Model 590

Engineered for Survival

ADVANCED SEALING INTERNATIONAL™

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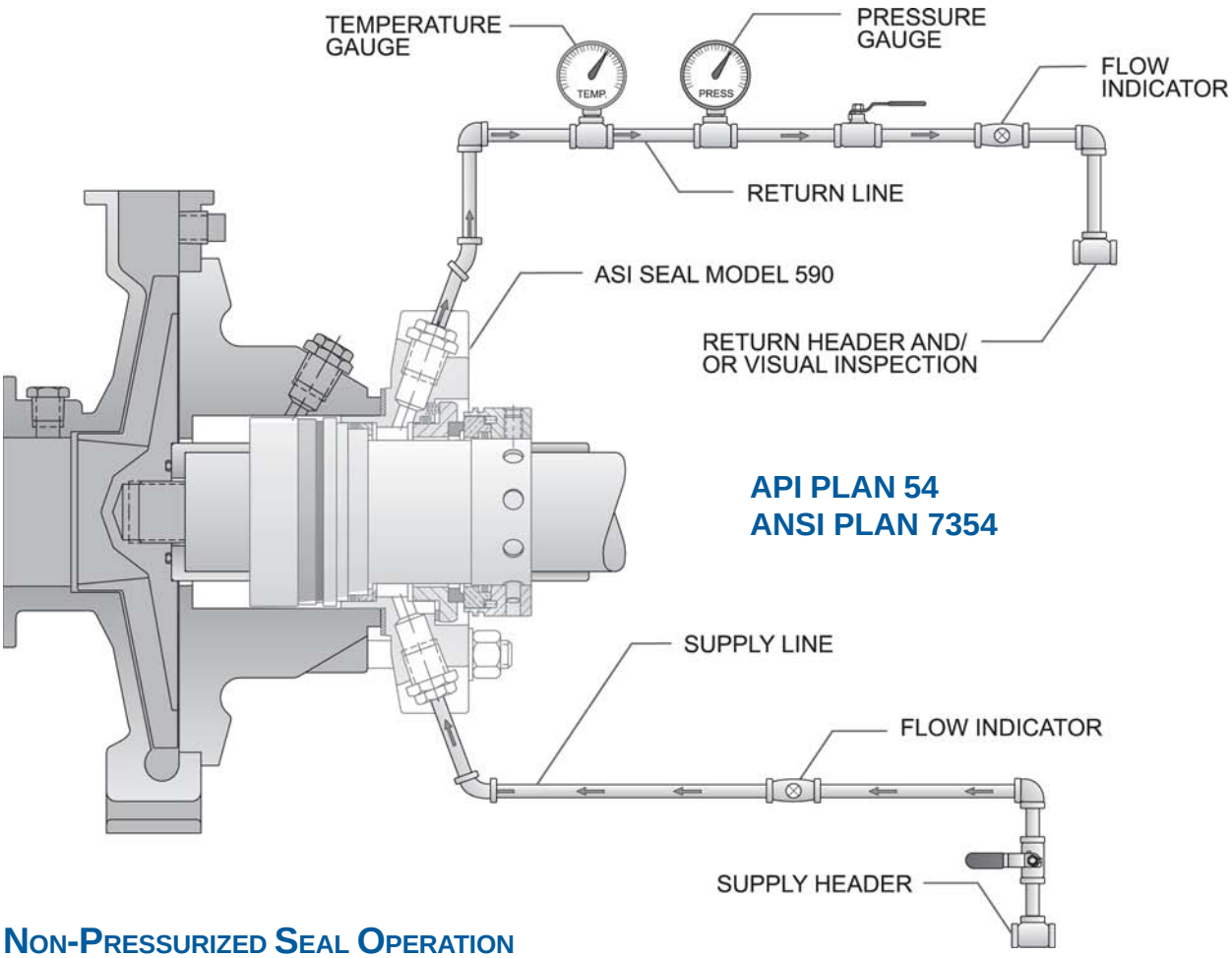
Engineered for Survival...

The **Model 590** mechanical seal operates as a double seal (pressurized or non-pressurized), automatically sensing when to perform each function by the barrier/buffer fluid pressure.

Open-Ended External Source Barrier Fluid System for ASI Model 590



Non-Pressurized Seal Operation

Stuffing box pressure higher than buffer fluid pressure

Pressurized Seal Operation

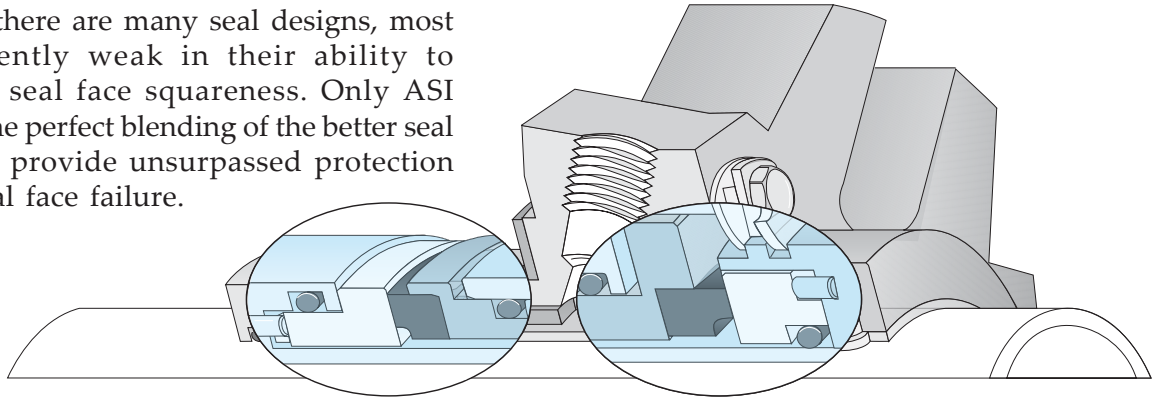
Barrier fluid pressure is 15 psi higher than stuffing box pressure

The **ASI Model 590** is a dual stationary mechanical seal. It is designed to operate with the occasional fluctuations that may occur in a seal barrier fluid supply. This, and many other features found in the **Model 590**, make it ideal for handling the more difficult to seal process liquids (including those that are sensitive to contact with air, contain abrasive material or may have environmental consequences). The **Model 590** monitors the barrier fluid pressure and takes evasive action to protect the environment (and itself) from damage caused by accidental over or under pressurized.

Tomorrow's Technology... Today

Seal Failure Protection

Although there are many seal designs, most are inherently weak in their ability to guarantee seal face squareness. Only ASI provides the perfect blending of the better seal designs to provide unsurpassed protection against seal face failure.



First, the surface for the back of the rotary has been machined at a perfect right angle to the axis of the pump shaft. This eliminates the possibility of face misalignment due to o-ring swelling [See Fig. 1], as well as allowing o-ring operation at cooler temperatures due to the dissipation of heat. The location of the drive pin protects against catastrophic seal face failure by localizing any chips or cracks that may develop. This prevents the almost inevitable spreading of these cracks to the seal face that would occur if the drive mechanism was closer to the face [See Fig. 2]. As an added safety feature, **ASI** has encased the most crucial part of the seal faces in metal, protecting both plant personnel and the environment from seal face failure. **ASI** has also engineered a natural seam or parting line into the seal design to aid in the removal of the face, without which, field repairability would be virtually impossible [See Fig. 3].

Fig. 1
The rotary face of this design rests upon an o-ring, which will often swell. This swelling (not necessarily uniform in shape) will push the rotary seal face axially and cause the seal faces to misalign. In addition, vacuum service can draw this o-ring completely out of its groove.

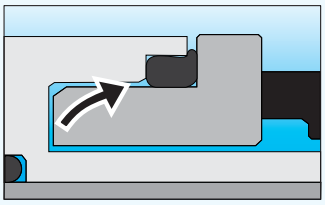


Fig. 2
At pump start-up, break-away torque causes a drive lug to hit against the side of a groove beneath the face causing chipping or breakage. Centrifugal force sends any hard, sharp fragments into the seal faces. Also, constant re-engagement with axial movement causes a phenomenon known as "ramping" which provides a sloped surface for the seal face to ride up on. When these forces overcome the tensile strength of the seal face, breakage occurs.

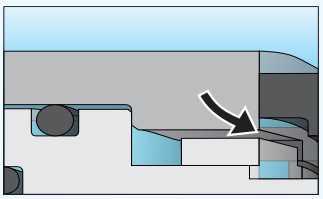
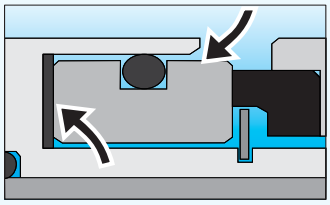


Fig. 3
Resting the rotary seal face on such materials as gaskets (without thickness accuracy of machined parts) may cause the resting surface to become uneven Any variable such as manufacturing variances, chemical decomposition or swelling will produce face misalignment.



ASI Encore Program

ASI's in-house repair program, **ASI Encore**, stands apart from other repair programs by employing the same standards used for our new seal parts when reconditioning seals. To our customers, this means each ASI Encore seal achieves the same performance level and seal life as a new **ASI** seal.

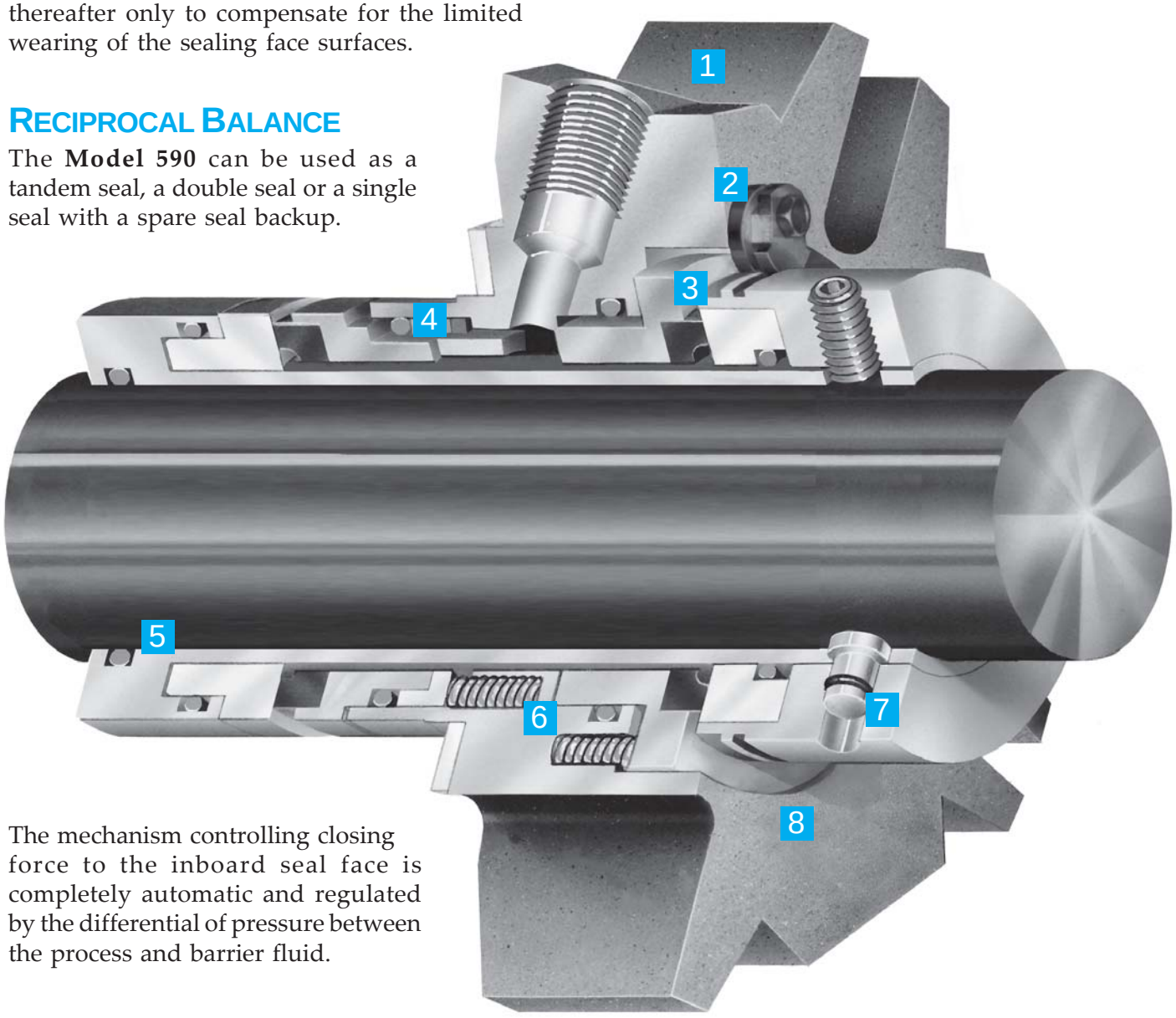
Custom Built Performance...

Stationary Design

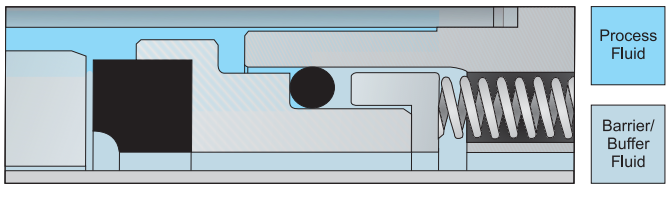
The **Model 590**'s stationary design derives sealing face alignment from the pump shaft and not the stuffing box or seal gland plate. Perfect sealing face squareness is automatic upon installation and requires no gland plate adjustments. Springs don't rotate with the shaft, nor do they flex. Under normal conditions, the **Model 590** adjusts one time upon installation and thereafter only to compensate for the limited wearing of the sealing face surfaces.

Reciprocal Balance

The **Model 590** can be used as a tandem seal, a double seal or a single seal with a spare seal backup.



The mechanism controlling closing force to the inboard seal face is completely automatic and regulated by the differential of pressure between the process and barrier fluid.



Double Seal Operation-
Barrier fluid pressure 15 psi higher than stuffing box pressure

The **Model 590**'s reciprocal balance protects both the environment and the seal from failure due to over or under-pressurization, while lengthening seal life.

Universal Design

1 Stress-Resistant Gland Plate

Eliminates bending tendency which can result in seal face misalignment, face gasket leakage, and "jamming" of seal components. **ASI**'s unique gland extends beyond the outboard seal face, protecting the seal faces against accidental damage, while providing a safety shield for plant personnel.

2 Assembly Cams

ASI's Handy-Cams™ not only align the seal, but protect against damage in handling and upon installation, all with the ease of one-step disengagement.

3 Metal Encased Seal Faces

Both inboard and outboard faces are encased, protecting plant personnel and the environment from catastrophic seal face failure.

4 Hydraulic Balance

Seals can operate at higher pressures without overheating.

5 Longer Seal Life

All o-rings and secondary sealing surfaces are virtually static under normal service conditions and are not required to adjust for misalignment, which provides longer seal life.

6 Isolated Springs

Inboard springs are removed from the fluid and cannot clog from sediments in the pumpage. Outboard springs are removed from barrier fluid, providing extra protection in case of barrier fluid contamination.

7 Safe-T-Stud™ (Patent # 5,275,421)

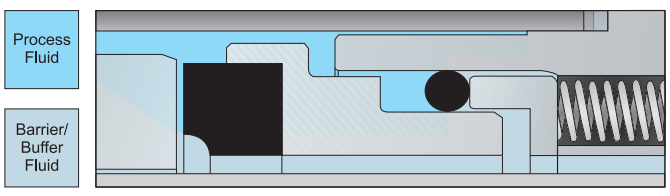
ASI's unique drive studs aid in precision alignment and transmit torque from the shaft to the lock collar, from the inside out, preventing seal damage, misalignment and accidental loosening.

8 Compact Cartridge Mounted Design

The self-contained unit provides simplified installation, as mechanics are not required to make critical installation measurements. Also, impeller clearance adjustments can be made without any interruptions in service; the cartridge mounted design makes disassembly of the pump to make such adjustments unnecessary.

Tandem Seal Operation-
Stuffing box pressure higher than barrier fluid pressure

This provides the flexibility to meet pollution and safety regulations by adjusting the barrier fluid pressure to meet specific seal needs.



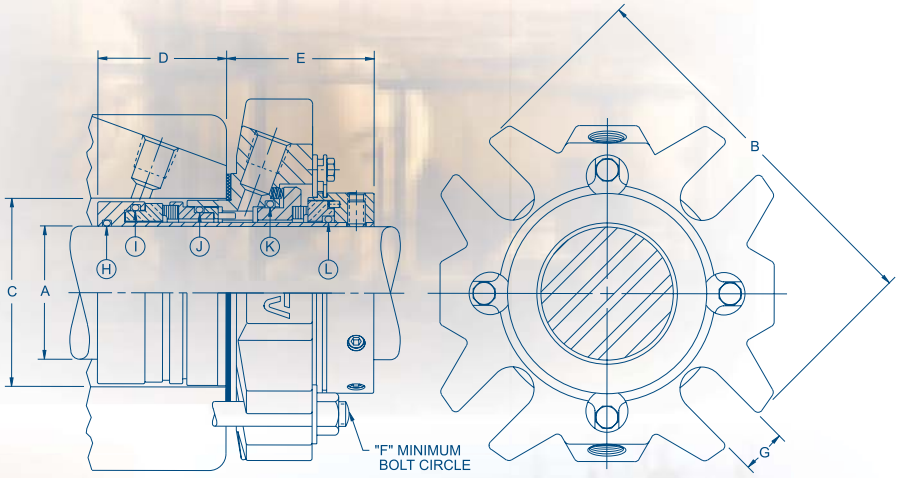
MATERIALS OF CONSTRUCTION

METAL PARTS[1]
Standard Metal Parts- 316ss
Standard Springs- Hastelloy® C
Standard Set Screws- 316ss

FACE MATERIALS[1]
Stationary Face- High Quality Carbon Graphite
(Tungsten and Silicon Carbide Also Available)
Rotary Face- Silicon Carbide

SECONDARY SEALS[1]
Standard O-ring Materials-
Fluorocarbon, EPDM or Aflas®

[1]Other Materials May Be Specified



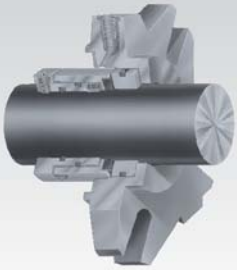
590 DIMENSIONAL DATA

A	B	C		D	E	F			G	H	I	J	K	L
		MIN	MAX			3/8"	1/2"	5/8"						
1.000	4.19	1.75	1.88	1.44	2.09	2.81	-	-	.44	120	029	127	130	124
1.125	4.19	1.75	1.88	1.44	2.09	2.81	-	-	.44	122	029	127	130	124
1.250	4.19	1.87	2.00	1.44	2.09	2.97	-	-	.44	124	030	129	132	126
1.375	4.19	2.00	2.13	1.44	2.09	3.13	-	-	.44	126	031	131	134	128
1.500	5.50	2.25	2.50	1.83	2.09	3.63	3.75	-	.63	128	135	134	137	130
1.625	5.50	2.37	2.62	1.83	2.09	3.63	3.75	-	.63	130	138	136	139	132
1.750	5.50	2.50	2.75	1.83	2.09	3.66	3.78	-	.63	132	139	138	141	134
1.875	5.50	2.62	2.88	1.83	2.09	3.75	3.88	-	.63	134	141	140	143	136
2.000	6.00	2.75	3.00	1.83	2.09	4.00	4.13	4.25	.69	136	143	142	145	138
2.125	6.00	2.87	3.13	1.83	2.09	4.13	4.25	4.38	.69	138	146	144	148	140
2.250	6.00	3.00	3.25	1.83	2.09	4.25	4.38	4.50	.69	140	148	146	149	142
2.375	6.50	3.12	3.38	1.83	2.09	4.38	4.50	4.63	.69	142	150	148	150	144
2.500	6.50	3.25	3.50	1.83	2.09	4.50	4.63	4.75	.69	144	151	150	151	146

ASI has designed a selection of mechanical seals for virtually all industrial applications

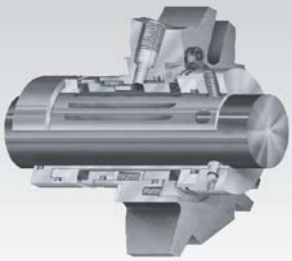
The Model 500
Single Inside Seal

The Model 505
Single Outside Seal



The Model SD-3
Single Inside Seal

The Model 585
Single Cartridge Stationary Seal



The Model 595
Double Pumping Stationary Seal

The Model 600
Double Cartridge Stationary Seal

Hastelloy is a trademark of Hayes Int'l, Inc., Aflas is a trademark of Asashi Glass Co., Ltd.

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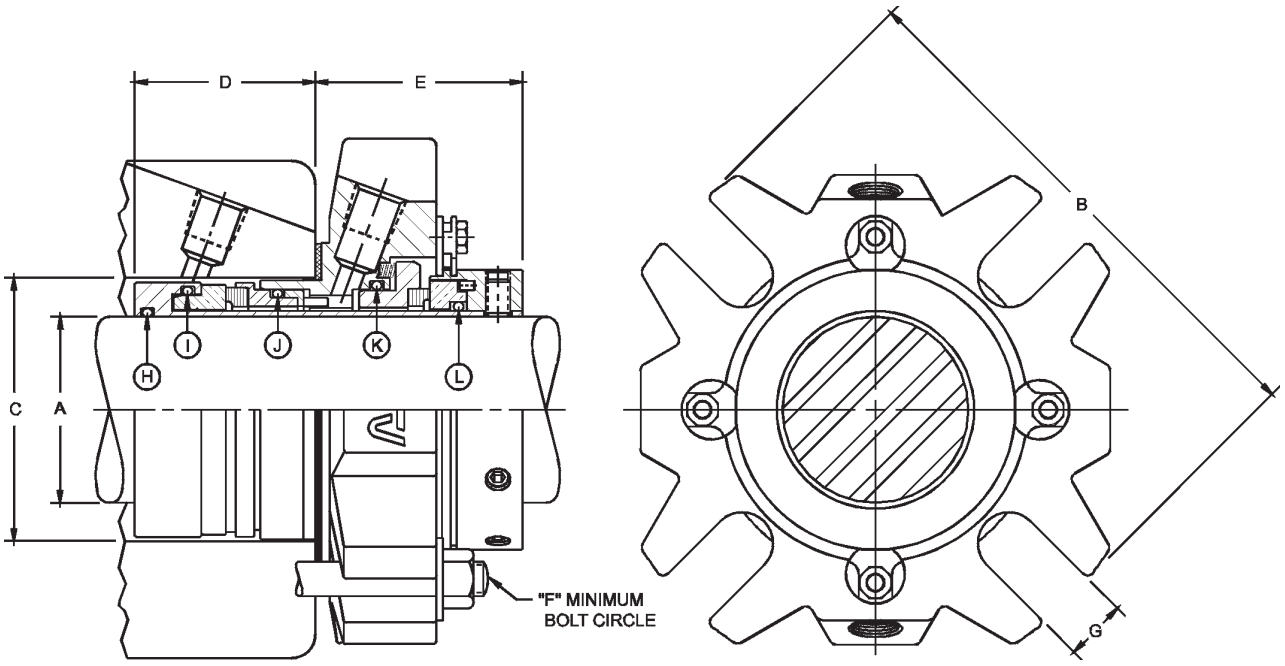

Model 590 / 595
Dimensional Data

		A.	B.	C.		D.	E.	F.			G.
Cross Section	Seal Code	Shaft Size	Max. Gland Width	Min. St. Box Bore	Max. St. Box Bore	Inb'd Seal Dim.	Outb'd Seal Dim.	Min. Bolt Circle by Bolt Size 3/8"	1/2"	5/8"	Max. Slot Width
.312	-16	1.000	4.19	1.625	1.75	1.44	2.09	2.81	--	--	.44
.312	-18	1.125	4.19	1.750	1.88	1.44	2.09	2.81	--	--	.44
.312	-20	1.250	4.19	1.875	2.00	1.44	2.09	2.94	--	--	.44
.312	-22	1.375	4.19	2.000	2.13	1.44	2.09	3.13	--	--	.44
.375	-24	1.500	5.50	2.250	2.50	1.83	2.09	3.63	3.75	--	.63
.375	-26	1.625	5.50	2.375	2.62	1.83	2.09	3.63	3.75	--	.63
.375	-28	1.750	5.50	2.500	2.75	1.83	2.09	3.66	3.78	--	.63
.375	-30	1.875	5.50	2.625	2.88	1.83	2.09	3.70	3.82	--	.63
.375	-32	2.000	6.00	2.750	3.00	1.83	2.09	4.00	4.13	4.25	.69
.375	-34	2.125	6.00	2.875	3.13	1.83	2.09	4.13	4.25	4.38	.69
.375	-36	2.250	6.00	3.000	3.25	1.83	2.09	4.25	4.38	4.50	.69
.375	-38	2.375	6.50	3.125	3.38	1.83	2.09	4.40	4.52	4.65	.69
.375	-40	2.500	6.50	3.250	3.50	1.83	2.09	4.50	4.63	4.75	.69
.500	-42	2.625	6.50	3.625	3.88	2.18	2.09	4.81	4.94	5.06	.75

		H.	I.	J.	K.	L.
Seal Code	Shaft Size	O-ring Data				
-16	1.000	120	028	125	128	122
-18	1.125	122	029	127	130	124
-20	1.250	124	030	129	132	126
-22	1.375	126	031	131	134	128
-24	1.500	128	135	134	137	130
-26	1.625	130	138	136	139	132
-28	1.750	132	139	138	141	134
-30	1.875	134	141	140	143	136
-32	2.000	136	143	142	145	138
-34	2.125	138	146	144	148	140
-36	2.250	140	148	146	149	142
-38	2.375	142	149	148	150	144
-40	2.500	144	151	150	151	146

INSTALLATION INSTRUCTIONS FOR MODELS 590, 595, 600
MECHANICAL SEAL ASSEMBLY

EQUIPMENT PREPARATION:

A. Visually inspect shaft or sleeve over which seal is to be installed for excessive burrs or sharp edges which might cut sleeve o-ring upon installation. If necessary, correct or replace part.

B. Check for excessive shaft movement, maximum whip .003" T.I.R. (including sleeve, if so equipped) and .010" maximum end play. If necessary, replace shaft sleeve or bearing.

C. If pump is equipped with shaft sleeve, inspect o-ring or gasket seal and replace if necessary to prevent possible leakage.

D. Compare actual stuffing box dimensions with those shown on assembly drawing. If actual dimensions do not fall within tolerances shown on assembly drawing, do not attempt to install mechanical seal.

E. The mechanical seal is manufactured from materials shown on contents label. Chemical compatibility with the product and barrier fluid must be established. If compatibility cannot be established, do not attempt to install mechanical seal. Consult factory.

INSTALL SEAL AS FOLLOWS: (USE ASSEMBLY DRAWING TO LOCATE PARTS SPECIFIED BELOW)

1. Only after equipment has been thoroughly inspected, necessary repairs made, and dimensional and chemical compatibility established, should seal be removed from protective packaging.
2. Lubricate sleeve o-ring with silicone lubricant furnished. DO NOT USE PETROLEUM BASED LUBRICANTS.
3. Slide seal assembly over shaft or sleeve.
4. Reassemble pump.
5. Slide seal assembly into position against stuffing box face.
6. Install nuts over gland studs and finger tighten. Then, in an opposing sequence, torque gland nuts uniformly.
7. Make any final impeller or bearing adjustments.
8. Tighten set screws (in lock collar) uniformly.
9. Loosen hex head screws and move assembly cams/clips out of path of lock collar, then retighten hex head screws. If cams are inaccessible, loosen hex head screws (if possible) and cams will automatically disengage from seal once equipment is started.
10. Install any applicable seal flush or bypass connections.
11. FOR DOUBLE SEAL OPERATION: Circulate barrier fluid in through connection in BOTTOM of gland plate, out through connection in TOP of seal gland plate. Maintain a constant pressure of 15 p.s.i. (min.) over maximum stuffing box pressure.
    FOR TANDEM SEAL OPERATION: Circulate barrier fluid in through connection in BOTTOM of gland plate, out through connection in TOP of seal gland plate. Maintain a constant pressure below stuffing box pressure but above product vapor pressure.

REMOVE SEAL AS FOLLOWS: (USE ASSEMBLY DRAWING TO LOCATE PARTS SPECIFIED BELOW)

1. Before removing seal, loosen hex head screws and reinstall assembly cams/clips into groove on lock collar, then retighten hex head screws.
2. Remove any pipe connections from seal gland plate.
3. Loosen shaft set screws (in lock collar).
4. Remove gland nuts.
5. With both hands, grasp seal gland plate by outer diameter and pull seal assembly beyond end of shaft.