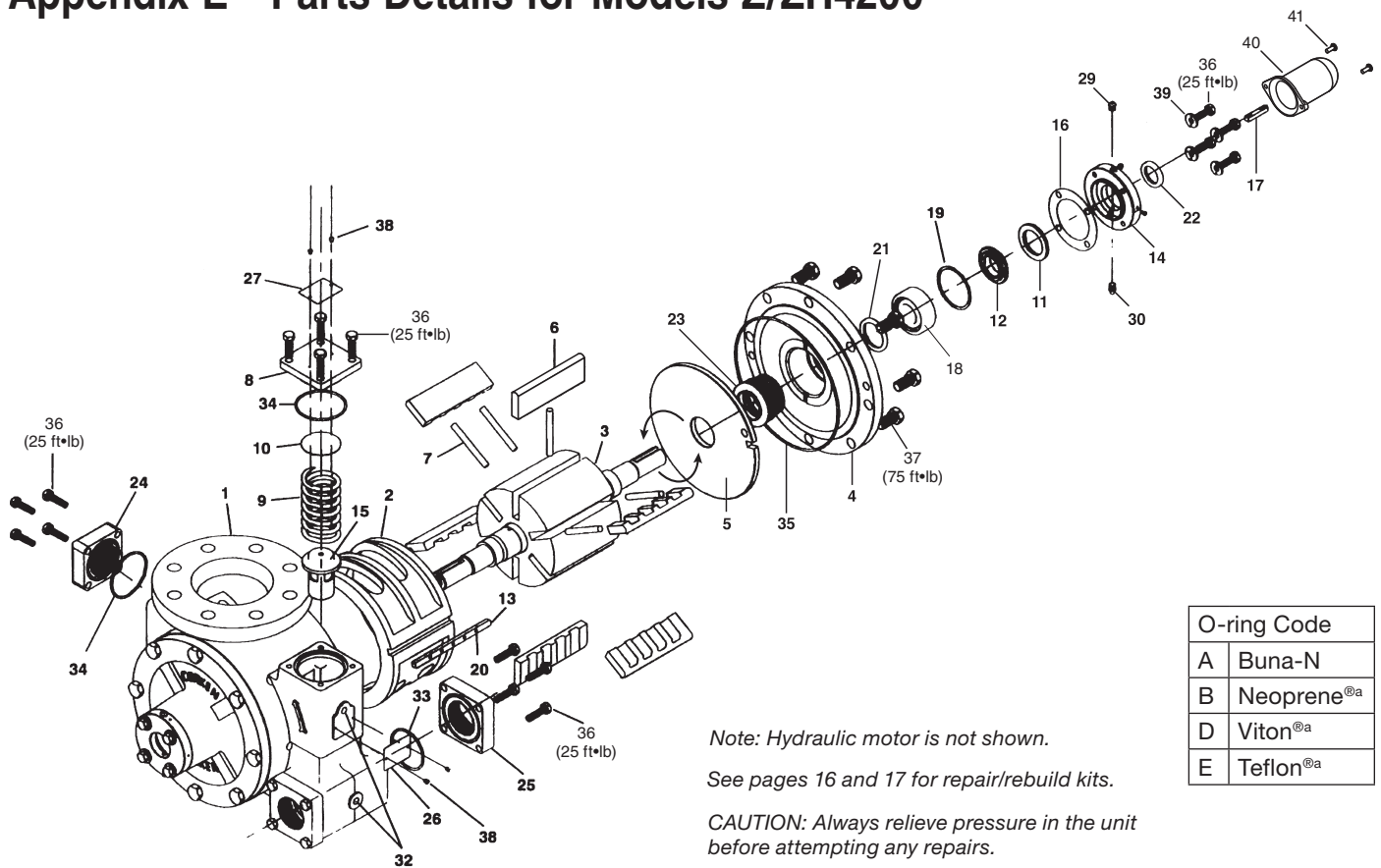
Ref. No.	Part No.	Description	Qty
23.	4417	Bearing cap	2
24.	4432	Thrust bearing assembly	2
25.	4435	Thrust bearing mounting ring	2
26.	4438	Grease seal / Oil seal	2
27.	4439	Bearing cap shim—0.002"	2
28.	4439-1	Bearing cap shim—0.010"	2
29.	4439-2	Bearing cap shim—0.020"	2
30.	4441	Grease seal	2
31.	6660-X_2 <sup>b</sup>	Mechanical seal assembly—cast iron	2
	6660-X_6 <sup>b</sup>	Mechanical seal assembly—silicon carbide	2
32.	4985	Shaft protector	1
33.	7001-037NC125A	Hex head bolt	24
34.	7001-037NC150A	Hex head bolt	16
35.	7001-043NC150A	Hex head bolt	6
36.	7012-006SF019E	Screw	9
37.	7012-010SF050E	Screw	2
38.	7206-037A	Lock washer—0.375"	8
39.	5534	Head	2
40.	5537	Case	1
41.	5539	Cam	1
42.	5538	Outlet flange—3" NPT Elongated	1
	5538-3S	Outlet flange—3" WF Elongated	1
43.	5548	Spring	1
44.	5554-X	Vane driver	6

<sup>a</sup>Registered trademarks of the DuPont company.

<sup>b</sup> \_ denotes O-ring code. See chart above.

<sup>c</sup>Slots in vanes must face TOWARDS the direction of rotation

# Appendix E—Parts Details for Models Z/ZH4200



Ref. No.	Part No.	Description	Qty
1.	4442 <sup>b</sup>	Case	1
2.	4443 <sup>b</sup>	Cam	1
3.	4444-X2R <sup>b</sup>	Rotor-shaft assembly	1
4.	4445 <sup>b</sup>	Head	2
5.	4446	Sideplate	2
6.	4448 <sup>c</sup>	Vane	6
7.	4449-X	Vane driver	5
8.	4450	Relief valve cap	1
9.	4451	Relief valve spring	1
10.	4452	Shim	1
11.	4453	Thrust bearing assembly	2
12.	4454	Bearing race mounting ring	2
13.	4455	Cam key	1
14.	4456	Bearing cap	2
15.	4457	Relief valve	1
16.	4458	Bearing cap shim (.002) red	As req.
	4458-1	Bearing cap shim (.010) brown	
	4458-2	Bearing cap shim (.020) yellow	
17.	4459	Shaft key—5/16 x 1-3/4	1
18.	4460-X	Roller bearing	2
19.	2760-283	Retainer ring	2
20.	3253	Cam key pin	5
21.	4462	Grease seal	2

Ref. No.	Part No.	Description	Qty
22.	4463	Grease seal	2
23.	4464-X_2 <sup>b</sup>	Mechanical seal assembly—cast iron	2
	4464-X_6 <sup>b</sup>	Mechanical seal assembly—silicon carbide	2
24.	1172-2	Aux. inlet flange—2" NPT	1
	1172-2S	Aux. inlet flange—2" WF	1
	1920-3	Aux. inlet flange—blind	1
25.	4479-2 <sup>d</sup>	Discharge flange—2" NPT	2
	4981-2	Discharge flange—2" NPT	2
26.	2649	Nameplate	1
27.	4248	Relief valve nameplate	1
28.	1359	Lubrication instruction plate	2
29.	1343	1/8 NPT relief fitting	2
30.	2158	1/8 NPT grease zerk	2
31.	2159 <sup>b</sup>	Lubricap	2
32.	3442	1/4 NPT pipe plug	2
33.	2-231_ <sup>b</sup>	O-ring—discharge flange	2
34.	2-234_ <sup>b</sup>	O-ring—auxiliary inlet flange	1
35.	2-270_ <sup>b</sup>	O-ring—case	2
36.	7001-037NC150A	Bolt—hexagon head	24
37.	7001-062NC125A	Bolt—hexagon head	16
38.	7012-006SF019E	Screw	8
39.	7206-037A	Lockwasher	8
40.	4985	Shaft protector	1
41.	7012-010SF050E	Screw	2

<sup>a</sup>Registered trademark of the DuPont company.

<sup>b</sup> \_ denotes O-ring code. See chart above.

<sup>c</sup>Slots in vanes must face TOWARDS the direction of rotation

<sup>d</sup>Prior to January 1998.

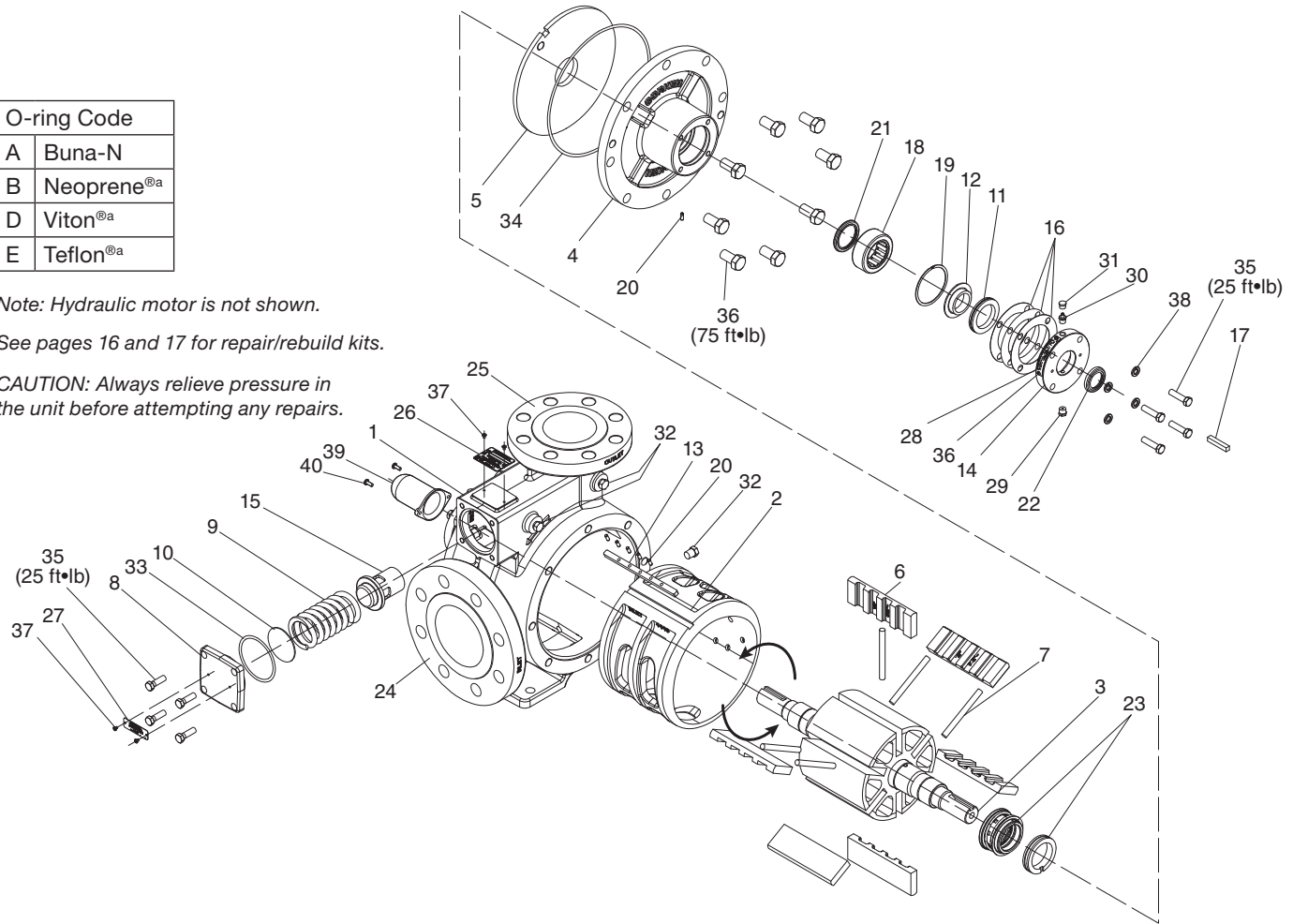
# Appendix E—Parts Details for Model Z4500

O-ring Code	
A	Buna-N
B	Neoprene <sup>®a</sup>
D	Viton <sup>®a</sup>
E	Teflon <sup>®a</sup>

Note: Hydraulic motor is not shown.

See pages 16 and 17 for repair/rebuild kits.

CAUTION: Always relieve pressure in the unit before attempting any repairs.



Ref. No.	Part No.	Description	Qty
1.	5522	Case	1
2.	4443	Cam	1
3.	4444-X2R	Rotor-shaft assembly	1
4.	4445	Head	2
5.	4446	Sideplate	2
6.	4448 <sup>c</sup>	Vane	6
7.	4449-X	Vane driver	5
8.	4450	Relief valve cap	1
9.	4451	Relief valve spring	1
10.	4452	Shim	1
11.	4453	Thrust bearing assembly	2
12.	4454	Bearing race mounting ring	2
13.	4455	Cam key	1
14.	4456	Bearing cap	2
15.	4457	Relief valve	1
16.	4458	Bearing cap shim (.002) red	As req.
	4458-1	Bearing cap shim (.010) brown	
	4458-2	Bearing cap shim (.020) yellow	
17.	4459	Shaft key—5/16 x 1-3/4	1
18.	4460-X	Roller bearing	2
19.	2760-283	Retainer ring	2

Ref. No.	Part No.	Description	Qty
20.	3253	Cam key pin	5
21.	4462	Grease seal	2
22.	4463	Grease seal	2
23.	4464-X_2 <sup>b</sup>	Mechanical seal assembly—cast iron	2
	4464-X_6 <sup>b</sup>	Mechanical seal assembly—silicon carbide	2
24.	---	Inlet flange—4" ANSI	1
25.	---	Outlet flange—3" ANSI	1
26.	2649	Nameplate	1
27.	4248	Relief valve nameplate	1
28.	1359	Lubrication instruction plate	2
29.	1343	1/8 NPT relief fitting	2
30.	2158	1/8 NPT grease zerk	2
31.	2159	Lubricap	2
32.	3442	1/4 NPT pipe plug	2
33.	2-234_ <sup>b</sup>	O-ring—relief valve	1
34.	2-270_ <sup>b</sup>	O-ring—case	2
35.	7001-037NC150A	Bolt—hexagon head	16
36.	7001-062NC125A	Bolt—hexagon head	16
37.	7012-006SF019E	Screw	8
38.	7206-037A	Lockwasher	8
39.	4985	Shaft cover	1
40.	7012-010SF050E	Screw	2

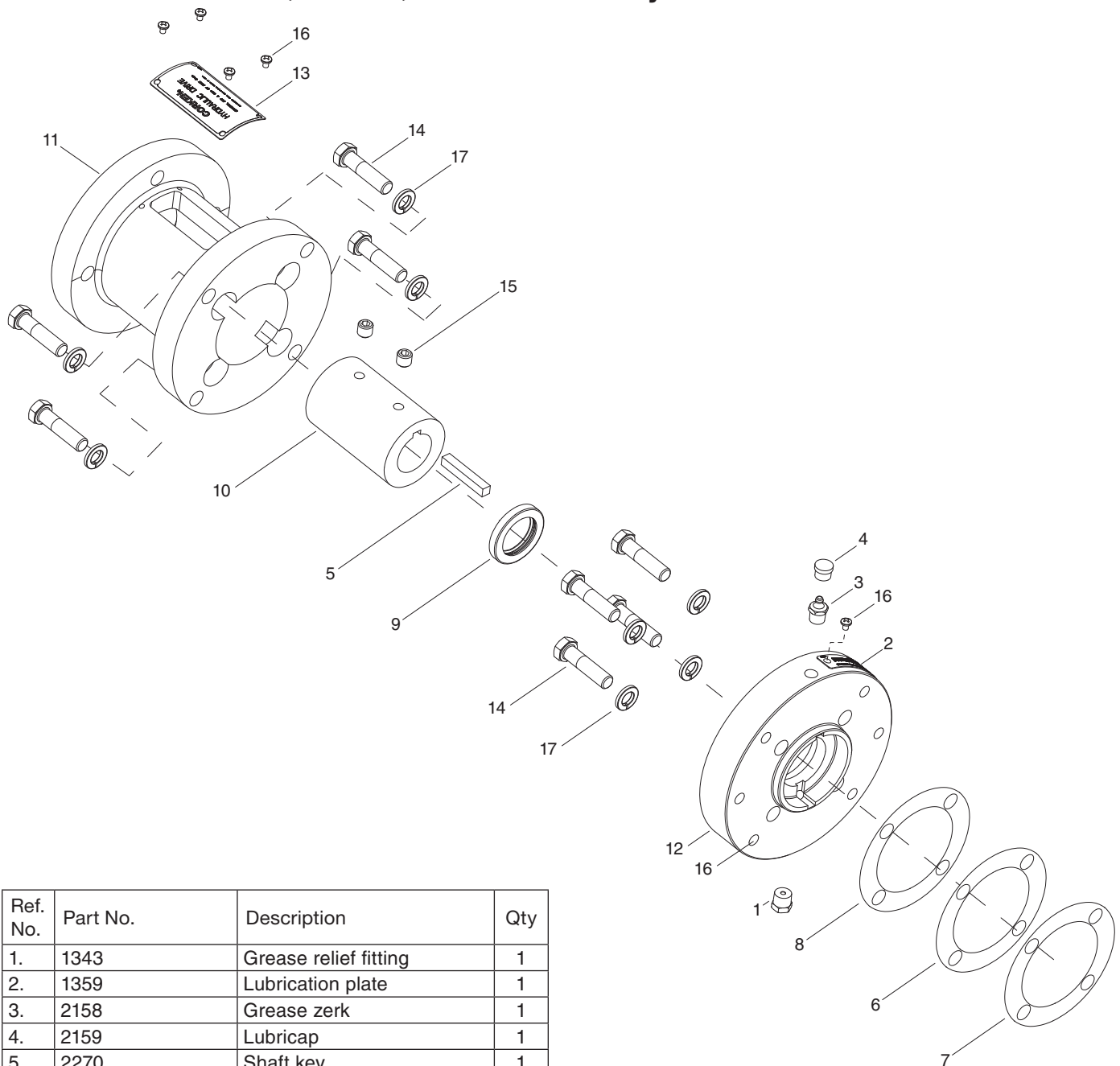
<sup>a</sup>Registered trademark of the DuPont company.

<sup>b</sup> \_ denotes O-ring code. See chart above.

<sup>c</sup>Slots in vanes must face TOWARDS the direction of rotation

# Appendix E—Parts Details for Hydraulic Adapter (4496-X1)

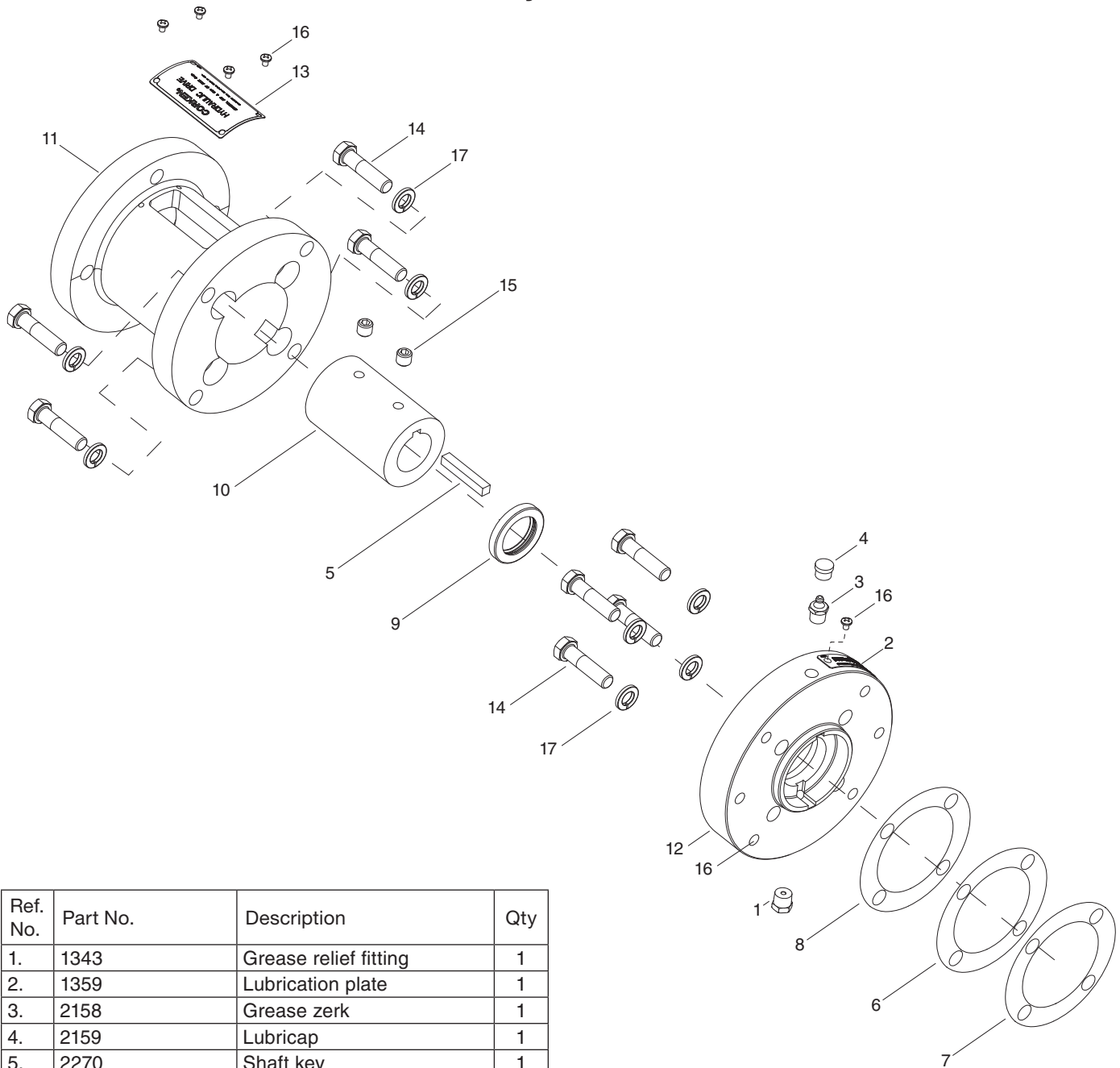
## Fits Models Z2000, Z3200, and Z3500 Only



Ref. No.	Part No.	Description	Qty
1.	1343	Grease relief fitting	1
2.	1359	Lubrication plate	1
3.	2158	Grease zerk	1
4.	2159	Lubricap	1
5.	2270	Shaft key	1
6.	4439	Bearing cap shim—0.002"	1
7.	4439-1	Bearing cap shim—0.010"	1
8.	4439-2	Bearing cap shim—0.020"	1
9.	4441	Grease seal	1
10.	4487-1	Hydraulic drive solid coupling	1
11.	4496	Hydraulic drive bracket	1
12.	4497	Hydraulic drive bearing cap	1
13.	4499	Hydraulic drive name plate	1
14.	7001-037NC150A	Bolt—hexagon head	8
15.	7006-037NC037A	Set screw	2
16.	7012-006SF019E	Screw	6
17.	7206-037A	Lock washer—0.375"	8

# Appendix E—Parts Details for Hydraulic Adapter (4496-1X1)

## Fits Models Z4200 and Z4500 Only



Ref. No.	Part No.	Description	Qty
1.	1343	Grease relief fitting	1
2.	1359	Lubrication plate	1
3.	2158	Grease zerk	1
4.	2159	Lubricap	1
5.	2270	Shaft key	1
6.	4439	Bearing cap shim—0.002"	1
7.	4439-1	Bearing cap shim—0.010"	1
8.	4439-2	Bearing cap shim—0.020"	1
9.	4463	Grease seal	1
10.	4487-2	Hydraulic drive solid coupling	1
11.	4496-1	Hydraulic drive bracket	1
12.	4939	Hydraulic drive bearing cap	1
13.	4499	Hydraulic drive name plate	1
14.	7001-037NC150A	Bolt—hexagon head	8
15.	7006-037NC037A	Set screw	2
16.	7012-006SF019E	Screw	6
17.	7206-037A	Lock washer—0.375"	8