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### INTRODUCTION

The illustrations used in this manual are for identification purposes only and cannot be used for ordering parts. Obtain a parts list from the factory or a Viking® representative. Always give complete name of part, part number and material with model number and serial number of the pump when ordering repair parts. The unmounted pump or pump unit model number and serial number are on the nameplate.

In the Viking model number system, basic size letters are combined with series number (32 and 432), indicating either an unmounted pump or mounted pump unit.

Model Number Chart

| UNMOUNTED PUMP |            | UNITS  |
|----------------|------------|--|
| PACKED         | MECH. SEAL |  |
| G32            | G432       | Units are designated by the unmounted pump model numbers followed by a letter indicating drive style.<br><br>V = V-Belt<br>D = Direct Drive<br>B = Bracket Mounted |
| H32            | H432       |  |
| HL32           | HL432      |  |
| J32            |            |  |
| K32            | K432       |  |
| KK32           |            |  |
| L32            | L432       |  |
| LQ32           |            |  |
| LL32           |            |  |
| Q32            |            |  |
| M32            |            |  |
| N32            |            |  |

This manual deals only with Series 32 and 432 General Purpose Pumps. Refer to Figures 1 thru 12 for general configuration and nomenclature used in this bulletin. Pump specifications and recommendations are listed in Catalog Section 310, Series 32 and 432 General Purpose Pumps.



FIGURE 1 - G Size Unmounted Pump

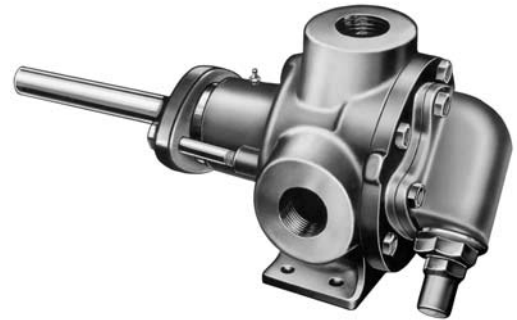


FIGURE 2 - H and HL Size Unmounted Pump

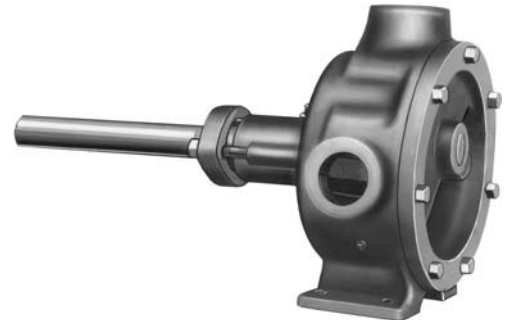


FIGURE 3 - J, K, KK and L Size Unmounted Pump  
(Shown without pressure relief valve)

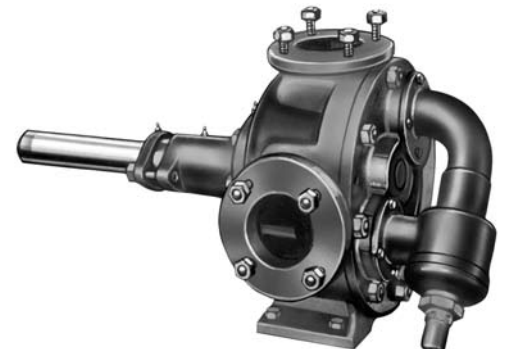


FIGURE 4 - LQ, LL, M and N Size Unmounted Pump

# 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.

## 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 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, a rupture disk or other device.
- 2.** There are relief valve options available on those pump models designed to accept a relief valve. Options may include a return to tank relief valve or a jacketed relief valve. Pumps equipped with a jacketed head plate are generally not available with a relief valve.
- 3.** If pump rotation is reversed during operation, pressure protection must be provided on **both** sides of pump.
- 4.** Relief valve adjusting screw cap must **always** point towards suction side of pump. If pump rotation is reversed, remove pressure relief valve and turn end for end. **Refer to Figures 1, 2, and 4, page 1.**
- 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.**

## MAINTENANCE

Series 32 and 432 pumps are designed for long, trouble-free service life under a wide variety of application conditions with a minimum of maintenance. The points listed below will help provide long service life.

**LUBRICATION** - Periodic external lubrication should be applied slowly with a hand gun at all lubrication fittings provided. A good quality of general purpose grease is satisfactory in the majority of cases, however, applications involving very high or low temperatures may require other types of lubricants. Suggested frequency of lubrication is once every 500 hours of operation. Do not over-grease. **Refer to Engineering Service Bulletin ESB-515.** Consult the factory with specific lubrication questions.

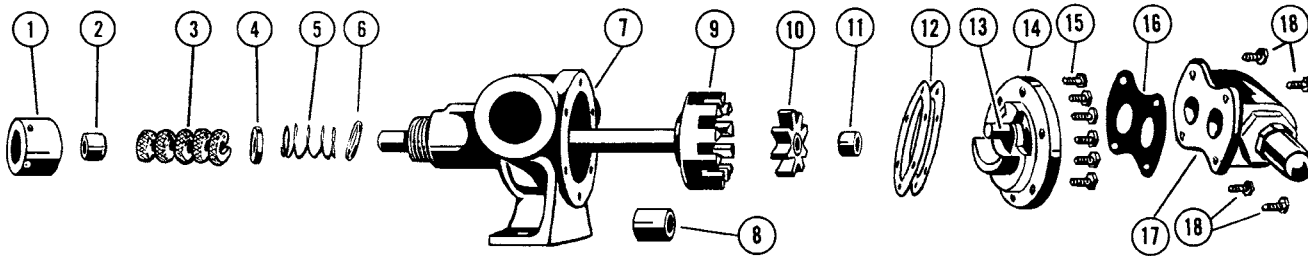
**PACKING ADJUSTMENT** - New packed pumps require some initial packing adjustment to control leakage as packing “runs-in”. Make initial packing adjustments carefully and do not over-tighten the packing gland. After initial adjustment, occasional inspection will reveal the need for packing gland adjustment or replacement of the packing. **Refer to instructions under DISASSEMBLY, page 6 and ASSEMBLY, page 7** regarding repacking the pump.

**CLEANING THE PUMP** - Keep the pump as clean as possible. This will facilitate inspection, adjustment and repair work and help prevent overlooking a dirt covered grease fitting.

**STORAGE** - If the pump is to be stored or not used for six months or more, pump must be drained and a light coat of non-detergent SAE 30 weight oil must be applied to all internal pump parts. Lubricate fittings and apply grease to pump shaft extension. Viking suggests rotating pump shaft by hand one complete revolution every 30 days to circulate the oil.

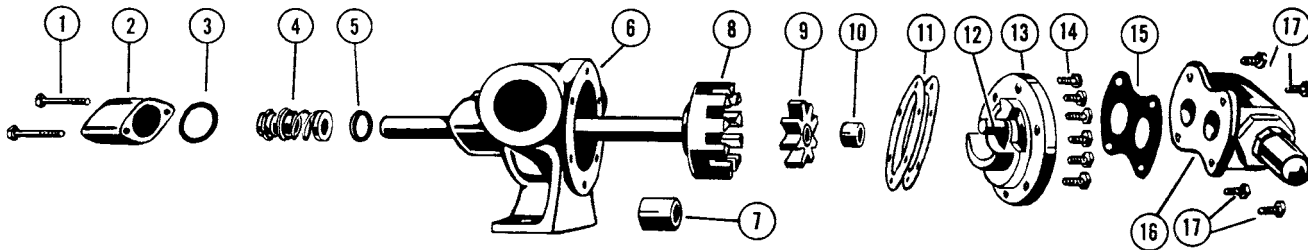
**SUGGESTED REPAIR TOOLS:** The following tools must be available to properly repair Series 32 and 432 pumps. These tools are in addition to standard mechanics' tools such as open end wrenches, pliers, screw drivers, etc. Most of the items can be obtained from an industrial supply house.

- 1.** Soft Headed hammer
- 2.** Allen wrenches (some mechanical seals and set collars)
- 3.** Packing hooks, flexible (packed pumps)  
Small for up to 5/16", G-KK (2-810-049-999).  
Large for 3/8" and larger, L size and up (2-810-042-999).
- 4.** Brass bar
- 5.** Arbor press



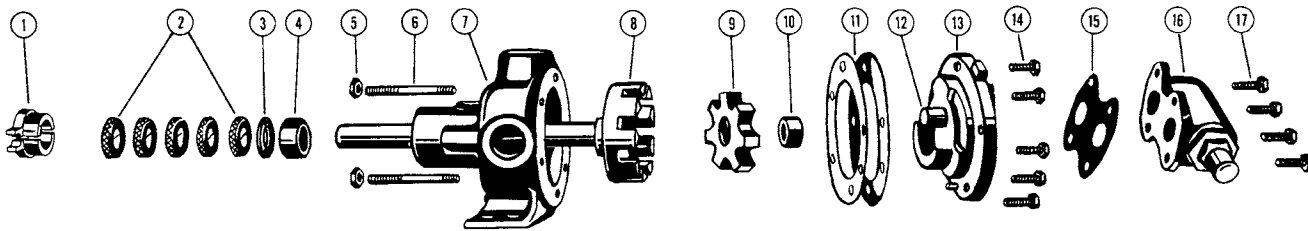
**FIGURE 5 - EXPLODED VIEW MODEL G32 PUMP**

| ITEM | NAME OF PART          | ITEM | NAME OF PART                | ITEM | NAME OF PART                |
|------|-----------------------|------|-----------------------------|------|-----------------------------|
| 1    | Packing Nut           | 7    | Casing and Bushing Assembly | 13   | Idler Pin                   |
| 2    | Outer Packing Gland   | 8    | Casing Bushing              | 14   | Head and Idler Pin Assembly |
| 3    | Packing Rings         | 9    | Rotor and Shaft Assembly    | 15   | Capscrews for Head          |
| 4    | Inner Packing Gland   | 10   | Idler and Bushing Assembly  | 16   | Relief Valve Gasket         |
| 5    | Packing Spring        | 11   | Idler Bushing               | 17   | Relief Valve                |
| 6    | Packing Spring Washer | 12   | Head Gasket Set             | 18   | Capscrews for Valve         |



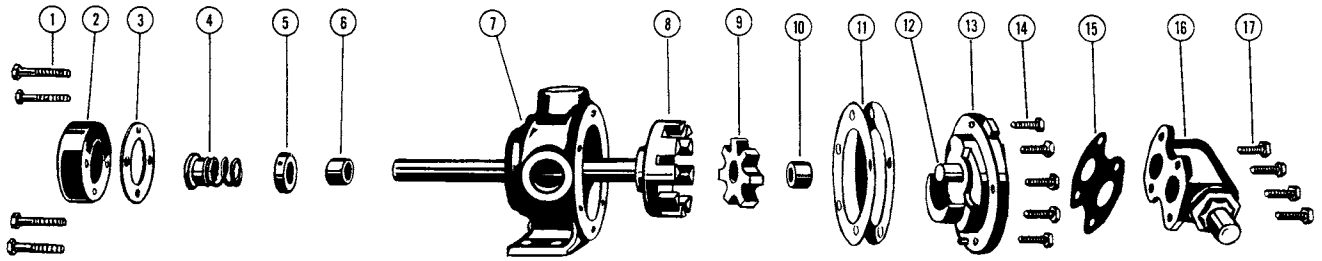
**FIGURE 6 - EXPLODED VIEW MODEL G432 PUMP**

| ITEM | NAME OF PART                | ITEM | NAME OF PART               | ITEM | NAME OF PART                |
|------|-----------------------------|------|----------------------------|------|-----------------------------|
| 1    | Capscrews for End Cap       | 7    | Casing Bushing             | 13   | Head and Idler Pin Assembly |
| 2    | End Cap                     | 8    | Rotor and Shaft Assembly   | 14   | Capscrews for Head          |
| 3    | Gasket for End Cap          | 9    | Idler and Bushing Assembly | 15   | Relief Valve Gasket         |
| 4    | Mechanical Seal (Complete)  | 10   | Idler Bushing              | 16   | Relief Valve                |
| 5    | Set Collar with Setscrew    | 11   | Head Gasket Set            | 17   | Capscrews for Valve         |
| 6    | Casing and Bushing Assembly | 12   | Idler Pin                  |      |                             |



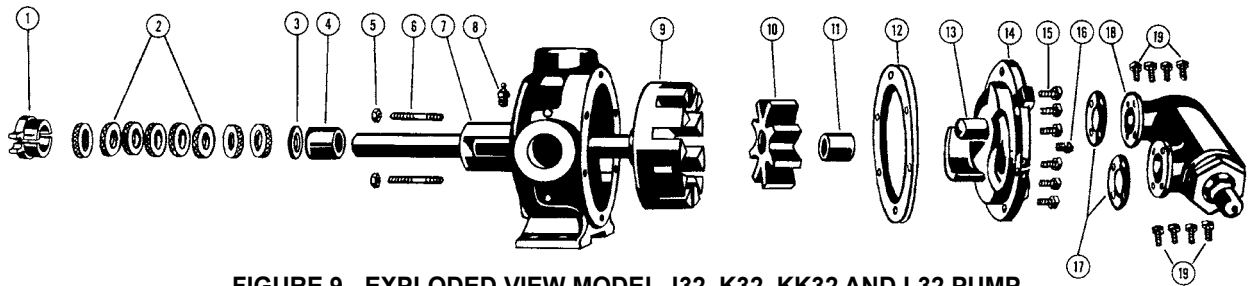
**FIGURE 7 - EXPLODED VIEW MODEL H32 AND HL32**

| ITEM | NAME OF PART            | ITEM | NAME OF PART                | ITEM | NAME OF PART                |
|------|-------------------------|------|-----------------------------|------|-----------------------------|
| 1    | Two Piece Packing Gland | 7    | Casing and Bushing Assembly | 13   | Head and Idler Pin Assembly |
| 2    | Packing Rings           | 8    | Rotor and Shaft Assembly    | 14   | Capscrews for Head          |
| 3    | Packing Retainer Washer | 9    | Idler and Bushing Assembly  | 15   | Relief Valve Gasket         |
| 4    | Casing Bushing          | 10   | Idler Bushing               | 16   | Relief Valve                |
| 5    | Packing Gland Nuts      | 11   | Head Gasket Set             | 17   | Capscrews for Valve         |
| 6    | Packing Gland Studs     | 12   | Idler Pin                   |      |                             |



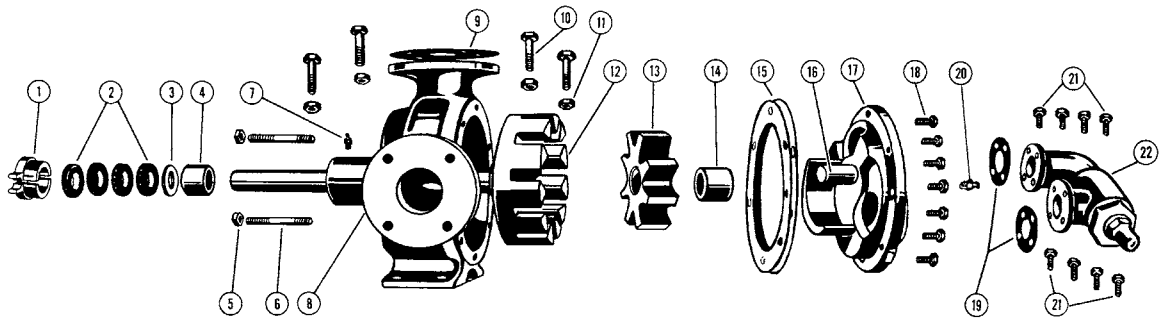
**FIGURE 8 - EXPLODED VIEW MODEL H432 AND HL432 PUMP**

| ITEM | NAME OF PART             | ITEM | NAME OF PART                | ITEM | NAME OF PART                |
|------|--------------------------|------|-----------------------------|------|-----------------------------|
| 1    | Capscrews for End Cap    | 7    | Casing and Bushing Assembly | 13   | Head and Idler Pin Assembly |
| 2    | End Cap                  | 8    | Rotor and Shaft Assembly    | 14   | Capscrews for Head          |
| 3    | Gasket for End Cap       | 9    | Idler and Bushing Assembly  | 15   | Relief Valve Gasket         |
| 4    | Mechanical Seal          | 10   | Idler Bushing               | 16   | Relief Valve                |
| 5    | Set Collar with Setscrew | 11   | Head Gasket Set             | 17   | Capscrews for Valve         |
| 6    | Casing Bushing           | 12   | Idler Pin                   |      |                             |



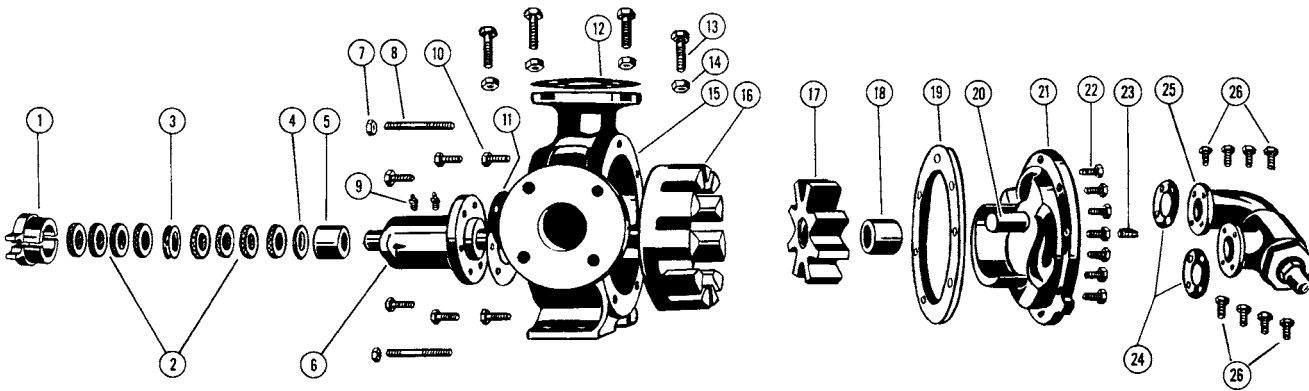
**FIGURE 9 - EXPLODED VIEW MODEL J32, K32, KK32 AND L32 PUMP**

| ITEM | NAME OF PART                | ITEM | NAME OF PART                | ITEM | NAME OF PART        |
|------|-----------------------------|------|-----------------------------|------|---------------------|
| 1    | Two Piece Packing Gland     | 8    | Grease Fitting              | 15   | Capscrews for Head  |
| 2    | Packing Rings               | 9    | Rotor and Shaft Assembly    | 16   | Pipe Plug           |
| 3    | Packing Retainer Washer     | 10   | Idler and Bushing Assembly  | 17   | Relief Valve Gasket |
| 4    | Casing Bushing              | 11   | Idler Bushing               | 18   | Relief Valve        |
| 5    | Packing Gland Nuts          | 12   | Head Gasket Set             | 19   | Capscrews for Valve |
| 6    | Packing Gland Studs         | 13   | Idler Pin                   |      |                     |
| 7    | Casing and Bushing Assembly | 14   | Head and Idler Pin Assembly |      |                     |



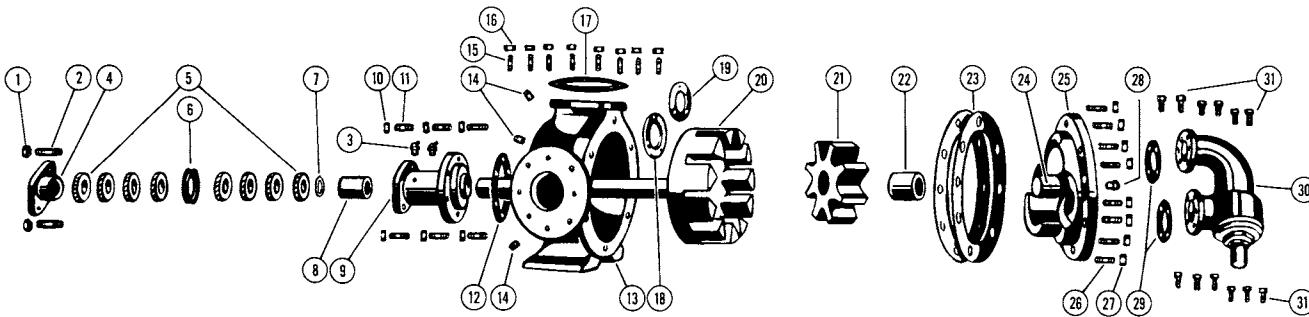
**FIGURE 10 - EXPLODED VIEW MODEL LQ32 PUMP**

| ITEM | NAME OF PART                | ITEM | NAME OF PART               | ITEM | NAME OF PART                |
|------|-----------------------------|------|----------------------------|------|-----------------------------|
| 1    | Two Piece Packing Gland     | 9    | Pipe Flange Gasket         | 17   | Head and Idler Pin Assembly |
| 2    | Packing Rings               | 10   | Capscrews for Flanges      | 18   | Capscrews for Head          |
| 3    | Packing Retainer Washer     | 11   | Hex Nuts for Flanges       | 19   | Relief Valve Gasket         |
| 4    | Casing Bushing              | 12   | Rotor and Shaft Assembly   | 20   | Pipe Plug                   |
| 5    | Packing Gland Nuts          | 13   | Idler and Bushing Assembly | 21   | Capscrews for Valve         |
| 6    | Packing Gland Studs         | 14   | Idler Bushing              | 22   | Relief Valve                |
| 7    | Grease Fitting              | 15   | Head Gasket Set            |      |                             |
| 8    | Casing and Bushing Assembly | 16   | Idler Pin                  |      |                             |



**FIGURE 11 - EXPLODED VIEW MODEL LL32 PUMP**

| ITEM | NAME OF PART                              | ITEM | NAME OF PART                       | ITEM | NAME OF PART                |
|------|---|------|------------------------------------|------|-----------------------------|
| 1    | Two Piece Packing Gland                   | 10   | Capscrews for Rotor Bearing Sleeve | 19   | Head Gasket Set             |
| 2    | Packing Rings                             | 11   | Gasket for Rotor Bearing Sleeve    | 20   | Idler Pin                   |
| 3    | Lantern Ring                              | 12   | Pipe Flange Gasket                 | 21   | Head and Idler Pin Assembly |
| 4    | Packing Retainer Washer                   | 13   | Capscrews for Flanges              | 22   | Capscrews for Head          |
| 5    | Bushing for Rotor Bearing Sleeve          | 14   | Nuts for Flanges                   | 23   | Pipe Plug                   |
| 6    | Rotor Bearing Sleeve and Bushing Assembly | 15   | Casing                             | 24   | Relief Valve Gaskets        |
| 7    | Packing Gland Nuts                        | 16   | Rotor and Shaft Assembly           | 25   | Relief Valve Assembly       |
| 8    | Packing Gland Studs                       | 17   | Idler and Bushing Assembly         | 26   | Capscrews for Valve         |
| 9    | Grease Fitting                            | 18   | Idler Bushing                      |      |                             |



**FIGURE 12 - EXPLODED VIEW MODEL Q32, M32 AND N32 PUMP**

| ITEM | NAME OF PART                              | ITEM | NAME OF PART                    | ITEM | NAME OF PART                |
|------|---|------|---------------------------------|------|-----------------------------|
| 1    | Packing Gland Nut                         | 12   | Gasket for Rotor Bearing Sleeve | 23   | Head Gasket                 |
| 2    | Packing Gland Stud                        | 13   | Casing                          | 24   | Idler Pin                   |
| 3    | Grease Fitting                            | 14   | Pipe Plug                       | 25   | Head and Idler Pin Assembly |
| 4    | Packing Gland                             | 15   | Studs for Flanges               | 26   | Studs for Head              |
| 5    | Packing Rings                             | 16   | Nuts for Flanges                | 27   | Nuts for Head               |
| 6    | Lantern Ring                              | 17   | Pipe Flange Gasket              | 28   | Pipe Plug                   |
| 7    | Packing Retainer Washer                   | 18   | Rotor Bearing Sleeve Washer     | 29   | Relief Valve Gasket         |
| 8    | Bushing for Rotor Bearing Sleeve          | 19   | Rotor Thrust Washer             | 30   | Relief Valve                |
| 9    | Rotor Bearing Sleeve and Bushing Assembly | 20   | Rotor and Shaft Assembly        | 31   | Capscrews for Valve         |
| 10   | Nuts for Rotor Bearing Sleeve             | 21   | Idler and Bushing Assembly      |      |                             |
| 11   | Studs for Rotor Bearing Sleeve            | 22   | Idler Bushing                   |      |                             |

## 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.**

- 1. Refer to figures 5 through 12 for name of parts.**
- 2. Mark head and casing before disassembly to insure proper reassembly. The idler pin, which is offset in pump head, must be positioned toward and equal distance between port connections to allow for proper flow of liquid through pump.**
- 3. Remove the head capscrews.**  
**NOTE:** The four valve capscrews, valve and gasket must be removed from the G models before the six head capscrews are removed.
- 4. Do not allow idler to fall from idler pin. Tilt top of head back when removing to prevent this. Remove head from pump. Avoid damaging head gasket set, all gaskets are required to maintain end clearance.**
- 5. Remove idler and bushing assembly. If idler bushing needs replacing, refer to **INSTALLATION OF CARBON GRAPHITE BUSHINGS, page 8.****

Remove the packing gland, packing and packing retainer washer.

If you have a mechanical seal pump, remove the end cap and the mechanical seal is exposed. For K and L 432, consult factory.

Remove the mechanical seal by sliding off the end of the shaft. Loosen the setscrew in the set collar and remove it.

**CAUTION:** Older pumps may have snap ring on shaft- remove the snap ring before removing rotor and shaft. Carefully remove the rotor and shaft from the pump to avoid damaging the casing or rotor bearing sleeve bushing.

**THRUST WASHERS:** Rotor thrust washer and rotor bearing sleeve thrust washer used in Q, M and N size pumps should be removed, examined for excessive wear and replaced if necessary. These thrust washers are located on the hub of the rotor and the casing end of rotor bearing sleeve.

If it is necessary to replace the bushing in the casing, rotor bearing sleeve or idler and/or repack the pump, remove the old packing and lantern ring and packing retainer washer. G-LQ pumps don't have a lantern ring.

Clean all parts thoroughly and examine for wear and/or damage. Check bushings, and idler pin and replace if necessary. Check all other parts for nicks, burrs, excessive wear and replace if necessary.

## ASSEMBLY

- 1. Install bushing into casing or rotor bearing sleeve. If bushing has a lubrication groove, install bushing with groove at 12:00 o'clock position in bracket. If carbon graphite, refer to **INSTALLATION OF CARBON GRAPHITE BUSHINGS, page 8.****
- 2. Thrust washers used in Q, M and N size pumps should be assembled on the rotor hub and rotor bearing sleeve. Put the plain washer on the two locating pins on the rotor hub. Put the grooved face washer on the pins on the rotor bearing sleeve with the grooved face toward the rotor.**
- 3. Coat shaft of rotor shaft assembly with non-detergent SAE 30 weight oil. Start end of shaft in bracket bushing turning from right to left, slowly pushing rotor into casing.**
- 4. Place the head gaskets 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. The Gasket Table (**Figure 13**) gives the normal amount of gaskets used on each pump.**
- 5. Coat idler pin with non-detergent SAE 30 weight oil and place idler and bushing on idler pin in head. If replacing carbon graphite bushing, refer to **INSTALLATION OF CARBON GRAPHITE BUSHINGS, page 8.****
- 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. Tighten the head capscrews or nuts and then check the end clearance. If the pump shaft cannot be rotated, more gaskets must be added. If, however, the pump has any noticeable end play, remove enough gaskets so the pump has no appreciable end play but still turns freely.**

| PUMP MODEL          | NORMAL AMOUNT USED | ONE SET OF GASKETS CONSISTS OF THE FOLLOWING | STANDARD END CLEARANCE |
|---------------------|--------------------|--|------------------------|
| G32<br>G432         | .010" - .015"      | 2 - .006"<br>1 - .005"<br>2 - .002"          | .003"                  |
| H, HL32<br>H, HL432 | .010" - .015"      | 2 - .006"<br>2 - .002"                       | .003"                  |
| J, K, KK32          | .015" - .020"      | 1 - .015"<br>1 - .010"<br>1 - .006"          | .005"                  |
| L, LQ, LL32         | .025" - .030"      | 1 - .015"<br>1 - .010"<br>1 - .006"          | .005"                  |
| Q32                 | .012" - .030"      | 2 - .015"<br>1 - .006"                       | .010"                  |
| M, N32              | .015" - .036"      | 2 - .015"<br>1 - .006"                       | .015"                  |

FIGURE 13 - GASKET TABLE

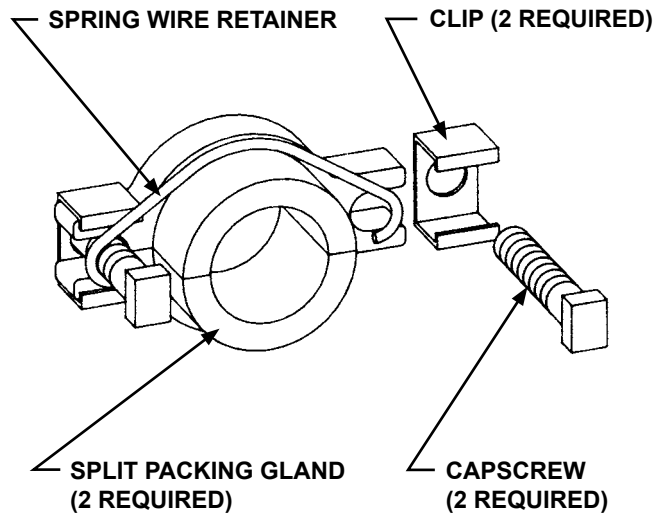


FIGURE 14

- Place packing retainer washer in bottom of packing chamber and pack pump with new packing. Use packing suitable for liquid being pumped. Install packing, staggering the joints from one side of shaft to other. Lubricate packing rings with oil, grease or graphite to aid assembly. A length of pipe will help to seat each packing ring.

**NOTE:** If the pump has a lantern ring it must be located below the grease fitting. The grease fitting may be removed to facilitate positioning of the lantern ring.

- Install packing gland, capscrews and nuts.

### DANGER !

**Before starting pump, be sure all drive equipment guards are in place.**

**Failure to properly mount guards may result in serious injury or death.**

**NOTE:** Pump may be equipped with a 2-piece split packing gland. See Figure 14.

## MECHANICAL SEAL OPTION

Install the mechanical seal: Place the set-collar on the shaft and tighten setscrew. See Figure 15, page 8 for set-collar location.

The seal used in this pump is simple to install and good performance will result if care is taken during installation.

The principle of the mechanical seal is contact between the rotary and stationary members. These parts are lapped to a high finish and their seating effectiveness depends on complete contact.

Once rotating position of mechanical seal is installed on rotor shaft, it is necessary to assemble parts as quickly as possible to ensure seal does not stick to shaft in the wrong axial position. The seal should be expected to stick to shaft after several minutes setting time.

- Never touch sealing faces with anything except clean hands or clean cloth. Minute particles can scratch the seal faces and cause leakage.
- The spring washer and spring must be put on the shaft first and in that order. (See Figure 15, page 8).
- Spread a film of lubricating oil on the inside diameter of the synthetic rubber bellows. Check the end of the pump shaft for sharp burrs or edges which might cut the bellows. Slide the seal rotary member over the shaft and up against the spring.
- Coat the synthetic rubber seal seat with lubricating oil and push the seal seat into the end cap. Put the end cap gasket on the end of the casing. Slide end cap over the shaft and flush both the seal seat and carbon wear ring in the seal rotary member with oil. Push the end cap up until the mating surfaces of the seal meet. Install the capscrews and tighten evenly.

# PRESSURE RELIEF VALVE INSTRUCTIONS

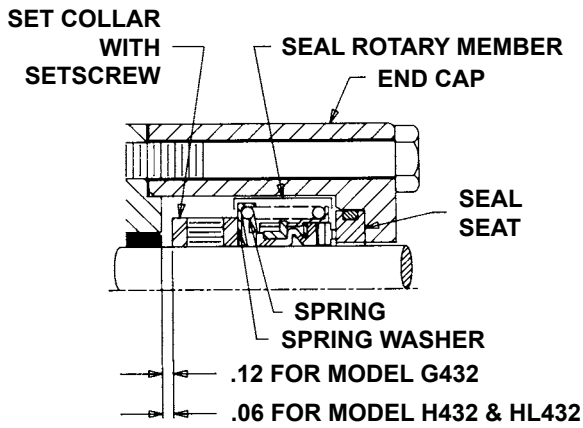


FIGURE 15 - SECTIONAL VIEW, SEAL AREA

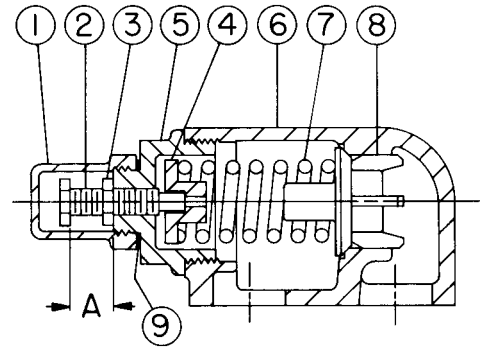


FIGURE 16 - SIZE G, H AND HL

## INSTALLATION OF CARBON GRAPHITE BUSHINGS

When installing carbon graphite bushings, extreme care must be taken to prevent breaking. Carbon graphite is a brittle material and easily cracked. If cracked, the bushing will quickly disintegrate. Using a lubricant and adding a chamfer on the bushing and the mating part will help in installation. The additional precautions listed below must be followed for proper installation:

1. A press must be used for installation.
2. Be certain bushing is started straight.
3. Do not stop pressing operation until bushing is in proper position. starting and stopping will result in a cracked bushing.
4. Check bushing for cracks after installation.

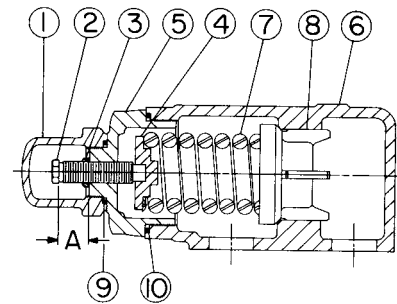


FIGURE 17 - SIZE AK AND AL

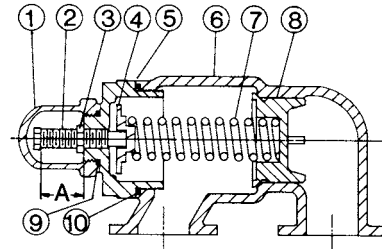


FIGURE 18 - SIZE K, KK, L, LQ AND LL

| VALVE - LIST OF PARTS |                   |
|-----------------------|-------------------|
| 1. Valve Cap          | 6. Valve Body     |
| 2. Adjusting Screw    | 7. Valve Spring   |
| 3. Lock Nut           | 8. Poppet         |
| 4. Spring Guide       | 9. Cap Gasket     |
| 5. Bonnet             | 10. Bonnet O-ring |

## 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.**

Mark valve and head before disassembly to insure proper reassembly.

1. Remove valve cap.
2. Measure and record length of extension of adjusting screw. Refer to "A" on Figures 16, 17 and 18, page 8.
3. Loosen locknut and back out adjusting screw until spring pressure is released.
4. Remove bonnet, spring guide, spring and poppet from valve body. Clean and inspect all parts for wear or damage and replace as necessary.

## ASSEMBLY

### DANGER !

Before starting pump, be sure all drive equipment guards are in place.

**Failure to properly mount guards may result in serious injury or death.**

Reverse procedures outlined under Disassembly. If valve is removed for repairs, be sure to replace in same position. Relief valve adjusting screw cap must always point towards suction side of pump. If pump rotation is reversed, remove relief valve and turn end for end. Refer to Figures 1, 2, and 4, page 1.

## PRESSURE ADJUSTMENT

If a new spring is installed or if pressure setting of pressure relief valve is to be changed from that which the factory has set, the following instructions must be carefully followed.

1. Install a pressure gauge in discharge line for actual adjustment operation. Do not deadhead pump for more than 30 seconds at a time.
2. Carefully remove valve cap which covers adjusting screw.  
Loosen locknut which locks adjusting screw so pressure setting will not change during operation of pump.
3. Turn adjusting screw in to increase pressure and out to decrease pressure.
4. With discharge line closed at a point beyond pressure gauge, gauge will show maximum pressure valve will allow while pump is in operation.

## IMPORTANT

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

**VIKING  
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# TECHNICAL SERVICE MANUAL

GENERAL PURPOSE PUMPS

SERIES 32 AND 432

SIZES G - N

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## 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.

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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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