

# Power Unit Systems

## Installation and Start-Up



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This system has been custom built to your specifications. Before operation, all service manuals, data sheets, specification sheets, warnings and cautions should be read and understood. It is the responsibility of the user to establish appropriate safety, health and training measures for all personnel installing, servicing and operating this equipment.

Optimum performance of the pump and accessories is dependent upon the entire liquid system and will be obtained only with the correct selection, installation and plumbing of any added components.

### POWER SOURCE

**⚠ WARNING: Do not service pump while energised. Moving, rotating or reciprocating parts can crush and cut, causing personal injury, death or property damage.**

**Electric Motor:** If equipped with an electric motor, it must be connected to an electrical source by a qualified electrician and must meet all local and state electrical codes. See specific application for the correct phase and voltage. Check for correct rotation.

**Combustion Engine:** If equipped with a combustion engine, it must be sufficiently filled with crankcase oil, coolant (if applicable) and the correct fuel before operation. Units fitted with a clutch must have the clutch **disengaged** before starting the engine. Check for correct polarity of battery cables before wiring to the battery.

**Hydraulic Motor:** If equipped with a hydraulic motor, the oil requirements are located on the nameplate of the unit. The oil must meet the specifications set by the hydraulic motor manufacturer for type of oil and filtration necessary.

### HIGH PRESSURE WATER PUMP

Positive displacement pumps can cause severe injury. Read and understand all specification sheets, service manuals, warnings and cautions before operation. Identify your specific accessories and their functions before operation. Check oil level in the pump.

### PUMP ROTATION

The high pressure pump is designed with internal splash lubrication. Forward rotation (toward the liquid-end) is recommended to allow optimum lubrication of the crosshead area. Reverse rotation is acceptable if the crankcase oil level is increased slightly above the centre line of sight gauge to assure adequate lubrication.

### LOCATION

If the pump is used in extremely dirty or humid conditions, it is recommended that the pump be enclosed. Do not store or operate in excessively high temperature areas or without adequate ventilation.

### INLET CONDITIONS

Refer to Inlet Plumbing Recommendations in the Cat Pumps "High-Pressure System Design Guide" before starting system. **DO NOT RESTRICT THE PUMP INLET FEED OR RUN DRY.** Installation of an inlet pressure stabiliser is recommended in applications with stressful inlet conditions such as high temperatures, booster pump feed, long inlet lines or quick closing valves. The inlet pressure stabiliser should not be used with a negative suction inlet.

## DISCHARGE CONDITIONS

OPEN ALL VALVES BEFORE STARTING SYSTEM to avoid a deadhead or overpressure condition that could result in severe damage to the pump or system. Use reinforced, flexible hose of appropriate pressure rating upstream of connection to rigid plumbing. Review Typical Installation diagram or contact factory for assistance in placement of system accessories.

**A Pressure Gauge** of appropriate pressure rating should be installed at the pump discharge manifold or in the discharge line near the pump head. This is extremely important in adjusting the pressure regulating devices and also for correct sizing of the nozzle or restricting orifice. The pump is rated for a maximum pressure; this is the pressure that is read at the discharge manifold (head) of the pump, not at the gun or nozzle.

**⚠ WARNING: Do not operate high-pressure pumping system unless all safety precautions have been observed. A high-pressure pumping system can deadhead or over-pressurise, causing serious personal injury and property damage.**

All high-pressure systems require a primary pressure regulating device (i.e., regulator, unloader) and a secondary pressure safety relief device (i.e., pop-off valve, relief valve, rupture disc) to provide correct pressure setting and over-pressure protection.

**A Pressure Regulator or Unloader Valve** (primary device) of appropriate pressure rating must be installed on the discharge side of the pump. Its function is to prevent over pressurising the pump in the event the discharge or downstream plumbing becomes plugged or is turned off. Severe damage to the pump will result if this condition occurs without a relief valve in the line.

**NOTE: Failure to install such a pressure regulating valve will void the warranty of the pump. Discharge regulating devices should be at minimum pressure setting at start-up.**

**A Relief or Pop-off Valve** (secondary device) of appropriate pressure rating must be installed between the primary device and pump. It serves as additional protection in the event the primary pressure regulating device malfunctions.

**NOTE: Failure to install such a relief valve will void the warranty of the pump. Secondary relief device should not be tampered with.**

**A Pulsation Dampening** device of appropriate pressure rating should be installed directly onto the discharge manifold (head) or in the discharge line near the head. Be certain the pulsation dampener is correctly sized for the system specification and pre-charged for the system pressure (see individual pulsation dampener data sheet.)

**A Bypass Line** can be routed to a supply tank, drain or to the pump inlet. If routed to the pump inlet, the bypass liquid can quickly develop excessive heat and result in damage to the pump. A thermal relief valve installed in the bypass line is recommended to protect the pump. An auto shut-off assembly may also be used.

## NOZZLES

A worn nozzle will result in loss of pressure. Do not adjust pressure regulating device to compensate. Replace nozzle(s) and reset regulating device to system pressure and secondary relief valve approximately 10 Bar above the primary valve pressure setting.

## PUMPED LIQUIDS

Some liquids may require a pump flush between operations or before storing. Standard pH range for Cat Pumps is 5 to 9. Viscosity should not exceed 500 cP or 2500 SSU. High temperature or high vapour liquids may require special installation. For pumping liquids other than water, contact your Cat Pumps supplier.

## STORING

For extended storing or between uses in cold climates, drain all pumped liquids from pump and flush with antifreeze solution to prevent freezing and damage to the pump. (Refer to Tech Bulletin 083).

**⚠ CAUTION: Do not operate the pump with frozen liquid. Operating the pump under this condition could over-pressurise and jettison the manifold from the crankcase, causing personal injury and property damage.**