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Remote Operable Coke Drum

U.S. Pat. No. 5,908,210



US05908210A

United States Patent [19] **Patent Number:** **5,908,210**
Fetzer [45] **Date of Patent:** **Jun. 1, 1999**

[54] **AUTOMATED FLANGE RETAINING CLAMP WITH REDUNDANT FASTENERS**
Primary Examiner—Lynne A. Reichard
Assistant Examiner—Greg Biada
Attorney, Agent, or Firm—Locke Liddell & Sepp LLP

[76] Inventor: Kelly Fetzer, 14515 Wuestelich, No. 1409, Houston, Tex. 77059

[21] Appl. No. 08/790,407
 [22] Filed: Feb. 3, 1997
 [51] Int. Cl.⁷ F16L 23/04
 [52] U.S. Cl. 285/24; 285/367; 285/411; 285/220; 292/256.6

[58] Field of Search 285/920, 24, 27, 285/84, 85, 365, 366, 367, 406, 411; 292/256.6, 256.65; 230/541, 592, 520

[56] **References Cited**

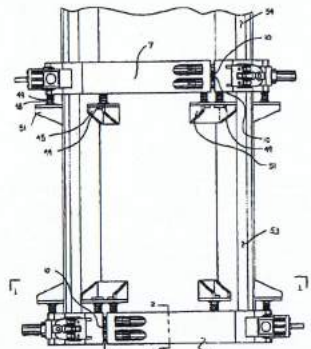
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41 Claims, 9 Drawing Sheets



U.S. Pat. No. 6,022,454



US06022454A

United States Patent [19] **Patent Number:** **6,022,454**
Fetzer [45] **Date of Patent:** **Feb. 8, 2000**

[54] **REMOTELY OPERABLE PRESSURE VESSEL SYSTEM**
Primary Examiner—Bakir L. Yildirim
Attorney, Agent, or Firm—Locke Liddell & Sepp LLP

[76] Inventor: Kelly Fetzer, 10801 Legacy Park Dr. Suite 212, Houston, Tex. 77064

[21] Appl. No. 08/932,419
 [22] Filed: Sep. 17, 1997
 [51] Int. Cl.⁷ C10B 25/10; B23P 19/04
 [52] U.S. Cl. 202/242; 202/239; 202/241; 202/243; 202/252; 294/26.3

[58] Field of Search 202/242, 243, 96, 262; 294/26.3, 244

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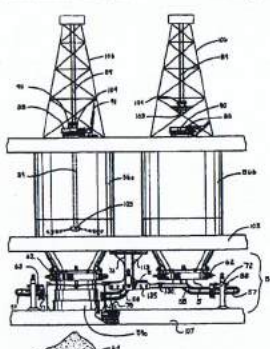
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[57] **ABSTRACT**

The present invention provides a substantially remote operable system for connecting and disconnecting a vessel. The system comprises substantially a remotely operable joint connector for connecting and disconnecting structural units. The system and the method using the system may also comprise a remote operable closure transport for removing a vessel closure from an opening in the vessel, and a substantially remote operable removal system for allowing material to be expelled from the vessel to increase operational efficiency.

18 Claims, 41 Drawing Sheets

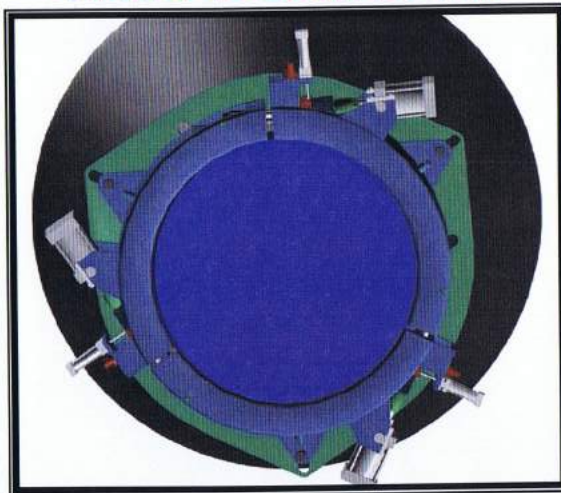


Foreign Patents Pending

Remote Operable Flange



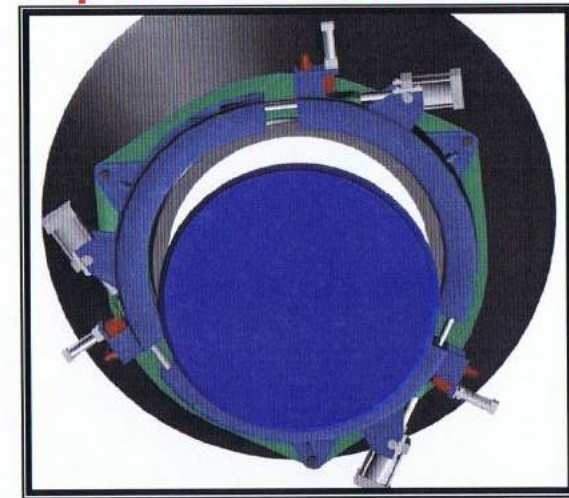
Close to Seal Drum



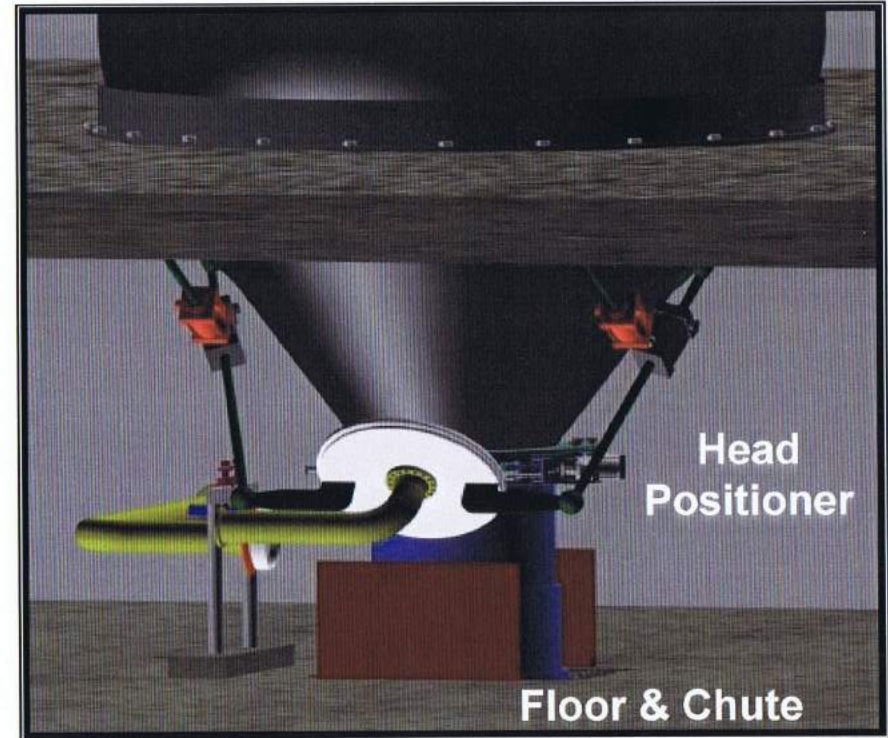
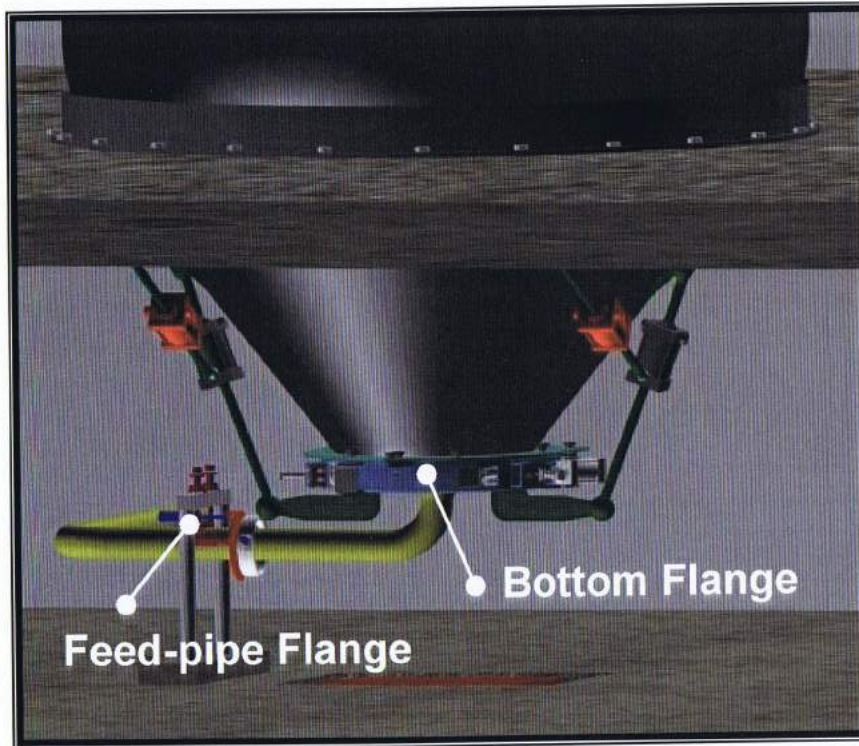
Proven 72" ID Flange



Open to Release Head

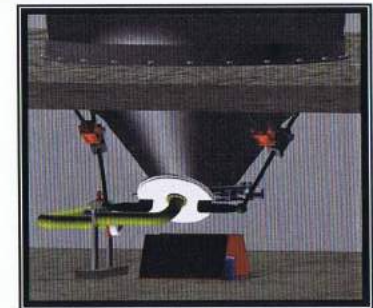


Remote Operable Drum-bottom Deheader



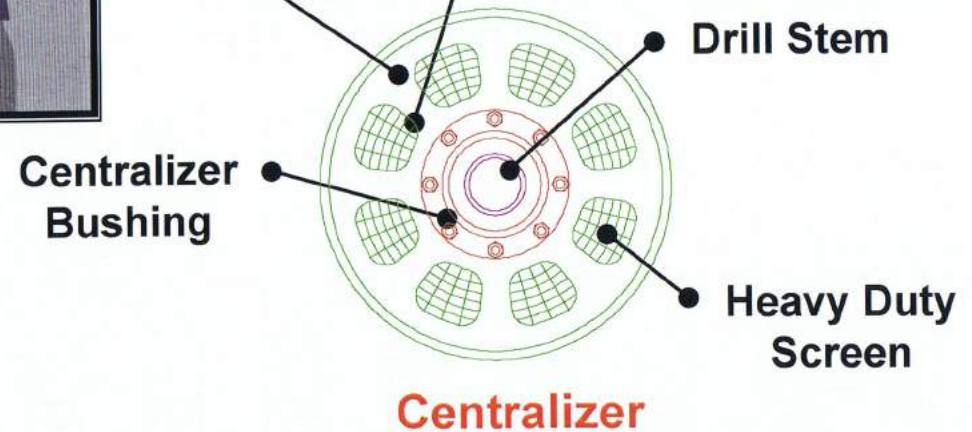
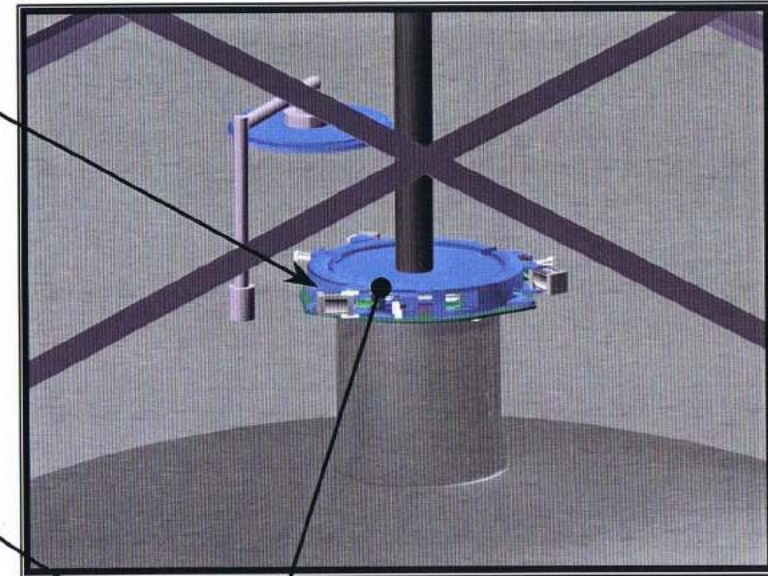
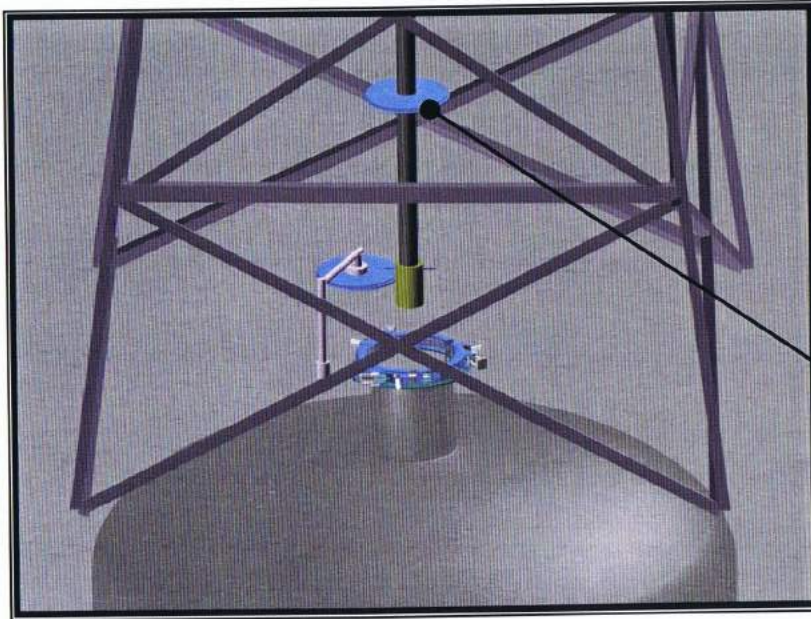
Remote Controlled Equipment

1. Disconnect Feed-pipe
2. Disconnect Bottom-head
3. Position Bottom-head
4. Deploy Floor & Chute



Remote Operable Drum-top Deheader

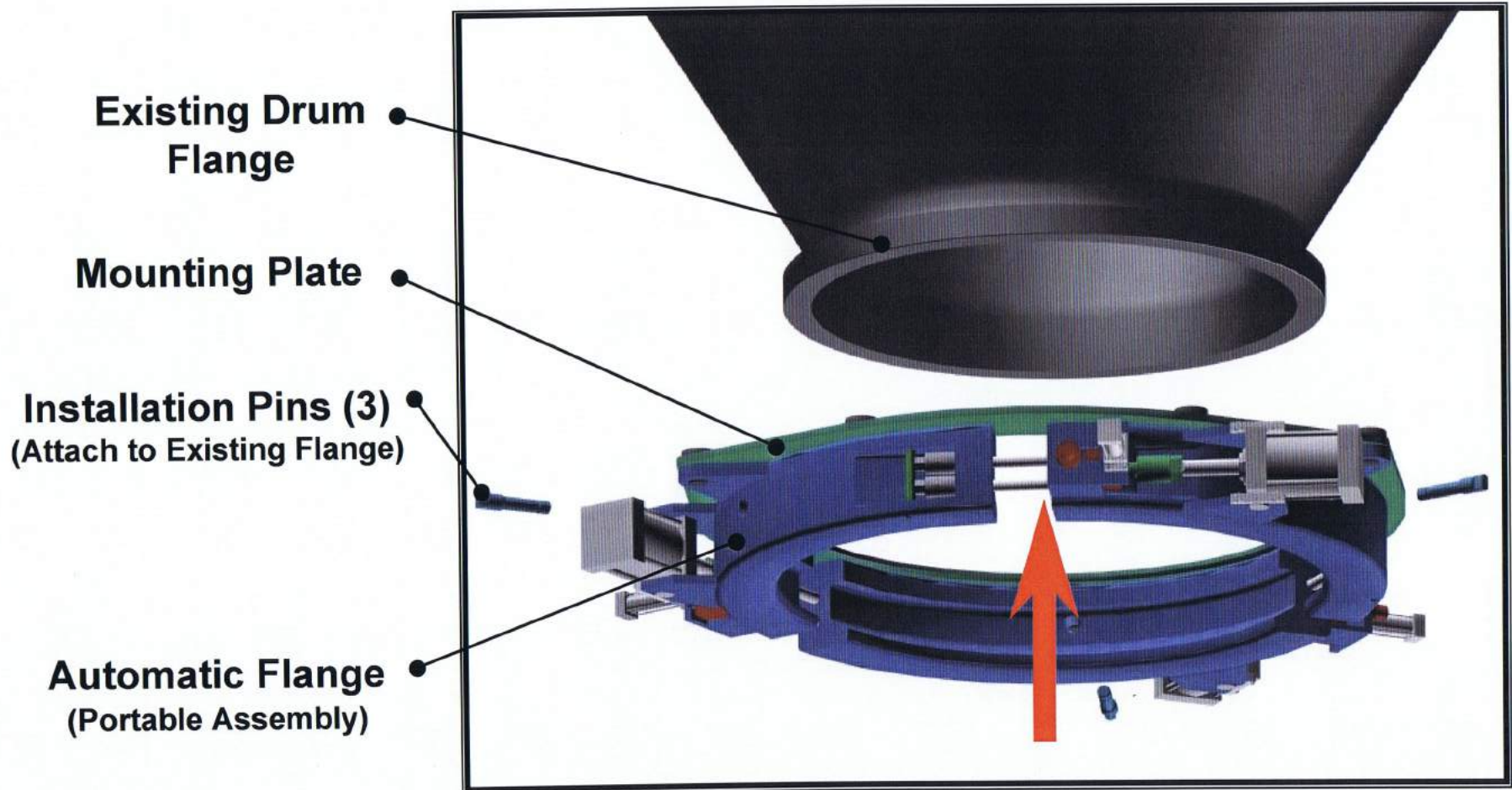
Remote Operable Flange



- Release & Position Top-head
- Lower Drill Stem
- Lock Centralizer with Flange

Remote Operable Flange

Advantageous Installation



Quickly Installs on Existing Drum Flange

Remote Operable Flange

Fully Operational 72" ID Flange

- Pressure Tested
- Cycle Tested

Hydraulic Bulkhead
(Supplies all Cylinders)

Safety Interlock

Lock Actuator

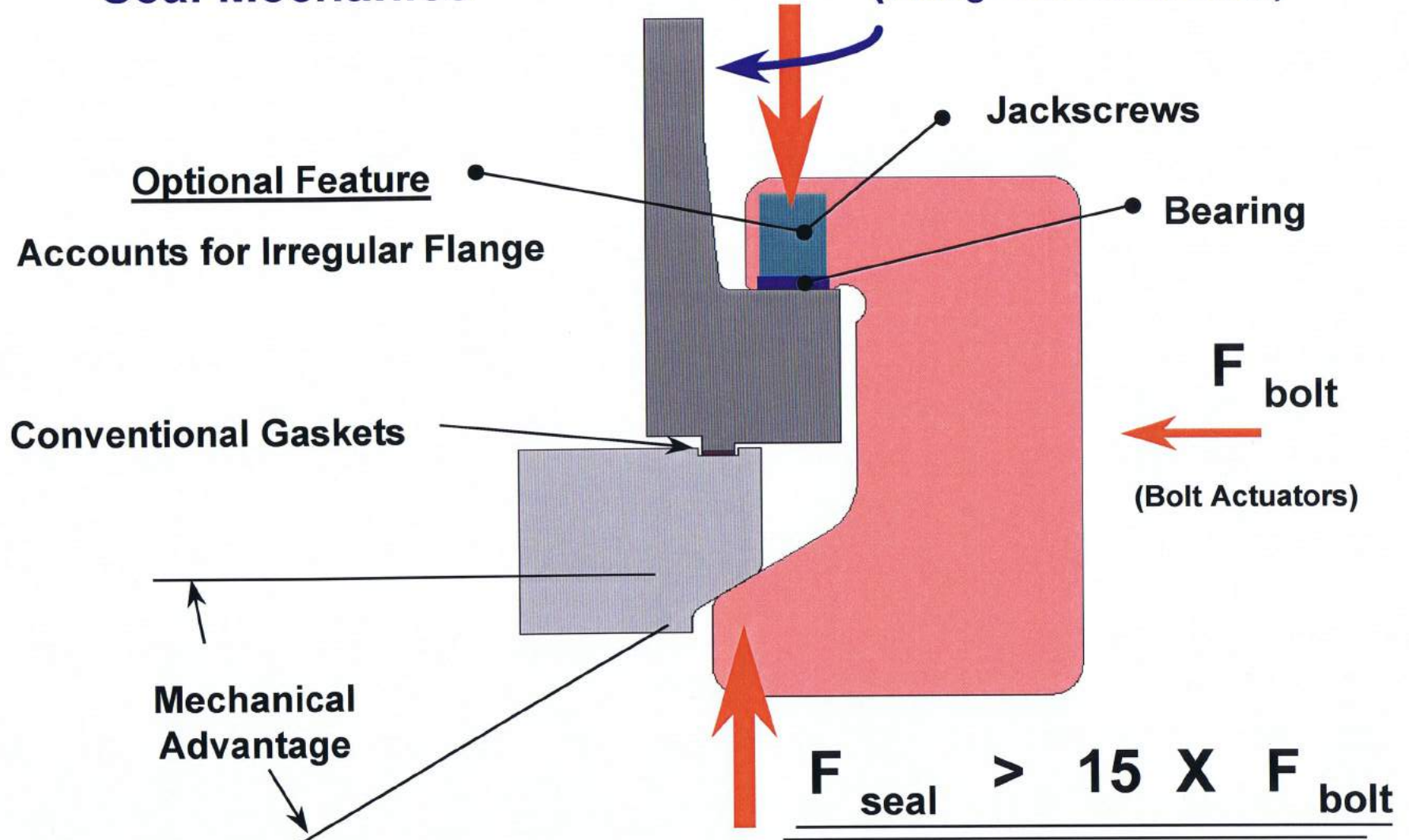


Tie-rod Actuator

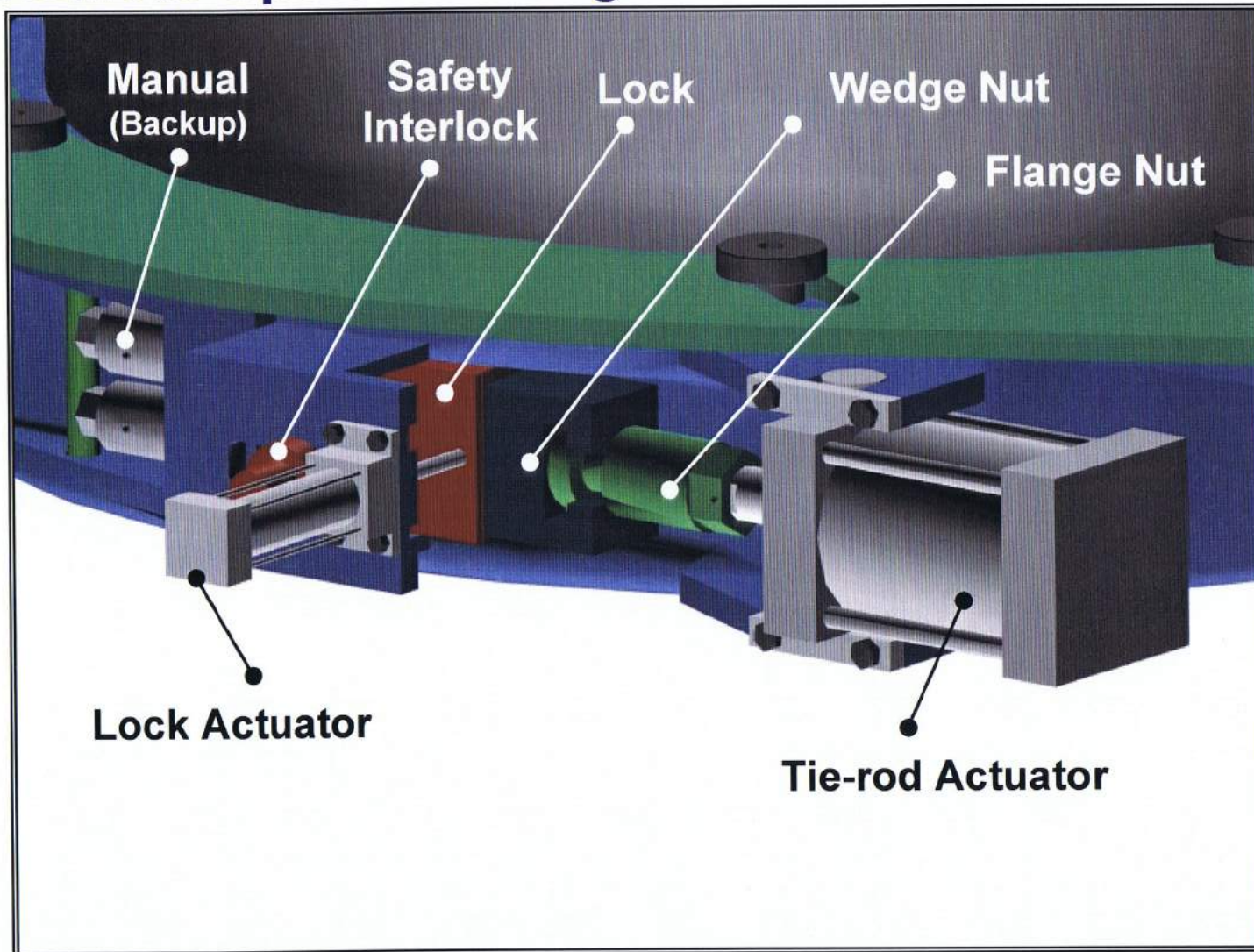
Proven Technology

Seal Mechanics

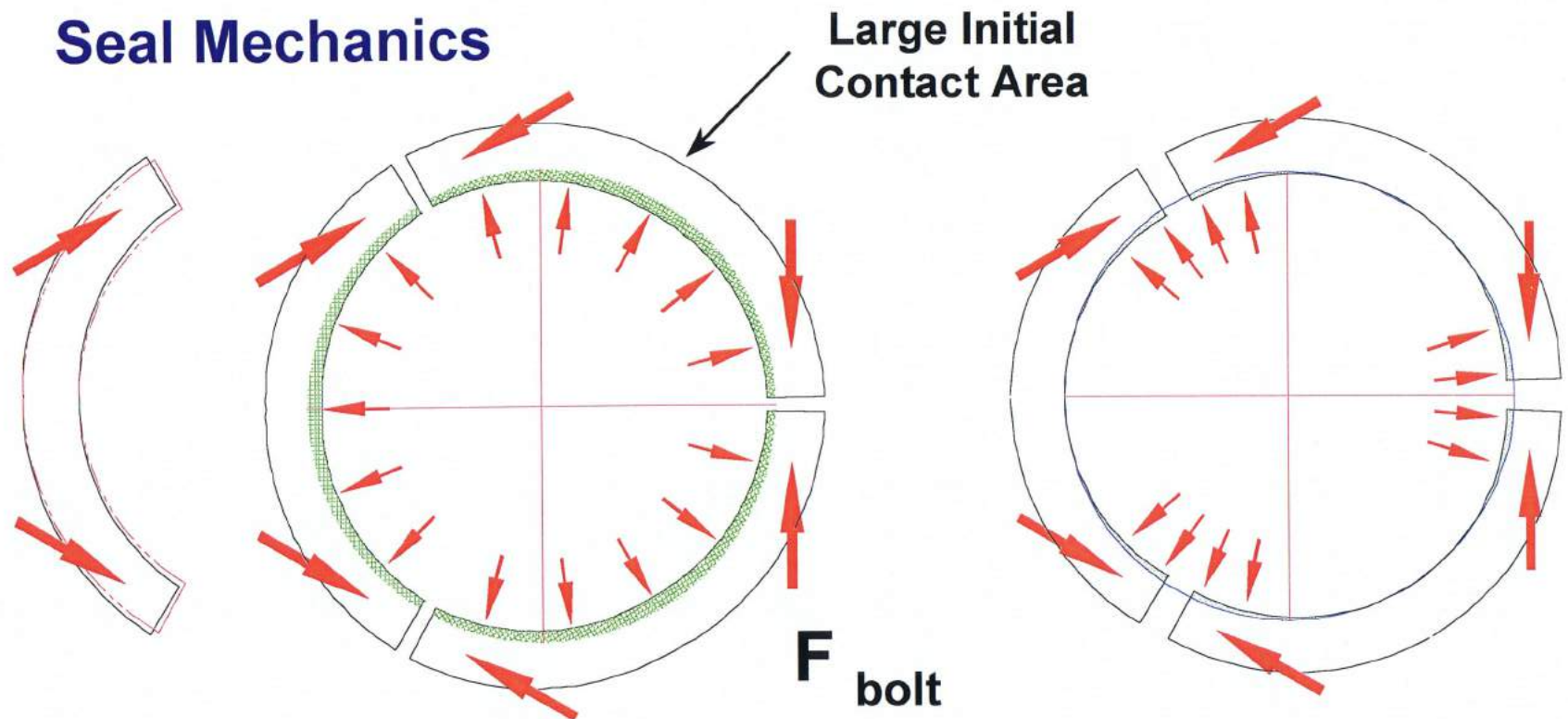
(Flange Cross-section)



Remote Operable Flange



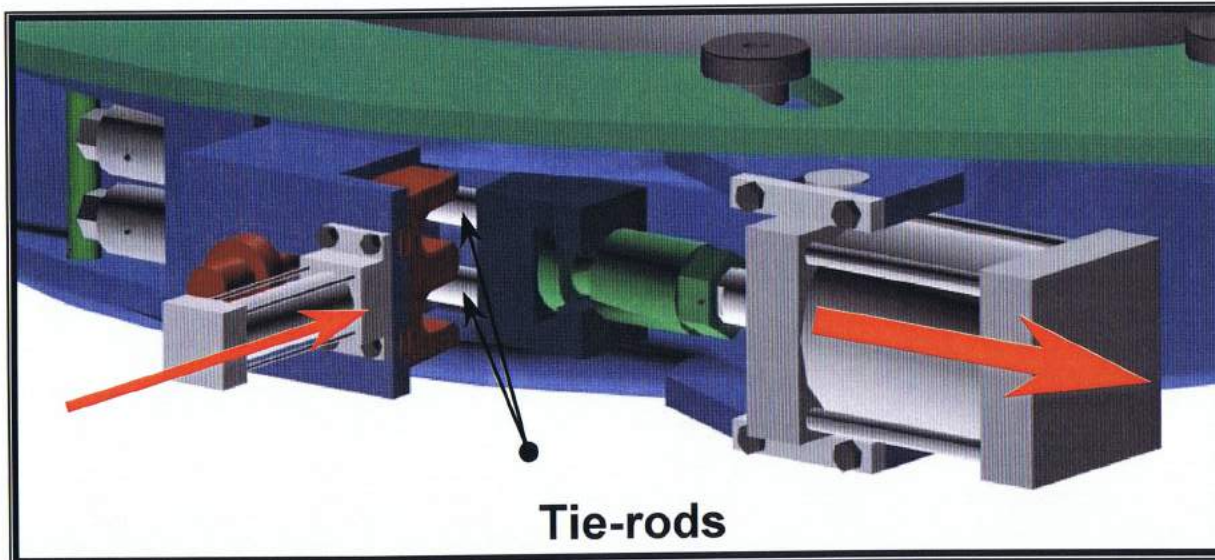
Seal Mechanics



Account for Deflection (Correct)

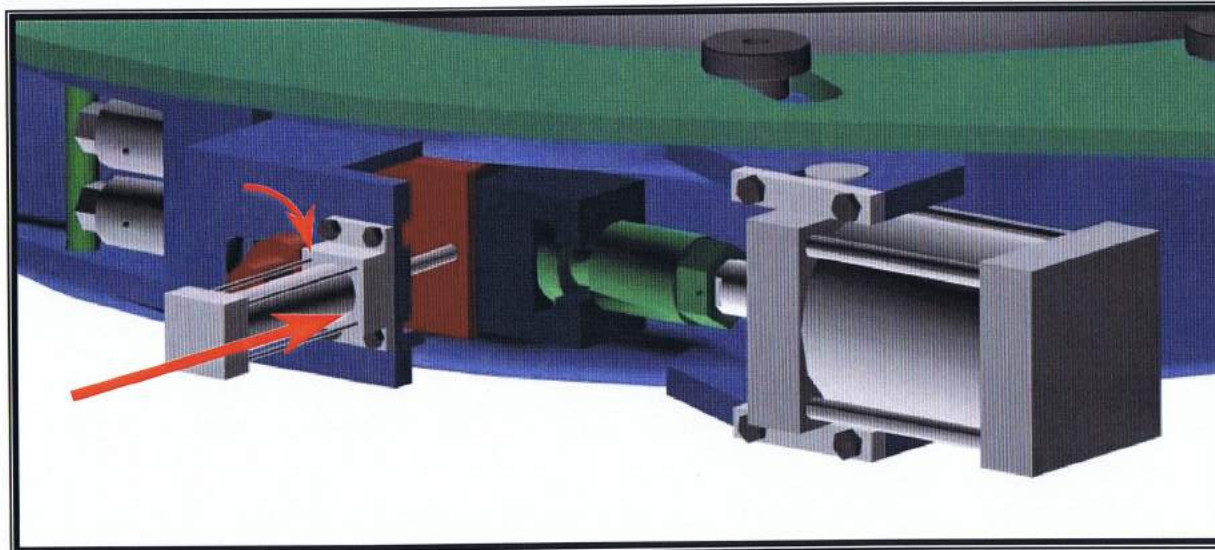
(Incorrect)

- Uniform Gasket Force
- Elimination of Wear
 - Negligible Dynamic Engagement
 - Large Initial Contact
 - Low Contact Stress



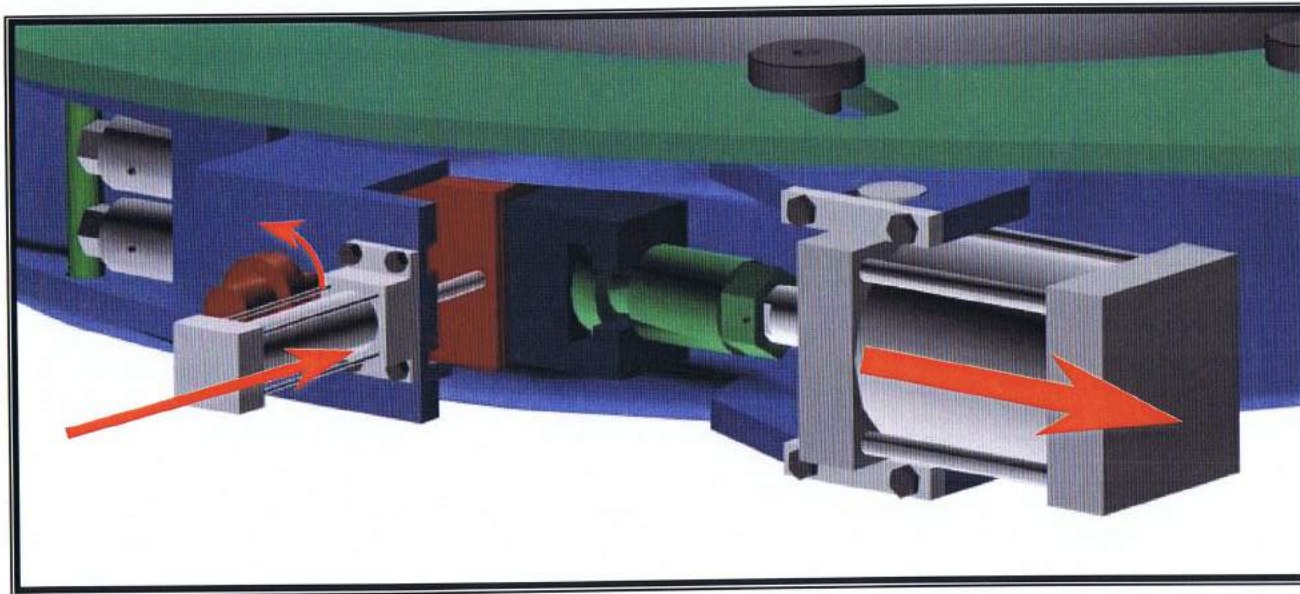
To Close & Lock

- Retract Tie-rod Actuators



- Extend Lock Actuators
- Engage Safety Interlock

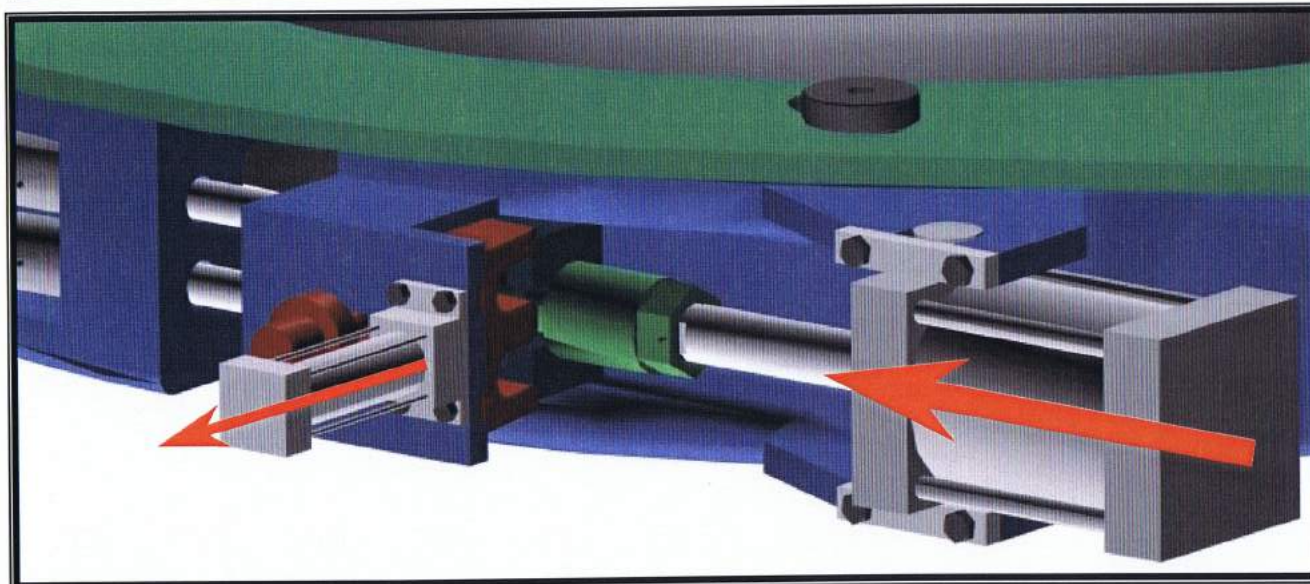
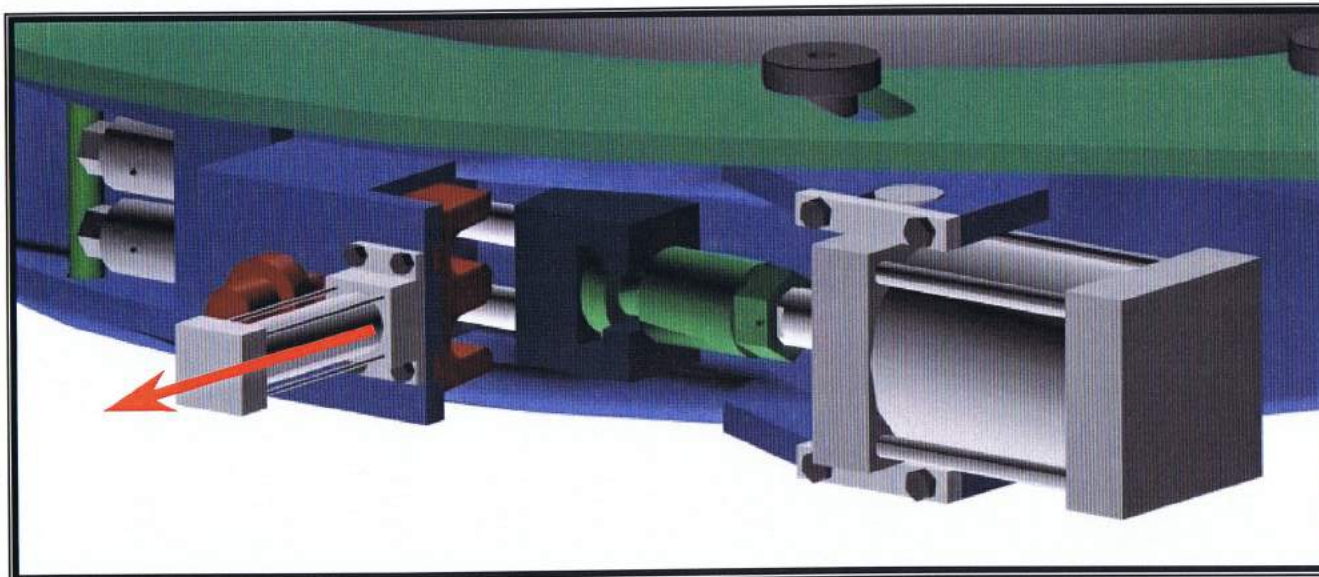
To Disengage Interlocks



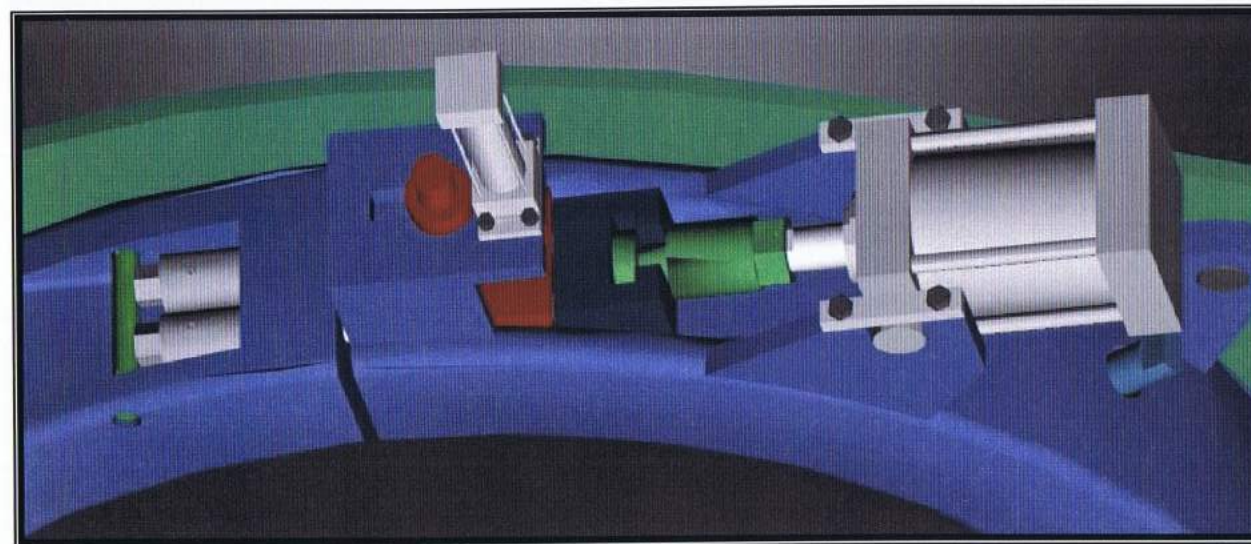
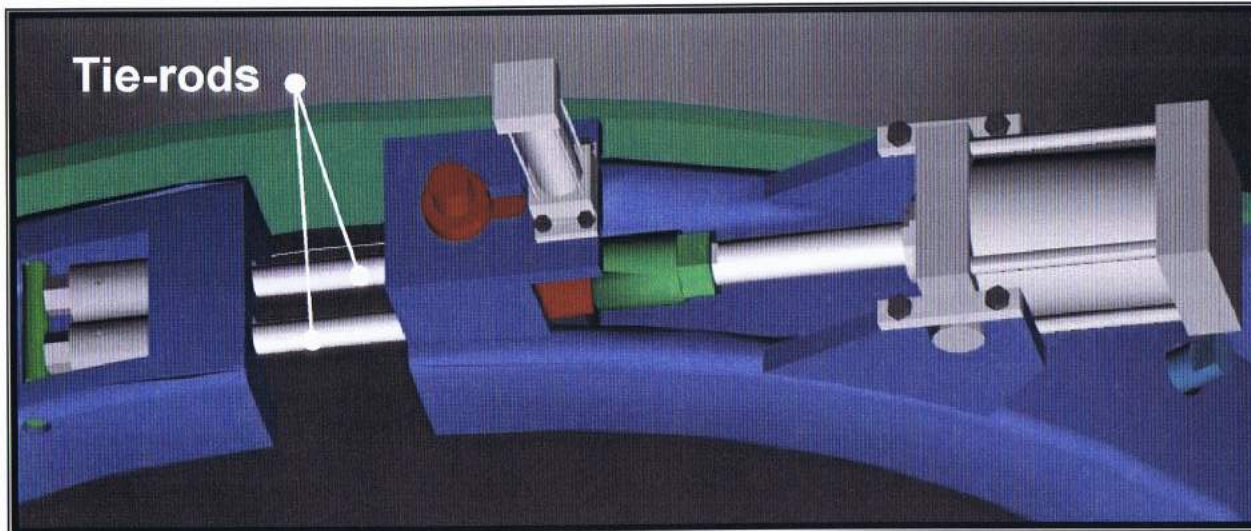
- Retract Tie-rod Actuators
- Extend Lock Actuators
- Disengage Safety Interlock

To Open

- Retract Positive Lock Actuators



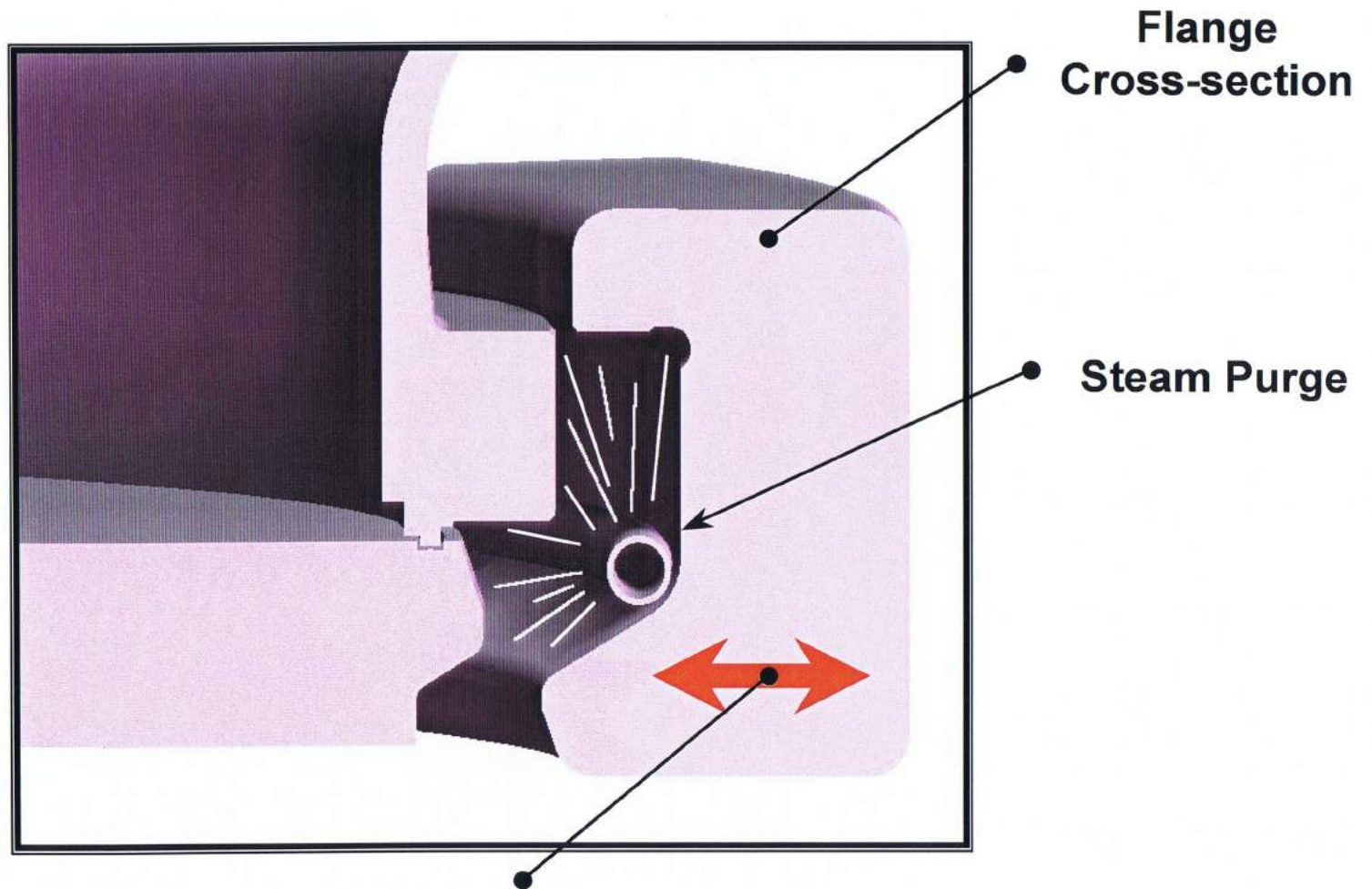
- Extend Tie-rod Actuators



Characteristics

- Remote Unlock
- Remote Open
- Self-limiting Open Position
- Remote Close
- Remote Lock
- Manual Interlock
- Self-adjusting Closed Position
- Actuators Off-line
- Stored Energy Locked in Tie-rods

Steam Purge System



Open & Close While Steam Cleaning