



## Tactical-Tanker Specification

Updated: 3-16-22

### **Intent of Specifications**

It shall be the intent of these specifications to cover the furnishing and delivery of a complete Tactical-Tanker apparatus to **Your Fire Department**. The apparatus shall be equipped as specified as follows in these specifications. These specifications only cover the general construction requirements, equipment, appliances and certain details to finish as to which the successful bidder must conform. Minor details of construction and materials, which are not otherwise specified, are left to the discretion of the successful bidder, who shall be solely responsible for the design and construction of all features.

The apparatus proposed by the bidders shall meet the requirements of the National Fire Protection Association-1901 (NFPA) as stated in the current edition at the time of signed contract.

### **Warranties**

The apparatus shall be warranted and free from defects in materials and workmanship under normal use and service for a period of one (1) year on the complete apparatus. Apparatus body components shall be warranted from the individual components manufacturer.

*Body:* There shall be a 10-year or 100,000-mile warranty on the structural integrity of the aluminum apparatus body to the original purchaser. There shall be a copy of the body warranty provided with the completed apparatus at delivery.

*Paint/Corrosion:* The apparatus shall be supplied with a seven (7) year paint and corrosion warranty from the delivery date of the apparatus.

*Plumbing:* The apparatus shall be supplied with a ten (10) year plumbing warranty from the delivery date of the apparatus.

*Tank:* The tank shall have a lifetime warranty provided from the tank manufacturer.

*Pump:* The fire pump shall have a five (5) year standard warranty provided by the WS Darley Company.

*Chassis:* The apparatus chassis will be provided with a warranty through the chassis builder.

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## **Chassis Modifications**

### **Cab Console/Map Box**

There shall be a control console installed in the chassis cab of the apparatus for mounting the emergency switch panel and siren. The console shall be constructed from smooth aluminum with a Black Line-X coating and shall have a removable Black Line-X coated aluminum face panel. The forward portion of the panel shall be for the emergency switch panel to be mounted into. At the rear of the console there shall be space provided for installing two (2) 3-ring binders or map books. The siren for the apparatus shall be mounted within the center console.

### **Chain on Key**

There shall be a chain installed onto the ignition key of the apparatus.

### **Chassis Exhaust**

The chassis exhaust shall be properly extended with exhaust pipe, elbows, and clamps to a position directly ahead of the right rear wheel.

### **Rear Mudflaps**

There shall be heavy duty rubber mudflaps installed behind each rear wheel.

### **Shoreline Inlet/Auto Eject**

There shall be an electrical shoreline inlet located on the cab near the driver's door area and wired to the vehicles battery conditioner/charger to keep all electrical components at a charged and ready state. This electrical inlet shall be a Kussmaul "Super" Auto Eject and shall automatically disconnect when the vehicle's starter is activated. The "Super" Auto Eject shall have a sealed box enclosing all the auto eject wiring and components to reduce water and road debris to cause corrosion to the auto eject.

### **Air Eject**

There shall be a Kussmaul Air Eject installed on the vehicle on the cab near the driver's door area and plumbed to the chassis air system. The Air Eject shall keep the vehicles air brake system at a charged and ready state. The Air Eject shall be automatically disconnected when the vehicle's starter is activated. The air eject shall be supplied with a weatherproof adapter kit.

### **Battery Conditioner/Charger**

There shall be a Kussmaul Auto Charge 1000 battery charger installed on the vehicle. The battery charger shall keep the batteries at a charged and ready state. The conditioner shall also be wired to the vehicle's shoreline inlet.

### **120-Volt Receptacle**

There shall be one (1) 120-volt/15-amp duplex household style receptacle installed in the cab of the apparatus. The receptacle shall be wired to the shoreline inlet for operation.

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**USB Ports**

There shall be a Kussmaul model 091-219-4 dual port 12-volt USB power/charging port installed in the master switch panel in the cab of the apparatus. The dual port module will be supplied with two (2) 2.1-amp USB outlets that are powered by the chassis 12-volt electrical system.

**Tow Eye**

There shall be two (2) tow eyes at the rear of the body above the rear step. The tow eyes shall be made from ¾" x 4" steel with a 2" x 4" oval eye center. The two eyes shall be bolted directly to the chassis frame rails. The tow eyes shall be finish painted black.

**Radio Antenna (Customer Supplied)**

There shall be a two-way radio antenna installed through the roof of the chassis cab towards the rear. The antenna shall be customer supplied and delivered with the customer's chassis for installation.

**12 Volt Power Wire**

There shall be a spare 12-volt wire located in the cab of the apparatus near the electric control console. The wire shall be labeled by the manufacturer and this wire shall be used for radio installation at a later date by the radio installation company.

**Wheel Chocks**

There shall be a pair of Worden HWG aluminum wheel chocks supplied with the apparatus with horizontal mounting brackets. The wheel chocks shall be mounted under the body directly in front of the driver's side rear wheels.

**Helmet Security**

There shall be provisions installed in the chassis cab to secure the firefighters helmets. These provisions shall prevent the helmets from being projectiles in the event of an accident.

**Tire Pressure Monitoring System**

There shall be a tire pressure monitoring system installed on each of the apparatus wheels to monitor the air pressure in each wheel. The sensor shall be a valve stem mounted device, similar to a valve stem cap, manufactured from chrome plated brass material.

The sensor shall be set to the tire pressure of the wheel when installed onto the wheels valve stem for pressure ratings up to 120PSI.

**Fire Pump**

**Pump Test**

The pump shall be tested to NFPA standards at the manufacturer's pump test location by an independent third-party company before delivery of the completed apparatus. A copy of the pump test shall be provided to the department and a stamped plate shall be installed on the operator's

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panel indicating the pump test ratings, pressures, and RPM's. The pump shall be tested at the following capacities:

750 GPM @ 150 PSI  
750 GPM @ 165 PSI  
525 GPM @ 200 PSI  
375 GPM @ 250 PSI

**Darley LSP 750GPM Fire Pump Specification**

A Darley model LSP 750 single stage, centrifugal, PTO driven fire pump shall be provided and installed.

Power to drive the pump shall be provided by the same engine used to propel the apparatus. The pump shall be midship mounted and designed to operate through a PTO. The pump is to be placed in gear from the chassis cab. Pump shift to be clearly labeled. The PTO and gear ratios are to be selected so as to provide good performance in "pump and roll".

Pump to be placed in gear from chassis cab. Pump shift to be clearly labeled. PTO and gear ratios are to be selected so as to provide good performance in "pump and roll" operation.

**Pump Shaft**

Pump shaft to be precision-ground stainless steel with long-wearing Chromium Oxide hard coating under the packing glands with a hardness level of #RC72. The pump shaft shall be splined to receive broached impeller hubs, for greater resistance to wear, torsional vibration, and torque imposed by engine, as well as ease of maintenance and repair

The bearings shall be heavy duty, deep groove, and radial-type ball bearings oversized for long life. Sleeve bearings on any portion of the pump or transmission shall be prohibited due to wear, deflection, and alignment concerns. Bearings to be protected at all openings from road dirt and water splash with oil seals and water slingers.

**Impeller**

The impellers shall be high-strength bronze alloy of mixed flow design, splined to the pump shaft for precision fit, durability, and ease of maintenance. Impeller shall be vacuum cast designed for maximum lift and highest capacity. The seal rings shall be renewable, double labyrinth, wrap around bronze type.

Impeller shaft oil seals shall be constructed to be free from steel components except for the internal lip spring. The impeller shaft oil seals shall carry a lifetime warranty against damage from corrosion from water and other fire-fighting fluids.

**Pump Transmission**

The transmission case shall be heavy duty cast iron. A magnetic drain plug shall be provided. Transmission case interior shall be powder coated to reduce oil contamination. Transmission case shall be equipped with a removable plate for quick inspection of gears, shafts, and bearings inside

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the transmission. The pump ratio shall be selected by the manufacturer's engineering department. Gears shall be helical in design and precision ground for quiet operation and extended life. Gears to be cut from high strength alloy steel, ground, and carburized. Chain drive and/or design requiring extra lubricating pump is not acceptable.

Pump casing shall be of ductile iron vertically split, with a minimum tensile strength of 65,000 PSI - bronze-fitted. Pump drive shaft shall be precision-ground, heat-treated alloy steel-minimum 1-1/2" x 10-spline ends.

### **Pump Primer with Auto Prime**

1. The pump primer shall be a Trident 2-stage venturi style powered by the engine's air compressor and conform to the requirements of NFPA 1901.
  2. The primer body shall be manufactured of heat-treated anodized aluminum for wear and corrosion resistance.
  3. The primer shall be capable of producing a minimum 24 Hg vacuum at 2000 feet above sea level.
  4. The priming pump shall not require lubrication.
- The priming pump shall be operated by a single push-pull control valve, which shall be mounted on the pump operator's panel. The control valve shall be of all bronze construction.

\*Note: The Auto Prime feature shall automatically keep the pump primed in the event there shall be a short-term loss of inlet pressure due to an air pocket/bubble in the system. This is done via a sensor on the inlet side of the pump.

### **Pump Shift**

The pump shall be operated off of a hot shift Chelsea PTO. The PTO shall be mounted directly to the chassis transmission with a tubular drive shaft connecting the PTO to the water pump for operation. The PTO shall be activated in the cab by a rocker type switch.

\*Note: Truck will be capable of pump and roll operations.

### **Drive Lines**

The drive lines shall be DOM (drawn over mandrel) made for drive shafts.

They shall be electronically MIG welded by a certified welder on a specially designed drive shaft fabrication machine. After welding, the drive shaft shall be checked for straightness and be dynamically balanced by computerized machinery. All drive shafts shall be balanced.

### **Suction Relief Valve**

A Task Force Tips (TFT) 2 1/2" suction side relief valve shall be provided and piped toward the ground under the apparatus. Rugged, cast aluminum construction with hard coat anodized and powdercoat finish for maximum corrosion resistance. Fully adjustable from 90 to 300 psi. Complies with NFPA 1901.

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## **Foam System**

### **FoamPro 1600 Foam Injection System w/Remote On/Off Switch**

A FoamPro 1600 direct injection foam system shall be installed. The systems shall have a rated capacity of 850 gpm of foam/water solution at .2% foam concentration, 340 gpm at .5% concentration and 170 gpm at 1.0% concentration.

The foam system shall be capable of discharging Class "A" foam only.

There will also be a remote On/Off switch for the foam system installed at the center control console in the cab to allow the foam system to be activated on from the seating locations.

The foam proportioning system operation shall be based on a direct measurement of water flows and pressure. The system shall be equipped with a control module on the pump control panel. Incorporated within the control display shall be a microprocessor, which receives input from the system flow meter while also monitoring the foam concentrate output. The microprocessor shall compare the values of the water flow versus the foam flow, to ensure that the proportion rate is accurate.

Push button control for the foam-proportioning system rate shall allow a ratio from 0.1% to 1.0% in 0.1% increments.

The foam injection pump shall be a positive displacement type rated at 1.7 gpm and powered by a 12-volt DC electric motor.

A check valve shall be installed between the water pump and the foam injection point to prevent foam agent from contaminating the water pump. Also, a check valve shall be placed between the foam pump and injection point to prevent water flowing into the foam pump and foam tank.

The foam system shall be plumbed from a 2" discharge opening on the pump with a 2" pipe and a 2" "Tee" for the flow meter sending unit and foam injector. After the flow meter and the foam injection point the discharge shall be split to feed the specified discharges.

\*Note: Foam to be plumbed to the customer specified discharges.

## **Plumbing**

### **Pump Plumbing**

The apparatus will be plumbed using stainless steel pipe and stainless-steel fittings. High-pressure rubber hose may be used when needed for discharges only. Victaulic couplings shall be used wherever needed to prevent vibration damage to the pump and plumbing. The suction and discharge piping of the pump shall include victaulic fittings for easy maintenance of the pump and plumbing when needed.

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### **Suction Inlet**

There shall be one (1) 5" non-gated suction inlet with 5" NST male threads, screen and long handle cap provided at the left side pump panel.

There shall also be one (1) 5" long handle NST female x 2 1/2" long handle NST female swivel adapter supplied with the apparatus at delivery.

*There shall be a label installed at the 5" inlet stating: "WARNING-SERIOUS INJURY OR DEATH COULD OCCUR IF INLET IS SUPPLIED BY A PRESSURIZED SOURCE WHEN THE VALVE IS CLOSED."*

### **Discharge Valve**

There shall be two (2) 2 1/2" discharges, Akron quarter turn ball valves controlled at the pump panel with Innovative Controls push-pull locking control handles. The outlets will be a chrome plated 30° elbow with male NST threads and a chrome plated 2 1/2" cap and chain. The one (1) discharge shall be located at the left side panel and one (1) at the lower right rear body panel.

Each discharge will have a 3/4" bleeder/drain with control piped toward the ground.

### **1 1/2" Preconnect Discharge**

There shall be one (1) 1 1/2" pre-connect discharge located on the apparatus. There shall be one (1) at the driver's side catwalk area above the low side compartment with a hose bed. The 1 1/2" discharge shall be plumbed with a 2" Akron valve, 2" stainless steel pipe/high-pressure hose, and shall terminate with a brass swiveling discharge elbow. The catwalk hose bed shall be constructed from aluminum diamond plate material with a capacity of 150'-200' of 1 3/4" double jacket hose with nozzle. The top of the hose bed shall be equipped with a hinged aluminum diamond plate cover. The cover shall be hinged at the body side of the hose bed and held open with pneumatic lift assists. There shall be compartment matting installed at the bottom of the hose bed for drainage and air flow. At the rear of the hose bed there shall be a single Velcro strap at the opening to retain the hose into the hose bed, per NFPA guidelines.

The 1 1/2" discharge will have a 3/4" bleeder drain with control piped toward the ground.

### **Hannay Booster Hose Reel**

There shall be one (1) Hannay model EPF30-23-24 electric rewind booster hose reel installed at the driver's side rear tailboard with a rewind button located at the base of the hose reel. There shall be a stainless-steel roller guide set, high mount, facing the rear of the apparatus. The hose reel shall be plumbed with a 1" ball valve and 1" flexible plumbing with the valve control at the pump operator's control panel in the L1 compartment. The reel shall have a maximum capacity of 150' of 1" Yellow lightweight booster hose which shall be supplied with the reel at delivery.

The booster reel discharge will have a 3/4" bleeder drain with control piped toward the ground at the pump control panel.

### **Front Bumper Ground Sweep Nozzles**

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There shall be a set of three (3) spray nozzles located under the front bumper of the apparatus. The nozzles shall be located one (1) each side and one (1) centered under the front bumper and positioned to properly cover the width of the apparatus. The nozzles shall be plumbed with an electrically actuated valve with control in the cab of the apparatus. The plumbing shall be split under the front bumper to feed the individual nozzle heads. Drains shall be installed in the plumbing to drain the water from the discharge line while not in use.

### **Master Drain**

There shall be one (1) master drain, to drain pump and lines toward the ground.

### **Individual Line Drains/Bleeders**

There shall be a ¾" "lift up/push down" drains provided for each 1 ½" or larger discharge and 2 ½" or larger inlet. The purpose of these drains is to aide firefighters in draining the pump or to bleed off water to help remove a hose from the apparatus that had water pressure. The drains shall be located on each side of the apparatus near the bottom of the pump house directly above the side running boards. These drains shall be identified with color-coded name labels to match the discharge or inlet that it is for.

### **Tank Fill (Pump to Tank)-Electric with Dual Controls**

There shall be one (1) pump to tank line for filling the water tank with the pump with an electrically actuated 2" line. The valve shall be equipped with two (2) Akron 9333 Navigator valve controls, one (1) in the cab at the center console and one (1) at the pump panel.

### **Tank to Pump-Electric with Dual Controls**

There shall be one (1) tank to pump line 3" in size with check valve. The valve shall be an electrically actuated 3" Akron quarter turn ball valve equipped with two (2) Akron 9333 Navigator valve controls. There shall be one (1) located at the pump control panel and one (1) in the cab at the control console. A flexible line shall be used between the tank sump and the valve.

### **Valves**

The valves used in the plumbing of the apparatus shall be Akron 8900 Series valves with composite ball and Polymer seats. The valves shall have a 10-year warranty provided by Akron Brass Company.

### **Heat Exchanger**

A Sen-dure model #1212-1 auxiliary booster cooler shall be installed on the apparatus made of brass and copper construction. The unit shall permit use of water from the discharge side of the pump for cooling of the coolant circulating through the engine cooling system with out intermixing. The auxiliary cooler lines shall be routed away from the engine exhaust and be properly secured to the truck frame.

## ***Pump Control Panel***

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There shall be a pump control panel shall be located at the front compartment of the apparatus body and totally enclosed with a roll up door. The control panel shall be at the left side compartment of the apparatus body. There shall be a vertical divider installed directly behind the operator's panel to separate the pump control panel from the remaining storage area. The pump panel shall be approximately 13" from the roll up door with the remaining compartment 26" deep.

### **Pump Panels**

The pump panels shall be black Line-X coated aluminum and shall be easily removable for service work. The left panel shall be where all pump controls and gauges shall be placed and all controls and gauges shall be labeled using color-coded name labels.

There shall be access doors installed where applicable in the left side compartment and one (1) at the rear wall of the right-side compartment to allow access into the pump area for service and maintenance work.

### **Panel Lighting**

Pump panel lighting shall consist of two (2), TecNiq LED pump panel lights and the compartment LED light strips for illumination of the pump operator panel. The lights shall be controlled at the pump operator's panel with an "On/Off" toggle switch. The lights shall be housed in a brushed stainless steel full width lamp shield above the gauge panel.

All suction and discharge inlets and outlets shall be trimmed with chrome plated garnish rings with color-coded inserts to match gauges and control handles.

### **Operators Panel**

The following items shall be furnished on the operator panel at the left side compartment:

- One (1) 4 ½" white master pressure gauge, liquid filled 0-400 PSI
- One (1) 4 ½" white master vacuum gauge, liquid filled 30"-0-400 PSI
- One (1) 2 ½" white pressure gauge one (1) per 1 ½" discharge or larger 0-400 PSI
- One (1) Fire Research Pump Boss Pressure Governor
- One (1) Innovative Controls water level readout
- One (1) Innovative Controls foam level readout
- One (1) pump panel light switch
- One (1) pump primer control
- All discharge controls
- One (1) tank fill control
- One (1) tank to pump control
- One (1) Master Drain control
- One (1) Pump Hourmeter
- One (1) FoamPro 1600 control head

### **Pressure Gauges**

All pressure gauges shall be fully filled with pulse and vibration dampening Interlube to lubricate the internal mechanisms to prevent lens condensation and to ensure proper operation to minus 40

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degrees F. The Zytel nylon cases shall be temperature compensated with an internal breathing diaphragm to permit fully filled cases and to allow a rigid lens with a distortion free viewing area.

To prevent internal freezing and to keep contaminants from entering the gauge, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem.

Individual 2 1/2" line gauges for each 1 1/2" or larger discharges shall be supplied and mounted adjacent to the discharge valve control handle. A chrome plated and color coded trim ring shall be supplied for each gauge.

**Pressure Governor and Engine Monitoring Display**

There shall be a Fire Research PumpBoss series PBA401-D00 pressure governor and monitoring display kit 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 6 3/4" high by 4 5/8". 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 engine information and outputs for engine control shall be on the J1939 databus. Inputs from the pump discharge and intake pressure sensors shall be electrical.

The following continuous displays shall be provided:

- Engine RPM; shown with four daylight bright LED digits more than 1/2" high
- Check engine and stop engine warning LEDs
- Engine 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
- Pressure and RPM operating mode LEDs
- Pressure / RPM setting; shown on a dot matrix message display
- Throttle ready LED.

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 night time 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).

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

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 and display shall be programmed to interface with a Cummins engine.

### **Water Tank Level Gauge**

There shall be an Innovative Controls model 3030385-31, Ultra Bright LED Master Water level gauge readout provided on the pump operator's panel. The level gauge will contain at least fourteen (14) high intensity LED's on the display in an inverted "V" pattern allowing the full,  $\frac{3}{4}$ ,  $\frac{1}{2}$ ,  $\frac{1}{4}$  and refill levels to be easily distinguished at a glance. The gauge shall use a pressure transducer installed near the bottom of the water tank to determine the correct volume in the tank. The readout will be provided with a single chrome plated housing.

### **Whelen PSTANK Water Level Readout**

There shall be one (1) Whelen model PSTANK2 LED light strip installed on the apparatus. There shall be one (1) at the rear panel of the apparatus body directly above the rear dump valve. The light strip shall coincide with the master water level gauge at the pump panel for water level readouts. The strip shall have the following colored indicators; Green (full), Blue ( $\frac{3}{4}$ ), Amber ( $\frac{1}{2}$ ) and Red ( $\frac{1}{4}$ ).

The light strip shall be activated upon setting the parking brake. The lights shall remain off until the parking brake is set so the strip lights do not interfere with another vehicles driver's vision.

### **Foam Tank Level Gauge-Class A**

There shall be an Innovative Controls model 3030386-31A, Ultra Bright LED Master Class A Foam level gauge readout provided on the pump operator's panel. The level gauge will contain at least fourteen (14) high intensity LED's on the display in an inverted "V" pattern allowing the full,  $\frac{3}{4}$ ,  $\frac{1}{2}$ ,  $\frac{1}{4}$  and refill levels to be easily distinguished at a glance. The gauge shall use a pressure transducer installed near the bottom of the water tank to determine the correct volume in the tank. The readout will be provided with a single chrome plated housing.

### **Discharge Controls**

The apparatus shall be equipped with Innovative Controls locking push-pull controls. The handles shall be chrome- plated zinc with a recessed area for identification label. The control shall be a  $\frac{1}{4}$

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turn locking in any position handle and the  $\frac{3}{4}$ " connecting rod shall be a hard coated anodized aluminum with ball swivels and  $\frac{1}{2}$ " stainless steel extensions, where applicable, also equipped with ball swivels for ease in operation.

## **Wet Side Booster Tank**

### **Tank Capacity**

The water booster tank shall have a capacity of **2000 US gallons of water and 20-gallons of foam concentrate** complete with lifetime warranty. The tank manufacturer shall mark the tank and furnish notice that indicates proof of warranty. The purpose of the markings and notice is to inform department personnel who store, stock, or use the tank that the unit is under warranty. Markings may be brief but should include a short statement that a warranty exists, the substance of the warranty, its duration, and who to notify if the tank is found to be defective.

### **Tank Construction**

The Poly Tank shall be constructed of polypropylene sheet stock. This material shall be a non-corrosive stress relieved thermo-plastic and UV stabilized for maximum protection.

The booster tank shall be a specific configuration and is so designed to be completely independent of the body and all compartments. All joints and seams shall be nitrogen welded and tested for maximum strength and integrity. The top of the booster tank is fitted with removable lifting eyes designed with a 3 to 1 safety factor to facilitate easy removability. The transverse swash partitions shall be manufactured of  $\frac{3}{8}$ " polypropylene (natural in color) and extend from approximately 4" off the floor to just under the cover. The longitudinal swash partitions shall be constructed of  $\frac{3}{8}$ " polypropylene (natural in color) and extend from the floor of the tank through the cover to allow for positive welding and maximum integrity. 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 welded to each other as well as to the walls of the tank.

### **Fill Tower and Cover**

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of  $\frac{1}{2}$ " polypropylene and shall be a minimum dimension of 15" x 15" outer perimeter. The tower shall be located in the center of the tank approximately 42" from the rear of the tank. The tower shall have a  $\frac{1}{4}$ " thick removable polypropylene screen and a polypropylene hinged-type cover. Inside the fill tower, approximately 4" down from the top, shall be fastened a combination vent overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of 6" that is designed to run through the tank, and shall be piped behind the rear wheels where specified by the purchaser in Special Provisions so as to maximize traction.

The tank cover shall be constructed of polypropylene and UV stabilized, to incorporate a multi three-piece locking design which allows for individual removal and inspection if necessary. The tank cover shall be recessed  $\frac{3}{8}$ " from the top of the tank and shall be welded to both sides and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" polypropylene dowels spaced a maximum of 30" apart. These dowels shall extend

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through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall be drilled and tapped ½" x 13" to accommodate the lifting eyes.

### **Sump**

There shall be one (1) sump standard per tank. The sump shall be constructed of polypropylene and be located in the left front quarter of the tank, unless specified otherwise in Special Provisions. On all tanks that require a front suction, a 3" schedule 40 polypropylene pipe shall be installed that will incorporate a dip tube from the front of the tank to the sump location. The sump shall have a minimum 3" N.P.T. threaded outlet on the bottom for a drain plug. This shall be used as a combination clean out and drain. All tanks shall have an anti-swirl plate located approximately 2" above the sump.

### **Outlets**

There will be two (2) standard tank outlets: one for tank-to-pump suction line which shall be a minimum of 3" N.P.T. coupling; and, one for a tank fill line which shall be a minimum of 3" pipe, N.P.T. coupling. 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 rated of up to 1,000 G.P.M. The addition of rear suction fittings, nurse valve fittings, dump valves fittings, and through the tank sleeves to accommodate rear discharge piping must be specified in Special Provisions. All auxiliary outlets and inlets must meet all NFPA 1900 guidelines in effect at the time of manufacture.

### **Mounting**

The Poly Tank shall rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40 inches, cross member spacing must be decreased to allow for not more than 400 square inches of unsupported area.

The tank must be isolated from the cross members through the use of hard rubber strips with, a minimum thickness and width dimension of .250 x 2" and a minimum Rockwell Hardness of 60 durometer. Additionally, the tank must be supported around the entire bottom outside perimeter and captured both front and rear as well as side to side to prevent tank from shifting during vehicle operation.

A picture frame type cradle mount shall be utilized with a minimum of 2" x 2" x .250" mild steel, stainless steel, or aluminum angle. Where aluminum or steel tubing and channel sub frames are incorporated in the body structure, the use of corner angles having a minimum dimension of 4" x 4" x .250" by 6" high are permitted for the purpose of capturing the tank.

Although the tank is designed on a free-floating suspension principle, it is required that the tank has adequate hold down restraints to minimize movement during vehicle operation. If proper retention has not been incorporated into the apparatus hose floor structure, an optional mounting restraint system shall be located on top of the tank, half way between the front and the rear on each side of the tank. These stops can be constructed of steel, stainless steel or aluminum angle having minimum dimensions of 3" x 3" x .250" and shall be minimum thickness of .250" affixed on the underside of the angle. The angle should then be bolted to the body side walls of the vehicle

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while extending down to rest on the top outside edge of the upper side wall of the tank. Internal mounting block design and hose bed floors must be so designed that the floor slat supports extend full width from side wall to side wall and are not permitted to drop off the edge of the tank or in any way come in contact with the individual covers where a puncture could occur. Hose floor loading must support up to 200 lbs per sq. foot and must be evenly distributed whenever possible. Other equipment such as generators, portable pumps, etc. must not be mounted directly to the tank top unless provisions have been designed into the Poly-Tank for that purpose. The tank shall be completely removable without disturbing or dismantling the apparatus structure.

## ***Dump Valves***

### **Newton Dump Valves**

There shall be one (1) Newton, model 1050, 10" square dump valve at the rear center of the apparatus. The valve shall open with a lever handle at the top of the dump valve. The dump valve shall be painted to match the body in color.

There shall be two (2) Newton, model 1060/1065, 10" square manually actuated dump valves located, one (1) each side, at the rear of the apparatus body that allows the tank to be emptied to each side of the truck. Each valve will open with a lever handle located at the rear body panel. The dump valves shall be painted to match the body in color.

### **Dump Chutes-Automatic/Gravity Flip Down**

There shall be provided one (1) 14" automatic/gravity operated flip down chute on each dump valve, the rear chute shall be a minimum 24" long. The dump chutes shall be automatically opened by the force of the water against the "closed" dump chute. The chute shall be supplied with a counter balance, so when the water pressure subsides the dump chute automatically closes. The closed side chutes shall be flat against the outside of the apparatus body and shall not have any "open" areas around the dump chute. The chutes shall be constructed from aluminum diamond plate.

## ***Direct Tank Fill***

There shall be one (1) 4" direct tank fill located at the right rear panel of the apparatus body/tank. The fill shall be a 4" Firemen's Friend Engineering stainless steel internal check valve terminated with a 4" storz elbow with 4" storz x 2 1/2" NST female swivel with 2 1/2" plug and chain.

There shall be a 3/4" bleeder/drain installed on the fill to bleed off water pressure from the fill hose. The drain shall be plumbed to a location under the apparatus body and away from stepping surfaces.

## ***Apparatus Body***

### **Aluminum Wet Side Tanker Skirting Body**

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### **Extruded Aluminum Body Construction and Sub Frame**

The apparatus body shall be of aluminum construction, using the electrically welded and bolted design and assembled with 1" radius corner extrusions, formed panels and structural tubing extrusions.

The apparatus body corners, both vertical and horizontal, shall be constructed with 1" radius corner extrusion framework around the entire perimeter of the apparatus, which incorporates aluminum sheeting. The body framework shall also be welded directly to the body subframe with 2" x 3" x ¼" wall tubing that run the full width of the apparatus body in a minimum of four (4) locations, more with tandem axle bodies. Bracing and gussets shall be used at the manufacturer's discretion to enhance the durability and life of the apparatus body without affecting the overall appearance of the finished product.

The rear of the apparatus shall be the flat back style to open up the work area both physically and visually.

### **Anti-Corrosion Protection**

No dissimilar metals shall contact each other. All stainless-steel screws shall have a nylon washer under their heads and "ECK" coated threads a non-hardening isolating material. All fasteners shall be stainless steel. "ECK" shall also be used behind all lights and mounting brackets to aid in corrosion protection.

### **Sub Frame**

There shall be a sub frame made up of all aluminum extrusions electrically welded together for superior strength and bolted to the chassis frame.

Between the sub frame and the frame rails there shall be ½" x 3" layer of fiber reinforced rubber of 60D hardness to separate the two dissimilar metals. The rubber is to prevent any electrolysis between the two dissimilar metals. The sub frame shall be made up of 2" x 3" x ¼" wall extruded aluminum tubing. Cross members for the water tank shall be on 12" centers and a 2" x 3" x ¼" thick aluminum angle shall be used for the tank carriage.

### **Aluminum Skirting Body Compartments**

All the body compartments shall be constructed of 1/8" smooth aluminum and to be the sweep out floor design. There shall be hat sections installed under the apparatus body compartments to help support the floors when loaded with heavy equipment, as needed. All compartments shall have louver panels in the back walls for adequate ventilation. All compartments shall be finished with spatter paint for scratching, scuffing resistance and for appearance. Each compartment shall have lighting in the compartment to illuminate the compartment during low light and dark conditions.

### **Compartment Layout**

(Compartment sizes are approximate sizes and may change with the chassis style, body style, and Cab to axle distance.)

### **Driver's Side**

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**L1**-The compartment forward of the rear wheels shall be equipped with a Gortite aluminum roll up door. Approximate size is: 34" high x 83" wide x 26" deep. This compartment shall house the pump operator's panel at the front portion.

### *Passenger Side*

**R1**-The compartment forward of the rear wheels shall be equipped with a Gortite aluminum roll up door.

Approximate size is: 34" high x 83" wide x 26" deep.

### **Gortite Roll Up Compartment Doors**

The roll up door shall be of an anodized satin finish, double faced, aluminum construction and manufactured by Dynatech Manufacturing (Gortite). Lath sections shall be an interlocking rib design and shall be individually replaceable without complete disassembly of the door. Between each slat at the pivoting joint shall be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals shall allow door to operate in extreme temperatures ranging from plus 180 to minus 40 degrees Fahrenheit. Side, top and bottom seals shall be provided to resist dirt and weather from entering the compartment. The seals shall be made of Santoprene. All hinges, barrel clips and end pieces shall be nylon 66. All nylon components shall withstand temperatures from plus 300 to minus 40 degrees Fahrenheit. A polished stainless steel lift bar shall be provided for opening the door. The lift bar shall be located at the bottom of the door and shall have latches on the outer extrusion of the doors frame. A ledge shall be supplied over the lift bar for an additional area to aid in closing the door. The doors shall be constructed from an aluminum box section. The exterior surface of each slat shall be flat and the interior surfaces shall be concave to provide strength and to prevent equipment from jamming against the door at the inside. The spring roller assembly shall not exceed 3" in diameter to conserve space in the compartment. The header panel for the roll up door shall not exceed 4" in height. There shall also be heavy-duty magnetic switches installed for activating the compartment lights and the "open compartment indicator light" in the cab.

### **Adjustable Shelf Tracking**

There shall be one (1) pair of adjustable tracking installed in each compartment on the apparatus. The tracking will allow for the provisions of adjustable shelves immediately or in the future.

### **Compartment Matting**

There shall be modular plastic floor matting installed at the bottom of each compartment, tray, and shelf in the apparatus body. The compartment matting shall allow air to move freely around equipment in the compartments to help prevent mold and mildew from forming on or around equipment.

### **Body to Frame Attachment**

The entire body is to be electrically welded to the sub frame and be fastened down to the chassis frame with a minimum of 5/8" "U" bolts.

### **Drip Moldings**

A polished aluminum drip molding shall be installed above each compartment door.

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### **Wheel Liners/Fenderettes**

There shall be rounded wheel liners installed in the body to protect the tank from being hit with road debris. There shall also be installed a polished aluminum ½” radius fenderette which is bolted to the body if it needs to be removed or replaced. There shall also be a black fender welting installed between the fenderette and the body for corrosion resistance and enhance the appearance.

### **Hose Bed**

The hose bed shall be an integral part of the apparatus water tank at the top and shall be fabricated from the same polypropylene material. The hose bed shall be 67 ½” wide inside and be able to carry an NFPA minimum of 30 cubic feet of hose. The hose bed floor shall also be integrated into the top of the tank and constructed of polypropylene material with ½” grooves installed for water drainage and air flow. The inside of the hose bed shall be smooth and free of any projections, (sharp angles, nuts, or brackets), which may injure the hose.

### **Hose Bed Divider**

There shall be one (1) hose bed divider installed on adjustable tracking. The divider shall be made of 3/16” smooth aluminum with a radius corner at the rear.

### **Hose Bed Cover**

There shall be one (1), vinyl hose bed cover located over the entire rear hose bed. This cover shall help keep the weather elements, dirt, and debris from fire scenes off of the hose and such equipment carried in the hose bed. The hose bed cover shall be held in place by lift a dot fasteners at each corner and heavy-duty Velcro at each side and front of the cover except the rear of the hose bed cover, which shall have a weighted flap and quick release tie down straps. The cover shall be Red in color.

### **Folding Tank Storage**

There shall be a manual drop-down folding tank rack at the passenger side of the apparatus body. The tank rack shall be installed onto the catwalk of the apparatus. The rack shall have two (2) locking mechanisms with manual releases at each end. The rack shall be constructed from aluminum tubing with an aluminum diamond plate end caps at the front and rear with the remaining portion of the rack left open. The tank rack shall hold a single 2100-gallon folding tank.

### **Suction Hose Storage**

There shall be storage for two (2) lengths of suction hose on the apparatus. The trays shall be 1/8” anodized aluminum and sized to fit a single length of 5” x 10’ long PVC style hard suction hose. The hoses shall be held in place by heavy-duty Velcro straps. The hoses shall be installed as low as possible above the driver’s side apparatus body catwalk to allow for lettering above.

### **Hand Rails**

There shall be three (3) hand rails installed, one (1) each side vertically mounted at the rear of the apparatus and one (1) horizontally at the top of the tank. The hand rails shall be rigidly mounted in

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chrome plated stanchions and be anodized aluminum extrusion, which is grooved and aggressively knurled to reduce hand slippage.

### **Rub Rails**

There shall be rub rails installed around the perimeter of the body below the bottom compartments. The rub rail shall be made of 1/8" aluminum "C" channel extrusion. The rub rail will then be installed using Teflon spacers to keep the rub rail away from the body and be bolted for easy removal and allow drainage between the body and the rub rail.

Red/White alternating reflective safety striping shall be installed within the rub rails also.

### **Aluminum Diamond Plate Overlays and Trim**

The top of the apparatus body compartments shall be finished with aluminum diamond plate. The aluminum diamond plate shall extend to the top radius edge of the catwalk location.

At the front of the body there shall be aluminum diamond plate installed full height to be a stone shield and to protect the body from road debris.

The lower rear body panel of the apparatus shall be smooth aluminum to allow the installation of chevron striping. There shall be stainless steel scuff plate installed from the hose bed floor to the top of the side body panels approximately 12" deep from the rear of the hose bed to protect the body and paint finish from scratching and marring.

### **Rear Step**

The rear step shall be formed from N.F.P.A. compliant 3/16" thick "embossed" aluminum diamond plate. The step shall be full width of the body and be approximately 20" deep. The step shall be supported underneath by 3" steel channels that extend off the chassis frame and have a spacer between the two dissimilar metals to reduce corrosion.

### **Hose Bed Access Ladder**

There shall be a hose bed access ladder vertically up the rear of the apparatus on the right side for easy access to the hose bed. The ladder shall be made of 1" x 2" aluminum tubing with extruded aluminum rungs.

## ***Electrical System***

### **12-Volt Electrical System Test**

The low voltage electrical system shall be tested and certified per NFPA 1901 requirements.

A certificate of compliance shall be provided with the completed vehicle upon delivery.

Minimum electrical load consists of the total amperage required to simultaneously operate the following in a stationary mode at the incident scene.

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- The propulsion engine and transmission.
- All clearance and marker lights.
- The communication radio. (Default of 5.0 amps used testing).
- Illumination of all walking surfaces, the ground at all egress points, controls and instrument panels and 50% of the total compartment lighting load.
- Minimum warning lights required for "Blocking Right of Way" mode.
- The current to simultaneously operate any fire pump, aerial device and hydraulic pumps.
- Anything defined by the purchaser to be critical to the mission of the apparatus.

The first test for the electrical system is the **Reserve Capacity Test**. All the above listed components operate with the engine shut off. After 10 minutes all electrical loads are shut off and the battery system must have adequate reserve power to start the engine.

The second test is the **Alternator Performance Test at Idle**. All the above listed components operate with the engine at an idle. There can be no current draw from the batteries of the apparatus.

The third test is the **Alternator Performance Test at Full Load**. All electrical components shall be activated with the engine operating at governed RPM for two hours. During the test the system voltage can not drop below 11.7-volts or have excessive battery discharge for more than 120 seconds. Any loads not listed in the minimum electrical load may be load managed in order to pass the test.

### **Wiring**

All electrical equipment shall be installed to conform to modern automotive practices. All wiring is to be SXL ultra high temperature cross-link type. Wiring installed by the builder to be run in loom or conduit, where exposed to the outside, it should have grommets where the wire passes through a metal plate and shall be protected by automatic reset circuit breakers which conform to SAE standards. The breakers shall be selected to prevent wire damage when subjected to extreme overload. Wiring to be color, function, and number coded every 3", the entire length of run.

All electrical components to have a 125% maximum rating for current carried.

### **ES-Key Management System**

The apparatus shall be equipped with a Class 1 ES-Key Management System for controlling electrical system devices. This management system shall be capable of performing loan management functions, system monitoring and reporting, and be fully programmable for a standardized electrical system.

The ES-Key system shall utilize a Controller Area Network to provide multiplexed control signals for "real time" operation.

### **Vehicle Data Recorder (VDR - Black Box)**

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There shall be a Vehicle Data Recorder (VDR-Black Box) installed on the apparatus. The VDR will capture data once per second in 48-hour loop. The VDR shall monitor and record the following information; Acceleration/Deceleration, Engine Speed, Engine Throttle Position, ABS Event, Seat Occupied & Seat Belt Status, Master Warning Device Switch On/Off, Date/Time. There will be a minute-by-minute summary for 100 engine hours.

### **Seat Belt Warning System**

There shall be a seat belt warning and indicator system installed in the cab of the apparatus warning the driver with an audible alarm that a certain seat is being occupied and the seat belt is not fastened. There shall be an icon display at the center console of the apparatus to indicate the seating position.

### **EMI/RFI Protection**

The apparatus design and construction shall incorporate the latest designs in incorporating Electromagnetic Interference Suppression, which is required to satisfy the radiation limits specified in SAE (Standard for Automotive Excellence) J551. "Performance Levels and Methods of Measurement of Electromagnetic Radiation from vehicles and devices (30-1000 MHz), and of which has been adopted by NFPA 1901. System design and components used shall insure that radiated and conducted electromagnetic interference (EMI) and radio frequency interference (RFI) emissions are suppressed at the source.

The apparatus proposed shall have the ability to operate in the electromagnetic environment typically found in fireground operations.

EMI/RFI susceptibility shall be controlled by applying immune circuit designs, shielding, twisted pair wiring and filtering. The electrical system shall be designed for full compatibility with low-level control signals and high-powered two (2) way radio communication systems. Harness and cable routing shall be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

### **Master Switch Panel**

All electrical light switches shall be mounted on the cab console by means of a custom switch panel. It shall be accessible to the driver and the officer. A Main Master Switch and individual switches to be provided to allow pre-selection of emergency and scene lights.

The light switches are to be "rocker" type with an internal indicator light to show when the switch is energized. All switches to be properly identified and mounted in a removable panel for ease in servicing. A backlit panel shall be used to identify the switches when it's dark.

Each rocker switch shall energize a 40-amp continuous duty relay. Each relay shall be labeled as to its function.

### **Wiring Diagrams**

Two (2) wiring diagrams for 12 VDC and/or 120/240 VAC, the body electrical system shall be included with the apparatus as built.

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**Master Battery Switch**

There shall be a master battery, on-off, switch located at the driver's door near the seat. This switch shall be wired to the chassis battery system to allow the system to be turn off when the vehicle is not in use. There shall be a green indicator light located next to the switch and shall automatically turn on when the battery system is activated.

**Compartment Lights**

There shall be LED strip compartment lighting in each compartment wired to a door switch. There shall be one (1) strip at each side of the compartment door opening. Upon opening the compartment door the lights automatically come on.

**Open Compartment Door Indicator Light**

There shall be a Red LED "open door" indicator light mounted in the cab where the driver can see it and hear it. This is to alert the driver that there is a door open or ajar on the apparatus. This light is also wired to the door switch.

**Ground Lights**

There shall be a total of six (6) LED ground lights installed under the apparatus. There shall be two (2) sealed lights located under the cab steps, two (2) sealed lights located under the front compartments and two (2) sealed lights located under the rear step. These ground lights will be activated upon setting the parking brake.

**Step Lights**

There shall be four (4) LED step lights installed on the apparatus, there shall be one (1) 4" round sealed light each side at the front bulkhead of the body and two (2) chrome-plated shielded lights at the rear step area. These lights shall be activated upon setting the parking brake.

**Engine/Pump Compartment Lights**

There shall be two (2) LED lights with switches mounted in both the engine and pump compartments to help in service.

**Stop, Tail, Directional Lights**

There shall be installed two (2) sets of Tecniq 4" round LED stop/tail/directional, and back up lights at the rear outer most location. The red taillights shall be model T40-RRFP-1, the amber turn signals shall be model T40-AAFP-1 and the backup lights shall be model T41-WCFP-1. The lights shall be wired to the chassis electrical system for operation. These lights shall be supplied with a flange style mount.

**Scene Lights**

There shall be six (6) Whelen, model C9SL, 12-volt LED scene lights installed two (2) each side of the apparatus body, one (1) in each front and rear corner, side facing. There shall also be two (2) lights installed, one (1) each side, at the rear body panel. The rear lights shall be wired to reverse gear of the transmission so the lights automatically come on when the truck is shifted to reverse

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gear. The lights shall also be wired to the in-cab switch panel and be activated with an individual switch per set of lights.

**Back Up Alarm**

There shall be installed one (1) back up alarm wired to reverse gear on the transmission.

**Clearance Lights/Reflectors**

There shall be LED clearance lights installed at the rear of the apparatus built into the rear step. There shall be a cluster of three (3) in the center, one (1) at the outer most beveled corner of the rear step at a 45° angle. These five (5) lights shall be Red in color. There also shall be LED clearance lights installed, one (1) each side at the upper rear corners, also Red in color.

There shall also be DOT reflectors at the outer most corners one (1) each side toward the rear and one (1) each side toward the side.

**Warning Systems**

(All warning systems will be provided as per NFPA 1901 requirements.)

The optical warning system on the fire apparatus shall be capable of two (2) separate signaling modes during emergency operations. The first mode shall signal to drivers and pedestrians that the apparatus is responding to an emergency and is CALLING for the “Right-of-way”. The second mode shall signal that the apparatus is stopped and is BLOCKING the “Right-of-way”.

The switching between modes shall be provided by a sensor that senses the position of a parking brake or the park position of an automatic transmission. When the master optical warning system switch is closed, and the parking brake is released or the automatic transmission is not in park, the warning devices signaling the call for “Right-of-way” shall be energized. When the master optical warning system is closed, and the parking brake is on or the automatic transmission is in park, the warning devices signaling the blockage of the Right-of-way shall be energized. The system shall be permitted to have a method of modifying the two signaling modes.

**Light Bar-Whelen Freedom IV Model F4N2VLED (Red, White)**

There shall be one (1) Whelen Freedom IV 55” LED light bar mounted on the roof of the cab and wired to the in-cab switch panel. The light bar shall have two (2) red forward-facing LED modules, two (2) clear forward-facing LED modules, two (2) red front corner LED modules, two (2) red rear corner LED modules. This light bar fulfills the requirements for Upper Zone A. The light bar lenses shall be clear in color.

Any clear warning light(s) in the light bar will be deactivated automatically for the “Blocking the Right of Way” mode.

**Grille and Intersection Lights-Whelen SurfaceMax LED Flashers (Red)**

There shall be two (2) grille lights installed at the front of the cab, one (1) each side, and two (2) intersection lights installed, one (1) each side of the engine hood. The lights shall be Whelen,

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model C7LR LED flashers wired to the in-cab switch panel. These lights shall fulfill the requirements of Lower Zone A.

**Lower Side Lighting-Whelen SurfaceMax LED Flashers (Red)**

There shall be two (2) Whelen, model C6LR LED flashers mounted one (1) each side at the rear wheel well area. The lights shall be wired to the in-cab switch panel. These lights shall fulfill the requirements of Lower Zones B and D. All of these lights shall be Red in color.

**Lower Rear Lighting-Whelen SurfaceMax LED Flashers (Red)**

There shall be two (2) Whelen, model C6LR LED flashers mounted one (1) each side at the rear of the apparatus above the rear taillights. The lights shall be wired to the in-cab switch panel for operation. These lights shall fulfill the requirements of Lower Zone C. The lights shall be Red in color.

**Upper Flashers-Whelen SurfaceMax LED Flashers (Red)**

There shall be four (4) Whelen, model C9LR LED flashers mounted one (1) each side at the upper rear corner, side facing, and two (2) at the upper rear panel. The lights shall be Red in color. The lights shall be wired to the in-cab switch panel for operation. These lights shall fulfill the requirements of Upper Zone B, C and D.

**Siren & Speaker**

There shall be installed one (1) Whelen model 295SLSA1 siren amplifier mounted in cab where both driver and officer can reach it shall be wired to the cab electrical system. There shall also be installed one (1) Whelen, model SA315P, 100-watt weatherproof speaker in the front bumper or grille area and wired to the siren amplifier and to the cab electrical system.

**Paint/Misc.**

**Paint Code:**

**Paint Code(s):**

The apparatus body shall be painted one (1) solid color, **Red**, per fire department specifications using PPG ESSS Polyurethane base coat/clear coat paint. The painting process shall follow the PPG painting process by PPG certified applier.

- All items such as brackets, compartment doors, door hinges, and diamond tread aluminum plate, etc. should be removed from the apparatus or body.
- Entire unit should be solvent washed using a two (2)-rag method using CFX436/330 Wax and Grease Remover.
- The welded areas on the entire unit should be ground down with a 36-grit disc for steel, and 80 grit discs for aluminum. Compartment seams and others not receiving the grinding process should be wire wheeled. All surface area then should be DA sanded using 120 grit then 180 grit on steel or Galvneal. On aluminum use 150-180 grit.

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Filling should be done where necessary with professional grade lightweight polyester resin filler. Presanding the polyester filler is recommended.

Final sanding should be done no courser than 180 grit.

- Entire unit should be solvent washed using a two (2)-rag method using CFX436/330 Wax and Grease Remove prior to priming.
- The unit will be Epoxy Primed with ESU 421, mixed with ESU 428 hardener and ESR 300 thinner. A minimum number of coats, 1-2, for a 1.5-2.0 MIL thickness. After a flash time of 10-15 minutes ESU 440 High Build primer surfacer mixed with ESU 4492 ESX 510 to be applied per PPG specifications. Minimum of 2-3 coats for a 3.0-6.0 dry MIL thickness.
- Sanding should be accomplished using 320 grit until all scratches are removed.
- Upon completion of the sanding procedure, all non-welded seams should be caulked with a compatible urethane caulk that is non-hardening and remains flexible during any atmospheric condition.
- After the unit is hand washed with CFX436/330 Wax and Grease Remover using the two-rag method, and tack wipe remaining lint to remove any surface partials.
- Prior to final paint and after sanding with 320 grit, all bare aluminum, steel or stainless-steel will be cleaned with CFX436/330 Wax and Grease Remover and resealed with ESU 421 Epoxy Primer prior to paint.
- PPG ESSS Polyurethane basecoat paint will be mixed with ESH210 Hardener and ESB800 BC Converter. A minimum of 2 coats will be applied or until "hiding" is achieved, 1.5-3.0 MIL thickness. Let dry.
- After a dry time of 30-45 minutes the unit will be clear coated with ESU621 Urethane mixed with ESH200 Hardener and ESR300 thinner. Two (2) full wet coats will be applied to a minimum of 2.0-4.0 MIL thickness. Let dry.

Unit should be allowed to dry 24 hours prior to buffing and 7-days prior to the applying decals/lettering/stripping.

### **Compartments**

The inside of the apparatus compartments shall be sprayed with White epoxy primer, minimum of 2-coats, prior to 1-coat of spatter type paint followed by 1-2 coats of clear coat. The clear coat allows the compartments a more durable and easier cleaned up finish.

### **Undercoating**

The inside and the underside of the apparatus body shall be sprayed with a rubberized vehicle undercoating to protect the body from corrosion.

### **Lettering**

There shall be 3" vinyl letters/numbers with black outline and shadow, sixty-(60) total applied on the apparatus per department specifications. (There shall be a picture supplied by the department of the style and what they want for lettering to the salesperson or to the manufacturer.)

### **Reflective Stripe**

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There shall be applied one (1) 6" white Scotchlite stripe with a shaded fold and ¼" black outline to enhance appearance and to be more visible in low light and dark conditions. There shall also be a reflective stripe installed at the front of the apparatus below the cab grille where applicable.

There shall be reflective striping installed on the inside of the cab doors per NFPA regulations, minimum of 96 square inches each door.

The rear of the apparatus body/tank shall be covered with alternating 6" Red and Fluorescent Yellow/Green reflective material in an inverted "V" Chevron pattern. This shall be 3M Diamond Grade Scotchlite material for maximum reflectivity at the rear of the apparatus.

### **Danger Plates**

There shall be supplied and installed "Warning/Danger" plates on the apparatus.

There shall be one (1) plate installed in the cab within view of the driver stating the maximum number of passengers in vehicle.

There shall be one (1) plate installed in the cab within view of the driver stating the overall height, overall length and GVWR of the completed apparatus.

There shall be one (1) plate installed in the cab within view of all passengers stating; "DANGER-personnel must be seated and seat belts must be fastened while vehicle is in motion or Death or Serious Injury May Result".

There shall be one (1) plate installed at the rear of the apparatus body stating; "DANGER-do not ride on rear step while vehicle is in motion or Death or Serious Injury May Result.

There shall be one (1) plate installed in the cab of the apparatus stating all the fluid types and capacities for the apparatus chassis and optional equipment.

There shall be one (1) plate installed in the cab within view of all seating locations stating: "Helmets must not be worn in the apparatus while vehicle is in motion."

### **Loose Equipment**

The following loose equipment shall be supplied with the apparatus upon delivery to the fire department.

Two (2) 5" x 10' lightweight hard suction hose with NST couplings

One (1) 5" barrel strainer

One (1) Husky 2100-gallon portable tank with a Red 22oz. liner, floor handles, 1-drain, and aluminum frame

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