

Ledyard Volunteer Fire Company and the Town of Ledyard

Bid Specifications for a 2022 Tanker/Pumper Fire Apparatus #2022-15

Ledyard Fire Company New Apparatus Committee

Fire Chief	Jonathan Mann
Chairperson	Todd Willis
Chairperson	Zachary Willis

Town Of Ledyard

Mayor	Mr. Fred Allyn III
Administrator of Emergency Services	Mr. Stephen Holyfield

Ledyard Fire Company District #1 INC.

11 Fairway Dr.
Ledyard, CT 06339
(860)464-9222

and the

Town of Ledyard

INVITATION TO BID

#2022-15

The Ledyard Fire Company District #1 Inc. is currently seeking bids for the purchase of a Class A pumper/tanker in accordance with the Ledyard Fire Company District #1 Inc.

GENERAL INSTRUCTIONS

It is the sole responsibility of the bidder that his or her proposal reaches the destination listed above on time. No phone bids or late proposals will be accepted. Postal delays or delivery schedules will not be considered justifiable reasons for late bids. Only one bid per vendor will be acceptable. Two or more bids by one vendor is unacceptable and will be cause for all bids from that bidder to be **REJECTED. "NO EXCEPTIONS"**. Bids are to be sealed and marked FIRE APPARATUS BID. Two hard copies shall be received no later than August 4, 2022, at 2:00 p.m. at which time the bids will be opened and read aloud in the Mayor's Office. Any bids received after August 4, 2022, at 2:00 p.m. will be returned, unopened, to the bidder. The bids will be reviewed by the Ledyard Fire Company District #1 Inc. Truck Committee within 30 days.

Bidders must submit their proposals in writing and in accordance with the enclosed specifications. The Town of Ledyard reserves the rights to reject any and all bids which are not considered in the best interest of the Town of Ledyard and the Ledyard Fire Company District #1 Inc.

INTENT OF BID SPECIFICATION

It is the intent of these specifications to describe the furnishing of a Class A Pumper Tanker Fire Engine. The apparatus shall be the manufacturers latest "Top of the line" model meeting these specifications. The unit shall be ready for immediate operation at the time of delivery the following details are assumed to be in addition to requirements of NFPA Standard #1901. Any questions and/or apparent conflicts shall be brought to the attention of the Apparatus Committee, Ledyard Fire Company 11 Fairway Dr Ledyard CT, 06339 at least five working days prior to the opening of the bids. Items not specifically covered in the following specifications shall meet the requirements of NFPA Standards #1901 current edition.

The truck shall be provided with the minimum equipment required by category A of the sectors which pertain to the type of apparatus being specified unless otherwise called out in the following specifications. Any specified equipment shall be taken to intend that said equipment are the only items to be supplied.

Each bidder shall provide proof that their manufacturer maintains and follows current NFPA Standard #1901 and Federal/State of Connecticut Department of Transportation standards. "NO EXCEPTIONS".

The purpose of this specification is to cover the furnishing and delivery to the Ledyard Fire Company District #1 Inc. of complete and soundly engineered apparatus equipped as hereinafter specified. Each bidder is to provide with the bid proof of full-time employment of a registered licensed, certified engineer qualified in the state of the manufacturer's location.

The construction, materials and equipment in these specifications have been researched and found to be acceptable and in the best interests of the Ledyard Fire Company District #1 Inc. In the consideration of material considered equal to, the final decision of equality shall be made by

Ledyard Fire Company District #1 Inc. and shall be final. We reserve the right to accept or reject any and all bids in the process of selecting the unit which will best serve the town of Ledyard, Connecticut. We reserve the right to accept the "HIGH" bid if it is deemed to be the best unit in regard to these specifications.

Each bidder shall list all exceptions on a separate sheet titled "Exceptions To Bid Specifications". The list shall include any and all **OR EQUAL** items. All such exceptions shall be explained in full to the satisfaction of the accepting authority, Ledyard Fire Company District #1 Inc. Truck Committee. Bids taking total exception to these specifications will be rejected.

It shall be the responsibility of the manufacturer that the apparatus meets all Federal Department of Transportation standards in effect at the time the unit leaves the factory as well as any and all State of Connecticut Department of Transportation requirements.

The importance of public safety associated with firefighting and rescue apparatus covered by this specification will be excluded from consideration, when evaluating bids, manufacturers of apparatus that have not fully field tested such apparatus for at least 5 years and have been in the business of manufacturing such apparatus for a minimum of 10 consecutive years. "NO EXCEPTIONS".

Bi-metal manufacturing of the apparatus will not be acceptable. Bidder must not subcontract any portion of the manufacture of the apparatus.

When a commercial chassis is specified, the bidder is to provide a complete truck list and engineering data with proof that the chassis GVWR and frame rail RBM is sufficient to carry the completed apparatus and equipment with water in accordance with the standards set forward in NFPA Standard # 1901. The above data shall be provided for any chassis being bid for this unit.

The standard set for field testing shall apply to commercial chassis provider also. No exceptions will be allowed, this includes body fabrication and painting.

As a continuous operation of the apparatus contemplated is of the utmost importance, it is necessary that the successful bidder be able to guarantee the furnishing of replacement parts for a period of not less than twenty years. Accordingly, bidders shall provide proof of their ability to render prompt service. The bidder shall also provide proof of operation of a service facility fully equipped to repair fire apparatus and provide 24 hour a day emergency service.

Bidders must be able to provide most service work in the Ledyard Fire Company District #1 Inc. station where the apparatus is garaged by use of road service. All major service shall be able to be done at a service center operated by the manufacturers dealer network within 75 miles of the apparatus. Due to the legal liability of the service work, ALL service work is to be done within the State of Connecticut. This is to ensure any litigation which may arise in the future will indisputably fall under the cognizance of the laws and court system of the State of Connecticut. It shall also be understood that no service work other than component warranty shall be sub-contracted out. "NO EXCEPTIONS".

All bidders shall provide with their bid a financial statement. This shall be by means of a current Dunn and Bradstreet Report as well as a current income and balance report of the firm.

The bidder shall provide a certificate of insurance for product liability for not less than \$3,000,000.00 (THREE MILLION DOLLARS). "NO EXCEPTIONS". All bidders must show proof of Worker's Compensation Insurance, a minimum of \$100,000/\$300,000, Bodily Injury Liability Insurance, and a minimum of \$50,000 Property Damage Liability.

PERFORMANCE AND TEST

A road test will be conducted with the apparatus fully loaded and a continuous run of ten (10) miles or more will be made under all driving conditions, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts, and rear axles shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus.

- A. The apparatus, when fully equipped and loaded, shall have not less than 25 % nor more than 50 % of the weight on the front axle, and not less than 50 % nor more than 75 % on the rear axle.
- B. The apparatus must be capable of accelerating to 45 mph from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed rpm of the engine.
- C. The service brakes shall be capable of stopping fully loaded vehicle in 35 feet at 20 mph on level concrete highway.
- D. The apparatus, fully loaded, shall be capable of obtaining a speed of 60 mph on a level concrete highway with the engine not exceeding its governed rpm (full load).

FAILURE TO MEET TEST REQUIREMENTS

In the event the apparatus fails to meet the test requirements of these specification on the first trials, second trials may be made at the option of the bidder within thirty (30) days of the date of the first trials. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Failure to comply with changes as the purchaser may consider necessary to conform to any clause of the specifications, within thirty (30) days after notice is given to the bidder of such changes shall also be cause for rejection of the apparatus.

Permission to keep or store the apparatus in any building owned or occupied by the purchaser or its use by the Fire Company during the above specified period with the permission of the bidder shall not constitute acceptance.

MANUALS

The contractor shall supply at time of delivery at least two (2) copies of a complete operation and service manual covering the completed apparatus as delivered and accepted, including but not limited to, the chassis, pump, wiring diagrams, lubrication charts, and firefighting equipment delivered with the apparatus. Copies may be (1) Digital and (1) Hardcopy.

BONDS

Bidders shall provide a Bid Bond in the amount of 10% of the bid price. The successful bidder shall provide at the time of the contract award, a performance bond in the amount of 100% of the final bid price. A certified bank letter stating the manufacturers bond rate/premium (per thousand) shall be provided with the bid.

The bidder shall provide a list of apparatus which it has delivered in Connecticut within the last five years.

The bidder shall state the delivery time of his proposed apparatus both in calendar day and **NO LATER THAN** delivery date. The Ledyard Fire Company District reserves the right to require the successful bidder to enter into contract with the town inclusive of a Penalty Clause stipulating a mandatory deduction of a minimum of \$500.00 per day for each and every day the unit delivery goes past the stated delivery date.

BOTH CHASSIS AND BODY MUST BE BUILT IN THE UNITED STATES OF AMERICA BY A COMPANY THAT IS ONE HUNDRED PERCENT HELD AND OWNED BY AN AMERICAN CORPORATION. MANUFACTURERS THAT DO NOT MEET THIS REQUIREMENT NEED NOT SUBMIT AS THAT BID WILL BE REJECTED IMMEDIATELY WITH NO FURTHER EXPLANATION GIVEN OR REQUIRED.

Each bid shall also be accompanied by a sample corner piece. This shall be a cut away section showing as a minimum to scale the construction of the bidder's body, sub body, door construction, door hinge, hold open device, door latch, wire runs, rub rail and full stage paint process. It shall remain in the truck committee chairman's possession for a minimum of 14 calendar days for evaluation by the Ledyard Fire Company District #1 Inc. Failure to provide the cross section shall be cause for rejection of your bid.

DELIVERY

As stated, the unit shall be ready for immediate operation. To ensure this requirement is met in its full intent each bidder shall submit with his bid a detailed description of his delivery procedure. We have set the following criteria to be met by the vendor as a minimum. No exceptions to these minimum requirements will be acceptable.

- The unit is to be driven under its own power from point of manufacture to deliver at the Ledyard Emergency Services Building, 11 Fairway Dr, Ledyard CT 06339.

- The unit shall have been inspected and completely serviced prior to delivery by the Ledyard Fire Company District #1 Inc. private service center at the expense of the manufacturer.
- Complete servicing shall include as a minimum, fluid levels, and filters as required.
- Complete inspection of all vehicle systems.
- The entire unit shall be cleaned prior to delivery.
- A four-hour pump test shall be conducted. This will be from draft not to exceed more than ten-foot lift, hydrant type of test will not be acceptable.
- An eight-hour training session on full operation of apparatus is to be conducted. Pump time not included in these eight hours.

TESTING COMPLIANCE STANDARD

Hose Bed Capacity

The hose bed shall have the capacity to store the following hose from the driver side to the officer side. 500' of 3" and 1000' of 5" supply hose.

Overall Height Restriction

The apparatus shall have overall height restriction of 11' 6" (unloaded condition).

The height of the apparatus shall be measured with no water/foam in the water/foam tank, no equipment, no ground ladders and no hoses.

Overall Length Restriction

The completed unit shall have a maximum overall length restriction of 35'.

NFPA Compliance

The supplied components of the apparatus shall be compliant with the NFPA 1901 current edition.

Equipment Capacity

Equipment allowance on the apparatus shall be 1000 lbs. This allowance is in addition to the weight of the hoses and ground ladders listed in the shop order as applicable.

CHASSIS PREP

Kenworth Commercial Chassis Preparation

The commercial chassis shall be made ready for installation of components required by the fire apparatus specifications such as warning lights and sirens, cab wire harness, etc. Preparation shall also include relocating of components as necessary to meet the fire apparatus requirements such as exhaust tail pipe, air system components, batteries, etc.

BUMPERS

Front Bumper

The vehicle shall be equipped with a one-piece 10" high bumper, made from 10 gauge (0.135" nominal) polished (chrome finish) stainless steel for corrosion resistance, strength, and long-lasting appearance. It shall be mounted directly to the front frame extensions for maximum strength. The bumper shall incorporate two (2) stiffening ribs.

Bumper Extension

The front bumper extension shall be approximately 10" from the face of the cab as required.

Bumper Gravel Shield

The extended front bumper gravel shield shall be made of 3/16" (.375") aluminum tread plate material.

Bumper Guides

Two chrome bumper guides with lights shall be installed at the furthest corner of the bumper. They shall be removable and easily replaced.

TIRE OPTIONS

Tire Pressure Indicators

The apparatus shall be provided with Real Wheels AirGuard LED tire pressure indicating valve stem caps. When the tire is under inflated by 5-10 PSI, the LED indicator on the cap shall flash red. The indicator housings shall be shock resistant and constructed from polished stainless steel. The indicators shall be calibrated by attaching to valve stem of a tire at proper air pressure per load ratings and easily re-calibrated by simply removing and re-installing them during service.

AIR SYSTEM OPTIONS

Air Inlet Auto-Eject

A Kussmaul Air Auto-Eject #091-28 airline disconnect shall be installed for the air inlet connection. The airline will automatically disconnect when the vehicle is started. A Red weatherproof gasketed cover, which automatically closes when the airline is ejected, shall be supplied. Location shall be determined by committee at a later date.

Isolated Auxiliary Air Reservoir

The air system shall have an additional 1738 cu. in. isolated reservoir. The supply side of the reservoir shall be equipped with a check valve and an 85-psi pressure protection valve.

Specified options shall be plumbed to the isolated air tank.

Auxiliary Air Tank Plumbing

The auxiliary air reservoir shall be plumbed to air primer.

Air Horns

Dual stutter air horns shall be provided, connected to the chassis air system. The horns shall be mounted in the front bumper of the vehicle. A pressure protection valve shall be installed to prevent the air brake system from being depleted of air pressure. Air horns shall be controlled by the steering wheel horn, a switch shall be provided to switch from air horn to factory horn. In addition to a pull chain that is accessible for both the driver and officer.

ENGINES & TRANSMISSIONS

Vehicle Speed

The maximum speed shall be electronic limited to 60 MPH as required by NFPA 1901.

Engine

The chassis shall be equipped with a Cummins X15 Fire/Emergency six-cylinder, EPA compliant, electronic engine.

The engine rating shall be 565 HP rating, 1850 lb-ft Torque @ 1150 RPM, 2100 RPM Governed Speed

Transmission

The chassis shall have an Allison 4000 EVS-P Transmission, Gen 5 for Fire and Emergency Applications.

CHASSIS OPTIONS

Rear Tow Eyes

Two (2) heavy duty tow eyes made of 3/4" (0.75") thick steel having 2-1/2" 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.

Front Tow Eyes

Two (2) heavy duty painted front tow eyes (not 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. In addition to two heavy duty rated shackles to utilize for towing.

Wheels and Tires

Alcoa brand aluminum dura-brite wheels shall be installed.

CAB MODEL

Must be a 2DR Kenworth model T880 chassis 6x4 tandem axle, cab width suitable for high horsepower engine and suitable for fire apparatus applications.

Fuel Tank

Fuel tank shall be mounted behind the rear most axle between the frame rails. Fuel fill shall be run on the driver's side behind the rear most axle. A stainless-steel hinged door shall cover the fill neck.

Custom Battery Box/ Driver's Step

A custom fabricated battery box with step shall be installed on drivers' side where the factory fuel tank was removed. Shall be constructed out of aluminum channel and all exterior surfaces shall be made to match officer side steps.

CAB DOOR OPTIONS

Cab Door Interior Striping

Reflective striping shall be installed on commercial cab doors, visible when the door is open, meeting NFPA requirement of 96 sq. in. coverage for each door.

MISC EXTERIOR CAB OPTIONS

Label ``Diesel Fuel Only``

Located above each fuel filler housing shall be a metallic label that designates `` Diesel Fuel Only`` requirements. It shall be black with white or equivalent contrasting letters a minimum of 1/2`` high.

SEATS

Driver's seat shall be a Kenworth Air ride seat (Most current model).
Officers seat shall be a non-air ride Kenworth seat.

MISC. INTERIOR CAB OPTIONS

Cab Console

The console shall be centrally located and shall allow the driver and/or officer access to all components while seated with seat belts secured.

The console shall be constructed of aluminum smooth plate with a black Zolatone finish. The top surface shall have a non-reflective material for increased visibility of labels and controls.

All switches located on the console shall be clearly labeled and shall be back lit for easy operation and visibility. Switch locations will be determined and approved by the apparatus committee at a later date.

All Camera and Dump functions shall be integrated into the console. Location will be provided for the install of three mobile radio remote heads.

CAB ELECTRICAL OPTIONS

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 location shall be determined at a later date, the cover color shall be red.

Antenna Base

Style and placement will be discussed at a further date.

Battery Charger

A fully automatic Kussmaul charging system shall be installed on the apparatus. The system shall have a 120-volt, 60 hertz, 7 amp AC input with an output of 40 amps 12 volts DC. The battery charging system shall be connected directly to the shoreline to ensure the batteries remain fully charged while the vehicle is in the fire station or firehouse.

The system shall include a remote charging status indicator panel located on the lower area of the driver's seat. Display will be visible from the ground level when the door is opened.

Cab Dome Lights

A Whelen model 60CREGCS LED dome light shall be installed. The light shall have twelve (12) high intensity Super LEDs; six (6) white and six (6) red. Two (2) switches shall be provided on the face of the light to activate the red or white lights. The white light shall activate with appropriate cab door and light assembly switch, the red light activates with light assembly mounted switch only.

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

BODY CONSTRUCTION

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.

The 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

Body shall be completely sanded and deburred to assure a smooth finish and painted job color.

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 COMPARTMENTS

Driver Side Compartments

The four (4) 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. Compartment floor shall be covered with 1/8" (.125") aluminum diamond plate.

There shall be one (1) full height compartment ahead of the rear wheels. This compartment shall be approximately 36" wide 26" deep on the bottom and 14" deep on the top.

There shall be (2) compartments located above the rear wheels. The compartment shall be equally sized and centered above the rear wheels.

There shall be one (1) Full height compartment located to the rear of the rear wheels. The compartment width shall be determined by body length specifications and the distance between the rear wheels and end of the body. Depth shall be approximately 26" on the bottom and 14" on the top.

BODY COMPT RIGHT SIDE

Officer Side Compartments

The four (4) 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. Compartment floor shall be covered with 1/8" (.125") aluminum diamond plate.

There shall be one (1) compartment located ahead of the rear wheels. This compartment shall be approximately 36" wide, depth shall be approximately 26" and height shall be determined by the height of the wheel well compartments.

There shall be two (2) compartments located above the rear wheels, The compartments shall be no taller than 12" and shall be centered above the rear wheels

There shall be one (1) compartment located to the rear of the rear wheels. The compartment width shall be determined by body length specifications and the distance between the rear wheels and end of the body. Depth shall be approximately 26" and height shall be determined by the height of the wheel well compartments.

Compartment Storage Provisions

Pac-Trac mounting system shall be installed on upper back wall on all driver side compartments.

Four (4) horizontal slide out trays (250 lb. rating) shall be provided and installed by the dealer, location to be determined at a later date by apparatus committee.

One (1) double sided vertical swing out tool board shall be installed by the dealer in one of the driver side compartments above the wheel wells. The tool board shall be made of Pac-trac. Orientation and location shall be determined by the apparatus committee at a later date.

One (1) full depth adjustable shelf shall be provided. Location shall be determined by the apparatus committee at a later date.

Two (2) half depth adjustable shelves shall be provided. Location shall be determined by the apparatus committee at a later date.

All Shelves and drawers shall have black Dri-Deck installed prior to apparatus delivery.

BODY COMPT REAR

Tailboard/Tailboard Step

A tailboard step shall be provided at the rear of the body. The tailboard shall 16" 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.

Beavertails

Two (2) angled beavertails shall be provided at the rear of the body. The beavertails shall be a part of the body framework and provide additional support to the tailboard. Each beavertail shall be constructed of formed 1/8" (0.125") aluminum treadplate and includes removable outside panels for access to internal wiring and bolt-on accessories.

Rear Access Handrails

Handrails shall be provided at the rear of the body to assist ground personnel accessing the tailboard step and hose bed 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.

The handrails shall be located- two (2) handrails, one (1) on each side, appropriately sized handrail mounted vertical on the trailing edge of the body and appropriately sized handrail(s) mounted horizontal below the rear hose bed opening.

Rear End Assembly

The rear end shall be set-up as tanker and shall have no rear body compartment.

The rear end shall be constructed of vertical and horizontal extrusions with interlocking smooth plate upper and lower panels. The lower center area shall have a smooth plate panel area that shall allow for a Newton tank dumping application.

The vertical, horizontal, and smooth plate panels shall have a sanded finish.

DOORS

Single Compartment Door

A single compartment door shall be constructed using a box pan configuration. The outer door pan shall bevel and shall be constructed from 3/16" (0.188") aluminum plate. The inner door pan shall be constructed from 3/32" (0.090") smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pan shall have a 95-degree bend to form an integral drip rail.

The compartment door shall have a 1" x 9/16" (1" x 0.43") closed-cell "P" EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the door to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage.

A polished stainless-steel Hansen D-ring style twist-lock door handle with #459 latch shall be provided on the door. The 4-1/2" (4.5") D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The compartment door shall be securely attached to the apparatus body with a full-length stainless steel 1/4" (0.25") rod piano-type hinge isolated from the body and compartment door with a dielectric barrier. The door shall be attached with machine screws threaded into the doorframe. The door shall have gas shock-style hold-open devices.

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door will be installed on the driver's side forward upper compartment. Door will open upwards.

Double Compartment Door

Double compartment doors shall be constructed using a box pan configuration. The outer door pans shall bevel and shall be constructed from 3/16" (0.188") aluminum plate. The inner door pans shall be constructed from 3/32" (0.090") smooth aluminum plate and shall have (Nutsert) fittings to attach hold-open hardware. The inner pans shall have a 90-degree bend to form an integral drip rail.

The compartment doors shall have a 1" x 9/16" (1" x 0.43") closed-cell "P" EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the doors to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage.

A polished stainless-steel Hansen D-ring style twist-lock door handle with #459 latch shall be provided on the primary door. The 4-1/2" (4.5") D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The secondary door shall have a dual stage rotary latch with a 750 lb rating to hold the door in the closed position. The latch shall be mounted at the top of the door. A stainless-steel paddle style handle shall be mounted on the interior pan of the door to actuate the rotary latch. The paddle handle shall be connected to the rotary latch by a 5/32" (.156") diameter rod. Cable actuation shall be deemed unacceptable due to the potential for cable stretch and slippage. The striker pin shall be 3/8" (.38") diameter with slotted mounting holes for adjustment.

Double door latch to have latch brackets fabricated from .125 aluminum smooth plate, installed with "PULL" tags #1032993 for left side and #1032294 for right side.

The compartment doors shall be securely attached to the apparatus body with a full-length stainless steel 1/4" (0.25") rod piano-type hinge isolated from the body and compartment doors with a dielectric barrier. The doors shall be attached with machine screws threaded into the doorframe.

The doors shall have a gas shock-style hold-open device. The gas shocks shall have a 30 lb. rating and be mounted near the top of the door (when possible).

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

These doors will be installed on the officer's side lower front and rear, the driver's side lower front and rear.

TRAYS

Running board Suction Tray

A running board suction hose storage tray "floating style" shall be provided and located on the officer side running board.

The tray shall be "floating style" mounted and constructed of 1/8" (.125") aluminum diamond plate (exterior) with a smooth sanded surface interior. The bottom of the tray shall have removable aluminum slats and drain holes to allow water drainage from hose stored in the tray. The tray shall have a 3" tapered front corner to protect tray against debris.

COVERS

Rear Hose Bed Cover

A cover constructed of heavy-duty black nylon cargo netting shall be installed at the rear apparatus hose bed.

The bottom of the cargo netting shall be mechanically attached to the hose bed. The cover shall be attached to comply with the latest edition of NFPA 1901.

Cover shall secure the hose load at the rear open back of the hose bed and shall compliment the separate top cover that secures top of body open areas over hose load.

NFPA Hose Bed Cover

The hose bed area will be covered by a black canvas cover secured on three sides. Cover will display the unit number in a contrasting (white) lettering.

The water tank fill tower(s) shall be accessible with the cover in the closed position through a Velcro opening.

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

Cross Lay Cover

A cross lay cover shall be provided for the cross lay storage area of the pump module. The cross lay cover shall be provided in compliance with NFPA 1901.

The cross lay cover shall be constructed from black canvas.

Cross Lay Cover - Sides

A pair of covers constructed of heavy-duty black nylon cargo netting shall be installed over the side openings of the apparatus cross lay.

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

Running Board Tray Securing Strap

A heavy-duty black nylon strap with an aluminum quick-release buckle shall be provided for the running board hose tray. The strap shall be attached to the inboard side of the tray as low as practical to allow cinching of strap for securing tray contents and shall not reduce the overall tray capacity.

Location: officer side running board.

PUMP MODULE

Pump Module Width

Pump module shall be a maximum of 50" wide.

Pump Module Frame

An extruded aluminum pump module shall be provided and located forward of the apparatus body. The pump module shall be constructed entirely of welded aluminum alloy extrusions and interlocking aluminum plates. The pump module framework shall consist of 1.5" x 3" x .188" wall, 1.5" x 3" x .375" wall with center web and 3" x 3" x .188" wall extrusions.

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 framework shall have a sanded finish.

Pump Module Mounting

The pump module shall be attached to the chassis using four (4) center bonded isolation mounts and a steel mounting frame. The isolation mounts shall be 2.75" diameter and mount to the chassis with two (2) 4" x 4" x .312" A36 steel angles.

Pump Access

A pump service access door shall be provided at the front of the pump module. The door shall be secured with two (2) thumb latches. (Access door not provided on fixed cab applications)

Pump Module Running Boards

The pump module shall include a running board on each side. The running boards shall be in accordance with NFPA in both step height and stepping surface. The running boards shall be formed from .125" aluminum treadplate.

Stepping Surface

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 .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 Panel Opening

The panel opening on the pump module shall be 39" wide.

Pump Module Height

The pump module height shall be 80".

PUMP PANELS

Zolatone Pump Panels

The driver and officer side pump panels shall have a black zolatone painted finish.

Pump Access Door

The officer side pump module shall have a three (3) piece panel, one (1) above the discharge outlets, one (1) encompassing the discharges and intakes and one (1) low for bleeder valves.

The upper two (2) pump panel sections shall have a vertical stainless-steel piano type hinge with 1/4" pins along the forward edge of the pump module. The hinges shall be "staked" on every other knuckle to prevent the pin from sliding. The panels shall have push button style latches to secure the panels in the closed position. The upper panel shall have one (1) pneumatic shock to hold the panel 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 1901 compliance.

PUMP MODULE OPTIONS

Flex Joint

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

Air Horn Switch

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: driver side pump panel.

Two Cross Lay Hose bed

Two (2) cross lay hose beds shall be provided on the pump module. The two (2) forward cross lay areas shall each have a capacity for up to 200' of 1.75" double-jacket fire hose single stacked.

The cross lay floor and side walls shall be constructed of 3/16" (.188) smooth aluminum plate. The floor shall be slotted to prevent the accumulation of water and allow for ventilation of wet

hose. One (1) 1/4" (.25") smooth aluminum plate fixed dividers with a sanded finish shall be provided to separate the two (2) hose storage areas.

WATER TANK

Tower Locations

Fill tower locations. Water fill tower to be located driver side of hose bed.

3000 Gallon Water Tank

A 3000 gallon (U.S.) "T" booster tank shall be supplied.

The booster tank shall be constructed of polypropylene material. The booster tank shall be completely removable without disturbing or dismounting the apparatus body structure. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal.

The booster tank top, sides, and bottom shall be constructed of a minimum 1/2" (0.50") thick black UV-stabilized copolymer polypropylene. Joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The tank cover shall be constructed of 1/2" thick polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions.

The tank shall have a combination vent and manual fill tower with a hinged lid. The fill tower shall be constructed of 1/2" polypropylene and shall be a typical dimension of 8" x 8" outer perimeter (subject to change for specific design applications). The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall have a 1/4" thick removable polypropylene screen and a polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid.

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. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates per the tank fill inlet size.

The sump shall be constructed of a minimum of 1/2" polypropylene. The sump shall have a minimum 3" N.P.T. threaded outlet for a drain plug per NFPA. This shall be used as a

combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 3" above the inside floor.

The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength.

Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with an I.D. of 3" or larger that is designed to run through the tank. This outlet shall direct the draining of overflow water past the rear axle, 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. All water tanks shall be tested and certified as to capacity on a calibrated and certified tilting scale.

Each tank shall be weighed empty and full to provide precise fluid capacity. Each tank shall be delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight. Engineering estimates for capacity calculations shall not be permitted for capacity certification. The tank must be designed and fabricated by a tank manufacturer that is ISO 9001:2008 certified in each of its locations. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank.

A tag shall be installed on the apparatus in a convenient location and contain pertinent information including a QR code readable by commercially available smart phones. The information contained on the tag shall include the capacity of the water and foam (s), the maximum fill and pressure rates, the serial number of the tank, the date of manufacture, the tank manufacturer, and contact information. The QR code will allow the user to connect with the tank manufacturer for additional information and assistance.

The tank shall have a limited Lifetime warranty that provides warranty service for the life of the fire apparatus in which the tank is installed. Warranties are transferable if the apparatus ownership changes by requesting the transfer from the tank manufacturer.

The booster tank shall include a rear tank dump mounting plate.

Tank capacity is 3000 US gallons / 2523 Imperial gallons / 11469 Liters.

WATER TANK OPTIONS

Tank Sump Additional [Qty: 2]

A second sump shall be added to the tank bottom for customer's special applications.

Newton Dump Provision [Qty: 3]

Special provisions for mounting a Newton dump valve on the poly water tank shall be provided.

TANK PLUMBING

Tank Fill 2 Elkhart Unibody 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 always visually indicate the position of the valve. The fill line shall be controlled using a chrome handle with an integral tag.

The valve shall be an Unibody series with stainless steel 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 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.

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

Tank Dumps

Side tank dumps 1080 or 1085 shall be provided. Located one on each side of the apparatus in between the rear wheels and 1 centered on the rear of the apparatus.

The tank dumps shall be Newton Kwik Dump and shall include a 10" x 10" flip-up valve plate for maximum water flow. Each dump assembly shall have a 5018 extension that shall extend the dump out past the side of the apparatus.

The dump valve and dump extension shall be electrically actuated. The exterior surface of the dump assembly shall be stainless steel.

Tank To Pump 3 Elkhart Unibody Valve

One (1) manually operated 3" Elkhart valve with 4" plumbing 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 Unibody series with a stainless-steel 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.

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

A check valve shall be provided in the tank to pump supply line to prevent the possibility of "back filling" the water 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.

Rear Direct Tank Fill

Two (2) 3" rear direct water tank fills with check valves shall be provided. The connection shall include an inlet strainer, 3" NST inlet with cap and retainer. Both will have 3" Storz connections. They will both have the capability to hold the weight of charged 3" Supply lines.

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

The direct tank fills shall be located one to the driver's side, one to the officer's side rear of the body. Both must be accessible from the ground.

LADDER STORAGE / RACKS

Hold Downs

The ladder brackets/rack to store one (1) 3-section 35' extension and one (1) 16' roof ladder.

Ladder Brand

The ladder brand capable of being carried on the unit shall be Alco-Lite.

Equipment Storage

A recessed equipment storage compartment shall be provided. The storage compartment shall store two (2) pike poles. (1) ten foot and (1) eight foot.

The storage compartment shall be accessed through a hinged 1/8" (.125") aluminum diamond plate door with a push-button latch. The door shall be wired to the door ajar indicator light in the cab and shall be interlocked with the parking brake per NFPA.

The storage compartment shall be located below officer side compartment top below the ladders and above the DOT light assembly on the rear of the apparatus. The door will open in the downward direction. This compartment will be duplicated on the driver's side below the portable tank.

Hard Suction Storage

An aluminum storage tray shall be provided and shall be capable of storing the supplied 6" x 15' hard suction hose.

The storage tray shall include a minimum of four (4) NFPA compliant hose restraints.

- One tray shall be located on the driver side above compartments.
- One tray shall be mounted to the top of the ladder storage track,
- Storage tray and suction hose shall not block any lighting on the high side of the apparatus.

Ladders

The length of ladders capable of being stored shall be the following: 35' 3-section and 16' roof ladder.

Ladder Storage Rack

A Zico QUIC-LIFT Ladder Access System (LAS) ladder rack shall be provided. The rack shall lower the ladders approximately 31" from the stored position to provide a safe and convenient height for unloading and loading.

The rack shall be electrically operated by two (2) durable high cycle 12-volt actuators and controlled by a 30 amp two-pole double-throw momentary switch located at the pump module area. The control switch location shall allow the operator to monitor operations, monitor positioning of apparatus mounted equipment in the ladder racks travel path and ground personnel while lowering and raising the rack.

The ladder rack shall be self-locking in any position during operation. 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.

The rack will be wired additionally to an indicator light on the center console that shows if it is in the stored or lowered position.

The ladder rack shall be capable of storing a maximum of three hundred pounds (300 lbs.).

The rack shall be located to the officer's side of the body.

Hard Suction Tray

One (1) hard suction storage tray shall be provided and mounted to the top of the Zico drop-down 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. The hard-suction hose shall be secured in the tray by Four (4) securing straps evenly spaced.

HANDRAILS / STEPS

Body Handrails

Hansen white LED lighted body handrails shall be provided (includes pump module if applicable). The 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.

Handrail lighting shall be wired through clearance / headlight switch and only activate when park brake is set.

Hose Bed Folding Steps

Innovative Controls dual lighted LED folding steps shall be positioned to the driver side and officers side rear of the body. The steps shall be NFPA compliant for access to the hose bed 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.

Innovative Controls dual lighted folding step with LED lights integral to the step on the top to provide NFPA requirements of 2 fc (20 lx) on the stepping surface. Folding step shall also have a LED light integral to the bottom of the step to meet NFPA requirements of a stepping surface up to 18" below the step. The folding step shall sustain a minimum static load of 500 lb with a 3 to 1 safety factor. The folding step shall also meet NFPA slip resistance qualifications. Corrosion resistance shall be demonstrated by a 1000 hr salt spray test with no visible signs of deterioration of the step body or hardware.

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.

Intermediate Rear Step

One (1) intermediate rear step shall be provided above the rear Newton dump.

The intermediate step shall be constructed of 3/16" (.187") aluminum treadplate. The step 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".

MISC. BODY OPTIONS

Mud Flaps

Black mud flaps provided for the body wheel wells.

Splash Guard

A one (1) piece splash guard shall be installed under the body full width behind the rear axle. The design and material of the splash guard shall be smooth rubber backing with front polly bristles designed to keep rear of vehicle clean of road spray and debris. The splash guard to be 18"H x 96"L. Rear will have in red Lettering TAN14KER.

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.

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. 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.

Hose Bed Side Assembly

The hose bed side assemblies shall be made of 3" x 3" slotted aluminum extrusion and 3/16" (.188") smooth plate.

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

Hose Bed

The area above the booster tank shall have a hose storage area provided. The hose bed 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 hose bed design shall incorporate adjustable tracks in the forward area and the rearward area of the hose bed for the installation of an adjustable divider(s). The adjustable tracks shall hold an adjustable divider(s) mounting nut straight, so only a hex head wrench is required to adjust a divider(s) from side to side (as is practical with other hose bed mounted equipment).

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

Hose Bed Dividers

There shall be two hose bed dividers provided the full fore-aft length of the hose bed.

The hose bed dividers shall be constructed of 3/8" smooth aluminum plate with an extruded aluminum base welded to the bottom. The rear end of the dividers shall have a 3" radius corner to protect personnel. The dividers shall be natural finish aluminum for long-lasting appearance and shall be sanded and de-burred to prevent damage to the hose.

The dividers shall be adjustable from side to side in the hose bed to accommodate varying hose loads.

Hose Bed Dividers Hand Hold

There shall be a hand hole cut-out(s) on the trailing edge of each hose bed divider. The cut-out(s) is specifically sized for use in adjusting of the hose bed divider.

Floor Matting

This unit shall have all applicable compartment floors, shelves and trays covered with a heavy-duty black DRI-DEK matting.

Rub Rail

The pump area module(s) and body shall have rub rails mounted along the sides.

The rub rail shall be C-channel in design and constructed of 3/16" thick 6463T6 anodized aluminum extrusion. The rub rail 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 rub rail depth shall allow marker and/or warning lights to be recessed inside for protection.

The top surface of the rub rail 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 rub rail 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.

Anodize Aluminum Trim

A anodize aluminum trim shall be located at the bottom edge of all body compartment openings with painted edge (as applicable). The trim shall provide added protection of the painted surface of the body when equipment is removed from the compartment.

Tank Dump Plates and Doors

The tank dumps shall have diamond plate dump panels. Included shall be lift-up diamond plate doors with spring loaded hinges.

Commercial Tandem Axle Tanker

Commercial chassis tandem axle wheelbase modification. Adds 1" to wheelbase due rear axle offset between commercial and custom chassis.

Body Mod High HP Commercial Engines

Body or pump module shall be notched to accommodate the exhaust canister for high horsepower engines (370 HP or more) on the commercial chassis. The top mount right side

walkway and/or speedlay module lower storage compartment may be modified or eliminated. Side mount or under tank pump bodies may have reduced front right-side lower storage areas.

SCBA BOTTLE STORAGE

SCBA Strap

Straps shall be provided in each exterior storage compartment to provide secondary means to hold each SCBA bottle in the compartment. The straps shall be constructed from 1" nylon webbing formed in a loop. The strap(s) shall be mounted to the storage compartment ceiling directly inside the door opening at each bottle location.

SCBA STORAGE

SCBA storage with hinged door and push button latch shall be provided in the body wheel well area.

The door shall match the wheel well area material and finish.

The door shall be wired to "Door Open" indicator inside cab.

Compartment shall be weather tight.

The storage area shall be capable of holding one complete Scott 4.5 SCBA and one spare Scott 30 min bottle.

Location: driver side rear wheel well offset forward, driver side rear wheel well offset rearward, officer side rear wheel well offset forward, officer side rear wheel well offset rearward

PUMPS

Pump Rating

The fire pump shall be rated at 1500 GPM or greater.

Fire 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 of commercial or custom truck chassis and have the capacity of 1,500 to 2,250 gallons per minute (U.S. GPM) NFPA 1901 rated performance and shall be split shaft driven from the truck transmission.

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" 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.

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. This control valve shall be in reach of the driver.

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 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 lock-up (4th gear lock-up). This will also be duplicated on the pump panel.

Test Ports

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

Gearbox Cooler

A gearbox cooler shall be provided to maintain safe operating temperatures during prolonged pumping operations for pump rating 1500 GPM and over.

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 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

Steamers, Flush+1

The pump 6" steamer intake(s) shall be mounted approximately 1" from the pump panel to back of cap when installed. The "Flush+1" dimension can vary + or - 1-1/4" or as practicable depending on the pump module width and options selected.

All electric MIV's.

Location: driver's side, officer's side.

Zinc Anodes

The zinc anodes help prevent damage caused by galvanic corrosion within the fire 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.

Thermal Relief Valve

A Hale thermal relief valve that protects the pump from overheating shall be provided. The 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.

Inlet Valve

A Hale Master Intake Valve (MIV-E) shall be provided for the specified intake. The large diameter inlet valve shall be capable of achieving an NFPA test rating of 1500 GPM through a single 6" suction hose.

The inlet valve shall be operated by a 12 VDC electric motor with a remote switch provided at the pump operator's position. The 12 VDC motor shall be provided with an automatic resetting, thermally compensated over-current protection circuit breaker to protect the 12 VDC motor and apparatus electrical system. The gear actuator on the valve will cycle from full closed to full open in not less than three (3) seconds. A hand-controlled pump panel mounted manual override (knob style) shall be provided.

An indicator light panel shall be located at the pump operator's position to show valve open, closed, or traversing from open to closed.

A built-in adjustable pressure relief valve shall be provided. The pressure relief valve shall be factory set to 125 psi. The pressure relief valve shall provide overpressure protection for the suction hose even when the intake valve is closed.

A 3/4" air bleeder valve shall be provided and controlled at the pump operator's position.

A 1/4" water bleeder shall be supplied and controlled at the pump operator's position.

Location: driver side pump panel, officer side pump panel.

Mechanical 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 back-up seal provided.

Only one 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.

Hale Pressure Relief Valve

A Hale pressure relief valve shall be provided and mounted on the pump operator's panel. The pump shall be equipped with an automatic pressure control device. A single bronze variable pressure setting relief valve shall be provided and be of ample capacity to prevent an undue pressure rise as outlined in NFPA 1901. The relief valve shall be normally closed and shall open against pump pressure. A relief valve control wheel with a control light to signal when open shall be mounted on the pump operator's panel.

Master Drain Valve

A manual master drain valve shall be installed on the pump panel. The master pump drain assembly shall consist of a Class 1 bronze master drain with a rubber disc seal. The master drain shall have a rubber seal to prevent water from running out on the running board.

The manual master drain valve shall have twelve (12) individual-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.

Trident Primer

A Trident air operated priming system shall be installed. The unit shall be of all brass and stainless-steel construction and designed for fire pumps of 1,500 GPM or more. Due to corrosion exposure no aluminum or vanes shall be used in the primer design. The primer shall be three-barrel design with ¾" NPT connection to the fire pump.

The primer shall be mounted above the pump impeller so that the priming line will automatically drain back to the pump. The primer shall also automatically drain when the panel control actuator is not in operation. The inlet side of the primer shall include a brass "wye" type strainer with removable stainless-steel fine mesh strainer to prevent entry of debris into the primer body.

The system shall create vacuum by using air from the chassis auxiliary air tank through a two-barrel multi-stage internal "venturi nozzles" within the primer body. The noise level during operation of the primer shall not exceed 75 Db.

Air Flow Requirements

The primer shall require a minimum of 15.6 cubic foot per minute air compressor and shall be capable of meeting drafting requirements at high idle engine speed. The air supply shall be from a chassis supplied "protected" air storage tank with a pressure protection valve. The air supply line shall have a pressure protection valve set between 70 to 80 PSIG.

Primer Control

The primer control shall have a 3 position switch labeled , Auto Prime, OFF and PRIME. The valve shall direct air pressure from the air brake storage tank to the primer body. To prevent freezing, no water shall flow to and from the panel control on the driver's side.

Warranty

The primer shall be covered by a five (5) year parts warranty.

INTAKES

Left Intake 2.5 Elkhart Unibody Valve

One (1) 2 1/2" suction inlet with a manually operated 2 1/2" Elkhart Unibody valve with chrome valve face shall be provided on the left side of the apparatus at the pump panel.

The valve shall be an Elkhart Unibody series with a 316 stainless steel ball and dual polymer 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 stainless-steel ball when in a throttle position and water is flowing through it.

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

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 control shall be located at the pump operator's panel and shall always visually indicate the position of the valve.

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 left side pump panel.

DISCHARGES AND PRECONNECTS

Deck Gun Discharge 3 Electric Unibody Valve

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

The valve shall be an Elkhart unibody series with a stainless-steel ball and dual UHMWPE 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 unibody series valve shall have the following features:

- 12-volt DC motor
- A toggle switch and indicator lamp assembly mounted on the pump operator's panel
- 10 LED indicator lights
- Manual override valve actuation

The system shall include a valve-controller and valve actuator.

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 located at the pump operator panel and shall always visually indicate the position of the valve.

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

Cross Lay 1.5 Elkhart Manual Unibody [Qty: 2]

One (1) cross lay discharge shall be provided at the front area of the body. The cross lay shall include one (1) 2" brass swivel with a 1-1/2" hose connection to permit the use of hose from either side of the apparatus.

The cross lay hose bed shall consist of a 2" heavy duty hose coming from the pump discharge manifold to the 2" swivel. The hose shall be connected to a manual operated 2" Elkhart valve. The valve shall be an Elkhart Unibody series with a stainless-steel ball, and dual UHMWPE 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 stainless 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.

The Unibody series valve shall have the following features:

- The system shall include a valve-controller and valve actuator.
- The valve control shall be located at the pump operator's panel and shall always visually indicate the position of the valve.

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 Unibody Valve

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 Unibody series with a stainless-steel 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.

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

The discharge shall extend out beyond the pump panel with a cast brass with 2-1/2" NST . 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: left side discharge 1, left side discharge 2

Right Panel Elkhart Unibody Valves

One (1) 3" discharge outlet and one (1) 2.5" discharge outlet with a manually operated Elkhart valve shall be provided at the left-hand side pump panel.

The valve shall be an Elkhart Unibody series with a stainless-steel 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.

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

The discharge shall extend out beyond the pump panel with a cast brass 2-1/2" NST threads.

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

Location: right side discharges

Hose Bed 2.5 Elkhart Unibody Valve

One (1) 2.5" discharge shall be provided at the front area of the driver's side hose bed. The hose bed connection shall include one (1) 2.5" hose connection.

The hose bed shall consist of a 2.5" heavy duty hose coming from the pump discharge manifold. The hose shall be connected to a manually operated 2.5" Elkhart valve. The valve shall be an Elkhart Unibody series with a stainless-steel ball, and dual UHMWPE 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 stainless 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.

The Unibody series valve shall have the following features:

- The system shall include a valve-controller and valve
- The valve control shall be located at the pump operator's panel and shall always visually indicate the position of the valve.

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

Blitz Fire Rear Discharge

One (1) discharge with 3" piping to a 2.5" coupling will be installed on the driver's side rear of the apparatus.

The Blitz Fire Master Stream will be mounted on the rear for easy access.

Decontamination Discharge

A .75" decontamination discharge outlet shall be provided on the driver side pump panel. The outlet shall include a 1/4 turn valve, hose bib connection and pressure reducing valve.

Deck Gun Location

Deck gun piping shall be positioned centered in deck gun channel. This location shall allow for optimal operation of a deck gun monitor once installed.

Booster Reel Discharge

A 1-inch discharge outlet shall be provided to the dunnage area for connection to a hose bed reel on the driver's side of the apparatus. The Valve shall be manually operated.

DISCHARGE OPTIONS

Elkhart 8598 Extender

Elkhart model 8598 3" electrically actuated extender shall be installed. The waterway shall be capable of being lowered to deck level (or into a monitor well) for storage and transportation and shall be capable of being raised to an extended height of 18" using panel mounted controls. These controls shall be capable of moving the waterway in either the raised or lowered position while maintaining the ability to horizontally rotate the monitor device 360 degrees. There shall be an accessible manual override control for use in the event power failure occurs. A power cable shall be supplied for connection from the panel control box to the extender.

A sensor shall be located on the waterway that signals a 12-volt indicator light installed in the cab to illuminate to indicate that the monitor is raised. Labeled as such.

The extender shall have a 3" waterway and a connection for an Elkhart remote controlled monitor.

Monitor Elkhart Cobra

An Elkhart Cobra RF with panel mounted control and handheld control and an adapter to mount to deck gun discharge or extender shall be provided with a 3" inlet. The monitor shall be capable of remote controlled 360 degree left/right travel (in deck mount mode), programmable automatic oscillating from 2 to 360 degree (in deck mount mode) and programmable stow feature. The monitor shall include a SM-1250E nozzle.

The charging base shall be mounted in L1 on forward wall.

The Remote control shall Also be able to open the deck gun valve and extend and lower the 8598 extender.

Hannay Hose Reel

A Hannay Electric rewind hose reel capable of holding between 150' and 200' of 1" rubber booster hose. The reel shall be mounted on the driver's side of the apparatus in the dunnage area on top of the pump. The reel shall be made from aluminum and be operated by a 12v electric motor. Where the hose leaves the side of the pump panel shall be protected by rollers as to protect pump area. A waterproof push button shall be installed on the pump panel to operate the rewind function of the reel.

IC Push/Pull Control

The apparatus pump panel shall be equipped with Innovative Controls Side Mount Valve Controls. The ergonomically designed ¼ turn push-pull T-handle shall be chrome-plated zinc with recessed labels for color-coding and verbiage. An anodized aluminum control rod and housing shall, together with a stainless spring steel locking mechanism, eliminate valve drift. Teflon impregnated bronze bushings in both ends of the rod housing shall minimize rod deflection, never need lubrication, and ensure consistent long-term operation. The control assembly shall include a decorative chrome-plated zinc panel-mounting bezel with areas for color-coding and/or FOAM and CAFS identification labels.

Bleeder Drain Valve [Qty: 8]

The bleeder/drain valves shall be Innovative Controls ¾" ball brass drain valves with chrome-plated lift lever handles and ergonomic grips. Each lift handle grip shall feature built-in color-coding labels and a verbiage tag identifying each valve, also supplied by Innovative Controls. The color labels shall also include valve open and close verbiage.

Discharge/Intake Bezel

Innovative Controls intake and/or discharge swing handle bezels shall be installed to the apparatus with mounting bolts. These bezel assemblies will be used to identify intake and/or discharge ports with color and verbiage. These bezels are designed and manufactured to withstand the specified apparatus service environment and shall be backed by a warranty equal to that of the exterior paint and finish. The specified assemblies feature a chrome-plated panel-mount bezel with durable UV resistant polycarbonate inserts. These UV resistant polycarbonate graphic inserts shall be sub-surface screen printed to eliminate the possibility of wear and protect the inks from fading. All insert labels shall be backed with 3M permanent adhesive (200MP), which meets UL969 and NFPA standards.

Pressure Governor and Engine Throttle

FRC InControl TGA401-D00

Fire Research InControl series TGA401-D00 pressure governor and monitoring display kit shall be installed. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 5 1/2" high by 10 1/2" wide by 2" deep. The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1 3/4" from the front of the control module. Inputs for monitored information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring.

The following continuous displays shall be provided:

- Pump discharge; shown with four daylight bright LED digits more than 1/2" high
- Pump Intake; shown with four daylight bright LED digits more than 1/2" high
- Pump discharge and intake pressure gauge shall have an accuracy of ± 3 percent over the full scale.
- Pressure / RPM setting; shown on a dot matrix message display
- Pressure and RPM operating mode LEDs
- Throttle ready LED
- Engine RPM; shown with four daylight bright LED digits more than 1/2" high
- Check engine and stop engine warning LEDs
- Oil pressure; shown on a dual color (green/red) LED bar graph display
- Engine coolant temperature; shown on a dual color (green/red) LED bar graph display
- Transmission Temperature; shown on a dual color (green/red) LED bar graph display
- Battery voltage; shown on a dual color (green/red) LED bar graph display.

The dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. All LED intensity shall be automatically adjusted for day and nighttime operation.

The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- High Battery Voltage
- Low Battery Voltage (Engine Off)
- Low Battery Voltage (Engine Running)
- High Transmission Temperature
- Low Engine Oil Pressure
- High Engine Coolant Temperature
- Out of Water (visual alarm only)
- No Engine Response (visual alarm only).

The program features shall be accessed via push buttons and a control knob located on the front of the control panel. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.

Inputs to the control panel from the pump discharge and intake pressure sensors shall be electrical. The discharge pressure display shall show pressures from 0 to 600 psi. The intake pressure display shall show pressures from -30 in. Hg to 600 psi.

The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

The pressure governor, monitoring and master pressure display shall be programmed to interface with a Cummins engine.

Location of the governor and monitoring display shall be: Pump operator's panel.

GAUGES

FUEL LEVEL GAUGE

One diesel fuel gauge will be mounted on the pump panel.

GAUGE IC 10 LED TANK LEVEL WATER, ADDITIONAL

An additional Innovative Controls brand water tank level gauge shall be located at the officer rear to provide a high-visibility display of the water tank water level. Ten (10) high-intensity light emitting diodes (LED's) on the display module shall have a 3-dimensional lens allowing the full, 3/4, 1/2, 1/4, and refill levels to be easily distinguished at a glance within full 180-degree visibility.

The display module shall be protected from vibration and contamination with the components being encased in an encapsulated plastic housing. 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 to the pump panel. Each display level can be set independently for maximum reliability.

The display shall provide a steady indication of fluid level despite sloshing inside of the tank when the vehicle is in motion due to an "anti-slosh" feature.

GAUGE IC 10 LED TANK LEVEL WATER MINI

Innovative Controls miniature tank indicator shall be installed in the cab dash. The indicator shall show the volume of water in the tank on five (5) easy to see super bright LED's with auto dimming feature. The miniature indicator shall receive input information over a single wire from a tank primary indicator.

WHELEN STRIP LIGHT PLUS XL SUPER LED TANK LIGHT

One (1) Innovative Controls brand water tank level gauge shall be located at the pump operator's panel to provide a high-visibility display of the water tank water level. Ten (10) high-intensity light emitting diodes (LEDs) on the display module shall have a 3-dimensional lens allowing the full, 3/4, 1/2, 1/4, and refill levels to be easily distinguished at a glance full 180-degree visibility.

The display module shall be protected from vibration and contamination with the components being encased in an encapsulated plastic housing. 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 to the pump panel. Each display level can be set independently for maximum reliability.

The display shall provide a steady indication of fluid level despite sloshing inside of the tank when the vehicle is in motion due to an "anti-slosh" feature.

In addition to the pump panel mounted lights there shall be Whelen strip light plus XL super LED tank level gauges. The system shall be controlled by an Innovative Controls tank level driver module that is integral of the NFPA required pump panel mounted tank level light assembly.

The remote light heads shall be arranged as follows.

Full Green
3/4 Blue
1/2 Amber
1/4 Red

Location of Whelen tank level lights: each side of cab up high and the rear below the arrow stick.

2.55" Discharge Pressure Gauge (Dual Read) [Qty: 9]

The valve discharge gauges shall be 2 ½"(63mm) diameter Innovative Controls pressure gauges. Each gauge shall have a rugged corrosion free stainless-steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation, and ensure proper operation from -40F to +160F. Each gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless-steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauges shall be installed into decorative chrome-plated mounting bezels that incorporate valve-identifying verbiage and/or color labels. The gauges shall display a range from 0-2750KPA/0-400PSI with black graphics on a white background.

MASTER INTAKE GAUGE

One 6" innovative controls gauge shall be located on the pump panel; the gauge shall read -30-400 PSI and represent the apparatus intake pressure. The gauge shall be placed at a 20 degree downward angle.

MASTER DISCHARGE GAUGE

One 6" innovative controls gauge shall be located on the pump panel. This gauge shall read 0-400 psi and represent the master discharge pressure of the apparatus. The gauge shall be placed at a 20 degree downward angle.

ELECTRICAL SYSTEMS

Multiplex Electrical System

The apparatus shall incorporate a Weldon V-MUX multiplex 12-volt electrical system. The system shall have the capability of delivering multiple signals via a CAN bus. The electrical system installed by the apparatus manufacturer shall conform to current SAE standards, the latest FMVSS standards, and the requirements of the applicable NFPA 1901 standards.

The electrical system shall be pre-wired for optional computer modem accessibility to allow service personnel to easily plug in a modem to allow remote diagnostics.

The electrical circuits shall be provided with low voltage over-current protective devices. Such devices shall be accessible and located in required terminal connection locations or weather-resistant enclosures. The over-current 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.

Any electrical junction or terminal boxes shall be weather-resistant and located away from water spray conditions.

For superior system integrity, the networked multiplex system shall meet the following minimum component requirements:

- The network system must be Peer to Peer technology based on RS485 protocol. No one module shall hold the programming for other modules. One or two modules on a network referred to as Peer to Peer, while the rest of the network consists of a one master and several slaves is not considered Peer to Peer for this application.
- Modules shall be IP67 rated to handle the extreme operating environment found in the fire service industry.
- All modules shall be solid state circuitry utilizing MOS-FET technology and utilize Deutsch series input/output connectors.
- Each module that controls a device shall hold its own configuration program.
- Each module should be able to function as a standalone module. No “add-on” module will be acceptable to achieve this form of operation.
- Load shedding power management (8 levels).
- Switch input capability for chassis functions.
- Responsible for lighting device activation.
- Self-contained diagnostic indicators.
- Wire harness needed to interface electrical devices with multiplex modules.
- The grounds from each device should return to main ground trunk in each sub harness using ultrasonic splices.

Wiring

All harnessing, wiring and connectors shall be manufactured to the following standards/guidelines. No exceptions.

- NFPA 1901-Standard for Automotive Fire Apparatus
- SAE J1127 and J1127
- IPC/WHMA-A-620 – Requirements and Acceptance for Cable and Wire Harness Assemblies. (Class 3 – High Performance Electronic Products)

All wiring shall be copper, or copper alloys of a gauge rated to carry 125 of the maximum current for which the circuit is protected. Insulated wire and cable 8 gauge and smaller shall be SXL, GXL, or TXL per SAE J1128. Conductors 6 gauge and larger shall be SXL or SGT per SAE J1127.

All wiring shall be colored coded and imprinted with the circuits function. Minimum height of imprinted characters shall not be less than .082" plus or minus .01". The imprinted characters shall repeat at a distance not greater than 3".

A coil of wire shall be provided behind electrical appliances to allow them to be pulled away from mounting area for inspection and service work.

Wiring Protection

The overall covering of the conductors shall be loom or braid.

Braid style wiring covers shall be constructed using a woven PVC-coated nylon multifilament braiding yarn. The yarn shall have a diameter of no less than .04" and a tensile strength of 22 lbs. The yarn shall have a service temperature rating of -65 F to 194 F. The braid shall consist of 24 strands of yarn with 21 black and 3 yellow. The yellow shall be oriented the same and be next to each other.

Wiring loom shall be flame retardant black nylon. The loom shall have a service temperature of -40 F to 300 F and be secured to the wire bundle with adhesive-backed vinyl tape.

Wiring Connectors

All connectors shall be Deutsch series unless a different series of connector is needed to mate to a supplier's component. The connectors and terminals shall be assembled per the connector/terminal manufacturer's specification. Crimble/Solderless terminals shall be acceptable. Heat shrink style shall be utilized.

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:

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:

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

Multiplex Display

The V-MUX multiplex electrical system shall include a Vista IV touch screen color display.

The display shall have the following features:

- Aspect ratio of 16:9 (Wide Screen)
- Diagonal measurement of no less than 7"
- Touch screen design with "virtual" switch capability

- Master warning switch
- Engine high idle switch
- Five (5) tactile switches to access secondary menus
- Eight (8) multi-function programmable tactile switches
- Specific door ajar indication
- Real time clock
- Provides access to the multiplex system diagnostics
- Video capability for optional back-up camera(s) and GPS display

The location of the display shall be determined by the fire company after seeing the cab.

Vehicle Data Recorder

A vehicle data recorder system shall be provided to comply with NFPA 1901, 2009 edition. The following data shall be monitored:

- Vehicle speed MPH
- Acceleration (from speedometer) MPH/Sec.
- Deceleration (from speedometer) MPH/Sec.
- Engine speed RPM
- Engine throttle position % of full throttle
- ABS Event On/Off
- Seat occupied status Occupied Yes/No by position
- Seat belt status Buckled Yes/No by position
- Master Optical Warning Device Switch On/Off
- Time: 24-hour time
- Date: Year/Month/Day

Occupant 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.

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 representation of each cab seat in the multiplex display screen that will continuously indicate the validity of each seat position.

The system shall include a seat sensor and safety belt latch switch for each cab seating position, audible alarm and wiring harness.

Electrical Connection Protection

The vehicle electrical system shall be made more robust by the application of a corrosion inhibiting spray coating on all exposed electrical connections on the chassis and body. If equipped with an aerial device, the exposed connections on the aerial components shall also be protected.

The coating shall use nanotechnology to penetrate at the molecular level into uneven surfaces to create a protective water repellant film. The coating shall protect electrical connections against the environmental condition's apparatus are commonly exposed to.

LIGHT BARS

Light Bar Mounts

One (1) fabricated high light bar mounts for use with Whelen Pioneer front brow light mounted center of the cab above the windshield.

Front Light Bar Color(s)

The front light bar shall be provided with the following color LED modules: Red/White with clear lenses

If applicable, includes side facing light bars when colors are the same.

Light Bar LED Filters

The Whelen Freedom IV light bar(s) shall be provided with filters for all colored LEDs'. The filters shall cover each individual LED module.

Light Bar

A Whelen Freedom IV Series 60" LED light bar model F4X0 with eight (8) LED modules shall be provided; two (2) front corner mounted LED modules, four (4) forward facing LED modules and two (2) side facing LED modules (with front vista windows) or two (2) rear corner LED modules (without front vista windows).

No rear facing LEDs.

The light bars shall have clear lenses.

The white LEDs (if equipped) shall be switched off in blocking right of way mode.

The light bar shall be installed centered on the front cab roof.

WARNING LIGHT PACKAGES

Lower-Level Warning Light Package

Eight (8) Whelen M6RC Super red LED with clear lens light heads shall be provided.

The rectangular lights shall include chrome flanges where applicable. The lights shall be wired with weatherproof connectors and shall be mounted as close to the corner points of the apparatus as is practical as follows:

- Four (4) on the front of the apparatus facing forward
- Two (2) on the rear of the apparatus facing rearward
- One (1) light each side at the rearward most point (as practical).

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

Lower-Level Warning Lights Cont.

Four (4) Whelen V-Series Combination 180-degree warning and perimeter light shall be installed on the apparatus. The M4V2R shall feature a red warning light that will be integrated with other lower-level warning lights. The rectangular lights shall include chrome flanges where applicable. The lights shall be wired with weatherproof connectors and shall be mounted as follows:

One (1) either side of the apparatus front bumper. The “scene” Function of the light shall activate when the turn signal is activated. Four-way flashers will not activate scene light.

One (1) Either side of the apparatus directly to the rear of the side tank dumps. The “scene” function of the light shall activate two ways:

1. When side turn signal is activated, Four way flashers will not activate lights.
2. A switch in the cab shall be provided to activate each light individually for better visibility of side dumps during night operations. Switch will be labeled.

WARNING LIGHTS

Whelen LED Warning Light Flasher

Three (3) Whelen model UFM8 warning light flashers shall be provided to control warning lights. One (1) flasher shall be located in the cab and two (2) located in the body. Each flasher shall have seventeen (17) selectable patterns with eight (8) outputs.

Upper Rear Warning Lights

Two (2) Whelen model L31H Super LED beacons with Red LED with Clear lens domes shall be supplied.

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 on the Interior of the cab roof.

Warning Lights

Two (2) Whelen M9RC Series Linear Super LED red light heads with clear lens shall be provided with diamond plate boxes. The rectangular lights shall include chrome flanges where applicable.

Location: (1) each side of body on forward upper body corners, (1) each side of body on rearward upper body corners.

RUBRAIL WARNING LIGHTS

Six (6) red LED emergency lights installed in the rub rail next to the DOT lights. Two (2) Officers side two (2) Drivers side and two (2) in the rear. Lights shall be Whelen.

Directional Traffic Warning Light

One (1) Whelen TAM65 LED 36" long Traffic Advisor with amber lenses shall be provided.

The directional bar shall include a TACTL5 control head. The control head shall include a remote flash control and end lamp enable/disable feature.

The light shall be installed at rear of body to direct traffic around the apparatus.

Recessed Directional Light Bar Mount

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

Directional Light Bar Control Location

The directional light bar control head shall be in the center console.

SIRENS

Electronic Siren

A Whelen 295SLSA1 electronic siren shall be installed in the cab. The siren amplifier and control panel module shall include a rotary selector for six (6) functions, on/off switch, push button switch for manual siren or air horn tones, and noise canceling microphone.

Mechanical Siren

A chrome plated flush mounted Federal Q2B-NN coaster siren shall be installed in the front bumper. An electric siren brake switch shall be in the cab accessible to driver.

The siren shall be in the front bumper to the officer's side.

Operation of the siren will be by a foot pedal mounted vertically next to the air horn pedal on the driver's side. In addition to a vertically mounted foot pedal on the officer's side. The siren brake switch will be mounted on the center console.

Electronic Siren Control Location

The electronic siren control shall be located in the center console.

SPEAKERS

Siren Speaker

One (1) Whelen model SP123BMC, 100-watt speaker with chrome grill shall be recessed in the front bumper.

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

The speaker shall be located officer side front bumper.

D.O.T. LIGHTING

License Plate Light

One (1) Truck-Lite model 15905 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.

Body Marker Lights

Trucklite LED clearance lights shall be installed as specified.

Upper Body:

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

Lower Body:

Three (3) red LED clearance lights centered at rear, recessed in the rub rail.

One (1) red LED clearance light each side at the trailing edge on either side of the apparatus body, recessed in the rub rail.

One (1) amber LED clearance / auxiliary turn light each side front of body, recessed in the rub rail.

A rectangular shaped marker light with a red colored lens shall be installed at the trailing edge on each side of the apparatus body/module, recessed in the rub rail.

Marker Lights

One (1) pair of Britax model L427.203L.12V LED amber/red marker rubber housed lights shall be provided. The lights shall be located on the rear body corners mounted in the down angle position. The red lenses shall illuminate to the rear of the apparatus and the amber shall illuminate to the front of the apparatus. The lights shall be wired to the marker light circuit.

Taillights

Three (3) Whelen model M6 series LED (Light Emitting Diode) lights shall be installed in a four (4) light vertical housing each side at rear and wired with weatherproof connectors.

Light functions shall be as follows:

- LED red running light with red brake light in upper position.
- LED amber populated arrow pattern turn signal in middle position.
- LED clear back-up light in lower position.

A one-piece chrome plastic housing shall be mounted around the three (3) individual lights in a vertical position. The lower space will be used by the M6 or equivalent lower NFPA warning light.

LED Head Lights

LED head lights shall be installed.

LIGHTS - COMPARTMENT, STEP & GROUND

Compartment Light Package

One (1) ROM V4 compartment light strip shall be mounted in each body compartment greater than 4 cu. ft. Transverse compartments shall have two (2) lights, located one (1) each side.

Each light bar shall include super bright white LEDs mounted to circuit boards that have acrylic conformal coating for corrosion protection. The LED circuit boards shall be mounted to an extruded aluminum base with lexan lens. The lights shall produce 250 lumens per foot and be waterproof up to 1 meter (3.3 feet).

Compartment lights shall be wired to a master on/off rocker switch on the cab switch panel.

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 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 TecNiq model T440 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.

LIGHTS - DECK AND SCENE

Rear Work Lights

Two (2) FireTech LED lights model FT-WL3500-FT-W shall be installed. The lights shall produce 1,981 effective lumens and have a white housing. The lights shall be switched with a labeled work light switch in the cab.

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

Hose Bed Lighting

LED rope lighting will be installed around the inside railing of the hose bed.

Cross Lay Light

A FireTech LED light model WL2000 shall be installed at the rear area of the cross lay to provide cross lay lighting per current NFPA 1901. The cross lay light shall be switched with work light switch in the cab.

LIGHTS - NON-WARNING

Engine Compartment Light

There shall be lighting provided in compliance with NFPA to illuminate the engine compartment area. The light wiring circuit shall activate when the cab is tilted, and master power is switched on.

Pump Compartment LED Light

An LED light shall be provided in the pump compartment area for NFPA compliance. The light shall be wired to operate with the work light switch in the cab.

LED Pump Panel Light Package

Three (3) TecNiq model E10 LED lights shall be mounted under a light shield directly above each side pump panel. The work light switch in the cab shall activate the lights when the park brake is set.

LED Pump Panel Light - Additional

One (1) TecNiq model E10 LED light shall be mounted under the light shield, in addition to the existing pump panel lights. The additional light shall be located at the officer side pump panel.

CONTROLS / SWITCHES

A 12-volt switch shall be provided.

The switch shall be located pump operator's panel for pump panel lights.

CAMERAS / INTERCOM

Camera Back-Up

There shall be a Safety Vision camera model number SV-625B-KIT provided. The camera shall be mounted up high at the rear of the vehicle to provide a wide-angle rear view with audio. The camera shall include a cable with metallic waterproof threaded o-ring seal connectors to ensure positive connection between video cable and camera to prevent unplugging due to vibration resulting in video loss to vehicle operator. The camera shall be interlocked with the chassis transmission. When the apparatus is placed in reverse the camera shall automatically be activated and when the transmission is placed in any other gear the screen shall return to the previously displayed screen.

Safety Vision Camera

A Safety Vision camera consisting of Safety Vision model SV-625B camera will be located one (1) each side of body for viewing of the dump chute. This camera will be interlocked with each dump chute. The system shall include a cable with metallic waterproof threaded o-ring seal connectors to ensure positive connection between video cable and camera to prevent unplugging due to vibration resulting in video loss to vehicle operator.

Will require the option for multiplex display or Safety Vision backup camera system.

Intercom

Two-way intercom system will be activated when cameras are in use or when activated by the driver. The driver will have open communication with the personnel around apparatus while it is in operation at low speed and always open two-way communication when chutes are deployed

MISC. ELECTRICAL

Alternating Headlights

The chassis high beam headlights shall alternately flash and shall be controlled by a switch inside the cab.

Back-Up Alarm

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

12 Volt DC Power Distribution Module

A Blue Sea model 5032 12 place, split bus fuse block with ground, 12-volt DC power distribution module shall be provided. The module shall provide two isolated groups of six circuits and shall be wired through switched hot and battery hot, and include a battery ground.

Location: behind driver's seat.

LIGHTS - SCENE

Bracket Mount Light

One (1) Pioneer Summit Series 12V LED bracket mounted flood light model S30MW 30" long shall be provided. The light shall feature 24 LEDs'. The 135W 12V light shall draw 7.2 amps. A switch shall be provided, accessible to driver, for activation of light.

The light assembly shall be recessed below the rear arrow stick.

A Switch in the cab accessible to the driver shall activate light. Light will also activate when apparatus is placed in reverse.

Side Scene Light [Qty: 4]

Two (2) Whelen M9 Series M9LZC with chrome flange shall be installed on each side of the body. The lights shall be operated by a switch in the cab accessible to the driver.

The light assembly shall be located high side corners on both sides of body. Not to be obstructed by equipment. Lights shall be mounted next to Whelen M9 warning lights.

The rearmost lights on the apparatus shall activate when the apparatus is placed in reverse.

Cab Brow Light

One (1) Whelen Pioneer Plus PFH2 LED flood shall be mounted in the center of the cab above the windshield and below the light bar. The 12V light shall draw 12 amps. A switch shall be provided, accessible to driver, for activation of light.

The light assembly will be located under light bar and above windshield.

GROUND LADDERS

Alco-Lite Roof Ladder

An Alco-Lite PRL-16, 16' aluminum roof ladder shall be provided. A pair of folding 3/4" (0.75") steel roof hooks shall be attached to one end of the ladder, and a pair of steel spiked feet on the other end. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931.

Alco-Lite Extension Ladder

An Alco-Lite 35' 3-section extension ladder shall be provided.

MISC. LOOSE EQUIPMENT

D.O.T. Required Drive Away Kit

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

EXTERIOR PAINT

Un-Painted Pump/Pre-Connect Module(s)

All applicable pump application modules shall have a sanded finish (not painted job color). Includes upper and lower pump modules, crosswalk module and/or speedlay/pre-connect module (as applicable). Rear mounted body/pump module shall be painted job color.

Any plumbing extending out past pump panel enclosure must be painted body color.

Paint Body Large

The apparatus body shall be painted to match the current apparatus color.

Any location where aluminum 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 pre-treatment (ECK Corrosion Control). The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, handrails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20-degree gloss meter. Coating thickness shall be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

Commercial Cab Paint

The Kenworth cab shall be painted black by the chassis supplier. The cab will then be painted body color by the body manufacturer.

Paint shall be warranted by the body manufacturer.

STRIPING

Striping

Reflective striping shall be provided and installed by the dealer under the instruction of the customer.

Reflective Stripe in Rub Rail

The reflective stripe in the body rub rail shall be white.

Rear Body Reflective Striping

Chevron style Reflexite V98 striping shall be provided on the rear of the apparatus. The stripes shall consist of 6" Red/Black alternating stripes in an "A" pattern. The striping shall be located on the rear facing extrusions, panels and doors inboard and outboard of the beavertails if applicable.

Designated Standing / Walking Area Indication

1" wide yellow perimeter marking consisting of individual Reflexite diamonds shall be applied to indicate the outside edge of designated standing and walking areas above 48" from the ground in compliance with 2016 NFPA 1901. Steps, ladders and areas with a railing or structure at least 12" high are excluded from this requirement.

GRAPHICS

Will match the existing apparatus.

SUPPORT, DELIVERY, INSPECTIONS AND MANUALS

Approval Drawing

A detailed large-scale approval drawing of the pump panel(s) shall be provided. The drawing shall be provided for purchased unit prior to the construction process.

A detailed approval drawing for the cab center console.

A detailed approval drawing for any graphics.

WARRANTY & EXTENDED

Standard 1 Year Warranty

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 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.

10 Year 100,000 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 Retention, Cracking)

0 to 72 months	100%
73 to 120 months	50%

Coating System, Adhesion & Corrosion:

(Includes Dissimilar metal corrosion, Flaking, Blistering, Bubbling)

0 to 36 months	100%
37 to 84 months	50%
85 to 120 months	25%

Corrosion perforation shall be covered 100% for 10 years. Corrosion perforation is defined as complete penetration through the exterior metal of the apparatus.

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.

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

INSPECTION TRIPS

Two inspection trips are to be provided. Both trips will be for three people. They are to be scheduled later. These trips shall cover the cost of flight, hotel, meals and transportation.