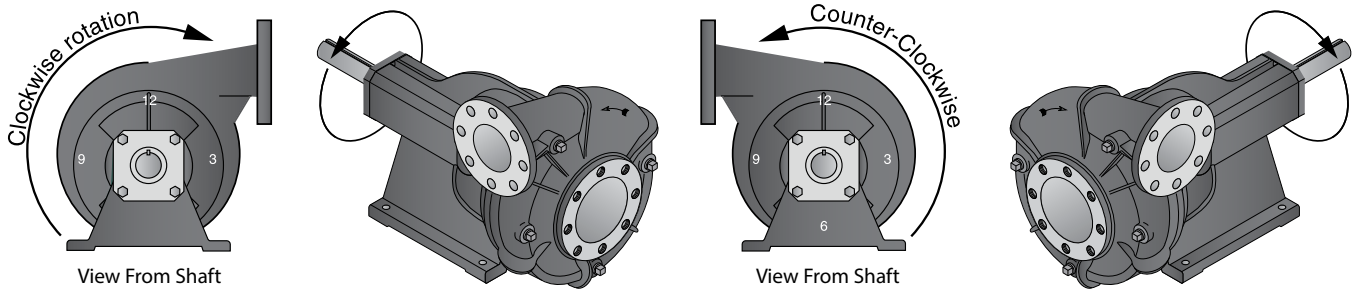
GENERAL PUMP INFORMATION & MAINTENANCE

Centrifugal pumps come in Clockwise (CW) and Counterclockwise (CCW) configurations. CW pumps are used with automatic transmissions, while CCW pumps are used with manual transmissions. A pump running in the wrong direction will still pump liquid, however GPM and head will be a fraction of the published performance. Before a pump is put into operation, rotational direction must be checked to ensure proper performance of pump. Refer to illustration below:



Using Cable or Air Shift PTO:

» **IMPORTANT:** To avoid Transmission or PTO damage, only engage the PTO while the truck is standing still, NEVER while moving. DO NOT close spray heads under full pressure! Let the engine wind down with clutch disengaged before closing the spray head valves to avoid pump or spray head damage.

Lubrication:

» **IMPORTANT:** Never run a pump without water, doing so will cause overheating and damage to internal parts. Grease should be added to the bearing frame as required by daily and weekly routine inspections. Add only enough of a lithium-based NGLI No. 2 extra pressure ball bearing grease to coat each bearing, excess grease will cause bearings to run hot. The liquid end of the pump requires no lubrication. Wear rings, packing rings, and models using a mechanical shaft seal are lubricated and cooled by the liquid being pumped.

Starting a New Mechanical Seal Pump:

Adjustment or maintenance of a mechanical seal is normally not required. The seal is enclosed within the pump and is self-adjusting. Seal is cooled and lubricated by the liquid being pumped.

Starting a New Rope Seal Pump:

Loosen rope packing gland nuts and re-tighten finger tight. Once running, allow packing to leak liberally for a few moments, then tighten gland nuts one complete turn each until leakage is reduced to 40 to 60 drops per minute. Over-tightening of packing will cause damage to shaft and promote further leakage.

A well maintained pumping system will extend the life of the unit, requiring fewer repairs. This means less down-time which can be very critical when a constant delivery of water is required.

A routine maintenance and inspection schedule should be set up on a weekly, quarterly, and annual basis with records kept of these actions.

WEEKLY MAINTENANCE

Observe the following to verify that the pump unit is operating properly:

- Vibration – All rotating machines can be expected to produce some vibration. However excessive vibration can reduce the life of the unit. If the vibration seems excessive, discontinue operation to determine cause and correct.

- Noise – When the unit is operating under load, listen closely for unusual sounds that might indicate the unit is in distress. Determine the cause and correct.

- Operating Temperature – During operation, heat is dissipated from the pump bearings and the driver. After a short period of time the surface of the pump bracket may reach temperatures as high as 150°F, which is normal. If the surface temperature of the pump bracket or driver is excessive, discontinue operation and determine the cause of the temperature rise to correct. Bearings will run hotter for a brief run-in period after packing which is normal. However, worn bearings will cause excessive temperatures and need to be replaced.

  The pump unit is cooled by the water flowing through it, and will normally be at the temperature of the pumping liquid.

- Rope Packing Box – After a short period of operation, verify that the rope packing box and gland are not hot. If heat is detected, loosen the gland nuts evenly until water begins to drip from the packing box. Water must not be streaming or spraying out. Verify cool operation periodically. Adjust gland nuts EVENLY as necessary until 40-60 drops per minute is achieved. If packing has been tightened to the limit of the packing gland travel, additional packing may be necessary.

- Mechanical Seal – Inspect seal for leakage. There should be no leakage from a mechanical seal, if there is, it needs to be replaced.

- Inspect suction line and/or screen for flow obstruction.

QUARTERLY MAINTENANCE

- Pump and Piping Connections – Inspect all system piping connections for leakage or possible misalignment. Misalignment of pipe connections to the pump will put excessive strain on the pump case and can cause damage to internal components of both the pump and motor. If stress on the pump case is suspected, adjust pipe supports to correct.

  For flange connections, misalignment can be checked by shutting down the pump, and removing the pipe flange bolts on the pump connections. If the mating flanges come apart or shift, there is pressure at the connection(s) and adjustments should be made to the piping supports until flanges mate without force. This procedure can be done throughout the piping system.

- Check pump foundation integrity and ensure all hold-down bolts are secure.
- Complete any lubrication requirements.
- Inspect packing or mechanical seal for possible replacement. Examine shaft sleeve if present for wear and replace it if necessary.
- Inspect pumping plant panel for signs of wear and replace/repair worn parts.
- Check pump bearings for signs of wear. Repack, grease or replace as necessary.

ANNUAL MAINTENANCE

- Inspect pump and entire pumping system for signs of wear.
- Inspect system valves, screens, gaskets, diaphragms etc.
- Check pump impeller eye clearance.
- Inspect impeller, volute case, and seal chamber for signs of excessive wear or corrosion.

WINTERIZING

The following storage procedures should be observed when a pump will be out of service for more than a month:

- Remove exterior dirt, grime or any substance that may trap moisture. Prime exposed metal and repaint if necessary.
- Flush suction and discharge lines. Check for leaks at this time and replace any worn gaskets.

- Lubricate all bearings and seals.
- Dry the pump and if possible, keep unit clean and dry during storage period to guard against corrosion.
- Seal all open ports to keep out foreign objects such as insects, rodents, dust and dirt.
- Shelter pump from the elements when possible.
- Turn the driver shaft periodically to prevent freeze-up of internal components.
- Remove exterior dirt, grime or any substance that may trap moisture. Exposed metal is subject to oxidation, prime and repaint if necessary.
- Flush suction and discharge lines. Check for leaks at this time and replace any worn gaskets.

RECOMMENDED SPARES

It is recommended that the following spare parts be kept on-site as a minimum back-up to service pump and reduce down-time. Parts shown do not apply to all models. Check your model/style against parts breakdown drawing(s) when selecting spares.

- Mechanical Shaft Seal.
- Packing and packing gland.
- Shaft Sleeve(s).
- Impeller wear ring.
- All gaskets and O-Rings required for one pump.
- Retaining Rings.

If having a pump non-operational has severe consequences, a back-up pump should be considered. Otherwise a back-up impeller, volute case, bearings and shaft would be prudent.