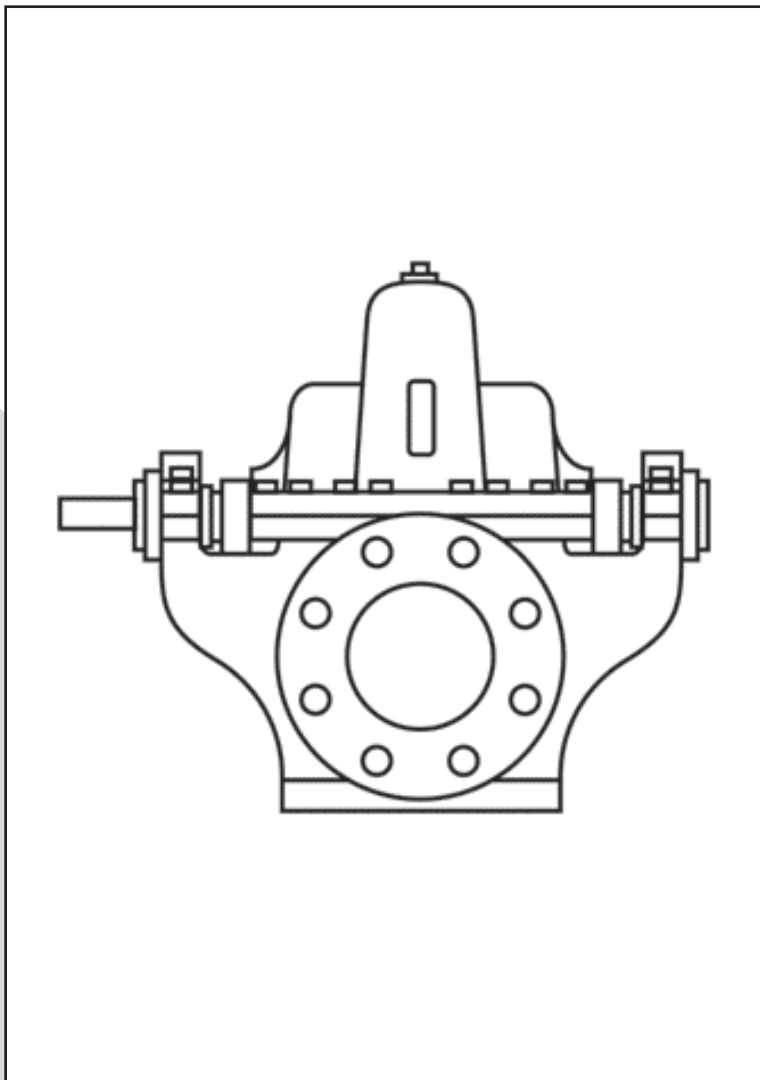


SPLIT-CASE PUMPS



ENGLISH: PAGES 2-40

INSTRUCTION AND REPAIR MANUAL

NOTE! To the installer: Please make sure you provide this manual to the owner of the equipment or to the responsible party who maintains the system.

1800 Split Case Pumps Repair Parts Index Table of Contents

Pump Model	Power Series	Description	Page
1810, 1820, 1840	1	2 x 2-1/2 x 9, 2 x 2-1/2 x 10, 2 x 2-1/2 x 12	6-7
1810, 1820, 1840	2	2-1/2 x 3 x 10B, 2-1/2 x 3 x 12 3 x 4 x 10B & C, 3 x 4 x 14, 4 x 5 x 10B	8-9
1810, 1820, 1840	3	4 x 5 x 11A & C, 4 x 5 x 15	10-11
1810, 1820, 1840	4	4 x 6 x 18B, 5 x 6 x 11A & C, 5 x 6 x 15, 5 x 6 x 17, 6 x 8 x 11, 8 x 8 x 11B	12-13
1810, 1820, 1840	4A	6 x 8 x 11HH	14-15
1810, 1820, 1840	5A	6 x 8 x 14HH	16-17
1810, 1820, 1840	5	6 x 8 x 15, 6 x 8 x 18A, B & C, 6 x 8 x 20, 8 x 10 x 12 & 12A, 8 x 10 x 15A & B, 8 x 10 x 17B	18-19
1810, 1820, 1840	6B	8 x 10 x 21, 8 x 10 x 21A, 10 x 12 x 12B, 10 x 12 x 18B & C, 10 x 12 x 18	20-21
1810, 1820, 1840	7A	10 x 12 x 18D	22
1810, 1820, 1840	7	12 x 14 x 15B, 12 x 14 x 18A, 14 x 16 x 18	23

Split Case Model Designations

1810 = Vertical Flexible Shaft
1820 = Horizontal Flex Coupled
1840 = Vertical Flex Coupled

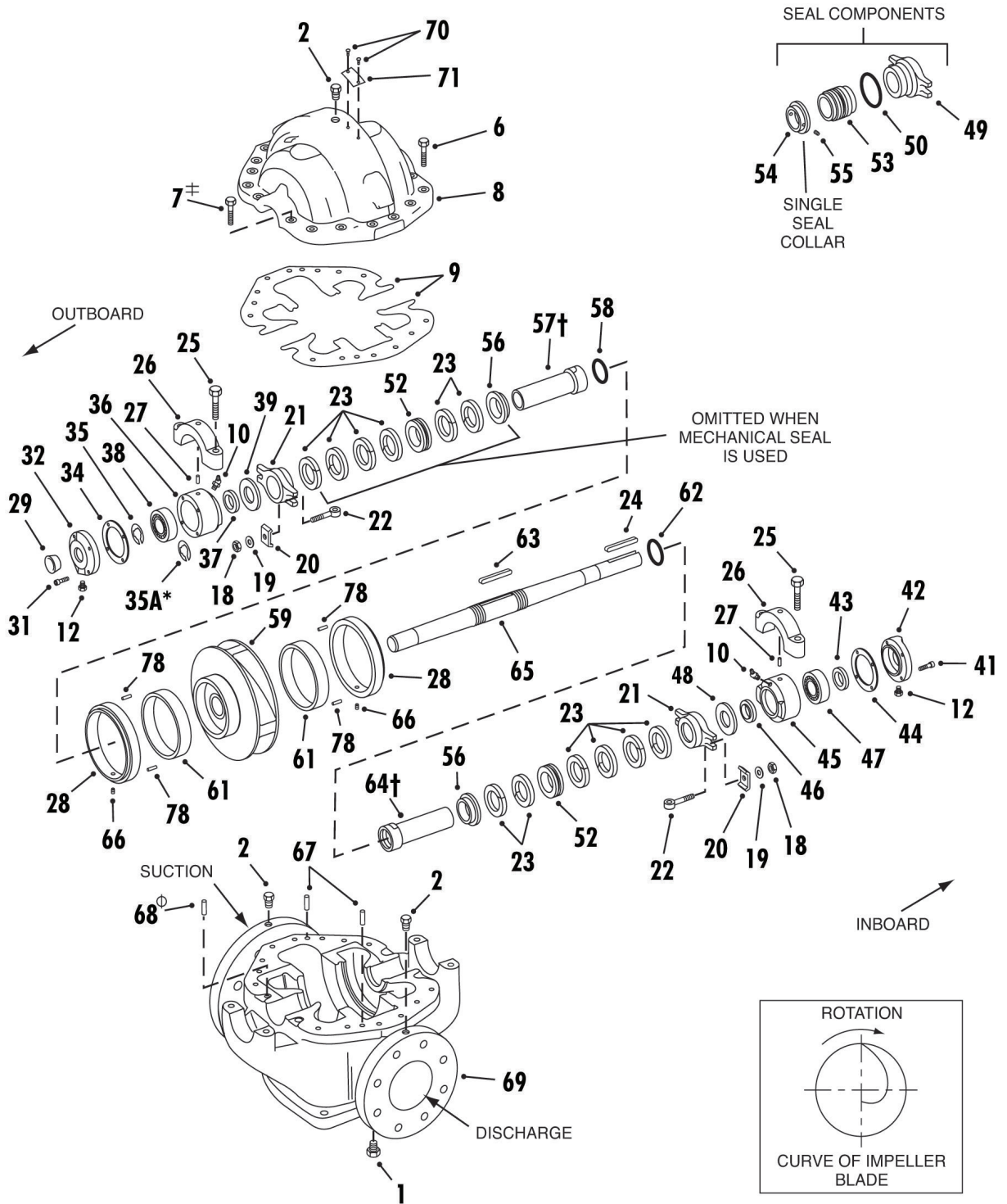
Note: Pumps are generally built in one of five (5) materials of construction:

B.F. = Bronze Fitted
S. F. = Standard Fitted
A. B. = All Bronze

A. I. = All Iron
S. S. = Stainless Steel

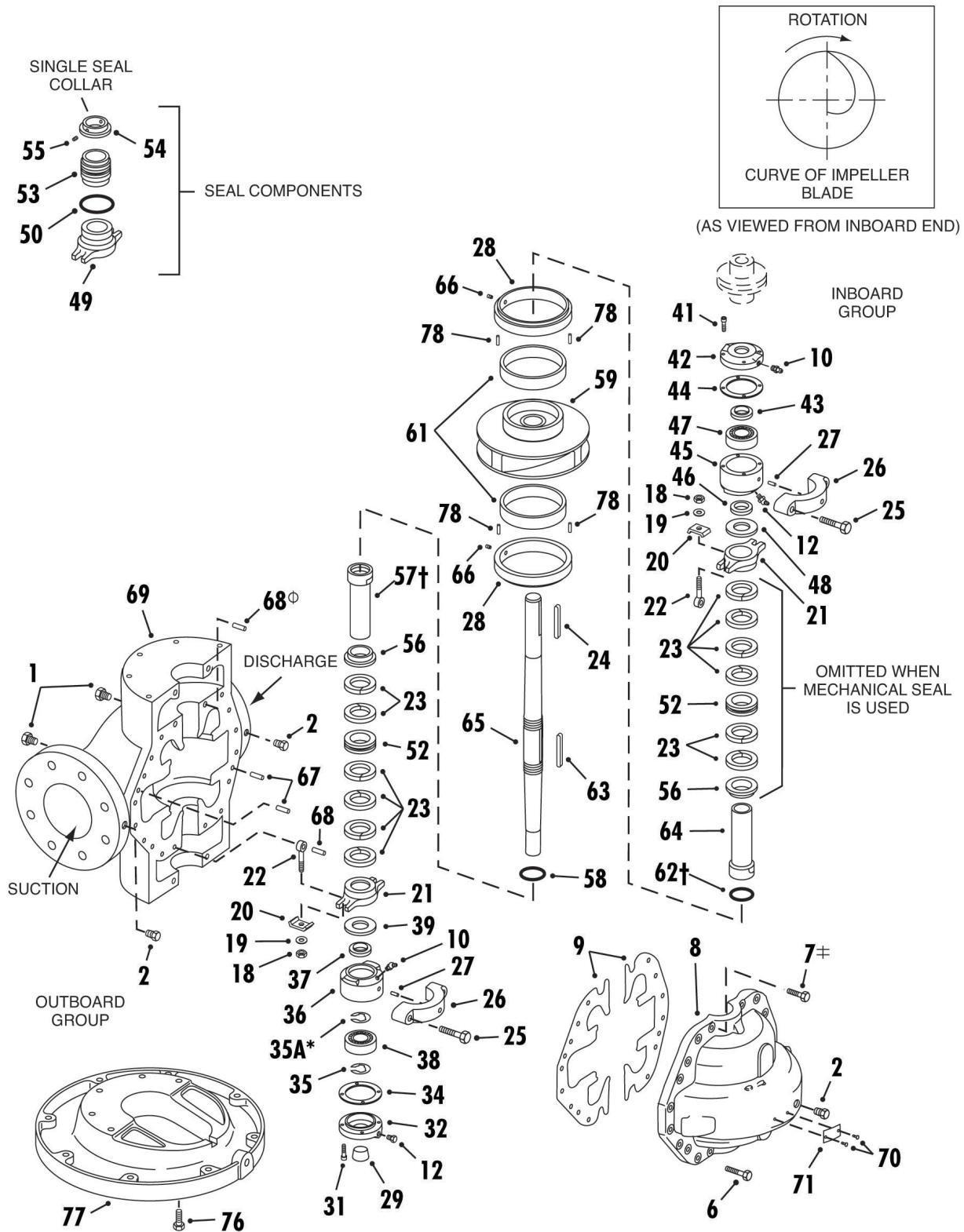
The only difference between B.F. and S.F. is the impeller material. B.F. pumps have bronze impellers, and S.F. pumps have cast iron impellers.

MODEL 1820 PIECE NUMBERS



* POWER FRAMES 6B, 7A & 7 ONLY.
 † PC. NO. 7 NOT REQUIRED FOR PS #1 & #2. REFER PC. NO. 68.
 Φ PC. NO. 68 FOR PS #1 & #2 ONLY. FOR OTHER PS REFER PC. NO. 7.
 † FOR 10x12x18D, SHAFT SLEEVE CONSISTS OF PC. NO. 79, PC. NO. 60, PC. NO. 64 AND PC. NO. 72.

MODEL 1810 PIECE NUMBERS



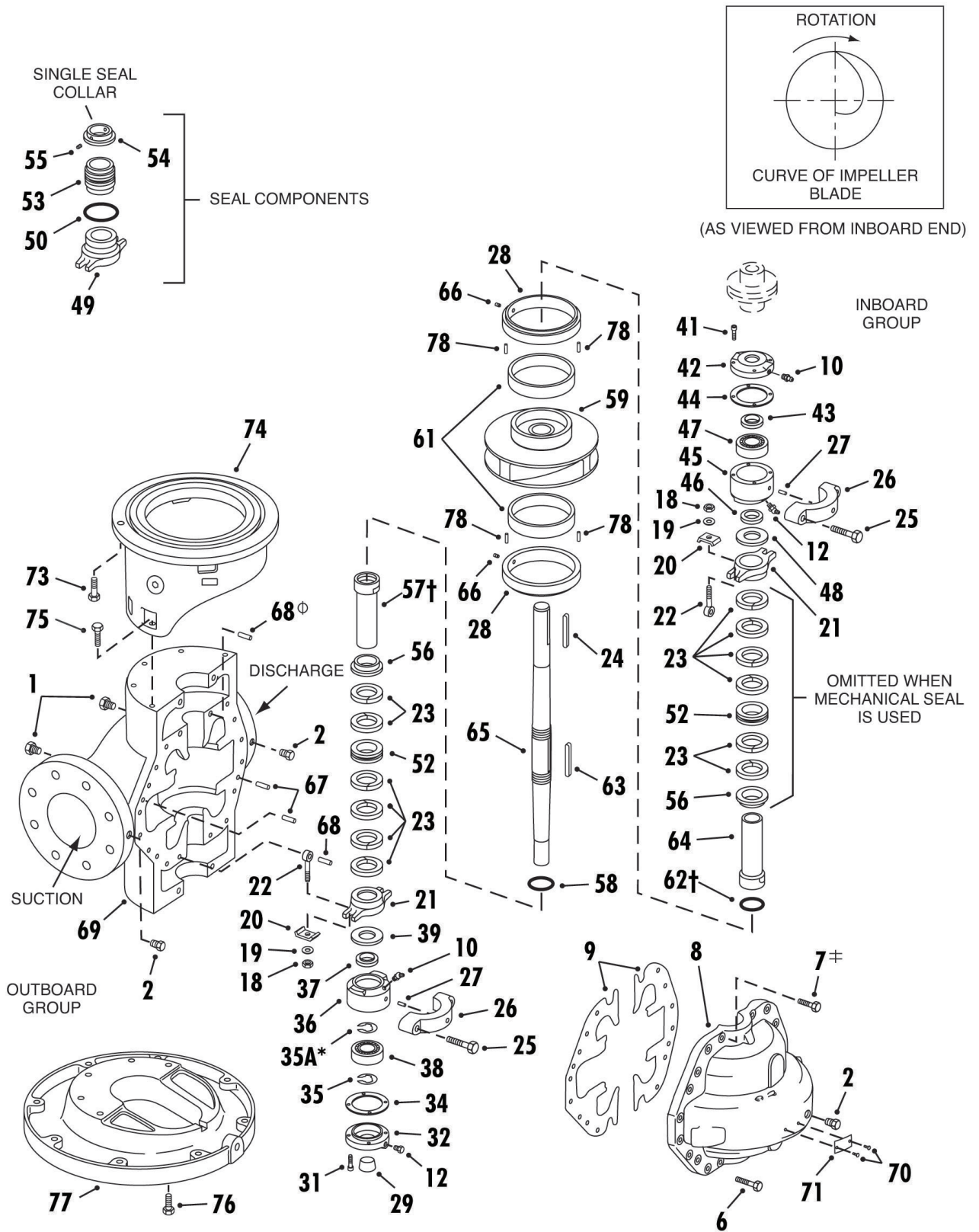
* POWER FRAMES 6B, 7A & 7 ONLY.

± PC. NO. 7 NOT REQUIRED FOR PS #1 & #2. REFER PC. NO. 68.

Φ PC. NO. 68 FOR PS #1 & #2 ONLY. FOR OTHER PS REFER PC. NO. 7.

† FOR 10x12x18D, SHAFT SLEEVE CONSISTS OF PC. NO. 79, PC. NO. 60, PC. NO. 64 AND PC. NO. 72.

MODEL 1840 PIECE NUMBERS



* POWER FRAMES 6B, 7A & 7 ONLY.
 ‡ PC. NO. 7 NOT REQUIRED FOR PS #1 & #2. REFER PC. NO. 68.
 † PC. NO. 68 FOR PS #1 & #2 ONLY. FOR OTHER PS REFER PC. NO. 7.
 † FOR 10x12x18D. SHAFT SLEEVE CONSISTS OF PC. NO. 79, PC. NO. 60, PC. NO. 64 AND PC. NO. 72

MODELS 1810, 1820, 1840 PARTS LIST 2 X 2-1/2 X 9, 2 X 2-1/2 X 10, 2 X 2-1/2 X 12

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
1	PLUG	2	600-0003	087	190	087	104
2	PLUG	5	600-0002	087	190	087	104
6	CAPSCREW 2x9&10 2x2-1/2x12	12	168-0490	082	082	082	104
		16	168-0490	082	082	082	104
7	PIN		REFER PC. NO. 68				
8	CASING HALF	1	INCLUDED WITH NO. 69				
9	GASKET 2x2-1/2x9&10 2x2-1/2x12	1	364-1262	598	598	598	598
		1	364-1256	598	598	598	598
10	GREASE FITTING	2	508-0001	651	651	651	651
12	PLUG	2	600-0001	087	087	087	087
18	NUT	4	544-0107		190	080	104
19	WASHER	4	908-0109		190	080	104
20	GLAND CLAMP	4	204-0120		190	360	104
21	GLAND (PACKING)A&C	2	372-0238	010	208	010	104
22	SWING BOLT	4	100-0216		190	082	104
22A	SWING BOLT ASSY. (18, 19, 20, 22)						
		4	099-0002	644			
23	PACKING	10	564-0152	802	802	802	802
24	KEY	1	472-0208	087	087	087	087
25	CAPSCREW	4	168-0490	082	190	082	104
26	BEARING CAP	2	163-0541	010		010	
27	PIN	2	592-0361	360	107	360	107
28	CASE RING	2	676-1744	208	208	010	107
29	PROTECTOR	1	624-0105	087	087	087	087
31	CAPSCREW	4	168-0015	082	082	082	082
32	CARTRIDGE CAP	1	164-0549	010	010	010	010
34	GASKET	1	364-1308	614	614	614	614
35	RETAINER RING	1	676-0440	088	088	088	088
36	CARTRIDGE	1	176-0064	010	010	010	010
37	GREASE SEAL OIL SEAL	1	712-6322	653	653	653	653
		1	712-0097	653	653	653	653
38	BEARING	1	068-0452	647	647	647	647
39	SLINGER	1	764-1012	478	478	478	478
41	CAPSCREW	4	168-0015	080	080	080	080
42	CARTRIDGE CAP	1	164-0549	010	010	010	010
43	GREASE SEAL OIL SEAL	1	712-6321	653	653	653	653
		1	712-0052	653	653	653	653
44	GASKET	1	364-1308	614	614	614	614
45	CARTRIDGE	1	176-0064	010	010	010	010

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
46	GREASE SEAL OIL SEAL	1	712-6322	653	653	653	653
		1	712-0097	653	653	653	653
47	BEARING	1	068-1905	647	647	647	647
48	SLINGER	1	764-1012	478	478	478	478
49	GLAND (SEAL)	2	372-0285	010	208	010	104
50	O-RING	2	364-0417	457	457	457	457
52	LANTERN RING	2	676-1767	512	512	512	512
53	SEAL	2	712-0907	749	764	749	764
54	COLLAR	2	224-0180	208	208	010	104
55	SETSCREW	4	724-0081	104	104	104	104
56	BUSHING	2	136-1423	208	208	010	104
57	SLEEVE WITH "O" RING SLEEVE (PACKING) (SEALS)	PC. NO. 58 (NOTE 1)					
		1	756-0641	644	644	646	623
		1	756-0641	644	644	623	623
58	O-RING	1	364-0328	457	457	457	457
59	IMPELLER 2x2-1/2x9 2x2-1/2x10 2x2-1/2x12	1	443-2104	225	225	010	104
		1	443-2105	225	225	010	104
		1	443-2106	225	225	010	104
	IMPELLER (FITTED WITH OPT. RING NO. 61)	FOR S.F. CONSTRUCTION USE MATERIAL 655					
	2x2-1/2x9	1	443-2479	643	643	642	646
	2x2-1/2x10	1	443-2476	643	643	642	646
	2x2-1/2x12	1	443-2471	643	643	642	646
61	IMP. RING (OPT.)	BEFORE 10/1/85					
		2	676-1047	208	108	010	104
		AFTER 10/1/85					
		2	676-2043	208	208	010	104
62	O-RING	1	364-0328	457	457	457	457
63	KEY	1	472-0410	107	104	107	104
64	SLEEVE WITH "O" RING SLEEVE (PACKING) (SEALS)	PC. NO. 62 (NOTE 1)					
		1	756-0641	644	644	646	623
		1	756-0641	644	644	623	623
65	SHAFT	1	728-0945	063	104	063	104
66	PIN	2	592-0361	360		360	
		2	592-0051		235		235
67	PIN	2	592-0375	360	107	360	107
68	PIN	4	592-0213	104	104	104	104

NOTE 1) MATERIAL CODE 644 - SLEEVE 208, "O" RING 457
646 - SLEEVE 108, "O" RING 457
623 - SLEEVE 104, "O" RING 457

MODELS 1810, 1820, 1840 PARTS LIST 2 X 2-1/2 X 9, 2 X 2-1/2 X 10, 2 X 2-1/2 X 12

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL				
				B.F.	A.B.	A.I.	S.S.	
69	MODEL 411 PUMPS CASING ASSY. (1, 2, 8, 26, 27, 66)							
	2x2-1/2x9	1	179-1563	010	208	010	104	
	2x2-1/2x10	1	179-1564	010	208	010	104	
	2x2-1/2x12	1	179-1565	010	208	010	104	
	MODEL 412 & 413 PUMPS CASING ASSEMBLY (1, 2, 8, 26, 27, 66)							
	2x2-1/2x9	1	179-1575	010	208	010	104	
	2x2-1/2x10	1	179-1576	010	208	010	104	
	2x2-1/2x12	1	179-1577	010	208	010	104	
	70	DRIVE SCREW	2	708-0013	365	365	365	365
71	NAMEPLATE	2	532-0045	114	114	114	114	
73	CAPSCREW							
	FR. 143HP-256HP	4	168-0388	082	082	082	082	
	FR. 284HPH-445HP	4	168-0566	082	082	082	082	
74	BRACKET							
	FR. 143HP-256HP	1	116-0373	010	010	010	010	
	FR. 284HPH-445HP	1	116-0374	010	010	010	010	
75	CAPSCREW	5	168-0490	082	082	082	082	
76	CAPSCREW	5	168-0490	082	082	082	082	
77	BASE	1	060-0484	010	010	010	010	
78	SETSCREW	NOT REQUIRED						

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.

MODELS 1810, 1820, 1840 PARTS LIST

2-1/2 X 3 X 10B, 2-1/2 X 3 X 12, 3 X 4 X 10B&C, 3 x 4 x 14. 4 x 5 x 10B

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
1	PLUG	2	600-0003	087	190	087	104
2	PLUG	3	600-0002	087	190	087	104
6	CAPSCREW 3x4x14	16	168-0492	082	082	082	082
		20	168-0492	082	082	082	082
7	PIN		REFER PC NO. 68				
8	CASING HALF	1	INCLUDED WITH NO. 69				
9	GASKET 2-1/2x3x10B	1	364-1263	598	598	598	598
	2-1/2x3x12	1	364-1264	598	598	598	598
	3x4x10B&C	1	364-1265	598	598	598	598
	3x4x14	1	364-1266	598	598	598	598
	4x5x10B	1	364-1265	598	598	598	598
10	GREASE FITTING	2	508-0015	651	651	651	651
12	PLUG	2	600-0001	087	087	087	087
12A	PLUG*	6	600-0003	087	087	087	087
18	NUT	4	544-0107		190		104
19	WASHER	4	908-0109		190		104
20	GLAND CLAMP	4	204-0120		190		104
21	GLAND (PACKING)	2	372-0225	010	208	010	104
22	SWING BOLT	4	100-0216		190		104
22A	SWING BOLT ASSY. (18, 19, 20, 22)	4	099-0005	644		644	
23	PACKING	12	564-0151	802	802	802	802
24	KEY	1	472-0247	087	087	087	087
25	CAPSCREW	4	168-0494	080	190	080	104
26	BEARING CAP	2	163-0306	010		010	
27	PIN	2	592-0361	360	107	360	107
28	CASE RING						
	2-1/2x3x10B & 12	2	676-1745	208	208	010	107
	3x4x10B, C & 14	2	676-1746	208	208	010	107
	4x5x10B	2	676-1719	208	208	010	107
29	PROTECTOR	1	624-0080	087	087	087	087
31	CAPSCREW	4	168-0015	082	082	082	082
32	CARTRIDGE CAP	1	164-0531	010	010	010	010
34	GASKET	1	364-1309	614	614	614	614
35	RETAINING RING	1	676-0267	088	088	088	088
36	CARTRIDGE	1	176-0065	010	010	010	010
37	GREASE SEAL	1	712-6324	653	653	653	653
	OIL SEAL	2	712-0053	653	653	653	653

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL				
				B.F.	A.B.	A.I.	S.S.	
38	BEARING	1	068-0454	647	647	647	647	
39	SLINGER	1	764-1017	478	478	478	478	
41	CAPSCREW	4	168-0015	080	080	080	080	
42	CARTRIDGE CAP	1	164-0531	010	010	010	010	
43	GREASE SEAL	1	712-0231	653	653	653	653	
	OIL SEAL	1	712-0016	653	653	653	653	
44	GASKET	1	364-1309	614	614	614	614	
45	CARTRIDGE	1	176-0065	010	010	010	010	
46	GREASE SEAL	1	712-6324	653	653	653	653	
	OIL SEAL	2	712-0053	653	653	653	653	
47	BEARING	1	068-1907	647	647	647	647	
48	SLINGER	1	764-1017	478	478	478	478	
49	GLAND (SEAL)	2	372-0287	010	208	010	104	
50	O-RING	2	364-0420	457	457	457	457	
52	LANTERN RING	2	676-1698	512	512	512	512	
53	SEAL	2	712-0910	749		479		
		2	712-0910		764		764	
54	COLLAR	2	224-0174	208	208	010	104	
55	SETSCREW	4	724-0081	104	104	104	104	
56	BUSHING	2	136-1411	208	208	010	104	
SLEEVE WITH "O" RING PC. NO. 58 (NOTE 1)								
57	SLEEVE (PACKING) (SEALS)	1	756-0642	644	644	646	623	
		1	756-0642	644	644	623	623	
58	O-RING	1	364-0368	457	457	457	457	
59	IMPELLER							
		2-1/2x3x10B	1	443-2295	225	225	010	104
		2-1/2x3x12	1	443-2108	225	225	010	104
		3x4x10B	1	443-2266	225	225	010	104
		3x4x10C & 14	1	443-2110	225	225	010	104
	4x5x10B	1	443-2251	225	225	010	104	
	IMPELLER (FITTED WITH OPT. RING NO. 61)	FOR S.F. CONSTRUCTION						
		USE MATERIAL 655						
		2-1/2x3x10B	1	443-2470	643	643	642	646
2-1/2x3x12		1	443-2475	643	643	642	646	
3x4x10B	1	443-2265	643	643	642	646		
3x4x10C & 14	1	443-1881	643	643	642	646		
4x5x10B	1	443-2468	643	643	642	646		

*USED WITH WATER COOLED CARTRIDGE CAPS ONLY

NOTE 1) MATERIAL CODE 644 - SLEEVE 208, "O" RING 457
646 - SLEEVE 108, "O" RING 457
623 - SLEEVE 104, "O" RING 457

MODELS 1810, 1820, 1840 PARTS LIST
4 x 5 x 11A&C, 4 x 5 x 15

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
1	PLUG	3	600-0004	028	190	028	104
2	PLUG	2	600-0002	087	190	087	104
6	CAPSCREW 4x5x15	14	168-0492	082	082	082	104
		16	168-0492	082	082	082	104
7	CAPSCREW	4	168-0492	082	082	082	104
8	CASING HALF	1	INCLUDED WITH NO. 69				
9	GASKET 4x5x11 A 4x5x11 C	BEFORE MARCH 1979					
		1	364-1267	614	614	614	614
		1	364-1267	614	614	614	614
	GASKET 4x5x11A 4x5x11C 4x5x11D 4x5x15 (ALL)	AFTER MARCH 1979					
		1	364-0099	598	598	598	598
		1	364-0099	598	598	598	598
		1	364-2165	598	598	598	598
		1	364-1268	598	598	598	598
10	GREASE FITTING	2	508-0015	651	651	651	651
12	PLUG	2	600-0001	087	087	087	087
12A	PLUG*	6	600-0003	087	087	087	087
18	NUT	4	544-0109		190	080	104
19	WASHER	4	908-0112		190	080	104
20	GLAND CLAMP	4	204-0120		190	360	104
21	GLAND (PACKING) GLAND (PACKING) 4X5X11D	2	372-0226	010	208	010	104
		1	372-0547	010	208	010	104
22	SWING BOLT	4	100-2011		190	360	104
22A	SWING BOLT ASSY. (18, 19, 20, 22)						
		4	099-0014	644			
23	PACKING	10	564-0175	816	816	816	816
24	KEY	1	472-0318	087	087	087	087
25	CAPSCREW	4	168-0494	080	190	080	104
26	BEARING CAP	2	163-0307	010		010	
27	PIN	2	592-0361	360	107	360	107
28	CASING RING 4x5x11A 4x5x11C 4x5x11D 4x5x15						
		2	676-1720	208	208	010	107
		2	676-1747	208	208	010	107
		2	676-2136	208	208	010	107
		2	676-1747	208	208	010	107
29	PROTECTOR	1	624-0081	087	087	087	087
31	CAPSCREW	4	168-0260	082	082	082	082
32	CARTRIDGE CAP	1	164-0550	010	010	010	010
34	GASKET	1	364-1310	614	614	614	614

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
35	RETAINING RING	1	676-0929	088	088	088	088
36	CARTRIDGE	1	176-0066	010	010	010	010
37	GREASE SEAL OIL SEAL	1	712-6326	653	653	653	653
		1	721-0017	653	653	653	653
38	BEARING	1	068-0455	647	647	647	647
39	SLINGER	1	764-1020	478	478	478	478
41	CAPSCREW	4	168-0260	082	082	082	082
42	CARTRIDGE CAP	1	164-0550	010	010	010	010
43	GREASE SEAL OIL SEAL	1	712-6325	653	653	653	653
		1	712-0019	653	653	653	653
44	GASKET	1	364-1310	614	614	614	614
45	CARTRIDGE	1	176-0066	010	010	010	010
46	GREASE SEAL OIL SEAL	1	712-6326	653	653	653	653
		1	712-0017	653	653	653	653
47	BEARING	1	068-1908	647	647	647	647
48	SLINGER	1	764-1020	478	478	478	478
49	GLAND (SEAL)	2	372-0289	010	208	010	104
50	O-RING	2	364-0423	457	457	457	457
52	LANTERN RING	2	676-1699	512	512	512	512
53	SEAL	2	712-1012	749	764	749	764
54	COLLAR	2	224-0175	208	208	010	104
55	SETSCREW	4	724-0081	104	104	104	104
56	BUSHING	2	136-1412	208	208	010	104
57	SLEEVE WITH "O" RING SLEEVE (PACKING) (SEALS)	PC. NO. 58 (NOTE 1)					
		1	756-0643	644	644	646	623
		1	756-0643	644	644	623	623
58	O-RING	1	364-0372	457	457	457	457
59	IMPELLER 4x5x11A 4x5x11C 4x5x11D 4x5x15						
		1	443-2112	225	225	010	104
		1	443-0147	225	225	010	104
		1	443-2984	225	225	-	-
		1	443-2115	225	225	010	104
	IMPELLER (FITTED WITH OPT. RING NO. 61)	FOR S.F. CONSTRUCTION					
		USE MATERIAL 655					
		1	443-2478	643	643	642	646
		1	443-2466	643	643	642	646
		1	443-1885	643	643	642	646

*USED WITH WATER COOLED CAPS ONLY

NOTE 1) MATERIAL CODE 644 - SLEEVE 208, "O" RING 457
646 - SLEEVE 108, "O" RING 457
623 - SLEEVE 104, "O" RING 457

MODELS 1810, 1820, 1840 PARTS LIST
4 x 5 x 11A&C, 4 x 5 x 15

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
61	IMP. RING (OPT.)		BEFORE 10/1/85				
	4x5x11A	2	676-1893	208	208	010	104
	4x5x11C	2	676-1059	208	208	010	104
	4x5x11 D		N/A	N/A	N/A	N/A	N/A
	4x5x15	2	676-1059	208	208	010	
	IMP. RING (OPT.)		AFTER 10/1/85				
	4x5x11A	2	676-2045	208	208	010	104
	4x5x11C	2	676-2038	208	208	010	104
	4x5x11D		N/A	N/A	N/A	N/A	N/A
	4x5x15	2	676-1059	208	208	010	104
62	O-RING	1	364-0372	457	457	457	457
63	KEY	1	472-0412	107	104	107	104
64	SLEEVE WITH "O" RING	PC. NO. 62 (NOTE 1)					
	SLEEVE (PACKING)	1	756-0643	644	644	646	623
	(SEALS)	1	756-0643	644	644	623	623
	FOR 4X5X11 D	1	756-0763	644	644	645	623
65	SHAFT	1	728-0947	063	104	063	104
66	PIN	2	592-0361	360		360	
		2	592-0051		235		235
	4X5X11 D	2	592-0361	360	235	360	235
67	PIN	2	592-0375	360	107	360	107
68	PIN	NOT REQUIRED					
69	MODEL 411 PUMPS						
	CASING ASSY.						
	(1, 2, 8, 26, 27, 66)						
	4x5x11A	1	179-1363	010	208	010	104
	4x5x11C	1	179-1363	010	208	010	104
	4x5x11 D	1	179-2511	010	208	010	104
	4x5x15	1	179-1364	010	208	010	104
	MODEL 412 & 413						
	PUMPS						
	CASING ASSY.						
	(1, 2, 8, 26, 27, 66)						
	4x5x11A	1	179-1451	010	208	010	104
	4x5x11C	1	179-1451	010	208	010	104
	4x5x11 D	1	179-2518	010	208	010	104
	4x5x15	1	179-1452	010	208	010	104
70	DRIVE SCREW	2	708-0013	365	365	365	365
71	NAMEPLATE	1	532-0045	114	114	114	114

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
73	CAPSCREW						
	FR. 143HP-256HP	4	168-0388	082	082	082	082
	FR. 284HP-445HP	4	168-0570	082	082	082	082
74	BRACKET						
	FR. 143HP-256HP	1	116-0376	010	010	010	010
	FR. 284HP-445HP	1	116-0364	010	010	010	010
75	CAPSCREW	5	168-0562	082	082	082	082
76	CAPSCREW	5	168-0562	082	082	082	082
77	BASE	1	060-0485	010	010	010	101
78	SETSCREW	NOT REQUIRED					

MODELS 1810, 1820, 1840 PARTS LIST
4 x 6 x 18B, 5 x 6 x 11A&C, 5 x 6 x 15, 5 x 6 x 17, 6 x 8 x 11, 8 x 8 x 11B

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
1	PLUG	3	600-0004	028	190	028	104
2	PLUG MODEL 411 MODEL 412 & 413	2	600-0002	087	190	087	104
		4	600-0002	087	190	087	104
6	CAPSCREW 5x6x11A, 6x8x11, 8x8x11B 5x6x11C, 5x6x15 5x6x17 4x6x18B						
		14	168-0564	082	082	082	104
		16	168-0564	082	082	082	104
		20	158-0564	082	082	082	104
7	CAPSCREW	4	168-0494	082	082	082	104
8	CASING HALF	1	INCLUDED WITH NO. 69				
9	GASKET 4x6x18B 5x6x11A 5x6x11C 5x6x15 5x6x17 6x8x11 8x8x11B	1	364-0801	598	598	598	598
		1	364-1269	598	598	598	598
		1	364-0809	598	598	598	598
		1	364-1270	598	598	598	598
		1	364-1270	598	598	598	598
		1	364-1271	598	598	598	598
		1	364-1271	598	598	598	598
10	GREASE FITTING	2	508-0015	651	651	651	651
12	PLUG	2	600-0001	087	087	087	087
12A	PLUG*	6	600-0003	087	087	087	087
18	NUT	4	544-0109		190	080	104
19	WASHER	4	908-0112		190	080	104
20	GLAND CLAMP	4	204-0120		190	360	104
21	GLAND (PACKING)	2	372-0227	010	208	010	104
22	SWING BOLT	4	100-2011		190	360	104
22A	SWING BOLT ASSY. (18, 19, 20, 22)						
		4	099-0014	644			
23	PACKING	12	564-0176	816	816	816	816
24	KEY	1	472-0318	087	087	087	087
25	CAPSCREW	4	168-0566	082	190	082	104
26	BEARING CAP	2	163-0308	010		010	
27	PIN	2	592-0361	360	107	360	107
28	CASE RING 4x6x18B 5x6x11A & C 5x6x15 5x6x17, 6x8x11 8x8x11B						
		2	676-1748	208	208	010	107
		2	676-1748	208	208	010	107
		2	676-1748	208	208	010	107
		2	676-1748	208	208	010	107

*USED WITH WATER COOLED CARTRIDGE CAPS ONLY

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
29	PROTECTOR	1	624-0081	087	087	087	087
31	CAPSCREW	4	168-0260	082	082	082	082
32	CARTRIDGE CAP	1	164-0532	010	010	010	010
34	GASKET	1	364-1311	614	614	614	614
35	RETAINING RING	1	676-0935	088	088	088	088
36	CARTRIDGE	1	176-0067	010	010	010	010
37	GREASE SEAL OIL SEAL	1	712-6327	653	653	653	653
		1	712-6327	653	653	653	653
38	BEARING	1	068-0456	647	647	647	647
39	SLINGER	1	764-1022	478	478	478	478
41	CAPSCREW	4	168-0260	082	082	082	082
42	CARTRIDGE CAP	1	164-0532	010	010	010	010
43	GREASE SEAL OIL SEAL	1	712-6326	653	653	653	653
		1	712-0017	653	653	653	653
44	GASKET	1	364-1311	614	614	614	614
45	CARTRIDGE	1	176-0067	010	010	010	010
46	GREASE SEAL OIL SEAL	1	712-6327	653	653	653	653
		1	712-6327	653	653	653	653
47	BEARING 5x6x11C (3500)	1	068-1909	647	647	647	647
		1	068-0359	647	647	647	647
48	SLINGER	1	764-1022	478	478	478	478
49	GLAND (SEAL)	2	372-0291	010	208	010	104
50	O-RING	2	364-0425	457	457	457	457
52	LANTERN RING	2	676-1700	512	512	512	512
53	SEAL	2	712-1014		764		764
		2	712-1014	749		749	
54	COLLAR	2	224-0176	208	208	010	104
55	SETSCREW	4	724-0081	104	104	104	104
56	BUSHING	2	136-1413	208	208	010	104
57	SLEEVE WITH "O" RING PC. NO. 58 (NOTE 1) SLEEVE (PACKING) (SEALS)	1	756-0644	644	644	646	623
		1	756-0644	644	644	623	623
58	O-RING	1	364-0375	457	457	457	457

NOTE 1) MATERIAL CODE 644 - SLEEVE 208, "O" RING 457
646 - SLEEVE 108, "O" RING 457
623 - SLEEVE 104, "O" RING 457

MODELS 1810, 1820, 1840 PARTS LIST
4 x 6 x 18B, 5 x 6 x 11A&C, 5 x 6 x 15, 5 x 6 x 17, 6 x 8 x 11, 8 x 8 x 11B

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL					
				B.F.	A.B.	A.I.	S.S.		
59	IMPELLER 4x6x18B	1	443-0648	225	225	010	104		
	5x6x11A	1	443-2116	225	225	010	104		
	5x6x11C	1	443-2300	225	225	010	104		
	5x6x15	1	443-2117	225	225	010	104		
	5x6x17	1	443-2118	225	225	010	104		
	6x8x11	1	443-2116	225	225	010	104		
	59	IMPELLER 8x8x11B	1	443-2122	225	225	010	104	
IMPELLER (FITTED WITH OPT. NO. 61 IMP. RING)			FOR S.F. CONSTRUCTION USE MATERIAL 655						
4x6x18B		1	443-1021	643	643	642	646		
5x6x11A		1	443-0126	643	643	642	646		
5x6x11C		1	443-2480	643	643	642	646		
5x6x15		1	443-2467	643	643	642	646		
5x6x17		1	443-1887	643	643	642	646		
6x8x11		1	443-0126	643	643	646	646		
8x8x11B		1	443-0119	643	643	642	646		
61		IMP. RING (OPT.)		BEFORE 10/1/85					
		4x6x18B, 5x6x11A & C							
	5x6x15, 5x6x17 &								
	6x8x11	2	676-1071	208	208	010	104		
	8x8x11B	2	676-1894	208	208	010	104		
			AFTER 10/1/85						
	4x6x18B, 5x6x11A & 5x6x17, 6x8x11	2	676-1071	208	208	010	104		
	5x6x11C	2	676-2046	208	208	010	104		
	5x6x15	2	676-2039	208	208	010	104		
	8x8x11B	2	676-1894	208	208	010	104		
62	O-RING	1	364-0375	457	457	457	457		
63	KEY	1	472-0412	107	104	107	104		
64	SLEEVE WITH "O" RING PC. NO. 62 (NOTE 1)								
	SLEEVE (PACKING) (SEALS)	1	756-0644	644	644	646	623		
65	SHAFT	1	728-0948	063	104	063	104		
	66	PIN	2	592-0361	360		360		
2			592-0051		235	235			
67	PIN	2	592-0375	360	107	360	107		
68	PIN		NOT REQUIRED						

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
69	MODEL 411 PUMPS CASING ASSEMBLY (1, 2, 8, 26, 27, 66)						
	4x6x18B	1	179-2047	010	208	010	104
	5x6x11A	1	179-1365	010	208	010	104
	5x6x11C	1	179-2129	010	208	010	104
	5x6x15	1	179-1366	010	208	010	104
	5x6x17	1	179-1367	010	208	010	104
	6x8x11	1	179-1368	010	208	010	014
	8x8x11B	1	179-1371	010	208	010	014
	MODEL 412 & 413 PUMPS CASING ASSY. (1, 2, 8, 26, 27, 66)						
	4x6x18B	1	179-2101	010	208	010	104
	5x6x11A	1	179-1453	010	208	010	104
5x6x11C	1	179-2135	010	208	010	104	
5x6x15	1	179-1454	010	208	010	104	
5x6x17	1	179-1455	010	208	010	104	
6x8x11	1	179-1456	010	208	010	104	
8x8x11B	1	179-1459	010	208	010	104	
70	DRIVE SCREW	2	708-0013	365	365	365	365
71	NAMEPLATE	1	532-0045	114	114	114	114
73	CAPSCREW						
	FR. 143HP-256HP FR. 284HPH-445HP	4 4	168-0388 168-0570	082 082	082 082	082 082	082 082
74	BRACKET						
	FR. 143HP-256HP FR. 284HPH-445HP	1 1	116-0376 116-0364	010 010	010 010	010 010	010 010
75	CAPSCREW	5	168-0562	082	082	082	082
76	CAPSCREW	5	168-0562	082	082	082	082
77	BASE	1	060-0485	010	010	010	010
78	SETSCREW	6	724-0027	104	104	104	104

MODELS 1810, 1820, 1840 PARTS LIST 6 x 8 x 11HH

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL				
				B.F.	A.B.	A.I.	S.S.	
1	PLUG	3	600-0004	028		028		
2	PLUG MODEL 411	2	600-0002	087		087		
	MODEL 412 & 413	4	600-0002	087		087		
6	CAPSCREW	24	168-0636	082		082		
7	CAPSCREW	4	168-0494	082		082		
8	CASING HALF	1	INCLUDED WITH NO. 69					
9	GASKET	1	364-2166	598		598		
10	GREASE FITTING	2	508-0015	651		651		
12	PLUG	2	600-0001	087		087		
18	NUT	4	544-0109	190		080		
19	WASHER	4	908-0112	080		080		
20	GLAND CLAMP	4	204-0120	360		360		
21	GLAND (PACKING)	2	372-0227	010		010		
22	SWING BOLT	4	100-2011	360		360		
22A	SWING BOLT ASSY. (18, 19, 20, 22)	4	099-0014	644				
23	PACKING	12	564-0176	816		816		
24	KEY	1	472-0318	087		087		
25	CAPSCREW	4	168-0566	082		082		
26	BEARING CAP	2	163-0308	010		010		
27	PIN	2	592-0361	360		360		
28	CASE RING	2	676-2138	208		010		
29	PROTECTOR	1	624-0081	087		087		
31	CAPSCREW	4	168-0260	082		082		
32	CARTRIDGE CAP	1	164-0532	010		010		
34	GASKET	1	364-1311	614		614		
35	RETAINING RING	1	676-0935	088		088		
36	CARTRIDGE	1	176-0067	010		010		
37	GREASE SEAL	1	712-6327	653		653		
	OIL SEAL	1	712-6327	653		653		
38	BEARING	1	068-0456	647		647		
39	SLINGER	1	764-1022	478		478		
41	CAPSCREW	4	168-0260	082		082		
42	CARTRIDGE CAP	1	164-0532	010		010		
43	GREASE SEAL	1	712-6327	653		653		
	OIL SEAL	1	712-6327	653		653		
44	GASKET	1	364-1311	614		614		
45	CARTRIDGE	1	176-0067	010		010		
46	GREASE SEAL	1	712-6326	653		653		
	OIL SEAL	1	712-6326	653		653		

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL				
				B.F.	A.B.	A.I.	S.S.	
47	BEARING	1	068-1909	647		647		
48	SLINGER	1	764-1022	478		478		
49	GLAND (SEAL)	2	372-0291	010		010		
50	O-RING	2	364-0425	457		457		
52	LANTERN RING	2	676-1700	512		512		
53	SEAL	2	712-1014	749		749		
54	COLLAR	2	224-0176	208		010		
55	SETSCREW	4	724-0081	104		104		
56	BUSHING	2	136-1413	208		010		
57	SLEEVE WITH "O" RING (PACKING) (SEALS)	1	756-0828	644		646		
		1	756-0828	644		623		
58	O-RING	1	364-0375	457		457		
59	IMPELLER	1	443-2990	225		010		
59	IMPELLER (FITTED WITH OPT. NO. 61 IMP. RING) 6x8x11HH	1	N/A	N/A		N/A		
61	IMP. RING (OPT.) 6x8x11HH	2	N/A	N/A		N/A		
62	O-RING	1	364-0375	457		457		
63	KEY	1	472-0412	107		107		
64	SLEEVE WITH "O" RING (PACKING) (SEALS)	1	756-0828	644		646		
		1	756-0828	644		623		
65	SHAFT	1	728-7304	063		063		
66	PIN	2	592-0305	360		360		
		2	592-0051					
67	PIN	2	592-0375	360		360		
68	PIN	NOT REQUIRED						
69	MODEL 411 PUMPS CASING ASSEMBLY (1, 2, 8, 26, 27, 66) 6x8x11HH	1	179-2505	010		010		
	MODEL 412 & 413 PUMPS CASING ASSY. (1, 2, 8, 26, 27, 66) 6x8x11HH	1	179-2508	010		010		

MODELS 1810, 1820, 1840 PARTS LIST
6 x 8 x 11H

PC. NO.	DESCRIPTION	Q T Y	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
70	DRIVE SCREW	2	708-0013	365		365	
71	NAMEPLATE	1	532-0045	114		114	
73	CAPSCREW						
	FR. 143HP-256HP	4	168-0388	082		082	
	FR. 284HPH-445HP	4	168-0570	082		082	
74	BRACKET						
	FR. 143HP-256HP	1	116-0376	010		010	
	FR. 284HPH-445HP	1	116-0364	010		010	
75	CAPSCREW	5	168-0562	082		082	
76	CAPSCREW	5	168-0562	082		082	
77	BASE	1	060-0485	010		010	
78	SETSCREW	6	724-0027	104		104	

MODELS 1810, 1820, 1840 PARTS LIST 6 x 8 x 14HH

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL				
				B.F.	A.B.	A.I.	S.S.	
1	PLUG	3	600-0004	028		028		
2	PLUG	2	600-0002	087		087		
6	CAPSCREW	24	168-0636	082		082		
7	CAPSCREW	4	168-0494	082		082		
8	CASING HALF	1	INCLUDED WITH NO. 69					
9	GASKET	1	364-2161	598		598		
10	GREASE FITTING	2	508-0015	651		651		
12	PLUG	2	600-0001	087		087		
18	NUT	4	544-0113	190		080		
19	WASHER	4	908-0114	080		080		
20	GLAND CLAMP	4	204-0121	360		360		
21	GLAND (PACKING)	2	372-0228	010		010		
22	SWING BOLT	4	100-2012	360		360		
22A	SWING BOLT ASSY. (18, 19, 20, 22)	4	099-0015	644				
23	PACKING	12	564-0177	816		816		
24	KEY	1	472-0321	087		087		
25	CAPSCREW	4	168-0638	080		080		
26	BEARING CAP	2	163-0309	010		010		
27	PIN	2	592-0361	360		360		
28	CASE RING	2	676-2137	208		010		
29	PROTECTOR	1	624-0110	087		087		
31	CAPSCREW	4	168-0260	082		082		
32	CARTRIDGE CAP	1	164-0533	010		010		
34	GASKET	1	364-1312	614		614		
35	RETAINING RING	1	676-0943	088		088		
36	CARTRIDGE	1	176-0068	010		010		
37	GREASE SEAL	1	712-6329	653		653		
	OIL SEAL	1	712-0037	653		653		
38	BEARING	1	068-0458	647		647		
39	SLINGER	1	764-1028	478		478		
41	CAPSCREW	4	168-0260	082		082		
42	CARTRIDGE CAP	1	164-0533	010		010		
43	GREASE SEAL	1	712-6328	653		653		
	OIL SEAL	1	712-0055	653		653		
44	GASKET	1	364-1312	614		614		
45	CARTRIDGE	1	176-0068	010		010		
46	GREASE SEAL	1	712-6329	653		653		
	OIL SEAL	1	712-0037	653		653		

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL				
				B.F.	A.B.	A.I.	S.S.	
47	BEARING	1	068-0160	647		647		
48	SLINGER	1	764-1028	478		478		
49	GLAND (SEAL)	2	372-0293	010		010		
50	O-RING	2	364-0429	457		457		
52	LANTERN RING	2	676-1701	512		512		
53	SEAL	2	712-1017	749		749		
54	COLLAR	2	224-0177	208		010		
55	SETSCREW	4	724-0081	104		104		
56	BUSHING	2	136-1414	208		010		
	SLEEVE WITH "O" RING PC. NO. 58 (NOTE 1)							
57	SLEEVE (PACKING) (SEALS)	1	756-0827	644		646		
		1	756-0827	644		623		
58	O-RING	1	364-0380	457		457		
59	IMPELLER 6x8x14HH	1	444-2985	225		010		
59	IMPELLER (FITTED WITH OPT. RING NO. 61) 6x8x14HH	1	N/A	N/A		N/A		
61	IMP. RING (OPT.) 6x8x14HH	2	N/A	N/A		N/A		
62	O-RING	1	364-0380	457		457		
63	KEY	1	472-0413	107		107		
	SLEEVE WITH "O" RING PC. NO. 62 (NOTE 1)							
64	SLEEVE (PACKING) (SEALS)	1	756-0765	644		646		
		1	756-0765	644		623		
65	SHAFT	1	728-7302	063		063		
66	PIN	2	592-0305	360		360		
		2	592-0030					
67	PIN	2	592-0375	360		360		
68	PIN	NOT REQUIRED						
69	MODEL 411 PUMPS CASING ASSEMBLY (1, 2, 8, 26, 27, 66) 6x8x14HH							
		1	179-2499	010		010		
MODEL 412 & 413 PUMPS CASING ASSY. (1, 2, 8, 26, 27, 66) 6x8x14HH								
	1	179-2502	010		010			

MODELS 1810, 1820, 1840 PARTS LIST
6 x 8 x 14HH

PC. NO.	DESCRIPTION	Q T Y	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
70	DRIVE SCREW	2	708-0013	365		365	
71	NAMEPLATE	1	532-0045	114		114	
73	CAPSCREW	4	168-0498	082		082	
74	BRACKET		RTF				
75	CAPSCREW	5	168-0634	082		082	
76	CAPSCREW	5	168-0634	082		082	
77	BASE	1	060-0470	010		010	
78	SETSCREW		NOT REQUIRED				

MODELS 1810, 1820, 1840 PARTS LIST
6 x 8 x 15, 6 x 8 x 18A, B & C, 6 x 8 x 20, 8 x 10 x 12 & 12A,
8 x 10 x 15A&B, 8 x 10 x 17B

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
1	PLUG	3	600-0004	028	190	028	104
2	PLUG MODEL 411 MODEL 412 & 413	2	600-0002	087	190	087	104
		4	600-0002	087	190	087	104
6	CAPSCREW 6x8x15 6x8x18A,B&C 6x8x20 ALL OTHER SIZES	17	168-0636	082	190	082	104
		20	168-0638	082	190	082	104
		19	168-0638	082	190	082	104
		18	168-0638	082	190	082	104
7	CAPSCREW	4	168-0498	082	190	082	104
8	CASING HALF	1	INCLUDED WITH NO. 69				
9	GASKET 6x8x15 6x8x18A,B&C 6x8x20 8x10x12, 12A 8x10x15A&B 8x10x17B	1	364-1272	598	598	598	598
		1	364-0802	598	598	598	598
		1	364-1273	598	598	598	598
		1	364-1274	598	598	598	598
		1	364-1275	598	598	598	598
1	364-1276	598	598	598	598		
10	GREASE FITTING	2	508-0015	651	651	651	651
12	PLUG	2	600-0001	087	087	087	087
12A	PLUG*	6	600-0003	087	087	087	087
18	NUT	4	544-0113		190	080	104
19	WASHER	4	908-0114		190	080	104
20	GLAND CLAMP	4	204-0121		190	360	104
21	GLAND (PACKING)	2	372-0228	010	208	010	104
22	SWING BOLT	4	100-2012		190	360	104
22A	SWING BOLT ASSY. (18, 19, 20, 22)						
		4	099-0015	644			
23	PACKING	12	564-0177	802	802	802	802
24	KEY	1	472-0321	087	087	087	087
25	CAPSCREW	4	168-0638	082	208	082	104
26	BEARING CAP	2	163-0309	010		010	
27	PIN	2	592-0361	360	107	360	107
28	CASE RING 6x8x15, 6x8x18A&C 6x8x20, 8x10x12 6x8x18B 8x10x15A 8x10x12A, 15B & 17B	2	676-1750	208	208	010	107
		2	676-1989	208	208	010	107
		2	676-1988	208	208	010	107
		2	676-0018	208	208	010	107
		1	624-0110	087	087	087	087
29	PROTECTOR	1	624-0110	087	087	087	087
31	CAPSCREW	4	168-0260	082	082	082	082
32	CARTRIDGE CAP	1	164-0533	010	010	010	010

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
34	GASKET	1	364-1312	614	614	614	614
35	RETAINING RING	1	676-0943	088	088	088	088
36	CARTRIDGE	1	176-0068	010	010	010	010
37	GREASE SEAL OIL SEAL	1	712-6329	653	653	653	653
		1	712-0037	653	653	653	653
38	BEARING	1	068-0458	647	647	647	647
39	SLINGER	1	764-1028	478	478	478	478
41	CAPSCREW	4	168-0260	082	082	082	082
42	CARTRIDGE CAP	1	164-0533	010	010	010	010
43	GREASE SEAL OIL SEAL	1	712-6328	653	653	653	653
		1	712-0055	653	653	653	653
44	GASKET	1	364-1312	614	614	614	614
45	CARTRIDGE	1	176-0068	010	010	010	010
46	GREASE SEAL OIL SEAL	1	712-6329	653	653	653	653
		1	712-0037	653	653	653	653
47	BEARING	1	068-0160	647	647	647	647
48	SLINGER	1	764-1028	478	478	478	478
49	GLAND (SEAL)	2	372-0293	010	208	010	104
50	O-RING	2	364-0429	457	457	457	457
52	LANTERN RING	2	676-1701	512	512	512	512
53	SEAL	2	712-1017	749	764	749	764
54	COLLAR	2	224-0177	208	208	010	104
55	SETSCREW	4	724-0081	104	104	104	104
56	BUSHING	2	136-1414	208	208	010	104
57	SLEEVE WITH "O" RING SLEEVE (PACKING) (SEALS)	1	756-0645	644	644	646	623
		1	756-0645	644	644	623	623
58	O-RING	1	364-0380	457	457	457	457
59	IMPELLER 6x8x15 6x8x18A 6x8x18B 6x8x18C 6x8x20 8x10x12 8x10x15A 8x10x12A & 15B 8x10x17B	1	443-2119	225	225	010	104
		1	443-0649	208	208	010	104
		1	443-0658	225	225	010	104
		1	443-2298	208	208	010	104
		1	443-2120	225	225	010	104
		1	443-2447	225	225	010	104
		1	443-2119	225	225	010	104
		1	443-2445	225	225	010	104
		1	443-0476	225	225	010	104

*USED WITH WATER COOLED CARTRIDGE CAPS ONLY

NOTE 1) MATERIAL CODE 644 - SLEEVE 208, "O" RING 457
646 - SLEEVE 108, "O" RING 457
623 - SLEEVE 104, "O" RING 457

MODELS 1810, 1820, 1840 PARTS LIST
6 x 8 x 15, 6 x 8 x 18A, B & C, 6 x 8 x 20, 8 x 10 x 12 & 12A,
8 x 10 x 15A&B, 8 x 10 x 17B

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
	IMPELLER (FITTED) WITH OPT. NO. 61 RING		FOR S.F. CONSTRUCTION				
			USE MATERIAL 655				
	6x8x15	1	443-1888	643	643	642	646
	6x8x18A	1	443-1022	643	643	642	646
	6x8x18B	1	443-0659	643	643	642	646
	6x8x18C	1	443-2299	643	643	642	646
	6x8x20	1	443-1889	643	643	642	646
59	IMPELLER (FITTED) WITH OPT. NO. 61 RING		FOR S.F. CONSTRUCTION				
			USE MATERIAL 655				
	8x10x12	1	443-2446	643	643	642	646
	8x10x15A	1	443-1888	643	643	642	646
	8x10x12A & 15B 8x10x17B	1	443-2473 443-2472	643 643	643 643	642 642	646 646
61	IMP. RING (OPT.)		BEFORE 10/1/85				
	6x8x15	2	676-1054	208	208	010	104
	6x8x18B	2	676-1990	208	208	010	104
	8x10x12A, 15B & 17B	2	676-0019	208	208	010	104
	IMP. RING (OPT.)		AFTER 10/1/85				
	6x8x15, 18A & 18C	2	676-1054	208	208	010	104
	6x8x20	2	676-1054	208	208	010	104
	8x10x12	2	676-1054	208	208	010	104
	8x10x15A	2	676-1054	208	208	010	104
	6x8x18B 8x10x12A, 15B & 17B	2	676-1990 676-2044	208 208	208 208	010 010	104 104
62	O-RING	1	364-0380	457	457	457	457
63	KEY	1	472-0413	107	104	107	104
64	SLEEVE WITH "O" RING SLEEVE (PACKING) (SEALS)		PC. NO. 62 (NOTE 1)				
		1	756-0645	644	644	646	623
		1	746-0645	644	644	623	623
65	SHAFT	1	728-0949	063	104	063	104
66	PIN	2	592-0361	360		360	
		2	592-0051		235		235
67	PIN	2	592-0375	360	107	360	107
68	PIN		NOT REQUIRED				

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
69	MODEL 411 CASING ASSEMBLY (1, 2, 8, 26, 27, 66)						
	6x8x15	1	179-1369	010	228	010	104
	6x8x18A,B&C	1	179-2049	010	208	010	104
	6x8x20	1	179-1370	010	208	010	104
	8x10x12	1	179-1373	010	208	010	104
	8x10x12A	1	179-2344	010	208	101	104
	8x10x15A&B	1	179-2204	010	208	010	104
	8x10x17B	1	179-2074	010	208	010	104
	69	MODEL 412 & 413 CASING ASSEMBLY (1, 2, 8, 26, 27, 66)					
6x8x15		1	179-1457	010	208	010	104
6x8x18A,B&C		1	179-2103	010	208	010	104
6x8x20		1	179-1458	010	208	020	104
8x10x12		1	179-1461	010	208	010	104
8x10x12A		1	179-2346	010	208	010	104
8x10x15A&B		1	179-2207	010	208	010	104
8x10x17B		1	179-2077	010	208	010	104
70		DRIVE SCREW	2	708-0013	365	365	365
71	NAMEPLATE	1	532-0045	114	114	114	114
73	CAPSCREW	4	168-0498	082	082	082	104
74	BRACKET		REFER TO FACTORY				
75	CAPSCREW	5	168-0634	082	082	082	082
76	CAPSCREW	5	168-0634	082	082	082	082
77	BASE	1	060-0470	010	010	010	010
78	SETScrew						
	6X8X15	6					
	6x8x18A	6					
	6x8x18C	6					
	6x8x20	6					
	8x10x12, 12A	6					
	8x10x15A	6	724-0027	104	104	104	104
	6x8x18B	6					
8x10x15B	8						
8x10x17B	8						

MODELS 1810, 1820, 1840 PARTS LIST
8 x 10 x 21, 8 x 10 x 21A, 10 x 12 x 12B, 10 x 12 x 15B&C, 10 x 12 x 18

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
1	PLUG	3	600-0004	028	190	028	104
2	PLUG	2	600-0002	087	190	087	104
	10x12x12B 412 &413	4	600-0002	087	190	087	104
6	CAPSCREW						
	8x10x21 & 21A	21	168-0638	082	082	082	082
	10x12x12B	24	168-0638	082	082	082	104
	10x12x15B	26	168-0638	082	082	082	104
	10x12x18	26	168-0638	082	082	082	104
7	CAPSCREW	4	168-0498	082	082	082	104
8	UPPER CASING		INCLUDED WITH NO. 69				
9	GASKET 8x10x21&21A	1	364-2110	598	598	598	598
	10x12x12B	1	364-0803	598	598	598	598
	10x12x15B&C	1	364-0804	598	598	598	598
	10x12x18	1	364-0805	598	598	598	598
10	GREASE FITTING	2	508-0015	651	651	651	651
12	PLUG	2	600-0001	087	087	087	087
18	NUT	4	544-0113		190	080	104
19	WASHER	4	908-0114	080	190	080	104
20	CLAMP	4	204-0121	360	190	360	104
21	GLAND (PACKING)	2	372-0065	010	208	010	104
22	SWING BOLT						
	PACKING	4	100-2012	360	190	360	104
	SEALS	4	100-2013	360	190	360	104
23	PACKING	10	564-0179	802	802	802	802
24	KEY	1	472-0366	087	087	087	087
25	CAPSCREW	4	168-0638	082	082	082	104
26	BEARING CAP	2	163-0309	010		010	
27	PIN	2	592-0361	360	107	360	107
28	CASE RING						
	8x10x21	2	676-2031	208	208	010	107
	8x10x21A	2	676-2014	208	208	010	107
	10x12x12B	2	676-1982	208	208	010	107
	10x12x15B&C	2	676-1983	208	208	010	107
	10x12x18	2	676-1984	208	208	010	107
29	PROTECTOR	1	624-0111	087	087	087	087
31	CAPSCREW	4	168-0260	082	082	082	082
32	CARTRIDGE CAP	1	164-0352	010	010	010	010
34	GASKET	1	364-1312	614	614	614	614
35	RETAINING RING	1	676-0382	088	088	088	088
35A	RETAINING RING	1	676-0925	088	088	088	088
36	CARTRIDGE	1	176-0001	010	010	010	010

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
37	GREASE SEAL	1	712-6331	653	653	653	653
	OIL SEAL	1	712-6331	653	653	653	653
38	BEARING	1	068-0362	647	647	647	647
39	SLINGER	1	764-0178	478	478	478	478
41	CAPSCREW	4	168-0260	082	082	082	082
42	CARTRIDGE CAP	1	164-0352	010	010	010	010
43	GREASE SEAL	1	712-6330	653	653	653	653
	OIL SEAL	1	712-6330	653	653	653	653
44	GASKET	1	364-1312	614	614	614	614
45	CARTRIDGE	1	176-0001	010	010	010	010
46	GREASE SEAL	1	712-6331	653	653	653	653
	OIL SEAL	1	712-6331	653	653	653	653
47	BEARING	1	068-1912	647	647	647	647
48	SLINGER	1	764-0178	478	478	478	478
49	GLAND (SEAL)	2	372-0150	010	208	010	104
50	O-RING	2	364-0433	457	457	457	457
52	LANTERN RING	2	676-1462	512	512	512	512
53	SEAL	2	712-0468	755	764	756	764
54	COLLAR	2	224-0004	208	208	010	104
55	SETSCREW	4	724-0081	104	104	104	104
56	BUSHING	2	136-1002	208	208	010	104
57	SLEEVE WITH "O" RING PC. NO. 58 (NOTE 1)						
	SLEEVE (PACKING) (SEALS)	1	756-0646	644	644	646	623
58	O-RING	1	364-0388	457	457	457	457
		1	756-0646	644	644	623	623
59	IMPELLER						
	8x10x21	1	443-2432	208	208	010	104
	8x10x21A	1	443-2662	208	208	010	104
	10x12x12B	1	443-0650	208	208	010	104
	10x12x15B	1	443-0651	208	208	010	104
	10x12x15C	1	443-0841	208	208	010	104
	10x12x18	1	443-0652	225	225	010	104
IMPELLER (FITTED WITH OPT. IMP. RING NO. 61)	FOR S.F. CONSTRUCTION						
	USE MATERIAL 655						
	8x10x21	1	443-2457	643	643	642	646
	8x10x21A	1	443-2663	643	643	642	646
	10x12x12B	1	443-1023	643	643	642	646
	10x12x15B	1	443-1024	643	643	642	646
	10x12x15C	1	443-2474	643	643	642	646
	10x12x18	1	443-2469	643	643	642	646

NOTE 1) MATERIAL CODE 644 - SLEEVE 208, "O" RING 457
646 - SLEEVE 108, "O" RING 457
623 - SLEEVE 104, "O" RING 457

MODELS 1810, 1820, 1840 PARTS LIST
8 x 10 x 21, 8 x 10 x 21A, 10 x 12 x 12B, 10 x 12 x 15B&C, 10 x 12 x 18

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
61	IMP. RING (OPT.) 8x10x21 10x12x12B 10x12x15B&C 10x12x18	ALSO ORDER #78 SETSCREW					
		BEFORE 10/1/85					
		2	676-1757	208	208	010	104
		2	676-1970	208	208	010	104
		2	676-1971	208	208	010	104
	8x10x21 8x10x21A 10x12x12B 10x12x15B 10x12x15C 10x12x18	AFTER 10/1/85					
		2	676-1757	208	208	010	104
		2	676-2013	208	208	010	104
		2	676-1970	208	208	010	104
		2	676-1971	208	208	010	104
		2	676-2047	208	208	010	104
		2	676-2041	208	208	010	104
62	O-RING	1	364-0388	457	457	457	457
63	KEY	1	472-0414	107	107	107	107
64	BEFORE JULY 1990 SLEEVE (PACKING) (SEALS)	1	756-0384	208	208	108	104
		1	756-0384	208	208	104	104
64	SLEEVE WITH "O" RING PC. NO. 62 (NOTE 1) SLEEVE (PACKING) (SEALS)	1	756-0646	644	644	646	623
		1	756-0646	644	644	623	623
65	SHAFT	1	728-0502	076	109	076	109
66	PIN	2	592-0361	360		360	
		2	592-0051		235		235
67	PIN	2	592-0375	360	107	360	107
68	PIN	NOT REQUIRED					
69	CASING ASSEMBLY (1, 2, 8, 26, 27, 66) 8x10x21 411 8x10x21A 8x10x21 412C & 413C 8x10x21A 10x12x12B 411 10x12x12B 412 & 413 10x12x15B&C 411 10x12x15B&C 412C, 413C 10x12x18 411 10x12x18 411B 10x12x18 412C & 413C	1	179-2328	010	208	010	104
		1	179-2464	010	208	010	104
		1	179-2330	010	208	010	104
		1	179-2466	010	208	010	104
		1	179-2051	010	208	010	104
		1	179-2315	010	208	010	104
		1	179-2053	010	208	010	104
		1	179-0310	010	208	010	104
		1	179-2055	010	208	010	104
		1	179-2317	010	208	010	104
		1	179-0312	010	208	010	104

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
70	DRIVE SCREW	2	708-0013	365	365	365	365
71	NAMEPLATE	1	532-0045	114	114	114	114
73	CAPSCREW	4	168-0566	082	082	082	082
74	BRACKET	REFER TO FACTORY					
75	CAPSCREW 8x10x21 & 21A 10x12x12B 10x12x15B&C 10x12x18	4	168-0636	082	082	082	082
		5	168-0634	082	082	082	082
		4	168-0636	082	082	082	082
		4	168-0636	082	082	082	082
76	CAPSCREW 8x10x21 & 21A 10x12x12B 10x12x15B&C 10x12x18	4	168-0636	082	082	082	082
		5	168-0634	082	082	082	082
		4	168-0636	082	082	082	082
		4	168-0636	082	082	082	082
77	BASE (MODELS 412 & 413) 10x12x12B * BASE (NOT ILLUSTRATED) MODEL 411B MODEL 412C REFER TO FACTORY	1	060-1292	010	010	010	010
		1	060-1335	087	087	087	087
		1	060-1335	087	087	087	087
78	10x12x12B 10x12x15B&C 10x12x18 MODEL 413C 8x10x21 & 21A 10x12x12B 10x12x15B&C 10x12x18	1	060-1298	087	087	087	087
		1	060-1336	087	087	087	087
		1	060-1328	087	087	087	087
		6	724-0027	104	104	104	104
80	REGISTER PLATE MODEL 413C	(NOT ILLUSTRATED)					
		1	008-0591	087	087	087	087

*411B – BOTTOM SUCTION PUMP. 412C – CHAIR MOUNTED PUMPS.

MODELS 1810, 1820, 1840 PARTS LIST 10 x 12 x 18D

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL				
				B.F.	A.B.	A.I.	S.S.	
1	PLUG	3	600-0004	028		028		
2	PLUG	2	600-0002	087		087		
6	CAPSCREW	32	168-0638	082		082		
7	CAPSCREW	4	168-0500	082		082		
8	UPPER CASING		INCLUDED WITH NO. 69					
9	GASKET	1	364-2168	598		598		
10	GREASE FITTING	2	508-0015	651		651		
12	PLUG	2	600-0001	087		087		
18	NUT	4	544-0113	190		104		
19	WASHER	4	908-0114	080		080		
20	CLAMP	4	204-7001	360		360		
21	GLAND	2	372-7009	010		010		
22	SWING BOLT	4	100-2013	360		360		
23	PACKING	12	564-0181	802		802		
24	KEY	1	472-0366	087		087		
25	CAPSCREW	4	168-0638	082		082		
26	BEARING CAP	2	163-0309	010		010		
27	PIN	2	592-0361	360		360		
28	CASE RING	2	676-2140	208		010		
29	PROTECTOR	1	624-0111	087		087		
31	CAPSCREW	4	168-0260	082		082		
32	CARTRIDGE CAP	1	164-0352	010		010		
34	GASKET	1	364-1312	614		614		
35	RETAINING RING	1	676-0382	088		088		
35A	RETAINING RING	1	676-0925	088		088		
36	CARTRIDGE	1	176-0001	010		010		
37	GREASE SEAL	1	712-6331	653		653		
	OIL SEAL	1	712-6331	653		653		
38	BEARING	1	068-0362	647		647		
39	SLINGER	1	764-0178	478		478		
41	CAPSCREW	4	168-0260	082		082		
42	CARTRIDGE CAP	1	164-0352	010		010		
43	GREASE SEAL	1	712-6330	653		653		
	OIL SEAL	1	712-6330	653		653		
44	GASKET	1	364-1312	614		614		
45	CARTRIDGE	1	176-0001	010		010		
46	GREASE SEAL	1	712-6331	653		653		
	OIL SEAL	1	712-6331	653		653		

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL				
				B.F.	A.B.	A.I.	S.S.	
47	BEARING	1	068-1912	647		647		
48	SLINGER	1	764-0178	478		478		
49	GLAND	2	372-7032	010		010		
50	O-RING	2	364-0384	457		457		
52	LANTERN RING	2	676-7030	509		509		
53	SEAL	2	712-0471	755		756		
54	COLLAR	2	224-0006	208		010		
55	SETSCREW	4	724-0089	104		104		
56	BUSHING	2	136-1672	208		010		
57	SLEEVE (PACKING)	1	756-0774	644		646		
	(SEALS)	1	756-0774	644		623		
58	O-RING	1	364-0384	457		457		
59	IMPELLER	1	443-2986	225		010		
60	SLEEVE PIN	2	592-0008	104		104		
61	IMP. RING (OPT.)	ALSO ORDER #78 SETSCREW						
		2	676-2139	208		010		
62	O-RING	1	364-0384	457		457		
63	KEY	1	472-7048	107		107		
64	SLEEVE (PACKING)	1	756-0774	644		646		
	(SEALS)	1	756-0774	644		623		
65	SHAFT	1	728-7306	076		076		
66	PIN	2	592-0310	360		360		
		2	592-0032					
67	PIN	2	592-0375	360		360		
68	PIN	NOT REQUIRED						
69	CASING ASSEMBLY	1	179-2422	010		010		
70	DRIVE SCREW	2	708-0013	365		365		
71	NAMEPLATE	1	532-0045	114		114		
72	SETSCREW	4	724-0643	113		113		
73	CAPSCREW	4	168-0566	082		082		
74	BRACKET	REFER TO FACTORY						
75	CAPSCREW	4	168-0636	082		082		
76	CAPSCREW	4	168-0636	082		082		
77	BASE							
	MODEL 412C	1	060-1553	087		087		
	MODEL 413C	1	060-1574	087		087		
78	SETSCREW	NOT REQUIRED						
79	SLEEVE COLLAR	2	544-7007	208		108		
80	REGISTER PLATE	1	008-0591	087		087		

MODELS 1810, 1820, 1840 PARTS LIST
12 x 14 x 15B, 12 x 14 x 18A, 14 x 16 x 18

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL			
				B.F.	A.B.	A.I.	S.S.
1	PLUG	3	600-0004	087	190	087	104
2	PLUG	2	600-0002	087	190	087	104
6	CAPSCREW 12x14x18A & 14x16x18	32	168-0638	082	190	082	104
		36	168-0790	082	190	082	104
7	CAPSCREW	4	168-0163	082	082	082	104
8	CASING HALF		INCLUDED WITH NO. 69				
9	GASKET 8x12x24 12x14x15B 12x14x18A 14x16x18	1	364-2171	598	598	598	598
		1	364-0806	598	598	598	598
		1	364-0807	598	598	598	598
		1	364-0808	598	598	598	598
10	GREASE FITTING	2	508-0010	651	651	651	651
11	GREASE FITTING		INCLUDED WITH NO. 10				
12	PLUG	2	600-0001	087	087	087	087
18	NUT	4	544-0113	080	190	080	104
19	WASHER	4	908-0114	080	190	080	104
20	GLAND CLAMP	4	204-0121	360	190	360	104
21	GLAND (PACKING)	2	372-0280	010	208	010	104
22	SWING BOLT	4	100-2013	360	190	360	104
23	PACKING	14	564-0180	802	802	802	802
24	KEY	1	472-0394	087	087	087	087
25	CAPSCREW	4	168-0642	082	190	082	104
26	BEARING CAP	2	163-0334	010		010	
27	PIN	2	592-0366	360	107	360	107
28	CASE RING 8x12x24 12x14x15B 12x14x18A 14x16x18	2	676-7125	208	208	010	107
		2	676-1985	208	208	010	107
		2	676-2056	208	208	010	107
		2	676-1969	208	208	010	107
29	PROTECTOR	1	624-0111	087	087	087	087
31	CAPSCREW	4	168-0388	082	082	082	082
32	CARTRIDGE CAP	1	164-0499	010	010	010	010
34	GASKET	1	364-1330	614	614	614	614
35	RETAINING RING	1	676-0295	088	088	088	088
35A	RETAINING RING	1	676-0926	088	088	088	088
36	CARTRIDGE	1	176-0002	010	010	010	010
37	GREASE SEAL OIL SEAL	1	712-6332	653	653	653	653
		1	712-0059	653	653	653	653
38	BEARING	1	068-0364	647	647	647	647
39	SLINGER	1	764-0177	478	478	478	478
41	CAPSCREW	4	168-0388	082	082	082	082

NOTE 1) MATERIAL CODE 644 - SLEEVE 208, "O" RING 457
 646 - SLEEVE 108, "O" RING 457
 623 - SLEEVE 104, "O" RING 457

PC. NO.	DESCRIPTION	QTY	PART NO.	MATERIAL				
				B.F.	A.B.	A.I.	S.S.	
42	CARTRIDGE CAP	1	164-0499	010	010	010	010	
43	GREASE SEAL OIL SEAL	1	712-6333	653	653	653	653	
		1	712-0058	653	653	653	653	
44	GASKET	1	364-1330	614	614	614	614	
45	CARTRIDGE	1	176-0002	010	010	010	010	
46	GREASE SEAL OIL SEAL	1	712-6332	653	653	653	653	
		1	712-0059	653	653	653	653	
47	BEARING	1	068-1914	647	647	647	647	
48	SLINGER	1	764-0177	478	478	478	478	
49	GLAND (SEAL)	2	372-0068	010	208	010	104	
50	O-RING	2	364-0436	457	457	457	457	
52	LANTERN RING	2	676-1943	010	208	010	104	
53	MECH. SEAL	2	712-0471	755	764	756	764	
54	COLLAR	2	224-0006	208	208	010	104	
55	SETSCREW	4	724-0081	104	104	104	104	
56	BUSHING	2	136-1602	208	208	010	104	
57	SLEEVE WITH "O" RING PC. NO. 58 (NOTE 1)							
	SLEEVE (PACKING) (SEALS)	1	756-0647	644	644	646	623	
58	O-RING	1	756-0647	644	644	623	623	
		1	364-0390	457	457	457	457	
59	IMPELLER 8x12x24 12x14x15B 12x14x15C 12x14x18A 14x16x18	1	443-3149	208	208	010	104	
		1	443-0653	208	208	010	104	
		1	443-3080	208	208	010	104	
		1	443-2482	208	208	010	104	
	1	443-0655	208	208	010	104		
	IMPELLER (FITTED WITH OPT. IMP. RING NO. 61) FOR S.F. CONSTRUCTION USE MATERIAL 655							
	1	8x12x24	1	443-3150	643	643	642	646
	1	12x14x15B	1	443-1026	643	643	642	646
	1	12x14x15C	1	443-3084	643	643	642	646
	1	12x14x18A	1	443-2481	643	643	642	646
1	14x16x18	1	443-1028	643	643	642	646	
61	IMP. RING (OPT.) ALSO ORDER #78, SETSCREW							
	8x12x24	2	676-7124	208	208	010	104	
	12x14x15B	2	676-1973	208	208	010	104	
	12x14x15C	2	676-2124	208	208	010	104	
	12x14x18A	2	676-2055	208	208	010	104	
	14x16x18	2	676-1975	208	208	010	104	
62	O-RING	1	364-0390	457	457	457	457	
63	KEY	1	472-0414	107	104	107	104	
64	SLEEVE WITH "O" RING PC. NO. 62 (NOTE 1)							
	SLEEVE (PACKING) (SEALS)	1	756-0647	644	644	646	623	
65	SHAFT	1	756-0647	644	644	623	623	
		1	728-0503	076	109	076	109	

INSTRUCTION MANUAL MODEL 1810, 1820 & 1840

This repair manual is applicable to pump Models 1810, 1820 & 1840. All photos illustrate Model 1810.

ATTENTION: SAFETY WARNINGS:

Read and understand all warnings before installation or servicing pump.

OPERATIONAL LIMITS: *

Maximum Operating Pressure: 175 psi at Temperatures to 150° (65.6°C)
Maximum Operating Temperature: 225°F (107°C)

SERVICE

Your Fairbanks Nijhuis™ pump requires no maintenance other than periodic inspection, lubrication and occasional cleaning. The intent of inspection is to prevent breakdown, thus obtaining optimum service life.

LUBRICATION OF BEARINGS

Regreasable bearings will require periodic lubrication and this can be accomplished by using the zerk or lubrication fitting at each bearing. Lubricate the bearings at regular intervals using high quality grease. The initial bearing lubrication at Aurora is Chevron SRI Grease NLGI 2 (polyurea thickener) (Pentair Part Number 384-0002-639). Before lubricating the bearings, thoroughly flushing the old grease with the new grease is required. We recommend Chevron SRI Grease NLGI 2 (polyurea thickener) for follow-up relubrication after the flushing. Most major brands of Grade No. 2 ball bearing grease are satisfactory for pump operation in both wet and dry applications.

CAUTION

Be aware that mixing of different brands or blends of grease should be avoided due to possible incompatibilities that could damage the bearings. A thorough flushing of the old grease with the new grease is required to minimize this potential incompatibility. Avoid using the following: (1) grease of vegetable or animal base that can develop acids or (2) grease containing rosin, graphite, talc or other impurities. Under no circumstances should grease be reused.

CAUTION

Over lubrication should be avoided as it may result in overheating and possible bearing failure. Under normal application, adequate lubrication is assured if the amount of grease is maintained at 1/3 to 1/2 the capacity of the bearing and adjacent space surrounding the bearing.

In dry locations, each bearing will need lubrication at least every 4,000 hours of running time or every 6 to 12 months, whichever is more frequent. In wet locations the bearings will need lubrication at least after every 2,000 hours of running time or every 4 to 6 months, whichever is more frequent. A unit is considered to be installed in a wet location if the pump and motor are exposed to dripping water, to the weather, or to heavy condensation such as found in unheated and poorly ventilated underground locations.

CALIFORNIA PROPOSITION 65 WARNING:

WARNING

This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

CAUTION

Use normal fire caution procedures when using any petroleum cleaner.

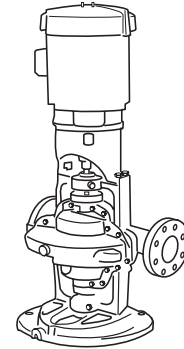
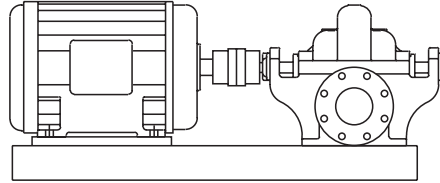
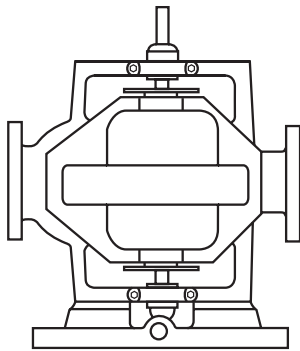
Model 1820 pumps are available with two options for lubricating the shaft bearings:

1. Re-greasable
2. Oil Lubrication

Oil lubricated bearings are standard on Model 1820 series pumps. A fixed oil level is maintained within the power frame of an oiler which allows visual indications of reserve oil.

At initial installation and before starting a unit that has been shut down for repairs or for any extended length of time, run enough 10W-30 weight motor oil through the oiler to maintain a constant oil level to insure that the bearing will never be without an oil supply. Oil will have to be added at intervals to maintain a constant level in the oiler. This interval can only be determined by experience.

Under working conditions, oil will breakdown and need to be replaced at regular intervals. The length of these intervals will depend on many factors. Under normal operation, in clean and dry locations, the oil should be changed about once a year.

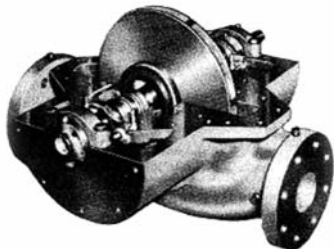


Models 1810, 1820 and 1840

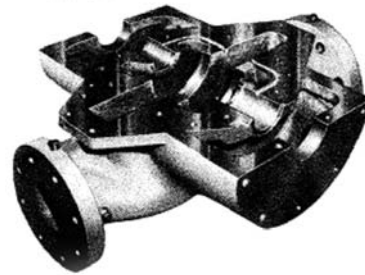
A. Complete pump assemblies.

However, when the pump is exposed to dirt contamination, high temperatures (200F. or above) or a wet location, the oil may have to be changed every 2 or 3 months.

The motor that drives your pump may or may not require lubrication. Consult the manufacturer's recommendations for proper maintenance instructions.



B. Casing Half Removed



C. Rotating element removed from casing half.

REPAIRS

The pump may be disassembled using the illustrations and text provided. Although complete disassembly is covered, it will seldom be necessary to completely disassemble your pump.

The illustrations accompanying the disassembly instructions show the pump at various stages of disassembly. The illustrations are intended to aid in the correct identification of the parts mentioned in the text.

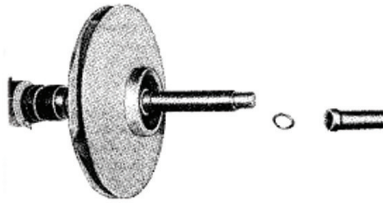
Inspect removed parts at disassembly to determine their reusability. Cracked castings should never be reused. All packing and gaskets should be replaced with new ones at reassembly simply as a matter of economy; they are much less expensive to replace routinely than to replace as the need accrues. In general it is economical to return to the manufacturer for repair only the motor and motor controller.

DISSASSEMBLY OF THE PUMP - Disassemble only what is needed to make repairs or accomplish inspection. Proceed to disassemble the pump as follows: (see figure 4 for Model 1820, Figure 5 for Model 1810 and Figure 6 for Model 1840.

1. Break the electrical connections to motor or take other steps needed to prevent drive unit from being unintentionally energized during disassembly.
2. Close such valves or flow-control devices necessary to make certain flow of liquid will no take place during disassembly.



D. Outboard rotating element components removed, illustrating disassembly order.



E. Sleeve and thrust washer removed.

NOTE:

Discharge and suction piping need not be disturbed unless complete pump assembly is to be removed.

3. Drain liquid from pump by removing plugs (1 and 2). Disconnect any flushing, cooling, by-pass lines that are connected to parts that will be removed.
4. Loosen and remove capscrews (6) securing casing half (8) to remainder of pump assembly.

NOTE:

If pump being disassembled is size 4x5x11 or larger, remove capscrews (7) also before attempting to separate casing halves. If possible drain and/or flush pump to remove any corrosive or toxic liquid before attempting further disassembly. Many units will not have drain taps.

5. Make certain all securing capscrews are removed, then carefully remove casing half (8) using hoist or crane with a sling attached around cast hooks on the casing and under the casing.

CAUTION

Use extreme care when casing comes loose that it does not drop out of sling, as this would cause extensive damage to other components of pump.

6. Remove gasket (9) and scrape mating surface of casing halves to remove pieces of gasket which have adhered in separation. Take care not to scratch or mar mating surface.
7. On Model 1820 and 1840 loosen flexible coupling and slide the halves apart. On Model 1810 pumps remove flexible shafting.
8. Remove four capscrews (25) SECURING TWO BEARING CAPS (26). Lift off bearing caps (26). Lift off bearing caps (26) and pins (27). Mark caps to insure correct replacement and orientation on the respective bearing arms.
9. Loosen and remove four nuts (18), washers (19), and gland clamps (20) securing split halves of two packing glands (21). Remove four swing bolts (22).
10. Assuming that further work is required on shaft and impeller assembly use properly secured rope sling and hoist or crane as required to lift it from casing half (69) and place it on a suitable bench or work surface.

CAUTION

Take care not to dent or damage impeller and/or other parts. Use of a supporting cradle or work stand is recommended.

NOTE:

Disassembly procedure from this point covers pumps having standard packing. If pump has mechanical seals, refer to specific instructions.

11. Remove and discard rings of packing (23). Replacement with new packing is recommended whenever pump is disassembled.
12. Slip off flexible coupling half or spacer coupling and remove key (24). If preferred, the key may be removed by carefully tapping it from outer end with a brass drift or similar non-marring tool, using a small hammer.

13. Remove two casing wearing rings (28)
14. Remove zerks (10) and pipe plugs (12) from cartridge caps (32 and 42).
15. Loosen and remove four capscrews (31) from cartridge cap (32). The outboard shaft end protector (29) may be removed from its recess in the outboard cartridge cap if necessary. Remove retainer ring (35) with a pair of traumauc pliers. Also remove gasket (34).

NOTE:

If the unit has a tandem shaft, protector (29) is not used.

16. Outboard bearing (38) is press fitted into shaft (65). To remove it, place a puller on bearing cartridge (36) and pull cartridge, grease seal (37) and bearing from shaft. The grease seal can be pressed from the bearing cartridge if it needs replacing, then slide slinger (39), lantern ring (52) and bushing (56) off shaft (65).
17. Removal of inboard bearing is basically the same as for outboard bearing. Remove capscrews (41) and slide slinger (40), cartridge cap (42), grease seal (43) and gasket (44) off shaft.
18. Pull or press off bearing cartridge (45), grease seal (46) and bearing (47). Remove slinger (48), lantern ring (52) and bushing (56) from shaft.
19. If pump has right hand rotation, unscrew and remove outboard sleeve (57) first. Remove o-ring (58). If pump has left hand rotation unscrew and remove inboard sleeve (64) first. Remove o-ring (62).
20. Key (63) holds impeller (59) and either sleeve (64) if pump is right hand or sleeve (57 for left hand pump). These parts can be removed by pulling impeller from shaft (65) and removing key (63) from its position in keyway and sleeve. Unscrew and remove remaining sleeve and gasket.
21. Disassemble wearing ring (61) (optional) from impeller (59) only if necessary. On power frames 5, 6B and 7, remove setscrews (78). Apply a puller and gradually withdraw wearing rings (61) from impeller (59). Wearing rings may have to be cut or trimmed off the impeller. If a lathe is used to trim rings off, use care not to clamp impeller too tight and cause distortion. Also use care not to remove any metal from impeller.
22. Remove locking and locating pins (66, 67, and 68) from casing have (69) only if replacement is necessary.
23. Nameplate (71) and its securing screws (70) should only be removed if replacement is necessary.
24. For model 413 & 483 pumps unscrew capscrews (75) to remove motor and motor bracket (74) from casing have (69). The motor can be separated from motor bracket by removing capscrews (73).

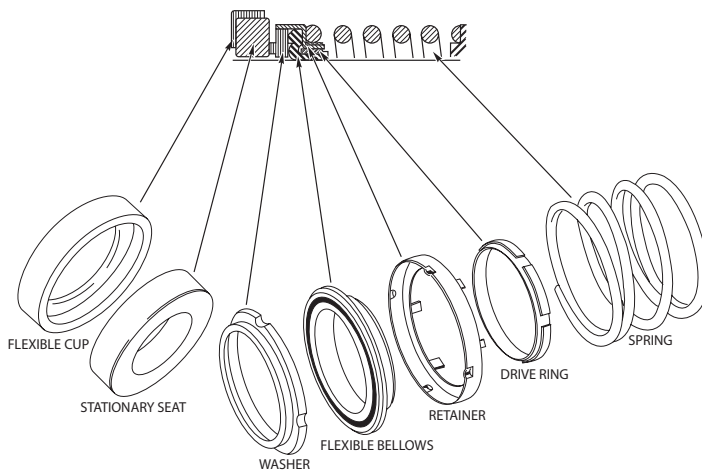
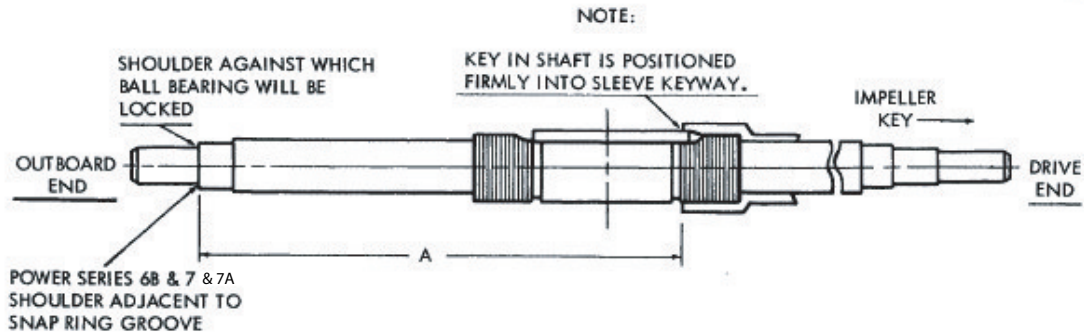


Figure 1. Mechanical Seal

25. If complete removal of pump is required, disconnect the suction and discharging piping from casing half (69). Remove nuts from foundation bolts and lift pump casing half (69) and base (77) out. When the casing half and base are moved away from the piping, lay them on their side, so that, by removing capscrews (76) the base can be separated from casing half (69).

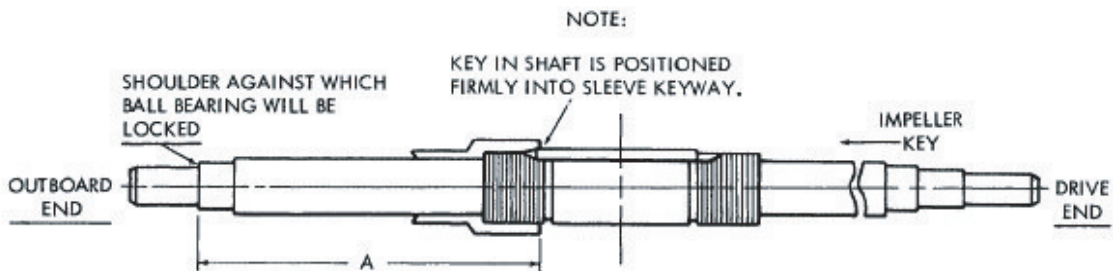


Power Series	Pump Size	A
1	2" 1823 2" 1842 2" 1825	8-15/64
2	2-1/2" 1823 2-1/2" 1824 3" 1824 3" 1825 4" 1822	10-31/64
3	4" 1823 4" 1824	11-11/64

Power Series	Pump Size	A
4	4" 1825 5" 1822 5" 1823 5" 1824 6" 1822 8" 1821	11-59/64
4A	6" 1822HH	14-1/64
5	6" 1823 6" 1824 6" 1825 8" 1822 8" 1823 8" 1824	13-31/64

Power Series	Pump Size	A
5A	6" 1823HH	15-23/32
6B	8" 1825 10" 1822 10" 1823 10" 1824	15-31/32
7	12" 1823 12" 1824 14" 1824	18-3/64
7A	10" 1924D	18-51/64

Figure 2. Locating Shaft Sleeve on Shaft, Right Hand Rotation



Power Series	Pump Size	A
1	2" 1823 2" 1842 2" 1825	8-15/64
2	2-1/2" 1823 2-1/2" 1824 3" 1824 3" 1825 4" 1822	10-31/64
3	4" 1823 4" 1824	11-11/64

Power Series	Pump Size	A
4	4" 1825 5" 1822 5" 1823 5" 1824 6" 1822 8" 1821	11-59/64
4A	6" 1822HH	14-1/64
5	6" 1823 6" 1824 6" 1825 8" 1822 8" 1823 8" 1824	13-31/64

Power Series	Pump Size	A
5A	6" 1823HH	15-23/32
6B	8" 1825 10" 1822 10" 1823 10" 1824	15-31/32
7	12" 1823 12" 1824 14" 1824	18-3/64
7A	10" 1924D	18-51/64

Figure 3. Locating Shaft Sleeve on Shaft, Left Hand Rotation.

DISSASSEMBY OF A PUMP WITH MECHANICAL SEALS

1. Perform disassembly procedure as previously given through step 8.
2. Loosen and remove four nuts (18), and washers (19) thus freeing swing bolts (22) to allow shaft and impeller assembly to be lifted from casing half (69) with sling and hoist or crane as described in paragraph 10 above.

CAUTION

Use extreme care in moving this assembly, because sliding loose on the shaft can crack ceramic seats. To prevent this, wrap seal securely in a cloth to stop it from sliding on shaft.

3. With shaft and impeller assembly on a suitable bench, cradle, or work stand, loosen and remove pipe plug (12) from inboard cartridge cap (42). Remove grease zerk (10) and capscrews (41) and slide cartridge cap with grease seal (43) off end of this shaft (65). Remove gasket (44)
4. Either pull or press bearing cartridge (45), grease seal (46) and bearing (47) off shaft. Remove slinger (48).



F. Impeller removed from outboard rotating element. G. Removing bearing from shaft using conventional puller.

5. The on piece gland (49) used with mechanical seal assembly can now be removed from the shaft.
6. O-ring (50) can be removed from seal gland if desired

CAUTION

7. **Exercise great care in removing seal assembly (53) to keep from marring or otherwise damaging precision ground mating surfaces.**
8. Scribe a mark on shaft sleeve for relocating seal collar on reassembly. Loosen setscrews (55), securing seal collars (54) to shaft sleeves and slide them off.
9. Proceed with further disassembly of outboard seal assembly using the same procedure.
10. After removal of mechanical seals, proceed with balance of disassembly in same manner as described for packing design.

REASSEMBLY

Reassembly will generally be in reverse order of disassembly. If disassembly was not complete use only those steps related to your particular repair program.

1. For Model 1810 and 1840 pumps, reassemble base (77) to casing half (69) with capscrews (76). Set these parts back on their foundation and connect them to the suction and discharge piping, then secure the base to its foundation by tightening nuts on foundation bolts.
2. Position locating pins (67) in lower casing (69), adding swing bolt pins (68), if used on your pump. Install wearing ring pins (66). Tap pins gently to seat them in place. If name plate (71) was removed, install it with screws (70). Install o-ring (62) in shaft sleeve
3. On right hand unit thread inboard sleeve (64) onto shaft (65) distance A (refer to figure 2). Onto the shaft a distance A (refer to figure 3). When the sleeve is in position its keyway should align with keyway on shaft. Coat key and keyway with Loctite sealant grade 242. Insert key (63) into keyways of shaft and sleeve. Tap it firmly in place.
4. Coat inside diameter of impeller wearing rings (61) (optional) with Loctite sealant grade 271 and press them over hubs of impeller (59). DO not attempt to hammer impeller wear rings into position, since they are press fit. Use of an arbor press is preferred. However, placing a block of wood over the impeller wearing ring and pressing it in will work satisfactorily. For power frames 5, 6B, and 7 only, two setscrews (78) will be installed by drilling into wearing rings and impeller. The opposite surface for the impeller should be protected from damage throughout the procedures by resting it against soft wood on the surface of workbench.



H. Shaft with sleeve and key in position.

CAUTION

Impeller wearing ring must be given special care because they press fit. Be sure rings are positioned squarely over the hub of impeller. A softheaded hammer may be used to gently tap impeller-wearing rings into correct alignment before they are pressed into place.

5. Coat impeller (59) keyway with Loctite sealant grade 242 and slide onto shaft until it is firmly against the shaft sleeve. Place o-ring (58) in shaft sleeve (57) and thread shaft sleeve firmly against the impeller.

NOTE

When assembling rotation element of an 1800 series pump, it is important that the curve of the impeller blades is in agreement with pump rotation (see insert in figures 4,5, and 6).

CAUTION

Carefully check that proper shaft sleeve has been keyed into place for rotation of pump. If correct shaft sleeve is not keyed into shaft, it can spin loose during operation of pump and cause excessive damage.

6. Install packing or mechanical seals and secure according to the following specific instructions.

STANDARD PACKING

- a. Slide a bushing (56) onto each end of shaft. The raised shoulder on these bushings must face away from impeller.
- b. Pump sizes 2 x 2 ½ x 9, 2 x 2 ½ x 10, 2 x 2 ½ x 12 have one packing ring (23) in front of lantern ring (52). All other pump sizes have two packing rings in front of lantern ring. Stagger the joints in packing rings so pump will not leak excessively.

MECHANICAL SEALS

- a. Single seal and balanced single seals
 - I. Slide one seal lock collar (54) with setscrews (55) facing the impeller onto each end of the shaft. Position on scribe mark made during disassembly and lock in place.
 - II. Put a light coat of liquid dishwashing detergent on the shaft sleeve. Check rotating parts of seal to make sure they are clean. Spread a light coat of liquid detergent on inside diameters of flexible bellows and washers.
 - III. Place the seal's spring, drive ring, retainer, flexible bellows, and washer on the shaft sleeve in respective order. (Refer to figure 1)
 - IV. Thoroughly inspect cavity of seal gland (49) for burrs or nicks which would damage seat of the seal. Apply a film of liquid detergent to seal seat and install it in seal gland cavity, taking care to seat it evenly and squarely.

CAUTION

Never place a mechanical seal into service after it has been used without replacing or relapping stationary seat and washer faces.

- V. Place O-rings (50) around the seal glands and slide seal glands onto the ends of the shaft.
- b. Double Seal
 - I. Place on seal seat in collar (54), the other one fits into seal gland (49). These parts are set into their cavities in the same manner as they are with a single seal.
 - II. Place o-rings (51) around collars (54) and put the collars with stationary seats facing away from impeller on ends of the shaft, then slide flexible bellows, washers, and springs on the shaft in order shown in figure 1, for each half of double seal assembly (53).

III. Place o-rings (50) around the seal glands (49) and slide seal glands onto ends of the shaft with stationary seats facing impeller.

7. Place slinger (39) on outboard end of shaft.
8. Press grease seal (37) into bearing cartridge (36). On 6B and 7 Power Frames replace snap ring (35A) on inboard side of bearing. Place outboard double row ball bearing (38) in bearing cartridge and press these parts onto outboard end of the shaft. Snap retainer ring (35) in place to secure outboard bearing. Place gasket (43) and cartridge cap (32) in position and secure with capscrews (31)

NOTE

Model 1810 and 1840 - Both the grease zerk holes in bearing cartridges and the pipe plugholes in cartridge caps must be facing the front of pump when it is assembled.

9. Protector (29) can be placed in the cartridge cap or if unit has a tandem shaft, press grease seal into cartridge cap and slide a slinger onto shaft.
10. Place slinger (48) on inboard end of the shaft.
11. Press grease seal (46) into bearing cartridge (45). Place the inboard ball bearing (47) in the bearing cartridge and press this assembly onto inboard end of the shaft.
12. Press grease seal (43) into cartridge cap (42). Position gasket (44) and cartridge cap against bearing cartridge and secure it in place with capscrews (41). Be sure to align grease zerk hole and pipe plughole to the front.
13. Place slinger (40) onto shaft place grease zerks (10) in bearing cartridges and pipe plugs (12) in bearing caps. If pump is oil lubricated, breather tubes are placed in bearing cartridges and oiler with nipples and elbows are placed in cartridge caps.
14. Slide casing wearing rings (28) over impeller wearing rings (61) and set rotating elements into casing halves (69). Make certain the holes that are drilled in bottom of surface of casing wearing rings locate over pins (66) previously set in casing halve (69). Grease zerks or breather tube should face outward.
15. Install key (24) in motor end of shaft (65). Check positioning and alignment of packing rings or seal components and install swing bolts (22) and split gland halves (21) if the pump has packing. Place in position clamps (20), washers (19), and nuts (18) securing loosely in place. Swing bolts (22) are set over pins (68) on 4x5x10 or smaller pumps. On larger pumps swing bolts are held in place by capscrews (7) after casing have (8) is in position.
16. Place pins (27) into bearing cartridges. Place bearing caps (26) in position and secure with capscrews (25)
17. Position new casing gaskets (9) on casing halve (69). Set casing halve (8) in place and secure it to casing halve (69) with capscrews (6). Pins (67) are used as means of locating position of the two casing halves.
18. On pumps larger than 4x5x10, thread in capscrews (7) making sure they are placed through the eyes of swing bolts (22).
19. Place drain plugs (1) and (2_) back in the casing halves.
20. On model and 1840 pumps, set the motor on motor bracket (74) and fasten them together with capscrews (73). Slide the flexible coupling halves onto the pump and motor shafts. Attach motor bracket to casing have (69) with capscrews (75). Connect flexible coupling halves. On model 1810 pumps, attach flexible shafting. Ideal joint operating angle is 1" to 5". On Model 1820 pumps, if lower casing was removed from the base, see section on installation for proper methods of realigning pump to motor and piping.
21. Replace any flushing, cooling, by-pass or drain lines that were removed from the pump. Connect electricity back to the motor.

STARTING PUMP AFTER REASSEMBLY – Do not start pump until all air and vapor have been blend and making sure that there is liquid in pump to provide necessary lubrication.

NOTE

Do not over tighten standard packing assembly before returning unit to operation. Jog the pump to check for proper rotation. Then allow pump to run for a short time, gradually tighten nuts (18) until dripping has been reduced to its normal level.

Model 1820 List of Parts (See Figure 4)

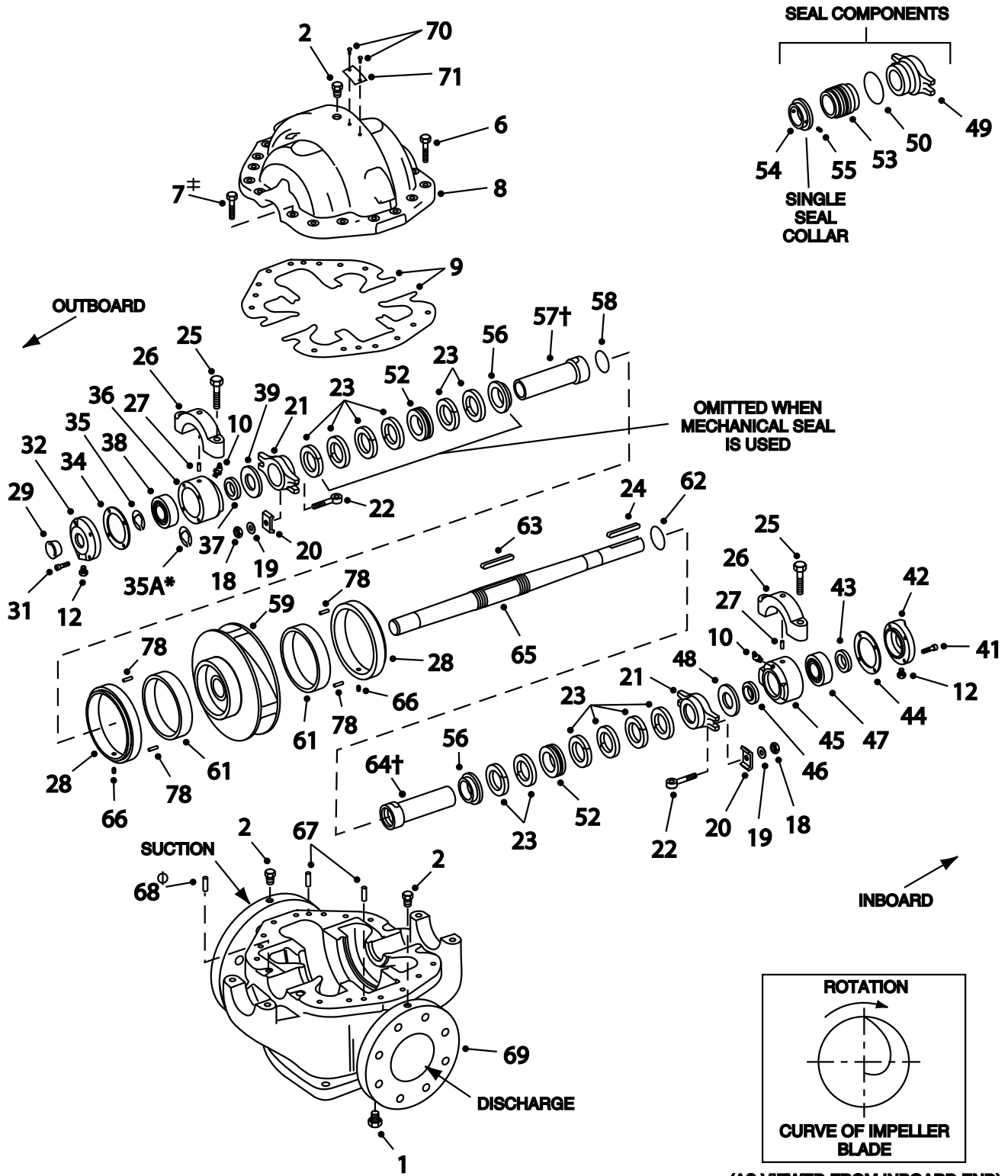
1. Plug	26. Bearing Cap	43. Grease Seal	59. Impeller
2. Plug	27. Pin	44. Gasket	60. Sleeve Pin
6. Capscrew	28. Wearing Ring	45. Cartridge	61. Wearing Ring
7. Capscrew	29. Protector	46. Grease Seal	62. O-Ring
8. Casing	31. Capscrew	47. Bearing	63. Key
9. Gasket	32. Cartridge Cap	48. Slinger	64. Sleeve
10. Grease Fitting	34. Gasket	49. Gland	65. Shaft
12. Plug	35. Retaining Ring	50. O-Ring	66. Pin
18. Nut	35A. Retaining Ring	51. O-Ring	67. Pin
19. Washer	36. Cartridge	52. Lantern Ring	68. Pin
20. Clamp	37. Grease Seal	53. Seal	69. Casing
21. Gland Half	38. Bearing	54. Collar	70. Drivescrew
22. Swing Bolt	39. Slinger	55. Setscrew	71. Nameplate
23. Packing	40. Slinger	56. Bushing	72. Setscrew
24. Key	41. Capscrew	57. Sleeve	78. Setscrew
25. Capscrew	42. Cartridge Cap	58. O-Ring	79. Sleeve Collar

Model 1810 List of Parts (See Figure 5)

1. Plug	26. Bearing Cap	43. Grease Seal	59. Impeller
2. Plug	27. Pin	44. Gasket	60. Sleeve Pin
6. Capscrew	28. Wearing Ring	45. Cartridge	61. Wearing Ring
7. Capscrew	29. Protector	46. Grease Seal	62. O-Ring
8. Casing	31. Capscrew	47. Bearing	63. Key
9. Gasket	32. Cartridge Cap	48. Slinger	64. Sleeve
10. Grease Fitting	34. Gasket	49. Gland	65. Shaft
12. Plug	35. Retaining Ring	50. O-Ring	66. Pin
18. Nut	35A. Retaining Ring	51. O-Ring	67. Pin
19. Washer	36. Cartridge	52. Lantern Ring	68. Pin
20. Clamp	37. Grease Seal	53. Seal	69. Casing
21. Gland Half	38. Bearing	54. Collar	70. Drivescrew
22. Swing Bolt	39. Slinger	55. Setscrew	71. Nameplate
23. Packing	40. Slinger	56. Bushing	72. Setscrew
24. Key	41. Capscrew	57. Sleeve	78. Setscrew
25. Capscrew	42. Cartridge Cap	58. O-Ring	79. Sleeve Collar

Model 1840 List of Parts (See Figure 6)

1. Plug	26. Bearing Cap	43. Grease Seal	59. Impeller
2. Plug	27. Pin	44. Gasket	60. Sleeve Pin
6. Capscrew	28. Wearing Ring	45. Cartridge	61. Wearing Ring
7. Capscrew	29. Protector	46. Grease Seal	62. O-Ring
8. Casing	31. Capscrew	47. Bearing	63. Key
9. Gasket	32. Cartridge Cap	48. Slinger	64. Sleeve
10. Grease Fitting	34. Gasket	49. Gland	65. Shaft
12. Plug	35. Retaining Ring	50. O-Ring	66. Pin
18. Nut	35A. Retaining Ring	51. O-Ring	67. Pin
19. Washer	36. Cartridge	52. Lantern Ring	68. Pin
20. Clamp	37. Grease Seal	53. Seal	69. Casing
21. Gland Half	38. Bearing	54. Collar	70. Drivescrew
22. Swing Bolt	39. Slinger	55. Setscrew	71. Nameplate
23. Packing	40. Slinger	56. Bushing	72. Setscrew
24. Key	41. Capscrew	57. Sleeve	78. Setscrew
25. Capscrew	42. Cartridge Cap	58. O-Ring	79. Sleeve Collar



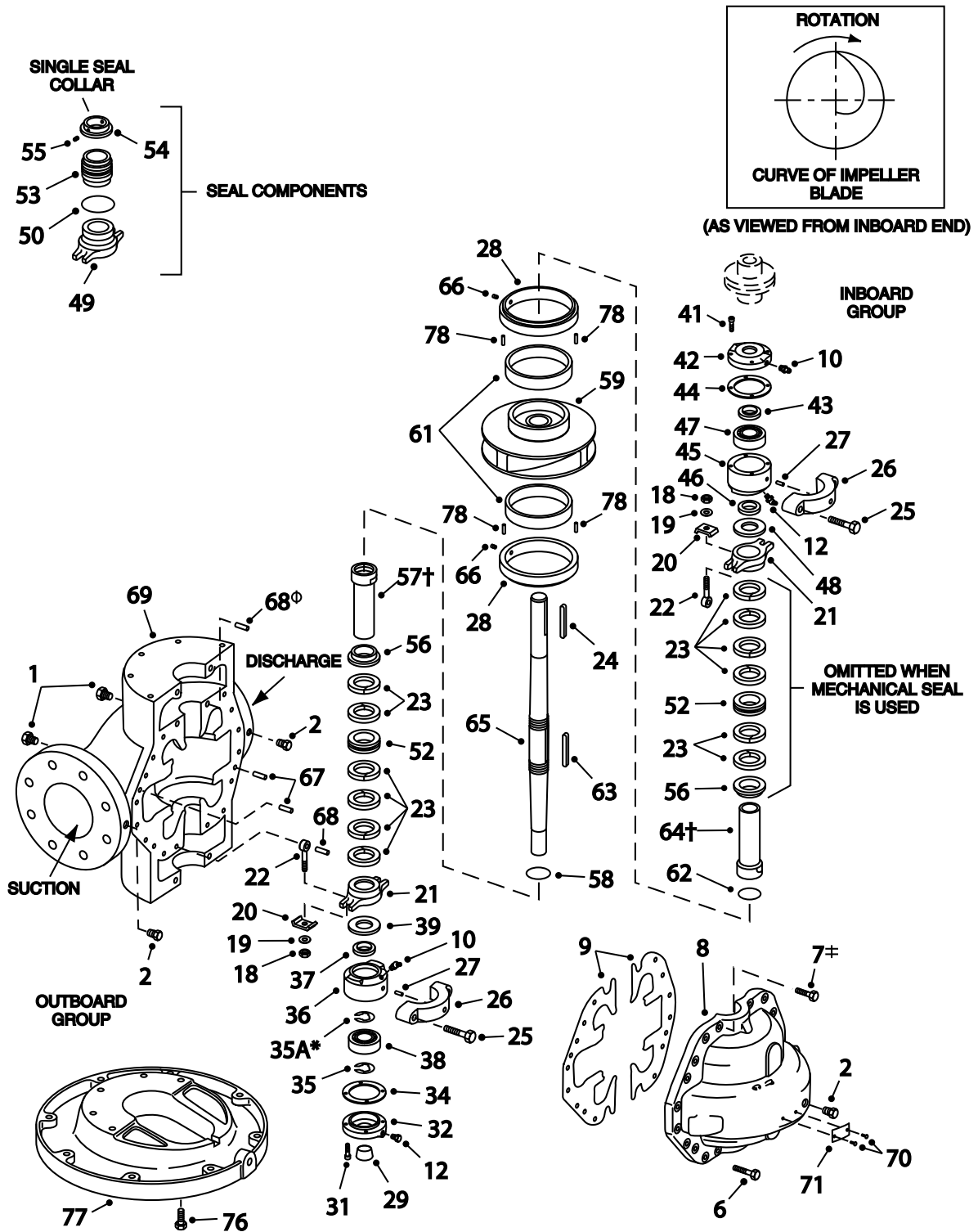
* POWER FRAMES 6B, 7A & 7 ONLY.

‡ PC. NO. 7 NOT REQUIRED FOR PS #1 & #2. REFER PC. NO. 68.

⊕ PC. NO. 68 FOR PS #1 & #2 ONLY. FOR OTHER PS REFER PC. NO. 7.

† FOR 10x12x18D, SHAFT SLEEVE CONSISTS OF PC. NO. 79, PC. NO. 60, PC. NO. 64 AND PC. NO. 72.

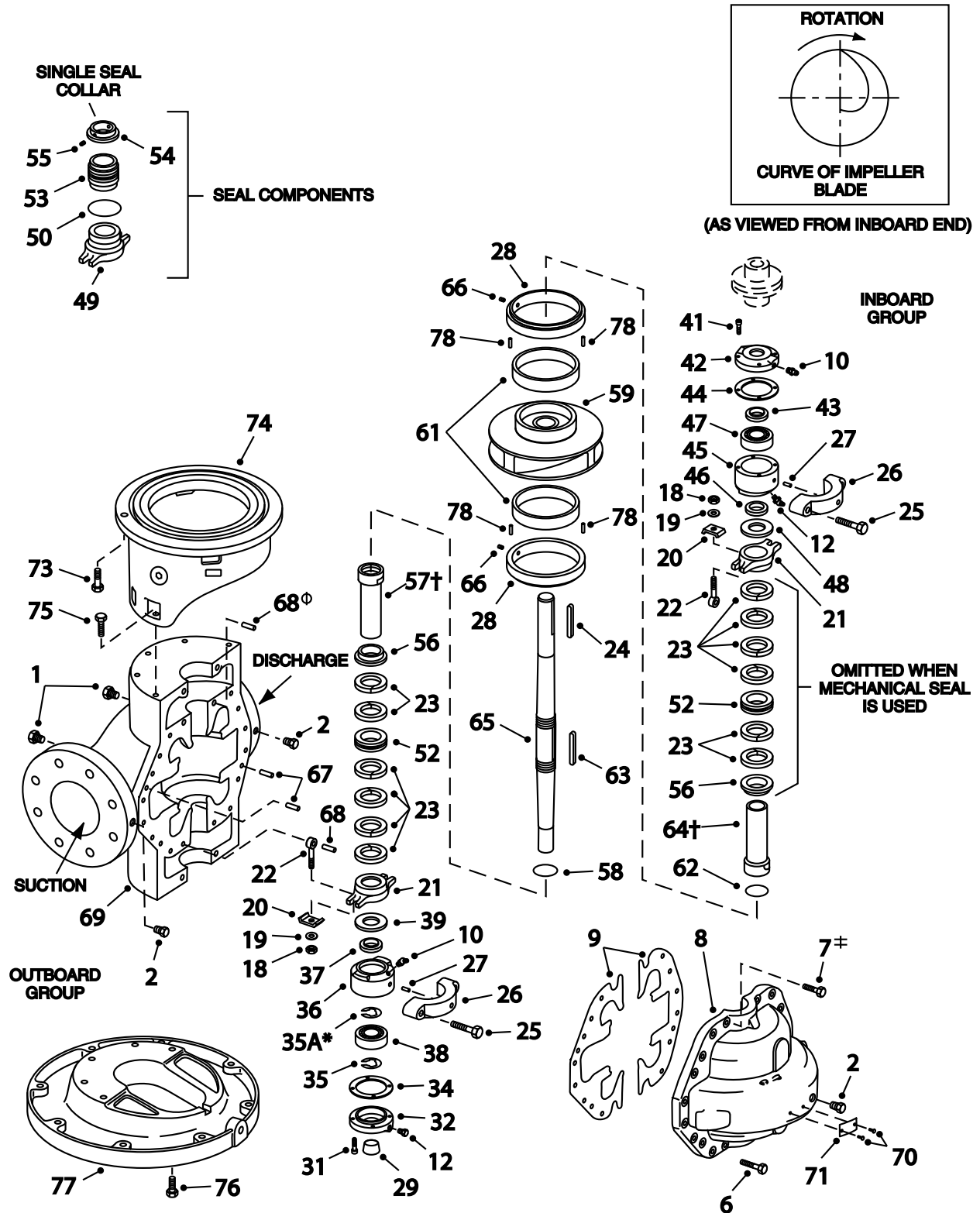
WHEN ORDERING SPARE PARTS ALWAYS INCLUDE THE PUMP TYPE, SIZE, SERIAL NUMBER AND THE PIECE NUMBER FROM THE EXPLODED VIEW IN THIS MANUAL.



* POWER FRAMES 6B, 7A & 7 ONLY.
 ‡ PC. NO. 7 NOT REQUIRED FOR PS #1 & #2. REFER PC. NO. 68.
 ◊ PC. NO. 68 FOR PS #1 & #2 ONLY. FOR OTHER PS REFER PC. NO. 7.
 † FOR 10x12x18D, SHAFT SLEEVE CONSISTS OF PC. NO. 79, PC. NO. 60, PC. NO. 64 AND PC. NO. 72.

Figure 5. Model 1810 Exploded View.

WHEN ORDERING SPARE PARTS ALWAYS INCLUDE THE PUMP TYPE, SIZE, SERIAL NUMBER AND THE PIECE NUMBER FROM THE EXPLODED VIEW IN THIS MANUAL.



* POWER FRAMES 6B, 7A & 7 ONLY.
 † PC. NO. 7 NOT REQUIRED FOR PS #1 & #2. REFER PC. NO. 68.
 ◊ PC. NO. 68 FOR PS #1 & #2 ONLY. FOR OTHER PS REFER PC. NO. 7.
 ‡ FOR 10x12x18D, SHAFT SLEEVE CONSISTS OF PC. NO. 79, PC. NO. 60, PC. NO. 64 AND PC. NO. 72.

Figure 6 Model 184 Exploded View.

WHEN ORDERING SPARE PARTS ALWAYS INCLUDE THE PUMP TYPE, SIZE, SERIAL NUMBER AND THE PIECE NUMBER FROM THE EXPLODED VIEW IN THIS MANUAL.

THIS PAGE INTENTIONALLY LEFT BLANK

THIS PAGE INTENTIONALLY LEFT BLANK

THIS PAGE INTENTIONALLY LEFT BLANK

