

Pyrolance, LLC

== B-2000 M-P, PTO, Manual - 2013.002 11/26/13 ==

SPECIFICATIONS FOR

PTO-HYDRAULIC DRIVEN

ULTRA HIGH PRESSURE

FIRE FIGHTING SYSTEM

B 2000 M-P

Pyrolance, LLC

SPECIFICATIONS FOR FIRE FIGHTING SYSTEM

HIGH PRESSURE FIRE FIGHTING SPECIFICATIONS

Scope and General Design Requirements

A fire-fighting system shall be provided for offensively attacking a fire. The high pressure fire-fighting system shall allow the operator to attack fire from a safe position. The system shall be extremely effective in fire attack operations with limited water supplies.

Components and Base Plate Design

The fire-fighting system shall consist of:

- Hydraulic Drive Package (Pump, Motor, Reservoir, Cooler, Control Valve)(PTO supplied by fire truck OEM)
- Water pump: High pressure positive displacement piston pump
- Hose Reel: Ultra-high pressure hose reel and attack hose
- Nozzle: Manually operated ultra-high pressure pistol grip style fog nozzle

The major components shall be assembled on a removable assembly. The entire system shall be designed to be a quickly installed or removable module.

Performance Capabilities

The fire-fighting system shall be tested and proven to be highly effective in the following scenarios:

- Wildland, grass, and brush fire applications
- Automobile and truck fires
- Limited structural fires
- Confined or concealed space fires
- Limited industrial fires
- Shipboard and marine firefighting
- Military fire-fighting applications
- Container fires

ENCLOSURE MOUNTING

The fire-fighting system shall be packaged in a self-supporting framework with dimensions of 36" (915 mm) wide, 24" (610 mm) deep, and 26" (660 mm) high. The mounting assembly shall be powder coated and shall be designed to contain the specified major components of the system.

ULTRA-HIGH PRESSURE FIRE PUMP SPECIFICATIONS

Pyrolance, LLC

The fire-fighting system shall be equipped with a heavy duty ultra-high pressure plunger type positive displacement fire pump.

The pump shall have the following features:

- Pump rating: 20 GPM @ 2,200 PSI (80 LPM @ 150 bar)
- System operational rating: 20 GPM @ 1,400PSI (80 LPM @ 100 bar)
- Brass Manifold
- Stainless Steel Check Valve
- Stainless Steel Plunger Rods
- Bronze Connecting Rods
- Tapered Roller Bearings
- Solid Ceramic Plungers
- Heavy Duty Flat Base
- High Pressure Seals
- Heat Treated Crankshaft

HYDRAULIC DRIVE SYSTEM SPECIFICATIONS

The hydraulically driven ultra high pressure water pump shall be controlled by a PTO that is activated on the pump control panel via the master PTO switch. The hydraulic drive motor shall be engaged via a pressure compensating hydraulic pump flow control switch which will activate when water flow in the fire pump circuit is sensed. This allows the variable speed hydraulic drive pump to spool up to maximum flow regardless of engine RPM with high idle being the starting point.

If the flow condition in the water circuit is stopped it will the pump will be put into standby mode that will allow the hydraulic pump to flow 1 GPM @2400PSI until the situation is reversed. As soon as water begins to flow again through the UHP fire pump, the demand on the hydraulic drive pump will return the system to pumping the full rated hydraulic pump capacity regardless of engine RPM.

The system shall:

1. Reduce engine RPM when the pump is in by-pass.
2. Prolong pump life by reducing potential heat build-up while the pump is in by-pass.
3. Allow the PyroLance system to be shut down in case of emergency by activating the Master/Emergency stop switch.
4. Allow rapid on/off throttle response eliminating pressure control delays when the PyroLance system is in operation.

Hydraulic drive system shall consist of the following components (supplied by PyroLance, except the PTO and Hydraulic Motor):

- Hydraulic Motor

Pyrolance, LLC

- 40 gallon (152 L) Hydraulic Reservoir
- Hydraulic Cooler
- Thermostat
- Hydraulic Pump*
- PTO *

The PTO and Hydraulic Pump shall be supplied and installed by the apparatus OEM truck builder. The PTO ratio and coupling shall be approved by PyroLance prior to the installation of the unit.

The system shall be capable of delivering full rated output at apparatus high idle rpm.

ELECTRIC SUPPLY CABLE AND CONNECTION

The unit shall be powered by the chassis power system. There shall be a 12V+ power stud, and a ground stud provided for the OEM / installer to power the system. The OEM / installer shall be responsible for supplying the power to the unit with a circuit breaker.

INSTRUCTIONS AND LABELING

A fire-fighting pump instruction nameplate and necessary warning labels shall be installed on the assembly. (English language)

PANEL LIGHT

The pump control panel shall be provided with an LED 12 volt light with switch.

PUMP CONTROL PANEL

The control panel shall be ergonomically designed and operator friendly. The panel shall be labeled and installed to be easily visible from the operator's position. The following instruments and controls shall be installed:

- Master electrical switch
- Emergency stop (red) switch
- Reel discharge control valve
- Control panel light and switch
- One (1) UHP pressure gauge
- Tank to pump open/closed switch

PLUMBING

The fire-fighting system shall be plumbed with high pressure hydraulic type hose, plumbing and fittings. This shall include double wire braided high pressure hoses of various sizes, zinc plated steel hose ends, and plated steel hydraulic fittings. The threads shall be male and female NPT, JIC and SAE O-ring style in various sizes. Rigid plumbing shall be in zinc plated steel piping with pipe fittings of zinc plated steel.

BYPASS UNLOADER VALVE

Pyrolance, LLC

The ultra-high pressure plumbing system shall include a bronze adjustable by-pass unloading valve set for the proper working pressure of the system. The valve shall unload the excess pressure to the intake side of the pump.

PRESSURE SAFETY, EASY START, THERMAL RELIEF VALVE

The ultra-high pressure plumbing system shall include the following devices:

- e.) One (1) pressure safety relief valve which shall relieve water pressure to atmosphere; set at a slightly higher pressure than the unloading valve.
- f.) One (1) thermal relief valve which shall open if water temperatures exceed 145 F (62 C) degrees; designed to protect the pump from high temperature conditions and relieve the water to atmosphere.
- g.) One (1) EZ start valve.

INTAKE FILTER

A 1-1/4" (31 mm) water filter with 32 mesh stainless steel screen shall be installed in the water supply line to the fire pump. The filter shall be accessible for cleaning the screen.

ELECTRICAL WIRING

Necessary low voltage automatic circuit breaker protection shall be provide where required. Wiring shall be stranded copper automotive type, sized for the appropriate electrical load. Exposed wiring shall be protected with convoluted split plastic loom; such looms shall be mechanically secured. Wiring shall be run in protected areas or enclosed in metal panels where subject to mechanical injury. Electrical connections and termination of wiring shall be within weather proof plastic enclosures with waterproof strain reliefs and connectors.

NO WATER TANK SUPPLY LINE

No tank to pump valve shall be used with the system. Water shall be constantly supplied to the UHP pump.

DISCHARGE PRESSURE GAUGE

One (1) 2.5" (62 mm) liquid filled pressure gauge shall be installed from the discharge side of the ultra-high pressure fire pump, with the gauge mounted on the pump panel.

THROTTLE CONTROL GOVERNOR (OEM SUPPLIED)

Once the PyroLance system is engaged the engine RPM shall be controlled by an electronic throttle control governor via the wireless remote control nozzle, which shall automatically increase engine speed to 1,450 RPM when actuated, and when released return the engine speed to idle.

The electronic throttle control governor is an engine type specific part and shall be supplied and fitted by the OEM in consultation with the specific engine/chassis manufacturer.

The electronic throttle control governor shall be interfaced with the engine electronic control module (ECM) and will be active once the PyroLance system is engaged and master/emergency stop switch is activated on the PyroLance control panel.

Pyrolance, LLC

The system shall:

- Reduce engine RPM when the pump is in by-pass resulting in reduced engine wear.
- Prolong pump life by reducing potential heat build-up while the pump is in by-pass.
- Reduce fuel consumption because the engine is not continually running at full RPM.
- Allow the PyroLance system to be shut down in case of emergency by activating the Master/Emergency stop switch.
- Allow the hydraulic bypass unloader valve to go into by-pass mode and drop the hydraulic system pressure to 300 PSI (20 bar) or less when the water flow control valve is closed.
- Allow rapid on/off throttle response eliminating pressure control delays when the PyroLance system is in operation.

ELECTRIC REWIND HOSE REEL – ULTRA-HIGH PRESSURE

One (1) ultra-high pressure steel hose reel shall be installed with a maximum capacity of 200' of 3/4" hose per reel. The reel shall have a leak proof ball bearing swing joint, electric 12 volt rewind provisions. The reel system shall be designed for a 2,000 PSI (135 bar) working pressure. The reel shall be painted red.

Each reel shall be equipped with a locking pin assembly.

The high pressure hose reel shall be supplied by a 1/2" (12 mm) hydraulic type wire braided flexible hose line.

One (1) push button electric rewind control shall be installed near the reel. The wiring from the hose reel electric box shall be protected with conduit or loom.

The hose reel shall be equipped with a electrical wiring junction box of plastic construction with a sealed cover assembly. The box shall house the reel solenoid, circuit breaker, and electrical wiring for the rewind control circuit and electric rewind motor power supply. The electrical supply shall be sized for the reel motor for both positive and neutral cables. The electrical supply wiring shall be supplied from the main electrical supply box for high pressure pump skid or module. The supply line to the reel shall have a quick disconnect connection at the main electrical supply box.

One (1) stainless steel hose roller assembly shall be supplied with reel for protection of the hose during hose removal and rewind operations.

REEL MOUNTED ULTRA-HIGH PRESSURE HOSE

150 foot (45 m) length x 3/4" (19 mm) hose shall be installed with threaded couplings. The hose shall have a working pressure of 3,125 psi (215 bar).

The hose reel(s) shall be installed by the OEM.

NOZZLE -- ULTRA-HIGH PRESSURE

One (1) 20 GPM (80 LPM) ultra-high pressure pistol grip fog nozzle shall be provided for the high pressure fog reel.

FACTORY TESTING PRIOR TO SHIPMENT

The entire pump and the plumbing system shall undergo a complete factory test. These test results shall be provided with shipment.

Pyrolance, LLC

CRATING

The equipment shall be properly crated, sealed, and protected for shipment. The crate shall be approximately: 48" (1219 mm) wide x 48" (1219 mm) long x 54" (1372 mm) high in size and less than 2,000 lbs. (907 kg) in weight.

WARRANTY

The PyroLance ultra-high pressure type firefighting system components shall be covered by a one (1) year parts and labor warranty. The installation portion of the warranty shall be covered by the final stage assembler.

TECHNICAL MANUAL

The ultra-high pressure firefighting system shall be covered by a detailed technical manual covering installation, testing, operation, maintenance, and parts. This manual shall have various levels of warnings and caution notices provided. Paper and electronic portions will be supplied with the apparatus.