

TECHNICAL SERVICE MANUAL

GENERAL PURPOSE SPECIAL MOUNTED PUMPS
 SERIES 75 AND 475
 SIZES G - HL

SECTION	TSM 320.2
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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 number and serial number of the pump when ordering repair parts. This model number and serial number can be found on the nameplate attached to the pump casing. This is important identification for ordering parts or replacement pump. It is positive assurance you will receive the correct pump parts.

Your pump is composed of four major parts. Only two of these are moving parts: the rotor and idler.

An exploded parts drawing and list of parts is included to help you identify each part correctly. However, to disassemble and reassemble the pump, you will be covered step by step. Refer to pages 2 to 9.

UNMOUNTED PUMP MODELS	
WITH LIP SEAL	WITH MECHANICAL SEAL
G75	G475
GG75	GG475
H75	H475
HJ75	HJ475
HL75	HL475

MOUNTED PUMP MODELS			
WITH LIP SEAL	WITH MECHANICAL SEAL	NORMAL GPM	
		@ 1200 RPM	@ 1800 RPM
G75M	G475M	5	7
GG75M	GG475M	7	10
H75M	H475M	10	15
HJ75M	HJ475M	13	20
HL75M	HL475M	20	30

INTERCHANGEABILITY

These pumps are furnished with either a mechanical seal or lip seal.

All models of the mechanical seal pumps and lip seal pumps are dimensionally interchangeable on any NEMA "C" flange motor. The mechanical seal is interchangeable with the lip seal in all pump sizes.

INSTALLATION

The suction line should be air tight and at least as large as the pump suction port connections to prevent loss of prime or capacity. It should also be equipped with a strainer and if pumping light liquids at a high suction lift, a foot or check valve should be used. Always avoid high spots and obstructions in the suction line as these may cause noise, loss of capacity or air lock. Since these are positive displacement pumps, be sure there is no obstruction in the discharge line and all valves are in operating position before starting the pump. Be sure the adjusting screws of the relief valve on the pump point towards the suction port. Factory assembled pumps will have right hand port suction and left hand port discharge unless otherwise specified. Port location is determined by looking at the mounting flange end of the pump. The relief valve on the pump is excellent insurance against a clogged discharge line or closed valves in the discharge line.

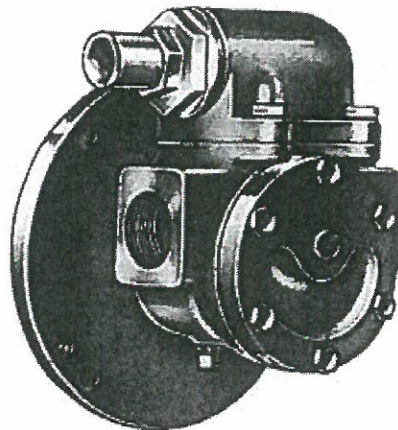


FIGURE 1
 UNMOUNTED PUMP SHOWING
 FRONT VIEW OF G AND GG SIZE

SPECIAL INFORMATION

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 area where pumping elements (gear teeth) come out of mesh is suction port.



PRESSURE RELIEF VALVES:

1. Viking pumps are positive displacement 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 or a rupture disk.
2. This series of pumps may be equipped with an integral pressure relief valve. Standard configuration is for clockwise rotation.
3. If pump rotation is reversed during operation, pressure protection must be provided on *both* sides of the pump.
4. Relief valve adjusting screw cap must *always* point towards the suction side of the pump.
5. Pressure relief valves should not be used to control pump flow or regulate discharge pressure.

For additional information on pressure relief valves, Refer to Technical Service Manual TSM000 and Engineering Service Bulletin ESB-31.

NOTE: Lip seal pumps, Models G75, GG75, H75, HJ75, HL75, G75M, GG75M, H75M, HJ75M and HL75M are equipped with an internal suckback arrangement. A small suckback screw (self-locking) is inserted in a hole on the discharge side of the pump. This can be seen through the port opening and behind the rotor (refer to figure 3). The hole on the suction side must be left open to prevent damage to the lip seals. Both holes are plugged in the mechanical seal pump Model G475, GG475, H475, HJ465, HL475, G475M, GG475M, H475M, HJ475M, and HL475M. Since these pumps have only two moving parts and are all performance tested at the factory, they seldom cause trouble. If trouble does occur we always advise investigating all other possible causes before disassembling the pump. Most troubles are caused by air leaks and obstruction in the suction line.

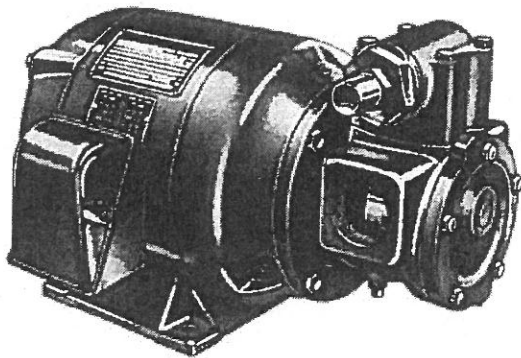


FIGURE 2
MOTOR MOUNTED PUMP SHOWING
H, HJ AND HL SIZE

MAINTENANCE

The Series 75 and 475 pumps are designed for long trouble free life under a wide variety of application conditions with minimum maintenance, however, the following should be considered:

1. **LUBRICATION** – External lubrication is not required for this series of pumps. The liquid being pumped lubricates the internal bearings in the pump.

2. **END CLEARANCE ADJUSTMENT** – After long term operation it is sometimes possible to improve the performance of the pump, without major repair, by adjusting the end clearance. Refer to ASSEMBLY, page 4, for information regarding this procedure.
3. **PRESSURE RELIEF VALVE** – If your pump is equipped with a pressure relief valve, adjustment can be made as follows. Remove the adjusting screw cap, turn in the adjusting screw to increase the pressure and turn-out to decrease the pressure. If the pump is not producing the rated capacity, adjustment of the pressure relief valve may be necessary. Be sure the adjusting screw cap is re-installed before the pump is started.
4. **CLEANING THE PUMP** – It is good practice to keep the pump as clean as possible. This will facilitate inspection, adjustment and repair work.
5. **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 75 and 475 pumps. These tools are in addition to standard mechanics' tools such as open end wrenches, pliers, screw drivers, 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. Mechanical seal installation sleeve
4. Brass bar
5. Arbor press

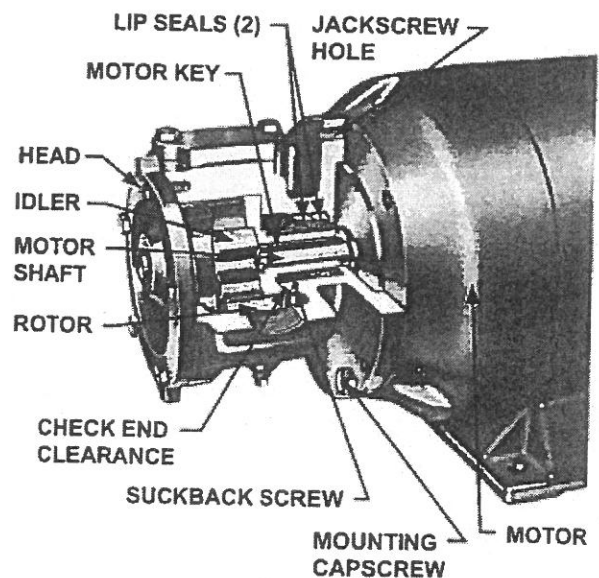


FIGURE 3
CUTAWAY OF H, HJ AND HL 75
LIP SEAL PUMPS

CAUTION !

Turn the rotor back and fourth as you exert enough force to push it through the lip seal and to the bottom of the casing. Be careful not to fold under the lip of the inner seal.

4. **INSTALL THE IDLER.** Put the idler with the bushings on the idler pin.

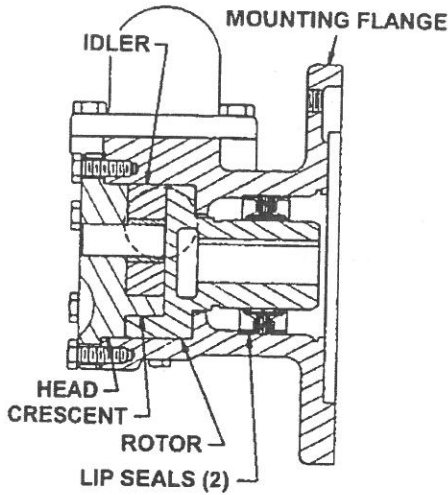


FIGURE 5
SECTIONAL DRAWING OF MODELS G75 & GG75
LIP SEAL PUMPS

5. **PLACE HEAD GASKETS ON THE PUMP HEAD.** The proper amount of gaskets should be used to provide necessary end clearance within the pump so it turns freely with no appreciable end play. Gasket Table 1 gives the normal amount of gaskets used.

6. **THE HEAD CAN NOW BE ASSEMBLED ON THE PUMP.** Tilt the top of the head away from the pump slightly until the crescent enters the inside diameter of the rotor and rotate the idler until its teeth mesh with the rotor teeth. Do not damage the head gaskets. Note correct position of the idler and crescent (See Figure 5 and Disassembly step 2). Tighten the head capscrews and then check the end clearance.
7. **CHECK PUMP END CLEARANCE.** Measure the clearance between the back of the rotor and the mechanical surface in the bottom of the casing by inserting a feeler gauge through the port opening. This is the end clearance; the normal amount is 0.003" to 0.005". Add or remove gaskets until the figure is reached.

PUMP MODELS	NORMAL AMOUNT USED (INCH)	ONE SET OF GASKETS CONSISTS OF THE FOLLOWING
G75 and GG75 Lip Seal Pumps	.010" - .015"	2 - .005" Plastic 3 - .002" Plastic

GASKET TABLE 1

8. **BOLT THE VALVE INTO THE CASING.** Place the valve gasket and valve or cover-plate on the pump and fasten securely with the four capscrews.

CAUTION !

Be sure the adjusting screw of the relief valve points toward the suction port.

9. **ASSEMBLE THE PUMP ON THE MOTOR.** Install the full length key in the keyway of the motor shaft.
- NOTE:** Key must be full length to avoid misalignment of the pump rotor, which could cause serious damage to the pump. Slide the pump on the motor shaft and fasten securely with the four capscrews.

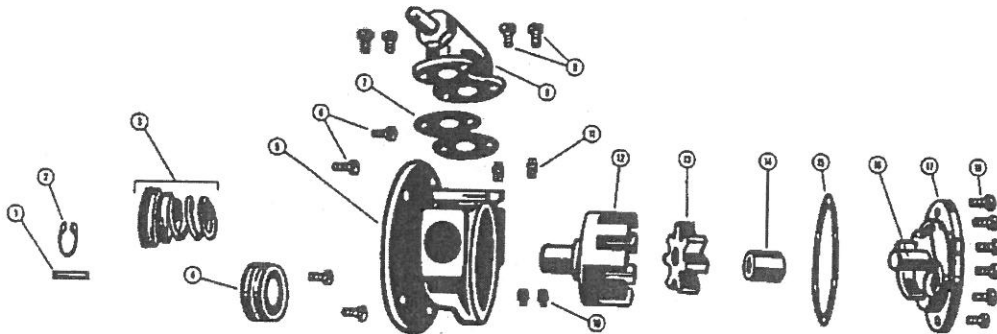


FIGURE 6
EXPLODED VIEW SERIES 75 & 475 PUMPS (G AND GG SIZE)

ITEM	NAME OF PART	ITEM	NAME OF PART	ITEM	NAME OF PART
1	Key for Motor Shaft (Full Length)	7	Gasket for Relief Valve or Cover Plate	13	Idler
2	Snap Ring (Mech. Seal Pumps Only)	8	Relief Valve	14	Idler Bushings
3	Mechanical Seal (Complete)	9	Capscrews for Relief Valve or Cover Plate	15	Gasket for Head
4	Lip Seal (2)	10	Pipe Plugs - 1/8"	16	Idler Pin
5	Casing	11	Machine Screw (2-Mech. Seal, 1-Lip Seal)	17	Head
6	Capscrews (Pump on Motor)	12	Rotor	18	Capscrews for Head

PUMP MODELS	NORMAL AMOUNT USED (INCH)	ONE SET OF GASKETS CONSISTS OF THE FOLLOWING
G75 and GG75 Lip Seal Pumps	.010" - .015"	2 - .005" Plastic 3 - .002" Plastic

GASKET TABLE 2

- BOLT THE VALVE TO THE CASING. Place the valve gasket and valve or coverplate on the pump and fasten securely with the four capscrews.

CAUTION !

Be sure the adjusting screw of the relief valve points toward the suction port.

- ASSEMBLE THE PUMP ON THE MOTOR. Install the full length key in the keyway of the motor shaft.

NOTE: Key must be full length to avoid misalignment of the pump rotor, which could cause serious damage to the pump. Slide the pump on the motor shaft and fasten securely with the four capscrews.

To Reassemble Model G475 or GG475 Mechanical Seal Pumps: see Figure 9)

- INSTALL THE ROTOR IN THE CASING.
- INSTALL THE IDLER. Put the idler with bushing on the idler pin.
- PLACE THE HEAD GASKET ON THE HEAD. The proper amount of gaskets should be used to provide the necessary end clearance within the pump so it turns freely with no appreciable end play. Gasket Table 3 gives the normal amount of gaskets used.

PUMP MODELS	NORMAL AMOUNT USED (INCH)	ONE SET OF GASKETS CONSISTS OF THE FOLLOWING
G75 and GG75 Lip Seal Pumps	.010" - .015"	2 - .005" Plastic 3 - .002" Plastic

GASKET TABLE 3

- THE HEAD CAN NOW BE ASSEMBLED ON THE PUMP. Tilt the top of the head away from the pump slightly until the crescent enters the inside diameter of the rotor and rotate the idler until its teeth mesh with the rotor teeth. Do not damage the head gaskets.

Note the correct position of the idler and crescent (See Figure 9 and Disassembly Step 2). Tighten the head capscrews and then check the end clearance.

- CHECK THE PUMP END CLEARANCE. Measure the clearance between the back of the rotor and the machined surface in the bottom of the casing by inserting the feeler gauge through the port opening. This is the end clearance. Normal amount is 0.003" to 0.005". Add or remove gaskets until the figure is reached.

- INSTALL THE MECHANICAL SEAL. Slide the seal spring washer over the rotor hub as far as it will go. Flush the rotor hub and seal housing bore with light oil (not grease) and assemble the spring, rotary member and seat of the mechanical seal in position, refer to Figure 9.

CAUTION !

Never touch the sealing faces of the mechanical seal with anything except fingers or a clean cloth.

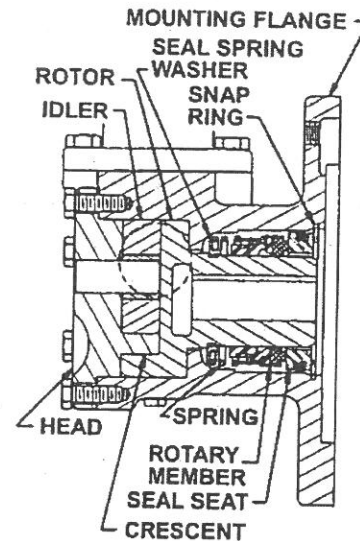


FIGURE 9
SECTIONAL DRAWING OF MODELS G475 & GG475
MECHANICAL SEAL PUMPS

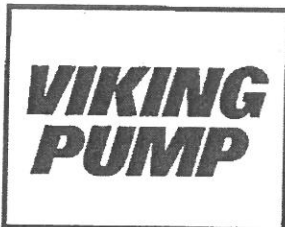
- INSTALL THE SNAP RING. Install the snap ring in the groove in the casing. This will hold the seal at its proper working length.
- BOLT THE VALVE TO THE CASING. Place the valve gasket and valve or coverplate on the pump and fasten securely with the four capscrews.

CAUTION !

Be sure the adjusting screw of the relief valve points toward the suction port.

- ASSEMBLE THE PUMP ON THE MOTOR. Install the full length key in the key way of the motor shaft.

NOTE: Key must be full length to avoid misalignment of the pump, which could cause serious damage to the pump. Slide the pump on the motor shaft and fasten securely with the four capscrews.



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DISASSEMBLY

NOTE: Mark valve and head to be sure they are reassembled in the same relative position.

1. Remove valve cap.
2. Measure and record the length of extension of the adjusting screw. See "A" on Figure 11.
3. Loosen the lock nut and back out adjusting screw until spring pressure is released.
4. Remove bonnet, spring guide, spring and poppet from the valve body. Clean and inspect all parts for wear or damage and replace as necessary.

ASSEMBLY

Follow the procedure outlined under disassembly.

If valve is removed for repairs, be sure to replace in the same position. The valve cap should point towards the suction port.

PRESSURE ADJUSTMENT

If the pressure setting of the safety relief valve is to be changed from that which the factory has set, the following instructions should be carefully followed:

1. Remove the valve cap, which covers the adjusting screw, and loosen the lock nut that locks the adjusting screw so the pressure setting will not change during operation of the pump.
2. A pressure gauge somewhere in the discharge line must be used for actual adjustment operation.
3. The adjusting screw should be turned in for increasing the pressure or turned out for decreasing the pressure.
4. With the discharge line closed at a point beyond the pressure gauge, the gauge will show the maximum pressure the valve will allow while the pump is in operation.

IMPORTANT

In ordering parts for the pressure relief valve, always give model number and serial number of the pump as it appears on the nameplate and the name of the part wanted. When ordering springs, be sure to give the pressure settings desired.

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. If, during said warranty period, any products sold by Viking prove to be defective in workmanship or material under normal use and service, and if such products are returned to Viking's factory at Cedar Falls, Iowa, transportation charges prepaid, and if the products are found by Viking to be defective in workmanship or material, they will be replaced or repaired free of charge, FOB. Cedar Falls, Iowa.

Viking assumes no liability for consequential damages of any kind and the purchaser by acceptance of delivery assumes all liability for the consequences of the use or misuse of Viking products by the purchaser, his employees or others. Viking will assume no field expense for service or parts unless authorized by it in advance.

Equipment and accessories purchased by Viking from outside sources which are incorporated into any Viking product are warranted only to the extent of and by the original manufacturer's warranty or guarantee, if any.

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