



# TECHNICAL SERVICE MANUAL

ABRASIVE LIQUID PUMPS  
 SERIES 4625  
 SIZES F - FH

SECTION	TSM 410.1
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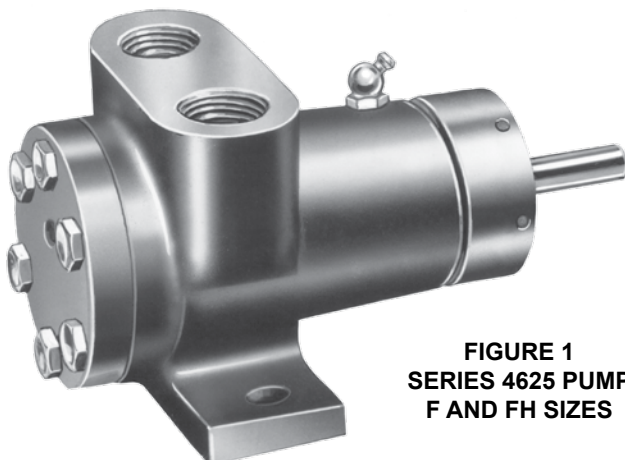
## INTRODUCTION

The illustrations used in this manual are for identification purposes only and should not be used for ordering parts. Secure a parts list from the factory or a Viking representative. Always give complete name of part, part number and material with the model and serial number of the pump when ordering repair parts.

### UNMOUNTED PUMP AND UNIT MODEL NUMBERS

UNMOUNTED PUMP	UNITS
F4625	Units are designated by the unmounted pump model numbers followed by a letter indicating drive style.  V = V-Belt D = Direct Connected
FH4625	

This manual deals exclusively with the F and FH 4625 pumps. **Figure 1** illustrates the overall appearance of the pumps in this manual.



**FIGURE 1**  
**SERIES 4625 PUMP**  
**F AND FH SIZES**

## SPECIAL INFORMATION

### DANGER !

**Before opening any Viking pump liquid chamber (pumping chamber, reservoir, relief valve adjusting cap fitting, etc.) Be sure:**

1. That any pressure in the chamber has been completely vented through the suction or discharge lines or other appropriate openings or connections.
2. That the driving means (motor, turbine, engine, etc.) has been "locked out" or made non-operational so that it cannot be started while work is being done on pump.
3. That you know what liquid the pump has been handling and the precautions necessary to safely handle the liquid. Obtain a material safety data sheet (MSDS) for the liquid to be sure these precautions are understood.

**Failure to follow above listed precautionary measures may result in serious injury or death.**

**ROTATION:** Viking pumps operate equally well in a clockwise or counterclockwise rotation. Shaft rotation determines which port is suction and which is discharge. Port in the area where the pumping elements (gear teeth) come out of mesh is suction port.

# SAFETY INFORMATION AND INSTRUCTIONS

IMPROPER INSTALLATION, OPERATION OR MAINTENANCE OF PUMP MAY CAUSE SERIOUS INJURY OR DEATH AND/OR RESULT IN DAMAGE TO PUMP AND/OR OTHER EQUIPMENT. VIKING'S WARRANTY DOES NOT COVER FAILURE DUE TO IMPROPER INSTALLATION, OPERATION OR MAINTENANCE.

THIS INFORMATION MUST BE FULLY READ BEFORE BEGINNING INSTALLATION, OPERATION OR MAINTENANCE OF PUMP AND MUST BE KEPT WITH PUMP. PUMP MUST BE INSTALLED, OPERATED AND MAINTAINED ONLY BY SUITABLY TRAINED AND QUALIFIED PERSONS.

THE FOLLOWING SAFETY INSTRUCTIONS MUST BE FOLLOWED AND ADHERED TO AT ALL TIMES.

Symbol  
Legend :



**Danger** - Failure to follow the indicated instruction may result in serious injury or death.

**WARNING**

**Warning** - In addition to possible serious injury or death, failure to follow the indicated instruction may cause damage to pump and/or other equipment.



**BEFORE** opening any liquid chamber (pumping chamber, reservoir, relief valve adjusting cap fitting, etc.) be sure that :

- Any pressure in the chamber has been completely vented through the suction or discharge lines or other appropriate openings or connections.
- The pump drive system means (motor, turbine, engine, etc.) has been "locked out" or otherwise been made non-operational so that it cannot be started while work is being done on the pump.
- You know what material the pump has been handling, have obtained a material safety data sheet (MSDS) for the material, and understand and follow all precautions appropriate for the safe handling of the material.

**WARNING**

**INSTALL** pressure gauges/sensors next to the pump suction and discharge connections to monitor pressures.



**WARNING**

**USE** extreme caution when lifting the pump. Suitable lifting devices should be used when appropriate. Lifting eyes installed on the pump must be used **only** to lift the pump, **not** the pump with drive and/or base plate. If the pump is mounted on a base plate, the base plate must be used for all lifting purposes. If slings are used for lifting, they must be safely and securely attached. For weight of the pump alone (which does not include the drive and/or base plate) refer to the Viking Pump product catalog.



**BEFORE** operating the pump, be sure all drive guards are in place.



**DO NOT** attempt to dismantle a pressure relief valve that has not had the spring pressure relieved or is mounted on a pump that is operating.



**DO NOT** operate pump if the suction or discharge piping is not connected.



**AVOID** contact with hot areas of the pump and/or drive. Certain operating conditions, temperature control devices (jackets, heat-tracing, etc.), improper installation, improper operation, and improper maintenance can all cause high temperatures on the pump and/or drive.



**DO NOT** place fingers into the pumping chamber or its connection ports or into any part of the drive train if there is **any possibility** of the pump shafts being rotated.



**WARNING**

**THE PUMP** must be provided with pressure protection. This may be provided through a relief valve mounted directly on the pump, an in-line pressure relief valve, a torque limiting device, or a rupture disk. If pump rotation may be reversed during operation, pressure protection must be provided on **both** sides of pump. Relief valve adjusting screw caps must always point towards suction side of the pump. If pump rotation is reversed, position of the relief valve must be changed. Pressure relief valves cannot be used to control pump flow or regulate discharge pressure. For additional information, refer to Viking Pump's Technical Service Manual TSM 000 and Engineering Service Bulletin ESB-31.



**WARNING**

**DO NOT** exceed the pumps rated pressure, speed, and temperature, or change the system/duty parameters from those the pump was originally supplied, without confirming its suitability for the new service.



**WARNING**

**BEFORE** operating the pump, be sure that:

- It is clean and free from debris
- all valves in the suction and discharge pipelines are fully opened.
- All piping connected to the pump is fully supported and correctly aligned with the pump.
- Pump rotation is correct for the desired direction of flow.



**WARNING**

**THE PUMP** must be installed in a matter that allows safe access for routine maintenance and for inspection during operation to check for leakage and monitor pump operation.

### **PRESSURE RELIEF VALVES:**

1. Viking pumps are positive placement pumps and must be provided with some sort of pressure protection. This may be a relief valve mounted directly on the pump, an inline pressure relief valve, a torque limiting device, a rupture disk, or other device.
2. If pump rotation is to be reversed during operation, pressure protection must be provided on both sides of the pump.
3. Relief valve adjusting screw cap must always point towards the suction side of the pump.
4. Pressure relief valves should not be used to control pump flow or regulate discharge pressure.

### **SPECIAL MECHANICAL SEALS:**

Extra care should be taken in repair of these pumps. Be sure to read and follow all special instructions supplied with your pump.

## **MAINTENANCE**

Model 4625 pumps are designed for long, trouble free life under a wide variety of application conditions with a minimum of maintenance, however, the following should be considered.

1. **LUBRICATION** - External lubrication must be applied slowly with a handgun to all lubrication fittings every 500 hours of operation with multi-purpose grease, NLGI # 2. Do not over-grease. Applications involving very high or low temperatures will require other types of lubrication. Refer to Engineering Service Bulletin ESB-515. Consult factory with specific lubrication questions.
2. **END CLEARANCE ADJUSTMENT** - After long term operation it is sometimes possible to improve the performance of the pump, without major repair, through adjustment of the end clearance of the pump. Refer to instructions under Reassembly of the pump for information regarding this procedure.
3. **CLEANING THE PUMP** - It is good practice to keep the pump as clean as possible. This will facilitate inspection, adjustment and repair work.
4. **STORAGE** - If the pump is to be stored or not used for any appreciable length of time it should be drained and a light coat of lubricating and preservative oil should be applied to the internal parts.

**SUGGESTED REPAIR TOOLS:** The following tools must be available to properly repair Series 4625 pumps. These tools are in addition to standard mechanics' tools such as open end wrenches, pliers, screwdrivers etc. Most of the items can be obtained from an industrial supply house.

1. Soft Headed Hammer
2. Allen Wrenches (some mechanical seals and set collars)
3. Adjustable Hook Spanner Wrench (2-810-043-375)
4. Arbor Press

## **DISASSEMBLY**

### **DANGER !**

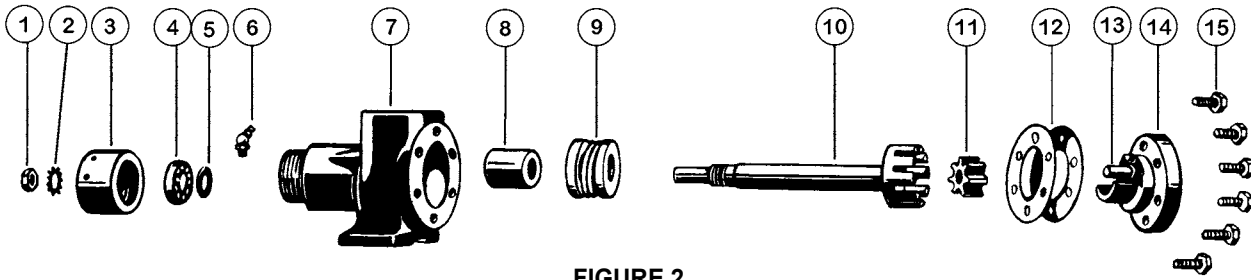
**Before opening any Viking pump liquid chamber (pumping chamber, reservoir, relief valve adjusting cap fitting, etc.) Be sure:**

1. **That any pressure in the chamber has been completely vented through the suction or discharge lines or other appropriate openings or connections.**
2. **That the driving means (motor, turbine, engine, etc.) has been "locked out" or made non-operational so that it cannot be started while work is being done on pump.**
3. **That you know what liquid the pump has been handling and the precautions necessary to safely handle the liquid. Obtain a material safety data sheet (MSDS) for the liquid to be sure these precautions are understood.**

**Failure to follow above listed precautionary measures may result in serious injury or death.**

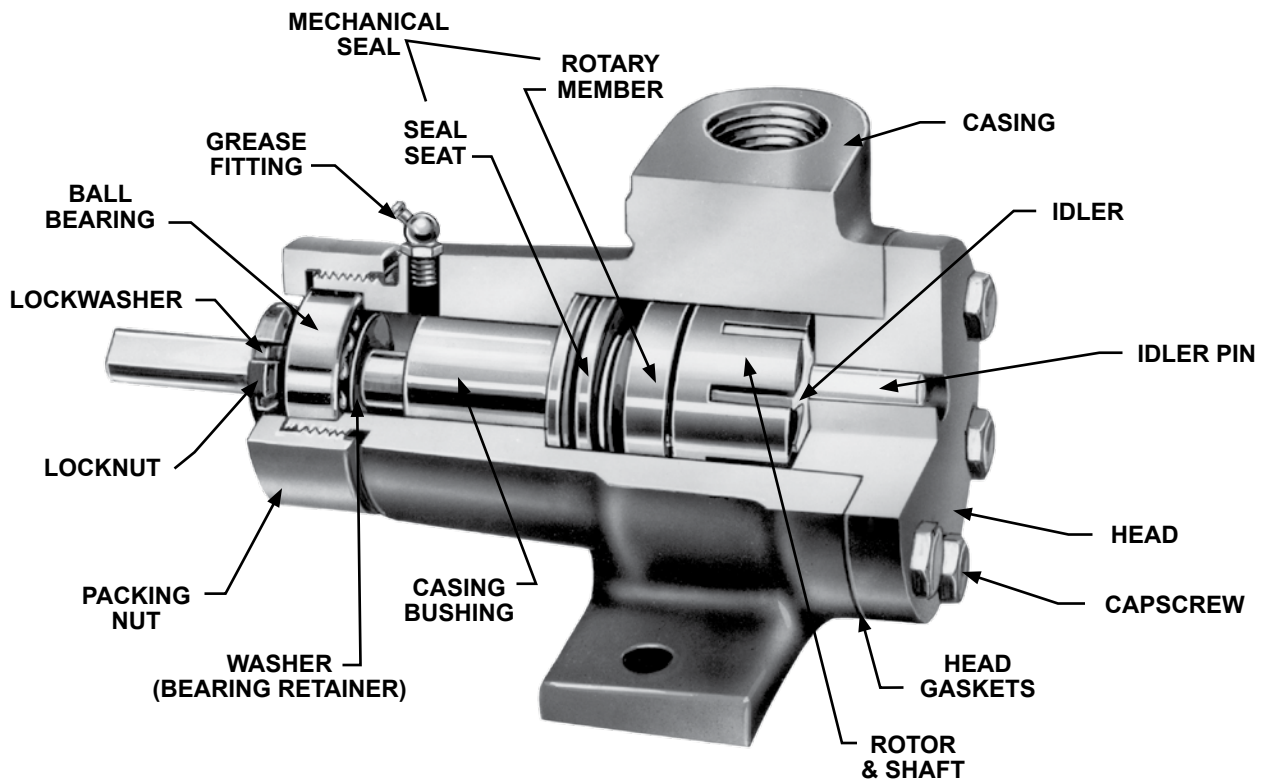
Review Fig. 2 and 3 before proceeding with disassembly.

1. Remove Locknut and Lockwasher from the drive end of the shaft. Be sure to bend up the tab of the lockwasher before attempting to remove locknut.
2. Remove Packing Nut.
3. Remove the Capscrews and the Head from the pump. It may be necessary to tap the drive end of the shaft to loosen the head. **DO NOT PRY** the head from the casing as this may damage the gasket surface.
4. Slide the rotor and shaft from the casing. It may be necessary to tap lightly on the drive end of the shaft in order to slide the shaft through the ball bearing bore. The rotary member of the mechanical seal will stay with the Rotor & Shaft when removed.
5. Remove the ball bearing and bearing retainer washer from the casing bore.
6. Remove the rotary member of the mechanical seal from the rotor shaft. Carefully inspect the ceramic face for wear and the o-ring in I.D. of the rotary member for cuts or other signs of damage. Replace if necessary.
7. Remove the seal seat from the casing. Use a simple tool such as a wire or old screwdriver with a short hook bent on the end. Slide this hook into the crevice between the seal seat and casing bushing and pull the seat out the head end of the casing. Inspect face for wear. It is recommended that a new mechanical seal be used every time a pump is disassembled.



**FIGURE 2**  
**EXPLODED VIEW SERIES 4625**

ITEM	NAME OF PART	ITEM	NAME OF PART	ITEM	NAME OF PART
1	Locknut	6	Grease Fitting	11	Idler
2	Lockwasher	7	Casing	12	Head Gaskets
3	Packing Nut	8	Casing Bushing	13	Idler Pin
4	Ball Bearing	9	Mechanical Seal	14	Head
5	Washer, Bearing Retainer	10	Rotor and Shaft	15	Capscrews



**FIGURE 3**  
**CUTAWAY VIEW OF SERIES 4625**

## ASSEMBLY

All parts should be examined for wear before the pump is put together. When making major repairs, such as replacing a rotor and shaft, it is advisable to install a new casing bushing.

**INSTALLING CASING BUSHING** - The casing bushing can be replaced in the following manner: Insert a bar approximately .9375" diameter and at least 3.5" long in the seal end of the casing and press the bushing out of the casing. When installing a new bushing, an arbor press should be used. Coat the bushing with light lube oil and press the bushing into the bore from the head end. The bushing

should be positioned so that the face of the bushing is .0625" below the surface of the step machined for the seal seat, see **Figure 4**.

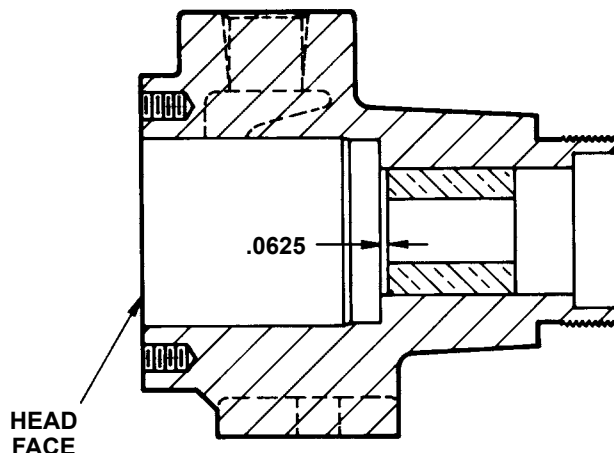
1. Clean all parts thoroughly.
2. Coat the complete seal seat with light oil and install it into the casing. Make sure that the pins on the backside of the seat go into the slots provided for them in the casing. (Putting a light pencil line in the bore of the seal seat in line with the pins will help keep the pins in proper alignment with the holes).
3. Coat the rotor shaft with light oil. Slide the mechanical seal wave spring onto the shaft. Coat

the bore and lapped face of the rotary member of the mechanical seal with light oil and slide onto the rotor shaft. Position the drive pins in two holes in back of the rotor. Slide the rotor into the pump casing.

- Place nine 0.002 inch (.018 inch total) gaskets on the head. Place the idler on the head and install into the pump casing. Install three capscrews (every other one), tighten finger tight then loosen one turn.
- Slide bearing retainer washer onto the drive end of the rotor shaft and position against the shoulder on the shaft. Slide the ball bearing onto the shaft and into the bore of the casing as far as it will go easily. At this point slide a sleeve over the drive end of the shaft and up against the inner race of the bearing and press the bearing into place.
- Install the lockwasher & locknut. Tighten the locknut to 15-20 ft.- lbs. Torque (F-FH) . Tighten the nut securely and bend the tang of the lockwasher into the slot of the locknut.  
**NOTE:** Hold the rotor shaft from turning while tightening the locknut by fastening a wrench on the flat of the shaft.
- Install the packing nut and tighten securely.
- Tighten the three capscrews. Add or remove gaskets (using either .001 or .003) until the rotor drags slightly on the head; then add two .001 thick gaskets. End clearance is now set properly. Put in the remaining three capscrews and double check to be sure the rotor is free to turn.

**NOTE:** If the capacity of the pump has decreased after long term operation, it is sometimes possible to increase the capacity again by removing (1) or more head gaskets. If this is done be sure to turn pump over by hand before starting.

**DO NOT OPERATE PUMP "DRY";** make sure there is a supply of liquid in the suction line prior to start-up.



## WARRANTY

Viking warrants all products manufactured by it to be free from defects in workmanship or material for a period of one (1) year from date of startup, provided that in no event shall this warranty extend more than eighteen (18) months from the date of shipment from Viking. The warranty period for Universal Seal series pumps ONLY (Universal Seal models listed below) is three (3) years from date of startup, provided that in no event shall this warranty extend more than forty-two (42) months from the date of shipment from Viking.

UNDER NO CIRCUMSTANCES SHALL VIKING BE LIABLE UNDER THIS WARRANTY OR OTHERWISE FOR SPECIAL, INCIDENTAL, INDIRECT, CONSEQUENTIAL OR PUNITIVE DAMAGES OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, LOST OR UNREALIZED SALES, REVENUES, PROFITS, INCOME, COST SAVINGS OR BUSINESS, LOST OR UNREALIZED CONTRACTS, LOSS OF GOODWILL, DAMAGE TO REPUTATION, LOSS OF PROPERTY, LOSS OF INFORMATION OR DATA, LOSS OF PRODUCTION, DOWNTIME, OR INCREASED COSTS, IN CONNECTION WITH ANY PRODUCT, EVEN IF VIKING HAS BEEN ADVISED OR PLACED ON NOTICE OF THE POSSIBILITY OF SUCH DAMAGES AND NOTWITHSTANDING THE FAILURE OF ANY ESSENTIAL PURPOSE OF ANY PRODUCT.

THIS WARRANTY IS AND SHALL BE VIKING'S SOLE AND EXCLUSIVE WARRANTY AND SHALL BE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ALL WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT ALL OF WHICH OTHER WARRANTIES ARE EXPRESSLY EXCLUDED.

See complete warranty at [www.vikingpump.com](http://www.vikingpump.com).