CONSTRUCTION DETAILS Metric Equivalents					
POWER END		**MODEL LVB S**	**MODEL LVB M**	**MODEL LVB L**	**MODEL LVB X**
Shaft Diameter	At Impeller	3/4" (19.0)	1" (25.4)	1 1/4" (31.8)	1 1/2" (38.1)
	In Stuffing Box (less sleeve)	1 3/8" (34.9)	1 3/4" (44.5)	2 1/8" (54.0)	2 1/2" (63.5)
	In Stuffing Box (with sleeve)	1 1/8" (28.6)	1 1/2" (38.1)	1 7/8" (47.6)	2" (50.8)
	Sleeve Outside Diameter	1 3/8" (34.9)	1 3/4" (44.5)	2 1/8" (54.0)	2 1/2" (63.5)
	Between Bearings	1 1/2" (38.1)	2 1/8" (54.0)	2 1/2" (63.5)	3 1/8" (79.4)
	At Coupling	7/8" (22.2)	1 1/8" (28.6)	1 7/8" (47.6)	2 3/8" (60.3)
Bearings	Radial	207-S	309-S	311-S	313-S
	Coupling End (Double Row)	5306	5309	5311	5313
	Bearing Span	4 1/8" (105)	6 1/4" (159)	6 7/8" (164)	9 1/4" (235)
	Shaft Overhang	6 1/8" (156)	8 3/8" (213)	8 3/8" (213)	9 31/32" (253)
Stuffing Box	Bore	2" (50.8)	2 1/2" (63.5)	2 7/8" (73.0)	3 3/8" (85.7)
	Depth	2 1/8" (54.0)	2 5/8" (66.7)	2 5/8" (66.7)	3" (76.2)
	Packing Size	5/16" x 5/16" (7.9 x 7.9)	3/8" x 3/8" (9.5 x 9.5)	3/8" x 3/8" (9.5 x 9.5)	7/16" x 7/16" (11.1 x 11.1)
	No. of Rings	5	5	5	5
	Width of Lantern Ring	7/16" (11.1)	5/8" (15.9)	5/8" (15.9)	5/8" (15.9)
	Distance – End of Box to Nearest Obstruction	2 3/16" (55.6)	3" (76.2)	3" (76.2)	2 15/16" (74.6)
Optional LVB Shaft and Bearing Frame Assembly available for customer preference or special applications on 10" and 13" pumps. General construction details identical to LVB except for coupling and shaft diameter.					

PUMP END		LVB S					LVB M											LVB X				
		1x1 1/2-6	1 1/2x3-6	2x3-6	1x1 1/2-8	1 1/2x3-8	2x3-6	2x3-8	3x4-8	3x4-8G	1x2-10	1 1/2x 3-10	2x3-10	3x4-10	4x6-10	1 1/2x 3-13	2x3-13	3x4-13	4x6-13	6x8-13	8x10-13	6x8-15	8x10-15	8x10-15G
Max. Diameter Solids		11/32" (8.6)	7/16" (11.2)	3/8" (9.5)	11/32" (8.6)	7/16" (11.2)	3/8" (9.5)	1/2" (12.7)	1 1/8" (28.6)	11/16" (17.5)	7/16" (11.2)	7/32" (5.6)	3/4" (9.5)	5/8" (15.9)	1" (25.4)	7/32" (5.6)	3/8" (9.5)	5/8" (15.9)	1" (25.4)	11/16" (17.5)	1" (25.4)	13/16" (20.6)	1 1/8" (28.6)	13/16" (20.6)
Shaft Defl. Load Factor (M)	3500RPM	3.0	6.2	7.0	6.0	7.8	6.2	8.6	—	15.0	7.2	8.6	9.8	15.0	—	10.0	15.7	35.5	—	—	—	—	—	—
	1750RPM	0.8	1.6	1.8	1.5	2.0	1.6	2.2	7.0	4.1	1.9	2.2	2.5	4.1	16.5	2.6	4.6	11.5	16.5	8.0	15.0	10.0	—	30.0
	1150RPM	0.3	0.7	0.8	0.7	0.9	0.7	1.0	3.1	1.8	0.8	1.0	1.1	1.7	6.8	1.2	1.9	5.0	6.8	3.6	6.7	4.5	11.5	13.6
Min. Casing Thickness		3/8" (9.5)					7/16" (11.2)				1/2" (12.7)						9/16" (14.3)	5/8" (15.9)		1/2" (12.7)*		9/16" (14.3)*		
Casing Corrosion Allowance		1/8" (3.2)																						
Working Pressure		See Pressure–Temperature Chart																						
Test Pressure		150% of Working Pressure at 100° F. (38° C.)																						
Max. Liquid Temp. (without cooling)		350° F. (177° C.)																						
Max. Liquid Temp. (with cooling)		500° F. (260° C.)																						
Unit Wgt. lbs. (Kg)		See Dimensions																						

* Minimum Thickness Titanium Casing – 3/8" (9.5)

Shaft Deflection and Bearing Life Data

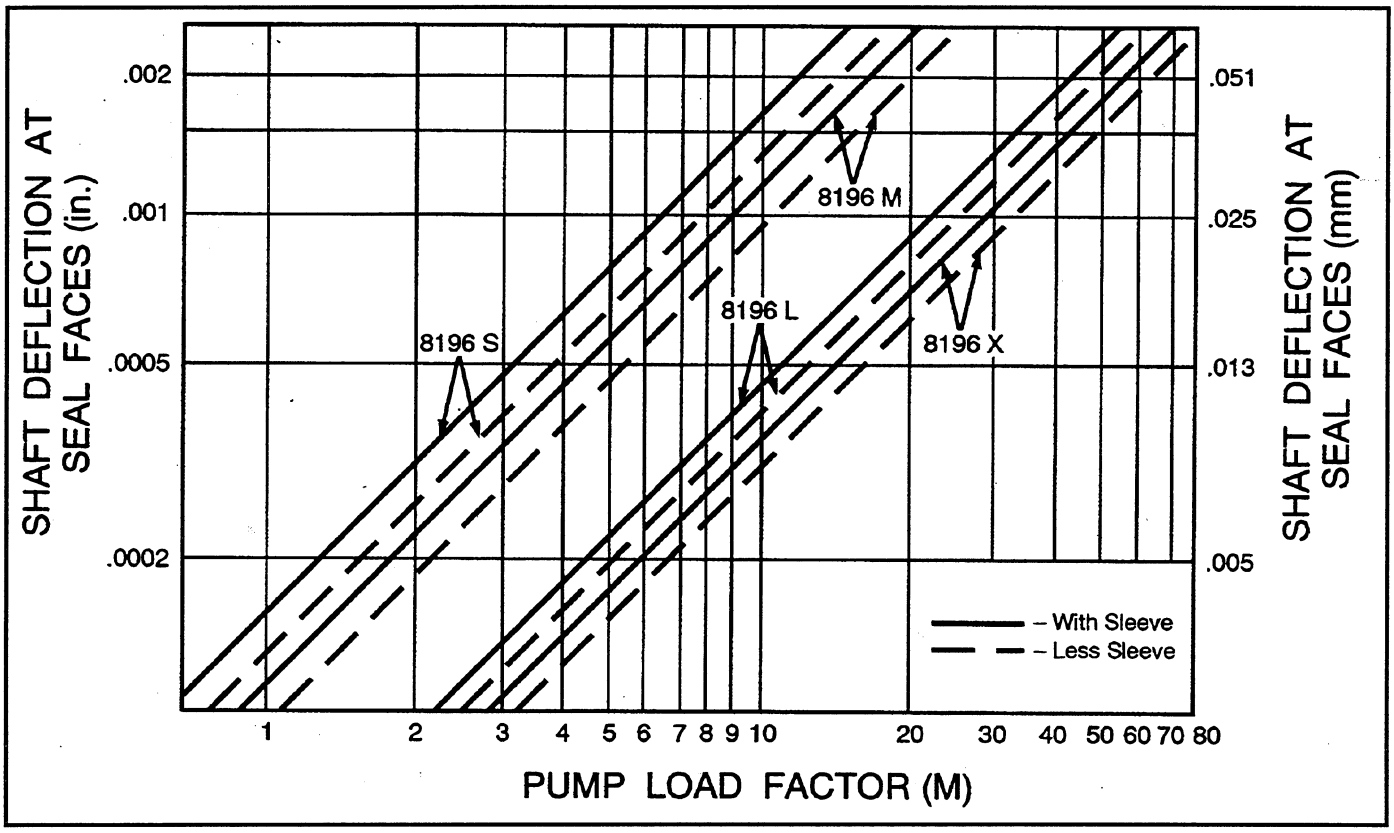
SHAFT DEFLECTION DATA							
FRAME	**SIZE**	**3500RPM**	**2900RPM**	**1750RPM**	**1450RPM**	**1150RPM**	**960RPM**
S	1 x 1½-6	3.0	2.1	.8	.5	.3	—
	1½ x 3-6	6.2	4.3	1.6	1.1	.7	—
	2 x 3-6	7.0	4.8	1.8	1.2	.8	—
	1 x 1½-8	6.0	4.2	1.5	1.1	.7	—
	1½ x 3-8	7.8	5.4	2.0	1.3	.9	—
M	2 x 3-6	6.2	4.3	1.6	1.1	.7	—
	2 x 3-8	8.6	5.9	2.2	1.5	1.0	—
	3 x 4-8	—	—	7.0	5.0	3.1	—
	3 x 4-8G	15.0	11.0	4.1	2.9	1.8	—
M / L	1 x 2-10	7.2	5.0	1.9	1.3	.8	—
	1½ x 3-10	8.6	5.9	2.2	1.5	1.0	—
	2 x 3-10	9.8	6.7	2.5	1.7	1.1	—
	3 x 4-10	15.0	11.0	4.1	2.9	1.7	—
	4 x 6-10	—	—	16.5	11.5	6.8	—
	1½ x 3-13	10.0	6.9	2.6	1.8	1.2	—
	2 x 3-13	15.7	11.0	4.6	3.0	1.9	—
	3 x 4-13	35.5	24.6	11.5	8.0	5.0	—
	4 x 6-13	—	—	16.5	11.5	6.8	—
X	6 x 8-13	—	—	8.0	5.3	3.6	2.4
	8 x 10-13	—	—	15.0	10.0	6.7	4.4
	6 x 8-15	—	—	10.0	6.6	4.5	3.0
	8 x 10-15	—	—	—	—	11.5	7.6
	8 x 10-15G	—	—	30.0	20.0	13.6	9.0

Shaft Deflection Load Factor (M)

To determine actual shaft deflection at rating:

1. Select proper shaft deflection load factor from chart above.
2. Multiply load factor by the specific gravity of the liquid.
3. To correct load factor for the actual impeller diameter being used, multiply by the ratio of the impeller diameter used to the maximum impeller available at that speed.
4. Enter curve on next page at corrected load factor. Intersection with selected shaft will give shaft deflection at seal faces.

Pump Load Factor and BHP Limits



Standard Shaft BHP Limits (Metric Equivalents kW) Threaded Impeller						
	RPM.					
Series/Frame	**3560**	**2900**	**1780**	**1450**	**1180**	**880**
LVB STP	40.0 (30.0)	32.7 (24.4)	20.0 (14.9)	16.3 (12.2)	13.3 (9.9)	9.9 (7.4)
LVB MTP	122.0 (91.0)	99.5 (74.2)	61.0 (45.5)	49.7 (37.1)	40.5 (30.2)	30.2 (22.5)
LVB LTP	200.0 (149.1)	165.0 (123.0)	100.0 (74.6)	81.5 (60.8)	66.4 (49.5)	49.5 (36.9)
LVB XLTP	N. A. N. A.	N. A. N. A.	250.0 (186.4)	204.0 (152.1)	166.0 (123.8)	124.0 (92.5)

PROCESS PUMPS
SINGLE STAGE END SUCTION
ANSI Standard Dimensions
Series LVB

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Engineering Data

Key and Bolt Impeller Design
Bhp Limitations ①

The following chart and notes are to be use for determining the maximum Bhp allowed when applying pumps with the key and bolt impeller design option. This feature is available on all LVB series pumps.

Frame Series ②	Shaft Style	Part	Shaft		Key			Impeller	
		Material Code	226	075	291	630	064	086	507
		Material	316 SS	4140 HT Steel	316 SS	304 SS	1018 Steel	CF8M	CD4MCu
		Yield Strength PSI	30,000	64,000	30,000	30,000	54,000	30,000	70,000
STP	Non-Sleeved	Max Bhp 1180 RPM	7	13	7	7	13	7	17
	Sleeved	Max Bhp 1180 RPM	10	13	10	10	13	10	23
MTP	Non-Sleeved	Max Bhp 1180 RPM	15	32	15	15	28	15	35
	Sleeved	Max Bhp 1180 RPM	21	40	21	21	38	21	48
LTP	Non-Sleeved	Max Bhp 1180 RPM	24	50	24	24	43	24	56
	Sleeved	Max Bhp 1180 RPM	32	66	32	32	58	32	76
XLTP	Non-Sleeved	Max Bhp 1180 RPM	74	154	74	74	133	74	173
	Sleeved	Max Bhp 1180 RPM	89	166	89	89	160	89	207
STP	Non-Sleeved	Max Bhp 1780 RPM	11	20	11	11	20	11	25
	Sleeved	Max Bhp 1780 RPM	15	20	15	15	20	15	35
MTP	Non-Sleeved	Max Bhp 1780 RPM	23	48	23	23	42	23	53
	Sleeved	Max Bhp 1780 RPM	31	61	31	31	57	31	72
LTP	Non-Sleeved	Max Bhp 1780 RPM	36	75	36	36	65	36	84
	Sleeved	Max Bhp 1780 RPM	49	100	49	49	88	49	114
XLTP	Non-Sleeved	Max Bhp 1780 RPM	112	232	112	112	201	112	261
	Sleeved	Max Bhp 1780 RPM	134	250	134	134	241	134	312
STP	Non-Sleeved	Max Bhp 3550 RPM	22	40	22	22	40	22	50
	Sleeved	Max Bhp 3550 RPM	30	40	30	30	40	30	70
MTP	Non-Sleeved	Max Bhp 3550 RPM	46	96	46	46	84	46	106
	Sleeved	Max Bhp 3550 RPM	62	122	62	62	114	62	144
LTP	Non-Sleeved	Max Bhp 3550 RPM	72	150	72	72	130	72	168
	Sleeved	Max Bhp 3550 RPM	98	199	98	98	176	98	227

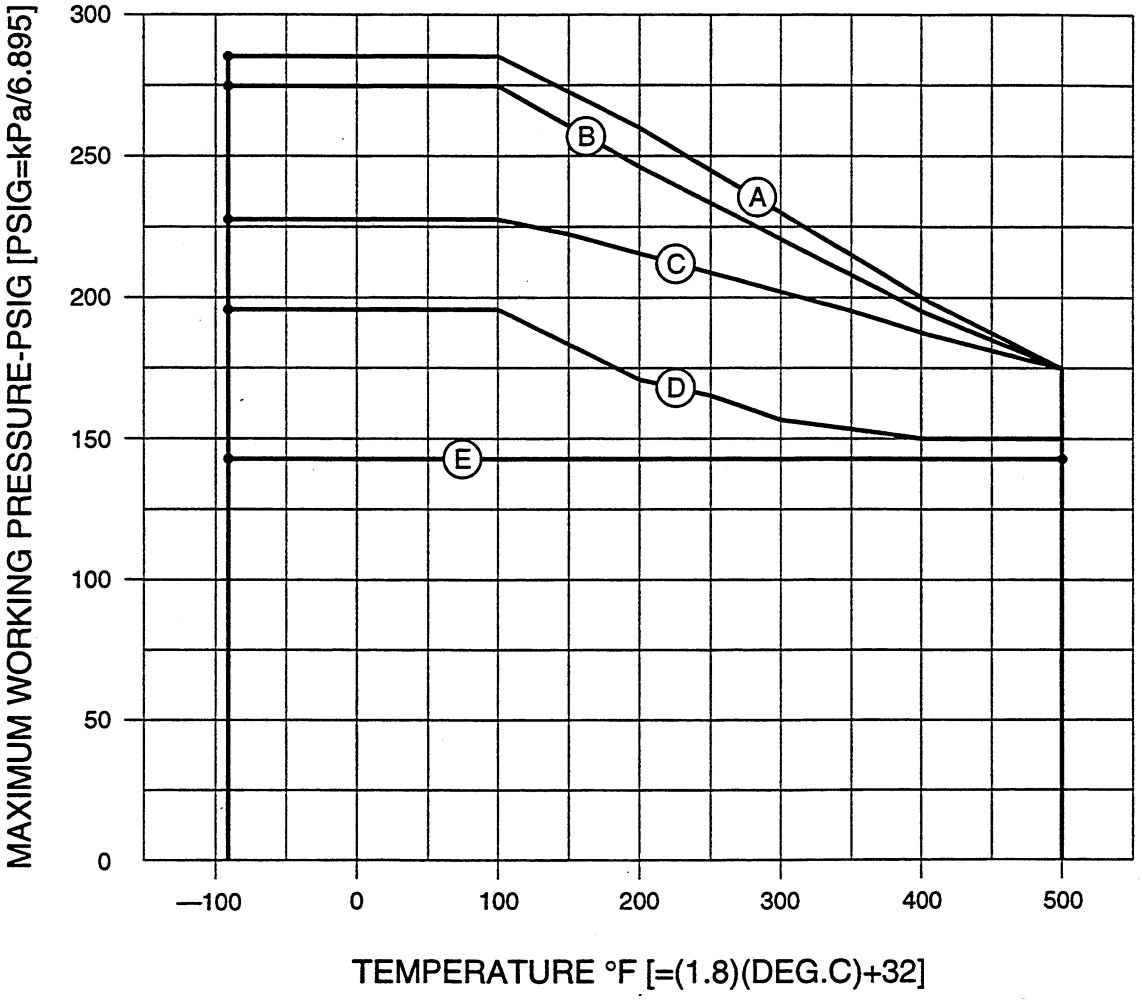
Notes:

① The lowest value of any combination of shaft, key or impeller materials prevails.

② Considerations other then maximum brake horsepower may keep specific models from being used with a specific frame arrangement.

Subject to change without notice

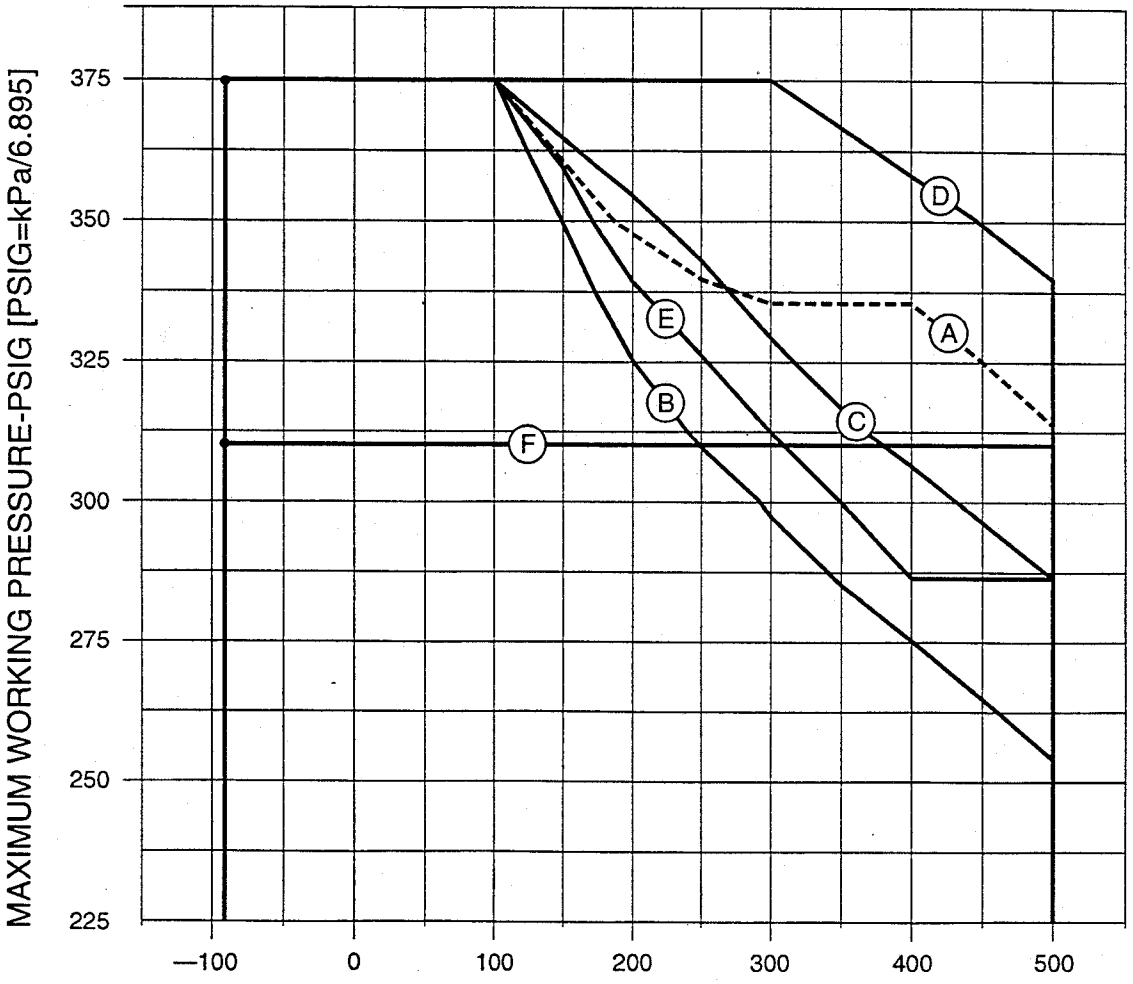
150 LB. FLANGES
PRESSURE / TEMPERATURE RATINGS



CURVE	MATERIAL	CURVE	MATERIAL
A	DUCT. IRON	B	316 S.S.
A	CAST STEEL	B	317 S.S.
A	CD4MCu	C	ALLOY 20
A	HAST. B	D	MONEL
A	HAST. C	E	NICKEL
A	TITANIUM		

CONTACT FACTORY FOR SUCTION PRESSURES OVER 160 PSIG.

300 LB. FLANGES
PRESSURE / TEMPERATURE RATINGS



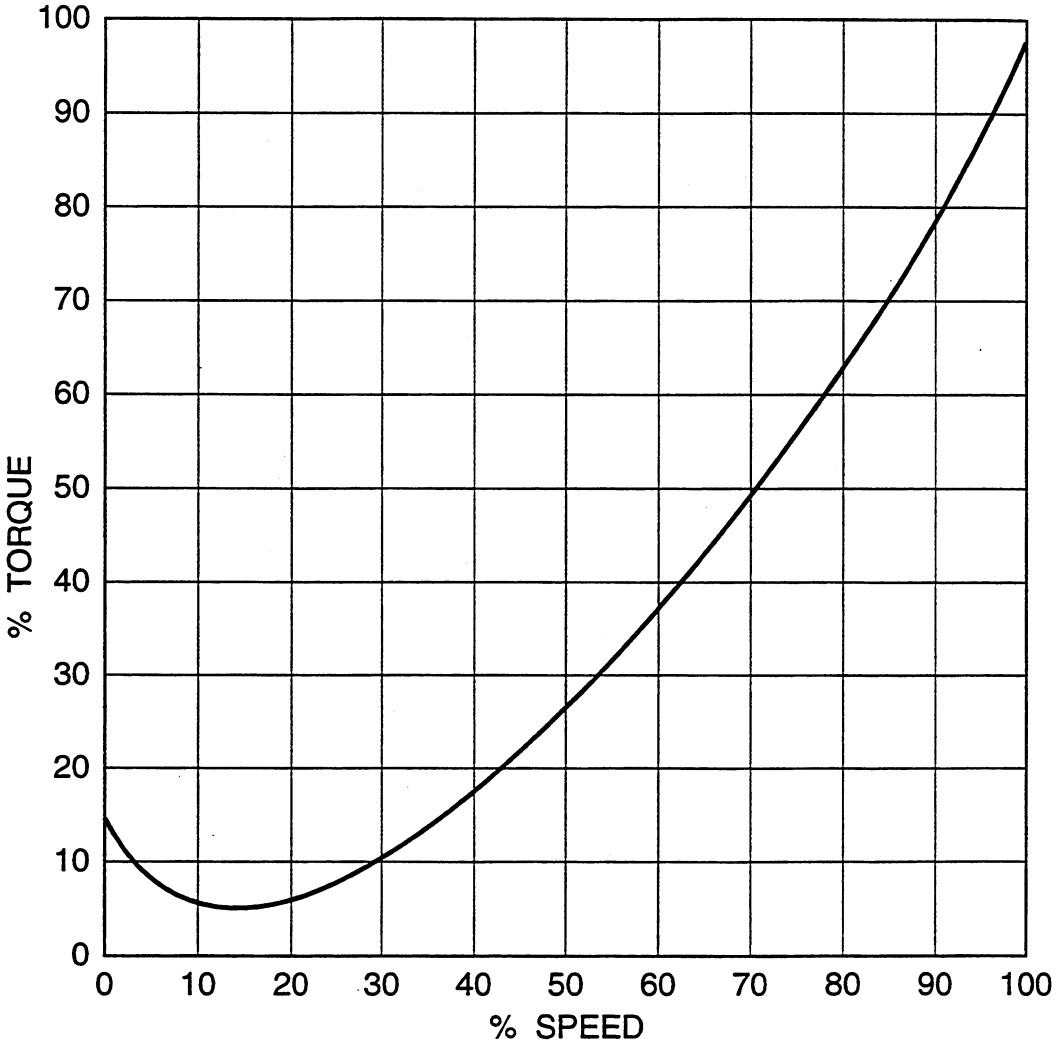
CURVE	MATERIAL	CURVE	MATERIAL
A	DUCT. IRON	D	HAST. C
A	CAST STEEL	D	CD4MCu
B	316 S.S.	D	TITANIUM
B	317 S.S.	E	MONEL
C	ALLOY 20	F	NICKEL
D	HAST. B		

CONTACT FACTORY FOR SUCTION PRESSURES OVER 160 PSIG.

Horizontal Speed - Torque Curve

Pump Model/Size _____

Pump No. _____



Information Required To Use Speed-Torque Curve

1 – 100% of torque = _____ Ft. Lbs. @_____ GPM _____ FEET

2 – 100% of speed = _____ RPM (true running speed)

To determine 100% of torque in Ft.Lbs. – use the following formula:

$$100\% \text{ of torque (in Ft. Lbs.)} = \frac{\text{(1) BHP x 5250}}{\text{RPM (true running speed)}}$$

(1) For open valve starting – use BHP at design point. _____

For close valve starting – use BHP at shut-off point. _____

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LVB PULP/PAPER & SOLIDS HANDLING

Pump Size	Max. Pulp Percentage	Max. sphere (in.)
STP 1x1.5-6	1	0.344
STP 1.5x3-6	1.5	0.438
STP 2x3-6	2	0.375
STP 1x1.5-8	1.5	0.344
STP 1.5x3-8	1.5	0.438
MTP 3x4-7	3	0.5
MTP 2x3-8	2	0.5
MTP 3x4-8	3	1.125
MTP 3x4-8G	3	0.688
MTP 1x2-10	1.5	0.438
MTP 1.5x3-10	1.5	0.219
MTP 2x3-10	2	0.375
MTP 3x4-10	3	0.625
MTP 3x4-10H	3	0.625
MTP 4x6-10	3.5	1
MTP 4x6-10G	3.5	1
MTP 4x6-10H	3.5	N/A
MTP 1.5x3-13	1.5	0.219
MTP 2x3-13	2	0.375
MTP 3x4-13	3	0.625
MTP 4x6-13	3.5	1

LaBour Taber

LVB PULP/PAPER & SOLIDS HANDLING

Pump Size	Max. Pulp Percentage	Max. sphere (in.)
LTP 3x4-7	3	0.5
LTP 2x3-8	2	0.5
LTP 3x4-8	3	1.125
LTP 3x4-8G	3	0.688
LTP 1x2-10	1.5	0.438
LTP 1.5x3-10	1.5	0.219
LTP 2x3-10	2	0.375
LTP 3x4-10	3	0.625
LTP 3x4-10H	3	0.625
LTP 4x6-10	3.5	1
LTP 4x6-10G	3.5	1
LTP 4x6-10H	3.5	N/A
LTP 1.5x3-13	1.5	0.219
LTP 2x3-13	2	0.375
LTP 3x4-13	3	0.625
LTP 4x6-13	3.5	1
XLTP 6x8-13	4	0.688
XLTP 8x10-13	4	1
XLTP 6x8-15	4	0.813
XLTP 8x10-15	4	1.125
XLTP 8x10-15G	4	1.125
XLTP 8x10-16H	4	1
XLTP 4x6-17	3.5	1.12
XLTP 6x8-17	4	0.88
XLTP 8x10-17	4	1

PROCESS PUMPS
SINGLE STAGE END SUCTION
ANSI Standard Dimensions
Series LVB

LaBour Taber

Seal Chamber Pressure

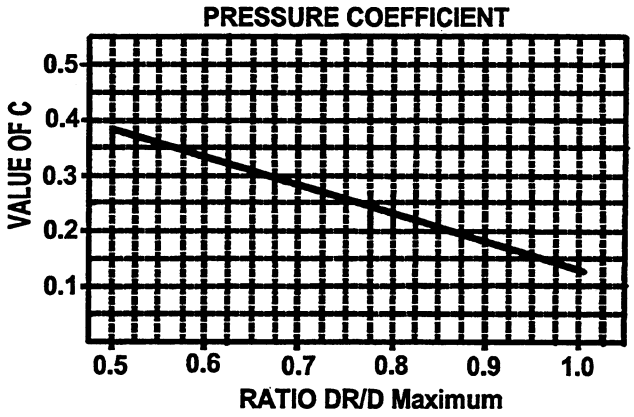
Approximate Pressure in Seal Chamber in Psi:

For applications when suction pressure exceeds O (zero) Psi.

$$PSC = PS + C \times (0.433 \times HT \times SG)$$

For applications when suction pressure is less than O (zero) Psi.

$$PSC = C \times (0.433 \times ID \times SG)$$



Where:

C	=	Pressure Coefficient
D (Max)	=	Maximum Diameter of Impeller in Inches
DR	=	Diameter of Impeller in Inches Required for Rating
HD	=	Discharge Head in Feet of Liquid = HT -HS
HS	=	Suction Lift in Feet of Liquid
HT	=	Total Head in Feet of Liquid
PS	=	Suction Pressure in Psi
SG	=	Specific Gravity of Liquid at Pumping Temperature

Maximum Allowable Seal Chamber Pressures Psi ①

1800 Rpm				3600 Rpm			
Pump Frame Size	Mechanical Seal Size Inches	Unbalanced Mechanical Seal	Balanced Mechanical Seal	Pump Frame Size	Mechanical Seal Size Inches	Unbalanced Mechanical Seal	Balanced Mechanical Seal
STP	1.375	200	400	STP	1.375	135	400
MTP	1.750	200	400	MTP	1.750	90	225
LTP	2.125	180	400	LTP	2.125	75	150
XLTP	2.500	150	350	XLTP	2.500	50	110

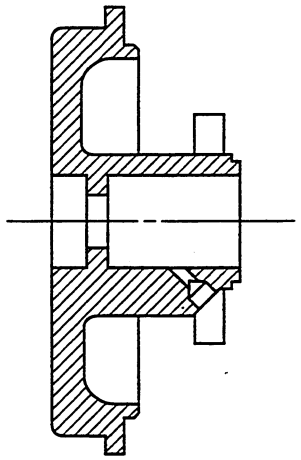
① Maximum pressure ratings will vary with the lubricity of the pumped liquid and materials of the seal mating faces, refer to the factory when required.

Elastomer Temperature Limits

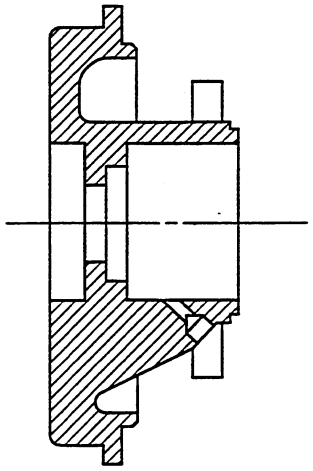
Elastomer Material	Minimum Temperature		Maximum Temperature	
Type Scale	°F.	°C.	°F.	°C.
Buna-N	+40	-40	+225	+107
Nitrile®	+40	-40	+225	+107
Viton®	0	-18	+400	+204
Kalrez®	0	-18	+500	+260
TFE Coated Viton	-40	-40	+350	+177
Solid TFE	-100	-73	+450	+232
Grafoil®	-450	-268	+750	+400

ANSI Box Cover/Seal Chambers

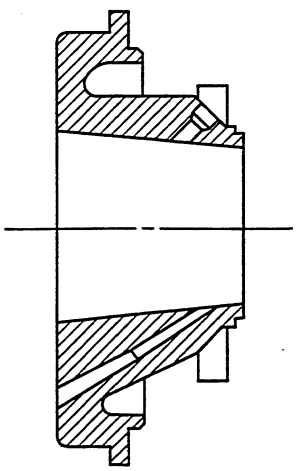
STANDARD BOX COVER



LARGE BORE SEAL CHAMBER



TAPER BORE SEAL CHAMBER



The Model LVB ANSI pumps are available with three different box cover/seal chamber arrangements: STANDARD, LARGE BORE, AND TAPER BORE.

STANDARD BOX COVER – The standard box cover is primarily used with packing or non-troublesome mechanical seal applications.

LARGE BORE SEAL CHAMBER – The large bore seal chamber is used with mechanical seals only. The advantages of this box cover are:

1. It effectively lubricates and cools the seals.
2. The large bore will accommodate more seals, such as larger, more complex seals that can provide better sealing.
3. It helps keep solids away from components and provides more area for liquid circulation and heat dissipation.

The results are longer seal life and reduced maintenance.

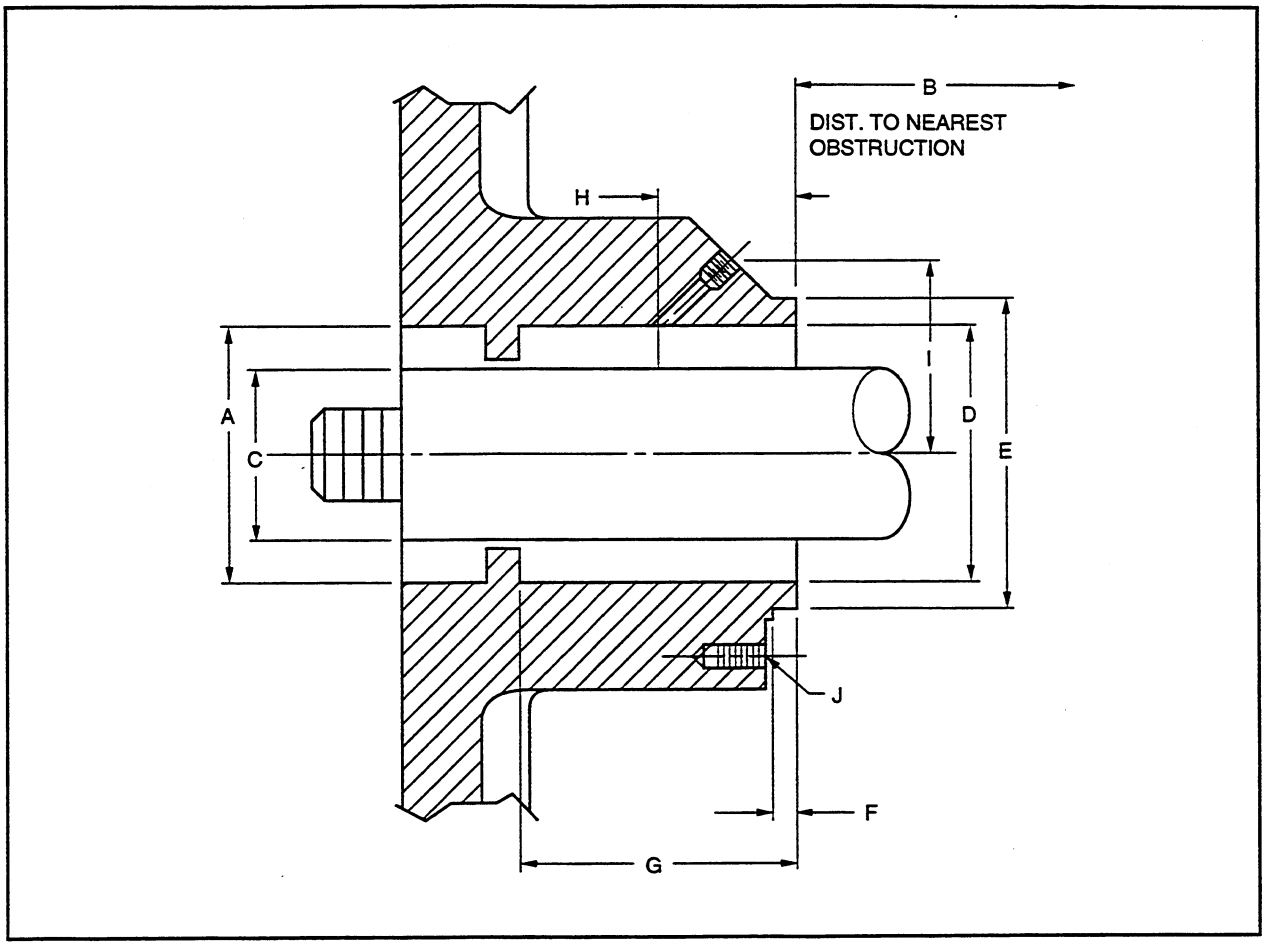
FRAME	STANDARD BORE SIZE	LARGE BORE SIZE
S	2.000	2.875
M	2.500	3.500
L	2.875	3.875
X	3.375	4.500

TAPER BORE SEAL CHAMBER – The taper bore seal chamber is used with mechanical seals where solid build-up is a problem. It has a large tapered bore and an internal bypass which circulates the pumping liquid. This lubricates, cools, and cleans the seal chamber. The results are longer seal life, no solid build-up, and less maintenance.

ALL THREE BOX COVERS:

- Are completely interchangeable.
- Can use standard mechanical seals.
- Are available in 316SS, 317SS, Alloy 20, CD4, and more.

Standard Stuffing Box Cover



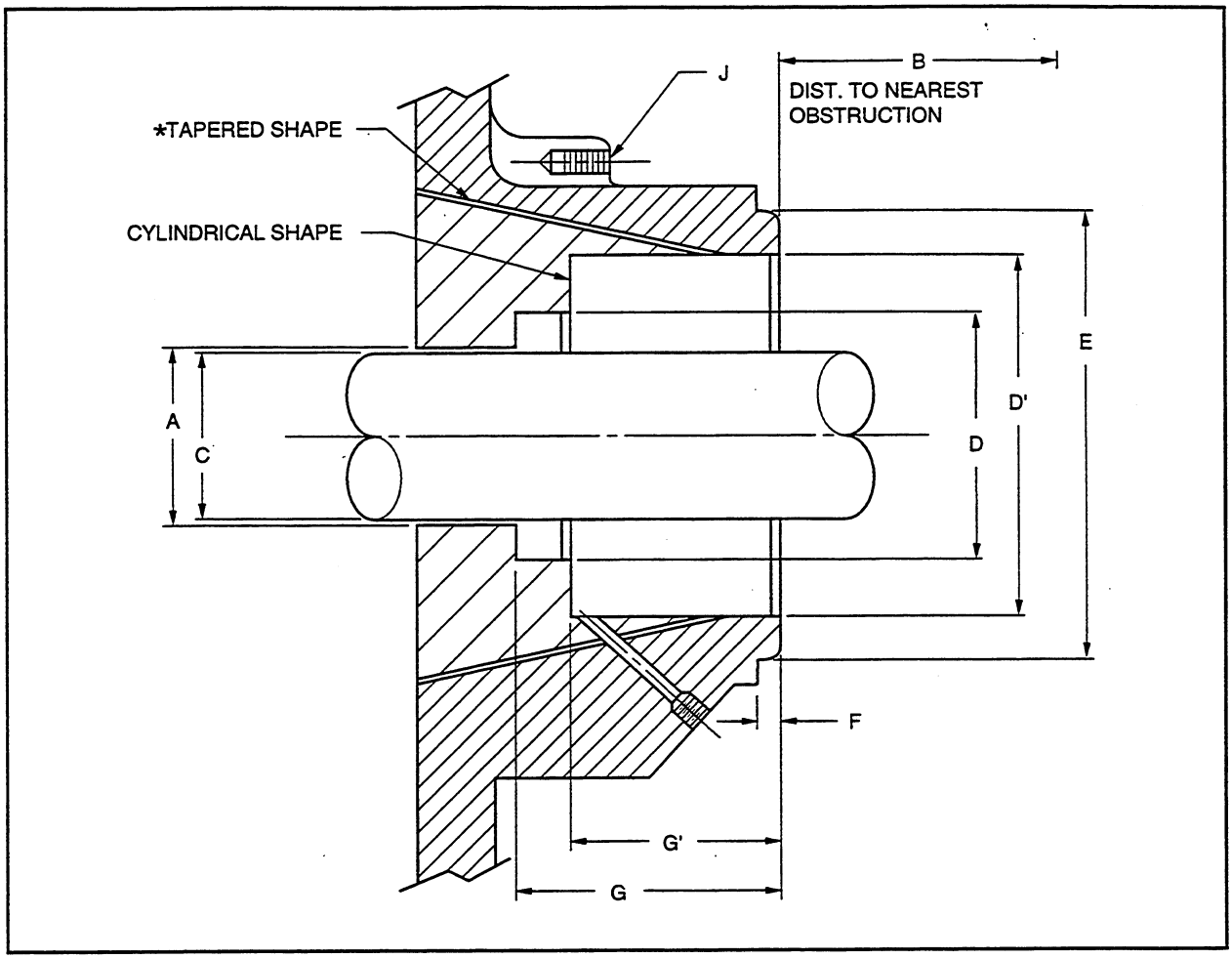
PUMP SIZE	BOX COVER									J			BOX CVR NPT	GLD NPT
										STUDS		BOLT HOLE CIR.		
	A	B	C	D	E	F	G	H	I	SIZE	NO.			
LVB S	1.400 1.405	2.19	1.373 1.375	1.999 2.003	2.392 2.395	.19	2.12	.97	1.81	.375	4	3.25	.25	.25
LVB M	1.770 1.780	2.81	1.748 1.750	2.499 2.503	3.017 3.020	.25	2.62	1.56	2.50	.500	4	4.12	.38	.50
LVB L	2.145 2.155	2.81	2.123 2.125	2.874 2.878	3.517 3.520	.25	2.62	1.56	2.63	.500	4	4.50	.38	.50
LVB X	2.520 2.530	2.85	2.498 2.500	3.374 3.378	4.371 4.374	.25	3.00	1.81	3.50	.625	4	5.38	.38	.50

Drawing # 4852609 6/26/92

PROCESS PUMPS
SINGLE STAGE END SUCTION
ANSI Standard Dimensions
Series LVB

LaBour Taber

ANSI Seal Chamber Box Cover - Large/Taper Bore



PUMP SIZE	BOX COVER									J			BOX CVR NPT	GLD NPT
										STUDS		BOLT HOLE CIR.		
	A	B	C	D	D'	E	F	G	G'	SIZE	NO.			
LVB S	1.400 1.405	2.19	1.373 1.375	1.999 2.003	2.88	3.594 3.597	.19	2.12	1.69	.375	4	4.50	.25	.25
LVB M	1.770 1.780	2.81	1.748 1.750	2.499 2.503	3.50	4.337 4.340	.25	2.62	2.12	.500	4	5.50	.38	.50
LVB L	2.145 2.155	2.81	2.123 2.125	2.874 2.878	3.88	4.708 4.711	.25	2.62	2.12	.500	4	6.00	.38	.50
LVB X	2.520 2.530	2.85	2.498 2.500	3.374 3.378	4.50	5.447 5.450	.25	3.00	2.50	.625	4	6.75	.38	.50

*TABLE DIMENSIONS: A, D, G AND G' ARE NOT APPLICABLE TO THE TAPERED DESIGN.

Drawing # 4853029 6/26/92

Stuffing Box Packing

LaBour generally supplies one of three different types of packing, although any specific type can be supplied upon request. The three types fall into the following categories:

1. General Service Packing - This is an Aramid - PTFE synthetic packing. It is best suited for cold water and general service applications. It has a PH range of 0 to 12 and a maximum operating temperature of 500 degrees F. This packing carries a material code of 679 and is similar to Crane type 1345 or equal.

2. Chemical and Solvent Packing - This is a PTFE - Synthetic packing. It is used for severe chemical and solvent applications. It has a PH range of 0 to 14 and a maximum operating temperature of 500 degrees F. This packing carries a material code of 676 and is similar to Crane type C1065 or equal.

3. High Pressure and Temperature Packing - This is a Metallic packing called Graphoil. It is used in high pressure and temperature applications. It has a PH range of 0 to 14 and a maximum operating temperature of 750 degrees F. This packing carries a material code of 670 and is similar to Crane 235 B or equal.

Packing Size

The following is a list of the standard packing size for all process pump models.

Model	Frame Size	Packing Size	Appox. Length	No.of Rings	Lantern Ring Width
LVB	S	$^5/_{16}$ x $^5/_{16}$	4.75	5	$^7/_{16}$
LVB	M	$^3/_8$ x $^3/_8$	5.75	5	$^5/_8$
LVB	L	$^3/_8$ x $^3/_8$	7.0	5	$^5/_8$
	X	$^7/_{16}$ x $^7/_{16}$	8.0	5	$^5/_8$

Packing Arrangements:

In order for packing to function properly, a liquid barrier must be present between the shaft and packing. This barrier lubricates the shaft and prevents air from entering the stuffing box, which would cause a loss of prime and possible seizing of rotating parts. This liquid barrier can be achieved in different ways depending on the application.

LVB Mechanical Seals

We offer a full selection of mechanical seals for the LVB. Available seals may be mounted either on the pump shaft or on the sleeve. Note: On less sleeve ductile iron units, corrosion of the steel shaft under the shaft packing may cause premature seal failure. Use of a stainless steel shaft is required.

Typical Mechanical Seal Arrangements

The following common Crane and Dura mechanical seals are available on the LVB. Seals from other manufacturers such as Borg-Warner, Chesterton, Sealol, etc., are also available and can usually be used without modification.

1. Single Inside Unbalanced Seals
   - A. Crane Type 1
   - B. Crane Type 9T
   - C. Dura RO & RO-TT

2. Single Inside Balanced Seals
   - A. Crane Type 9BT
   - B. Dura PT & PTO

3. Dbl. Inside Unbalanced Seals
   - A. Crane Type 9T
   - B. Dura RO & RO-TT
   - C. Dura CRO

4. Outside Unbalanced Seals
   - A. Crane Type 9T
   - B. Dura RO & RO-TT

5. Outside Balanced Seals
   - A. Crane Type 20
   - B. Dura RA

Mechanical Seal Description

1. Single Inside Unbalanced Seals

A. Crane Type 1
The Type 1 seal available has an "O" ring-mounted stationary seat and is suitable for use on clear liquids which are not detrimental to the synthetic rubber bellows.

Buna and Viton bellows are stocked. Buna is satisfactory for use at temperatures to 212° F. Use of Viton allows utilization of seal at temperature to 400° F. and in liquids which could attack Buna. Type 1 seals are satisfactory for use at pressure to 200 PSIG, depending upon the face material.

A 316SS flush type gland is standard but other types and materials are available.

B. Crane Type 9T
Type 9T seals are used when handling corrosive liquids at moderate temperatures. The shaft packing is a Teflon wedge ring.

This seal has a temperature range of –350° F. (with special shaft packing) to 500° F. It can operate satisfactorily at pressures to 200 PSIG. On high temperature applications (above 250° F.), use of a water cooled (jacketed) stuffing box and/or heat exchanger is generally recommended. See chart #2 on page xx.

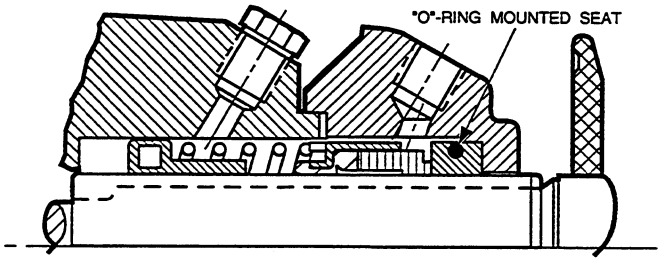


Fig. 1A
Type 1 seal with standard flush gland

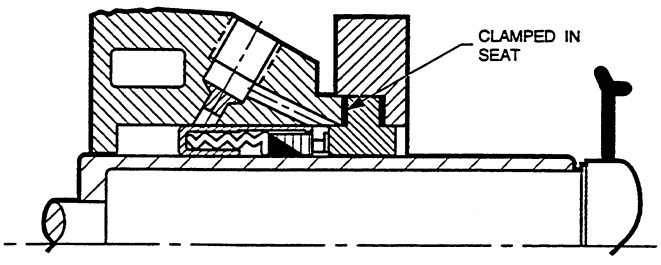


Fig. 1B
Type 9T seal with plain style gland, jacketed stuffing box, and backdrilled seal face flush

Vent and Drain Gland

This style gland is used when handling liquefied gases such as propane. Since any leakage past the seal faces will create a highly explosive gas, the vent and drain gland allows the vapor to be vented to a safe, external disposal. In addition, the drain connection also removes any liquid leakage that may occur while preventing spray which may be dangerous.

Probably the most important advantage of this style of gland is the safety feature it provides. In fact, petroleum refineries specify vent and drain glands as standard for all seals.

Vent and drain glands contain two tapped openings located behind the stationary seat. A throttle bushing or an auxiliary stuffing box is located behind the tapped openings. VENT AND DRAIN CONNECTIONS ARE LOCATED ON THE VERTICAL CENTERLINE FOR MAXIMUM EFFICIENCY IN VENTING AND DRAINING. NOTE THAT WITH THIS ARRANGEMENT, THE GLAND IS EXPOSED TO CORROSIVES; THE GLAND SHOULD MATCH THE PUMP METALLURGY.

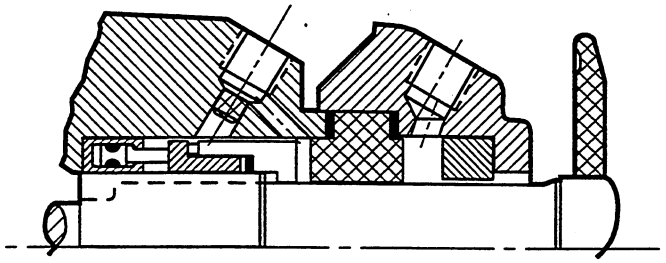


Fig. 8
Vent and drain gland with throttle bushing

Quench Gland

The vent and drain gland described above can be used as a quench gland. Quench glands have proven very effective as safeguards when handling corrosive liquids since any leakage past the seal faces will be diluted and washed away. They also provide an effective means of washing away any crystallization of the liquid upon contact with the atmosphere.

This arrangement also provides a method for cooling the seal faces on inside mounted seals. They are frequently used on high temperature applications as an additional cooling feature.

By careful regulation of the quenching liquid (usually water) at the top inlet, all the liquid will drain through the bottom outlet port. The bushing will contain only very low pressure. Where higher quench pressures are required, use an auxiliary stuffing box gland.

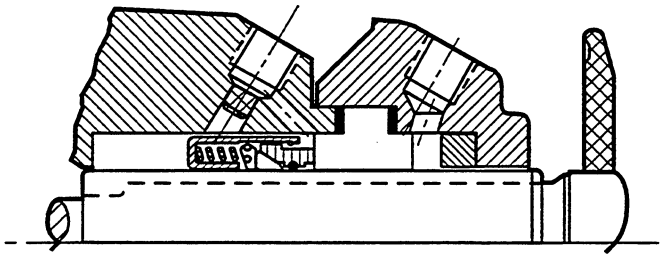


Fig. 9
Quench (vent and drain) gland

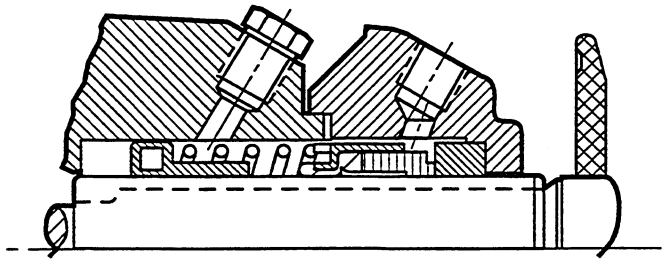


Fig. 10
Flush gland

Flush Gland

A liquid flush directly at the seal faces can effectively improve seal life. A face flush on seals with a back-clamped-in seat is effectively accomplished with drilling of the stuffing box to direct the flush liquid at the seal and with use of the standard plain gland.

A flush gland is furnished as standard on seals with "O" ring-mounted seats to provide a flush directly at the seal faces.

Flushing the seal faces accomplishes the following:

1. It Cools the Faces – As the seal faces rotate against each other, there is a temperature rise of as much as 60–80° F. On some applications, such as hot water, gasoline, propane, etc., this heat buildup can result in vaporization at the faces causing the faces to run dry. This results in considerably short ened seal life.

2. It Prevents Solids Buildup – Flushing prevents the accumulation of solids or abrasives within the stuffing box.

Mechanical Seal Cooling

When handling high temperature liquids, it is desirable to reduce the temperature in the stuffing box to improve the lubricating qualities of the liquid and to insure that the liquid is well below its vapor pressure. Flush liquid directed at the seal faces through a flush connection in the stuffing box or in the gland may provide adequate cooling. This flush may be a cooled liquid from an external source or recirculation from the pump casing. A heat exchanger can be used to cool the recirculated liquid if required.

A water-cooled (jacketed) stuffing box can be used to reduce liquid temperature in the seal chamber. The pumpage should be "dead-ended" in the stuffing box for effective cooling. This is accomplished with a restricting bushing in the bottom of the stuffing box. Chart #2 shows cooling water requirements for temperature reduction in a water-cooled (jacketed) stuffing box with a dead-ended seal chamber. Note: By-passing liquid from the casing reduces the efficiency of a water-cooled (jacketed) stuffing box and is generally required to lubricate seal faces.

Restricting Bushings and Lip Seals

If a flush into the stuffing box is utilized, a carbon restricting bushing or a Teflon lip seal with alloy expansion collars can be pressed into the bottom of the stuffing box to help control leakage of injected fluid into the pumpage.

TEMPERATURE OF LIQUID IN STUFFING BOX FOR VARIOUS PUMPING TEMPERATURES WITH DEAD-ENDED SEAL CHAMBER.
(These figures do not reflect actual seal face cooling. No face cooling will be obtained with this method.)

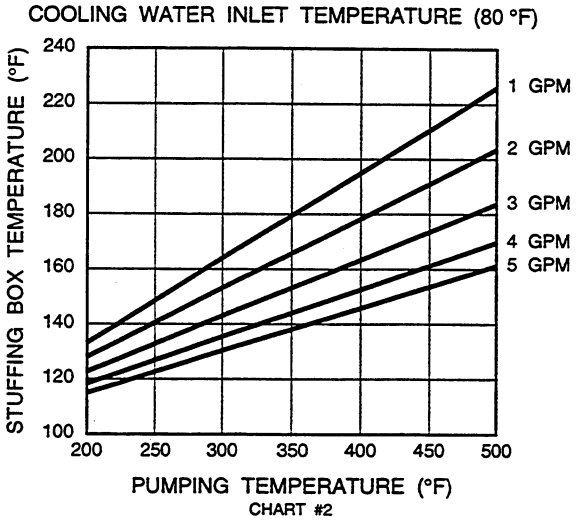


CHART #2

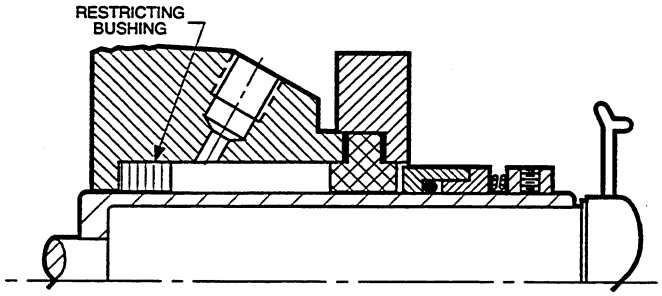


Fig. 11
Restricting bushing

Recommended Lubricants

Standard Oils:

The recommended oil for general use in all LaBour process pumps is a high quality Turbine oil with rust and oxidation inhibitors. The oil should be non-detergent and have a viscosity of approximately ISO 68, 315SSU, or SAE20 at 100 Degrees F. In general, the maximum oil temperature should not exceed 170 degrees F. If temperatures exceed 170 degrees F, bearing cooling may be required along with using a heavier oil. For temperatures below 80 degrees F. a lighter oil is recommended. For extreme conditions consult the factory.

Specific recommendations are:

Atlantic Richfield	Duro S-315, Duro AW S-315
Chevron	Chevron OC Turbine Oil 68
Exxon	Teresstic 68
Gulf	Gulf Harmony 68
Mobil	Mobil DTE 26 300SSU
Phillips	Mangus Oil Grade 315 MM Motor Oil SAE 20-20W HDS
Shell	32 - 150 Degrees F Tellus Oil 68 20 to 32 Degrees F Tellus Oil 23 150 - 200 Degrees F Turbo Oil 150
Texaco	Below 80 Degrees F Regal Oil R&O-46 #10 Weight Above 80 Degrees F Regal Oil R&O-68 #20 Weight

Synthetic Oils:

Recently many customers have been inquiring about Diester Base Synthetic Oils. Using synthetic oil has many advantages:

1. Much longer service life (as much as 8 times longer.)

2. Bearing operating temperatures are from 5 to 15 degrees F cooler.

3. 1% to 5% energy reduction for operating equipment.

Durametallic Supply Tank Assemblies for Mechanical Seals

Supply Tank Assemblies

Durametallic Corporation offers two-gallon (7.6l) supply tank assemblies as shown in Figure 6.15. Under some circumstances, these supply tanks can be used to provide a source of clean, pressurized buffer fluid to a double seal assembly. *Dura* Model 900N Supply Tanks have the following standard features:

1. Carbon steel or stainless steel construction.
2. 900 psig (62 bar) design pressure at 400°F (204°C).
3. Hydrostatically tested at 1350 psig (93 bar).
4. Certified in accordance with *ASME* Code Section VIII, Division I.
5. Mounting nuts for easier installation.
6. Vent and fill connections.

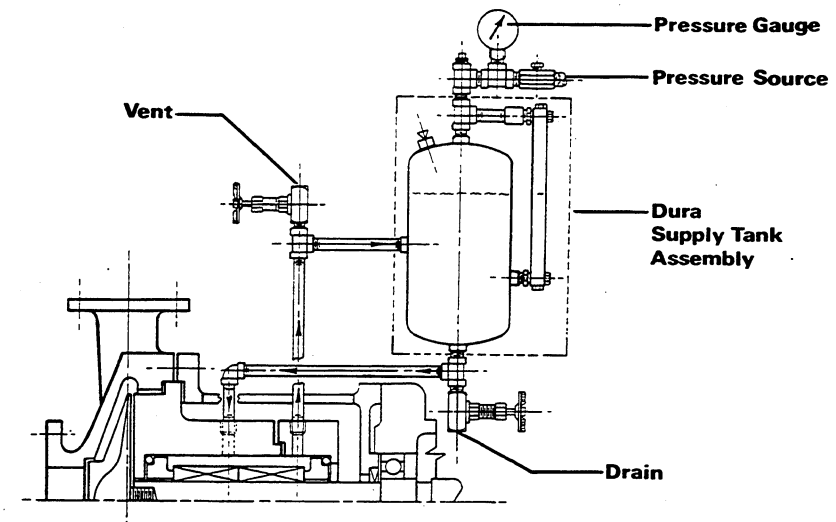
Optional features available with *Dura* Supply Tank assemblies include:

1. Armored level indicator (AG).
2. Low Level Switch (LL).
3. Complete tandem seal system (TSS).
4. Cooling coil (CC).
5. High level switch (HL).

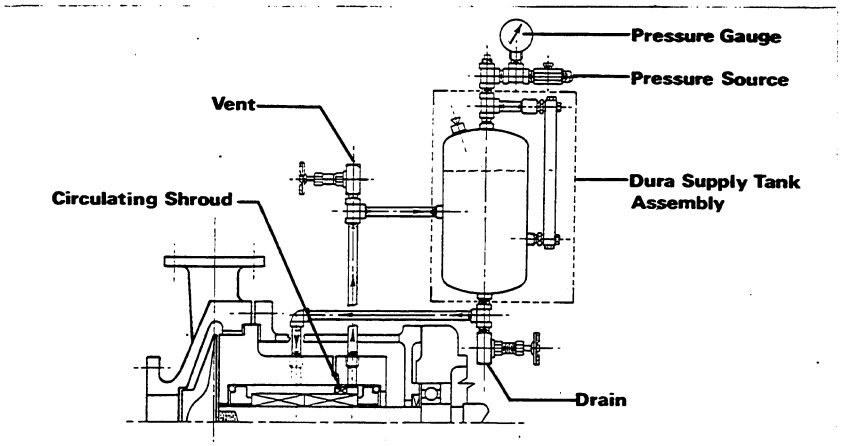
The cooling coil (CC) option is available for applications where the buffer fluid requires more cooling than possible from thermal convection. Stainless steel cooling coils, providing 3 sq. ft. (0.28 m²) of cooling area, are suitable for pressures up to 1650 psig (114 bar) at 400°F (204°C), and are hydrostatically tested at 3000 psig (207 bar).

Supply tank assemblies can be used with induced and thermal convection circulating systems in double and tandem seal arrangements.

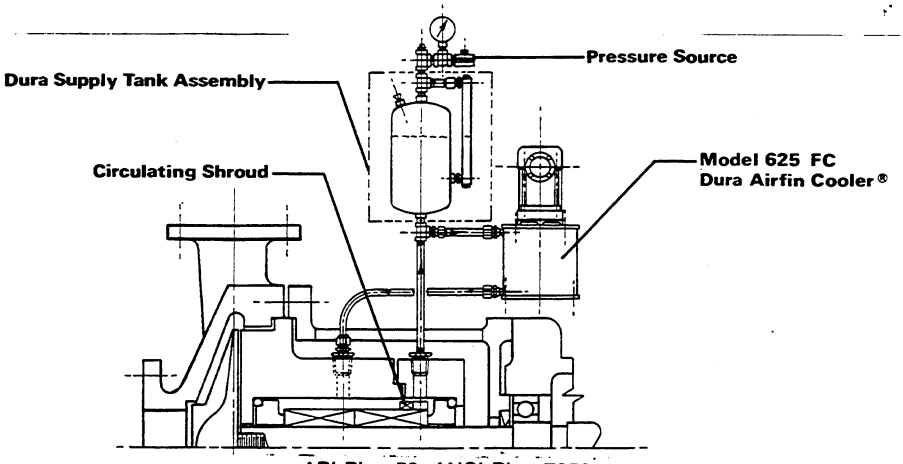
Thermal Convection Cooling



Induced Circulation System



Induced Circulation System with Cooler



API Plan 53, ANSI Plan 7353

PROCESS PUMPS
SINGLE STAGE END SUCTION
ANSI Standard Dimensions Series LVB

LaBour Taber

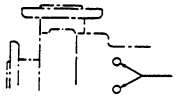
API Piping Plans for Durametallic Mechnical Seals

Piping Plan Cross Reference

API Plan 1 ANSI Plan 7301

Integral (internal) recirculation from pump discharge to seal.

API Plan 2 ANSI Plan 7302 Dura Seal Manual Fig. 4.8

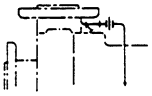


Dead-ended seal box with no circulation of flush fluid. Water-cooled box jacket and throat bushing required unless otherwise specified.

API Plan 11 ANSI Plan 7311 Dura Seal Manual Fig. 4.1(a)

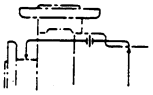
Recirculation from pump case through orifice to seal.

API Plan 12 ANSI Plan 7312



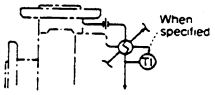
Recirculation from pump case through strainer and orifice to seal.

API Plan 13 ANSI Plan 7313 Dura Seal Manual Fig. 4.1(b)



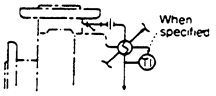
Recirculation from seal chamber through orifice and back to pump suction.

API Plan 21 ANSI Plan 7321 Dura Seal Manual Fig. 4.2, 4.3



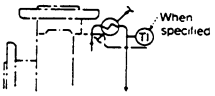
Recirculation from pump case through orifice and cooler to seal.

API Plan 22 ANSI Plan 7322



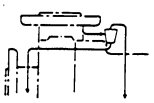
Recirculation from pump case through strainer, orifice, and cooler to seal.

API Plan 23 ANSI Plan 7323 Dura Seal Manual Fig. 4.11, 4.12



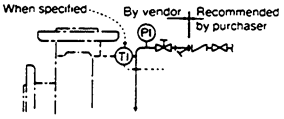
Recirculation from seal with pumping ring through cooler and back to seal.

API Plan 31 ANSI Plan 7331 Dura Seal Manual Fig. 4.27



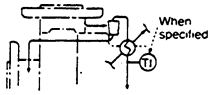
Recirculation from pump case through cyclone separator delivering clean fluid to seal and fluid with solids back to pump suction.

API Plan 32 ANSI Plan 7332 Dura Seal Manual Fig. 4.4, 4.34



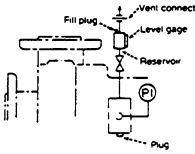
Injection to seal from external source of clean fluid.

API Plan 41 ANSI Plan 7341



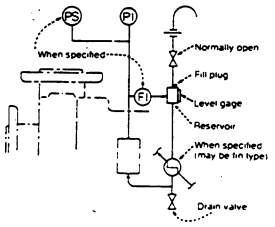
Recirculation from pump case through cyclone separator delivering clean fluid through cooler to seal and fluid with solids back to pump suction.

API Plan 51 ANSI Plan 7351



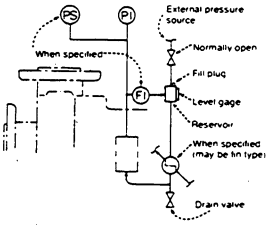
Dead-ended blanket.

API Plan 52 ANSI Plan 7352 Dura Seal Manual Fig. 4.15



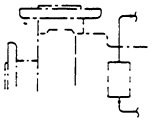
External fluid reservoir nonpressurized; forced circulation.

API Plan 53 ANSI Plan 7353 Dura Seal Manual Fig. 4.13, 4.14, 4.16



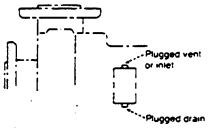
External fluid reservoir pressurized; forced circulation.

API Plan 54 ANSI Plan 7354 Dura Seal Manual Fig. 4.5, 4.6



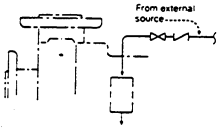
Circulation of clean fluid from an external system.

API Plan 61 ANSI Plan 7361



Tapped connections for purchaser's use.

API Plan 62 ANSI Plan 7362 Dura Seal Manual Fig. 4.25, 4.26



External fluid quench (steam, gas, water, etc.)

Recommended Lubricants

Synthetic Oils (con't):

4. Lower pouring point (-70 degrees F.), so equipment can be started and operated at a lower temperature.

5. Higher maximum operating temperature.

Synthetic oils are compatible with conventional non-detergent petroleum oils although mixing will reduce the performance of the synthetic lubricant. Also, neoprene rubber lip seals are not recommended for use with synthetic oils. Compatible seal materials are: viton, teflon, silicon rubber and buna N.

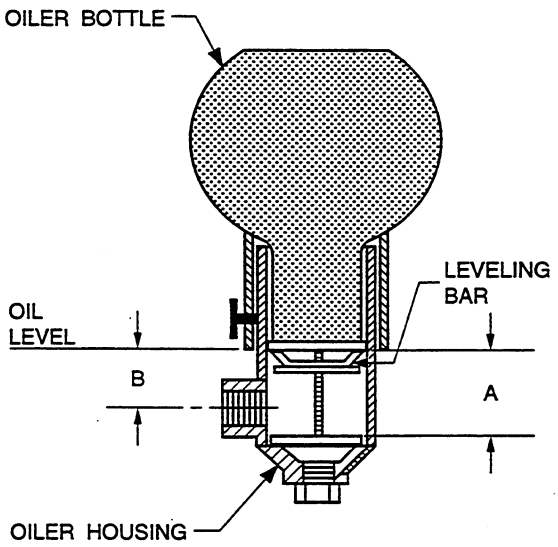
The recommended synthetic oil for general use in all Peerless process pumps is a non-detergent oil with an approximate viscosity of ISO68, 315SSU, or SAE20.

Specific recommendations are:

Exxon	Synestic 68
Mobil	SHC626
Texaco	Syn-Star DE68

*ISO68, 315SSU, and SAE20 are approximately the same viscosity but in different units.

Filling Bearing Frame



1. Remove adjustment assembly from oiler.
2. Adjust bars to dimension "A".
3. Lock in position.
4. Replace adjustment assembly in oiler.

A = 0.8125 inches

The approximate oil capacity of each bearing frame is as follows:

MODEL	SIZE	APPROX. CAPACITY
	S	1/2 qts.
LVB	M	3/4 qts.
LVB	L	1 qt.
	X	2 1/2 qts.

Oil Type

The recommended oil for general use in all LVBpump models is a high quality turbine type oil with rust and oxidation inhibitors. The oil should be non-detergent and have a viscosity of approximately ISO 68, 3155SSU, or SAE20 at 100° F. See section 8120, pages 21 and 22.

Oil Changes

As a general recommendation, the oil in a LaBour LVB should be changed every 3 months or every 2000 operating hours, whichever comes first.

Item No.	Description	Standard Construction									
		Ductile Iron W/316 SS Imp	All 316 SS	CD4MCu	Alloy 20	317 SS	Monel	Nickel	Hast. B	Hast. C	TI
100	Casing	Ductile Iron.	316SS	CD4MCu	Alloy 20	317 SS	Monel	Nickel	Hast. B	Hast. C	TI
101	Impeller	316 SS		CD4MCu	Alloy 20	317 SS	Monel	Nickel	Hast. B	Hast. C	TI
101	Shaft	4140 Steel		316SS							
105	Ring, Lantern	TFE									
106	Packing	Aramid - PTFE Synthetic Fiber									
107	Gland, Packing	316ss	316SS	Alloy 20		317 SS	Monel	Nickel	Hast. B	Hast. C	TI
108	Adapter	Ductile Iron									
109C	Cover, Bearing, Outboard	Cast Iron									
112	Bearing, Outboard	Steel Assembly -Double Row Ball (Duplex Angular Contact for LTP)									
113A	Plug, Oil Fill	Steel									
126	Sleeve, Shaft	316ss	316SS	Alloy 20		317 SS	Monel	Nickel	Hast. B	Hast. C	TI
134	Housing: Bearing, Outboard	Cast Iron									
136	Locknut, Bearing	Steel									
143	Gauge; Sight, Oil	Steel/Glass									
168A	Bearing, Inboard	Steel Assembly-Single Row Ball									
184	Cover, Stuffing Box	Ductile Iron.	316SS	CD4MCu	Alloy 20	317 SS	Monel	Nickel	Hast. B	Hast. C	TI
228	Frame STP	Ductile Iron.									
228	Frame, MTP, LTP, XLTP	Cast Iron									
241	Foot, Frame	Cast Iron									
248A	Ring, Oil - LTP Frame Only	Steel									
250	Gland, Mechanical Seal	As Specified									
332A	Labyrinth, Outboard Frame	Bronze Viton® Rubber									
333A	Labyrinth, Inboard Frame	Bronze Viton® Rubber									
351	Gasket, Case	Aramid Fiber w/ EPDM Binder									
353	Stud, Gland (Mechanical Seal)	18-8 SS									
353	Stud, Gland (Packing)	18-8 SS									
353A	Nut, Gland Stud (Mechanical Seal)	18-8 SS									
353A	Nut, Gland Stud (Packing)	18-8 SS									
358A	Plug, Casing Drain	Steel	316 SS	Alloy 20		317 SS	Monel	Nickel	Hast. B	Hast. C	TI
360C	"O" Ring - XLTP Only	Viton® Rubber									
360D	Frame/Adapter - O-Ring	Buna N Rubber									
360Q	Gasket; Gland, Mechanical Seal	Varies									
361A	Snap Ring, Bearing	Steel									
365	Seal, Mechanical Stationary Element	As Specified									
370	Bolt, Casing	Steel	18-8 SS								
370	Bolt, Casing 6 Inch Pumps	Steel									
370	Bolt, Casing 8 Inch Pumps	Steel									
370	Bolt, Casing 10 Inch Pumps	Steel									
370	Bolt, Casing 13 Inch Pumps	Steel									
370	Bolt, Casing 15 Inch Pumps	Steel									
370B	Bolt, Frame/Adapter	Steel									
370C	Bolt, Bearing Housing STP, MTP, LTP	Steel									
370C	Bolt, Bearing Housing XLTP	Steel									
370D	Jack Bolt, Bearing Housing STP, MTP, LTP	Steel	18-8 SS								
370D	Jack Bolt, Bearing Housing XLTP	Steel									
370F	Bolt, Frame Foot To Frame	Steel									
370G	Bolt, Bearing Cover	Steel									
370H	Box Cover/Adapter Stud	18-8 SS									
382	Lock Washer, Bearing	Steel									
383	Sea], Mechanical Rotating Element	Varies									
400	Key. Coupling	Steel									
408A	Plug, Frame Drain	Steel									
408H	Plug, Frame Lubrication Port	Steel									
408H	Plug, Bearing Housing Lubrication - XLTP Only	Steel									
408L	Plug, Oil Cooler Inlet	Steel									
408M	Plug, Oil Cooler Outlet (Not Shown)	Steel									
423	Jam Nut, Bearing Housing Jack Bolt	Steel									
423B	Nut, Box Cover/Adapter Stud	18-8 SS									
469B	Dowel Pin, Frame/Adapter	Steel									
496	Bearing Housing/Frame - O-Ring	Buna N Rubber									
496A	Gasket, Shaft Sleeve	TFE									
529	Washer, Frame Foot	Steel									
NA	Foot, Casing	Cast Iron									
NA	Pin, Sleeve	420 Stainless Steel									

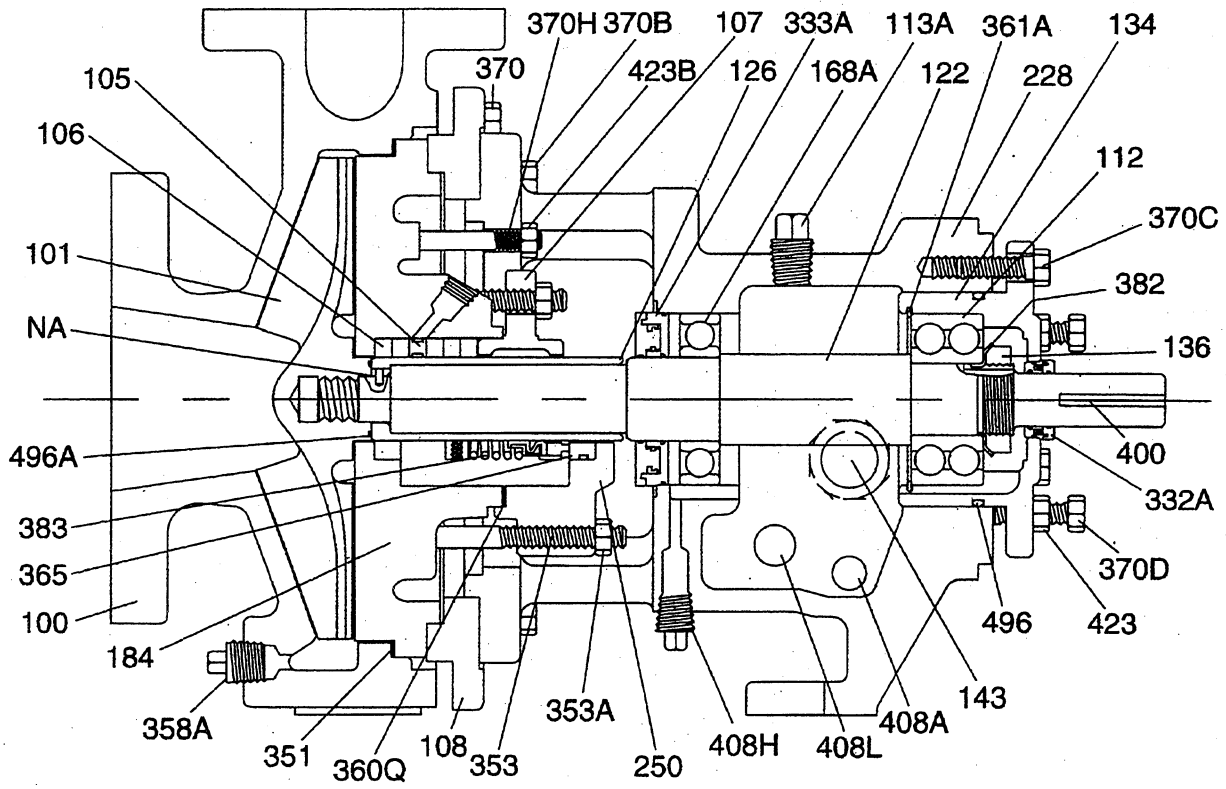
Materials Of Construction

Material	Code	Specification	Material	Code	Specification
316 Stainless Steel	086	Cast, ASTM A743, Grade CF-8M	Ductile Iron	680	ASTM A536, Grade 65-45-12
317 Stainless Steel	653	Cast, ASTM A743, Grade CG-8M	Hastelloy B	101	ASTM A494, Grade N - 12MV, Class I
Alloy 20	654	Cast, ASTM A743, Grade CN-7M	Hastelloy. C	102	ASTM A494, Grade CW-2M
Cast Iron	040	ASTM A48, Class 30	Monel	651	Cast, ASTM A494 M-35
Cast Iron	650	ASTM A48, Class 25	Nickel	485	ASTM A494, Grade C2100
CD4MCu	507	ASTM A743, Grade CD4MCu	Steel	075	4140 Steel, ASTM A331-64
Ductile Iron	596	ASTM A395, Grade 60-40-18	Titanium	652	Cast, ASTM B367, Grade C-3

PROCESS PUMPS
SINGLE STAGE END SUCTION
ANSI Standard Dimensions
Series LVB

LaBour Taber

STP Frame Cross Sectional Drawing

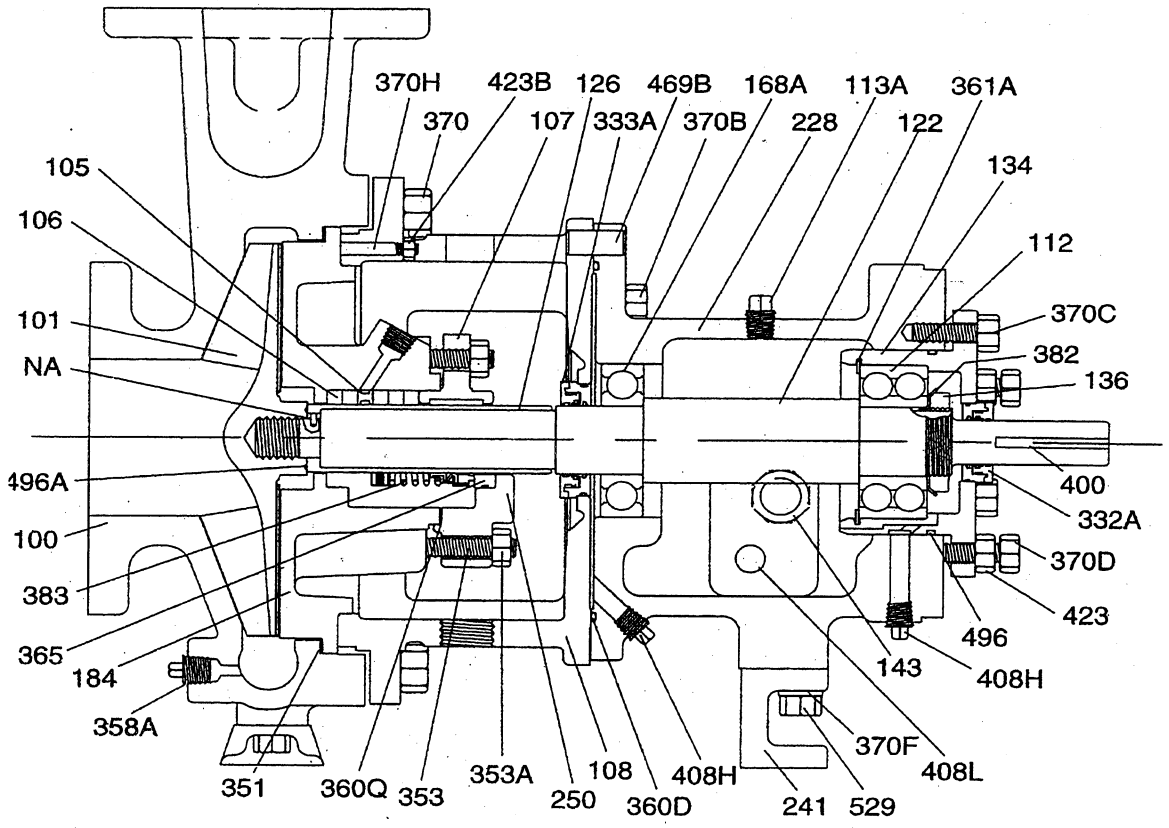


Parts List

Item Number	Quantity	Description	Item Number	Quantity	Description
100	1	Casing	353A	2	Nut, Gland Stud (Packed)
101	1	Impeller	358A	1	Plug, Casing Drain
105	1	Ring, Lantern	360Q	1	Gasket; Gland, Mechanical Seal
106	5	Packing	361A	1	Snap Ring, Bearing
107	1	Gland, Packing	365	1	Seal, Mechanical Stationary Element
108	1	Adapter 8 Inch Pumps Only	370	4	Bolt, Casing 6 Inch Pumps
112	1	Bearing, Outboard	370	8	Bolt, Casing 8 Inch Pumps
113A	1	Plug, Oil Fill	370B	4	Bolt, Frame/Adapter
122	1	Shaft	370C	3	Bolt , Bearing Housing
126	1	Sleeve, Shaft	370D	3	Jack Bolt, Bearing Housing
134	1	Housing; Bearing, Outboard	370H	2	Box Cover/Adapter Stud
136	1	Locknut, Bearing	382	1	Lock Washer, Bearing
143	1	Gauge; Sight, Oil	383	1	Seal, Mechanical Rotating Element
168A	1	Bearing, Inboard	400	1	Key, Coupling
184	1	Cover, Stuffing Box	408A	1	Plug, Frame Drain
228	1	Frame	408H	4	Plug, Frame Lubrication Port
250	1	Gland, Mechanical Seal	408L	1	Plug, Oil Cooler Inlet
332A	1	Labyrinth, Outboard Frame	408M	1	Plug, Oil Cooler Outlet (Not Shown)
333A	1	Labyrinth, Inboard Frame	423	3	Jam Nut, Bearing Housing Jack Bolt
351	1	Gasket, Case	423B	2	Nut, Box Cover/Adapter Stud
353	4	Stud, Gland (Mechanical Seal)	496	1	"O" Ring, Bearing Housing/Frame
353	2	Stud, Gland (Packed)	496A	1	"O" Ring, Shaft Sleeve
353A	4	Nut, Gland Stud (Mechanical Seal)	NA	1	Pin, Sleeve

Subject to change without notice

MTP Frame Cross Sectional Drawing



Parts List

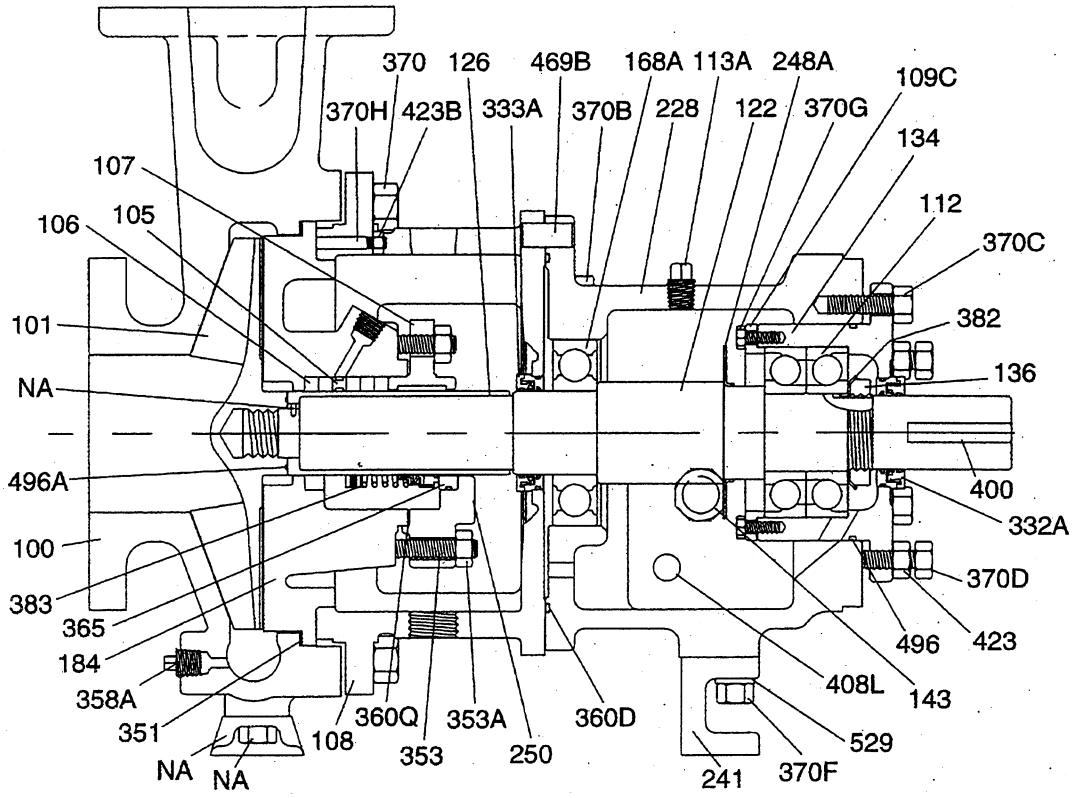
Item Number	Quantity	Description	Item Number	Quantity	Description
100	1	Casing	361A	1	Snap Ring, Bearing
101	1	Impeller	365	1	Seal, Mechanical Stationary Element
105	1	Ring, Lantern	370	4	Bolt, Casing 6 Inch Pumps
106	5	Packing	370	8	Bolt, Casing 8 Inch Pumps
107	1	Gland, Packing	370	12	Bolt, Casing 10 Inch Pumps
108	1	Adapter	370	16	Bolt, Casing 13 Inch Pumps
112	1	Bearing, Outboard	370B	4	Bolt, Frame/Adapter
113A	1	Plug, Oil Fill	370C	3	Bolt, Bearing Housing
122	1	Shaft	370D	3	Jack Bolt, Bearing Housing
126	1	Sleeve, Shaft	370F	1	Washer, Frame Foot
134	1	Housing; Bearing, Outboard	370H	2	Box Cover/Adapter Stud
136	1	Locknut, Bearing	382	1	Lock Washer, Bearing
143	1	Gauge; Sight, Oil	383	1	Seal, Mechanical Rotating Element
168A	1	Bearing, Inboard	400	1	Key, Coupling
184	1	Cover, Stuffing. Box	408A	1	Plug, Frame Drain (Not Shown)
228	1	Frame	408H	4	Plug, Frame Lubrication Port
241	1	Foot, Frame	408L	1	Plug, Oil Cooler Inlet
250	1	Gland, Mechanical Seal	408M	1	Plug, Oil Cooler Outlet (Not Shown)
332A	1	Labyrinth, Outboard Frame	423	3	Jam Nut, Bearing Housing Jack Bolt
333A	1	Labyrinth, Inboard Frame	423B	2	Nut, Box Cover/Adapter Stud
351	1	Gasket, Case	469B	2	Dowel Pin, Frame/Adapter
353	4	Stud, Gland (Mechanical Seal)	496	1	"O" Ring, Bearing Housing/Frame
353	2	Stud, Gland (Packing)	496A	1	"O" Ring,, Shaft Sleeve
353A	4	Nut, Gland Stud (Mechanical Seal)	529	2	Bolt, Frame Foot to Frame
353A	2	Nut, Gland Stud (Packing)	NA	1	Foot, Casing
358A	1	Plug, Casing Drain	NA	2	Bolt, Casing Foot
360D	1	Gasket, Frame/Adapter	NA	1	Pin, Sleeve
360Q	1	Gasket; Gland, Mechanical Seal			

Subject to change without notice

PROCESS PUMPS
SINGLE STAGE END SUCTION
ANSI Standard Dimensions
Series LVB

LaBour Taber

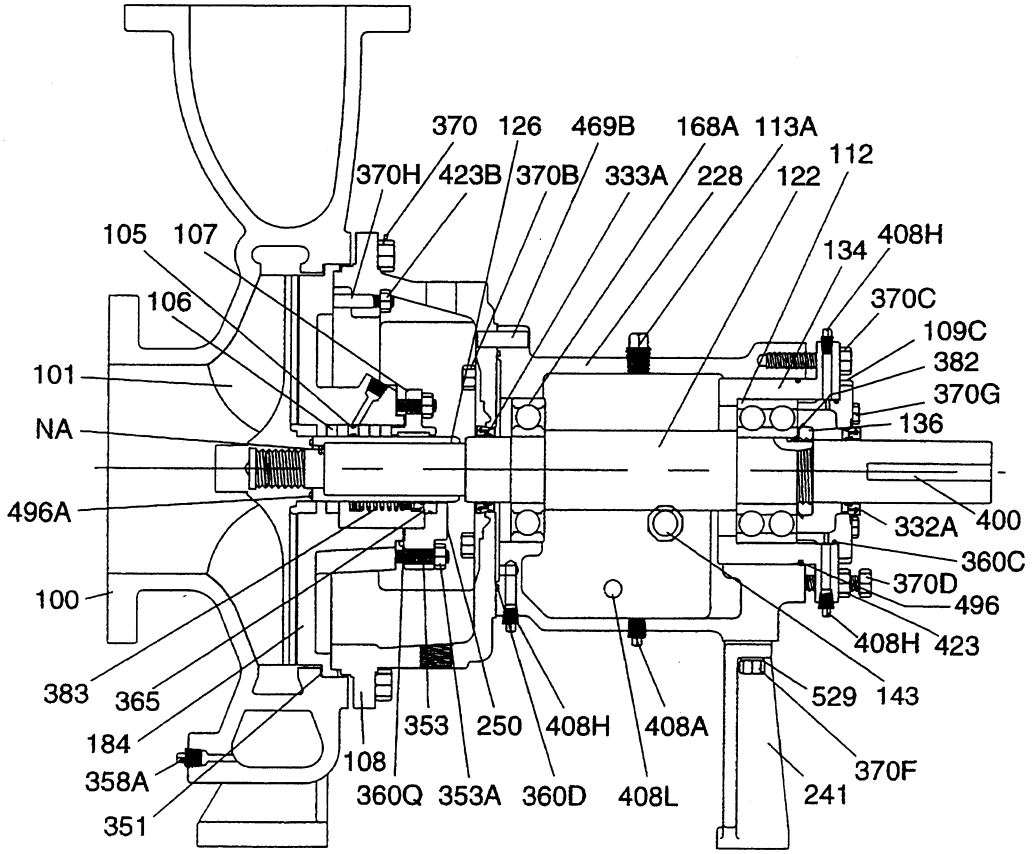
LTP Cross Sectional Drawing



Parts List

Item Number	Quantity	Description	Item Number	Quantity	Description
100	1	Casing	358A	1	Plug, Casing Drain
101	1	Impeller	360D	1	Gasket, Frame/Adapter
105	1	Ring, Lantern	360Q	1	Gasket; Gland, Mechanical Seal
106	5	Packing	365	1	Seal, Mechanical Stationary Element
107	1	Gland, Packing	370	12	Bolt, Casing 10 Inch Pumps
108	1	Adapter	370	16	Bolt, Casing 13 Inch Pumps
109C	1	Cover; Bearing, Outboard	370B	4	Bolt, Frame/Adapter
112	1	Bearing, Outboard	370C	3	Bolt, Bearing Housing
113A	1	Plug, Oil Fill	370D	3	Jack Bolt, Bearing Housing
122	1	Shaft	370F	2	Bolt, Frame Foot to Frame
126	1	Sleeve, Shaft	370G	6	Bolt, Bearing Cover
134	1	Housing; Bearing, Outboard	370H	2	Box Cover/Adapter Stud
136	1	Locknut, Bearing	382	1	Lock Washer, Bearing
143	1	Gauge; Sight, Oil	383	1	Seal, Mechanical Rotating Element
168A	1	Bearing, Inboard	400	1	Key, Coupling
184	1	Cover, Stuffing Box	408A	1	Plug, Frame Drain (Not Shown)
228	1	Frame	408H	4	Plug, Frame Lubrication Port (Not Shown)
241	1	Foot, Frame	408L	1	Plug, Oil Cooler Inlet
248A	1	Ring, Oil	408M	1	Plug, Oil Cooler Outlet (Not Shown)
250	1	Gland, Mechanical Seal	423	3	Jam Nut, Bearing Housing Jack Bolt
332A	1	Labyrinth, Outboard Frame	4238	2	Nut, Box Cover/Adapter Stud
333A	1	Labyrinth, Inboard Frame	469B	2	Dowel Pin, Frame/Adapter
351	1	Gasket, Case	496	1	"O" Ring, Bearing Housing/Frame
353	2	Stud, Gland (Packing)	496A	1	"O" Ring, Shaft Sleeve
353	4	Stud, Gland (Mechanical Seal)	529	1	Washer, Frame Foot
353A	2	Nut, Gland Stud (Packing)	NA	2	Bolt, Casing Foot
353A	4	Nut, Gland Stud (Mechanical Seal)	NA	1	Pin, Sleeve

XLTP Frame Cross Sectional Drawing



Part List

Item Number	Quantity	Description	Item Number	Quantity	Description
100	1	Casing	360C	1	"O" Ring; Bearing Cover
101	1	Impeller	360D	11	Gasket; Frame/Adapter
105	1	Ring, Lantern	360Q	11	Gasket; Gland, Mechanical Seal
106	5	Packing	370	16	Bolt, Casing 13 Inch Pumps
107	1	Gland, Packing	370	24	Bolt, Casing 15 Inch Pumps
108	1	Adapter	370B	4	Bolt, Frame/Adapter
109C	1	Cover; Bearing, Outboard	370C	3	Bolt, Bearing Housing
112	1	Bearing, Outboard	370D	3	Jack Bolt, Bearing Housing
122	1	Shaft	370F	2	Bolt, Frame Foot to Frame
126	1	Sleeve, Shaft	370G	6	Bolt, Bearing Cover
134	1	Housing; Bearing, Outboard	370H	2	Box Cover/Adapter Stud
136	1	Locknut, Bearing	382	1	Lock Washer, Bearing
143	1	Gauge, Sight Oil	383	1	Seal, Mechanical Rotating Element
168A	1	Bearing, Inboard	400	1	Key, Coupling
184	1	Cover, Stuffing Box	408A	1	Plug, Frame Drain
228	1	Frame	408H	4	Plug, Frame Lubrication Port
241	1	Foot, Frame	408H	2	Plug, Bearing Housing Lubrication
250	1	Gland, Mechanical Seal	408L	1	Plug, Oil Cooler Inlet
332A	1	Labyrinth, Outboard Frame	408M	4	Plug, Oil Cooler Outlet (Not Shown)
333A	1	Labyrinth, Inboard Frame	423	3	Jam Nut, Bearing Housing Jack Bolt
351	1	Gasket, Case	423B	2	Nut, Box Cover/Adapter Stud
353	4	Stud, Gland (Mechanical Seal)	469B	2	Dowel Pin, Frame/Adapter
353	2	Stud, Gland (Packing)	496	1	"O" Ring, Bearing Housing/Frame
353A	4	Nut, Gland Stud (Mechanical Seal)	496A	1	"O" Ring, Shaft Sleeve
353A	2	Nut, Gland Stud (Packing)	529	1	Washer, Frame Foot
358A	1	Plug, Casing Drain	NA	1	Pin, Sleeve