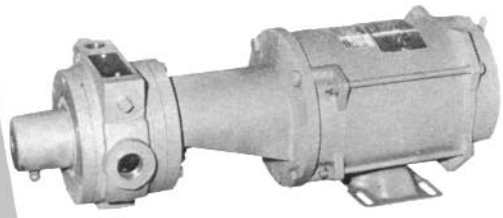
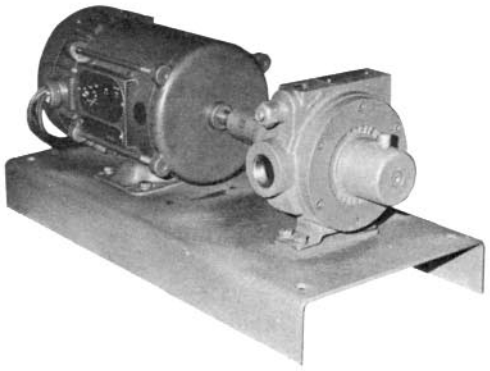
IMPORTANT INSTRUCTIONS





CORO-VANE® BOTTLE FILLING PUMPS

WARNING: (1) Periodic inspection and maintenance of Corken products is essential. (2) Inspection, maintenance and installation of Corken products must be made only by experienced, trained and qualified personnel. (3) Maintenance, use and installation of Corken products must comply with Corken instructions, applicable laws and safety standards (such as NFPA Pamphlet 58 for LP-Gas and ANSI K61.1-1972 for Anhydrous Ammonia). (4) Transfer of toxic, dangerous, flammable or explosive substances using Corken products is at user's risk and equipment should be operated only by qualified personnel according to applicable laws and safety standards.

CORKEN®
IDEX

WARNING

Install, use and maintain this equipment according to CORKEN instructions and all applicable federal, state, local laws and codes, and NFPA Pamphlet 58 for LP-Gas or ANSI K61.1-1972 for Anhydrous Ammonia). Periodic inspection and maintenance is essential.

CORKEN ONE YEAR LIMITED WARRANTY

CORKEN warrants that its products will be free from defects in material and workmanship for a period of 12 months following date of purchase from CORKEN. CORKEN products which fail within the warranty period due to defects in material or workmanship will be repaired or replaced, at CORKEN's option, when returned, freight prepaid, to:

CORKEN, INC.
3805 N.W. 36th St.
Oklahoma City, Oklahoma 73112.

Parts subject to wear or abuse, such as mechanical seals, blades, piston rings, and packing, and other parts showing signs of abuse are not covered by this limited warranty. Also, equipment, parts and accessories not manufactured by CORKEN but furnished with CORKEN products are not covered by this limited warranty and the purchaser must look to the original manufacturer's warranty, if any. This limited warranty is void if the CORKEN product has been altered or repaired without the consent of CORKEN.

All implied warranties, including any implied warranty of merchantability or fitness for a particular purpose, are expressly negated to the extent permitted by law and shall in no event extend beyond the expressed warranty period.

CORKEN DISCLAIMS ANY LIABILITY FOR CONSEQUENTIAL DAMAGES DUE TO BREACH OF ANY WRITTEN OR IMPLIED WARRANTY ON CORKEN PRODUCTS. Transfer of toxic, dangerous, flammable or explosive substances using CORKEN PRODUCTS **is at the user's risk.** Such substances should be handled by **experienced, trained personnel in compliance with governmental and industrial safety standards.**

WRITING THE FACTORY

If you have occasion to write the factory about your equipment, please tell us the Serial Number. This Serial Number directs us to a file containing all information on material specifications and test data applying to your unit as well as to when it was built. For your convenience, the Model and Serial Numbers are shown on the nameplate of the unit. Space is provided below for you to keep a written record of this information.

Always include the Model and Serial Numbers when ordering parts. This assures you of getting the correct replacements for your machine. The construction details in these instructions are for reference only; your CORKEN Service Manual should be consulted for the actual Part Numbers.

Model No._____ Serial No._____

Date Purchased_____ Date Installed_____

Purchased From_____

Installed By_____

Temporary Instructions

Coro-Vane Bottle Filling Pump
(Model 51)

GENERAL DESCRIPTION

These pumps are specifically designed for filling small LP-gas bottles but are equally well suited for other low capacity LP-gas fueling and transfer applications. The refrigerant gases and other non-corrosive liquefied gases can also be handled. These are moderate duty pumps for intermittent service. The Corken Coro-Flo pumps are recommended for continuous duty applications.

As with all liquefied gas pumps, proper installation is essential for the long trouble-free service you can expect from your Corken pump.

The Model 51 Coro-Vane pumps are positive displacement rotary sliding-vane pumps designed for operating speeds up to 1750 RPM. They are a smaller version of the Corken standard Coro-Vane pump and are built to the same high standards that have characterized Corken volatile liquid transfer pumps for over 25 years.

The sliding vane pumping principle is quite simple. Liquid flows into the cresent-shaped pumping chamber, is trapped in the pocket formed between successive sliding blades and the rotor, and is carried around to the discharge port where the tapered chamber forces the liquid out. (See cross section drawings) Centrifugal force and controlled liquid pressure under the blades move them out radially to track the surface of the pumping chamber. No springs, rods or mechanical means are required to activate the blades, so they will wear slowly and evenly without reduction in pump capacity.

CONSTRUCTION DETAILS

Bearings:

Heavy duty roller bearings give long life and allow the rotor and shaft assembly to "float". This means that no precise adjustment is necessary to position the rotor in the case. The hardened shaft surface acts as the inner bearing race. The bearings have integral seals which eliminate the need for separate grease seals and 'O'rings. The outward turned lip on the outboard bearing seal also acts as a grease relief to prevent over lubrication.

Sideplates:

The sideplates are replaceable and reversible for wear. This is a quality feature generally found only in much larger pumps.

Mechanical Seals:

The mechanical seal is basically the same as that used in the Corken Coro-Flo pumps. It is a hydraulically balanced seal specifically designed for long life with high pressure volatile liquids. Also included is the exclusive Teflon Coro-Seal which eliminates the rubber 'O'ring under the seal carbon.

By-pass Valve:

An adjustable by-pass valve is built in to limit maximum pump differential pressure. Positive displacement pumps require this feature to prevent destructive pressures and to limit the motor loading. The by-pass valve is normally furnished for back-to-tank piping of the by-passed liquid, but removal of an internal plug and plugging of the external opening quickly modifies the pump for internal by-passing. In all but the most unusual applications, the external by-pass line is preferred for liquefied gas handling. If used as an internal valve, a separate external valve must be used too.

Mounting Styles:

The Model 51 pumps are available in two basic styles: Frame Mounted for mounting on a baseplate to be directly driven with motor or engine (F51) and Close Coupled (C51) where the pump is mounted directly on any NEMA 56 or 66 C-face electric motor. The Close Coupled pump includes the motor mounting bracket and the shaft coupling.

INSTALLATION OF YOUR CORO-VANE PUMP

General

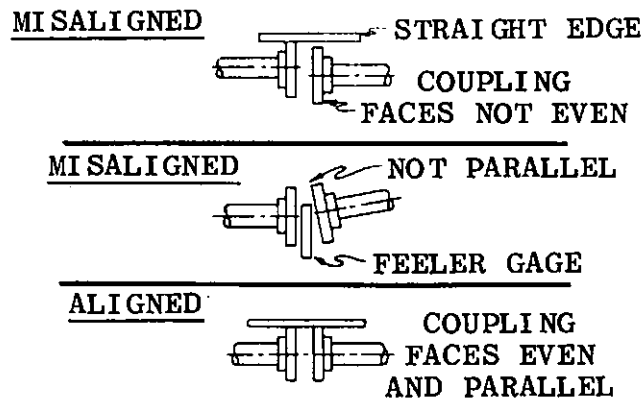
Proper installation of the Coro-Vane pump is no more difficult or costly than improper work would be, but your ultimate satisfaction will hinge greatly on how well the instructions below are followed. The pump should be located as near the storage tank as possible. This holds down piping costs and eliminates unnecessary pressure losses through long inlet lines. This also minimizes the possibility of vaporization in the inlet line...a real problem with liquefied gas pumping. As with all liquefied gas handling, the higher the tank is relative to the pump the better. Nevertheless, you will get good service from your Corken pump, with good piping, with no more static head than would be available to flood the pump suction. Proper engineering on a liquefied gas piping system requires the liquid to flow into the pump suction by gravity. You should not rely on the pump "pulling" the liquid in.

Foundation

The pump should always be mounted on a firm foundation. The Close Coupled pump is designed to be bolted directly to any standard NEMA 56 or 66 C-face motor with four 3/8 x 1 inch cap screws. The feet on the motor will support both the motor and the pump. The frame mounted pump and its driver should be bolted to a steel baseplate on a solid foundation.

Coupling Alignment

The pump and motor on the Frame Mounted pump must be carefully aligned after installation to assure long life and quiet operation. Although your pump was aligned at the factory (if Corken mounted the driver), it is essential that the pump - motor be realigned before startup. Shipping and installation stresses may have disturbed the alignment. The drawing shows the two ways a coupling can be misaligned and how the proper alignment looks. Lay a straight edge across the coupling halves in two places 90 degrees apart. Both positions must be lined up.



Inlet Piping

As mentioned above, the pumping of volatile liquids requires well designed inlet piping. It is generally a good idea to size the suction pipe one size larger than the suction opening of the pump. Good practice would therefore dictate the use of 1¼ inch piping on the suction side of a pump with a 1 inch inlet. All inlet piping should be level or sloped downward toward the pump. This prevents the entrapment of a large vapor bubble in the suction piping that would restrict the flow of liquid into the pump. For LP-gas installations, all piping, valves, fittings and electrical wiring must be in accordance with the National Fire Protection Association Pamphlet No. 58, Standard for the Storage and Handling of Liquefied Petroleum Gases. Copies of this are available from the NFPA, 30 Battery March Street, Boston, Mass. 02110. You should also check all federal, state and local laws and codes.

The tank excess flow valve should have a flow rate of one and one half to two times the capacity of the pump. Never use an excess flow valve without knowing its flow capacity. The tank shut-off valve should be an angle valve or a free flow type. Do not use a standard globe valve.

Always install a strainer in your inlet piping system. This is essential for long pumping and seal life. The strainer should be of the "Y" type with 1/16 inch (.16 centimeter) mesh screen.

It is recommended that a flexible connection be used either on the pump inlet or outlet to eliminate piping strains. Unions in the piping should be installed so that the pump can be readily removed.

When reducing down from the 1¼ inch piping to the 1 inch NPT pump inlet, an eccentric swage should be used with the flat side on top. This helps to prevent entrapment of vapor in the suction piping.

If you find it necessary to compromise any of the foregoing instructions in regard to suction piping design, it would be wise to install a Corken SF-200 1¼ inch Sight Flow Glass immediately up-stream of the eccentric reducer. This will enable the system operator to observe suction conditions.

Any fairly strong man with a big enough pipe wrench can easily crack a pump nozzle or spring a pump out of alignment unless a back-up wrench is used on the pump nozzle. Use the proper wrench size and be sure that the pipe threads are clean and well doped with a proper thread seal for the service.

Outlet Piping

A pressure gauge should be mounted near the outlet of the pump. A ¼ inch NPT opening is provided in the case of your small Coro-Vane just above the discharge nozzle. This gauge is one of the earliest indicators in case of a malfunction in the system. A hydrostatic relief valve must be installed in any of the piping where liquid can be trapped between two valves. This is most easily accomplished with a Tee in a position where you would already need an elbow. A ¼ inch hydrostatic relief valve set at 350 to 375 psi (24.6 to 26.4 kilograms per square centimeter) should be sufficient.

The outlet piping system will vary with the application, but whether you are using pipe or hose, a ½ inch line should be sufficient for most cases. If the outlet piping exceed 50 feet (15 meters) it is good practice to install a check valve near the pump.

By-pass System

The built in by-pass in your Coro-Vane pump may be piped internally or externally. The external style is the factory standard, but this can easily be converted by removing the 1/8 inch NPT plug reference No. 25 on the cross sectional drawing. This is a "flush seal" low profile socket head pipe plug. The by-passed liquid is then circulated through the pump rather than piped out the ½ inch NPT opening shown on the cross sectional drawing.

If by-passing internally, a separate external by-pass valve is required; use a 3/4 inch Corken Model B166. The inlet of the valve is connected to the pump discharge and the outlet of the valve is piped to the storage tank. The tank fitting should be an excess flow valve or vapor return valve. The external valve should be set at a pressure slightly below that of the internal valve.

Motor Installation

A NEMA 56 or 66 C-face motor can be bolted directly to the bracket on the Model C51 using four 3/8 inch diameter bolts 1 inch long.

The wiring of your electric motor is extremely important and must be done by a competent electrician. Minimum standards for wire sizes are given in Table 1. Improper motor wiring will cause you to experience expensive motor difficulties from low voltage. If you suspect that you have a low voltage problem, call your power company. On LP-gas installations, remember to consult NFPA Pamphlet No. 58.

A humid climate can cause problems, particularly in explosion motor applications. The normal breathing of the motor, and alternating between being warm when running and being cool when stopped, often will cause moisture to be drawn into the pump housing. This moist air will condense and may eventually add enough free water to the inside of the motor to cause it to fail. To prevent this, make a practice of running the motor at least once a week on a bright, dry day for an hour or so with the coupling halves separated. In this period of time the motor will heat up and vaporize the condensed water, driving it from the motor. No motor manufacturer will guarantee his explosion proof or totally enclosed (TEFC) motor against damage from moisture.

Engine drivers pose a special consideration, and the particular manufacturer installation instructions must be followed. If your Coro-Vane is equipped with an engine from the factory, the engine speed should not exceed the desired pump speed for the application.

The horsepower requirement of the pump and the output horsepower of the engine must be carefully balanced. An engine loses about 3% of its power for every 1000 feet (305 meters) above sea level, so if your installation is at a high altitude and this was not taken into prior consideration, consult the factory.

MOTOR				(a) Recommended Wire Size, AWG		
				Length of Run in Feet		
Hp.	Motor Phase	Volts	Approx. Full Load Amperes	0--100	to 200	to 300
1/3	1	115	7.2	14		
		230	3.6	14		
	3	220	1.2	14		
		440	0.6	14		
1/2	1	115	9.8	14		
		230	4.9	14		
	3	220	1.7	14		
		440	0.85	14		
3/4	1	115	10.0	12	8	6
		230	5.0	14	14	12
	3	220	2.4	14	14	14
		440	1.2	14	14	14
1	1	115	13.0	10	8	6
		230	6.5	12	12	12
	3	220	3.0	14	14	14
		440	1.5	14	14	14

Initial Operation of your Coro-Vane Pump

Starting the Pump

Check the motor for proper voltage. See instructions under "driver installation" above. Close the shut-off valve at the end of the delivery hose. Then open the storage tank bottom shut-off valve in your inlet line; do this slowly to avoid slugging the excess flow valve.

If your pump is set up to by-pass externally, open the storage tank shut-off valve in the by-pass system. Start the pump, by-passing the liquid. When adjusting the internal by-pass, do so for as short a period of time as possible. By-passing internally for any length of time will cause the liquid to hear up and eventually "flash" (or vaporize) letting the pump run dry. This can cause early failure, particularly to the seals.

By-pass Setting

The built-in by-pass valve is adjusted very easily. Remove the 1/8 inch pipe plug (reference No. 23 in the cross sectional drawing) carefully as it may have pressure behind it. There may be a very slight amount of leakage around the stem seal, however, this does not indicate a failure of any kind. To set the valve at the desired pressure, just turn the stem in (clockwise) to increase the pressure and out (counter clockwise) to decrease it. Always replace the plug (reference No. 23) after adjustment.

If a B166 external by-pass valve is used, install it according to the instructions furnished with it. Set the pressure on the B166 slightly lower than that of the built-in valve.

The valve in your Coro-Vane is designed to operate in a range from about 60 psi (4.22 kilograms per square centimeter) differential to about 125 psi (8.79 kilograms per square centimeter) differential. For settings below 60 psi, remove the inner relief valve spring (reference No. 20 in the cross sectional drawing). Note: On LP-gas installations, a maximum differential pressure of 125 psi is allowed by the Underwriters' Laboratories Inc. and NFPA Pamphlet No. 58. In most cases the motor size will be the limiting factor on differential pressure with the Model 51. The table below shows the maximum intermittent differential pressure for various drivers.

Driver Size, Horsepower	Maximum Differential Pressure psid (kg/cm^2)
1/2	125 (8.79)
Briggs & Stratton 146402 1800 RPM	125 (8.79)

Motor Overload and Reset

If the motor stops because the differential pressure has caused the pump to overload the motor, turn the starter to the "off" position, and wait a few minutes for the motor to cool off. If the motor has a manual reset thermal overload, gently push the reset button. Then, turn the starter to the "reset" position and back to the "on" position. If the motor has cooled sufficiently, it will restart.

Filling New Cylinders and Tanks

All new cylinders are full of air and must be purged. Purging air from new cylinders is very important, in fact, essential, to assure relatively easy filling of any liquefied gas and proper gas supply to burners, carburetors, and aerosol systems. This air content would be compressed to 10 to 15% of its initial volume when the tank is filled. Therefore, in this case, if the air is not purged, the pressure required just to compress the air would be over 100 psi (7.03 kilograms per square centimeter) which would be added to that necessary to force the liquid into the cylinder. This, of course, would overload the pump and motor needlessly. All new containers regardless of size can be purged. Feed vapor if possible, but liquid if necessary, into the tank slowly until its pressure gauges indicate about 10 to 20 psi (0.703 to 1.406 kilograms per square centimeter): wait a few minutes to allow the gas and air to separate. If the gas is heavier than air (such as with LP-gas) open a valve on top of the tank to the atmosphere, letting the air blow out. If the air is heavier than the gas use a bottom opening or turn the container upside down. Continue purging until vapor appears; it will generally look like heat waves.

If you suspect that the container has moisture inside, purge for a short time through the bottom opening or turn the cylinder upside down. This will remove the moisture.

Some cylinders are difficult to fill because they are equipped with a fill tube that extends down into the liquid section. If possible, these should be refitted so the incoming liquid enters the vapor section of the cylinder. If refitting is impossible or impractical, rock the cylinder as it is being filled so that liquid will splash up into the vapor section; this will help keep the cylinder fill pressure down to a reasonable limit. A properly fitted cylinder with the correct filling manifold or connection will permit filling with no more than 50 to 60 psi (3.52 to 4.22 kilograms per square centimeter) differential pressure.

Do not blame the pump for not filling a container. Most complaints about bottle filling pumps are due entirely to the fact that the container is too small, the container or piping system is improperly fitted, or the container was never purged of air.

REPAIR SERVICE ON YOUR CORO-VANE PUMP

Routine Maintenance

Repair services is generally limited to replacing the sliding plastic vanes or the mechanical seals. When it comes time to order replacement parts be sure to consult your Corken Service Manual, Section B for the correct part number and include the pump Model and Serial Number. The only maintenance required on your pump is to lubricate the bearings; under normal service this should be every six months. The bearings were lubricated at the factory for initial operation.

The bearings in your pump are precision, heavy-duty roller bearings with integral seals. Use only ball or roller bearing grease such as Corken ball bearing grease; nothing else will do. A grease zerk fitting is provided on each end of the pump for easy lubrication. These fittings will fit most grease gunds. The Corken ball bearing grease comes in handy squeeze tubes with nozzle; just remove the zerk fittings and stick the nozzle of the tube in the opening. Always clean the area around the opening before greasing. If dirt is forced into the bearings, early failure will result. The outside bearing seal will act as a grease relief fitting. Do not overgrease.

After lubrication remove the zerk fitting and run the pump for several minutes. The bearings will force out excess grease, and they may continue to pump out a small amount of grease for a period of time after replacing the zerk fitting. More bearings are ruined by too much grease than by too little. The only other necessary maintenance is to lubricate your motor bearings and check your starter contact points. This should be done according to the manufacturer's recommendations.

Blades

The blades or vanes are the only real wearing part in the pumping chamber. They are easily replaced by removing one head and one sideplate. If the sideplate is difficult to remove, loosen the shaft coupling and push the rotor-shaft assembly against it. After replacing the blades make sure everything is lined up and turning free before tightening the bolts completely.

Before opening up the pump, an "efficiency" check is suggested. Close off the discharge and pump through the by-pass. If the unit builds about as much differential pressure as it did when new, the problem is in the system and not the blades and pump.

Mechanical Seals

The balanced seals in your Coro-Vane pump are designed specifically for low viscosity "thin" fluids such as LP-gas and other volatile liquids. Under the carbon of the seal is the exclusive Teflon* Coro-Seal to help insure long life.

Should replacement become necessary, full instructions are provided with the new seal assembly.

Sideplates

In some instances there will be wear on the sideplates. This can be due to misalignment, foreign material in the pump or running dry. The sideplates are completely reversible; just remove them and turn them around.

*Teflon is a registered trademark of DuPont

Coro-Vane Pump Trouble Shooting

In most cases problems with your Corken Coro-Vane pump can be solved quite simply. Table 6 lists some of the problems that occur with sliding vane pumps along with a list of possible causes. If you are having a problem which is not listed or if you cannot find the source of the problem, consult your nearest Corken distributor or the factory. For anyone to be able to help diagnose your pump and systems troubles, you will need to provide the following information:

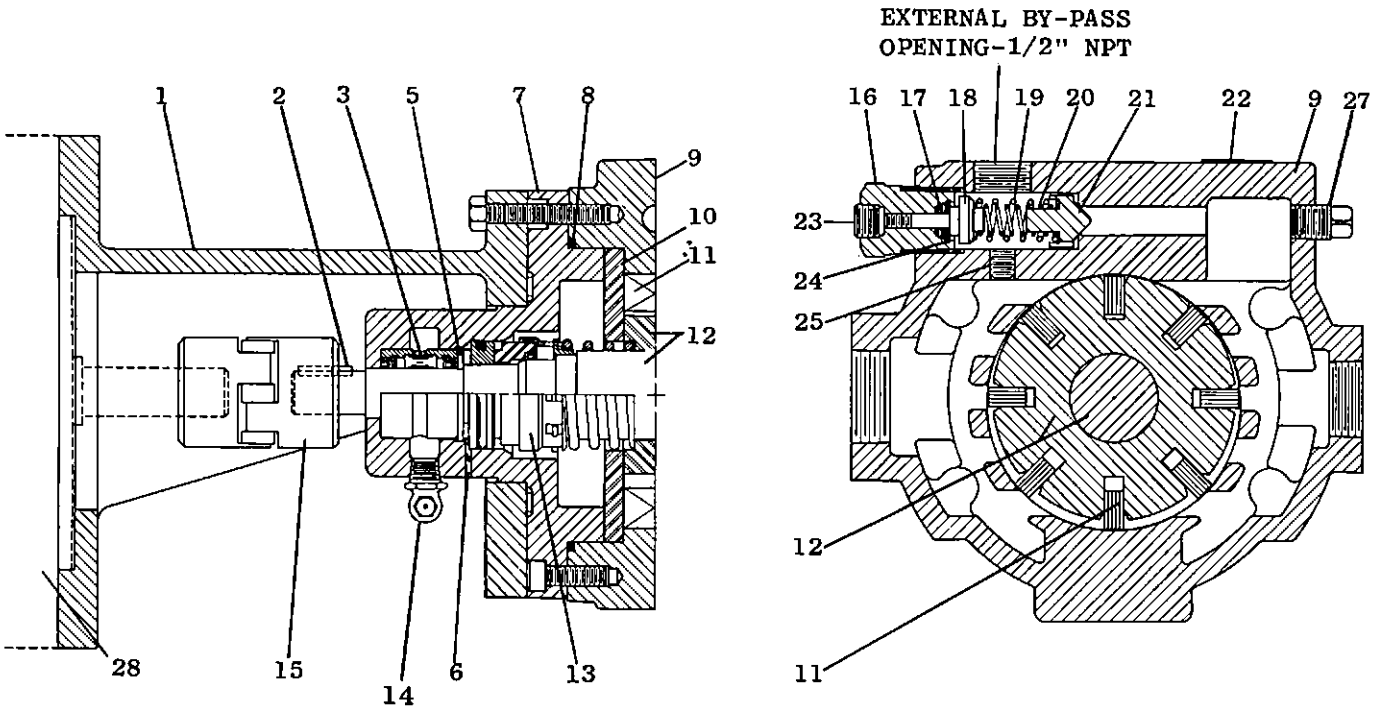
1. Pressure at pump suction
2. Pressure at pump discharge
3. Pressure in storage tank
4. Pressure in container being filled
5. Pipe size and length of suction and discharge lines
6. Pipe size and length of by-pass lines.
7. Pump Model Number
8. Pump Serial Number.

Coro-Vane Pump Trouble Shooting Guide

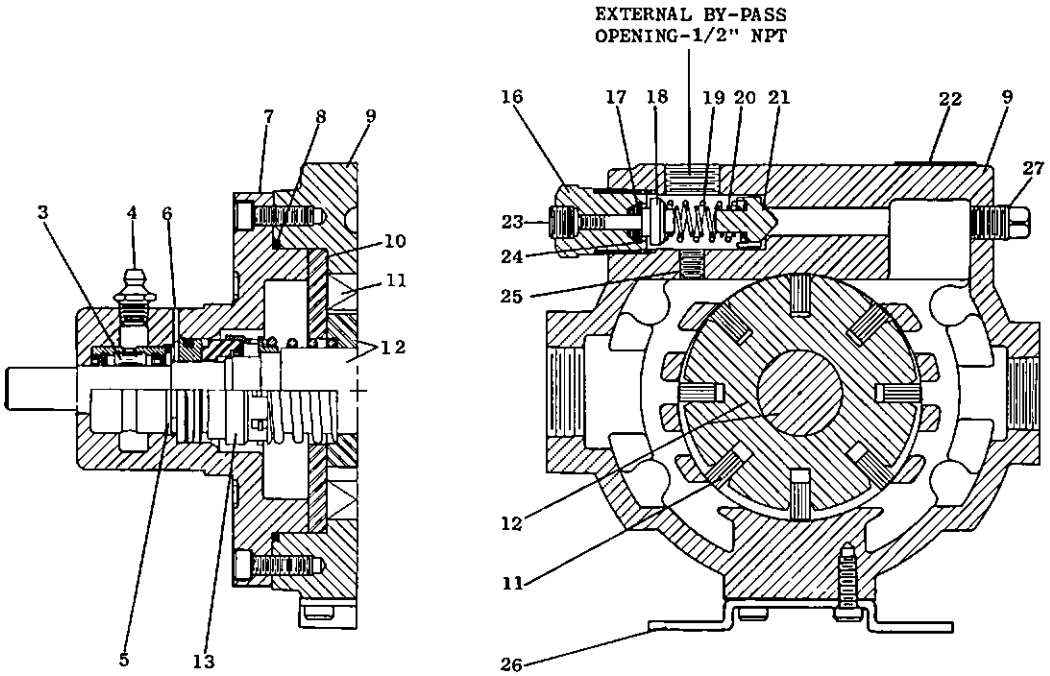
Problem	Possible Causes
Low Capacity	1,2,3,4,5,6,7,9
Pump Runs, But No Flow	4,7,8,10,11,13
Pump Will Not Turn (Locked)	8,12,14,16,17
Pump Will Not Build Pressure	2,3,5,6,7,9
Pump is Noisy	1,5,7,14,17
Pump Leaks Around Shaft	15
Motor Gets Hot - Motor or Switch Overload Trips Out	1,17,18,19,20

Ref.	Possible Causes	What to Do
1.	Differential Pressure is too high	Check for restriction in discharge; line may be too small. Container to be filled may need to be purged.
2.	By-Pass Valve Stuck	Inspect and clean or repair as necessary.
3.	By-Pass Valve Set Too Low	Re-adjust
4.	Clogged Strainer	Clean
5.	Suction Line is Too Small or restricted (indicated by drop in inlet pressure on start-up). Cavitation can be the result.	Find and remove restriction or modify piping. See "Inlet Piping".
6.	Worn Vanes	Replace
7.	Sticking Vanes	Clean out foreign matter and replace as necessary.
8.	Broken Vanes	Replace
9.	Worn Sideplates	Reverse or replace as necessary.
10.	Valve Closed	Open the valve.
11.	Excess Flow Valve Slugged	Stop pump until valve opens; if problem continues the valve may be too small.
12.	Foreign Matter in Pump	Clean pump and inspect the strainer screen
13.	Broken Shaft or Coupling	Inspect and replace parts as necessary
14.	Bearing Seized or Worn	Replace as necessary; Grease regularly
15.	Seal or 'O'ring Failure	Inspect and replace as necessary. Follow instructions with seal
16.	Moisture Frozen in Pump	Thaw and break loose carefully
17.	Coupling Misaligned	Check and align as discussed under "Coupling Alignment".
18.	Motor Overloaded	Check motor load with Ammeter. Check for low voltage at motor while pump is operating. Be sure the motor is wired for the proper voltage; consult motor nameplate and wiring diagram
19.	Starter Overload Heaters are too small	Check motor load with ammeter and confirm heater size with starter manufacturer's instructions
20.	Motor shorted out due to condensation	See "Driver Installation"

PARTS DETAILS
CORO-VANE PUMPS
C51A



PARTS DETAILS
CORO-VANE PUMPS
F51A



Reference Number	Part Name	Qty.
1	Mounting Bracket (Model C51)	1
2	Key - 1/8 Sq. x 16"	1
3	Roller Bearing (install with grease seals positioned as shown)	2
4	Grease Zerk - 1/8" NPT (Model F51)	2
	Lubricap #2 (Not shown)	2
5	Retainer Ring	2
6	Seat Location Pin	2
7	Head	2
8	Case 'O'ring	2
9	Case	1
10	Sideplate	2
11	Blade	8
12	Rotor and Shaft Assembly	1
13(a)	Seal Assembly	2
14	Elbow Grease Zerk - 1/8" NPT (Model C51)	2
	Lubricap #2 (Not shown)	2
15	Coupling	1
16	Relief Valve Plug	1
17	Stem Seal	1
18	Adjusting Stem Assembly	1
19	Outer Relief Valve Spring	1
20	Inner Relief Valve Spring	1
21	Relief Valve	1
22	Nameplate	1
23	Flush Seal Plug - 1/8" NPT (Always replace after adjusting relief valve)	1
24	Retainer Ring	1
25(b)	Flush Seal Plug - 1/8" NPT	1
26	Base (Model F51)	1
27	Pipe Plug - 1/4" NPT	1
28	Motor (Model C51)	1



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