

# SYSTEM ONE® PARTS

PN: 967127 **PARTS LIST****1301-C02-08**

## Frame A and LD17 Size 1.5x3-13

Keep with Instructions 1301-C00 for Installation, Operation and Maintenance

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Effective	Oct 2013
Replaces	Jan 2013

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Frame A and LD17 pumps share all parts except:

Ref 6	Shafts and Rotating Elements
Ref 11	Backcovers (& hardware)
Ref 71	Frame Adaptors

Low Speed (FRA08L, LD08L) versions are for use at 1800 rpm and below.

High Speed (FRA08H, LD08H) versions are for use at over 1800 rpm.

High Speed versions feature 17-4 shafts and impellers with balance holes as standard.

### Recommended Spare parts (Ref # is shaded.)

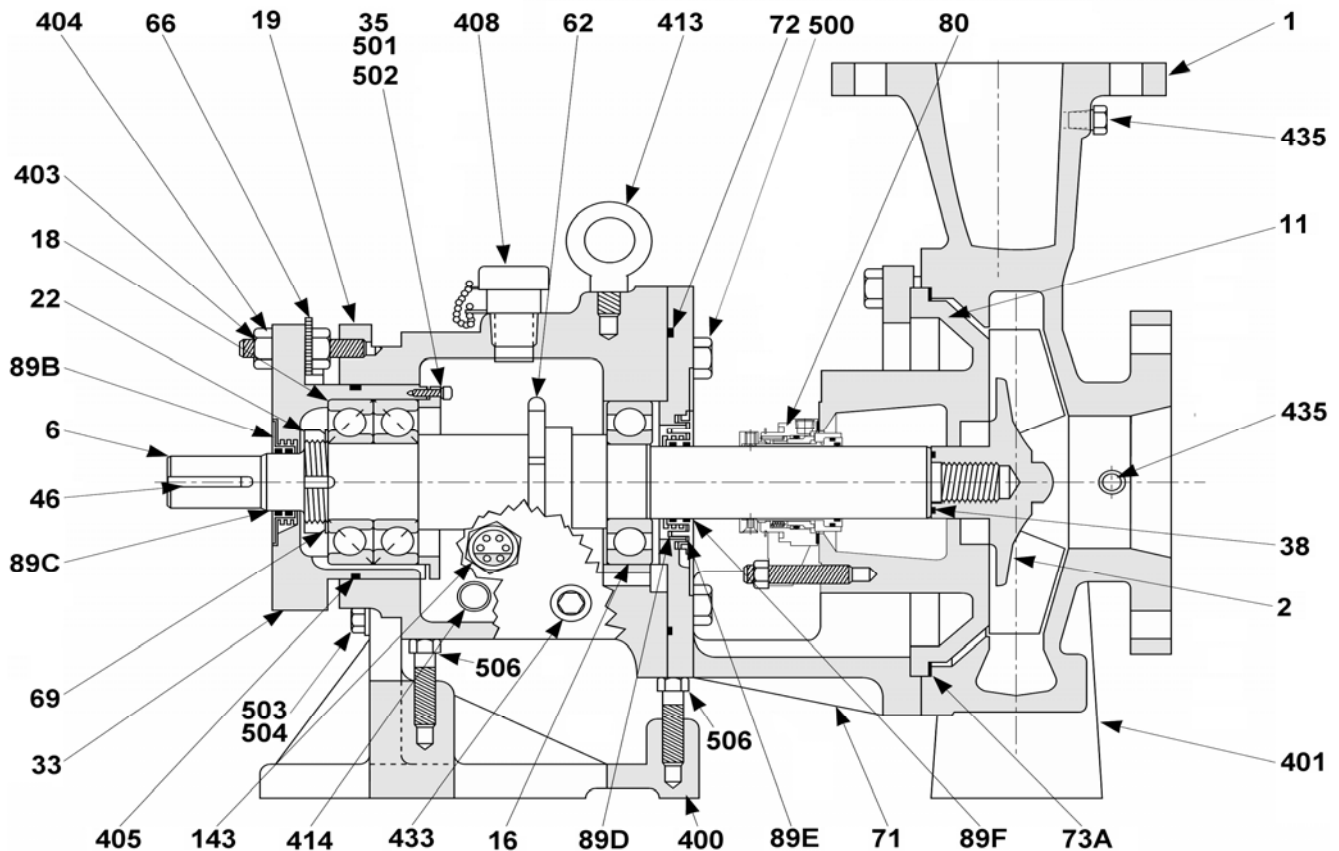
Ref #	Description
2	Impeller
6-RE	Rotating Element
72	Frame Adapter O-ring
73A	Casing Gasket
80	Mechanical Seal
89B	Lab Seal Rotor (w/ O-ring), Thrust Bearing
89E	Lab Seal Rotor (w/ O-ring), Radial Bearing
405	Cartridge O-ring



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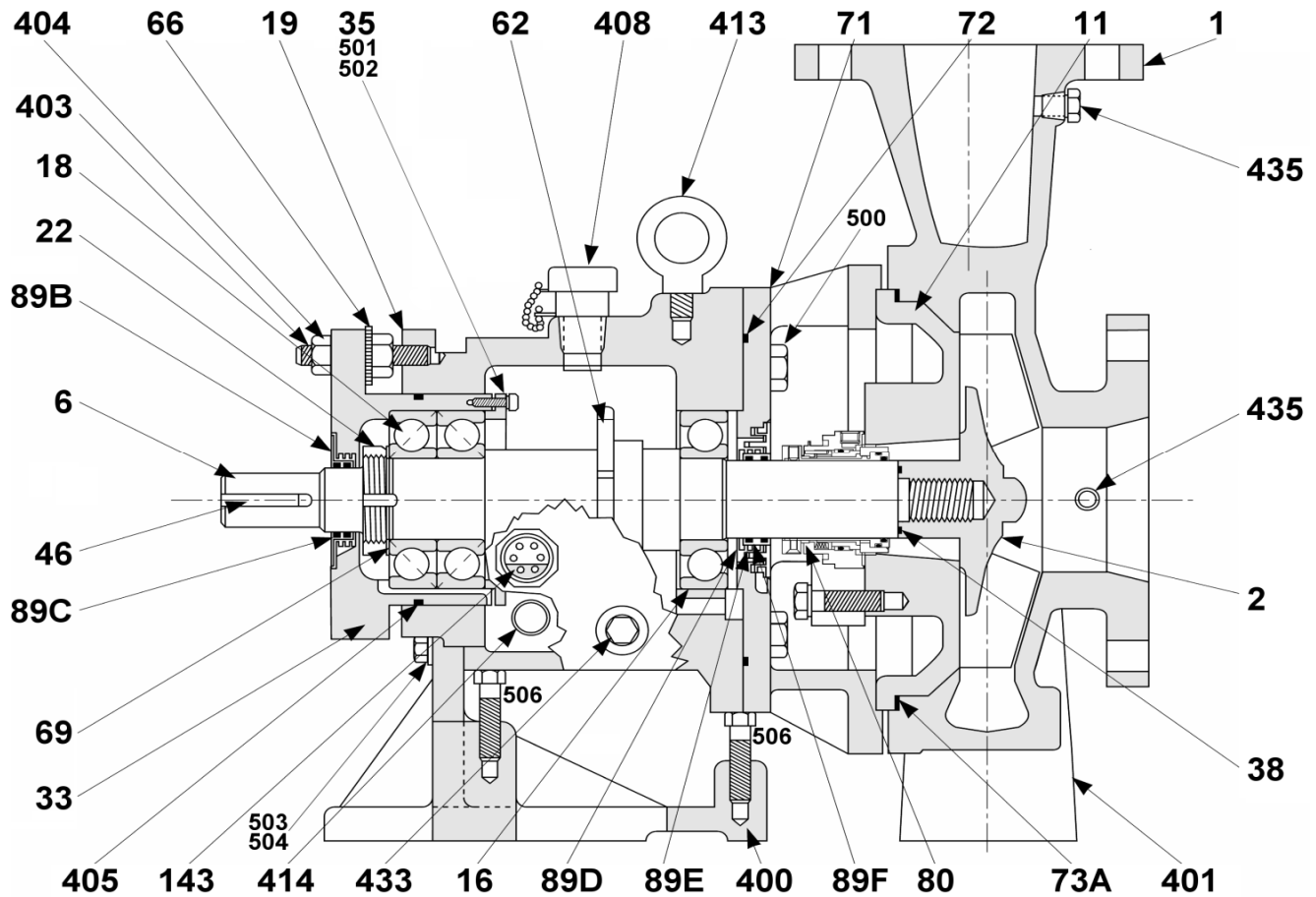
## Frame-A Cross Section



Ref.	Description	Ref.	Description	Ref.	Description
1	Casing	69	Lockwasher, Thrust Bearing	403	Stud, Cartridge
2	Impeller	71	Frame Adapter	404	Locknut, Cartridge
6	Shaft	72	O-Ring, Frame Adapter	405	O-Ring, Cartridge
11	Back Cover	73A	Gasket, Casing	408	Oil Filler Assembly
16	Bearing, Radial	80	Mechanical Seal	413	Bolt, Eye
18	Bearing, Thrust	89A	Seal, Labryinth Stator, Thrust *	414	Plug, Magnetic
19	Bearing Frame	89B	Seal, Labryinth Rotor, Thrust	433	Plug, Bearing Frame
22	Locknut, Thrust Bearing	89C	Seal, Labryinth O-Ring, Thrust	435	Plug, Casing
33	Bearing Cartridge	89D	Seal, Labryinth Stator, Radial	500	Cap Screw, Frame Adapter
35	Retainer Cover	89E	Seal, Labryinth Rotor, Radial	501	Screw, Retainer Cover
38	O-Ring, Impeller Hub	89F	Seal, Labryinth O-Ring, Radial	502	Washer for 501
46	Key, Coupling	143	Oil Sight Glass	503	Screw, Bearing Frame Foot
62	Flinger	400	Foot, Bearing Frame	504	Washer for 503
66	Micrometer Nut	401	Foot, Casing	506	Bolt, Bearing Frame Support

\* 89A Incorporated as part of the cartridge after Mar. 2000 (not shown)

# LD17 Cross Section



Ref.	Description	Ref.	Description	Ref.	Description
1	Casing	69	Lockwasher, Thrust Bearing	403	Stud, Cartridge
2	Impeller	71	Frame Adapter	404	Locknut, Cartridge
6	Shaft	72	O-Ring, Frame Adapter	405	O-Ring, Cartridge
11	Back Cover	73A	Gasket, Casing	408	Oil Filler Assembly
16	Bearing, Radial	80	Mechanical Seal	413	Bolt, Eye
18	Bearing, Thrust	89A	Seal, Labryinth Stator, Thrust *	414	Plug, Magnetic
19	Bearing Frame	89B	Seal, Labryinth Rotor, Thrust	433	Plug, Bearing Frame
22	Locknut, Thrust Bearing	89C	Seal, Labryinth O-Ring, Thrust	435	Plug, Casing
33	Bearing Cartridge	89D	Seal, Labryinth Stator, Radial	500	Cap Screw, Frame Adapter
35	Retainer Cover	89E	Seal, Labryinth Rotor, Radial	501	Screw, Retainer Cover
38	O-Ring, Impeller Hub	89F	Seal, Labryinth O-Ring, Radial	502	Washer for 501
46	Key, Coupling	143	Oil Sight Glass	503	Screw, Bearing Frame Foot
62	Flinger	400	Foot, Bearing Frame	504	Washer for 503
66	Micrometer Nut	401	Foot, Casing	506	Bolt, Bearing Frame Support

\* 89A Incorporated as part of the cartridge after Mar. 2000 (not shown)

Ref #1 Casing Assembly Frame A and LD17				1.5x3-13			
Casings assemblies do not include gaskets (see item 73A) or feet (see item 401).							
Options		Material - Part Number for Casing Assembly					
Flange	Other	DI	CF8M	CD4	CN7M	HB	HC
150FF	-	090804	098206	098104	098469	644174	628481
	Drain	801928	097840	636871			
	LSD						
	RSD						981096
150RF	-						
	Drain						
	LSD						
	RSD						
300FF	-	090816	098575	363436			
	Drain	981329					
	LSD						
	RSD						
300RF	-		801333				
	Drain	628219					
	LSD						
	RSD						
Hardware included in STANDARD casing assemblies (material may differ from casing)							
Ref.	Description	pts/pump	DI/CF/CD	CN7M	HB	HC	
435	Plug for gage tap	2	098395	350664	628343	628482	
*	Bolt for back Cover	12		098331			
*	Bolt for casing foot	4		098278			
*	Washer for bolt	4		098318			
*	Drain Plug (optional)	1	098280	098008		981101	

\* Not depicted in drawing

Ref #2 Impeller Assembly Frame A and LD17			1.5x3-13			
Impeller assembly includes trim, ISO G 6.3 balance and PTFE O-ring (098296). Specify trim at time of order. Unspecified impellers ship with full trim. There is a charge to retrim impellers after shipment. (981631) Lock Bolt impeller assembly also includes lock bolt (640644) and washer (628585). Keyed impeller assemblies includes Bolt, Bushing, Jack screws,and O-ring. (CF for part #s) Specify balance holes for 13" impellers running over 1800 rpm.						
Ref #	Impeller Type	CD4	CF8M	CN7M	HB	HC
2	Standard w/ Balance Holes	098220 801929	636995	098458	644177	697793
	Lock Bolt* w/ Balance Holes	982880				
	Keyed* w/ Balance Holes	098536 628802				
	1.25" Thread w/ Balance Holes	983330				

\* Not depicted in drawing

## 6 Shaft Assemblies and Rotating Elements.

**17-4Ph shaft material is required for the following sizes operated over 1800 rpm: 4x6-10 and all 13".**

Ref# 6-RE: Rotating Element Includes shaft assembly (6-SA), bearings (16&18), bearing cover (35), flinger filter (62).

Ref# 6-SA: Shaft Assembly Includes shaft (6), locknut (22), locknut washer (69), and key (46).

(Ref# 6-SA: Shaft Assembly for keyed impellers also include impeller key as noted.)

All shafts are stated material in the wet end portion and carbon steel in the power end portion.

Ref.#	Description	Parts/pump	Part #	Note
6-RE FRA	Rotating Element Frame-A 316/CS	1	364152	
	Rotating Element Frame-A 316/CS Vertical		059353	
	Rotating Element Frame-A 17-4/CS		099917	
	Rotating Element Frame-A 17-4/CS Vertical		364242	
	Rotating Element Frame-A A20/CS		097722S	
	Rotating Element Frame-A HC/CS		097746	
	Rotating Element Frame-A HB/CS		628849	
	Rotating Element Frame-A 316/CS Lock Bolt		981795	
Rotating Element Frame-A 17-4/CS Lock Bolt	981796			
6-SA FRA	Shaft Assembly Frame-A 316/CS	1	364153	
	Shaft Assembly Frame-A 17-4/CS		099918	
	Shaft Assembly Frame-A A20/CS		097721	
	Shaft Assembly Frame-A HC/CS		097745	
	Shaft Assembly Frame-A HB/CS		628850	
	Shaft Assembly Frame-A 316/CS Lock Bolt		981791	
	Shaft Assembly Frame-A 17-4/CS Lock Bolt		981792	
6-RE LD17	Rotating ElementLD17 316/CS	1	099706	
	Rotating Element LD17 316/CS Vertical		059340	
	Rotating Element LD17 17-4/CS		099920	
	Rotating Element LD17 17-4/CS Vertical		090964	
	Rotating Element LD17 A20/CS		628943	
	Rotating Element LD17 HC/CS		685255	
	Rotating Element LD17 HB/CS		628333	
	Rotating Element LD17 316/CS Lock Bolt		981797	
	Rotating Element LD17 17-4/CS Lock Bolt		981798	
	Rotating Element LD17 17-4/CS 1.25" Thread		640681	Use over 150hp
	Rotating Element LD17 17-4/CS Keyed 1.84" Hub		643161	All except 1x2-10
	Rotating Element LD17 17-4/CS Keyed 1.47" Hub		090983	1x2-10 Only
6-SA LD17	Shaft Assembly LD17 316/CS	1	098422	
	Shaft Assembly LD17 17-4/CS		099922	
	Shaft Assembly LD17 A20/CS		628942	
	Shaft Assembly LD17 HC/CS		685256	
	Shaft Assembly LD17 HB/CS		628331	
	Shaft Assembly LD17 316/CS Lock Bolt		981793	
	Shaft Assembly LD17 17-4/CS Lock Bolt		981794	
	Shaft Assembly LD17 17-4/CS 1.25" Thread		640680	Use over 150hp
	Shaft Assembly LD17 17-4/CS Keyed 1.84" Hub (includes 350161 key)		643143	All except 1x2-10
	Shaft Assembly LD17 17-4/CS Keyed 1.47" Hub (includes 360698 key)		090977	1x2-10 Only
Original Frame-A design uses 5310 thrust bearing and shaft is 1.125" at the coupling end. If ordering a shaft assembly or a rotating element for an original ANSI Fame-A power end, it is highly recommended that the power end be converted to the current standard with angular contact thrust bearings. This can be accomplished by using a current design rotating element (as listed above), thrust labyrinth seal, and a new coupling half for the larger shaft diameter.				
<b>Parts required to convert ANSI Original Frame-A Power End (1.125" cplg. end ) to current design (1.375" cplg. end):</b>				
1 ea Rotating Element Frame-A		see table above for PN		
1 ea Thrust Lab Seal Stationary 1.50" NPS**		364238**		
1 ea Thrust Lab Seal Rotary 1.50" 316SS		090697		
1 ea Coupling half for 1.375" shaft		by others		
** If cartridge (33) is also being replaced, this item is unnecessary.				

<b>REF #11 Back Cover Assemblies Frame-A</b>						
Cover includes integral seal chamber and is backwards compatible with old two piece design. Cover assembly does not include gasket (73A). Cover assembly machined for bushing does not include bushing. Cover assembly machined for jacket does not include the jacket. Cover assembly machined for tap includes plug for tap (361388). CN7M, HB, HC covers use same alloy plugs.						
Bush/Other options	DI	CF8M	CD4MCu	CN7M	HB	HC
<b>13 inch Frame A</b>	Part Number for Back Cover Assembly					
Standard for carbon bush	363766	364161	364190	685160	644170	628587
For jacket	059469	059471	059473	643228		981095
With tap	628812					
For jacket/with tap		801543	982900			
Optional for Enviroseal	644079	628860				
For jacket	981415	982369				
With tap						
For jacket/with tap						
<b>REF #11 Back Cover Assemblies LD17</b>						
Cover includes integral seal chamber and is backwards compatible with old two piece design. Cover assembly does not include gasket (73A). Cover assembly machined for bushing does not include bushing. Cover assembly machined for tap includes plug for tap (361388). CN7M, HB, HC covers use same alloy plugs. Seal chamber jacket not available on LD17.						
Bush/Other options	DI	CF8M	CD4MCu	CN7M	HB	HC
<b>13 inch LD17</b>	Part Number for Back Cover Assembly					
No bushing	363936	685053	685474			
with tap						
Carbon/14K	097407	697732	644361			
with tap						
EnviroSeal	801264	801118	644158			
with tap						

<b>Hardware included with standard Back Cover Assemblies</b>						
Frame A				LD 17		Comment/Note
Ref.	Description	Qty	Part No.	Qty	Part No.	
*	Gland Stud	4	360642	NA		
*	Nut for Gland Stud	4	098316	NA		
*	Gland Bolt	NA		4	364229	
*	Washer for Gland Bolt	NA		4	090696	
*	Adaptor Stud	8	098281	8	098281	
*	Nut for Adaptor Stud	8	098289	8	098289	

<b>Optional Seal Chamber Jacket for Frame-A (Requires Back Cover for Jacket. Not available for LD17.)</b>				
Ref.	Description	Parts/pump	Part No.	Comment/Note
*	Jacket Assembly for Seal Chamber Frame-A only	1	090873	
*	Jacket for Seal Chamber Frame-A only	1	363015	Included in Jacket Assembly
*	O-Ring for Seal Chamber Jacket Frame-A only	2	360976	Included in Jacket Assembly
*	Screw for Seal Chamber Jacket Frame-A only	1	360362	Included in Jacket Assembly

\* Not depicted in drawing

Ref.#	Description	Parts/pump	Part No.	Note
16	Radial Bearing 6310 C3	1	098381	Included in #6-RE
	Radial Bearing 6310-Z C3 (Grease Lube and Vertical)		098732	Included in #6-RE
18	Thrust Bearing 7310 BEGAY (2 required)	2	098054	Included in #6-RE
19	Bearing Frame Assembly Includes: bearing frame (19), sight glass (143), stud (403), oil cap (408), eyebolt (413), plugs (414 and 433).	1	098299	
	Bearing Frame Assembly (Grease Lube and Vertical)		099537	
22	Bearing Locknut N10	1	098383	Included in #6-SA
33	Cartridge Assembly for Thrust Bearing Includes: cartridge (33), screw (501), washers (502), O-ring (405).	1	801140	
	Cartridge Assembly (Grease Lube and Vertical)		099513	
35	Retainer Cover	1	098371	Included in #6-RE
	Retainer Cover (Grease Lube and Vertical)	1	361491	Included in #6-RE
38	O-ring Impeller PTFE 2-027	1	098296	Included in #2 assy
	O-ring Impeller: pure PTFE 2-029 for keyed impellers after Mar. 2000		098880	Included in #2 assy
	O-ring Impeller: PTFE Encapsulated 2-029 for keyed after Mar. 2000		002998	Special Order
	Keyed impellers prior to March 2000 had no O-ring.			
46	Key	1	059241	Included in #6-SA
62	Flinger Filter	1	098385	Included in #6-RE
66	Micrometer Nut SS	3	098376	
69	Bearing Lockwasher W10	1	098384	Included in #6-SA
71	Frame Adapter Frame-A	1	098297	
	Frame Adapter LD17		099605	
	Frame Adapter Frame-A (Grease Lube and Vertical)		364243	
	Frame Adapter LD17 (Grease Lube and Vertical)		099796	
72	Frame Adapter O-ring (2-265 Buna)	1	098396	Included in #71 assy
73A	Casing Gasket 13 CFN .06	1	363411	
	Casing Gasket 13 CFN .09		363412	
	Casing Gasket 13 RGO .12		059208	
	Casing Gasket 13 CRPE .06		981932	
	Casing Gasket 13 CRPE .09		Special	
	Casing Gasket 13 PTFE .06		099583	
	Casing Gasket 13 PTFE .09		Special	

**Material Key for Wet End Gaskets**

Abv	Description	Application	Old Type
CFN	Carbon Fiber with Nitrile binder (Std DI-CF8-CD4)	General	197
RG0	Reinforced Graphite no binder	High Temperature	199
CRPE	Ceramic Reinforced PTFE	Hi Temperature/Pressure	196
PTFE	PTFE Style 2000 (Std A20-HB-HC)	Chemical Resistance	2000

Ref.#	Description	Parts/pump	Part No.	Note
80	Mechanical Seal - See mechanical seal pages	1		
89A	Thrust Lab seal Stationary 1.50" NPS (before May 2000)	1	364238	
	Frame-A and LD17 pumps built after May 2000 do not use thrust lab seal stationaries.			
89B	Thrust Lab Seal Rotary 1.50" 316SS	1	090697	
89C	Thrust lab seal rotary O-ring 1.50" (2-128)	2	099924	Included in #89B assy
89D	Radial Lab Seal Stationary 1.87" NPS	1	364240	
89E	Radial Lab seal Rotary 1.87" 316SS	1	098478	
89F	Radial lab seal rotary O-ring (2-134)	2	098374	Included in #89E assy
143	Oil sight glass 1.00-11.5 NPT	1	098306	2nd SG optional
400	Bearing Frame Foot 10.00" pumps without C-frame Adaptor	1	059295	Marked 2537
	C-Frame Adaptor Foot for 10.00" pumps	2	059293	Marked 2536
	If C-frame adaptor is used, use C-frame adaptor feet attached to adaptor rather than bearing frame foot attached to frame.			
	Bearing Frame Feet and C-Frame Adaptor feet include ref. 503, 504 & 506.			
401	Casing Foot for Centerline Mount	2	098114	Marked D51496 or 307
	Casing Foot for Side Discharge	1	CF	
403	Micrometer stud 1/2-20 UNF SS	3	098366	
404	Cartridge Locknut 1/2-20 UNF SS	3	098377	
405	Cartridge O-Ring (2-248 Buna)	1	098375	Included in #33 assy
408	Oil Filler & Cap Assembly	1	098364	
413	Lifting Eyebolt .50-13	1	098365	
414	Magnetic Plugs .50-14 NPT	2	098363	
433	Oil drain plug .25-18 NPT	1	099792	
435	Plug for suction or discharge tap	1 or 2	Varies by mat'l	See Ref #1 Casing assy
500	Bolt for frame adaptor (HHCS .62-11x1.25)	4	098331	
501	Retainer Cover Socket Head Cap Screws 10-32	8	098387	Included in #33 assy
502	Washer for 501	8	098389	Included in #33 assy
503	Screw, Bearing Frame Foot	2	350729	
504	Washer for Screw 503	2	350727	
505	Jackscrew - Hex Head Cap Screw	2	098278	Included in #71 assy
506	Screw, Bearing Frame Support	2	350728	
*	Temperature Monitor (Optional)	1	685361	
*	Bearing Housing Cooling Coil Assy (Optional)	1	098308	
*	Throat Bushings - See Components and Accessories Price page 10-1301-08.			

\* Not depicted in drawing.