SPECIFICATIONS FOR

PTO DRIVEN

ULTRA HIGH PRESSURE

FIRE FIGHTING SYSTEM

B 2000 M-P

SPECIFICATIONS FOR FIRE FIGHTING SYSTEM

HIGH PRESSURE FIRE FIGHTING SPECIFICATIONS

Scope and General Design Requirements

A firefighting system shall be provided for offensively attacking a fire. The high pressure firefighting system shall allow the operator to attack fire from a safe position. The system shall be extremely effective on wildland fire and initial fire attack operations with limited water supplies.

Components and Base Plate Design

The firefighting system shall consist of:

- Engine: PTO driven (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 with integral hydraulic motor. The entire system shall be designed to be a quickly installed or removable “plug-and-play” module.

Safety and Standards Compliance

The system shall be designed for the safety of the operator and fire fighter in mind with a safety margin of 4:1 built into all components.

Performance Capabilities

The firefighting 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 firefighting applications
- Container fires

BASE FRAME MOUNTING

The firefighting system shall be mounted in a frame assembly. 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

The firefighting system shall be equipped with a heavy duty ultra high pressure three plunger type positive displacement fire pump. The pump shall be driven as specified under the “drive system” section of these specifications.

The pump shall have the following features:

- Pump rating: 20 GPM @ 2,200 PSI (80 LPM @ 150 bar)
- Operational rating: 20 GPM @ 1,450 PSI (80 LPM @ 100 bar)
- Solid Keyed Shaft
- Brass Manifold
- Stainless Steel Check Valve
- Stainless Steel Plunger Guides
- Bronze Connecting Rods
- Tapered Roller Bearings
- Solid Ceramic Plungers
- Heavy Duty Flat Base
- High Pressure Seals
- Heat Treated Crankshaft.

REXROTH HYDRAULIC DRIVE SYSTEM SPECIFICATIONS

Once the PTO is activated on the pump control panel via the master PTO switch the variable speed hydraulic drive motor is controlled via an pressure compensating flow control switch which will activate when water flow in the fire pump circuit is sensed and allow the variable speed hydraulic drive pump to spool up to maximum flow regardless of engine RPM.

Once the flow condition in the water circuit is stopped it will send a return signal via the pressure sensor flow control switch which in turn will put the pump into standby mode that will allow the pump to flow 1 GPM @2400PSI until the situation is reversed.
As soon as the demand on the fire pump is replaced the hydraulic drive motor will spool up and pump 28GPM@2400PSI regardless of engine RMP.

Once the PyroLance PTO system is engaged and master/emergency stop switch is activated on the PyroLance control panel the system is active until either the PTO is disengaged or the E-Stop button is depressed.

The system shall:

a.) Reduce engine RPM when the pump is in by-pass resulting in reduced engine wear.
b.) Prolong pump life by reducing potential heat build-up while the pump is in by-pass.
c.) Reduce fuel consumption because the engine is not continually running at full RPM.
d.) Allow the PyroLance system to be shut down in case of emergency by activating the Master/Emergency stop switch.
e.) Allow rapid on/off throttle response eliminating pressure control delays when the PyroLance system is in operation.

Hydraulic drive pump flow requirement shall be 28GPM@2400PSI and consist of the following:

- Hydraulic Pump
- Hydraulic Motor
- 40 gallon (152 L) Hydraulic Reservoir
- Hydraulic Cooler
- Thermostat
- PTO (Supplied by OEM0

The system shall be capable of delivering full rated output at 925 engine rpm.
The system shall be compatible with a PTO with the following specifications:

- 1.3 step up ratio.
- 1.25" – 14 Tooth Splined Shaft
- Left Hand Rotation
- 2 Bolt C Mount

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:

- Emergency Stop/Master Switch (red)
- PTO engagement switch
- Control panel light and switch
- One (1) pressure gauge
- Tank to pump open/closed switch

PLUMBING

The firefighting 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, 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

The ultra-high pressure plumbing system shall include a bronze adjustable by-pass unloading valve set for the maximum working pressure of the system. The valve shall unload the main pump 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:

f.) One (1) pressure safety relief valve which shall relieve water pressure to atmosphere; set at a slightly higher pressure than the unloading valve.

g.) 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.

h.) 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 provided 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.

WATER TANK SUPPLY LINE

A 1.25" (31 mm) water tank to fire pump line shall be installed as follows:

- From the fire pump to the water filter shall be a 1.25” (31 mm) flexible transparent hose.
- 15' (5 m) of 1.25” (31 mm) flexible water hose with removable connections and clamping devices.
- One (1) 1.25” (31 mm) manual two way tank to pump control valve.

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.

ELECTRIC REWIND HOSE REEL – ULTRA-HIGH PRESSURE

One (1) painted ultra-high pressure steel hose reel shall be installed. The reel shall have a leak proof ball bearing swing joint, electric 12 volt rewind provisions. The reel system shall have a minimum of 4:1 safety ratio and designed for a 2,000 PSI (135 bar) working pressure.

Each reel shall be equipped with a locking pin assembly.

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.

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

The high pressure hose reel shall be supplied by a ½" (12 mm) hydraulic type wire braided flexible hose line.

One (1) chrome plate hose roller assembly shall be supplied 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)

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.

OPTIONS AND MODIFICATIONS: (INSERT OPTIONS AND MODIFICATIONS ONLY IN THIS SPACE)

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.

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 36" (914 mm) high in size and under 500 lbs. (227 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 highly detailed technical manual covering installation, testing, operation, maintenance, and parts. This manual shall have various levels of warnings and caution notices provided. The manual shall be spiral bound with divided sections with a CD electronic version.