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Specification for: FIRE SERVICE, INC.

E-One Base Model

American Eagle Program

The overall unit as configured shall be part of the American Eagle program.

BUMPERS

Bumper

A heavy duty 10" high steel channel type front bumper shall be provided. The front corners of the bumper shall be angled at 45 degrees to reduce swing clearance. The bumper shall be painted job color.

Bumper Extension

The bumper extension shall be approximately 20" from the face of the cab as required.

Bumper Gravel Shield

The extended front bumper gravel shield shall be made of 1/8" (.125") aluminum treadplate material.

BUMPER TRAYS

Lid, Bumper Hose Tray

The center bumper tray shall have a diamond plate lid. The lid shall be hinged and shall be secured in the closed position by a latch and held open with a pneumatic shock.

Bumper Tray - Center

A hose tray constructed of 1/8" aluminum shall be recessed into the front bumper extension. The tray shall be located in the center of the bumper and be approximately 12" deep (11" to the top of the slats). One inch thick aluminum slats shall be included in the bottom of the hose tray to aid in the dissipation of water from the tray.

FRAME ASSEMBLY

Frame Rail Construction

The frame shall consist of two (2) C-channel frame rails with heavy-duty fabricated crossmembers. The frame shall be bolted together using high-strength Grade 8 threaded fasteners for durability and ease of repair.

Specification for: FIRE SERVICE, INC.

Each frame rail shall have the following minimum specifications in order to minimize frame deflection under load and thereby improve vehicle ride and extend the life of the frame:

Dimensions: Frame rail - 10-1/4" x 3-1/2" x 3/8" (10.25" x 3.50" x 0.375")

Material: Frame rail - 110,000-psi minimum yield strength, high strength, low alloy steel

Section Modulus: 16.61 cu. in.

(RBM): 1,827,045-in. lbs.

If larger rails are provided, the maximum height of each frame rail shall not exceed the 10-1/4" (10.25") dimension by more than 1/2" (0.50") in order to ensure the lowest possible body height for ease of access as well as the lowest possible vehicle center of gravity for maximum stability.

There shall be a minimum of eight (8) crossmembers joining the two (2) frame rails/frame liners in order to make the frame rigid and hold the rails/liners in alignment. Six (6) of the crossmembers shall be a steel C-channel design bolted back-to-back in pairs to form three (3) heavy-duty crossmembers located at points of critical stress -- one (1) near the back of cab supports, one (1) at the forward bracket of the rear suspension, and one (1) at the rear bracket of the rear suspension. The three (3) heavy-duty crossmembers shall be attached to the frame rail with not less than six (6) bolts at each end arranged in a bolt pattern that is not less than 8.87" apart in the fore-aft direction in order to adequately distribute the crossmember load into the rail/liner and minimize stress concentrations.

All frame fasteners shall be high-strength, Grade 8, flanged-head threaded bolts and nuts for frame strength, durability, and ease of repair. The nuts shall be Stover locknuts to help prevent loosening. The frame fasteners shall be tightened to the proper torque at the time of assembly.

The frame rails and frame liners shall be finished with a corrosion-inhibiting black powder coat. The frame crossmembers and frame-mounted components (suspensions, axles, air tanks, battery boxes, fuel tank, etc.) shall be painted black.

The apparatus manufacturer shall supply a full lifetime frame warranty including crossmembers against defects in materials or workmanship. Warranties that provide a lifetime warranty for only the frame rails, but not the crossmembers, are not acceptable. **NO EXCEPTIONS.**

The custom chassis frame shall have a **WHEEL ALIGNMENT** in order to achieve maximum vehicle road performance and to promote long tire life. The alignment shall conform to the manufacturer's internal specifications. All wheel lug nuts and axle U-bolt retainer nuts shall be tightened to the proper torque at the time of alignment. The wheel alignment documentation shall be made available at delivery.

Frame Liner

Specification for: FIRE SERVICE, INC.

A 9-3/8" x 3-1/8" x 3/8" channel frame liner shall be bolted to each frame rail for added strength and rigidity. Frame liners shall be made of 110,000-psi minimum yield, high strength, low alloy steel. Each frame rail with liner shall have the following minimum characteristics:

Section Modulus: 28.74 cu. in.

RBM: 3,161,400 in. lbs.

The frame liners shall be inserted inside the open portion of the frame rails and shall run continuously from the rear of the frame to a point 42" in front of the front axle to provide maximum frame strength at all critical load points.

Rear Underbody Support Frame

The body shall be supported at the rear by a steel frame extension bolted to the chassis frame rails. The frame rails and frame extension shall be isolated from the aluminum body extrusions by 5/16" x 2" fiber reinforced rubber.

The frame extension shall be built with (2) 2.5" sq. x .25 wall thickness x. full width cross rails welded to (2) 2.5" sq. x .25 wall thickness side rails. The frame extension assembly will be welded to steel weldments, which are secured to the chassis frame with grade 8 5/8" bolts.

The frame extension shall not interfere with N.F.P.A. minimum requirements for angle of departure.

AXLE OPTIONS

Front Axle

The vehicle shall utilize an ArvinMeritor FL-941 front axle with a rated capacity of 18,000 lbs. It shall have "easy steer" knuckle pin bushings and 68.5" kingpin centers. The axle shall be of I-beam construction and utilize grease-lubricated wheel bearings. The vehicle shall have a nominal cramp angle of 45 degrees, plus two (+ 2) degrees to minus three (- 3) degrees including front suction applications.

The front axle hubs shall be made from ductile iron and shall be designed for use with 10 hole hub-piloted wheels in order to improve wheel centering and extend tire life.

The front springs shall be parabolic tapered, minimum 4" wide x 54" long (flat), minimum three (3) leaf, progressive rate with bronze bushings and a capacity of 18,000 lbs. at the ground.

Tapered leaf springs provide a 20% ride improvement over standard straight spring systems. Supporting documentation/data shall be provided upon request.

Specification for: FIRE SERVICE, INC.

The vehicle shall be equipped with a Sheppard model M-110 integral power steering gear used in conjunction with a model 292 slave gear or a power assist cylinder depending on application. The steering assembly shall be rated to statically steer a maximum front axle load of 18,000 lbs. Relief stops shall be provided to reduce system pressure upon full wheel cut. The system shall operate mechanically should the hydraulic system fail.

A 2-year/unlimited miles parts and 2-year labor axle warranty shall be provided as standard by ArvinMeritor Automotive.

In order to achieve maximum vehicle road performance and to promote long tire life, there shall be a wheel alignment. The alignment shall conform to the manufacturer's internal specifications. All wheel lug nuts and axle U-bolt retainer nuts shall be tightened to the proper torque at the time of alignment. The wheel alignment documentation shall be made available at delivery.

Front Shock Absorbers

The front suspension shall be furnished with two (2) heavy-duty, double acting shock absorbers, one (1) on each side.

Rear Axle

The vehicle shall be equipped with an ArvinMeritor RS-25-160 single rear axle with single-reduction hypoid gearing and a manufacturer's rated capacity of 27,000 lbs. The axle shall be equipped with oil-lubricated wheel bearings with ArvinMeritor oil seals.

The rear axle hubs shall be made from ductile iron and shall be designed for use with 10 hole hub-piloted wheels to improve wheel centering and extend tire life.

A 2-year/unlimited miles parts and 2-year labor rear axle warranty shall be provided as standard by ArvinMeritor Automotive.

SUSPENSIONS

Rear Suspension

The rear suspension shall be a pair of variable-rate leaf springs with auxiliary ("helper") leaf springs and bronze bushings. The variable-rate springs with auxiliary springs ensure that the vehicle rides and handles smoothly under both loaded and unloaded conditions. The suspension shall be rated for the maximum axle capacity.

WHEEL OPTIONS

Front Rims

Specification for: FIRE SERVICE, INC.

The vehicle shall have two (2) polished (on outer wheel surfaces only) aluminum disc wheels. They shall be forged from one piece corrosion-resistant aluminum alloy and sized appropriately for the tires.

Front Wheel Trim Package

The front wheels shall have stainless steel lug nut covers (chrome-plated steel lug nut covers not acceptable). The front axles shall be covered with American made Real Wheels brand mirror finish, 304L grade, non-corrosive stainless steel universal baby moons. All stainless steel baby moons shall carry a lifetime warranty plus a 2 year rebuffering policy. There shall be two (2) baby moons and twenty (20) lug nut covers.

Rear Wheels

The vehicle shall have four (4) polished (on outer wheel surfaces only) aluminum disc wheels. They shall be forged from one-piece corrosion-resistant aluminum alloy and sized appropriately for the tires.

Rear Wheel Trim Package Single Axle

The rear wheels shall have stainless steel lug nut covers (chrome-plated steel lug nut covers not acceptable), or American made chrome-plated plastic lug nut covers. The rear axle shall be covered with American made Real Wheels brand mirror finish, 304L grade, non-corrosive stainless steel, spring clip band mount high hats, DOT user friendly. All stainless steel high hats shall carry a lifetime warranty plus a 2 year rebuffering policy. There shall be two (2) high hats and twenty (20) lug nut covers.

TIRE OPTIONS

Front Tires

The front tires shall be Goodyear 315/80R22.5 tubeless type 18 PR radial tires with highway tread. The tires with wheels shall have the following weight capacity:

Front Rating - 18,000 lbs. (single) @ 65 MPH.

The wheels and tires shall conform to the Tire and Rim Association requirements.

Rear Tires

Specification for: FIRE SERVICE, INC.

The rear tires shall be Goodyear12R 22.5 tubeless type tires with G124 mud and snow tread.

The tires with wheels shall have the following weight capacity:

27,000 lbs. (dual) @ 75 MPH.

The wheels and tires shall conform to the Tire and Rim Association requirements.

BRAKE SYSTEMS

Front Brakes

The front axle shall be equipped with Meritor DiscPlus EX225 17 inch disc brakes.

The brakes shall be covered by the manufacturer`s standard warranty which is three years, unlimited mileage and parts only.

Rear Brakes

The rear axle shall be equipped with Meritor DiscPlus EX225 17 inch disc brakes with a maximum rated capacity of 27,000lbs.

The brakes shall be covered by the manufacturer`s standard warranty which is three years, unlimited mileage and parts only.

Brake System

The vehicle shall be equipped with air-operated brakes and an anti-lock braking system (ABS). The brake system shall meet or exceed the design and performance requirements of the current Federal Motor Vehicle Safety Standard (FMVSS)-121, and the test requirements of the current NFPA 1901 Standard.

A dual-treadle brake valve shall correctly proportion the braking power between the front and rear systems. The air system shall be provided with a rapid pressure build-up feature, designed to meet current NFPA 1901 requirements, to allow the vehicle to begin its emergency response as quickly as possible.

A pressure-protection valve shall be installed to prevent use of the air horns or other air-operated devices should the air system pressure drop below 85 psi. This feature is designed to prevent inadvertent actuation of the emergency/parking brakes while the vehicle is in motion.

Two (2) air pressure needle gauges, one (1) each for front and rear air pressure, with a warning light and buzzer shall be installed at the driver`s instrument panel.

The braking system shall be provided with a minimum of three (3) air tank reservoirs for a total air system capacity of 5,214 cu. in. One (1) reservoir shall serve as the wet tank and a minimum of one (1) tank shall be supplied for each of the front and rear axles. The total system shall carry a sufficient volume of air to comply with FMVSS-121.

Specification for: FIRE SERVICE, INC.

Tank Capacities in Cubic Inches:

Wet	Front	Rear	Total
1,738	1,738	1,738	5,214

Spring-actuated emergency/parking brakes shall be installed on the rear axle.

A Bendix-Westinghouse SR-1 valve, in conjunction with a double check valve system, shall provide automatic emergency brake application when the air brake system pressure falls below 40 psi in order to safely bring the vehicle to a stop in case of an accidental loss of braking system air pressure.

A four-channel Wabco ABS shall be provided to improve vehicle stability and control by reducing wheel lock-up during braking. This braking system shall be fitted to both front and rear axles. All electrical connections shall be environmentally-sealed for protection against water, weather, and vibration.

The system shall constantly monitor wheel behavior during braking. Sensors on each wheel transmit wheel speed data to an electronic processor, which shall detect approaching wheel lock-up and instantly modulate (or pump) the brake pressure up to five (5) times per second to prevent wheel lock-up. Each wheel shall be individually controlled. To improve field performance, the system shall be equipped with a dual-circuit design configured in a diagonal pattern. Should a malfunction occur in one circuit, that circuit shall revert to normal braking action. A warning light at the driver`s instrument panel shall signal a malfunction.

The system shall also be configured to work in conjunction with all auxiliary engine, exhaust, or driveline brakes to prevent wheel lock-up.

To improve maintenance troubleshooting, provisions in the system for an optional diagnostic tester shall be provided. The system shall test itself each time the vehicle is started, and a dash-mounted light shall go out once the vehicle is moving above 4 MPH.

A 3 year/300,000 mile parts and labor Anti-Locking Braking System (ABS) warranty shall be provided as standard by Meritor Automotive.

Park Brake Release

One (1) Bendix-Westinghouse PP-5 parking brake control valve shall be supplied on the lower dash panel within easy reach of the driver.

Electronic Stability Control

The apparatus shall be equipped with a G4 4S4M Electronic Stability Control (ESC) system that combines the functions of Roll Stability Control (RSC) with the added capability of yaw - or rotational – sensing.

Specification for: FIRE SERVICE, INC.

RSC focuses on the vehicle's center of gravity and the lateral acceleration limit or rollover threshold. When critical lateral acceleration thresholds are exceeded, RSC intervenes to regulate the vehicle's deceleration functions. The added feature of ESC is to automatically intervene to reduce the risk of the vehicle rotating while in a curve or taking evasive action, prevents drift out through selective braking, and controlling and reducing vehicle speed when lateral acceleration limits are about to be exceeded.

Intervention by the system occurs in three forms - engine, retarder and brake control. The ESC system uses several sensors to monitor the vehicle. These include a steering wheel angle sensor, lateral accelerometer, and yaw position sensor. ESC constantly monitors driving conditions and intervenes if critical lateral acceleration is detected or if the vehicle begins to spin due to low friction surfaces. The system provides control of engine and retarder torque as well as automatically controlling individual wheels to counteract both over steer and under steer.

To further improve vehicle drive characteristics, the unit shall be fitted with Automatic Traction Control (ATC). This system shall control drive wheel slip during acceleration from a resting point. An extra solenoid valve shall be added to the ABS system. The system shall control the engine and brakes to improve acceleration slip resistance. The system shall have a dash mounted light that shall come on when ATC is controlling drive wheel slip.

3 year/300,000 miles parts and labor warranties for ESC, RSC, and ATC shall be provided as standard by Meritor Automotive.

AIR SYSTEM OPTIONS

Air Dryer

The chassis air system shall be equipped with a Meritor/Wabco system saver 1200 air dryer located under the cab. The air dryer shall utilize a single spin-on desiccant cartridge.

Air Inlet

A 1/4" brass quick-release air inlet with a male connection. The inlet shall allow a shoreline air hose to be connected to the vehicle, discharging air directly into the wet tank. It shall be located driver door jamb.

Auxiliary Air Tank Plumbing

The auxiliary air tank shall be plumbed to the following optional accessories (if equipped): Chassis air horns, brake system air outlet and light tower.

Air Lines

Air-lines shall be constructed of color-coded nylon tubing routed in a manner to protect from damage. Brass fittings shall be provided.

Air Horns

Specification for: FIRE SERVICE, INC.

Dual Grover air horns shall be provided, connected to the chassis air system. The horns shall be mounted through the front bumper. The front bumper shall have two (2) holes punched to accommodate the horns. A pressure protection valve shall be installed to prevent the air brake system from being depleted of air pressure.

Isolated Air Reservoir

The air system shall have an additional 1738 cu. in. isolated reservoir. The reservoir shall be equipped with a valve that automatically closes when the ignition is turned off. This shall effectively protect the reservoir from any leaks in the air system.

Unless specified otherwise the following options (if equipped) shall be plumbed to the isolated air tank:

Air horns, Light tower, Air outlet

ENGINES & TRANSMISSIONS

Engine/Transmission Package

Engine

The vehicle shall utilize a Cummins ISL 2007 electronic engine as described below:

- 425 gross bhp at 2200 rpm
- 1200 lb.-ft. peak torque at 1300 rpm
- Six (6)-cylinder, charge air cooled, 4-cycle diesel
- 543 cu. in. displacement -- 4.49 in bore x 5.69 in stroke (8.9 liters)
- 16.6:1 compression ratio
- Interact System Controlled Viable Geometry Turbocharged
- Engine shall be equipped with Full-Authority Electronics
- Electronic Timing Control fuel system
- Fuel cooler (when equipped with a fire pump)
- Fleetguard FS1022 fuel filter with integral water separator and water-in-fuel sensor approved by Cummins for use on the ISL engine
- Fleetguard LF9009 Venturi Combo combination full-flow/by-pass oil filter approved by Cummins for use on the ISL engine
- Engine lubrication system, including filter, shall have a minimum capacity of 25 quarts
- Delco-Remy 39 MT-HD 12-volt starter
- Cummins 18.7 cubic foot per minute (cfm) air compressor
- Corrosion inhibitor additive for coolant system
- Ember separator compliant with 2003 NFPA 1901 standard

The engine shall be compliant with 2007 EPA Emission standards

Specification for: FIRE SERVICE, INC.

The engine air intake shall be through a grille located over the left-hand front wheel well where it is protected from direct frontal impingement by road debris, dust, road spray, and high-water "bow wakes". The air cleaner shall be a 10" diameter Farr Eco-Lite with a replaceable element. Air cleaner intake piping shall be made from aluminized steel tubing with flexible rubber hoses. Air cleaner intake piping clamps shall be heavy-duty, constant-torque, T-bolt clamps to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine.

The engine exhaust piping shall be a minimum of 4" diameter welded aluminized steel tubing. The muffler shall be mounted horizontally under the right-hand frame rail in back of the cab in order to minimize heat transmission to the cab and its occupants. The exhaust shall be directed away from the vehicle on the right side ahead of the rear wheels in order to keep exhaust fumes as far away as possible from the cab and pump operator position.

A 5-year/100,000-miles parts and labor warranty shall be provided as standard by Cummins Bulletin 3381161.

A copy of the Engine Installation Review stating the engine installation meets Cummins recommendations shall be provided once available. The engine installation shall not require the operation of any type of "power-down" feature to meet engine installation tests.

Transmission

The vehicle shall utilize an Allison EVS3000P, electronic, 5-speed automatic transmission.

A push button shift module shall be located right side of the steering column, within easy reach of the driver. The shift position indicator shall be indirectly lit for after-dark operation. The shift module shall have a "Do Not Shift" light and a "Service" indicator light that are clearly visible to the driver. The shift module shall have means to enter a diagnostic mode and display diagnostic data.

A transmission oil temperature gauge with warning light and buzzer shall be installed on the cab instrument panel to warn the driver of high oil temperatures that may damage the transmission.

The transmission shall have a gross input torque rating of 1250 lb.-ft. and a gross input power rating of 425 HP.

The gear ratios shall be as follows:

1 - 3.49

2 - 1.86

3 - 1.41

4 - 1.00

5 - .75

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R - 5.03

The transmission shall have an oil capacity of 23 quarts and shall be equipped with a fluid level sensor (FLS) system, providing direct feedback of transmission oil level information to the driver.

A water-to-oil transmission oil cooler shall be provided in the lower tank of the radiator to ensure proper cooling of the transmission when the vehicle is stationary (no air flow). Air-to-oil transmission oil coolers, which require constant air flow, are not acceptable.

The transmission shall be provided with two (2) engine-driven PTO openings located at the 4 o'clock and 8 o'clock positions for flexibility in installing pto-driven equipment.

The automatic transmission shall be equipped with a power lock-up device. The transmission lock-up shall prevent down shifting of the transmission when the engine speed is decreased during pump operations, thereby maintaining a constant gear ratio for safe operation of the pump. The transmission lock-up shall be automatically activated when the pump is engaged in gear. The transmission lock-up shall be automatically deactivated when the pump is disengaged for normal road operation.

A 5-year/unlimited miles parts and labor warranty shall be provided as standard by Allison Transmission.

Transmission Selector

A push button shift module Allison model #29538373 shall be located right side of the steering column, within easy reach of the driver. The shift position indicator shall be indirectly lit for after dark operation. The shift module shall have a "Do Not Shift" light and a "Service" indicator light. The shift module shall have means to enter a diagnostic mode and display diagnostic data. A transmission temperature gauge with warning light and buzzer shall be installed on the cab instrument panel.

Transmission Fluid

The transmission shall have conventional fluid.

Vehicle Speed

The apparatus shall have a speed range of between 62mph and 67mph.

SECONDARY BRAKING

Jacobs Engine Brake

One (1) Jacobs engine brake shall be installed to assist in slowing and controlling the vehicle as required by NFPA 1901 for vehicles with gross vehicle weight ratings (GVWR) of 36,000 lbs.

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or greater. An on-off control switch and a high-low (Cummins) or high-medium-low (Detroit Diesel) selector switch shall be mounted in the cab.

When activated, the Jacobs engine brake shall cut off the flow of fuel to the cylinders and alter the timing of the exhaust valves. This shall transform the engine into a high-pressure air compressor, driven by the wheels, and the horsepower absorbed by the engine in this mode shall slow the vehicle. The selector switch allows the driver to select the amount of retarding power.

When the on-off switch is in the "on" position, the engine brake shall be automatically applied whenever the accelerator is in the idle position and the automatic transmission is in the lock-up mode. If the accelerator is depressed or if the on-off switch is placed in the "off" position, the engine brake shall immediately release and allow the engine to return to its normal function.

COOLING PACKAGE

Engine Cooling Package

The cooling system shall have a tube-and-fin radiator with a minimum of 1,362 square inches of frontal area to ensure adequate cooling under all operating conditions. The radiator shall have five (5) rows of brass tubes with sixteen (16) copper fins per inch, and bolted steel top and bottom tanks for durability and ease of repair. There shall be a drain valve in the bottom tank to allow the radiator to be serviced.

There shall be a coolant overflow recovery system provided.

All radiator and heater hoses shall be silicone. Pressure compensating band clamps shall be used to eliminate hose pinching on all hoses over 1".

The cooling system shall be filled with a 50/50 mixture of water and antifreeze/coolant conditioner to provide freezing protection to minus 40 (- 40) degrees F for operation in severe winter temperatures.

The system shall include a charge air cooler with a minimum of 883 square inches of frontal area to ensure adequate cooling of the turbocharged air for proper engine operation and maximum performance. The charge air cooler core shall be 2.62" deep with seven (7) fins per inch.

Charge air cooler hoses shall be made from high-temperature wire-reinforced silicone to withstand the extremely high temperatures and pressures of the turbocharged air. The hoses shall incorporate a flexible hump section to allow motion and misalignment of the engine relative to the charge air cooler. Charge air cooler hose clamps shall be heavy-duty, constant-torque, T-bolt clamps to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine.

The fan shall be 30" in diameter with eleven (11) blades for maximum airflow and dynamic balance. It shall be made of nylon for strength and corrosion resistance. A fan shroud attached to the radiator shall be provided to prevent recirculation of engine compartment air around the fan in order to maximize the cooling airflow through the radiator.

FUEL SYSTEMS

Fuel System

One (1) 65 gallon fuel tank shall be provided. The tank shall be of an all-welded, aluminized-steel construction with anti-surge baffles and shall conform to all applicable Administration (FHWA) 393.65 and 393.67 standards. The tank shall be mounted below the frame rails at the rear of the chassis for maximum protection. The tank shall be secured with two (2) wrap-around T-bolt type stainless steel straps. Each strap shall be fitted with protective rubber insulation and shall be secured with grade 8 hardware. This design allows for tank removal from below the chassis.

The fuel tank shall be equipped with a 2" diameter filler neck. The filler neck shall extend to the rear of the vehicle behind the rear tires and away from the heat of the exhaust system as required by NFPA 1901 Standard for Automotive Fire Apparatus. The open end of the filler neck shall be equipped with a twist-off filler cap with a retaining chain.

The tank shall be plumbed with top-draw and top-return fuel lines in order to protect the lines from road debris. Bottom-draw and/or bottom-return fuel lines are not acceptable. A vent shall be provided at the top of the tank. The vent shall be connected to the filler neck to prevent splash-back during fueling operations. A .50" NPT drain plug shall be provided at the bottom of the tank.

The tank shall have a minimum useable capacity of 65 gallons of fuel with a sufficient additional volume to allow for thermal expansion of the fuel without overflowing the vent.

A mechanical fuel pump shall be provided and sized by the engine manufacturer as part of the engine.

Fuel Line Hose

Wire braided fuel hose meeting SAE J-1402 shall be provided for the chassis fuel system. The hose shall have a working temperature rating of -55 degree F to 300 degree F.

The ends of the hose shall have connections that shall allow the hose to be reattached if removed.

Fuel/Water Separator

A Racor fuel/water separator shall be installed in place of the primary fuel filter on DDC engines, and in addition to the fuel filters on all other engine models. The unit shall utilize a three-step separate process: centrifuge for primary contaminant separation, conical baffles for water coalescing, and a replaceable filter for final particulate removal. The separator shall have a bottom drain for removing contaminants, shall be heated and shall have a rated maximum flow of 3.16 gpm. A sensor with indicator light and audible alarm shall be provided for the Racor

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fuel/water separator. The indicator light shall be mounted in the dash with the unit located inside the pump module. The unit will alert the driver of high water content in the separator bowl.

ALTERNATOR

320 AMP Alternator

There shall be a 320 Amp Leece Neville alternator installed as specified. The alternator shall be a Leece Neville 7890JB series brushless type with integral rectifier and adjustable voltage regulator with an output of 275 amp per NFPA 1901 rating (320 amp per SAE J56).

BATTERIES

Battery System

The manufacturer shall supply four (4) heavy-duty Group 31 12-volt maintenance-free batteries. Each battery shall be installed and positioned so as to allow easy replacement of any single battery. Each battery shall be equipped with carrying handles to facilitate ease of removal and replacement. There shall be two (2) steel frame-mounted battery boxes, one (1) on the left frame rail and one (1) on the right frame rail. Each battery box shall be secured to the frame rail with Grade 8 hardware. Each battery box shall hold (2) batteries. The batteries shall have a minimum combined rating of 4,000 (4 x 1000) cold cranking amps (CCA) @ 0 degrees Fahrenheit and 820 (4 x 205) minutes of reserve capacity for extended operation. The batteries shall have 3/8-16 threaded stud terminals to ensure tight cable connections. The battery stud terminals shall each be treated with concentrated industrial soft-seal after cable installation to promote corrosion prevention. The positive and negative battery stud terminals and the respective cables shall be clearly marked to ensure quick and mistake-proof identification.

Batteries shall be placed on non-corrosive rubber matting and secured with hold-down brackets to prevent movement, vibration, and road shock. The hold-down bracket J-hooks shall be cut to fit and shall have all sharp edges removed. The batteries shall be placed in plastic trays to provide preliminary containment should there be leakage of hazardous battery fluids. There shall be two (2) plastic trays, each containing (2) batteries. Each battery tray shall be equipped with a rubber vent hose to facilitate drainage. The rubber vent hose shall be routed to drain beneath the battery box. The batteries shall be positioned in well-ventilated areas.

One (1) positive and one (1) negative jumper stud shall be provide below the officer side battery box.

Batteries shall have a warranty of twelve (12) months that shall commence upon the date of delivery of the apparatus.

CHASSIS OPTIONS

Drivelines

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Drivelines shall have a heavy-duty metal tube and shall be equipped with Spicer 1710HD universal joints to allow full-transmitted torque to the axle(s). Drive shafts shall be axially straight, concentric with axis and dynamically balanced.

Front Tow Hooks

Two (2) heavy-duty painted front tow hooks shall be securely bolted to the front chassis frame rail extensions to allow towing (not lifting) of the apparatus without damage. They shall be mounted in the downward position.

Engine Fan Clutch

The engine shall be equipped with a thermostatically controlled engine cooling fan. The fan shall belt driven and utilize a clutch to engage when engine reaches a specified temperature. The fan shall be equipped with a fail safe engagement.

Rear Tow Eyes

Two (2) heavy-duty tow eyes made of 3/4" (0.75") thick steel having 2.5" diameter holes shall be mounted below the body at the rear of the vehicle to allow towing (not lifting) of the apparatus without damage. The tow eyes will be welded to the lower end of a 5" steel channel that is bolted at the end of the chassis frame rails. The tow eyes shall be painted chassis black.

Three (3) Class III Hitch Receivers

An underbody three (3) way Class III hitch receiver with (3) hitch receiver connections shall be provided.

There shall be three (3) Class III hitch receivers provided below the rear of the body and they shall be of an integral construction to the underbody support assembly.

The rearward facing hitch receiver shall include two (2) tow hook eye connections and an electrical connection for a portable winch application. The two (2) side facing hitch receivers shall be located one (1) each side below the rearward most body compartment. Each side facing hitch receiver shall include an electrical connection for a portable winch application.

Each portable winch connection shall be rated for a maximum of 5,000 pounds.

CAB MODEL

Cab Typhoon X Long

The vehicle shall be distinguished by an all-welded aluminum and fully enclosed tilt cab. The cab shall be designed exclusively for fire/rescue service and shall be pre-engineered to ensure long life. It shall incorporate an integral welded substructure of high-strength aluminum alloy extrusions that creates an occupant compartment that is essentially a protective perimeter. The

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end result is a distinctive structure that is aesthetically appealing, functionally durable, and characterized by increased personnel safety.

The cab shall be constructed from 3/16" (0.188") 3003 H14 aluminum alloy plate roof, floor, and outer skins welded to a high-strength 6063-T6 aluminum alloy extruded subframe. Wall supports and roof bows are 6061 T6 aluminum alloy. This combination of a high-strength, welded aluminum inner structure surrounded on all sides by load-bearing, welded aluminum outer skins provides a cab that is strong, lightweight, corrosion-resistant, and durable.

The inner structure shall be designed to create an interlocking internal "roll-cage" effect by welding two (2) 3" x 3" x 0.188" wall-thickness 6063-T5 aluminum upright extrusions between the 3" x 3" x 0.375" wall-thickness 6061-T6 roof crossbeam and the 2.25" x 3" x 0.375" wall-thickness 6063-T6 subframe structure in the front. An additional two (2) aluminum upright extrusions within the back-of-cab structure shall be welded between the rear roof perimeter extrusion and the subframe structure in the rear to complete the interlocking framework. The four (4) upright extrusions -- two (2) in the front and two (2) in the rear -- shall be designed to effectively transmit roof loads downward into the subframe structure to help protect the occupant compartment from crushing in a serious accident. All joints shall be electrically seam welded internally using aluminum alloy welding wire.

The subframe structure shall be constructed from high-strength 6061-T6 aluminum extrusions welded together to provide a structural base for the cab. It shall include a side-to-side C-channel extrusion across the front, with 3/4" x 2-3/4" (.75" x 2.75") full-width crossmember tubes spaced at critical points between the front and rear of the cab.

The cab floor shall be constructed from 3/16" (0.188") 3003 H14 smooth aluminum plate welded to the subframe structure to give the cab additional strength and to help protect the occupants from penetration by road debris and under-ride collision impacts.

The cab roof shall be constructed from 3/16" (0.188") 3003 H14 aluminum treadplate supported by a grid of fore-aft and side-to-side aluminum extrusions to help protect the occupants from penetration by falling debris and downward-projecting objects. Molded fiberglass or other molded fiber-reinforced plastic roof materials are not acceptable.

The cab roof perimeter shall be constructed from 4" x 6-5/8" (4" x 6.625") 6063-T5 aluminum extrusions with integral drip rails. Cast aluminum corner joints shall be welded to the aluminum roof perimeter extrusions to ensure structural integrity. The roof perimeter shall be continuously welded to the cab roof plate to ensure a leak-free roof structure.

The cab rear skin shall be constructed from 3/16" (0.188") 3003 H14 aluminum plate. Structural extrusions shall be used to reinforce the rear wall.

The left-hand and right-hand cab side skins shall be constructed from 3/16" (0.188") 3003 H14 smooth aluminum plate. The skins shall be welded to structural aluminum extrusions at the top, bottom, and sides for additional reinforcement.

The cab front skins shall be constructed from 3/16" (0.188") 3003 H14 smooth aluminum plate. The upper portion shall form the windshield mask, and the lower portion shall form the cab front. Each front corner shall have a full 9" outer radius for strength and appearance. The left-

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hand and right-hand sides of the windshield mask shall be welded to the left-hand and right-hand front door frames, and the upper edge of the windshield mask shall be welded to the cab roof perimeter extrusion for reinforcement. The cab front shall be welded to the subframe C-channel extrusion below the line of the headlights to provide protection against frontal impact.

Cab Exterior

The exterior of the cab shall be 94" wide x 139.5" long to allow sufficient room in the occupant compartment for up to ten (10) fire fighters. The cab roof shall be approximately 101" above the ground with the flat roof option. The back-of-cab to front axle length shall be a minimum of 67.5".

Front axle fenderette trim shall be brushed aluminum for appearance and corrosion resistance. Bolt-in front wheel well liners shall be constructed of 3/16" (0.188") composite material to provide a maintenance-free, damage-resistant surface that helps protect the underside of the cab structure and components from stones and road debris.

Side air intakes shall be provided for additional airflow and shall include polished stainless steel grilles. Stainless steel provides excellent resistance to corrosion and stone impacts.

The cab windshield shall be of a two-piece replaceable design for lowered cost of repair. The windshield shall be made from 1/4" (0.25") thick curved, laminated safety glass with a 75% light transmittance automotive tint. A combined minimum viewing area of 2,700-sq. in. shall be provided. Forward visibility to the ground for the average (50th percentile) male sitting in the driver's seat shall be no more than 11 feet 7 inches from the front of the cab to ensure good visibility in congested areas.

Cab Mounts and Cab Tilt System

The cab shall be independently mounted from the body and chassis to isolate the cab structure from stresses caused by chassis twisting and body movements. Mounting points shall consist of two (2) forward-pivoting points, one (1) on each side; two (2) intermediate rubber load-bearing cushions located midway along the length of the cab, one on each side; and two (2) combination rubber shock mounts and cab latches located at the rear of the cab, one (1) on each side.

An electric-over-hydraulic cab tilt system shall be provided to provide easy access to the engine. It shall consist of two (2) large-diameter, telescoping, hydraulic lift cylinders, one (1) on each side of the cab, with a frame-mounted electric-over-hydraulic pump for cylinder actuation.

Safety flow fuses (velocity fuses) shall be provided in the hydraulic lift cylinders to prevent the raised cab from suddenly dropping in case of a burst hydraulic hose or other hydraulic failure. The safety flow fuses shall operate when the cab is in any position, not just the fully raised position.

The hydraulic pump shall have a manual override system as a backup in the event of an electrical failure. Lift controls shall be located in a compartment to the rear of the cab on the right side of the apparatus. A parking brake interlock shall be provided as a safety feature to prevent the cab from being tilted unless the parking break is set.

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The entire cab shall be tilted through a 42-45 degree arc to allow for easy maintenance of the engine, transmission and engine components. A positive-engagement safety latch shall be provided to lock the cab in the full tilt position to provide additional safety for personnel working under the raised cab.

In the lowered position, the cab shall be locked down by two (2) automatic, spring-loaded cab latches at the rear of the cab. A "cab ajar" indicator light shall be provided on the instrument panel to warn the driver when the cab is not completely locked into the lowered position.

Cab Interior

The interior of the cab shall be of the open design with an ergonomically-designed driver area that provides ready access to all controls as well as a clear view of critical instrumentation.

The engine cover between the driver and the officer shall be a low-rise contoured design to provide sufficient seating and elbow room for the driver and the officer. The engine cover shall blend in smoothly with the interior dash and flooring of the cab. An all-aluminum subframe shall be provided for the engine cover for strength. The overall height of the engine enclosure shall not exceed 23" from the floor at each side and 27" in the center section. The engine cover shall not exceed 41" in width at its widest point.

The rear portion of the engine cover shall be provided with a lift-up section to provide easy access for checking transmission fluid, power steering fluid, and engine oil without raising the cab. The engine cover insulation shall consist of 3/4" dual density fiberglass composite panels with foil backing manufactured to specifically fit the engine cover without modification to eliminate "sagging" as found with foam insulation. The insulation shall meet or exceed DOT standard MVSS 302-1 and V-0 (UI subject 94 Test).

Externally, the engine cover is a molded 18 lb/cu.ft (+/-0.5) flexible integral skinned polyurethane foam at a Durometer of 60 (+/- 5.0) per ASTM F1957-99 and with a minimum skin thickness of 0.0625 inches and shall be provided to reduce the transmission noise and heat from the engine. There shall be molded integral arm rests provided for both the driver and the officer as well as large cup holders.

All cab floors shall be covered with a black rubber floor mat that provides an aggressive slip-resistant surface in accordance with current NFPA 1901.

A minimum of 57.25" of floor-to-ceiling height shall be provided in the front seating area of the cab and a minimum of 55.25" floor-to-ceiling height shall be provided in the rear seating area. A minimum of 40" of seated headroom shall be provided over each fenderwell.

The floor area in front of the front seat pedestals shall be no less than 20.5" side to side by 25.0" front to rear for the driver and no less than 20.5" side to side by 26.0" front to rear for the officer to provide adequate legroom.

Battery jumper studs shall be provided to allow jump-starting of the apparatus without having to tilt the cab.

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All exposed interior metal surfaces shall be pretreated using a corrosion prevention system.

The interior of the cab shall be insulated to ensure the sound (dbA) level for the cab interior is within the limits stated in the current edition of NFPA 1901. The insulation shall consist of 2 oz. wadding and 1/4" (0.25") foam padding. The padding board shall be backed with 1/4" (0.25") thick reflective insulation. The backing shall be spun-woven polyester. Interior cab padding shall consist of a rear cab headliner, a rear wall panel, and side panels between the front and rear cab doors.

All surfaces subject to repeated contact and wear -- the dash, overhead console, windshield posts, headliner, door panels, and door post trim -- shall be covered with thermoformed, non-metallic, non-fiber trim pieces or panels to provide excellent scuff and abrasion resistance, as well as chemical stain resistance. The thermoformed material shall comply with Federal Motor Vehicle Safety Standard (FMVSS) 302 for flammability of interior materials.

The vehicle shall use a seven-position tilt and telescopic steering column to accommodate various size operators. An 18" padded steering wheel with a center horn button shall be provided.

A full-width overhead console shall be mounted to the cab ceiling for placement of siren and radio heads, and for warning light switches. The console shall be made from a thermoformed, non-metallic material and shall have easily removable mounting plates.

Storage areas, with hinged access doors, shall be provided below the driver and officer seats. The driver side compartment shall be approximately 20" x 12" x 3.5" high and the officer side compartment shall be approximately 20.25" x 22.75" x 11" high.

The front cab steps shall be a minimum of 8" deep x 24" wide. The first step shall be no more than 24.0" above the ground with standard tires in the unloaded condition per NFPA 1901 standards. The rear cab steps shall be a minimum 12" deep x 21" wide. The first step shall be no more than 24.0" above the ground with standard tires in the unloaded condition per NFPA 1901 standards. The rear steps shall incorporate intermediate steps for easy access to the cab. The steps are to be located inside the doorsill, where they are protected against mud, snow, ice, and weather. The step surfaces shall be aluminum diamond plate with a multi-directional, aggressive gripping surface incorporated into the aluminum diamond plate in accordance with current NFPA 1901.

A black rubber grip handle shall be provided on the interior of each front door below the door window to ensure proper hand holds while entering and exiting the cab. An additional black rubber grip handle shall be provided on the left and right side windshield post for additional handholds.

Cab Doors

There shall be reflective signs on each cab door in compliance with all NFPA requirements.

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Four (4) side-opening cab doors shall be provided. Doors shall be constructed of a 3/16" (0.188") aluminum plate outer material with an aluminum extruded inner framework to provide a structure that is as strong as the side skins.

Front cab door openings shall be approximately 36" wide x 71.5" high, and the rear cab door openings shall be approximately 33.75" wide x 73" high. The front doors shall open approximately 75 degrees, and the rear doors shall open approximately 80 degrees.

The doors shall be securely fastened to the doorframes with full-length, stainless steel piano hinges, with 3/8" (0.375") diameter pins for proper door alignment, long life, and corrosion resistance. Mounting hardware shall be treated with corrosion-resistant material prior to installation. For effective sealing, an extruded rubber gasket shall be provided around the entire perimeter of all doors.

Stainless steel paddle-style door latches shall be provided on the interiors of the doors. The latches shall be designed and installed to protect against accidental or inadvertent opening as required by NFPA 1901.

The front door windows shall provide a minimum viewing area of 530 sq. in. each. The rear door windows shall provide a minimum viewing area of 500 sq. in. each. All windows shall have 75% light transmittance automotive safety tint. Full roll-down windows shall be provided for the front cab doors with worm gear drive cable operation for positive operation and long life. Scissors or gear-and-sector drives are not acceptable.

Cab Instruments and Controls

Two (2) pantograph-style windshield wipers with two (2) separate electric motors shall be provided for positive operation. Air-operated windshield wipers are not acceptable because of their tendency to accumulate moisture, which can lead to corrosion or to freezing in cold weather. The wipers shall be a wet-arm type with a one (1) gallon washer fluid reservoir, an intermittent-wipe function, and an integral wash circuit. Wiper arm length shall be approximately 28", and the blade length approximately 20". Each arm shall have a 70 degree sweep for full coverage of the windshield.

An overhead mounted heater and defroster with a minimum capacity of 60,000 Btu/hr and all necessary controls shall be mounted in the cab. The airflow system shall consist of two (2) levels, defrost and cab, and shall have fresh air and defogging capabilities.

Cab controls shall be located on the cab instrument panel in the dashboard on the driver's side where they are clearly visible and easily reachable. Emergency warning light switches shall be installed in removable panels for ease of service. The following gauges and/or controls shall be provided:

- Master battery switch/ignition switch (rocker with integral indicator)
- Starter switch/engine stop switch (rocker)
- Heater and defroster controls with illumination
- Marker light/headlight control switch with dimmer switch
- Self-canceling turn signal control with indicators

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- Windshield wiper switch with intermittent control and washer control
- Master warning light switch
- Transmission oil temperature gauge
- Air filter restriction indicator
- Pump shift control with green "pump in gear" and "o.k. to pump" indicator lights • Parking brake controls with red indicator light on dash
- Automatic transmission shift console
- Electric horn button at center of steering wheel
- Cab ajar warning light on the message center enunciator

Controls and switches shall be identified as to their function by backlit wording adjacent to each switch, or indirect panel lighting adjacent to the controls.

Fast Idle System

A fast idle system shall be provided and controlled by the cab-mounted or pump panel-mounted switch. The system shall increase engine idle speed to a preset RPM for increased alternator output. (The cab dash has a position for the switch by default, if the switch is to be located on the pump panel it must be annotated in "Location".)

Electrical System

The cab and chassis system shall have a centrally located electrical distribution area. All electrical components shall be located such that standard operations shall not interfere with or disrupt vehicle operation. An automatic thermal-reset master circuit breaker compatible with the alternator size shall be provided. Automatic-reset circuit breakers shall be used for directional lights, cab heater, battery power, ignition, and other circuits. An access cover shall be provided for maintenance access to the electrical distribution area.

A 6 place, constantly hot, and 6 place ignition switched fuse panel and ground for customer-installed radios and chargers shall be provided at the electrical distribution area. Radio suppression shall be sufficient to allow radio equipment operation without interference.

All wiring shall be mounted in the chassis frame and protected from impact, abrasion, water, ice, and heat sources. The wiring shall be color-coded and functionally-labeled every 3" on the outer surface of the insulation for ease of identification and maintenance. The wiring harness shall conform to SAE 1127 with GXL temperature properties. Any wiring connections exposed to the outside environment shall be weather-resistant. All harnesses shall be covered in a loom that is rated at 280 degrees F to protect the wiring against heat and abrasion.

A Vehicle Data Computer (VDC) shall be supplied within the electrical system to process and distribute engine and transmission Electronic Control Module (ECM) information to chassis system gauges, the message center, and related pump panel gauges. Communication between the VDC and chassis system gauges shall be through a 4 wire multiplexed communication system to ensure accurate engine and transmission data is provided at the cab dash and pump. The VDC shall be protected against corrosion, excessive heat, vibration, and physical damage.

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Two (2) dual rectangular sealed beam halogen headlights shall be installed on the front of the cab, one (1) on each side, mounted in a polished chrome-plated bezel. The low beam headlights shall activate with the release of the parking brake to provide daytime running lights (DRL) for additional vehicle conspicuity and safety. The headlight switch shall automatically override the DRL for normal low beam/high beam operation.

Cab Crashworthiness Requirement

The apparatus cab shall meet and/or exceed relevant load and impact tests required for compliance certification with ECE Regulation No. 29, Addendum 28, Revision 1, "Uniform Provisions Concerning the Approval of Vehicles with Regard to the Protection of the Occupants of the Cab of a Commercial Vehicle." **NO EXCEPTIONS.**

As part of this test (Regulation No. 29), a pendulum weight of 3,700 lbs. shall strike the apparatus cab with a frontal impact. The pendulum weight shall have been released from approximately 9' above the ground, imparting over 32,500 ft. lbs. of energy into the cab. This event shall simulate a 3,700 lb. vehicle hitting the cab at approximately 16 MPH. Upon completion, there shall be minimal to no intrusion into the cab's occupant compartment. Moreover, the cab doors shall be capable of opening readily.

A copy of a certificate or letter verifying minimum compliance to Regulation No. 29 by an independent, licensed, professional engineer shall be provided upon request.

In terms of exceeding the requirements of Regulation No. 29, the apparatus cab shall be capable of withstanding with minimal intrusion to the occupant compartment, the following tests:

- With the apparatus cab positioned at an angle of 49 degrees to a line running perpendicular in the center of a pendulum test weight, or 41 degrees to a line running parallel to the face of the same weight, an impact test shall have been executed. A 3,700 lb. pendulum shall have been positioned to strike the driver's side corner of the cab with the center of gravity of the pendulum at 53" above the ground reference plane. The pendulum test weight shall have been released from a height of 158.25" above the same ground reference plane. At this drop height, when released, the pendulum shall impart 32,715 ft. lbs. of energy into the driver's side corner. Upon completion, the resultant impact shall not cause significant intrusion to the driver's space. This shall have been verified with the placement of a 50th percentile male mannequin into the driver's seat after the impact.
- After completion of the test noted in #1 above, the apparatus cab shall have been submitted to a static cab roof load test exceeding Regulation No. 29. With minimal deformation or intrusion, the cab structure shall withstand a static load of 54,300 lbs., exceeding Regulation No. 29 by two and half times (2.5 x) the required amount.

For any or all of the above tests, the cab manufacturer shall provide either photographs or video footage of the procedure upon request.

ISO Compliance

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The manufacturer shall ensure that the construction of the apparatus cab shall be in conformance with the established ISO-compliant quality system. All written quality procedures and other procedures referenced within the pages of the manufacturer's Quality Manual, as well as all Work Instructions, Workmanship Standards, and Calibration Administration that directly or indirectly impacts this process shall be strictly adhered to. By virtue of its ISO compliance the manufacturer shall provide an apparatus cab that is built to exacting standards, meets the customer's expectations, and satisfies the customer's requirements.

CAB ROOF TYPE

Raised Roof

The rear portion of the cab roof shall be raised 12". This will provide at least 5`-7" standing room. The front of the vista hood shall be sloped at 45 degrees from the vertical. The slope shall begin slightly in front of the centerline of the front axle to leave room for warning lights and air conditioning in front of the vista. The main roof extrusion shall extend up into the vista to strengthen the roof perimeter. Windows shall be provided on front, side, and rear unless otherwise specified.

The rear door shall have an 85" vertical dimension for improved ingress/egress characteristics. The door shall be equipped with a dual striker bolt system.

CAB BADGE PACKAGE

Logo Package

The apparatus shall have manufacturer logos provided on the cab and body as applicable.

GRILLE

GRILLE, ABS CHROME

The front cooling air intake grille shall be constructed of stainless steel mesh and supported by an impact-resistant chrome plated ABS frame providing no less than 81% open area for excellent cooling performance.

CAB DOOR OPTIONS

Cab Front Door Windows

Driver and officer door windows shall have the support pillar located toward the front of the window. There shall be a vent that can be opened and closed within the window itself, located towards the front.

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Cab Door Front Windows

The front door cab windows shall be electrically controlled. Each window shall have a switch on the door to control operation. The driver door shall have a switch panel to control each door window individually.

Cab Door Rear Windows

The rear cab door windows shall be electrically controlled. Each window shall have a switch on the door to control operation.

Cab Door Panels

The inner door panels shall be made from 14 gauge brushed finish stainless steel for increased durability. The cab door panels shall incorporate an easily removable panel for access to the latching mechanism for maintenance or service.

Rear Cab Door Position

The cab rear doors shall be moved to the rear of the wheel opening. This door placement facilitates easier entry and egress by reducing the rear facing seat protrusion into the door opening.

Rear door position to the 58" or (medium cab)

Cab Door S/S Trim

Each cab door shall have a stainless steel trim on the trailing edge of the door opening.

Cab Door Exterior Latches

All cab doors shall have "L" style exterior door latches.

Cab Door Area Lighting

There shall be four (4) clear LED lights provided to illuminate the cab step well area. Each light shall be located on each cab door in the inboard position. Each light shall be activated by the cab door ajar circuit.

Cab Door Reflective Material

Reflective White/Red material striping shall be supplied on each of the lower cab doors. The stripes shall run from the top outer corner to the bottom inside corner of the panel, forming a "V" shape when viewed from the rear. The reflective material shall meet NFPA 1901 requirements.

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MIRRORS

Cab Mirrors

Two (2) Ramco model 6001FFR remote controlled aluminum mirrors shall be installed. The mirrors shall incorporate a full face main section with a convex mirror with housing, model CAS750, mounted to the top. The adjustment of main sections shall be through dash mounted switches. Location: mounted on front corners of cab

Mirrors, Heated

The cab mirrors shall be heated.

MISC EXTERIOR CAB OPTIONS

Rear Cab Wall Construction

The rear cab wall shall be constructed using formed 3/16" (.188") aluminum smooth plate interlocking in aluminum extrusions. A rear cab wall overlay constructed of 3/32" (.090") diamond plate shall be provided over the smooth plate.

Front Mud Flaps

Black linear low density polyethylene (proprietary blend) mudflaps shall be installed on the rear of the cab front wheelwells. The design of the mudflap shall have corrugated ridges to distribute water evenly.

Cab Windows Rear Wall

Fixed glass windows shall be supplied on either side of the cab, providing visibility at the rear. The windows shall be approximately 4" wide and approximately the same height as the door windows.

Cab Canopy Window

There shall be a fixed window provided between the front and rear doors on the driver's side of the cab.

Handrails

Cab door assist handrails shall consist of two(2) 1.25" diameter x 18" long 6063-T5 anodized aluminum tubes mounted directly behind the driver and officer door openings each side of the cab. The handrails shall be machine extruded with integral ribbed surfaces to assure a good grip for personnel safety. Handrails shall be installed between chrome end stanchions and shall be positioned at least 2" from the mounting surface to allow a positive grip with a gloved hand.

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Cab Canopy Window

There shall be a fixed window provided between the front and rear doors on the officer`s side of the cab.

Handrails

Cab door assist handrails shall consist of two(2) 1.25” diameter x 36” long 6063-T5 anodized aluminum tubes mounted directly behind the driver and officer rear door openings each side of the cab. The handrails shall be machine extruded with integral ribbed surfaces to assure a good grip for personnel safety. Handrails shall be installed between chrome end stanchions and shall be positioned at least 2” from the mounting surface to allow a positive grip with a gloved hand.

HVAC

Air Conditioning

An overhead air-conditioner / heater system with a single radiator mounted condenser shall be supplied.

The unit shall be mounted to the cab interior headliner in a mid cab position, away from all seating positions. The unit shall provide ten (10) comfort discharge louvers, four (4) to the back area of the cab and six (6) to the front. These louvers will be used for AC and heat air delivery. Two (2) additional large front louvers shall be damper controlled to provide defogging and defrosting capabilities to the front windshield as necessary.

The unit shall consist of a high output evaporator coil and heater core with one (1) high output dual blower for front air delivery, and two (2) high performance single wheel blowers for rear air delivery.

The control panel shall actuate the air-distribution system with air cylinders, which are to be separated from the brake system by an 85-90 psi pressure protection valve. A three-speed blower switch shall control air speed.

The condenser shall be radiator mounted and have a minimum capacity of 65,000 BTU`s and have dual fans with a built in receiver drier.

Performance Data: (Unit only, no ducting or louvers)

AC BTU: 55,000

Heat BTU: 65,000

CFM : 950 @ 13.8V (All blowers)

The compressor shall be a ten-cylinder swash plate type Seltec model TM-31HD with a capacity of 19.1 cu.in. per revolution.

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The system shall be capable of cooling the interior of the cab from 100 degrees ambient to 75 degrees or less with 50% relative humidity in 30 minutes or less.

SEATS

All seats shall be Bostrom brand.

Seat Cover Material

All seats shall have vinyl seat cover material.

Seat Fabric Color

All seats shall be gray in color.

Seat, Driver

One (1) H. O. Bostrom 400 Series Sierra Air- 100RX4 suspension seats with high back styling shall be supplied for the driver position.

Features shall include:

- Air-100 suspension assembly with weight, height and ride adjustment.
- Built in lumbar support.
- 4" vertical suspension motion.
- 5" fore and aft adjustment.

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.

Seat, Officer

One (1) H. O. Bostrom 400 Series fixed seat with high back SCBA storage for the officer's position shall be supplied.

Features shall include:

- Removable "Store-All" side cushions.
- Auto-pivot and return headrest to open for improved exit with SCBA.
- 12.5" wide SCBA cavity to store leading SCBA Brands.
- Built in lumbar support.
- Replaceable seat, side and headrest cushions.

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so

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the male end can be easily grasped and the female end easily located while sitting in a normal position.

Seat, Rear Facing

One (1) Bostrom 400 Series tanker 450 SCBA high back SCBA storage seat shall be provided in the rear facing position over the driver side wheel well.

Features shall include:

- Removable "Store-All" side cushions.
- Auto-pivot and return headrest to open for improved exit with SCBA.
- 12.5" wide SCBA cavity to store leading SCBA Brands.
- Built in lumbar support.
- Replaceable seat, side and headrest cushions.

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.

Seat, Rear Facing

One (1) Bostrom 400 Series tanker 450 SCBA high back SCBA storage seats shall be provided in the rear facing position over the officer side wheel well.

Features shall include:

- Removable "Store-All" side cushions.
- Auto-pivot and return headrest to open for improved exit with SCBA.
- 12.5" wide SCBA cavity to store leading SCBA Brands.
- Built in lumbar support.
- Replaceable seat, side and headrest cushions.

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.

Seating Capacity Tag

A tag that is in view of the driver stating seating capacity of six (6) personnel shall be provided.

Bostrom SecureAll Locking System

The H.O. Bostrom SecureAll™ SCBA Locking System shall be one bracket model and store all U.S. and international SCBA brands and sizes while in transit or for storage on fire trucks. The

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bracket shall be easily adjustable; all adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ bracket shall fit in all H.O. Bostrom Tanker SCBA seats including ABTS and non-ABTS seats and all flip-up ABTS and non-ABTS seats. Additional seat depth shall not be required for proper bracket fit; changes to the shroud back shall not be required for proper mounting of the bracket.

The standard release handle shall be integrated into the seat cushion for quick and easy release and shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

The H.O. Bostrom SecureAll™ system meets NFPA 1901 standards and requirements of EN 1846-2.

The bracket(s) shall be located officer's seat, rear facing driver's side, inboard driver's side rear wall, inboard officer's side rear wall, rear facing officer's side.

Seat, Rear Wall

One (1) Bostrom Tanker 400CT flip up jump seat with SCBA storage be installed. Location on the rear wall to be driver's side inboard, officer's side inboard.

Features shall include:

- Seat bottom constructed of high density foam with a heavy wear resistant covering
- Automatically flip up when not in use to provide increased room in the rear of the cab.
- Removable "Store-All" side cushions.
- Auto-pivot and return headrest to open for improved exit with SCBA.
- 12.5" wide SCBA cavity to store leading SCBA Brands.
- Built in lumbar support.
- Replaceable seat, side and headrest cushions.

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.

Cab Occupant Seating Detection System

There shall be a visual and audible warning system installed in the cab that indicates the occupant buckle status of all cab seating positions that are designed to be occupied during vehicle movement.

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The audible warning shall activate when the vehicle's park brake is released and a seat position is not in a valid state. A valid state is defined as a seat that is unoccupied and the seat belt is unbuckled, or one that has the seat belt buckled after the seat has been occupied.

The visual warning shall consist of a graphical display that will continuously indicate the validity of each seat position.

The system shall include a display panel with LED back-lit ISO indicators for each seating position, seat sensor and safety belt latch switch for each cab seating position, audible alarm, main control module, and braided wiring harness.

The display panel shall be located Driver side of center dash electrical cover.

MAP BOXES

Map Box

An aluminum map/storage box shall be installed in the cab. The map box shall be constructed of 1/8" (.125) inch smooth aluminum. Hinged drop down doors, with push button latches, shall be installed on the front of the box for the access to two (2) storage areas. Each storage area shall have three (3) fixed shelves for storage of ring binders, map books, etc. Each latch shall have a 50 lb. Rating.

The map box shall be mounted on the vertical uprights in the center of the cab between the driver and officer seating positions. The map box shall be secured and tested to meet with current N. F. P. A. requirements.

Approximate Dimensions:

Divided Storage area - 34" W x 12.50" H x 12" D.

Map Box Finish

All map boxes shall have OTO gray finish.

MISC INTERIOR CAB OPTIONS

Cab Interior Color

Cab instrument panel, overhead console, trim panels, headliner, and door panels shall be gray.

Sunvisors

Lexan sun visors shall be provided for the driver and officer matching the interior trim of the cab and shall be flush mounted into the underside of the overhead console.

Air Horn Lanyard

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There shall be a "Y" style lanyard mounted in the center of the cab that allows the driver and officer to operate the air horns. The lanyard shall activate an electrical air switch.

Heat, Supplemental

A single 40,000 BTU water heater shall be supplied in the front area of the cab. The unit shall heat the lower section of the driver`s and officer`s footwell.

Dual 23,000 BTU water heaters with diamond plate covers shall be supplied in the rear of the cab to heat the rear cab lower section.

Dual climate control will be achieved via dual switches installed on a front instrument panel.

CAB ELECTRICAL OPTIONS

Cab Dome Lights

A dome light assembly with two (2) incandescent bulbs with one (1) white lens and one (1) red lens and plastic housing shall be installed. The white light activates with appropriate cab door and light assembly mounted push-button switch, the red light activates with light assembly mounted push-button switch only.

There shall be two (2) mounted in the front of the cab, one (1) in the driver and one (1) in the officer ceiling.

There shall be two (2) mounted in the rear of the cab, one (1) in the driver side and one (1) in the officer side ceiling.

Battery Charger/Air Comp

A Kussmaul auto charger 1200 battery charger, air compressor with automatic battery charger shall be installed.

The battery charger shall be completely automatic with an output of 0-40 amp @ 12 volts DC and an input current requirement of 10 amps @ 120 volts AC.

A Kussmaul air compressor with automatic battery conditioner model 091-9-1200 shall be installed. The battery conditioner is completely automatic with a 0-40 amp output to maintain the charge in the battery system. The air compressor shall be powered by a 12 volt DC output from the battery charger and has an output of .30 cfm at 80 psi. A pressure switch senses the system pressure and operates the compressor whenever the pressure in the air brake system drops below a predetermined level.

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Radio

Unit shall be equipped with an AC Delco model XTA2300 AM/FM stereo CD with weather band. Two (2) Prestige model 2525 5-1/4" radio speakers and antenna shall be supplied mounted in padding adjacent to driver`s and officer`s seat.

Unit shall be suppressed from engine noise to provide clear sound through respective speakers.

Location: center overhead

Auto Eject Battery Charger Receptacle

The battery charger receptacle shall be a Kussmaul 20 Amp NEMA 5-20 super auto-eject #091-55-20-120 with a cover. The super auto-eject receptacle shall be completely sealed and have an automatic power line disconnect.

The receptacle shall be located outside driver's door next to handrail and the cover color shall be Yellow.

Switch Horn Button Three Position

A three (3) position rocker switch shall be installed in the cab and properly labeled to enable operator to activate one of the following from the steering wheel horn button: OEM Traffic horn; air horn or electronic siren.

English Dominant Gauge Cluster

The cab operational instruments shall be located in the dashboard on the driver side of the cab and shall be clearly visible. The gauges in this panel shall be English dominant and shall be the following:

- Speedometer/Odometer
- Tachometer with integral hour meter
- Engine oil pressure gauge with warning light and buzzer
- Engine water temperature gauge with warning light and buzzer
- Two (2) air pressure gauges with a warning light and buzzer (front air and rear air)
- Fuel gauge
- Voltmeter
- Transmission oil temperature gauge

This panel shall be backlit for increased visibility during day and night time operations.

Headlights

The front of the cab shall have four (4) headlights. The headlights shall be mounted on the front of the cab in the upper position. The headlights shall be day time operational.

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Cab Door Warning Lights

One (1) Whelen model PSR00FRR LED strip light shall be provided on each interior cab door panel. The light shall be horizontally mounted on the lower kick panel and wired through the door switch.

Cab Turn Signals

There shall be a pair of Federal Signal QuadraFlare model QL64Z-ARROW LED (Light Emitting Diode) turn signal light heads with populated arrow pattern and amber lens mounted lower headlight bezel and wired with weatherproof connectors.

Cab 12 Volt Outlet[Qty: 2]

A plug-in type receptacle for hand held spotlights, cell phones, chargers, etc. shall be installed driver side dash, officer side dash. The receptacle shall be wired battery hot.

Speedometer for Officer

An electronic speedometer shall be mounted on the passenger's side of the cab, mounted in the overhead console.

Antenna Base

There shall be a Tessco P/N 90942 universal antenna base mounted on the cab roof with a weatherproof connector. The antenna base shall be NMO Motorola Style (equivalent to a MATM style). The antenna shall be located driver side forward with coaxial cable terminating at the center of the dash board, officer side forward with coaxial cable terminating at the center of the dash board

Cab Tilt Interlock

An interlock shall be provided to prevent tilting the cab unless the front intake is positioned to prevent interference.

BODY COMPT LEFT SIDE

Driver Side Assembly

The driver side assembly shall be constructed entirely of aluminum extrusions and interlocking aluminum plates. This aluminum modular design shall provide a high strength-to-weight ratio for increased equipment carrying capacity.

The driver side body corners shall be 6063-T5 extruded aluminum corner sections with a 3/16" (0.188") wall thickness. The side body extrusions shall be 6063-T5 aluminum tubing with a 3/16" (0.188") wall thickness and 3/16" (0.188") outside corner radius. The corners and sides

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shall be welded both internally and externally at each joint using an aluminum alloy welding wire.

The driver side body shall be completely sanded and deburred to assure a smooth finish and painted job color.

Driver Side Compartments

The three (3) driver side compartments shall be constructed from 3003 H14 1/8" (.125") smooth aluminum plate. The compartments shall be modular in design and shall not be a part of the body support structure.

There shall be one (1) compartment located ahead of the rear wheels. This compartment shall be approximately 42" wide x 68" high x 26" deep in the lower 57" high section and 12" deep in the upper 11" high section. The compartment shall contain approximately 39.2 cu. ft. of combined storage space. The door opening shall be approximately 42" wide x 68" high.

There shall be one (1) compartment located over the rear wheel. The compartment shall be approximately 56" wide x 34" high x 26" deep and contain approximately 28.6 cu. ft. of storage space. The door opening shall be approximately 56" wide x 34" high.

There shall be one (1) compartment located behind the rear wheel. The compartment shall be approximately 56" wide x 68" high. The forward area of the compartment shall be approximately 42" wide x 68" high x 26" deep in the lower 57" high section and 12" deep in the upper 11" high section. The enhanced extended rear portion of the compartment shall be approximately 14" wide x 68" high x 25" deep in the lower 57" high section and 11" deep in the upper 38" high section. The total combined storage space shall be approximately 51.7 cu. ft. The door opening shall be approximately 56" wide x 68" high.

Each compartment seam shall be sealed using a permanent pliable silicone caulk. The walls of each compartment shall be machine-louvered for adequate ventilation.

An externally-mounted compartment top shall be provided and constructed of a 1/8" (.125") aluminum treadplate.

BODY COMPT RIGHT SIDE

Officer Side Assembly

The officer side assembly shall be constructed entirely of aluminum extrusions and interlocking aluminum plates. This aluminum modular design shall provide a high strength-to-weight ratio for increased equipment carrying capacity.

The officer side body corners shall be 6063-T5 extruded aluminum corner sections with a 3/16" (0.188") wall thickness. The side body extrusions shall be 6063-T5 aluminum tubing with a 3/16" (0.188") wall thickness and 3/16" (0.188") outside corner radius. The corners and sides shall be welded both internally and externally at each joint using an aluminum alloy welding wire.

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The officer side body shall be completely sanded and deburred to assure a smooth finish and painted job color.

Officer Side Compartments

The three (3) officer side compartments shall be constructed from 3003 H14 1/8" (.125") smooth aluminum plate. The compartments shall be modular in design and shall not be a part of the body support structure.

There shall be one (1) compartment located ahead of the rear wheel. The compartment shall be approximately 42" wide x 68" high x 26" deep in the lower 57" high section and 12" deep in the upper 11" high section. The compartment shall contain approximately 39.2 cu. ft. of combined storage space. The door opening shall be approximately 42" wide x 68" high.

There shall be one (1) compartment located over the rear wheel. The compartment shall be approximately 33" wide x 34" high x 26" deep and contain approximately 16.8 cu. ft. of storage space. The door opening shall be approximately 33" wide x 34" high.

There shall be one (1) compartment located behind the rear wheel. The compartment shall be approximately 56" wide x 68" high. The forward area of the compartment shall be approximately 42" wide x 68" high x 26" deep in the lower 57" high section and 12" deep in the upper 11" high section. The enhanced extended rear portion of the compartment shall be approximately 14" wide x 68" high x 25" deep in the lower 57" high section and 11" deep in the upper 38" high section. The total combined storage space shall be approximately 51.7 cu. ft. The door opening shall be approximately 56" wide x 68" high.

Each compartment seam shall be sealed using a permanent pliable silicone caulk. The walls of each compartment shall be machine-louvered for adequate ventilation.

An externally-mounted compartment top shall be provided and constructed of a 1/8" (.125") aluminum treadplate. The compartment top shall be removable for easy access to the main body wiring harness.

Ladder Rack

A Zico Quick-Lift HLAS overhead ladder rack shall be provided to place the ladders at a safe and convenient height for unloading and loading. The rack shall be located over the rear wheel well.

The rack shall be electrical/hydraulically operated by a durable high cycle 12 volt actuator and controlled by a 30 amp two-pole double-throw momentary switch located in the officer side pump module area. The control switch location shall allow the operator to monitor operations and ground personnel while lowering and raising the rack.

A visual signal shall be provided to indicate when the ladder rack is in motion by two (2) yellow flashing lights installed one (1) on each side of the rack. The rack shall also be wired through the door ajar indicator light located in the cab to alert the driver that the rack is not stowed if the park brake is released.

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Ladder Rack Offset Rearward

Overhead Ladder Rack shall be offset rearward includes shifting of wheel well compartment forward.

BODY COMPT REAR

Rear Body Assembly

The rear body shall be constructed entirely of aluminum extrusions and interlocking aluminum plates and includes a full height center rear compartment.

The rear body frame shall be 6063-T5 1.5" x 4" and 1.5" x 3" aluminum extrusions with a 3/16" (0.188") wall thickness and 3/16" (0.187") outside corner radius and 1/8" (0.125") aluminum tread plate. The rear extrusions shall be welded both internally and externally at each joint using an aluminum alloy welding wire.

Rear Body Compartment

The full height center rear compartment shall be constructed from 3003 H14 1/8" (.125") smooth aluminum plate. The compartment shall be modular in design and shall not be a part of the body support structure.

The compartment shall be approximately 38" wide and shall vary in height and depth dependent upon water tank capacity.

The compartment seams shall be sealed using a permanent pliable silicone caulk. Machined louvers shall be provided for adequate ventilation.

Tailboard Step

A tailboard step shall be provided at the rear of the body. The tailboard shall 15.5" in depth and in accordance with NFPA in both step height and stepping surface. The maximum rear step height to the tailboard shall not exceed 24".

The tailboard step shall be formed from 3/16" (0.188") aluminum treadplate and shall be reinforced with 6063-T5 1.5" x 3" aluminum extrusion. The tailboard shall be in accordance with current NFPA requirements and shall include a multi-directional aggressive gripping surface incorporated into the diamond plate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8" (0.125") Gripping surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4".

The tailboard step shall be bolted on to the body from the underside assuring a clear surface and shall be easily removable for replacement in the case of damage.

Enhanced Extended Compartment Framework

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Each side of the tailboard shall be the external compartment frame work of the enhanced extended side compartments. The compartment frame work shall be 6063-T5 1.5"x 4" and 1.5" x 3" aluminum extrusions with a 3/16"(0.188") wall thickness and 3/16" (0.188") outside corner radius. The rear extrusions shall be welded both internally and externally at each joint using an aluminum alloy welding wire.

Rear Access Handrails

Three (3) handrails shall be provided at the rear of the body to assist ground personnel accessing the tailboard step and hosebed area. Each handrail shall be constructed of 6063T5 1.25" OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, and shall be mounted between chrome stanchions.

Three (3) handrails shall be located- two (2) handrails, one (1) on each side, appropriately sized handrail mounted vertically on the trailing edge of the body and one (1) appropriately sized handrail mounted horizontally below the rear hosebed opening.

DOORS

Roll Up Compartment Door

A ROM brand roll up door with satin finish shall be provided on a compartment up to 45" tall. The door(s) shall be installed in the following location(s): L2, R2

The Robinson door slats shall be double wall box frame and manufactured from anodized aluminum. The slats shall have interlocking end shoes on each slat. The slats shall have interlocking joints with a PVC/vinyl inner seal to prevent any metal to metal contact and inhibit moisture and dust penetration.

The track shall be anodized aluminum with a finishing flange incorporated to provide a finished look around the perimeter of the door without additional trim or caulking. The track shall have a replaceable side seal to prevent water and dust from entering the compartment.

The doors shall be counterbalanced for ease in operation. A full width latch bar shall be operable with one hand, even with heavy gloves. Securing method shall be a positive latch device.

A magnetic type switch integral to the door shall be supplied for door ajar indication and compartment light activation.

The door opening shall be reduced by 2" in width and approximately 8-9" in height depending on door height.

Roll Up Compartment Door

A ROM brand roll up door with satin finish shall be provided on a compartment greater than 45" tall. The door(s) shall be installed in the following location(s): L1, L3, R1, R3, B1

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The Robinson door slats shall be double wall box frame and manufactured from anodized aluminum. The slats shall have interlocking end shoes on each slat. The slats shall have interlocking joints with a PVC/vinyl inner seal to prevent any metal to metal contact and inhibit moisture and dust penetration.

The track shall be anodized aluminum with a finishing flange incorporated to provide a finished look around the perimeter of the door without additional trim or caulking. The track shall have a replaceable side seal to prevent water and dust from entering the compartment.

The doors shall be counterbalanced for ease in operation. A full width latch bar shall be operable with one hand, even with heavy gloves. Securing method shall be a positive latch device.

A magnetic type switch integral to the door shall be supplied for door ajar indication and compartment light activation.

The door opening shall be reduced by 2" in width and approximately 8-9" in height depending on door height.

Drip Pan

A ROM drip pan shall be supplied for each roll-up door. The drip pan shall be made from a high strength aluminum alloy. The splashguard and end caps shall be made from extruded and injection molded high-impact plastic. Drip pan location(s): L1, L2, L3, R1, R2, R3, B1

COVERS

Hosebed Cover

A cover constructed of Black 18 oz. PVC vinyl coated polyester shall be installed over the apparatus hosebed. The base fabric shall be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 square inch.

The front edge of the cover shall be mechanically attached to the body. The sides of the cover shall be held in place with heavy duty Velcro strips running the length of the hosebed. The rear of the cover shall have an integral flap that extends down to cover the rear of the hosebed. This flap shall be secured in place with heavy duty nylon straps to comply with the latest edition of NFPA 1901.

Speedlay Cover - Front

A cover constructed of Black 18 oz. PVC vinyl coated polyester shall be installed over the front openings of the apparatus speedlay. The base fabric shall be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 square inch.

The cover shall be secured in place to comply with the latest edition of NFPA 1901.

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Speedlay Covers - Sides

A pair of covers constructed of Black 18 oz. PVC vinyl coated polyester shall be installed over the side openings of the apparatus speedlay. The base fabric shall be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 square inch.

The covers shall be secured in place to comply with the latest edition of NFPA 1901.

PUMP MODULE

Crosswalk Module

An aluminum extruded crosswalk module shall be provided and located forward of the pump module. The crosswalk module shall be constructed entirely of aluminum extrusions and interlocking aluminum plates. The crosswalk module design and mounting shall be separate from the pump module and the body to allow each to move independently of each other in order to reduce stress from frame twisting and vibration. The exterior surface of the crosswalk module shall have a sanded finish.

The crosswalk walkway shall be in accordance with NFPA in both step height and stepping surface. The crosswalk shall include two (2) crosswalk walkway access folding steps, two (2) 36" handrails, one (1) on each side mounted vertically on the forward extrusion of the pump module. The crosswalk walkway shall be formed from 3/16" (.188") aluminum treadplate and shall include a multi-directional, aggressive gripping surface incorporated into the treadplate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8" (.125"). Gripping surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4". The crosswalk walkway shall be bolted on to the module and be easily removable for replacement in the case of damage.

Crosswalk Walkway Compartments

The area directly below the crosswalk walkway shall include two (2) compartments, one (1) each side. Each compartment shall provide approximately 1.4 cu. ft. of storage space. The compartments shall include spring loaded, vertically-hinged 1/8" (.188") aluminum treadplate doors with push-button latches. A switch wired to the door ajar indicator light in the cab shall be provided interlocked with the parking brake per NFPA.

Crosswalk Module Running Boards

The crosswalk module shall include a running board on each side of the pump module. The running boards shall be in accordance with NFPA in both step height and stepping surface. The maximum step height to each running board shall not exceed 24". The running boards shall be formed from 1/8" (.125") aluminum treadplate. Each running board shall include a multi-directional, aggressive gripping surface incorporated into the treadplate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8" (.125"). Gripping surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4". Each running board shall be bolted on to the module and be easily removable for replacement in the case of damage.

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Upper Pump Module

An aluminum extruded upper pump module with a forward area for the top mounted pump control panel, backboard storage and dunnage pan shall be provided. The upper pump module shall be constructed entirely of aluminum extrusions and interlocking aluminum plates. The upper pump module design and mounting shall allow the upper area of the pump module to be reconfigured to meet possible future needs or growth of the department. The exterior surface of the upper pump module shall have a sanded finish.

Top Mounted Pump Control Area

The forward upper pump module shall have an area for mounting all the necessary components for a top mount controlled pump application.

Backboard Storage

The module design shall include backboard storage area forward of the dunnage pan. The storage area shall have an opening of approximately 20" high x 5" wide. The backboards shall be secured with 1/8" (.125) aluminum treadplate vertically hinged doors on each end of the compartment.

Dunnage Pan

A dunnage pan constructed of 3/16" (.188") aluminum treadplate shall be located rearward of the dunnage pan. The dunnage pan shall be sized to maximize available storage space.

Pump Module Width

Pump Module shall be 76" wide.

Lower Pump Module

An aluminum extruded lower pump module shall be provided and located forward of the body. The pump module shall be constructed entirely of aluminum extrusions and interlocking aluminum plates. The pump module design and mounting shall be separate from the body to allow the pump module and body to move independently of each other in order to reduce stress from frame twisting and vibration. The exterior surface of the pump module shall have a sanded finish. The pump module panel opening shall be 45" in width.

Pump Module Running Boards

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The pump module shall include a running board on each side of the pump module. The running boards shall be in accordance with NFPA in both step height and stepping surface. The maximum step height to each running board shall not exceed 24". The running boards shall be formed from 1/8" (.125") aluminum treadplate. Each running board shall include a multi-directional, aggressive gripping surface incorporated into the treadplate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8" (.125"). Gripping surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4". Each running board shall be bolted on to the pump module and be easily removable for replacement in the case of damage.

Speedlay Module Location

Speedlay module shall be located between crosswalk and pump module.

Speedlay Module

An aluminum extruded speedlay module with an area for a triple speedlay shall be provided and located to the forward area of the pump module. The speedlay module shall be constructed entirely of aluminum extrusions and interlocking aluminum plates. The speedlay module design and mounting shall be separate from the pump module and the body to allow each to move independently of each other in order to reduce stress from frame twisting and vibration. The exterior surface of the speedlay module shall have a sanded finish.

Speedlay Preconnect Storage

The module design shall include an area for a stacked triple speedlay. The two (2) upper speedlays shall have a capacity of 250` of 1.75" double jacket hose. The one (1) low`er speedlay shall have a capacity the capacity for 250` of 1.75" double jacket hose or 200` of 2.5" double jacket hose. The floor of the speedlays shall be slotted to prevent the accumulation of water and allow for ventilation of wet hose.

Speedlay Compartments

The area directly below the speedlay shall include two (2) compartments, one (1) each side. Each compartment shall provide approximately 1.4 cu. ft. of storage space. The compartments shall include vertically-hinged 1/8" (.125") aluminum treadplate doors with push-button latches. A switch wired to the door ajar indicator light in the cab shall be provided interlocked with the parking brake per NFPA.

Speedlay Module Running Boards

The speedlay module shall include a running board on each side of the module. The running boards shall be in accordance with NFPA in both step height and stepping surface. The maximum step height to each running board shall not exceed 24". The running boards shall be formed from 1/8" (.125") aluminum treadplate. Each running board shall include a multi-directional, aggressive gripping surface incorporated into the treadplate. The surface shall

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extend vertically from the diamond plate sheet a minimum of 1/8" (.125"). Gripping surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4". Each running board shall be bolted on to the pump module and be easily removable for replacement in the case of damage.

PUMP PANELS

Top Mount Pump Panels

The top mount gauge panel, driver and officer side pump panels shall be constructed of 14 gauge stainless steel.

The top mount gauge panel shall be able to lift forward for access to panel mounted electrical connections.

The driver and officer panels shall have the ability to be removed from the module for easier access and for maintenance in the pump area.

Pump Access Doors

The driver and officer side pump module shall include an upper horizontally hinged pump access door.

The doors shall be constructed of 3/16" (.187") aluminum treadplate. The compartment doors shall be securely attached with a full-length stainless steel piano type hinge with 1/4" pins. The hinges shall be "staked" on every other knuckle to prevent the pins from sliding. The doors shall include two (2) push button style latches to secure the doors in the closed position and two (2) hold open devices to hold the doors in the open position.

MISC PUMP PANEL OPTIONS

Pump Panel Tags

Color coded pump panel labels shall be supplied to be in accordance with NFPA compliance.

PUMP MODULE OPTIONS

Flex Joint

The area between the pump modules and body shall include a rubber flex joint.

Air Horn Switch

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A heavy duty, weatherproof, push button switch shall be installed at the pump operator`s panel to operate the air horns.

The switch shall be labeled "Evacuation Alert".

Location: top mount control panel

WATER TANK

1030 Gallon Water Tank

A 1030 gallon (U.S.) "R" booster tank shall be supplied. The booster tank shall be of a pinned baffle design. The booster tank shall be completely removable without disturbing or dismantling the apparatus body structure.

The booster tank top, sides, and bottom shall be constructed of 1/2" (0.50") black UV-stabilized copolymer polypropylene. The copolymer polypropylene tank material shall be welded together utilizing thermoplastic welding technology. A clean hot air temperature controlled process, shall ensure that each weld reaches its plasticized state without cold or hot spots. The copolymer polypropylene material shall be used for its high strength and corrosion resistance for a prolonged tank life.

The booster tank shall have a fill tower with a rearward hinged lid. The fill tower shall be located in the forward area of the tank and shall assist with tank ventilation. The fill tower shall include a removable 1/4" (0.25") thick polypropylene screen.

The booster tank shall have two (2) tank plumbing openings. One (1) for a tank-to-pump suction line with an anti-swirl plate, and one (1) for a tank fill line. A 3" cleanout plug shall be shall be provided at the bottom of the tank sump.

The booster tank shall include longitudinal and latitudinal baffles. The baffles shall be interlocking and thermo welded to the shell of the tank to minimize water surge during travel and provide enhanced road handling stability. The baffle design shall allow waterflow in accordance with NFPA during tank filling or pump operations.

A 2.5` length of black flex hose shall be installed to the bottom of the tank. This shall direct the draining of overflow water past the rear axle and fuel tank, thus reducing the possibility of freeze-up of these components in cold environments. This drain configuration shall also assure that rear axle tire traction shall not be affected when moving forward.

The booster tank shall undergo extensive testing prior to installation in the truck. The testing shall include an electronic spark and tank fill test after both the internal and external tank shell welds are completed.

A lifetime manufacture`s limited warranty shall be included.

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TANK PLUMBING

Tank Fill 2 Elkhart Valve

One (1) 2" pump-to-tank fill line having a 2" manually operated full flow valve. The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times. The fill line shall be controlled using a chrome handle with an integral tag.

The valve shall be an Elkhart 800 series with an acetal ball and dual adjustable neoprene seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the acetal ball when in a throttle position with water flowing through it.

The valve shall be of the unique Elkhart Drop-out or Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Tank to Pump 3 Elkhart Valve

One (1) manually operated 3" Elkhart valve shall be installed between the pump suction and the booster tank in order to pump water from the tank. The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times.

The valve shall be an Elkhart 800 series with an acetal ball and dual adjustable neoprene seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the acetal ball when in a throttle position with water flowing through it.

The valve shall be of the unique Elkhart Drop-out or Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

FOAM TANK

30 Gallon Foam Tank

A 30 gallon (U.S.) foam cell for class A foam shall be supplied. The foam cell shall be integral to the water tank.

The integral tank top, sides, and bottom shall be constructed of black UV-stabilized copolymer polypropylene. The copolymer polypropylene tank material shall be welded together utilizing thermoplastic welding technology. A clean hot air temperature controlled process, shall ensure

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that each weld reaches its plasticized state without cold or hot spots. The copolymer polypropylene material shall be used for its high strength and corrosion resistance for a prolonged tank life.

The foam tank shall have one (1) fill tower with a hinged lid. The foam fill tower shall include a stainless steel butterfly latch to secure the lid in the closed position and a pressure/vacuum vent mounted in the lid. The fill tower shall be located in the forward area of the tank. The fill tower shall include a removable 1/4" (0.25") thick polypropylene screen.

The foam tank shall undergo extensive testing prior to installation in the truck. The testing shall include an electronic spark and tank fill test after both the internal and external tank shell welds are completed.

A lifetime manufacturer's limited warranty shall be included. As this vehicle is intended to perform the function of a pumper with foam capability, foam tank capacity of less than 30 gallons shall not be acceptable.

LADDER STORAGE / RACKS

Hold Downs

The ladder brackets/rack to store a one (1) three section 35` and one (1) 14` roof ladder.

Ladder Storage

Attic Ladder Storage Brackets

Two (2) brackets shall be provided for the storage of one (1) attic ladder. The brackets shall be constructed of high tensile strength aluminum alloy and shall be located inboard side of ladder rack.

Ladder Brand

The ladder brand that shall be carried on the unit shall be Alco-Lite.

Ladder Rack Door

The center support arm of the ladder rack shall be provided with a hinged 1/8" (.125") aluminum tread plate door. The door shall move with the rack as it is raised and lowered.

Hard Suction Rack

One (1) hard suction hose storage rack shall be provided on the driver side compartment top.

The storage rack shall be constructed of anodized extruded aluminum and includes two (2) spring-mounted latch handles with stainless steel scuff plates. The scuff plates shall be located on the hosebed side to protect the painted surface.

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The storage rack shall store one (1) 6" x 10' hard suction hose.

Hard Suction Tray

One (1) hard suction storage tray shall be provide and mounted to the inboard side of the overhead ladder rack. The tray shall provide ground level access to the suction hose with the rack in the lowered position.

The hard suction tray shall be constructed of 1/8" (.125") smooth aluminum plate with a sanded finish with welded corners for increased strength and rigidity. The hard suction hose shall be secured in the tray by two (2) securing straps- one (1) each end.

Pike Pole Storage

Three (3) aluminum tubes shall be mounted on the overhead ladder rack for storing of three (3) pike poles. The tubes shall be mounted on the inboard side of the rack and in such a way that the poles when in the stowed position shall not interfere with hose deployment from the hosebed.

Pike Pole

Pike pole(s) shall be the following length: (3) 10' pike poles.

Attic Ladder

Attic ladder shall be the following length: 35' 3-Section and 14' roof ladder.

HANDRAILS / STEPS

Folding Step[Qty: 3]

Heavy-duty folding step(s) shall be located officer side front compartment face, driver side front compartment face. The folding step(s) shall meet current NFPA in step height and surface area.

One (1) handrail shall be installed in compliance with current NFPA. The handrail shall be constructed of 6063T5 1.25" OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, mounted between chrome stanchions.

Intermediate Pump Panel Steps

Two (2) intermediate pump panel steps shall be provided.

Each intermediate step shall be constructed of 3/16" (.187") aluminum treadplate. The steps shall include a multi-directional, aggressive gripping surface incorporated into the treadplate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8" (.125"). Gripping surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4". The steps shall be bolted onto the pump module and be easily removable for replacement in the case of damage.

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Lighting shall be provided to and positioned illumination of the upper surface of each step.

Hosebed Folding Steps

Heavy-duty folding steps shall be positioned to the driver side rear of the body. The steps shall be NFPA compliant for access to the hosebed storage area and in step height and surface area. The steps shall be staggered stepped as applicable with tailboard depth, not applicable with recessed step mounting.

One (1) handrail shall be installed (as applicable) in compliance with current NFPA. The handrail shall be constructed of 6063T5 1.25" OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, mounted between chrome stanchions.

Hosebed Folding Steps

Heavy-duty folding steps shall be positioned to the officer side rear of the body. The steps shall be NFPA compliant for access to the hosebed storage area and in step height and surface area. The steps shall be staggered stepped as applicable with tailboard depth, not applicable with recessed step mounting.

One (1) handrail shall be installed (as applicable) in compliance with current NFPA. The handrail shall be constructed of 6063T5 1.25" OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, mounted between chrome stanchions.

MISC BODY OPTIONS

Overall Height Restriction

The apparatus shall have no overall height restrictions.

Overall Length Restriction

The unit has no overall length restrictions.

Body Mainframe

The body mainframe shall be entirely constructed of aluminum. The complete framework shall be constructed of 6061T6 and 6063T5 aluminum alloy extrusions welded together using 5356 aluminum alloy welding wire.

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The body mainframe shall include 3" x 3" 6061-T6 aluminum 3/8" (0.375") wall crossmember extrusion or 3" x 3" I-beam section aluminum extrusion depending on the application at the front of the body . A solid 3" x 3" "I-beam" section aluminum extrusion shall be provided the full width of the body forward and rearward of the rear wheel well. The crossmembers shall be designed to support the compartment framing and shall be welded to 1-3/16" x 3" (1.188" x 3") solid 6063-T5 aluminum frame sill extrusions. The frame sill extrusions shall be shaped to contour with the chassis frame rails and shall be protected from contact with the chassis frame rails by 5/16" x 2" (0.31" x 2") fiber-reinforced rubber strips to prevent wear and galvanic corrosion caused when dissimilar metals come in contact.

Body Mounting System

The main body shall be attached to the chassis frame rails with six (6) of 5/8" (0.625") diameter steel U-bolts. The rear of the body shall be spring mounted to allow for chassis flex. This body mounting system shall be used to allow easy removal of the body for major repair or disassembly.

Water Tank Mounting System

The body design shall allow the booster tank to be completely removable without disturbing or dismounting the apparatus body structure. The water tank shall rest on top of a 3" x 3" frame assembly covered with rubber shock pads and corner braces formed from 3/16" angled plate to support the tank. The booster tank mounting system shall utilize a floating design to reduce stress from road travel and vibration. To maintain low vehicle center of gravity the water tank bottom shall be mounted within 5" of the frame rail top.

Hosebed Side Assembly

The hosebed side assemblies shall be made of 3" x 3" slotted aluminum extrusion and 3/16" (.188") smooth plate. The hosebed side assemblies shall provide a 90" high body.

The exterior hosebed side surface shall be completely sanded and deburred to assure a smooth finish and painted job color. The interior hosebed side surface shall be completely sanded and deburred to assure a smooth sanded finish.

Rubrail

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The pump area module(s) and body shall have rubrails mounted along the sides and at the rear.

The rubrail shall be C-channel in design and constructed of 3/16" thick 6463T6 anodized aluminum extrusion. The rubrail shall be 2.75" high x 1.25" deep and shall extend beyond the body width to protect compartment doors and the body side. The rubrail depth shall allow marker and/or warning lights to be recessed inside for protection.

The top surface of the rubrail shall have minimum of five (5) raised serrations. Each serration being a minimum of .1" in height and with cross grooves to provide a slip-resistant edge for the tailboard step and pump module running board areas. The rubrail shall be mounted a minimum of 3/16" off the pump module and body with nylon spacers. The ends of each section shall be provided with a finished rounded corner piece.

Fuel Fill

A recessed fuel fill shall be provided at the driver side rear wheel well area.

Hosebed Capacity

The hosebed shall have an NFPA required cubic foot capacity.

Hosebed

The area above the booster tank shall have a hose storage area provided. The hosebed shall be constructed entirely from maintenance-free, 3/4" deep x 7.5" wide, extruded aluminum slats that shall be pop-riveted into a one-piece grid system. Each slat shall have all sharp edges removed and have an anodized ribbed top surface that shall prevent the accumulation of water and allow for ventilation of wet hose.

The hosebed shall include an open area for the fill tower(s). The hosebed design shall incorporate adjustable tracks in the forward area rearward of the fill tower(s) and the rearward area of the hosebed for the installation of an adjustable divider(s). The adjustable tracks shall hold an adjustable divider(s) mounting nut straight, so only a philips head screwdriver is required to adjust a divider(s) from side to side.

The hosebed shall be easily removable to allow access to the booster tank below.

Storage Pan

A storage pan shall be provided in the forward area of the hosebed.

The storage pan shall constructed of 3/16" (.188") aluminum treadplate.

Hosebed Divider[Qty: 2]

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There shall be a hosebed divider provided the full fore-aft length of the hosebed.

The hosebed divider shall be constructed of 1/4" (0.25") smooth aluminum plate with an extruded aluminum base welded to the bottom. The rear end of the divider shall have a 3" radius corner to protect personnel. The divider shall be natural finish aluminum for long-lasting appearance and shall be sanded and deburred to prevent damage to the hose.

The divider shall be adjustable from side to side in the hosebed to accommodate varying hose loads.

Hosebed Divider Hand Hold

There shall be a hand hole cutout on the trailing edge of each hosebed divider. The cutout is specifically sized for use in adjusting of the hosebed divider.

Body Wheel Well

The body wheel well frame shall be constructed from 6063-T5 aluminum extrusion with a slot the full length to permit an internal fit of 1/8" (0.125") aluminum treadplate. The wheel well trim shall be constructed from 6063-T5 formed aluminum extrusion. The wheel well liners shall be constructed of a 3/16" (.187") composite material. The liners shall be bolt-on and shall provide a maintenance-free and damage-resistant surface.

Rear Mud Flaps

The rear tires shall have a set of black mud flaps mounted behind the rear chassis wheels with E-ONE logo.

Corner Guards

The forward body corners of the body shall have corner guards installed. The corner guards shall be constructed of (.063") aluminum treadplate.

Corner Guards

The rearward body corners of the body shall have corner guards installed. The corner guards shall be constructed of (.063") aluminum treadplate.

Recessed Directional Lightbar Mount

An area at the rear of the body shall be provided for recess mounting of a directional lightbar. The recess shall reduce the opening height(s) of the rear compartment(s).

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SCBA BOTTLE STORAGE

Wheel Well SCBA Storage

The body wheel well area shall store up to seven (7) SCBA bottles- four (4) on the officer side and three (3) on the driver side. The bottles shall be secured in each storage area by a vertically hinged door which shall be secured in the closed position by a push button latch. The doors shall match the wheel well area material and finish.

PUMPS

Pump System

The pump shall be a midship-mounted Hale QMAX single stage centrifugal pump. The pump shall be mounted on the chassis frame rails and shall be split-drive driven.

The entire pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 psi (207 MPa). All metal moving parts in contact with water shall be of high quality bronze or stainless steel. Pump body shall be horizontally split in two sections, for easy removal of impeller assembly including wear rings and bearings from beneath the pump without disturbing pump mounting or piping.

The pump impeller shall be hard, fine grain bronze of the mixed flow design and shall be individually ground and hand balanced. Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and of wrap-around double labyrinth design for maximum efficiency.

The pump shaft shall be heat-treated, corrosion-resistant stainless steel and shall be rigidly supported by three (3) bearings for minimum deflection. The sleeve bearing is to be lubricated by a force fed, automatic oil lubricated design, pressure-balanced to exclude foreign material. The remaining bearings shall be heavy-duty, deep groove ball bearings in the gearbox and shall be splash-lubricated. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of the gearbox.

Two (2) 6.0" diameter suction ports with 6" NST male threads and removable screens shall be provided, one each side. The ports shall be mounted one (1) on each side of the midship pump and shall extend through the side pump panels. Inlets shall come equipped with long handle chrome caps.

Discharge Manifold

The pump system shall utilize a stainless steel discharge manifold system that allows a direct flow of water to discharge valves. The manifold and fabricated piping systems shall be constructed of a minimum of Schedule 10 stainless steel to reduce corrosion.

The apparatus manufacturer shall provide a full 10 year stainless steel plumbing components warranty. This warranty shall cover defects in materials or workmanship of apparatus

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manufacturer designed foam/water plumbing system stainless steel components for 10 years. A copy of the warranty document shall be provided with the proposal.

Priming System

The electrically-driven priming pump shall be a positive displacement vane type. One (1) priming control, located at the pump operator's position, shall open the priming valve and start the priming motor. The primer shall be oil-less type. The priming valve shall be electronically interlocked to the "Park Brake" circuit to allow priming of the pump before the pump is placed in gear.

Pump Shift

The pump shift shall be pneumatically-controlled using a power shifting cylinder.

The power shift control valve shall be mounted in the cab and be labeled "PUMP SHIFT". The apparatus transmission shift control shall be furnished with a positive lever, preventing accidental shifting of the chassis transmission.

A green indicator light shall be located in the cab and be labeled "PUMP ENGAGED". The light shall not activate until the pump shift has completed its full travel into pump engagement position.

A second green indicator light shall be located in the cab and be labeled "OK TO PUMP". This light shall be energized when both the pump shift has been completed and the chassis automatic transmission has obtained converter lockup (4th gear lockup).

System

Two (2) test plugs shall be pump panel-mounted for third party testing of vacuum and pressures of the pump.

A master drain valve shall be installed and operated from the pump operator's panel. The master pump drain assembly shall consist of a Class 1 bronze master drain with a rubber disc seal and turning handle.

The manual Master Drain Valve shall have six (6) individually-sealed ports that allow quick and simultaneous draining of multiple intake and discharge lines. It shall be constructed of corrosion-resistant material and be capable of operating at a pressure of up to 600 psi.

The master drain shall provide independent ports for low point drainage of the fire pump and auxiliary devices.

Gearbox Cooler

A gearbox cooler shall be provided to maintain safe operating temperatures during prolonged pumping operations.

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Auxiliary Engine Cooler

An engine cooler used to lower engine water temperature during prolonged pumping operations and controlled at the pump operator`s panel shall be provided.

The engine cooler shall be installed in the engine coolant system in such a manner as to allow cool pump water to circulate around engine water, thus forming a true heat exchanger action. Cooler inlet and outlet shall be continuous, preventing intermixing of engine coolant and pump water.

Rating 1500gpm

The pump shall be rated at 1500gpm.

Hale Pump Additional 3 Year Warranty

There shall be an additional (3) Three year warranty provided on the Hale pump.

PUMP CERTIFICATION

Pump Certification

The pump, when dry, shall be capable of taking suction and discharging water in accordance with current NFPA 1901. The pump shall be tested at the manufacturer`s facility by an independent, third-party testing service. The conditions of the pump test shall be as outlined in current NFPA 1901.

The tests shall include, at a minimum, the pump test, the pumping engine overload test, the pressure control system test, the priming device tests, the vacuum test, and the water tank to pump flow test as outlined in current NFPA 1901.

A piping hydrostatic test shall be performed as outlined in current NFPA 1901.

The pump shall deliver the percentage of rated capacities at pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure
- 100% of rated capacity at 165 psi net pump pressure
- 70% of rated capacity at 200 psi net pump pressure
- 50% of rated capacity at 250 psi net pump pressure

A test plate, installed at the pump panel, shall provide the rated discharges and pressures together with the speed of the engine as determined by the certification test, and the no-load governed speed of the engine.

A Certificate of Inspection certifying performance of the pump and all related components shall be provided at time of delivery. Additional certification documents shall include, but not limited

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to, Certificate of Hydrostatic Test, Electrical System Performance Test, Manufacturer`s Record of Pumper Construction, and Certificate of Pump Performance from the pump manufacturer.

PUMP OPTIONS

Pump Seal

The midship pump shall be equipped with a high quality, spring loaded, self-adjusting mechanical seal capable of providing a positive seal to atmosphere under all pumping conditions. This positive seal to atmosphere must be achievable under vacuum conditions up to 26 Hg (draft) or positive suction pressures up to 250 psi.

The mechanical seal assembly shall be 2 inches in diameter and consist of a carbon sealing ring, stainless steel coil spring, Viton rubber boot, and a tungsten carbide seat, with a Teflon backup seal provided.

One only mechanical seal shall be required, located on the first stage suction (inboard) side of the pump and be designed to be compatible with a one piece pump shaft (no exceptions). A continuous cooling flow of water from the pump shall be directed through the seal chamber when the pump is in operation.

Steamers Flush

The pump 6" Steamer/Intake(s) shall be "Flush" mounted. When cap installed close as possible/practicable to pump panel. Actual dimension will vary do to pump module width and options selected. The Flush option could result in Panel scratching.

Example 72" or 76".

Location: driver's side, officer's side

Thermal Relief Valve

A Hale thermal relief valve, TRVL-120 shall be provided.

The valve shall help protect the pump by automatically monitoring pump water temperature. The relief valve shall automatically dump a controlled amount of water to the ground when the pump water exceeds the pre-set temperature of the relief valve.

A pump panel mounted indicator shall be installed at the pump operator`s panel.

Manual Pump Shift Override

One (1) manual pump shift shall be side panel mounted to engage the pump in the event of an air pressure failure. The pump shift shall be operated by a chrome handled push-pull cable.

Additional Hale Primer

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An additional primer valve shall be provided and installed on the 5 in. front intake and controlled at the pump operator`s panel.

One (1) priming control shall open the priming valve in conjunction with the priming valve that comes with the pump and start the priming motor. The priming valve shall be electronically interlocked to the "Park Brake" circuit to allow priming of the pump before the pump is placed in gear.

Anodes

The Zinc anodes help prevent damage caused by galvanic corrosion within the pump. The system provides a sacrificial metal which helps to diminish or prevent pump and pump shaft galvanic corrosion. One anode will be located on the suction side and one will be located on the discharge side of the pump.

Master Drain Manual

A manual master drain valve shall be installed and operated from the driver side. The master pump drain assembly shall consist of a Class 1 bronze master drain with a rubber disc seal.

The manual Master Drain Valve shall have nine (12) individually-sealed ports that allow quick and simultaneous draining of multiple intake and discharge lines. It shall be constructed of corrosion-resistant material and be capable of operating at a pressure of up to 600 PSI.

The master drain shall provide independent ports for low point drainage of the fire pump and auxiliary devices.

INTAKES

Intake 2.5 Top Mount Controlled Elkhart Valve

One (1) 2 1/2" suction inlet with a manually operated 2 1/2" Elkhart valve shall be provided on the driver side pump panel, officer side pump panel.

The valve shall be an Elkhart 800 series with an acetal ball and dual adjustable neoprene seats for ease of operation and increased abrasion resistance. The valve shall have a self locking ball feature using an automatic friction lock design to balance the acetal ball when in a throttle position and water is flowing through it.

The valve shall be of the unique Elkhart Drop-out or Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

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The outlet of the valve shall be connected to the suction side of the pump with the valve body located behind the pump panel. The valve shall come equipped with a brass inlet strainer, 2 1/2" NST female chrome inlet swivel and shall be equipped with a chrome-plated, rocker-lug plug with a retainer device.

The valve shall be controlled by a vertically mounted quarter turn locking handle located on the top mounted operator's panel and shall visibly indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance, and decreased friction loss.

A 3/4" bleeder valve assembly will be installed on the side pump panel.

Intake Front 5 Elkhart Electric with Relief

A 5" stainless steel pipe shall extend from the right intake side of the pump to the front of the apparatus. The outside end on the front intake shall have a 5" female NPT x 5" male NST chrome adapter with strainer. The intake shall come capped with a 5" long handle chrome cap. The intake shall be controlled by a 5" Elkhart valve and shall be electric operated and controlled from the operator's panel. A valve(s) shall be provided to allow water to be drained. An intake relief valve shall be installed external of the electric valve to relieve excess pressure.

INTAKE OPTIONS

Intake Relief Valve

The pump shall be equipped with an Elkhart cast brass, variable pressure setting suction side relief valve. The valve shall be normally closed and shall limit pressures in the pumping system. When excessive intake pressures are received, the water shall be directed below the body to an area visible to the pump operator. The outlet shall terminate with a male 2-1/2" NST threaded fitting.

Front Intake Swivel 6

A heavy-duty 6" 90 degree cast brass elbow designed and constructed specifically for fire/emergency vehicle usage shall serve as the auxiliary front suction inlet. The elbow, also referred to as the "swivel", shall be attached to the front suction piping. This component shall have the following features:

- 1) The ability to rotate 180 degrees.
- 2) A rugged twist-lock mechanism to hold the elbow in place at the desired position.
- 3) A double-ball race with bronze balls.
- 4) A 5.0" NPT free swivel female inlet.
- 5) A 6.0" NHT male outlet with strainer.

Specification for: FIRE SERVICE, INC.

6) Cast brass with polished chrome finish.

The elbow/swivel shall be mounted so that it extends above the extended front bumper.

A 6" 90 degree polished chrome swivel shall be attached to the front suction piping. The swivel shall turn 180 degrees and shall extend above the extended front bumper.

DISCHARGES AND PRECONNECTS

Front Bumper 1.5 Elkhart Valve

One (1) 1-1/2" preconnect outlet with a manually-operated Elkhart valve shall be supplied to the extended front bumper. The preconnect shall consist of a 2" heavy-duty hose coming from the pump discharge manifold to a 2" FNPT x 1-1/2" MNST mechanical swivel hose connection to permit the use of the hose from either side of the apparatus.

The valve shall be an Elkhart 800 series with an acetal ball and dual adjustable neoprene seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the acetal ball when in a throttle position with water flowing through it.

The valve shall be of the unique Elkhart Drop-out or Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

An air blowout valve shall be installed between the chassis air reservoir and the front jump line. The control shall be installed on the pump operator's panel.

The discharge shall be supplied with a Class 1 automatic 3/4" drain valve assembly. The automatic drain shall have an all-brass body with stainless steel check assembly. The drain shall normally be open and automatically close when the pressure is greater than 6 psi.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Swivel FJL Polished Stainless Steel

There shall be a polished stainless steel swivel provided for the front bumper discharge located on top of bumper driver's side of center tray.

Speedlay Triple 1.5/2.5 Elkhart Valve

Specification for: FIRE SERVICE, INC.

One (1) triple speedlay discharge shall be provided. The first two (2) speedlay sections shall include one (1) 2" brass swivel with a 1-1/2" NST male hose connection each to permit the use of the hose from either side of the apparatus. One (1) third speedlay section shall include one (1) 2-1/2" brass swivel with a 2-1/2" NST male hose connection to permit the use of the hose from either side of the apparatus.

The first two (2) speedlays shall consist of a 2" heavy-duty hose from the pump discharge manifold to the 2" swivel. The discharges shall include a 2" manually operated Elkhart valve. The third speedlay shall consist of one (1) 2-1/2" heavy-duty hose from the pump discharge manifold to the 2-1/2" swivel. The third discharge shall include a 2-1/2" manually-operated Elkhart valve.

The valve shall be an Elkhart 800 series with an acetal ball and dual adjustable neoprene seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the acetal ball when in a throttle position with water flowing through it.

The valve shall be of the unique Elkhart Drop-out or Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve controls shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Left Panel 2.5 Elkhart Valve with Droop

One (1) 2-1/2" discharge outlet with a manually-operated Elkhart valve shall be provided at the left hand side pump panel.

The valve shall be an Elkhart 800 series with an acetal ball and dual adjustable neoprene seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the acetal ball when in a throttle position with water flowing through it.

The valve shall be of the unique Elkhart Drop-out or Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

The discharge shall extend out beyond the pump panel with a cast brass 45 degree downward angle with 2-1/2" NST threads to help prevent kinking of the discharge hose. The 45 degree droop shall be an integral part of the discharge valve and shall be equipped with a chrome-plated rocker-lug cap with a retainer chain.

Specification for: FIRE SERVICE, INC.

The discharge shall be supplied with a 3/4" bleeder valve assembly. The bleeder valve shall be installed to drain water from the gauge pressure line to prevent freezing of the line. The drain shall be controlled with a quarter-turn valve on the pump panel.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: left side discharge 1, left side discharge 2

Right Panel 2.5 Elkhart Valve with Droop

One (1) 2-1/2" discharge outlet with a manually-operated Elkhart valve shall be provided at the right side pump panel.

The valve shall be an Elkhart 800 series with an acetal ball and dual adjustable neoprene seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the acetal ball when in a throttle position with water flowing through it.

The valve shall be of the unique Elkhart Drop-out or Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

The discharge shall extend out beyond the pump panel with a cast brass 45 degree downward angle with 2-1/2" NST threads to help prevent kinking of the discharge hose. The 45 degree droop shall be an integral part of the discharge valve and shall be equipped with a chrome-plated rocker-lug cap with a retainer chain.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: right side discharge 2

Left Rear 2.5 Elkhart Valve

One (1) 2-1/2" discharge outlet with a manually-operated Elkhart valve shall be supplied to the left rear of the apparatus by a 2-1/2" stainless steel pipe.

The valve shall be an Elkhart 800 series with an acetal ball and dual adjustable neoprene seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the acetal ball when in a throttle position with water flowing through it.

The valve shall be of the unique Elkhart Drop-out or Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

Specification for: FIRE SERVICE, INC.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: left rear discharge

Right Rear 2.5 Elkhart Valve

One (1) 2-1/2" discharge outlet with a manually-operated Elkhart valve shall be supplied to the right rear of the apparatus by a 2-1/2" stainless steel pipe.

The valve shall be an Elkhart 800 series with an acetal ball and dual adjustable neoprene seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the acetal ball when in a throttle position with water flowing through it.

The valve shall be of the unique Elkhart Drop-out or Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: right rear discharge

Right Panel 3 Elkhart Valve

One (1) 3" discharge outlet with a manually-operated Elkhart valve shall be provided at the right side pump panel.

The discharge shall be equipped with a device that shall not allow the valve to open or close in less than three (3) seconds.

The valve shall be an Elkhart 800 series with an acetal ball and dual adjustable neoprene seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the acetal ball when in a throttle position water flowing through it.

The valve shall be of the unique Elkhart Drop-out or Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

Specification for: FIRE SERVICE, INC.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: right side discharge 1

Deck Gun 3 Elkhart Valve

One (1) 3" deck gun discharge outlet with a manually-operated Elkhart valve and 3" stainless steel pipe shall be provided above the pump compartment.

The valve shall be an Elkhart 800 series with an acetal ball and dual adjustable neoprene seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the acetal ball when in a throttle position with water flowing through it.

The valve shall be of the unique Elkhart Drop-out or Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve shall be equipped with a device that limits the opening and closing speeds to comply with the current edition of NFPA1901.

The valve control shall be a RC-10 slow closing valve controller with lights located at the pump operator panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

DISCHARGE OPTIONS

Top Mount Control Lever

Top mount controls handles for tank supply, tank fill, all top mount controlled intakes, and all discharges shall be lever style controls. The valve control lever shall be a locking chrome top mount control handle located at the pump operator's panel and shall visibly indicate the position of the valve at all times. The control levers shall be located directly adjacent to one another and shall be mounted in line so they are in the same position when shut off. The control lever shall be connected directly to its respective valve by a 7/8" rod to form a direct linkage control system.

Bleeder Drain Valve

The specified discharge shall be supplied with a 3/4" bleeder valve assembly. The bleeder valve shall be installed to drain water from the gauge pressure line to prevent freezing of the line. The drain shall be controlled with a quarter-turn valve on the pump panel.

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Plumbed to: front bumper discharge, left rear discharge, right rear discharge, deck gun, speedlay preconnect, left discharge, right discharge

PRESSURE GOVERNORS

Pressure Governor

The apparatus shall be equipped with a Class 1 engine/pump pressure governor/throttle system connected directly to the Electronic Control Module (ECM) mounted on the engine. The governor shall control and monitor the pump master discharge pressure, eliminating any need for a relief valve on the discharge side of the pump. A special preset feature shall permit a predetermined pressure or RPM to be set and hold it against varying flow rates at independent discharge lines by modulating engine rotation speed. Control of the engine speed shall be dictated by preprogrammed software in the electronic control module. The preset shall be easily adjustable by the operator.

The Class 1 system shall be installed in place of the discharge relief valve and the pump panel mounted hand throttle.

A display/control unit shall be mounted on the pump operator's panel. The control unit shall be a self-contained, weatherproof module, approximately 4.5"W x 6"H. The display unit shall provide alpha-numeric display.

GAUGES

Engine Gauge Package

A gauge package shall be supplied at the pump operator's panel to monitor the vehicle's engine. The weatherproof package shall include the following:

- Tachometer - to monitor engine revolutions per minute.
- Oil pressure gauge - to monitor engine oil pressure.
- Water temperature gauge - to monitor the engine water temperature.
- Voltmeter - connected to the vehicle electrical system.
- Engine alarm system - Two (2) warning lights, one (1) to indicate low oil pressure and one (1) to indicate high water temperature, and a buzzer alarm for audible warning.

Hourmeter

A 2" weatherproof hourmeter shall be located on the pump operator's panel.

Fuel Gauge

A 2" weatherproof engine fuel gauge shall be pump panel mounted.

Tank Level Gauge

Specification for: FIRE SERVICE, INC.

One (1) Class 1 brand Intelli-Tank™ water tank level gauge shall be located at the pump operator's panel of the apparatus to provide wide angle viewing and a high-visibility display of the water tank level. Four (4) ultra-bright LED's (light emitting diodes) on the display module allow the full, 3/4, 1/2 and refill levels to be easily distinguished at a glance.

The long life and extreme durability of LED indicators eliminates light bulb replacement and maintenance. Color coded cover plates shall complete the assembly of the display module.

The system shall calibrate to any size and shape of tank and has a built-in diagnosis feature. It comes complete with an industrial pressure transducer, which will provide nine (9) accurate levels of indications. Each display also has a programmable night dimming feature.

Foam Gauge Requirement

The foam cell(s) shall not have a tank level gauge(s).

Gauge Pressure 3.5in 30-0-400

A Class 1 weatherproof 3-1/2" compound vacuum pressure gauge with a range of 30-0-400 shall be installed on the pump panel. The gauge shall be filled with a liquid solution.

Gauge shall be provided for the following discharge: front bumper discharge, left rear discharge, right rear discharge, 1.5 in. speedlay preconnect, 2.5 in. speedlay preconnect, deck gun, left side discharge 1, left side discharge 2, right side discharge 1, right side discharge 2

Gauge Pressure 4.5in 30-0-400[Qty: 2]

A Class 1 weatherproof 4-1/2" compound vacuum pressure gauge with a range of 30-0-400 shall be installed on the pump panel. The gauge shall be filled with a liquid solution.

FOAM SYSTEMS

Dealer Installed Foam System

Foam System to be installed and warranted by the dealer according to customer specifications.

ELECTRICAL SYSTEMS

Multiplex Electrical System

The following specifications describe the low voltage electrical system on the specified fire apparatus. The electrical system shall include all panels, electrical components, switches and relays, wiring harnesses and other electrical components. The electrical equipment installed by the apparatus manufacturer shall conform to current automotive electrical system standards, the latest Federal DOT standards, and the requirements of the applicable NFPA #1901 standards.

Specification for: FIRE SERVICE, INC.

The apparatus shall have a multiplexing system to provide diagnostic capability. The system shall have the capability of delivering multiple signals via a CAN bus, utilizing specifications set forth by SAE J1939. The electrical system shall be pre-wired for computer modem accessibility to allow service personnel to easily plug in a modem to allow remote diagnostics, troubleshooting, or program additions.

For superior system integrity, the networked system shall meet the following minimum requirement components:

- Power management center
- Load shedding power management
- Solid-state circuitry
- Switch input capability
- Responsible for lighting device activation
- Self-contained diagnostic indicators
- Power distribution module

All wiring shall be stranded copper or copper alloy conductors of a gauge rated to carry 125 percent of the maximum current for which the circuit is protected. Voltage drops in all wiring from the power source to the using device shall not exceed 10 percent. The wiring and wiring harness and insulation shall be in conformance to applicable SAE and NFPA standards. The wiring harness shall conform to SAE J-1128 with GXL temperature properties. All exposed wiring shall be run in a loom with a minimum 289 degree Fahrenheit rating. All wiring looms shall be properly supported and attached to body members. The electrical conductors shall be constructed in accordance with applicable SAE standards, except when good engineering practice requires special construction.

The wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection and shall be installed in accordance with the device manufacturer's instructions. Electrical connections shall be with mechanical type fasteners and large rubber grommets where wiring passes through metal panels.

The wiring between the cab and body shall be split using Deutsche type connectors or enclosed in a terminal junction panel area. This system will permit body removal with minimal impact on the apparatus electrical system. All connections shall be crimp-type with heat shrink tubing with insulated shanks to resist moisture and foreign debris such as grease and road grime. Weather-resistant connectors shall be provided throughout to ensure the integrity of the electrical system.

Any electrical junction or terminal boxes shall be weather-resistant and located away from water spray conditions. In addition, the main body junction panel shall house the automatic reset breakers and relays where required.

There shall be no exposed electrical cabling, harnesses, or terminal connections located in compartments, unless they are enclosed in an electrical junction box or covered with a removable electrical panel. The wiring shall be secured in place and protected against heat, liquid contaminants and damage. Wiring shall be uniquely identified at least every two feet (2') by color coding or permanent marking with a circuit function code and identified on a reference chart or electrical wiring schematic per requirements of applicable NFPA #1901 standards.

Specification for: FIRE SERVICE, INC.

The electrical circuits shall be provided with low voltage overcurrent protective devices. Such devices shall be accessible and located in required terminal connection locations or weather-resistant enclosures. The overcurrent protection shall be suitable for electrical equipment and shall be automatic reset type and meet SAE standards. All electrical equipment, switches, relays, terminals, and connectors shall have a direct current rating of 125 percent of maximum current for which the circuit is protected. The system shall have electro-magnetic interference suppression provided as required in applicable SAE standards.

The electrical system shall include the following:

- a) Electrical terminals in weather exposed areas shall have a non-conductive grease or spray applied. A corrosion preventative compound shall be applicable to all terminal plugs located outside of the cab or body.
- b) The electrical wiring shall be harnessed or be placed in a protective loom.
- c) Heat shrink material and sealed connectors shall be used to protect exposed connections.
- d) Holes made in the roof shall be caulked with silicone. Large fender washers shall be used when fastening equipment to the underside of the cab roof.
- e) Any electrical component that is installed in an exposed area shall be mounted in a manner that will not allow moisture to accumulate in it.
- f) A coil of wire must be provided behind an electrical appliance to allow them to be pulled away from mounting area for inspection and service work.
- g) All lights that have their sockets in a weather exposed area shall have corrosion preventative compound added to the socket terminal area.

The warning lights shall be switched in the chassis cab with labeled switching in an accessible location. Individual rocker switches shall be provided only for warning lights provided over the minimum level of warning lights in either the stationary or moving modes. All electrical equipment switches shall be mounted on a switch panel mounted in the cab convenient to the operator. For easy nighttime operation, an integral indicator light shall be provided to indicate when the circuit is energized. All switches shall be appropriately identified as to their function.

A single warning light switch shall activate all required warning lights. This switch will allow the vehicle to respond to an emergency and "call for the right of way". When the parking brake is activated, a "blocking right of way" system shall be automatically activated per requirements of NFPA #1901. All "clear" warning lights shall be automatically shed on actuation of parking brake.

NFPA Required Testing of Electrical System

The apparatus shall be electrical tested upon completion of the vehicle and prior to delivery. The electrical testing, certifications, and test results shall be submitted with delivery documentation per requirements of NFPA #1901. The following minimum testing shall be completed by the apparatus manufacturer:

Specification for: FIRE SERVICE, INC.

1. Reserve capacity test:

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged. The engine shall be shut off and the minimum continuous electrical load shall be activated for ten (10) minutes. All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a test fail.

2. Alternator performance test at idle:

The minimum continuous electrical load shall be activated with the engine running at idle speed. The engine temperature shall be stabilized at normal operating temperature. The battery system shall be tested to detect the presence of battery discharge current. The detection of battery discharge current shall be considered a test failure.

3. Alternator performance test at full load:

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of two (2) hours. Activation of the load management system shall be permitted during this test. However, an alarm sounded by excessive battery discharge, as detected by the system required in NFPA #1901 Standard, or a system voltage of less than 11.7 volts dc for a 12 volt nominal system, for more than 120 seconds, shall be considered a test failure.

4. Low voltage alarm test:

Following the completion of the above tests, the engine shall be shut off. The total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates. The battery voltage shall be measured at the battery terminals. With the load still applied, a reading of less than 11.7 volts dc for a 12 volt nominal system shall be considered a test failure. The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure.

NFPA Required Documentation

The following documentation shall be provided on delivery of the apparatus:

- a. Documentation of the electrical system performance tests required above.
- b. A written load analysis, including:
 1. The nameplate rating of the alternator.
 2. The alternator rating under the conditions.
 3. Each specified component load.
 4. Individual intermittent loads.

Specification for: FIRE SERVICE, INC.

Multiplex Data Logger

The data logger shall record historical faults within the multiplex system and be accessible through the diagnostic software as well as the information center.

LIGHT BARS

Light Bar

A Federal Signal JLX6001C 60" LED JetStream light bar shall be installed with clear domes. The light bar shall contain nine (9) SOL 6 Red LED Solaris reflectors, and six (6) SOL 3 red LED Solaris reflectors.

The lightbar(s) shall be installed in the following location: Centered on the front cab roof.

WARNING LIGHT PACKAGES

Lower Level Warning

Eight (8) Federal Signal QL64XF-R LED light heads & Two (2) Federal Signal Model 3300-04 LED light heads all with red lens shall be provided.

The light heads shall be mounted as close to the corner points of the apparatus (as is practical) as follows:

- Two (2) QL64XF-R light heads on the front of the apparatus facing forward.
- Two (2) QL64XF-R light heads on the rear of the apparatus facing rearward.
- Two (2) QL64XF-R light heads each side of the apparatus, one (1) each side at the forward most point and one (1) centrally located to provide midship warning lighting.
- Two Model 3300-04 LED light heads shall be mounted one (1) each side at the rearward most point (as practical).

The side facing lights shall be located at forward most position, centered in rear wheelwell, and side facing at rear of body in rubrail if equipped.

All warning devices shall be surface mounted in compliance with NFPA standards.

Flashers

One (1) Intelli-flash series flashers shall be provided.

Lower Level LED Warning Light Flash Rate

The lower level Federal Signal Qudraflare LED warning lights shall be set to flash at an alternating 75 quad flashes per minute.

Specification for: FIRE SERVICE, INC.

WARNING LIGHTS

Upper Rear Warning Lights

Two (2) Federal Signal Sentry Model SY12FS rotating lights with a polycarbonate base, a single 55-watt halogen lamp, and a twist-on lexan dome. Each light shall produce 175 flashes per minute. The dome colors to be driver red, officer amber.

The lights shall be located rear upper body on aerial style brackets to meet Zone C upper requirements.

Hazard (Door Ajar) Light

There shall be a 2" red LED hazard light installed as specified.

The light shall be located center overhead.

DIRECTIONAL LIGHT BARS

Directional Traffic Warning Light

A Federal SML-6 Signal Master light bar with amber lens shall be installed at rear of the apparatus. The unit shall include a total of six (6) LED (light Emitting Diode) modules. Four operating modes are available: left arrow, right arrow, split (center out) and flashing warn pattern. A Federal SMC-56 control shall be provided with LED indicators to emulate the warning pattern.

Light bar dimensions: 31.50" Long X 3.50" Deep X 3.00" High

Directional Light Bar Control Location

The directional light bar control head shall be located in the center overhead console offset to officer side.

SIRENS

Electronic Siren

A Federal PA300 siren model 690010 solid state electronic siren with attached noise-canceling microphone shall be installed. The unit shall be capable of driving a single high power speaker up to 200 watts to achieve a sound output level that meets Class "A" requirements.

Operating modes shall include Hi-Lo, yelp, wail, P.A., air horn and radio re-broadcast.

The siren shall be recessed mounted in the cab.

Specification for: FIRE SERVICE, INC.

Electronic Siren Control Location

The electronic siren control shall be located in the center overhead console offset to driver side.

SPEAKERS

Speaker

One (1) Federal model MS100 Dynamax 100 watt speaker shall be flush-mounted as far forward and as low as possible on the front of the cab. A polished Model MSFMT-EF "Electric F" grille shall be provided on the outside of the speaker to prevent road debris from entering the speaker.

Speaker dimensions shall be: 5.8 in. high x 5.8 in. wide x 2.6 in. deep. Weight = 5.5 lbs.

The speaker shall produce a minimum sound output of 120 db(A) at 10 feet to meet current NFPA 1901 requirements.

The speaker shall be located driver side front bumper inboard of frame, officer side front bumper inboard of frame.

DOT LIGHTING

LED Marker Lights

LED clearance/marker lights shall be installed as specified.

Upper Cab:

- Five (5) amber LED clearance lights on the cab roof.

Lower Cab:

- One (1) amber LED side turn/marker each side of cab ahead of the front door hinge.

Upper Body:

- One (1) red Trucklite LED clearance light each side, rear of body to the side.

Lower Body:

- Three (3) red Trucklite LED clearance lights centered at rear, recessed in the rubrail.
- One (1) red Trucklite LED clearance light each side at the trailing edge of the apparatus body, recessed in the rubrail.

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- One (1) amber Trucklite LED clearance/auxiliary turn light each side front of body/module, recessed in the rubrail.

License Plate Light

One (1) Truck-Lite Model 15205 white LED license plate light mounted in a Truck-Lite Model 15732 chrome-plated plastic license plate housing shall be mounted at the rear of the body.

License Plate Bracket

There shall be bracket fabricated from aluminum diamond plate, secured to rear of the body to accommodate a license plate.

Tail Lights

One (1) Federal Signal model QL64Z-BTT red L.E.D. (Light Emitting Diode) light, one (1) Federal Signal model QL64Z-ARROW amber LED light and one (1) Federal Signal QL64Z-BACKUP white LED light shall be installed in a Cast 3 housing in a vertical position each side at rear and wired with weatherproof connectors.

Light functions shall be as follows:

- L.E.D. red running light with red brake light in upper position.
- L.E.D. amber populated arrow pattern turn signal in middle position.
- L.E.D. white backup light in lower position.

A one-piece polished aluminum trim casting shall be mounted around the three (3) individual lights in a vertical position.

LIGHTS - COMPARTMENT, STEP & GROUND

Compartment Light Package

There shall be a minimum of one (1) Federal Signal model 607141-05 4" circular LED (Light Emitting Diode) mounted in each body compartment greater than 4 cu ft. Compartments over 36" in height shall have a minimum of two (2) lights, one (1) high and one (1) low. Transverse compartments shall have a minimum of two (2) lights, located one (1) each side.

Compartment lights shall be wired to a master on/off rocker switch on the cab switch panel. Each light shall be in a resilient shock shock-absorbent mount for improved bulb life.

The wiring connection for the compartment lights shall be made with a weather-resistant plug in style connector. A single water- and corrosion-resistant switch with a polycarbonate actuator

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and sealed contacts shall control each compartment light. The switch shall allow the light to illuminate if the compartment door is open.

Ground Lights

The apparatus shall be equipped with a sufficient quantity of lights to properly illuminate the ground areas around the apparatus in accordance with current NFPA requirements. The lights shall be Federal Signal model 607141-05 4" circular LED (Light Emitting Diode) with clear lenses mounted in a resilient shock absorbent mount for improved bulb life. The wiring connections shall be made with a weather resistant plug in style connector.

Ground area lights shall be switched from the cab dash with the work light switch.

One (1) ground light shall be supplied under each side of the front bumper extension if equipped.

Lights in areas under the driver and crew area exits shall be activated automatically when the exit doors are opened.

Step Lights

The apparatus shall be equipped with a sufficient quantity of lights to properly illuminate the steps around the apparatus in accordance with current NFPA requirements. The lights shall be Federal Signal model 607141-05 4" circular LED (Light Emitting Diode) with clear lenses mounted in a resilient shock absorbent mount for improved bulb life. The wiring connections shall be made with a weather resistant plug in style connector.

The step lights shall be switched from the cab dash with the work light switch.

LIGHTS - DECK AND SCENE

Deck Lights

Two (2) Unity model AGS4413 6" chrome-plated 12-volt, 35-watt floodlights shall be installed at the rear of the apparatus. Each light shall be manually operated by an on/off switch at the light.

Location: rear body/beavertail area on the trailing edge up high

Hosebed Light

A Truck-Lite rectangular light shall be installed at the front area of the hosebed to provide hosebed lighting per current NFPA 1901. The rectangular rubber housing shall contain a 12-volt 2700 candlepower halogen floodlight bulb. The hosebed light shall be switched with work light switch in the cab.

LIGHTS - NON-WARNING

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Map Light

A Sunnex 742-20 map light shall be supplied.

The map light shall be 12 volt, 20" flexible gooseneck. A 20 watt halogen bulb and spot reflector with clear lens shall be supplied. An on-off switch shall be supplied on the base of the light.

The map light shall have a matte black finish.

Location: officer's A post, map box

Handheld Spotlight

A specialty #2150 hand held spotlight with mounting bracket shall be provided. It shall be hardwired and located at the officer's side of the cab dash.

Engine Compartment Light

There shall be lighting provided in compliance with NFPA to illuminate the engine compartment area .

LED Pump Panel Light Package

Two (2) Whelen LED Strip lights shall be mounted under a light shield directly above each side pump panel with the top mount panel having three (3) lights. The work light switch in the cab shall activate the lights when the park brake is set.

Light Wiring

One pump panel light at the pump operator's panel shall be wired to the pump shift to provide pump panel illumination when the pump is placed into gear.

Pump Compartment LED Light

A LED light shall be provided in the pump compartment area for NFPA compliance. The light shall be wired to operate with a switch located on the pump panel.

MISC ELECTRICAL

Back-up Alarm

An electronic back-up alarm shall be supplied. The 97 dB(A) alarm shall be wired into the chassis back-up lights to signal when the vehicle is in reverse.

12 Volt DC Power Distribution Module

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There shall be a 12 place 12-volt DC power distribution module installed as specified.

The module will have six (6) circuits wired directly to the battery and have six (6) circuits wired through the master battery switch with 12 positions for grounds. Connection to the power module circuit will be through a .250 female spade connector. Each buss will be protected with a 50-amp circuit breaker for overload protection. The module will accept ATC blade type fuses or 22X series circuit breakers.

The module shall be located behind officer's seat.

MISC LOOSE EQUIPMENT

DOT Required Drive Away Kit

Three (3) triangular warning reflectors with carrying case shall be supplied to satisfy the DOT requirement.

EXTERIOR PAINT

Paint Custom Cab

Cab Paint

The apparatus cab shall be painted DuPont color L6572EG Red The paint shall be of the highest quality finish for low maintenance, long life, and attractive appearance. The finish shall consist of a corrosion-resistant primer, urethane high build primer, and high performance durable color coat. The vehicle finish shall be protected with a minimum of 2 mils film thickness of UV resistant clear coat.

The paint process shall meet or exceed current State regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water and soil. Manufacturer shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The cab exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint. Any vertically or horizontally hinged smooth-plate doors shall be painted separately to assure proper paint coverage on the cab, doorjamb, and door edges.

The paint process shall feature DuPont Performance Coatings high-solid, low VOC products and be performed in the following steps:

- Corrosion Prevention - all raw materials shall be pre-treated with the MetaLok-CVP system to provide superior corrosion resistance and excellent adhesion of the top coat.
- DuPont Uro® Prime 1340S™ polyurethane primer shall be applied to guarantee excellent gloss hold-out, chip resistance, and barrier coat corrosion protection.
- DuPont Imron® Elite Express System (Top coat) - a lead free, chromate-free, high-solids polyurethane color coat shall be applied. A minimum of two coats shall be applied providing

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excellent coverage and durability.

- DuPont High Solids Clear coat TC35000™ - a high-solids, low VOC clear coat shall be applied as the final step. To ensure full gloss, color retention and durability a minimum of two coats shall be applied at 2 mils film thickness minimum.

Any location where a surface is penetrated after painting for the purpose of mounting steps, handrails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting system. All hardware used in mounting steps, handrails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting system.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20-degree gloss meter and distinction of image meter to assure a smooth mirror like finish.

Paint Cab Two Tone Color

The two-tone chassis cab shall be DuPont Imron™ Elite Express System poly urethane paint color L0006EG White applied to the upper section of the cab.

Paint Body Small

Body Paint Finish

The apparatus body shall be painted DuPont color L6572EG Red. The paint shall be of the highest quality finish for low maintenance, long life, and attractive appearance. The finish shall consist of a corrosion-resistant primer, urethane high build primer, and high performance durable color coat. The vehicle finish shall be protected with a minimum of 2 mils film thickness of UV resistant clear coat.

The paint process shall meet or exceed current State regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water and soil. Manufacturer shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The body exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint. Any vertically or horizontally hinged smooth-plate compartment doors shall be painted separately to assure proper paint coverage on the body, doorjambs, and door edges.

The paint process shall feature DuPont Performance Coatings high-solid, low VOC products and be performed in the following steps:

- Corrosion Prevention - all raw materials shall be pre-treated with the MetaLok-CVP system to provide superior corrosion resistance and excellent adhesion of the top coat.
- DuPont Uro®Prime 1340S™ polyurethane primer shall be applied to guarantee excellent gloss hold-out, chip resistance, and barrier coat corrosion protection.
- DuPont Imron® Elite Express System (Top coat) - a lead free, chromate-free, high-solids polyurethane color coat shall be applied. A minimum of two coats shall be applied providing

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excellent coverage and durability.

- DuPont High Solids Clear coat TC35000™- a high-solids, low VOC clear coat shall be applied as the final step. To ensure full gloss, color retention and durability a minimum of two coats shall be applied at 2 mils film thickness minimum.

Any location where the metal is penetrated after painting for the purpose of mounting steps, handrails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting system. The system shall be applied to the sheet metal or extrusions in all locations where the metal has been penetrated. All hardware used in mounting steps, handrails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting system.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20-degree gloss meter and distinction of image meter to assure a smooth mirror like finish.

Undercoating

Undercoating shall consist of a heavy coating of soft seal film sprayed on the entire underside of the vehicle to repel water and road elements.

Paint Break with Dip to Grille

The cab shall have a two-tone paint break. The break line shall be approximately 31.5 inches below the cab roof drip rail. The paint break shall include a dip down to the corners of the cab grille.

INTERIOR PAINT

Cab Interior Paint

The interior of the cab shall be painted OTO gray.

STRIPING

WARRANTY / STANDARD & EXTENDED

Standard 1 Year Warranty

Statement of Warranty

1-Year Standard

The apparatus manufacturer shall provide a full 1-year standard warranty. All components manufactured by the apparatus manufacturer shall be covered against defects in materials or workmanship for a 1-year period. All components covered by separate suppliers such as

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engines, transmissions, tires, and batteries shall maintain the warranty as provided by the component supplier. A copy of the warranty document shall be provided with the proposal.

Lifetime Frame Warranty

The apparatus manufacturer shall provide a full lifetime frame warranty. This warranty shall cover all apparatus manufacturer designed frame, frame members, and crossmembers against defects in materials or workmanship for the lifetime of the covered apparatus. A copy of the warranty document shall be provided with the proposal. Frame warranties that do not cover crossmembers for the life of the vehicle shall not be acceptable.

10 Year 100000 Mile Structural Warranty

The apparatus manufacturer shall provide a comprehensive 10-year/100,000-mile structural warranty. This warranty shall cover all structural components of the cab and/or body manufactured by the apparatus manufacturer against defects in materials or workmanship for 10 years or 100,000 miles, whichever occurs first. Excluded from this warranty are all hardware, mechanical items, electrical items, or paint finishes. A copy of the warranty document shall be provided with the proposal.

10 Year Stainless Steel Plumbing Warranty

The apparatus manufacturer shall provide a full 10-year stainless steel plumbing components warranty. This warranty shall cover defects in materials or workmanship of apparatus manufacturer designed foam/water plumbing system stainless steel components for 10 years. A copy of the warranty document shall be provided with the proposal.

10 Year Paint and Corrosion Warranty

The apparatus manufacturer shall provide a 10-year limited paint and corrosion perforation warranty. This warranty shall cover paint peeling, cracking, blistering, and corrosion provided the vehicle is used in a normal and reasonable manner.

The paint shall be prorated for 10 years as follows:

Topcoat & Appearance: Gloss, Color Rentention, Cracking		Coating System, Adhesion & Corrosion: Includes Dissimilar metal corrosion, Flaking, Blistering, Bubbling	
0 to 72 months	100%	0 to 36 months	100%
73 to 120 months	50%	37 to 84 months	50%
		85 to 120 months	25%

Corrosion perforation shall be covered 100% for 10 years.

The warranty period shall begin upon delivery of the apparatus to the original user-purchaser. A copy of the warranty document shall be provided with the proposal.

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UV paint fade shall be covered in a separate warranty supplied by DuPont and shall be for a minimum of 10 years.

SUPPORT, DELIVERY, INSPECTIONS AND MANUALS

Approval Drawings

A general arrangement drawings depicting the vehicle`s appearance shall be provided. The drawing shall consist of left side, right side, front, and rear elevation views

Vehicles requiring pump controls shall include a general arrangement view of the pump operator`s position, scaled the same as the elevation views.

Electronic Manuals

Two (2) copies of all operator, service, and parts manuals **MUST** be supplied at the time of delivery in electronic format (CD-ROMs) -**NO EXCEPTIONS!** The electronic manuals shall include the following information:

Operating Instructions, descriptions, specifications, and ratings of the cab, chassis, body, installed components, and auxiliary systems.

Warnings and cautions pertaining to the operation and maintenance of the fire apparatus and fire fighting systems.

Charts, tables, checklists, and illustrations relating to lubrication, cleaning, troubleshooting, diagnostics, and inspections.

Instructions regarding the frequency and procedure for recommended maintenance.

Maintenance instructions for the repair and replacement of installed components.

Parts listing with descriptions and illustrations for identification.

Warranty descriptions and coverage.

The CD-ROM shall incorporate a navigation page with electronic links to the operators manual, service manual, parts manual, and warranty information, as well as instructions on how to use the manual. Each copy shall include a table of contents with links to the specified documents or illustrations.

The CD must be formatted in such a manner as to allow not only the printing of the entire manual, but to also the cutting, pasting, or copying of individual documents to other electronic media, such as electronic mail, memos, and the like.

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A find feature shall be included to allow for searches by text or by part number.

These electronic manuals shall be accessible from any computer operating system capable of supporting portable document format (PDF). Permanent copies of all pertinent data shall be kept file at both the local dealership and at the manufacturer`s location.

NOTE: Engine overhaul, engine parts, transmission overhaul, and transmission parts manuals are not included.