

3-A Sanitary Standards, Inc.

Trust But Verify: The TPV Inspection for 3-A Symbol Authorization



Certified Conformance Evaluator Demonstration of TPV Inspection of Equipment

Equipment Evaluation

CCE Required Documents:

- **Current TPV Manual**
- **CCE Checklist**
(Customized to Specific Standard)
- **Equipment Specific 3-A Sanitary Standard**
(For CCE Use & Marking)
- **CCE Guidance Bulletins**
- **Any Other Referenced Standards**

CCE Evaluation Equipment:

- **Inspection Light**
- **Radius Gauges**
- **Surface Inspection Profilometer**
- **Calipers (Digital or Dial)**
- **Length Measuring Tool
(Tape Measure Inch/mm)**
- **Simple Hand Tools
(Adjustable Wrench, O-Ring Removal)**

Fabricator Required Document:

- **Equipment EDTCF
(Engineering Design and Technical
Construction File)**

EDTCF Document Contents:

- **Table of Contents**
- **Instruction Manual(s)**
- **Operation Manual(s)**
- **User Guidance for Specific Equipment Being Evaluated**
- **Example of Nameplate Showing 3-A Symbol Use and Standard No.#**
- **Material Certifications – Metals**

EDTCF Document Contents: cont.

- **Material Certifications for Rubber and Rubber-like Materials Showing 3-A Standard 18-03 Conformity & Class**
- **Material Certifications for Plastics showing 3-A Standard 20 Conformity**
- **Bill of Materials**
- **Copy of Applicable 3-A Standards**

EDTCF Document Contents: cont.

- **Copies of Applicable Supporting Standards (Fittings, Materials, etc.)**
- **Copy of Quality Program and Written Procedures for In-process and Final Inspection for 3-A Conformity**
- **Detailed Drawings Showing ALL Product Contact Surface Finishes, Radii, and Materials**

EDTCF May Also Contain:

- **Supporting Test Data**
- **Example of Information Plate
Showing Standard Specific
Marking**
- **Change Control Records**
- **3-A Symbol Authorization Certificate
and Historical Records**

TPV Evaluation Process – 02-10

- **A – Scope**
- **B – Definitions**
- **C – Materials**
 - **Metals**
 - **Surface Modification Materials**
 - **Nonmetals**
 - **Heat Resistant Materials**
 - **Nonproduct Contact Surfaces**
- **D – Fabrication**
 - **Surface Finish**
 - **Permanent Joints**
 - **Coatings**
 - **Cleaning**
 - **Draining**
 - **Fittings**
 - **Seals**
 - **Gaskets**

TPV Evaluation Process – 02-10

■ D – Fabrication

- Radii – 1/8" Base, 1/32" for Essential Functional Reasons (Seal Components, Rotor Retaining Fasteners, Impeller Head Slots)
- Springs
- Threads
- Exposed Threads
- Enclosed Threads

■ D – Fabrication

- Bonded Parts
- Sterilization Systems
- Inspectability
- Nonproduct Contact Parts
- Supports – Baseplate, Legs, Casters

TPV Evaluation Process – 02-10

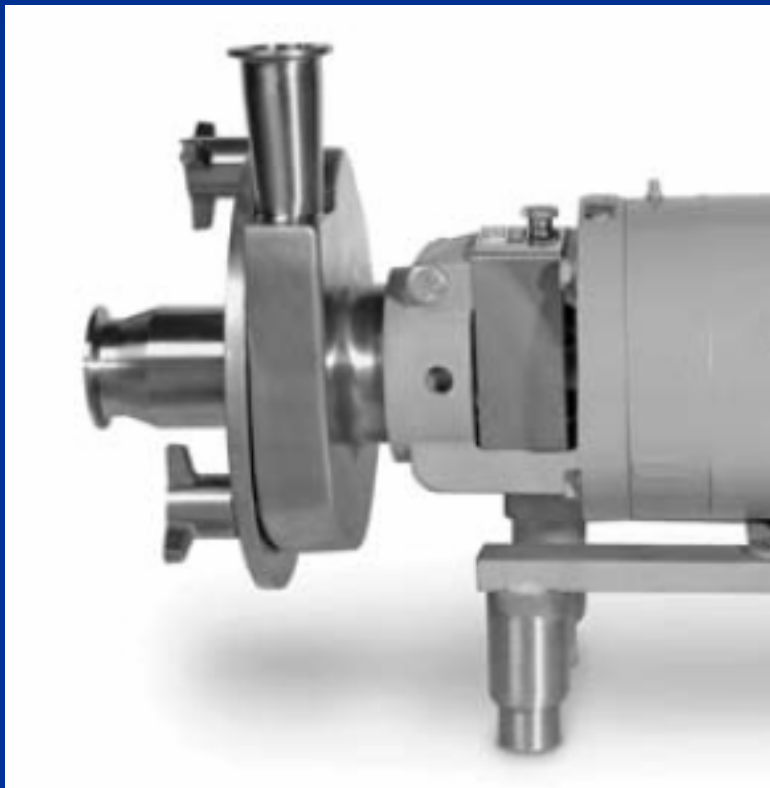
■ E – Appendix

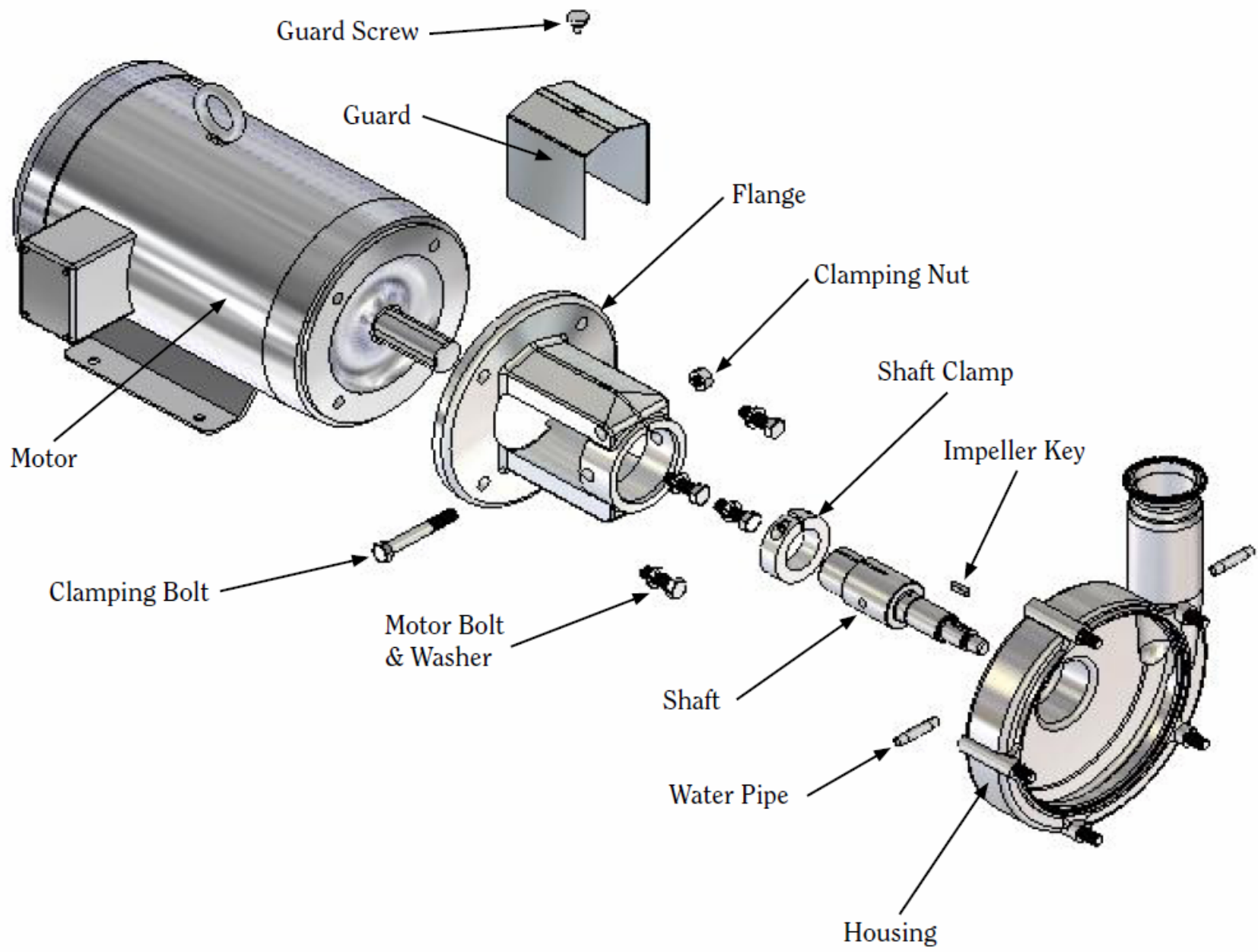
- E1 – User Guidance
- E2 – Seal Replacement Procedures
- E3 – Validated Cleaning Procedures
- E4 – Stainless Steel Materials
- E5 – Optional Metal Alloys

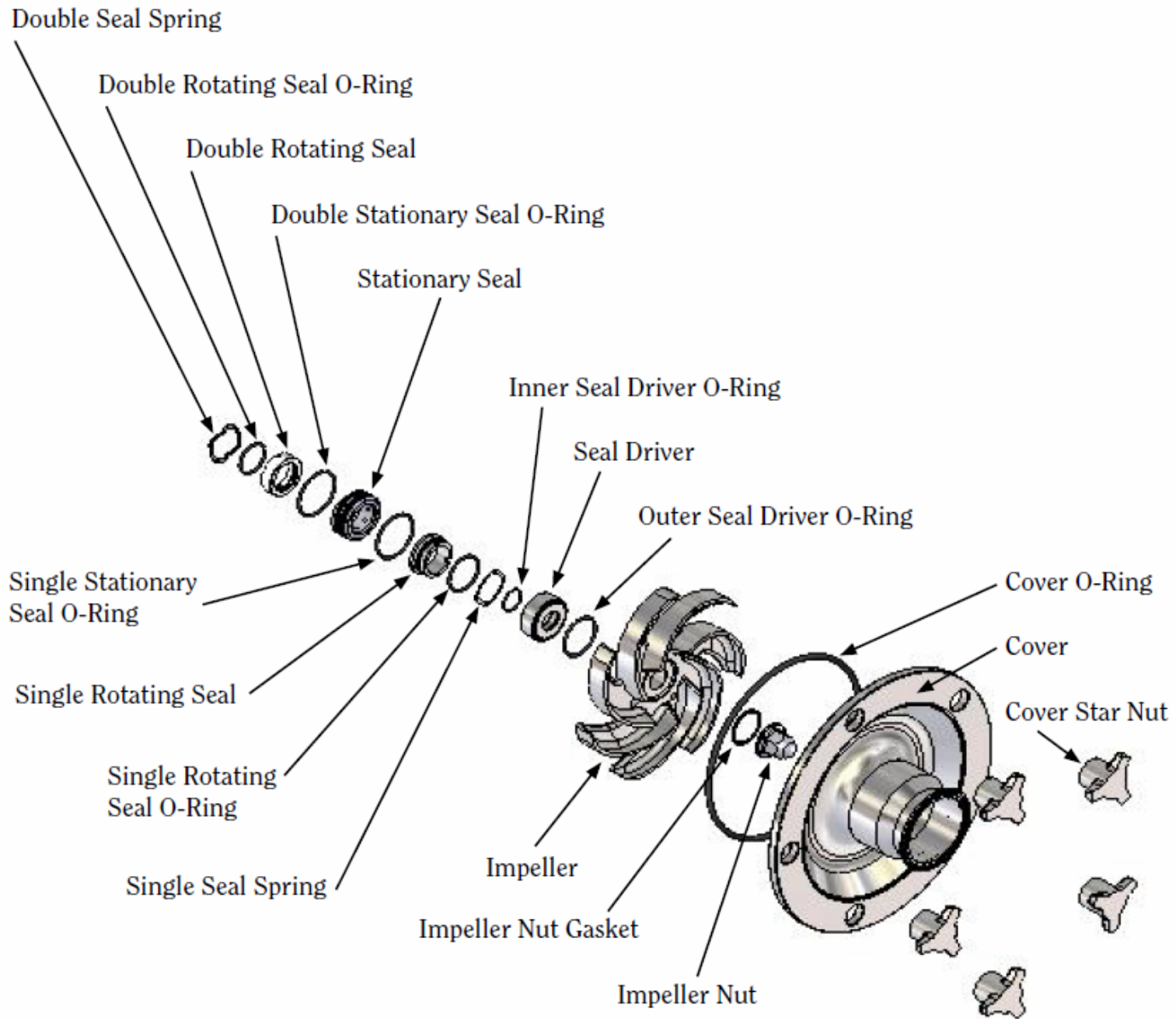
■ E – Appendix

- E6 – Product Contact Surfaces
- E7 – Press and Shrink Fits
- E8 – Threads Inspectability
- E9 – O-Ring Groove Radii
- E10 - Diagrams

Centrifugal Pump TPV Evaluation







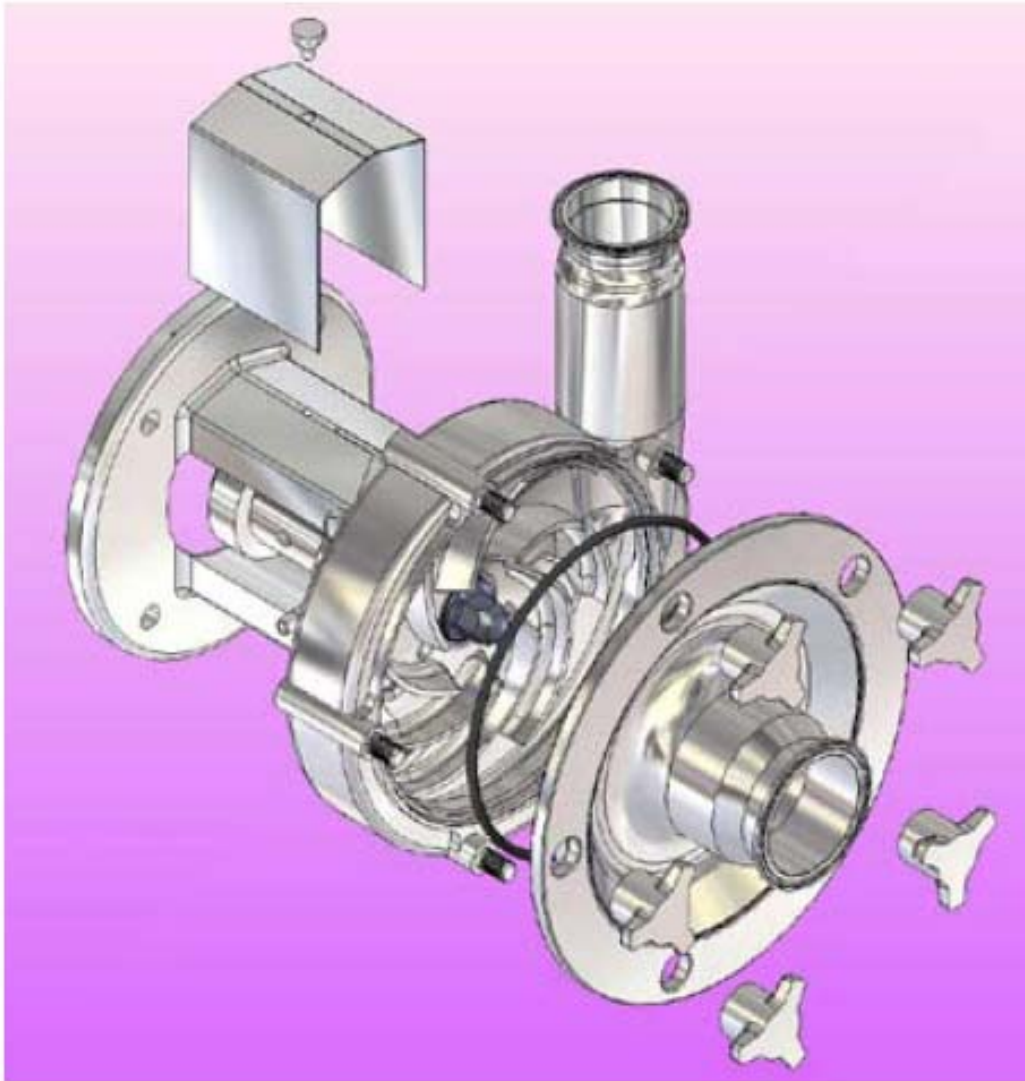


Figure 1

Remove flange guard.

Remove cover star nuts with soft-faced hammer.

Remove cover and discard cover o-ring.



Figure 2

Place 3/8" rod or Phillips screwdriver in shaft hole. Use 15/16" socket with ratchet to remove impeller nut. Discard impeller nut gasket.

Remove impeller and discard impeller o-ring.

Remove key.

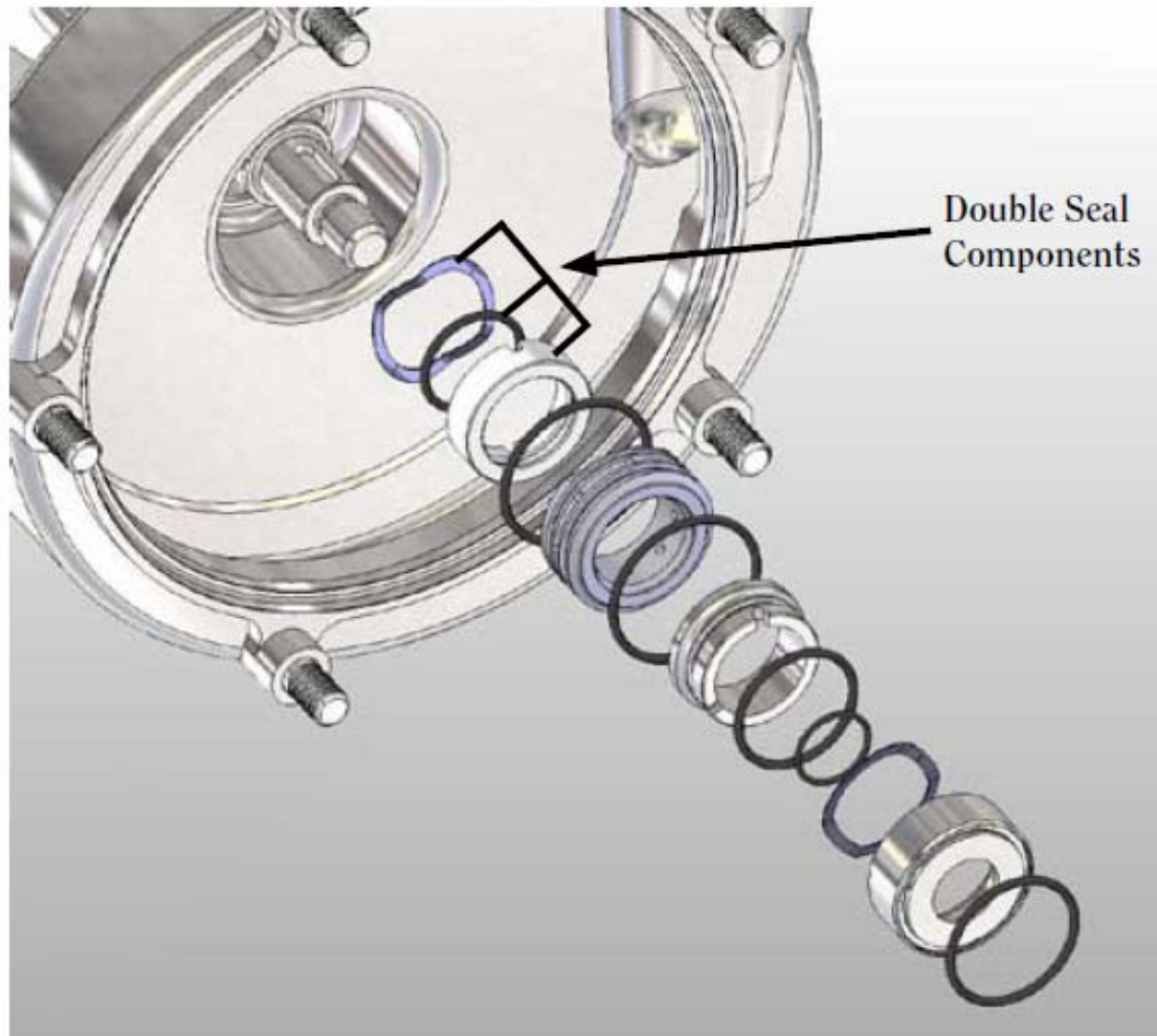


Figure 3

Remove seal driver/rotating seal assembly.

Discard rotating seal, o-rings and spring.

Remove stationary seal and discard.

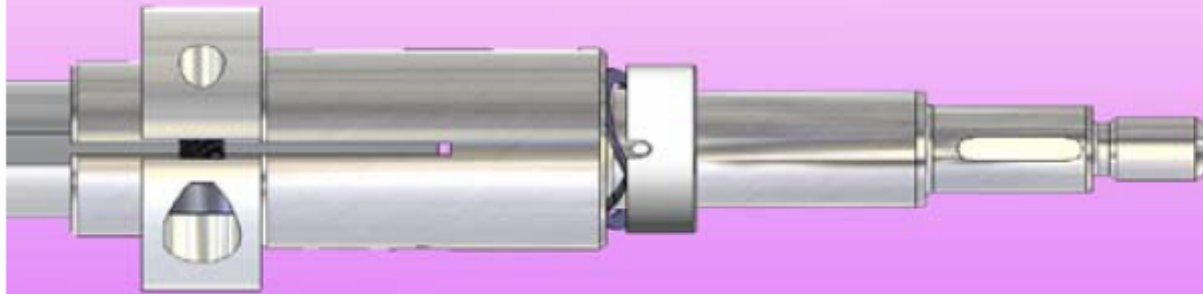
Double Seal Only: Remove double rotating seal and double spring and discard.

While Disassembled –

- ✓ **All Radii Can Be Measured**
- ✓ **Agreement with Drawings Verified**
- ✓ **Exposure of Seals Verified**
- ✓ **Surface Finishes Verified**
- ✓ **General Suitability Confirmed**
- ✓ **Nonproduct Contact Materials Checked**
- ✓ **Agreement with Documentation**

While Disassembled –

- ✓ **CCE Checklist Completion**
- ✓ **Marking of Standard Performed**
- ✓ **Material Options Verified**
- ✓ **Understanding of QC Process**
- ✓ **Confirm Any Special User Guidance**
- ✓ **Reassembly Instructions Verified**
- ✓ **Facility Review and QC Verified**



Double Seal Only:

Figure 4

Install spring behind shaft pins. Place o-ring into double rotating seal and lubricate. Push seal onto shaft making sure slots align with pins.

(Note: housing and flange removed from picture for clarity)

Single Stationary Seal O-ring

Double Stationary Seal O-ring

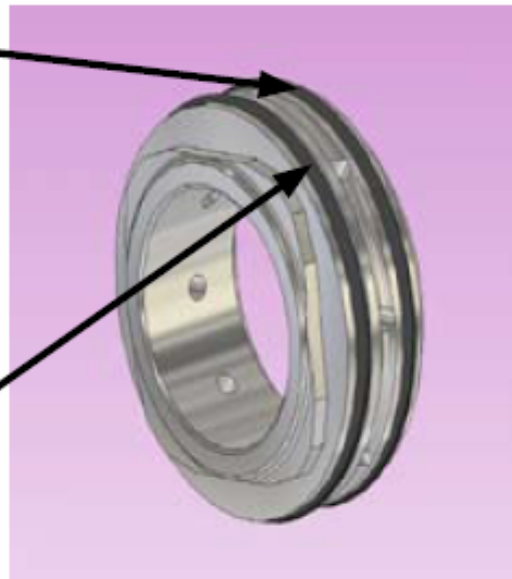


Figure 5

Single Seal:
Install single stationary seal o-ring and lubricate.

Double Seal:
Install single and double stationary seal o-rings and lubricate.

Align flats on
housing & seal

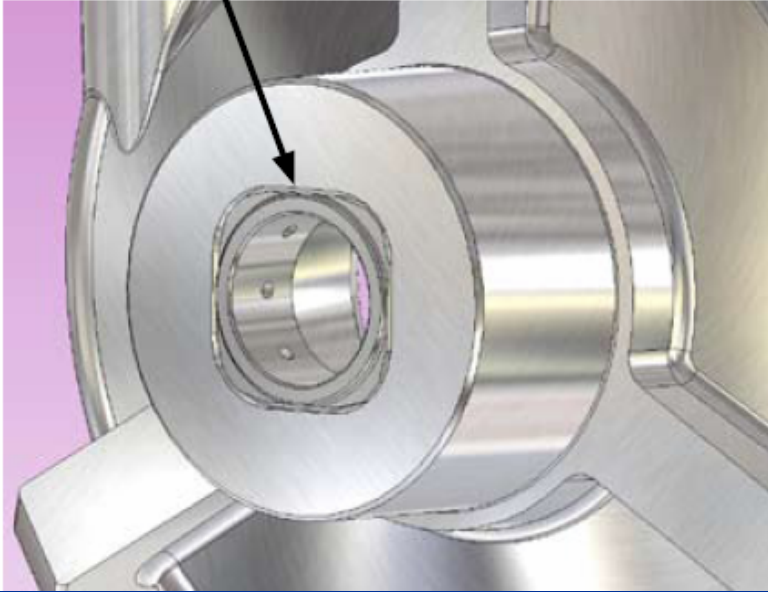


Figure 6

Install the stationary seal into housing making sure to align flats on the seal with the flats on the housing.



Figure 7

Install spring behind seal pins inside the seal driver.



Figure 8

Install single rotating seal o-ring and lubricate. Slide seal driver onto rotating seal making sure to align pins inside the driver with the slots on the seal.

Inner Seal Driver O-ring

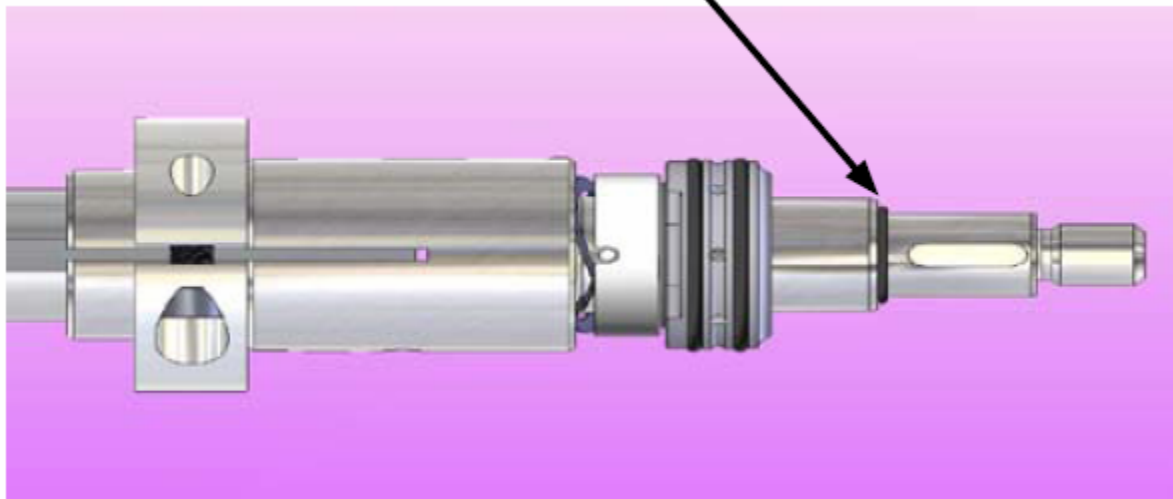


Figure 9

Slide inner seal driver o-ring onto the shaft and lubricate.

(Note: housing and flange removed from picture for clarity)

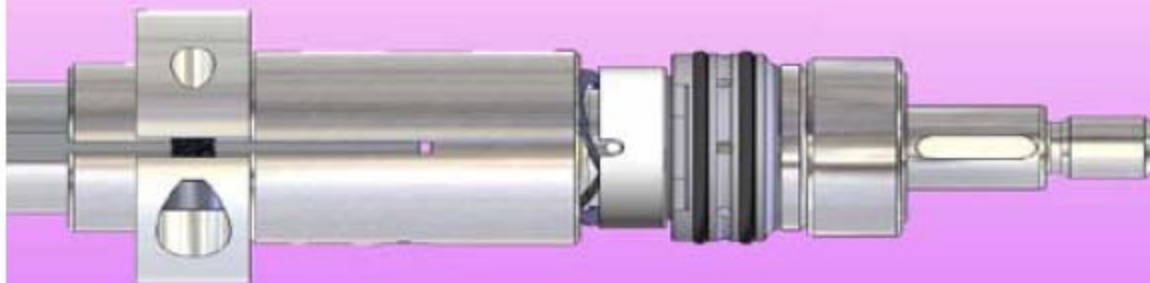


Figure 10

Slide seal driver assembly onto the shaft.

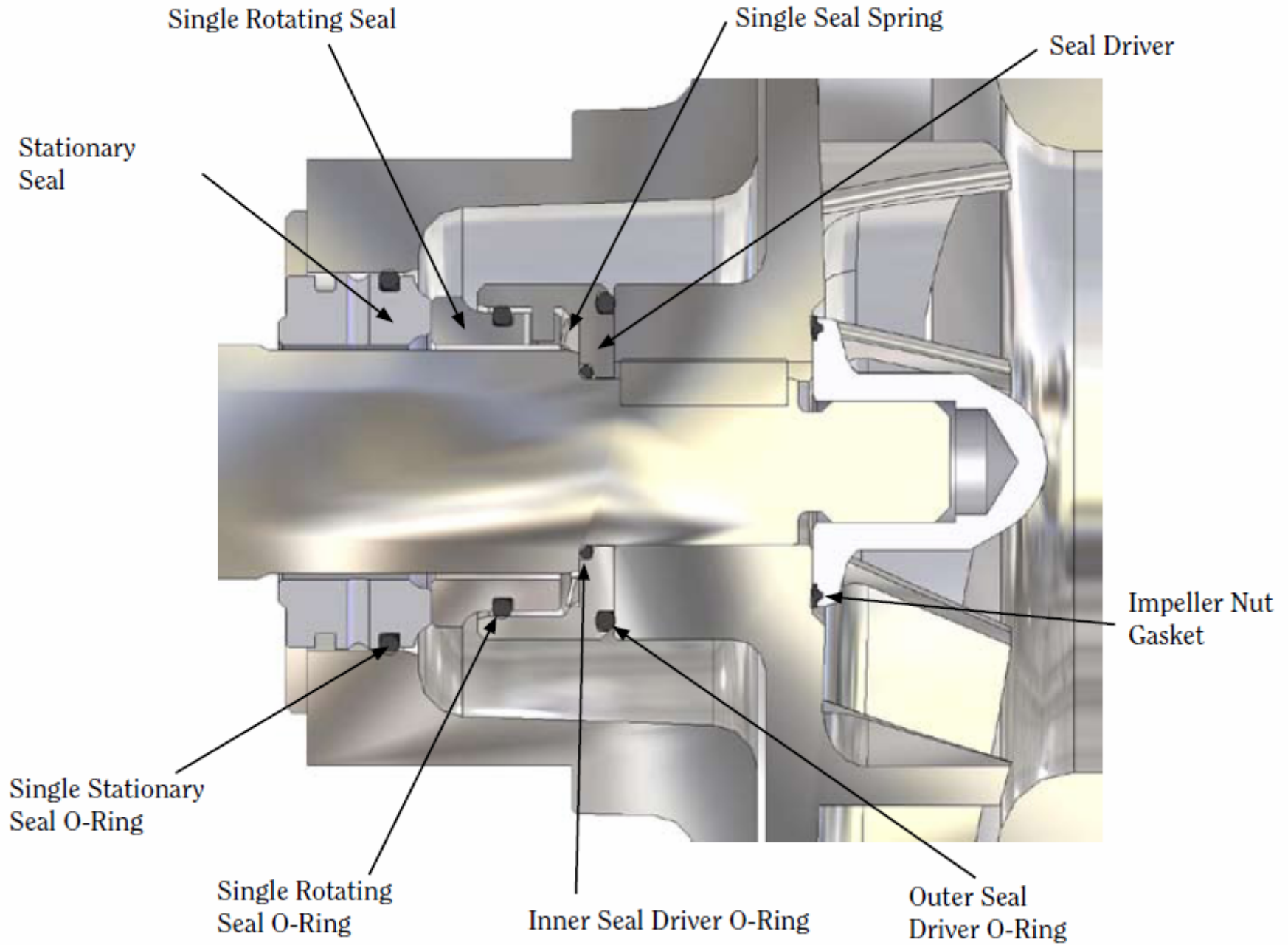
(Note: housing and flange removed from picture for clarity)



Figure 11

Install impeller key and outer seal driver o-ring. Lubricate o-ring.

SINGLE SEAL ASSEMBLY



DOUBLE SEAL ASSEMBLY

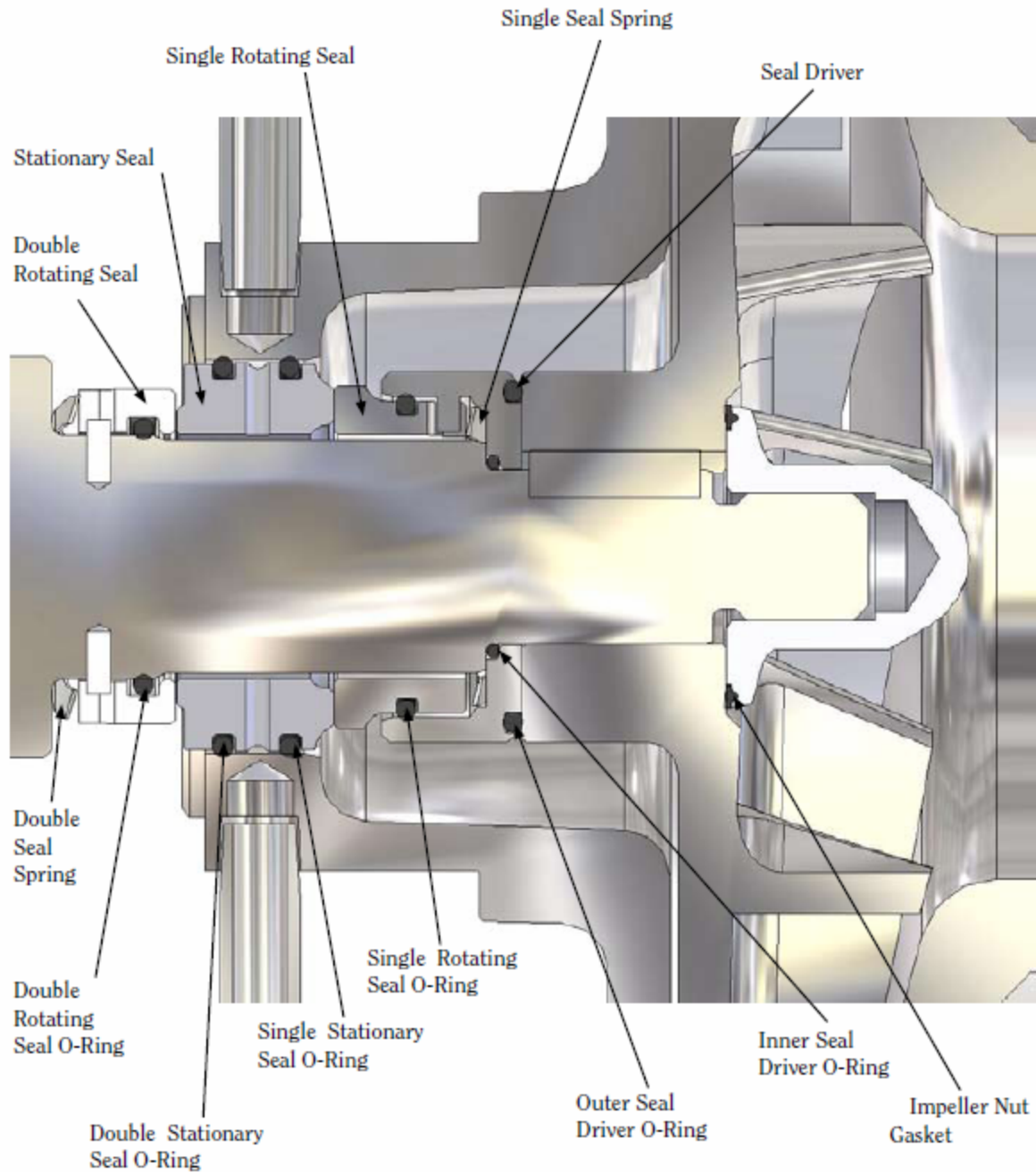




Figure 12

Slide impeller onto shaft making sure to align keyway in impeller with key in the shaft.

Lubricate impeller nut gasket and place it onto the impeller nut.

Thread impeller nut onto shaft. Place 3/8" rod or Phillips screwdriver in shaft hole. Use 15/16" socket with torque wrench and torque nut to 40 ft-lbs.

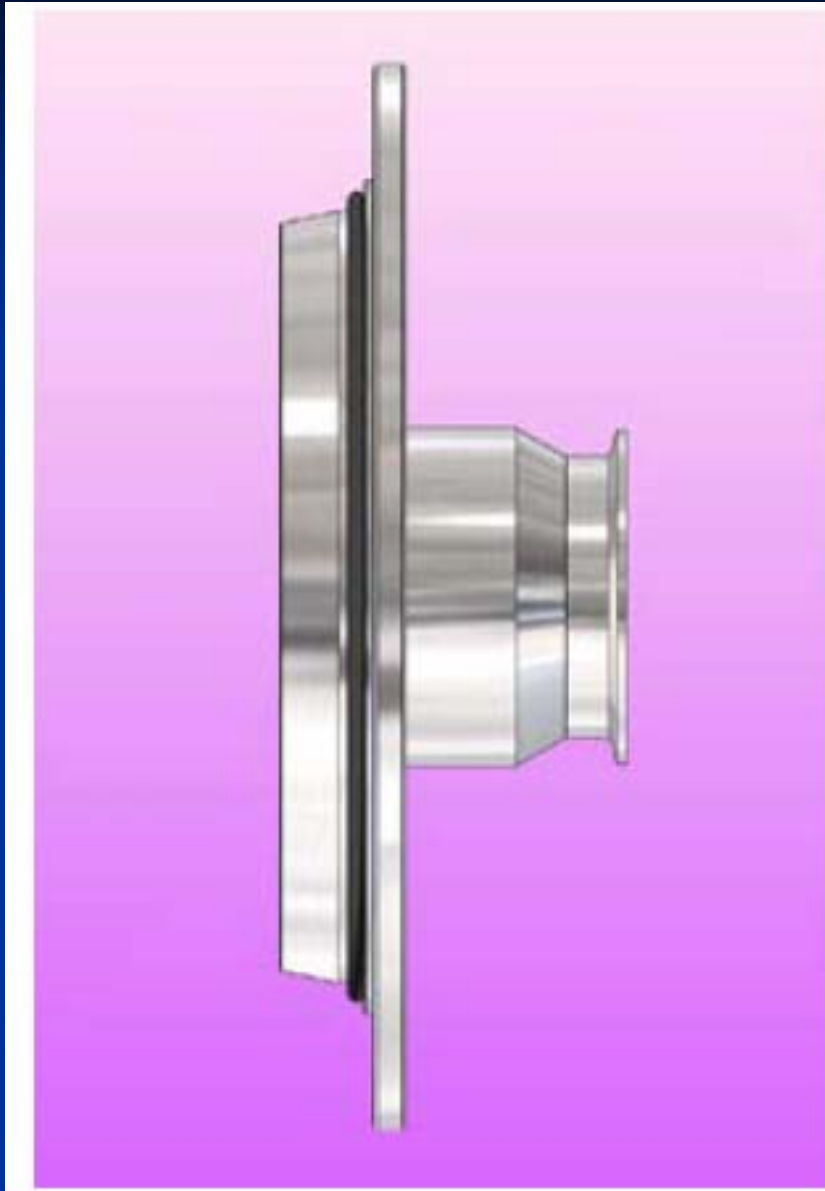


Figure 13

Install cover o-ring.

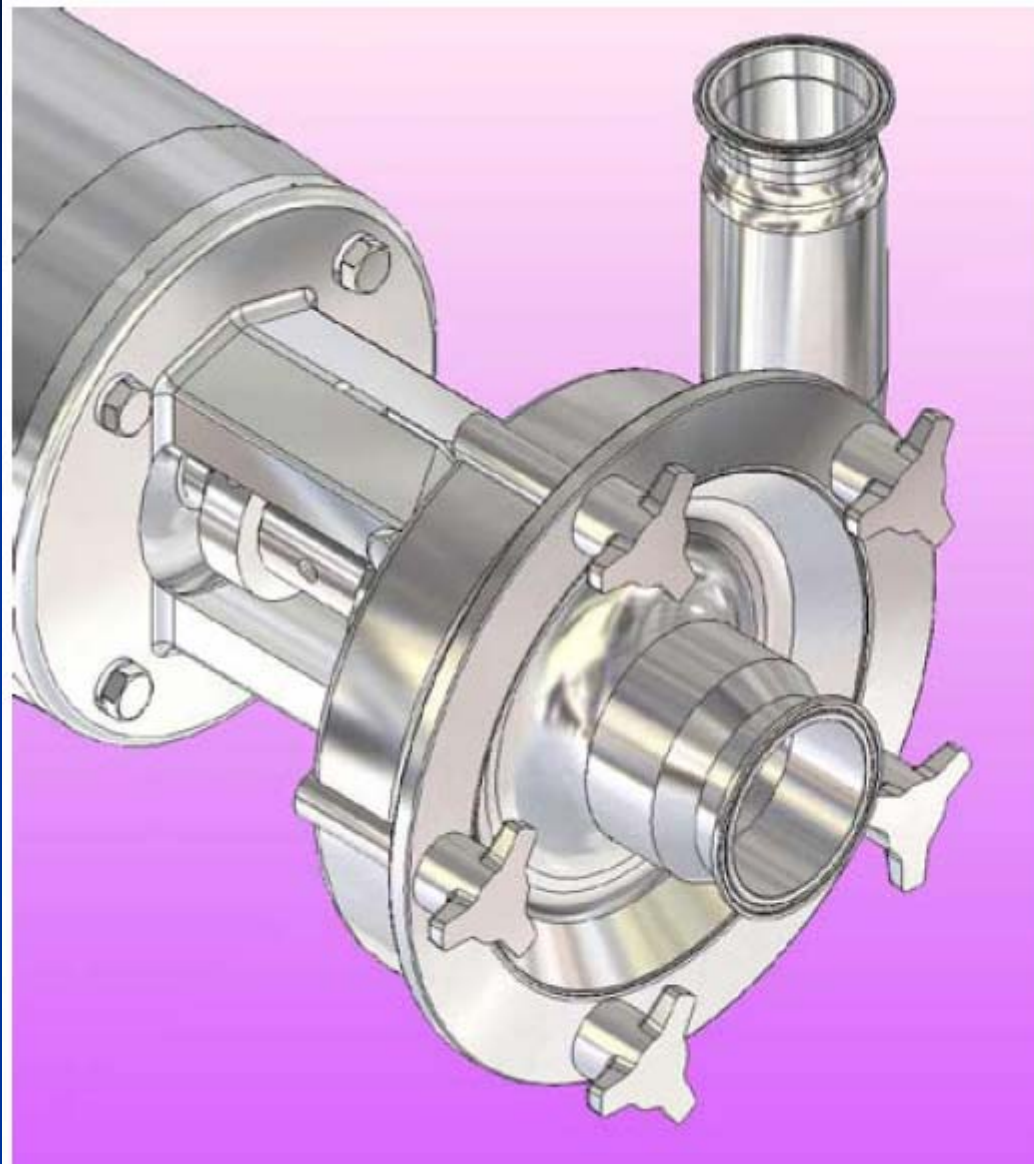


Figure 14

Install cover.

Install cover star nuts and tighten with a soft-faced hammer.

Completion –

- ✓ **TPV Report Cover Completion**
- ✓ **Provide 3-A Application Forms**
- ✓ **Submit Report & Standard to Client**
- ✓ **Submit Report & Standard to 3-A SSI**
- ✓ **Maintain CCE File Copies**
- ✓ **Prepare Invoice and Issue**
- ✓ **Ongoing Amendments & Contact**