



***Installation,
Operation,
&
Maintenance
Manual***

Welker[®] Liquid Stainless Sampler

***Model
LSS-1***

The information in this manual has been carefully checked for accuracy and is intended to be used as a guide for the installation, operation, and maintenance of the Welker equipment described above. Correct operating and/or installation techniques, however, are the responsibility of the end user. Welker reserves the right to make changes to this and all products in order to improve performance and reliability.

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INTRODUCTION

1. GENERAL

1.1 Introduction

We appreciate your business and your choice of Welker products. The installation, operation, and maintenance liability for this product becomes that of the purchaser at the time of receipt. Reading the applicable *Installation, Operation, and Maintenance (IOM) Manual* prior to installation and operation of this equipment is required for a full understanding of its application and performance prior to use. If you have any questions, please call 1-800-776-7267 in the USA or 1-281-491-2331.

The following procedures have been written for use with standard Welker parts and equipment. Assemblies that have been modified may have additional requirements and specifications that are not listed in this manual.

Notes, Warnings, and Cautions



NOTE

Notes emphasize information or set it off from the surrounding text.



CAUTION

Caution messages appear before procedures that, if not observed, could result in damage to equipment.



WARNING

Warnings alert users to a specific procedure or practice that, if not followed correctly, could cause personal injury.

1.2 Product Description

The Welker LSS-1 sampler is designed to take accurate samples of a liquid product. A continuous stream of product flows through the body of the sampler, enabling the device to take a representative sample. When activated by a solenoid, the device will grab a predetermined amount from the stream at a specified rate. The solenoid is activated by an instrument air or auxiliary gas supply. The sampler is also equipped with one of three types of internal relief assemblies that function as a check valve for the device. The *B relief*, *cartridge relief*, and *internal relief* are the standard relief assemblies used, while the *sand relief* is designed for samplers used in severe service, where sand or salt water exists in the product. The sampler can be used separately or as part of a complete sampling system.



NOTE

The instructions in this manual assume that the LSS-1 will be part of a complete sampling system. If the device is purchased to be installed by itself, it should be installed and operated in a manner that is similar to the instructions in this manual.

Timing Systems

Several systems are available for the sampler, and there are two basic systems. One uses a simple timer that can be field adjusted. The other uses an interface with a totalizer for proportional-to-flow actuation of the solenoid.

SPECIFICATIONS

1.3 Specifications

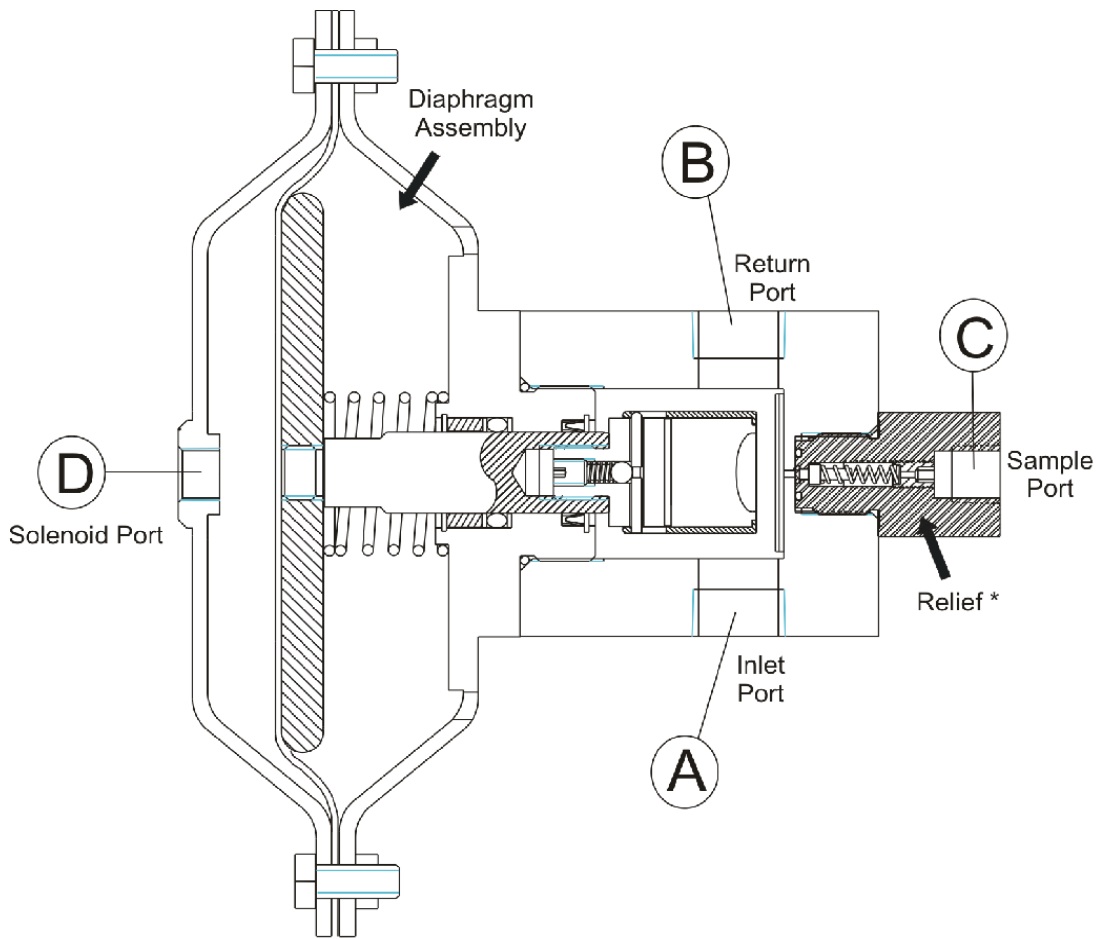


NOTE

The specifications listed in this Section are generalized for this equipment. Welker can modify the equipment according to your company's needs. However, please note that **the specifications may vary depending on the customization of your product.**

LSS-1	
Products	Liquids
Materials of Construction	Stainless Steel, Viton [®] and PTFE (others available)
Sample Outlet Connection	1/4" NPT (others available)
Sample Inlet Connection	1/4" NPT (others available)
Relief Valve Connection (Optional)	1/4" NPT
Maximum Allowable Pressure	<u>Working Pressure:</u> 2,160 psi @ -20° F to 100 ° F (148 bar @ -29° C to 37° C)

SPECIFICATIONS



* Relief shown here is a *Standard Inline Relief*

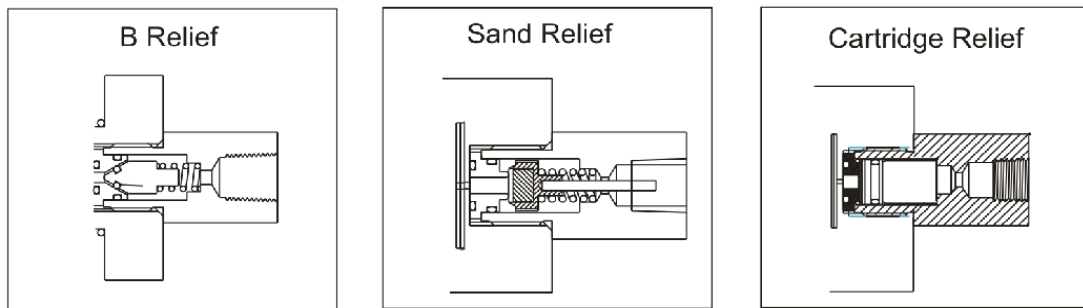


Figure 1

INSTALLATION & OPERATION

2. INSTALLING & OPERATING THE SAMPLER

2.1 General

After unpacking the unit, check it for compliance and for any damages that may have occurred during shipment.

N NOTE

Claims for damages caused during shipping must be initiated by the receiver and directed to the shipping carrier. Welker is not responsible for any damages caused from mishandling by the shipping company.

N NOTE

When sealing fittings with PTFE tape, refer to the proper sealing instructions for the tape used.

Recommended Tools

It would be advisable to have the following tools available for installation of the unit. However, tools used will vary depending on model.

- Flexible hose or tubing
- Tubing cutters
- 6" adjustable wrench (2)
- PTFE tape

2.2 Installation & Operation

N NOTE

The sampler should be installed horizontal to the pipeline probe and as close to the sample point as practical.

2.2.1 Install a sample probe into the center $\frac{1}{3}$ of the pipeline (*refer to manual for sample probe*). The probe should be inserted in a relatively turbulent area of the flowing stream (i.e., downstream of a static mixer or a discharge pump).

2.2.2 Use tubing to connect from the probe to the sample inlet port (Port A, Figure 1) of the sampler.

N NOTE

In order to collect a representative sample, the sampler must constantly return product to the pipeline, creating a continuous flow through the sampling system. In order to assure an uninterrupted flow, the sampler should be installed with a pitot probe or with a single probe that will return the product to a lower pressure within a pipeline system.

2.2.3 Use tubing to connect from the return port (Port B) to the return on the probe.

N NOTE

The continuous flow through the sampler should be kept **within 1° of pipeline temperature** in order to assure the sample is accurate. Insulating the tubing may be required.

INSTALLATION & OPERATION

- 2.2.4 Connect a pneumatic gas supply to a 3-way solenoid valve (*refer to manual for solenoid valve*).
- 2.2.5 If needed, connect a pressure regulator to the pneumatic gas supply.
- 2.2.6 If a pressure regulator is used on the supply, set it between 50-60 psi.



CAUTION

Pressure from the pneumatic supply should not exceed 60 psi.

- 2.2.7 Connect the solenoid valve into Port D of the sampler.
- 2.2.8 Connect from Port C (the sample port) to the sample container or cylinder (*If you are using a Welker constant pressure cylinder, refer to manual for constant pressure cylinder*).
- 2.2.9 Tighten all fittings and seal all connections.
- 2.2.10 If applicable, close the bypass valve that is connected from the inlet tubing to the cylinder tubing.
- 2.2.11 If your system is being controlled by an electronic signal from an outside source, make the appropriate electrical connections.
- 2.2.12 Open the valve on the pneumatic gas supply.
- 2.2.13 **Slowly** open the pipeline isolation valve.
- 2.2.14 **Slowly** and completely open the valves on the probe.
- 2.2.15 If you are using a constant pressure cylinder, make sure it is pre-charged (*refer to manual for constant pressure cylinder*).
- 2.2.16 Make sure all valves are open on the constant pressure cylinder.
- 2.2.17 Check the entire system for leaks.
- 2.2.18 With pre-charge and all valves open, energize the solenoid for at least three seconds to receive a sample output.
- 2.2.19 Turn off the solenoid for at least three seconds to reset the sampler.
- 2.2.20 Adjust the controller to energize the solenoid proportional to flow or according to time (see Sections 2.3 or 2.4, below).

2.3 Sampling proportional to flow

2.3.1 Determine the number of samples needed per batch



NOTE

The container should not exceed an 80% capacity. To ensure this, multiply the total volume by .80.

$$\frac{\left(\begin{array}{l} \text{Total volume needed in container} \\ \text{(converted to cc)} \end{array} \times .80 \right)}{\text{Grab size}} = \text{Total number of samples needed per batch}$$

Formula 1

INSTALLATION & OPERATION

2.4.2 Determine the time period between samples

$$\frac{\text{Sample period (convert to minutes)}}{\text{Samples needed for sample period}} = \text{Minutes between sampling}$$

Formula 4

EXAMPLE: Samples needed for sample period is **2,000**.
Sample period is one week (10,080 minutes).

$$\frac{10,080}{2,000} = \text{sample every } 5 \text{ minutes.}$$

2.4.3 Input the calculated information into the controller.

MAINTENANCE

3. MAINTENANCE

3.1 General

Prior to maintenance or disassembly of the unit, it is advisable to have a repair kit handy for the system in case of unexpected wear or faulty seals. All maintenance and cleaning of the unit should be done on a smooth, clean surface.



NOTE

We recommend that the unit have bi-annual maintenance under normal operating conditions. In the case of severe service, dirty conditions, excessive cycling usage, or other unique applications that may subject the equipment to unpredictable circumstances, a more frequent maintenance schedule may be appropriate.

Recommended Tools

It would be advisable to have the following tools available for maintenance of the unit; however, tools used will vary depending on model.

- ½" wrench
- 6" adjustable wrench
- Hex wrenches 1/8" and 3/16"
- Adjustable pliers
- Snap ring pliers

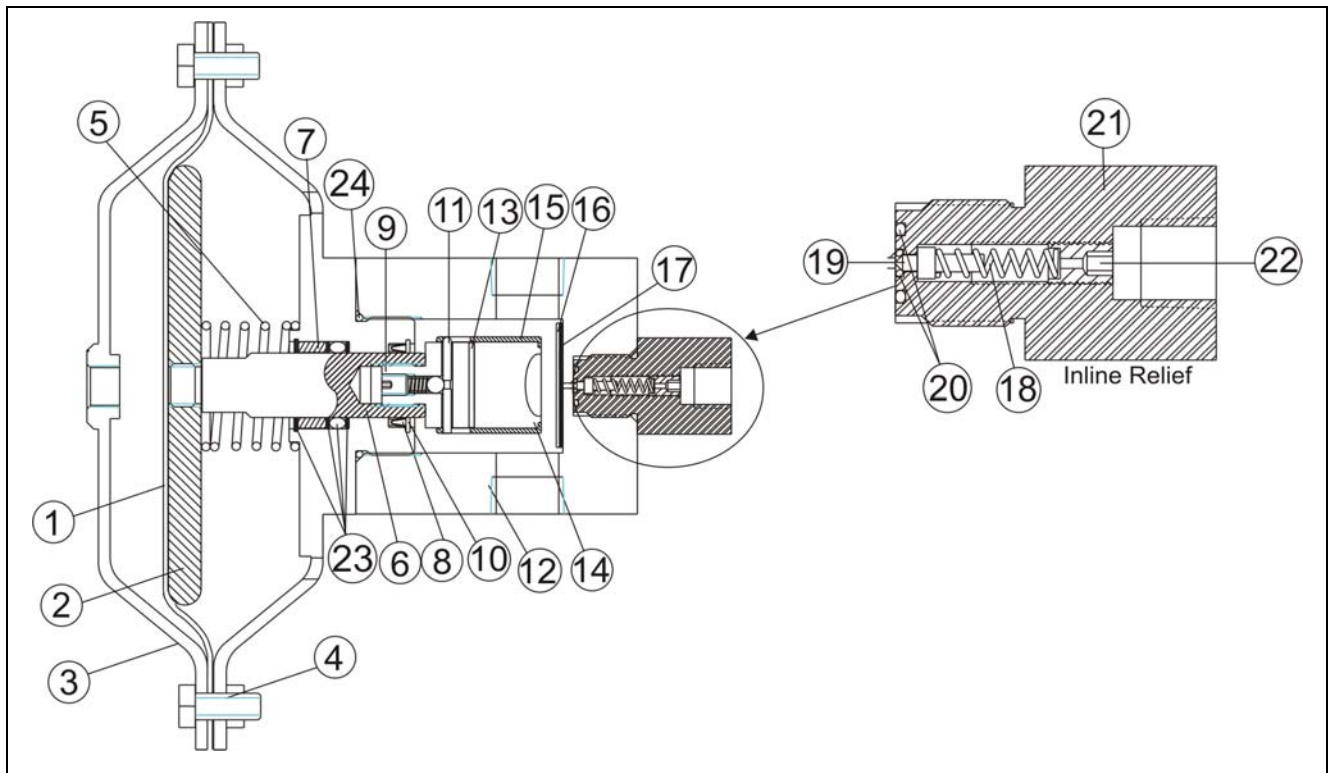


Figure 2

Refer to this Figure throughout the entire maintenance process.

MAINTENANCE

3.2 Maintenance

- 3.2.1 Close the pipeline isolation valve and vent all pressure.
- 3.2.2 Disconnect the solenoid from the sampler body.
- 3.2.3 Relieve and disconnect all the tubing from the sampler to the probe.
- 3.2.4 Relieve and disconnect all the tubing from the sampler to the sample cylinder.
- 3.2.5 Unscrew the diaphragm housing case (Part 3) from the sampler body (Part 12) (also see Figure 3).
- 3.2.6 Remove the Kel-F seal (Part 17) and vacuum breaker disk (Part 16) from the body.
- 3.2.7 Clean the seal and disk. If either is scratched or unable to be cleaned, they will need replacement.

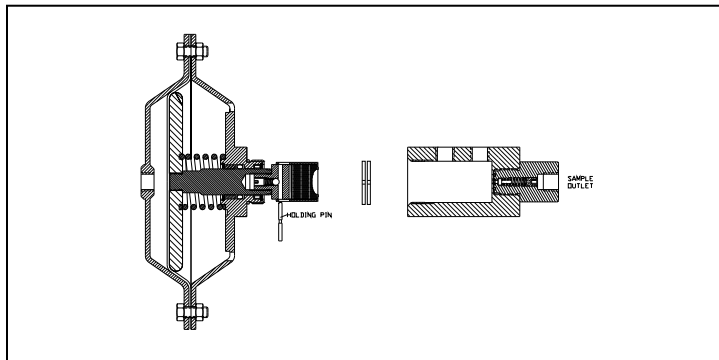


Figure 3

- 3.2.8 Push out the holding pin (Part 11). Examine the collection head. If it does not need replacement, proceed to step 3.2.9.



NOTE

If the collection cup (Part 14) is not functioning properly during operation it will need replacement.

- 3.2.9 Slide the shield (Part 15) off the adapter (Part 9).
- 3.2.10 Push the collection cup out of the shield. The non-extrusion disc (Part 13) will come out first (also see Figure 4).



NOTE

All collection cups are marked on the back side with the size, compound, and durometer. Take note of what you are replacing. (i.e. **V-70 1.0** is a 70 durometer Viton collection cup, 1.0 cc in volume). Contact Welker for other compounds available.

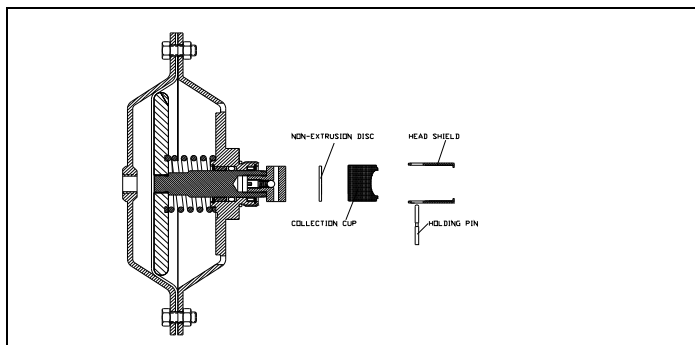


Figure 4

MAINTENANCE

- 3.2.11 Lightly lubricate the inside surface of the shield and push in the new collection cup. Reattach the non-extrusion disc.
- 3.2.12 Remove the eighteen hex head nuts and bolts (Part 4) that hold the diaphragm case together.
- 3.2.13 Separate the two halves and examine the diaphragm (Part 1) (also see Figure 5). If the diaphragm is leaking or is cracked, it will need replacement.

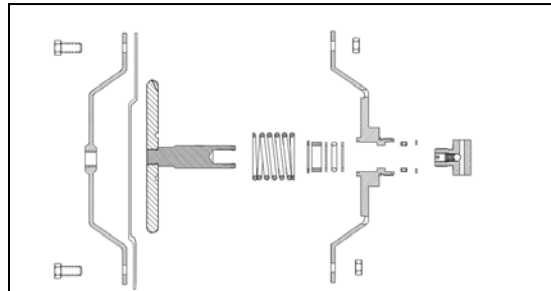


Figure 5

- 3.2.14 Remove the adapter (Part 9) by holding on to the diaphragm plate (Part 2) and unscrewing the adapter from the shaft (Part 6) (also see Figure 6).

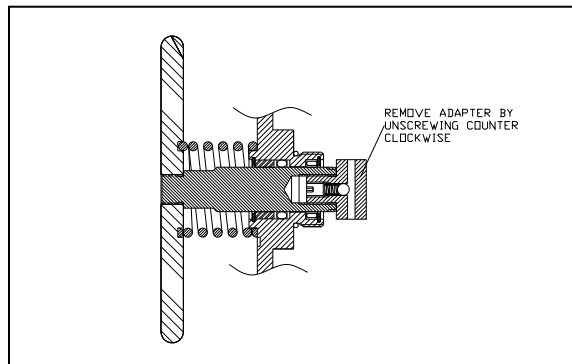


Figure 6

- 3.2.15 **Carefully** push the shaft through the lower half of the diaphragm case until the diaphragm plate (Part 2) clears the case. Then, pull out the plate and shaft (See Figure 7).

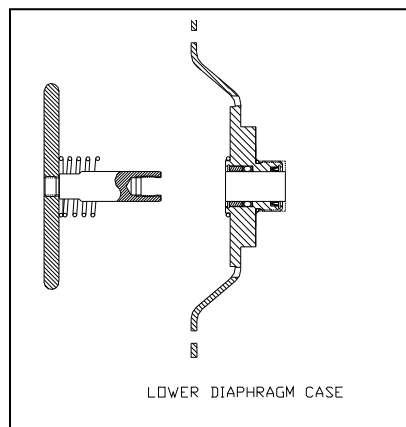


Figure 7

MAINTENANCE

3.2.16 Examine the shaft for damage. The shaft is polished and should be free of scratches and pits. If it needs to be replaced, place the diaphragm plate in a vise and remove the shaft with an adjustable wrench on the shaft flats.

3.2.17 Replace the four shaft seals (Part 23).



NOTE

New seals supplied in spare parts kits are not lubricated. They should be lightly coated with lubrication grease (Dow Corning 111 [DC 111] grease or equivalent lubricant) before they are installed into the equipment. This helps with the installation of the seals while reducing the risk of damage when positioning them on the parts. After the seals are installed, some additional lubrication can be applied to the shaft or cylinder inner diameters to allow a smooth transition of parts.

3.2.18 From the body side of the lower diaphragm case, remove the snap ring (Part 8) and the variseal (Part 10).



CAUTION

When replacing the variseal, be careful not to damage it.

3.2.19 Lubricate the shaft. Place the shaft through the return spring (Part 5) and in the center of the diaphragm case. Push the shaft back into the case, carefully guiding it through the seals.

3.2.20 Reattach the adapter securely.

3.2.21 Reattach the diaphragm and install the upper diaphragm case.

3.2.22 Cross bolt the eighteen hex head nuts and bolts securely.

3.2.23 Reattach the collection cup assembly, which includes the shield (Part 15), collection cup (Part 14), non-extrusion disc (Part 13), and holding pin (Part 11).

3.2.24 Examine the vacuum breaker disc (Part 16) and seal (Part 17) in the body. If either are scratched or embedded with debris, they will need replacement.



NOTE

These are free floating in the body and simply need to be reinstalled with the seal first and then the disc. The collection cup will seal against the disc.

3.2.25 Replace the diaphragm seal (Part 24) around the male threads on the lower diaphragm case assembly and screw the lower diaphragm case back to the body (hand tighten only).

3.2.26 Replace instrument tubing.

3.3 Relief maintenance

3.3.1 Close pipeline isolation valve and relieve pressure from sampler.

3.3.2 Disconnect tubing and remove relief cap by unscrewing counterclockwise.

3.3.3 *For an Inline Relief*

a) Remove the spring adjustment screw, spring (Part 18), and poppet (Part 19). Examine the poppet sealing surface for damage. Replace, if necessary.

b) Replace the two O-rings (Part 20) on the face of the relief cap.

c) Reassemble the pieces and thread the relief cap back into the body and tighten.

d) Relief is now ready to be reset. Complete Section 3.4 and reassemble.

MAINTENANCE

3.3.4 For a B Relief

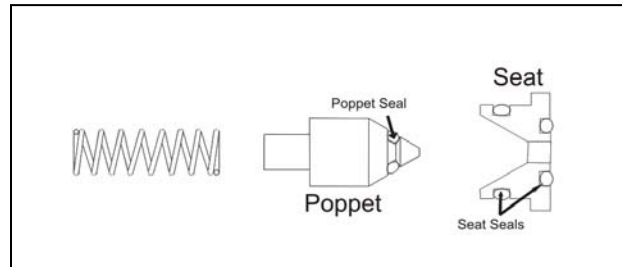


Figure 8

Refer to this Figure for the following steps.

- Replace the seal on the poppet (see Figure 8).
- Replace the two seals on the seat.
- Examine the poppet and the seat for wear. The seat should have a smooth tapered finish.
- Reassemble the relief to the sampler.

3.3.5 For a Sand Relief

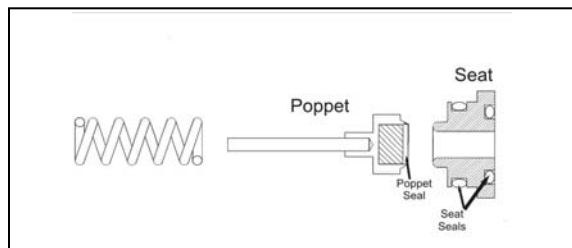


Figure 9

Refer to this Figure for the following steps.

- Replace the seals on the seat (see Figure 9).
- Inspect the poppet seal. This seal, under normal operation, will show a smooth indentation from the seat. Replacement will be necessary if the seal has deteriorated.
- Reassemble the relief to the sampler.

3.3.6 For a Cartridge Relief

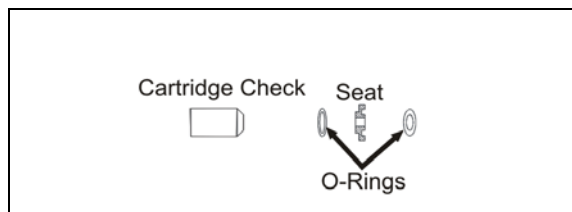


Figure 10

Refer to this Figure for the following steps.

- Replace the cartridge check (see Figure 10).
- Inspect O-rings for wear. Replace if necessary.
- Reassemble the relief to the sampler.

MAINTENANCE

3.4 Adjusting the inline relief



NOTE

Only samplers equipped with the *inline relief* will need adjusting. The *sand relief*, *cartridge relief* and *B relief* assemblies are all factory adjusted prior to shipment.

- 3.4.1 Reinstall the poppet (Part 20) and spring (Part 22) into the relief cap.
- 3.4.2 Reinstall the adjusting screw (Part 21).
- 3.4.3 Tighten the adjusting screw until you see the poppet rise into the center hole on the face of the relief cap.
- 3.4.4 When the poppet comes to a stop, add one more complete rotation on the adjusting screw.



NOTE

This should set the adjustment at approximately 200 psi.

- 3.4.5 Replace the two O-rings (Part 18) on the face of the relief cap.
- 3.4.6 Tighten the relief cap (Part 21) into the body.
- 3.4.7 Reinstall the fitting and tubing on the sample outlet.
- 3.4.8 Check the adjustment by pressurizing the sampler and checking the sample outlet gauge. The pressure should be approximately 200 psi less than pipeline pressure.



NOTE

Once you begin sampling, the pressure should equalize. Checking the adjustment can only be performed on start-up.

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