



## **NFPA Compliance**

The E-ONE supplied components of the apparatus shall be compliant with NFPA 1901, 2016 edition.

## **Commercial Chassis**

The commercial chassis shall be a Freightliner Business Class M2 106 MD Two (2) door and shall be supplied with the following equipment:

### **GVW Rating**

The gross vehicle weight rating shall be 44,600 lbs with an overall wheel base of 185".

### **Frame**

The chassis frame rails shall be channel type, 10-15/16" x 3-1/2" x 11/32" steel. The frame shall have a 41" rear frame overhang. The frame rails shall be clear with no protrusions outboard of the rail from the back of the cab to the rear suspension.

Full 1/4" C-channel reinforcement shall be provided.

### **Tow Hooks**

There shall be two (2) front tow hooks, frame-mounted.

### **Front Axle and Suspension**

The front axle shall be set back with 14,600 lbs. capacity.

### **Front Suspension**

The front suspension shall be taper leaf with a 14,600 lb capacity and front shock absorbers.

### **Front Tires**

Front tires shall be 12R22.5 tubeless type 14 ply radial tires.

Black hard rubber mudflaps shall be provided behind the front tires.

### **Rear Axle**

The rear axle shall have a 30,000 lbs. capacity. 4.89 rear axle ratio.

### **Rear Suspension**



The rear suspension shall be 52" variable rate multi-leaf spring with leaf spring helper rated at 30,000 lbs capacity.

### **Rear Tires**

Rear tires shall be 315/80R22.5 tubeless type 20 ply radial tires.

### **Brake System**

The vehicle shall be equipped with a WABCO 4S/4M ABS brake system without traction control. Reinforced nylon, fabric braid and wire braid chassis air lines. BW AD-9 brake line air dryer with heater. Air dryer frame mounted.

### **Cooling System**

950 square inch aluminum radiator. Antifreeze to -34F, Ethylene Glycol pre-charged SCA heavy duty coolant. Gates blue stripe coolant hoses or equivalent. Constant tension hose clamps for coolant hoses. Auxiliary engine cooling using water from the fire pump. Lower radiator guard.

### **Exhaust System**

RH outboard under step mounted horizontal after treatment system assembly with RH horizontal tailpipe exiting forward of rear tires. Engine after treatment device, automatic over the road active regeneration and dash mounted single regeneration request/inhibit switch.

### **Fuel Tank**

A fifty (50) gallon rectangular aluminum fuel tank shall be mounted at the driver side. Fuel lines shall be reinforced nylon fuel hose. 6 gallon diesel exhaust fluid tank. Alliance fuel filter/water separator. Equiflo inboard fuel system. High temperature reinforced nylon fuel line. Fuel cooler.

### **Transmission**

An Allison EVS3000 automatic 5 speed transmission shall be provided. The push-button electronic shift control shall be located within easy reach of the driver and shall be indirectly lit for after-dark operation. A label shall be provided within easy view of the driver to indicate the chassis transmission shift selector position to be used for pumping.

A transmission water-to-oil cooler shall be provided in the radiator end tank.

A transmission fluid check and fill with electronic oil level check.

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

### **Battery System**



(2) Alliance model 1131, group 31, 12 volt maintenance free 1900 CCA threaded stud batteries. Standard battery jumpers. Single battery box frame mounted LH side under cab. Wire ground return for battery cables with additional frame ground return.

### **Alternator**

The alternator shall be DR 12V 275 AMP 40-SI brushless pad with remote battery voltage sense.

### **Ember Separator**

Side of hood air intake with NFPA compliant ember screen and fire retardant Donaldson air cleaner.

### **Rims - Painted Steel**

The chassis rims shall be Accuride 22.5" x 8.25" 10 hub piloted 2-hand steel disc wheels. The rims shall be painted job color.

### **Air Horns**

Dual Stuttertone Hood Mounted Air Horns with Driver and Officer Foot Switches to be Supplied and Installed by Freightliner.

### **OEM Chassis Step Package**

The chassis shall be provided with the OEM step package on a Freightliner M2 106 and 112 chassis. Included shall be mounting plate/area for the battery charger receptacle and air inlet.

### **Battery Location**

The batteries shall be located under left hand side of cab.

### **NFPA Compliance**

The E-ONE supplied components of the apparatus shall be compliant with NFPA 1901, 2016 edition.

### **Fire Apparatus/Rescue Chassis Prep**

The following items shall be installed on the commercial chassis in preparation for fire apparatus/rescue application:

- Exhaust Extension - The chassis exhaust pipe shall be extended to the front of the right rear wheels.



- **Fast Idle System** - A fast idle system shall be provided and controlled by a cab or pump panel mounted switch. The system shall increase engine idle speed to a preset RPM for increased alternator output.
- **Master Light Switch** - The master light switch shall consist of one (1) illuminated rocker switch wired through a solenoid to accessory switches to allow pre-selected switches to be turned on or off at one time.
- **Battery Master Disconnect** - A heavy duty on/off single battery master disconnect switch shall be mounted in the cab within easy reach of the driver.
- **Auxiliary Engine Cooler** - As required for pumping applications, an engine cooler shall be installed. The engine cooler shall be required to lower engine water temperature during prolonged pumping operations and shall be controlled at the pump operator's position.

### **Auxiliary Engine Cooler**

An auxiliary engine cooler shall be provided to lower the engine coolant temperatures during prolonged pumping operations.

This auxiliary engine cooler shall be installed in-line with the engine coolant system in such a manner as to allow cool pump water to circulate around engine coolant, thus forming a true heat exchange action.

The auxiliary cooler inlet and outlet shall be continuous and shall prevent intermixing of engine coolant and pump water.

The auxiliary cooler shall be controlled at the pump operator's panel.

### **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.

Real Wheel Part number RWC1234 was superseded by RWC1235 as of June 2015

### **Air Inlet**

A 1/4" male plug air hose inlet shall be connected to the air reservoir tank. A 1/4" inline check valve will be installed in the line. Air hose connection will provide the capability of filling the air brake system with air from an outside source. Location: driver's door step area.

### **Vehicle Speed**



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

### **Freightliner Engine**

The chassis shall be equipped with a Cummins ISL six-cylinder, 2013 EPA compliant, electronic engine.

The engine shall be 350HP @ 2000 RPM (2200 RPM Governed) with 1000 lb/ft @ 1400 RPM.

### **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.

### **Tow Hooks**

The chassis shall have two (2) forward frame mounted tow hooks.

### **OEM Chassis Step Package**

The chassis shall be provided with the OEM step package on a Freightliner M2 106 and 112 chassis. Included shall be mounting plate/area for the battery charger receptacle and air inlet.

### **Logo Package**

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

### **Cab Door Reflective Material**

Reflective Red/Lemon Yellow material striping shall be supplied on each of the cab doors. The stripes shall be be angled from the lower outer corner to the upper inside corner, forming an "A" shape when viewed from the rear. The reflective material shall be at least 96 square inches to meet NFPA 1901 requirements.

### **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.

### **Seating Capacity Tag**



A tag that is in view of the driver stating seating capacity of two (2) personnel shall be provided.

### **Battery Charging Connector**

A 12 volt battery charging connector shall be installed on the apparatus. The connector shall be an Anderson model SB175 with mechanically keyed housing and weatherproof cover. A mating connector shall be shipped loose for connection to the fire department's station mounted battery charger.

The connector shall be installed in the driver's door step area.

### **Apparatus Body**

The apparatus body shall be constructed entirely of aluminum extrusions with interlocking aluminum plates. An extruded modular aluminum body is required due to the high strength-to-weight ratio of aluminum, corrosion-resistant body structure, easy damage repair, and lighter overall body weight to allow for increased equipment carrying capacity.

The body design shall provide 38.4 cubic feet of storage, which exceeds the minimum NFPA 1901 requirements.

The entire body shall be constructed with aluminum extrusions. Body designs that incorporate steel sub-frames connected to aluminum compartments are not as corrosion-resistant and not acceptable.

### **Mainframe Construction**

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. 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. Three (3) U-shaped brackets shall be installed on the bottom of the tank to retain the water tank. The brackets shall be equally spaced along the tank centerline and wrap around the body crossmembers.

To maintain low vehicle center of gravity the water tank bottom shall be mounted within 5" of the frame rail top.

### **Side Assembly**

The driver and officer side assemblies shall be constructed entirely of aluminum extrusions and interlocking aluminum plates. This aluminum modular design shall provide a high strength-to-weight ratio for increased equipment carrying capacity. The 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 driver side body shall be completely sanded and deburred to assure a smooth finish.

### **Compartments**

The compartments shall be constructed from formed 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. 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 tread plate. The compartment top shall be removable for easy access to the main body wiring harness.

### **Compartment Sizes**

#### **Left Side:**

There shall be one (1) compartment (L1) located ahead of the rear wheels. The compartment shall be approximately 23" wide x 30" high x 26" deep. The compartment shall contain approximately 10.4 cu. ft. of storage space. The door openings shall be approximately 23" wide x 30" high.

**NOTE:** The left side front compartment height is reduced by approximately 4" when a driver side pre-connect tray and roll-up doors are specified.

#### **Right Side:**

There shall be one (1) compartment (R1) located ahead of the rear wheels. The compartment shall be approximately 62" wide x 30" high x 26" deep. The compartment shall contain approximately 28 cu. ft. of storage space. The door openings shall be approximately 62" wide x 30" high.



## **Wheel Well**

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

## **Rear End Assembly**

The rear end shall be constructed of vertical and horizontal extrusions with interlocking smooth plate panels. The center area shall have a notched area to allow for tank dump valve. The vertical, horizontal, and smooth plate panels shall have a sanded finish.

## **Tailboard Step**

A tailboard step shall be provided at the rear of the body. The tailboard shall 12" 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 tread plate and shall be reinforced with 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.

## **ISO Compliance**

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

## **Wheel Base Mod**

Wheel base modification code to add additional cab to body gap to support internal programming only. Not a value for total cab to body gap, refer to layout and sales drawings for total wheelbase and cab to body gap for application.





## **Single Compartment Door**

A single compartment door shall be constructed using a box pan configuration. The outer door pan shall beveled and shall be constructed from 3/16" (0.188") aluminum diamond plate. The inner door pan shall be constructed from 1/8" (0.125") 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 a gas shock-style hold-open device.

The door(s) shall be installed in the following location(s): L1

## **Double Compartment Door**

Double compartment doors shall be constructed using a box pan configuration. The outer door pans shall beveled and shall be constructed from 3/16" (0.188") aluminum diamond plate. The inner door pans shall be constructed from 1/8" (0.125") smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pans shall have a 95-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.

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).

The door(s) shall be installed in the following location(s): R1

### **Hose Bed Cover**

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

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

### **Pre-connect Tray Rear Cover**

A cover constructed of Black 18 oz. PVC vinyl coated polyester shall be installed over the rear opening of the pre-connected hose tray. The base fabric shall be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 square inch.

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

### **Lower Pump Module**

An aluminum extruded lower pump module shall be provided and located forward of the body. The pump module shall be constructed entirely of aluminum extrusions and interlocking aluminum plates. The pump module design and mounting shall be separate from the body to allow the pump module and body to move independently of each other in order to reduce stress from frame twisting and vibration. The exterior surface of the pump module shall have a sanded finish. The officer side panel opening shall be 33" in width.

### **Pump Operator Control Panel**



The driver side pump panel shall be constructed of 14 gauge stainless steel. The panel shall have the ability to be removed for easier maintenance access in the pump area.

### **Pump Panel Tags**

Color coded pump panel labels shall be supplied to be in accordance with NFPA 1901 compliance.

### **Water Tank**

A 2000 gallon (U.S.) booster tank shall be supplied. The booster tank shall be of a pinned baffle design. The booster tank shall be completely removable without disturbing or dismounting the apparatus body structure.

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

The booster tank shall have a fill tower with a rearward hinged lid. The fill tower shall be centrally located on the tank and shall assist with tank ventilation. The fill tower shall include a removable polypropylene screen.

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

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

The tank overflow piping shall exit aft of the chassis' rear axle. This drain configuration shall assure that rear axle tire traction shall not be affected when moving forward by overflowing water.

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

A lifetime manufacture's limited warranty shall be included.

Tank capacity shall be 2000 US gallons / 1665 Imperial gallons / 7571 Liters.

### **Newton Dump Provision**



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

### **Tank Fill 2 Akron Valve**

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

The valve shall be an Akron 8800HD 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 with water flowing through it.

The valve shall be of unique Akron 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.

### **Rear Tank Dump**

A tank dump shall be provided at the rear of the apparatus.

The tank dump shall be a Newton Kwik Dump and shall include a 10"x 10" flip-up valve plate for maximum water flow.

The dump valve shall be manual actuated from the upper area of the dump assembly and shall be accessible from the driver or officer side during side to side dumping operations.

The exterior surface of the dump assembly shall be mild steel.

### **Tank To Pump 3 Akron Air Valve**

One (1) air actuated 3" Akron valve shall be installed between the pump suction and the booster tank. Includes flex hose with stainless steel hose clamps for connection to the 4" tank sump outlet. 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 Akron 8800HD 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 Akron 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.

### **Rear Direct Tank Fill**

One (1) 3" rear direct water tank fill shall be provided.

The valve shall be installed between the fill connection port and the water tank to prevent water from flowing out of the tank after filling or disconnecting of the fill line. The connection shall include an inlet strainer, 3" FNST inlet swivel with droop and plug with retainer. The valve shall be constructed of brass and shall be slow closing per NFPA.

The valve control shall be a swing handle located on the valve that shall visually indicate the position of the valve at all times.

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

The direct tank fill shall be located to the officer's side rear of the body.

### **Ladder Brand**

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

### **Ladders**

The length of ladders capable of being stored shall be the following: 24' 2-section and 14' roof ladder.

### **Adjustable Ladder Brackets**

There shall be two (2) adjustable ladder brackets provided with spring-loaded hold-down handles mounted in the adjustable ladder tracks.

The tracks shall be located to the driver's side of the body.

### **Adjustable Tracking**

Adjustable tracking shall be provided on the driver's side of the apparatus.



The tracking shall be positioned above the compartment top and shall allow for maximum adjustment of items mounted to the tracks.

### **Portable Tank Rack**

A manually operated drop-down portable tank storage rack shall be provided.

The rack shall be made of aluminum tubing in a grid pattern that shall be capable of enclosing around a portable water tank along the front, top, sides and rear.

The rack shall be secured in the up position with manually released clamps. The clamps shall be accessible from the tailboard and running board.

The rack shall be wired through the ajar indicator light located in the cab.

The rack shall be located to officer side on compartment top of body. The rack shall be sized for a steel framed 2100 gallon portable tank.

### **Graphic Plate**

There shall be a metal plate mounted to the side of the portable tank rack to assist in the application of the NFPA stripe and/or Lettering.

### **Access Ladder**

A ladder shall be provided to access the top of the apparatus body. The ladder shall be constructed with 3/8" aluminum plate side rails and 1-1/4" diameter extruded ribbed aluminum steps. The ladder shall be designed with a slight inward taper to facilitate easier climbing. LED lighting shall be provided to illuminate the ladder steps per NFPA.

The ladder shall be located rear of body officer side.

### **Rear Mud Flaps**

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

### **Hose Bed Capacity**

Hosebed hoseload allowance on the apparatus shall be 800 lbs.

### **Overall Height Restriction**



The apparatus shall have no overall height restrictions.

### **Overall Length Restriction**

The unit has no overall length restrictions.

### **Hosebed Storage Area**

The upper sides and front of the water tank shall be extended upward to provide a hose storage area.

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

The hosebed shall include an open area for the fill tower that shall be centrally located on top of the tank. The hosebed design shall incorporate adjustable tracks for the installation of an adjustable divider(s). The adjustable tracks shall hold an adjustable divider(s) mounting nut straight, so only a philips head screwdriver is required to adjust a divider(s) from side to side.

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

### **Hose Tray**

A hose tray shall be provided on top of the driver side body compartment top for storage of pre-connected hose. The tray shall be constructed of 3/16" (.188) aluminum diamond plate. The top and rear of the tray shall be open for deployment and re-packing of hose.

The floor of the tray shall have machine punched slots to prevent the accumulation of water and allow for ventilation of wet hose.

### **Tray Cover**

A cover shall be provided for the pre-connected hose tray in compliance with NFPA 1901.

The hose tray cover shall be constructed from 1/8" (.125) aluminum treadplate. The cover shall include a full-length stainless steel (0.25") rod piano-type hinge. The cover shall be hinged to open outward.

The cover shall include two (2) grab handles and two (2) hold downs to secure the cover in the closed position. The cover shall be labeled as a non-stepping surface.

### **Tank Dump Elbow and Extension Chute**



A slip-on Newton Dump elbow and straight extension chute shall be provided for side water dumping operations.

The dump elbow and straight chute assemblies shall be mild steel with a gray epoxy finish. The straight chute shall be 36" long.

The dump elbow and straight extension shall be stored on the rear tailboard area. Each chute shall be securely fastened to the body with a formed aluminum angle on one end and a hinged aluminum formed flatbar latch on the other end. The hinged latches shall be held closed with a .25" retaining pin.

A support bracket shall be provided to hold the chutes in position for left and right side dumping operations. The bracket shall be removable and shall be able to be attached to the trailing edge of either the left or right side of the apparatus when side tank dumping is required. The chute support bracket shall be stored in a body compartment to be determined by the fire department.

## **Light Shield**

There shall be a shield mounted over the electrical items at the center upper rear of the apparatus to protect them from damage. The shield shall be constructed from .125" aluminum diamond plate.

## **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.

## **Pump Rating**

The fire pump shall be rated at 500 GPM.

## **Pump**

A Hale AP50 pump with a 5" driver side intake with cap shall be provided and shall be of a size and design to mount on the chassis rails. The pump shall have the capacity of 500 gallons per minute (U.S. GPM/1892 Liters per minute). The pump shall be driven by a power take off (PTO) from the chassis transmission.

The entire pump shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be free from objectionable pulsation and vibration. The pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI (2069 bar). All metal moving parts in contact with water shall be of high quality bronze or stainless steel. (Lower tensile strength cast iron not acceptable).

The pump body shall be vertically split, on a single plane for easy removal of entire impeller assembly including clearance rings. The pump shaft to be rigidly supported by two bearings for minimum deflection. The pump shaft shall be heat-treated, electric furnace, corrosion resistant stainless steel.





Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of gearbox. The bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated. The pump impeller shall be hard, fine grain bronze of the mixed flow design; accurately machines, hand-ground and individually balanced.

The vanes of the impeller intake eye shall be hand ground and polished to a sharp edge, and be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower. The pump impeller shall be hard, fine grain bronze of the mixed flow design; accurately machined hand ground and individually balanced. Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body.

### **Gearbox**

The pump gearbox shall be of sufficient size to withstand the torque of the engine. The drive unit shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature. The gearbox drive shafts shall be of heat-treated chromium steel and shall withstand the torque of the engine in pump operating conditions.

All gears, both drive and pump, shall be of highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated and hardened, to give an extremely accurate gear for long life, smooth, quiet running, and higher load carrying capability. An accurately cut spur design shall be provided to eliminate all possible end thrust. (No exceptions.)

The pump ratio shall provide the maximum performance with the engine and transmission of the chassis.

### **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.

### **Test Ports**

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

### **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.

## **Manual Master Drain**

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

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

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

## **Auxiliary Engine Cooler Control**

The auxiliary engine cooler shall be controlled from the pump operator's panel by an Innovative Controls 1/4 turn valve with "T" handle. The 1/4 turn handle grip shall feature built-in color-coding label and a verbiage tag.

1/2" lines shall be installed from the pump discharge via the valve to the cooler and back to the pump intake to allow a small amount of water to circulate through the engine cooler.

## **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 1,000 GPM (3,750 LPM) or less. Due to corrosion exposure no aluminum or vanes shall be used in the primer design. The primer shall be two-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 air brake system 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 13.2 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 manually operated, panel mounted "push to prime" air valve. 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.

### **Warranty**

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

### **Left Intake 2.5 Akron Valve**

One (1) 2-1/2" suction inlet with a manually operated 2-1/2" Akron valve shall be provided on the left side pump panel.

The valve shall be an Akron 8800HD 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 Akron 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 rockerlug plug with a retainer device.

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

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

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

### **Intake Relief Valve**

The pump shall be equipped with an Akron style 59 cast brass, variable-pressure-setting relief valve on the pump suction side. It shall be designed to operate at a maximum inlet pressure of 250 PSI. The relief valve shall be normally closed and shall be set to begin opening at 125 PSI in order to limit intake pressures in the pumping system. When the relief valve opens, the overflow water shall be directed through a plumbed outlet to discharge below the body in an area visible to the pump operator. The overflow outlet shall terminate with a male 2-1/2" NST threaded fitting to allow the overflow water to be directed away from the vehicle with a short hose (supplied by the fire department) during freezing weather or under other conditions where an accumulation of water around the apparatus might be hazardous.

### **Left Panel 2.5 Discharge Akron Valve**

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

The valve shall be an Akron 8800HD 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 with water flowing through it.

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

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

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

Location: left side discharge 1, left side discharge 2.



## **Pre-Connect Plumbing**

A pair of 1.5" pre-connect discharges shall be provided.

The valves shall be a 2" Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valves shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

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

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

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

The pre-connects shall be routed from the plumbing manifold to the driver side compartment top.

## **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: 4]**

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 bezel 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**

The apparatus shall be equipped with a Class 1 "TOTAL PRESSURE GOVERNOR PLUS" (TPG) Integrated pump control system. The TPG Plus shall have a weatherproof color display. The TPG will operate as an engine/pump pressure governor/throttle system that is connected directly to the Electronic Control Module (ECM) mounted on the engine. The TPG is to operate as a pressure sensor (regulating) governor (PSG).

The TPG Plus shall display master intake and discharge gauge readings, engine RPM, oil pressure, engine temperature and voltage along with providing critical warnings. The warning levels for oil pressure, high engine temperature, low voltage and high voltage shall be independently programmable.

## **GAUGE IC 10 LED WATER TANK LEVEL**

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 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.

## **2.5 Gauges**

The valve discharge gauges shall be 2 1/2"(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 to 400 psi with black graphics on a white background.

### **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 display that will continuously indicate the validity of each seat position.

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

The display panel shall be located cab dash above transmission shift panel.

### **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.

## **Multiplex System**

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 by the use of 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 unless used within the confines of the cab.

### **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:

- A. Documentation of the electrical system performance tests required above.
- B. 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 text display.

The display shall have the following features:

- Rugged vacuum fluorescent technology
- Two twenty character lines
- Programmed to show door ajar status and diagnostic information

The display shall be located center of dash.

## **Light Bar**

A Whelen Justice series 56" all LED light bar model JE2NFPA shall be installed. The light bar shall consist of four (4) corner facing LIN6 red LED modules, six (6) forward facing CON3 Linear LED modules, four (4) red / two (2) white, and MKEZ7 mounts.

Lens color: Clear.

The white LEDs shall be switched off in blocking right of way mode.

The light bar shall be installed in the following location: Centered on the front cab roof.

## **Lower Level Warning Light Package**

A lower level warning light package consisting of ten (10) Whelen LIN3 Super LED 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:

- Two (2) Whelen LIN3 Super LED red lights on the front of the apparatus facing forward.
- Two (2) Whelen LIN3 Super LED red lights on the rear of the apparatus facing rearward.
- Two (2) Whelen LIN3 Super LED red lights each side of the apparatus, one (1) each side at the forward most point (as practical), and one (1) each side at the rearward most point (as practical).
- One (1) Whelen LIN3 Super LED red light each side of the apparatus centrally located to provide mid ship warning light.

The side facing lights shall be located at forward most position, in rear wheelwell offset to front, and in rear wheelwell offset to rear.

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



## **Upper Rear Warning Lights**

Two (2) Whelen model RB6T rotating beacons with Red domes shall be supplied. Each light shall contain a 60 watt halogen bulb with dual parabolic reflectors and produce 130 FPM.

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

## **Hazard (Door Ajar) Light**

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

The light shall be located center overhead.

## **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.

## **Electronic Siren Control Location**

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

## **Siren Speaker**

One (1) Federal Signal model ES100 Dynamax 100 watt speaker shall be flush mounted as far forward and as low as possible on the front of the vehicle. A polished model MSFMT with "E-ONE" grille shall be provided on the outside of the speaker to prevent road debris from entering the speaker.

Speaker dimensions shall be: 5.5 in. high x 5.9 in. wide x 2.5 in. deep. Weight = 5.5 lbs.

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.

## **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.

## **Tail Lights**



Three (3) Federal Signaltech 4" (100 mm) circular LED (Light Emitting Diode) lights shall be installed each side at the rear of the apparatus.

Light functions shall be as follows:

LED red stop/tail light in upper position  
LED amber turn signal middle position  
LED clear back-up light in lower position.

The lights shall be in resilient shock absorbent mount for improved life.

The wiring connections shall be made with a weather resistant plug-in style connector.

### **Body Marker Lights**

TecNiq 3/4" LED grommet clearance lights shall be installed as specified.

#### **Upper Body:**

- One (1) red LED clearance light each side at rear of body, facing rear.

#### **Lower Body:**

- Three (3) red LED clearance lights centered at rear.
- One (1) red LED clearance light side facing at the trailing edge on either side of the apparatus body.
- One (1) amber LED clearance light side facing at front of body.
- One (1) amber LED auxiliary turn light side facing at front of body.

### **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 EON LED (Light Emitting Diode) with clear lenses. The wiring connections shall be made with a weather resistant plug in style connector.

One (1) light shall be supplied to illuminate the ground below each cab door. Lights in areas under the driver and crew area exits shall be activated automatically when the exit doors are opened.

One (1) ground light shall be supplied under each side of the pump panel area (if equipped).

One (1) ground light shall be installed below each side body staircase (if equipped).

Three (3) ground lights shall be supplied under the rear of the apparatus.



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

### **Cab Step Lights**

The apparatus shall be equipped with four (4) lights located two (2) each side to properly illuminate the cab steps in accordance with current NFPA requirements. The lights shall be EON LED (Light Emitting Diode) with clear lenses. The wiring connections shall be made with a weather resistant plug in style connector.

The step lights shall be controlled by the work light switch in cab that is accessible by the driver.

### **Compartment Light Package**

One (1) 12" ROM V4 compartment light strip shall be mounted in each body compartment greater than 4 cu. ft.

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 light 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.

### **Hose Bed Light**

A Truck-Lite round LED light model 81380 shall be installed at the front area of the hose bed to provide hose bed lighting per current NFPA 1901. The hose bed light shall be switched with the work light switch in the cab.

### **Scene Lights**

Six (6) Whelen 600 series Super LED scene lights shall be provided. Each light shall have 12 Super LED diodes with internal light deflecting optics.

Lights shall be located as follows:

- One (1) each side of the tank up high offset forward
- One (1) each side of the tank up high offset rearward
- Two (2) at the rear of the apparatus up high



The lights shall be controlled in the cab by three switches accessible by the driver. The lights shall be wired as left side, right side and rear so they can be controlled individually.

### **Engine Compartment Light**

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

### **Pump Panel Light Package**

Three (3) LED lights shall be mounted under a light shield directly above the side pump panel. The lights shall be TecNiq EON with polished stainless steel housings. The light shields shall be formed from 14 gauge brushed finish stainless steel. The work light switch in the cab shall activate the lights when the park brake is set.

### **Pump Compartment Light**

An LED light shall be provided in the pump compartment area for NFPA compliance. The light shall be a Tecniq EON with polished stainless steel housing. The light shall be controlled by a switch located on the pump operator's panel.

### **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.

### **DOT Required Drive Away Kit**

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

### **Body Unpainted**

Body to be unpainted.

### **Tank Finish**

The exterior surfaces of the Wetside water tank shall be unpainted.

### **Cab and Body Scotchlite Striping**

A straight Scotchlite reflective stripe, 4" minimum in width, shall be applied horizontally around the cab and body to comply with NFPA 1901. The color and location of the stripe to be specified by the purchaser.



Location: low on side of cab and low on side of wet side tank.

Color: White.

### **Rear Body Scotchlite Striping**

Chevron style reflective striping shall be provided on the rear of the apparatus. The stripes shall consist of 6" red/yellow alternating colors printed in an "A" pattern on reflective material meeting NFPA requirements. The striping shall be located on the rear body platework.

### **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.

### **Electronic Manuals**

Two (2) copies of all operator, service, and parts manuals MUST be supplied at the time of delivery in electronic format (CD-ROMs). The electronic manuals shall include the following information:

- Operating Instructions, descriptions, specifications, and ratings of the cab, chassis, body, aerial (if applicable), installed components, and auxiliary systems.
- Warnings and cautions pertaining to the operation and maintenance of the fire apparatus and fire fighting systems.
- Charts, tables, checklists, and illustrations relating to lubrication, cleaning, troubleshooting, diagnostics, and inspections.





- Instructions regarding the frequency and procedure for recommended maintenance.
- Maintenance instructions for the repair and replacement of installed components.
- Parts listing with descriptions and illustrations for identification.
- Warranty descriptions and coverage.

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

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

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

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