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S P E C I F I C A T I O N S

COMMERCIAL CHASSIS

The chassis shall be a new, unused commercial cab and chassis provided by the fire apparatus body manufacturer. Chassis specifications, as ordered, shall be reviewed by the apparatus body manufacturer with the Purchaser within seven (7) days in advance of the purchase order release to the chassis supplier. The apparatus body manufacturer shall be totally responsible for all chassis specifications being in compliance with their bid proposal as accepted by the Purchaser. The purchased chassis shall be drop shipped to the apparatus body manufacturer's production facility.

CHASSIS SPECIFICATIONS

Chassis shall be a new 2017 Ford F-550 Super Duty Crew Cab 4x4 Model w/ the following:

Brakes: 4-Wheel Anti-Lock; Vented Power Disc Brakes, ABS
Frame: 200.2" WB; 84" CA, Open C-channel Straight Frame
Engine: 6.7L V-8 Power Stroke Diesel, 330 BHP; 750 lbs/ft Torque, Fail-safe Cooling System
Exhaust: Stainless Steel Exhaust System meeting 2010 Emissions
Transmission: 6-Speed Automatic Transmission w/ SelectShift; 1- Live-Drive PTO Access
Front Axle GAWR: 7,000 lbs. Monobeam Drive Axle w/ Sway Bar, Power Steering
Rear Axle GAWR: 14,706 lbs. Solid Beam 4.88/1, Limited Slip, w/ Sway Bar
Transfer Case: 2-Speed Electronic Shift-on-Fly w/ Locking Hubs; Marco Live Drive PTO w/ Harmonic Driveline Balancer; DEF Tank Mtd on L/S - Outside Frame Rail
Suspension: Coil Front; Leaf Rear; Auxiliary Rear Springs; Low Deflection Pkg.- Rear; 1.38" Gas Shock Absorbers- Front and Rear
G.V.W.R.: 19,500 lbs.
Cab: Aluminum Four Door Crew Cab, XL Trim Package, Heated- Power Trailer Tow Mirrors, Power Windows, Power Door Locks, Front & Rear Dome Lights, Gray H-D Vinyl 40/20/40 Bench Seating- Front and 2-Outside SCBA Seats-Rear; Belt-Minders, H-D Rubber Floor Material, Tilt / Telescoping Steering Column; Cruise Control; AM/FM/CD Stereo w/ 6-Speakers, Digital Clock; Keyless Entry Fob, Driver & Front Passenger Air Bags, Side Air Bags- Front and Rear w/ Roll-over Sensor, Heater / Air Conditioner, Overhead Console w/ Storage.
Electrical: Dual Alternators 377-Amp Total; Dual 750-CCA Batteries; Jewel Effect Aero Headlamps, Roof Clearance Lamps, Underhood Service Lamp
Front Bumper: Chrome, Step type; (2) Front Tow Hooks
Tires: (6) Ford Maximum Traction, 225/70R x 19.5"
Wheels: Dual Rear Wheels, 19.5" Steel, Argent
Fuel Tank: 40-Gal Fuel Tank-Rear Mount; Side Fill; DEF Tank-Side Mount, Side Fill
Other: Engine Block Heater; Manual Regeneration DPF; Pre-Delivery Inspection
Paint Color: Oxford White
Standard Equipment: All standard equipment for XL model F-550 Crew Cab
Warranty: Ford Provided 3-Yr/36,000 Miles Bumper-to-Bumper; 5-Yr/60,000 Powertrain; 5-Yr/50,000 Safety Restraint; 5-Yr/ Unlimited Mileage Corrosion Perforation; 5-Yr/60,000 Roadside Assistance

CHASSIS PREPARATION

The chassis shall receive adjustments and frame drillings as required to ensure proper fit-up of the added chassis components and mounting of the modular body components. OEM provided chassis frame holes shall be utilized whenever possible to maintain frame integrity as designed by the chassis OEM.

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DELIVERY FUEL

The chassis fuel tank shall be one-quarter full at time of shipment from the apparatus manufacturer.

POWER TAKE-OFF

A Muncie model FR66 series compact power take-off (PTO) shall be installed on the chassis transmission and shall have a maximum output torque of 200 lbs/ft. It shall be electrically controlled from the cab with a power shift clutch on the PTO. An indicator light shall illuminate whenever the PTO is engaged.

PTO DRIVE LINE

The power takeoff (PTO) shall be connected to the driven device through a tubular drive shaft with U-joints and a slip yolk. The assembly shall be properly measured, balanced and installed. The PTO drive line shall be checked for vibration with the driven device operating at low (idle) speed and at high (maximum output) speed.

C H A S S I S U P G R A D E S

BACK UP ALARM

The vehicle shall be provided with a Whelen model WBUA97 automatic 97dB (decibel rating) back-up alarm that shall activate automatically whenever the vehicle's transmission is placed into reverse gear. There shall be no back-up alarm cut-off switch, in violation of safety regulations.

BATTERY DISCONNECT SWITCH

Manufacturer shall supply and install a Cole Hersee master battery disconnect switch in the cab to provide an effective emergency power cutoff, protecting vehicle from tampering and battery drain.

A Cole Hersee model 75920 switch shall incorporate a composite engineered polymer housing that will not rust or corrode and shall have been tested per SAE 1455 for road salt, calcium chloride and magnesium chloride, and it is waterproof to IP67. The switch shall have a high amperage capacity of 300A at 12V DC, can be used in high side or low side applications, and shall have a large red knob for easy operation with gloved hands. 90º switch travel shall make it easy to identify the switch position.

BATTERY SWITCH PILOT LIGHT

A Green LED pilot light signifying that the master battery switch is in the "On" position shall be mounted on the dash or control console and is visible from outside the vehicle when illuminated.

BATTERY CHARGER

A Kussmaul model 091-215-12 Auto Charge 1000PLC battery charger shall be installed in the apparatus. The charger shall be fully automatic and shall produce up to 15-amp output while sensing battery voltage and balancing the battery charge rate with the battery bank condition. A parasitic load compensator shall be built-into the charger's electronic control module allowing the purchaser to input via a dip switch, the actual vehicle battery type and actual total amps required by all connected auxiliary devices. A built-in 3-amp, 12-volt Battery Saver circuit shall be dedicated to auxiliary loads placed on the battery system from ancillary items such as hand lights or portable radios. The charger shall

automatically set the ancillary charge rate allowing the ancillary battery's to float when normal operating current is reached. The electronics shall prevent ancillary batteries from overcharging and overheating.

A remote bar graph display indicating the vehicle batteries' state of charge shall be mounted in the cab or as otherwise directed by the Purchaser.
The charger shall carry a manufacturer's 3-year warranty.

SHORELINE CONNECTION

A Kussmaul Super Auto-Eject 20-amp, 120-VAC power inlet connection with a weatherproof cover shall be installed at the driver's side rear body fender, at an easily accessible height. The unit shall automatically eject a connected shore line upon vehicle start-up.
A mating shore line connection plug shall be supplied with the connection.
The spring loaded, protective cover shall be Yellow.

BUMPER MOUNTED GRILLE GUARD

A Setina model PB400 high strength aluminum grille guard shall be installed on the OEM front bumper to protect the cab grille and headlight assemblies from impact. All stainless steel hardware shall be used to install the grille guard to the chassis and bumper.
The guard shall be powder coated Black.

CENTER CAB CONTROL CONSOLE

A custom design smooth aluminum console shall be fabricated and installed on the cab floor, centered between the driver's and officer's seats, as far rearward as possible. The console shall contain warning light controls, siren, communications radio(s) and additional items as required by the Purchaser. The console shall have a hinged top for easy service access and shall be coated with gloss Black PPG DuraBull truck bed liner on all interior and exterior surfaces for durability and appearance.
A 3D design drawing showing all specified console mounted items shall be submitted to the Purchaser for signature approval prior to console fabrication.

CAB STORAGE COMPARTMENT

There shall be one (1) open front storage cabinet installed in the cab center, between the rear crew seats. The cabinet shall be constructed of .125" smooth aluminum and shall be approximately 42" high x 22" wide x 16" deep.
There shall be two (2) adjustable trays provided in the cabinet. The trays shall be constructed of .125" smooth aluminum plate and shall have a 1" formed retaining lip along the front and rear edge for reinforcement. The trays shall be full width and length of the cabinet's interior dimensions.

The stored contents shall be retained by Black nylon webbing which fastens and unfastens at the sides and bottom of the cabinet. A full height LED strip light shall be installed and controlled by the dome light switch circuitry.
The entire cabinet including the trays shall be coated with gloss Black DuraBull truck bedliner material for a scuff resistant, long lasting finish.
The compartment shall contain the Fire Department's Jump Kit, Pharmaceutical Bag, Heart Monitor, Oxygen Bottle and two (2) handlights w/ chargers.

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A 3D design drawing showing all specified cabinet design items shall be submitted to the Purchaser for signature approval prior to cabinet fabrication.

MAP LIGHT

A Federal Signal model LF 18TSB-LED Littlite, LED map light shall be installed on the front of the center console.
The map light shall be 12-volt powered and hard wired to the dash circuitry. It shall have a sturdy, pliable 18” gooseneck design that will not vibrate out of position during transit. A bright LED bulb and spot reflector shall be supplied with a switch changeable Red or Clear lens. The light shall be controlled by a rotary on-off switch on the base of the light.
The light base and shade housing shall have a matte Black finish.

CAB ENTRY RUNNING BOARD STEPS

One (1) set of formed aluminum treadplate running boards shall be installed as a continuous step under the front and rear cab doors. Running boards shall be .125" thick treadplate and 7"deep. An aluminum treadplate mud guard shall be sloped to the cab fender to prevent road splash from the front tires. All aluminum treadplate shall be coated with BriteGard to prevent corrosion and all stainless steel hardware shall be used to install the steps.
An LED step light, controlled by the dome light door switches, shall be installed at the forward guards.

EXHAUST REMOVAL SYSTEM PREPARATION

The chassis exhaust tailpipe shall be located and prepared for use with Purchaser’s in-station Plymovent exhaust removal system.

USB POWER PORT

A reverse polarity protected Kussmaul USB dual power port shall be recess mounted in the cab console and located at the direction of the Purchaser. The power port shall be wired direct to battery power or to an ignition controlled circuitOne port shall provide 1.0 amp output and the other port shall provide 2.1 amps output. Total output voltage shall be 5.0 volts and total output current shall be 3.1 amps. A Red LED indicator shall illuminate whenever the devise is supplying current to a connected device.
The USB power port shall be warranted by the manufacturer for a period of 3-Years.

CAB AREA GROUND LIGHTING

There shall be four (4) TecNiq model Eon E03 linear LED lights shall be installed beneath the chassis cab. Lights shall be 0.9” wide x .5" high x 2.9" long with a polycarbonate lens, fully encapsulated electronics and a gasketed black stainless steel case mount. The lights shall illuminate the ground within 30" of the cab entry doors to provide visibility of any obstructions or ground hazards. Lights shall be wired to illuminate when the Park Brake or Park Gear is set and the running lights / headlights are switched on.
Lights shall carry the manufacturer's lifetime warranty.

TIRE PRESSURE MONITORS

The apparatus shall be provided with six (6) TireWatch pressure indicating tire valve stem caps. The indicators shall be installed on each tire and be a heavy-duty design manufactured specifically for trucks. When a tire is properly inflated, the

dicator inside the cap shall be clear. When the tire is under-inflated by 8 psi or more, the LED indicator inside the cap shall flash red, alerting the viewer to pressurize the tire and monitor it for leakage.

TRAILER HITCH RECEIVER and 7-WAY CONNECTION

A trailer towing hitch receiver with safety chain anchors shall be installed at the rear of the apparatus.

The hitch receiver shall be constructed of 2.0" heavy steel tubing and reinforced to the apparatus framework. The hitch receiver shall have a Class IV rating of 10,000 pounds towing and 1,000 pounds tongue weight when used with a weight distributing hitch assembly.

A trailer towing electrical connection shall be provided, consisting of a (7)-way flat blade recreational vehicle connector for trailer wiring compatible with electric brake systems, and a second connector with inverted ground meeting SAE J560 standards providing an auxiliary connection for warning devices.

A label shall be placed near the receiver stating the maximum trailer weight, tongue weight and straight-line pull rating.

STAINLESS STEEL WHEEL INSERTS

Polished 304L stainless steel full wheel inserts shall be furnished for front wheels and outside rear wheels.
The inserts shall simulate the look of chrome or highly polished aluminum wheels. Front wheels shall have snap-on/off centers for oil seal window viewing. Both front and rear wheel inserts shall have integral wheel lug nut covers and styled inset perimeter openings so as not to impede brake cooling.

IN-CAB AUXILIARY 12-VDC POWER

Two (2) fused 20-Amp 12-VDC circuits shall be provided; one (1) on each side of the rear cab storage compartment, with covered plug-in receptacles for installation of hand lights and or other similar equipment.

IN-CAB AC POWER OUTLETS - 120-VOLT

The shore line connection shall supply the electrical outlets outlined below. Proper circuit protection shall be installed with the shore line.
Two (2) 120-volt Duplex exterior outlets shall be installed, inside the cab rear equipment compartment as directed by the Purchaser.
- Each receptacle shall be 15-amp, straight blade (NEMA 5-15R).

F I R E P U M P

PUMP TEST and CERTIFICATION

The rated fire pump shall be tested and documented by the apparatus manufacturer to be in compliance with the pump performance standards listed in the current edition of NFPA pamphlet 1901 as follows:
Pumping Test per NFPA 16.13.2
Pumping Test for Engine Overload per NFPA 16.13.3
Pump Pressure Control System Test per NFPA 16.13.4
Pump Priming System Tests per NFPA 16.13.5
Pump Vacuum Test per NFPA 16.13.6
Water Tank-to-Pump - Flow Test per NFPA 16.13.7

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Engine Speed Advancement - Interlock Test per NFPA 16.13.8
Pump Gauge / Flowmeter Test per NFPA 16.13.9

The pump performance results along with the pump manufacturer's certification of hydrostatic test, the engine manufacturer's certified brake horsepower curve and the apparatus manufacturer's record of pump construction details shall collectively be delivered to the Fire Department within 10-days of pump test completion.

SIDE CONTROL PUMP MODULE DESIGN

The pump module body shall be a self-supporting structure, mounted independently from the body and behind the chassis cab. It shall be designed to locate all the pump controls and instruments on the left side of the vehicle. The structure shall be a welded framework, properly braced to withstand chassis frame flexing. The pump module shall be constructed entirely of aluminum alloy extrusions and aluminum plate. The framework shall be formed from beveled aluminum alloy extrusions and shall be electrically seam welded at each joint using 5356 aluminum alloy welding wire. The main framework shall be 3.0” x 3.0” x 0.18” wall, or 3.0” x 1.5” webbed 0.25” wall, 6063-T5 aluminum extrusion. The pump module design shall allow normal chassis frame deflection through isolation mounts without imposing dynamic load stress on the structure or side running boards. The pump module support shall be bolted to the frame rails of the chassis.

STAINLESS STEEL SIDE PANELS

The pump module side panels shall be 14-gauge brushed stainless steel and shall be an integral part of the module.

PUMP MODULE WIRING HARNESS

An automotive quality, professionally produced electrical wiring harness shall be manufactured with GXL wire per SAE-J1128 rated performance requirements. The electrical wiring harness shall be covered by a black split-convoluted loom, rated at a minimum of +275º F. All wiring terminals shall meet the minimum pull test as required by the manufacturer’s pull test and crimp measurement data. All splices shall be manufactured using the ultrasonic splice process. The harness shall be 100% tested by a Dynalab circuit tester to ensure continuity and to verify correct assembly. An LED strip light controlled by a pump panel switch shall be provided inside the pump module. Two (2) LED pump panel strip lights with wide angle disbursement lenses shall be installed, one above each pump side panel.

PIPING AND MANIFOLDS

All the plumbing and/or hard piping in the pump module shall be 304 alloy stainless steel or high strength flexible piping for long life. All stainless steel plumbing castings shall be a minimum of schedule 40.
All pipe thread connections larger than ¾” diameter shall be avoided.
The following valves shall have groove connection: rear discharge, tank fill, all 2” and 2.5” (5.08 and 6.35cm) pre-connect valves.
High strength flexible piping shall be black SBR synthetic rubber hose with 300 psi working and 1200 psi burst pressure for sizes 1.5” through 4”.
Sizes .75”, 1.0” and 5.0” shall be rated at 250 psi working and 1000 psi burst pressure. All sizes shall be rated at 30 HG vacuum.
Flexible hose reinforcement shall consist of two plies of high tensile strength tire cord for all sizes with the addition of helix wire installed in sizes 1.0” through 5.0” to provide long life performance in maximum bend applications. The flexible hose jacket material shall have a temperature rating of – 40 degrees F to +210 degrees F. Flexible hoses shall

utilize full flow male couplings precision machined from high tensile strength alloy stainless steel. All female couplings shall be brass. All .75" and 1.0" male and Victaulic couplings shall be brass.

FIRE PUMP (PTO)

The pump shall be a Hale Model MBP750 designed to mount on a heavy truck chassis, and shall have NFPA 1901 rated performance capacity of **750** gallons per minute (U.S. GPM.)
The entire pump shall be manufactured and tested in the pump manufacturer's factory.

The pump shall be driven by a transmission mounted power take-off (PTO). The engine shall provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance within the torque rating of the PTO, the truck transmission gears and the drive line components.
The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 500 PSI. The pump shall be fully tested by the pump manufacturer to the performance criteria as outlined in the latest published edition of NFPA Standard 1901. 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. All moving parts in contact with water shall be of high quality bronze or stainless steel. Pump utilizing castings made of lower tensile strength cast iron not acceptable.
Pump body design shall be vertically split, on a single plane, for easy removal of impeller assembly, including clearance rings.
The pump's main center suction and discharge manifold shall be manufactured and tested by the pump manufacturer. The lower suction manifold section shall incorporate a 700 GPM capacity tank-to-pump line check valve.

The pump shaft shall be electric furnace heat-treated and corrosion resistant with a positive impeller lock. The shaft must be sealed with a double lip oil seal to prevent road dirt and water from entering the gearbox. The pump shaft shall be rigidly supported by two bearings for minimum deflection. The bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated. The pump shaft shall have only one mechanical seal which shall be spring loaded, maintenance free and self-adjusting.

The pump impeller shall be hard, fine grain bronze of the mixed flow design; accurately machined, hand-ground and individually balanced. The vanes of the impeller intake eye shall be hand-ground and polished to a sharp edge and shall be of sufficient size and design to provide ample reserve flow capacity while requiring minimum engine horsepower.

The impeller clearance rings shall be bronze and shall be easily renewable without replacing impeller or pump body.

PUMP GEARBOX

The gearbox shall be manufactured and tested at the pump manufacturer's factory.
It shall be of sufficient size to withstand the torque of the engine in full flow pump operating conditions. The gearbox shall be designed with ample capacity for lubrication reserve and to maintain the proper operating temperature.
The gearbox drive shaft shall be heat-treated chromium steel and shall withstand the torque of the engine during pump operating conditions. An accurately cut helical design shall be provided. (No exceptions.)

All gears shall be of highest quality electric furnace chrome-nickel steel. Bores shall be ground to size and teeth integrated, crown-shaved and then hardened.

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The gear manufacturing process shall provide an extremely accurate gear for long life, quiet operation and high load carrying capability. The pump ratio shall be selected by the apparatus manufacturer to provide the maximum performance level with the engine, transmission and power take-off selected.

PUMP PERFORMANCE CERTIFICATION

The pump shall be final tested at manufacturer under full NFPA suction conditions.

The pump will perform and meet the following tests:
100% of rated capacity [750 GPM] @150 PSI net pump press.
100% of rated capacity [750 GPM] @ 165 PSI net pumps press.
70% of rated capacity [525 GPM] @ 200 PSI net pump press.
50% of rated capacity [375 GPM] @ 250 PSI net pump press.

PUMP CERTIFICATION TEST PLATE

A permanently affixed plate shall be installed at the pump operators position and shall display the rated discharge and pressures together with the speed of the engine as determined by the certification test for each unit, (the position of the parallel/series pump as applicable) and the no load governed speed of the engine as stated by the engine manufacturer on a certified brake horsepower curve.

OIL-LESS PRIMING PUMP

The priming system shall be an electric motor driven Hale positive displacement rotary vane pump. It shall be and oil-less design and shall not require lubrication. The pump body shall be manufactured of heat-treated anodized aluminum for wear and corrosion resistance and the drive motor shall be a 12-volt DC powered, totally enclosed design. The priming pump shall be controlled by a spring loaded bronze pull valve mounted on the pump panel.
The pump shall be capable of producing a minimum of 24 Hg vacuum at 2,000 feet (609.6m) above sea level and shall conform to NFPA-1901 rated priming performance requirements.

PUMP ANODES

The fire pump shall be equipped with replaceable, sacrificial zinc anodes to protect against corrosion. The pump shall have one anode on each intake section and one anode on the discharge section of the Fire Pump. Each anode shall have an NPT thread to allow replacement and proper sealing and removal for replacement.

PUMP COOLER and ENGINE COOLER VALVES

An auxiliary engine cooler and a pump bypass cooler valve shall be installed in the instrument panel.
Each valve shall be a 1/4" multi-turn valve installed through the instrument panel and properly labeled.

MASTER PUMP DRAIN

The pump shall be equipped with a Class 1 Master Pump drain to allow draining of the lower pump cavities, volute and selected water carrying lines and accessories. The drain shall have an all brass body with a stainless steel return spring.

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INDIVIDUAL LINE DRAINS

All gated inlets and 2.0" (5.08cm) and larger discharge outlets shall be equipped with a .75" ball valve drain.

PUMP PERFORMANCE TEST PORTS

Two (2) dedicated pump performance test ports shall be installed on the pump panel specifically for testing pump inlet system vacuum and discharge system pressures.

MASTER PUMP GAUGES

Two (2) 4.5" diameter (11.43cm) master pump gauges shall be provided. The master discharge gauge shall indicate pressure from 0 to 400 PSI. The master intake gauge shall indicate pressure from -30Hg to 400 PSI. The gauges shall be fully filled with pulse and vibration dampening Interlube fluid to lubricate the internal mechanisms, to prevent lens condensation and to ensure proper operation to -40 degrees F. The stem and Bourdon tube shall be filled with low temperature material to prevent internal freezing and they shall be sealed from the water system using an insulating Sub-Z diaphragm located in the stem to prevent contaminants from entering the gauge.

INDIVIDUAL DISCHARGE LINE GAUGES

A 2.5" (6.35cm) diameter line gauge shall be provided for each 2.0" (5.08cm) or larger discharge line and shall be mounted adjacent to the discharge valve control handle. The gauges shall indicate pressure from 0 to 400 PSI. The pressure gauge shall be fully filled with pulse and vibration dampening Interlube fluid to lubricate the internal mechanisms, to prevent lens condensation and to ensure proper operation to - 40 degrees F. To prevent internal freezing and to keep contaminants from entering the gauge, the stem and Bourdon tube shall be filled with low temperature material and shall be sealed from the water system using an isolating Sub-Z diaphragm located in the stem. A colored bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage.

TOTAL PRESSURE GOVERNOR (TPG)

The pump system shall be equipped with a Class 1 "Total Pressure Governor" (TPG) connected to the ECM (Electronic Control Module) mounted on the engine. The "TPG" shall operate as a pressure regulating governor utilizing the engine's J1939 data link for optimal resolution and response provided by the engine manufacturer. Where the J-1939 engine control is not supported, then an analog remote throttle control shall be provided by the TPG.

The TPG shall utilize control algorithms that minimize pressure spikes during low or erratic water supply situations and display operational status messages to the operator under certain circumstances. The TPG shall be backwards compatible to any engine that supplies J1939 RPM, engine temperature and oil pressure information and shall have the ability to use either a 300 PSI or a 600 PSI transducer. Pressure sensing system diagnostics shall be built-in and accessible by technicians.

Programmable pre-sets for engine RPM and pump Pressure settings shall be easily configurable. The TPG shall incorporate configurable parameters in the menu structure accessed only through a diagnostic password.

The "TPG" shall also include engine RPM, battery system voltage, engine oil pressure and engine temperature with audible alarm output for all information monitored.

The TPG shall use J1939 broadcast warnings for the alarm points as a standard.

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VALVE CONTROLS

Class 1 locking push/pull controls shall be provided for gated discharge valves as well as tank fill and tank-to-pump valve actuation. The polished chrome plated zinc T-handles shall have a recessed face area for a 1” x 3” (2.54 x 12.70cm) identification tag. The controls shall be lockable by a quarter-turn in either direction and at any extension. The primary rod shall be a .75” diameter anodized aluminum rod and shall pull straight out from the control panel. The control panel connection and rod guide shall be a 4-bolt pattern polished chrome zinc casting. Valve control rods shall be made from galvanized pipe with .5”-20m threaded insert / connection studs.
Gated inlets shall have chrome swing handle controls mounted directly to the valve’s ball trunion.

INTAKE RELIEF VALVE

There shall be one (1) inlet side stainless steel relief valve provided on the pump system. It shall exit pump water to the ground when inlet pressure exceeds 140 psi. The exit pipe shall terminate in 2.5" MNST threads and the exit point shall be labeled "Do Not Cap"

STEAMER INLETS

Two 6” (15.24cm) steamer inlets will be provided, one (1) on the left side and one (1) on the right side. Both inlets shall have a debris screen and NST male ends with vented, long handle chrome caps.

LEFT SIDE AUXILIARY GATED INLET

One (1) 2.5" (6.35cm) inlet with a stainless steel ball valve shall be located on the left side panel. The valve shall be a quarter-turn ball type fixed pivot design allowing easy operation at all pump pressures. The valve shall be controlled at the left side pump panel with a swing handle. The valve shall be equipped with a chrome plug with chain, an inlet strainer, a 2.5” (6.35 cm) NST chrome inlet swivel and .75” drain valve.

TANK FILL LINE

One (1) 1.5" (3.81cm) discharge with a stainless steel ball valve shall be plumbed to the water tank. The valve shall be a quarter-turn ball type fixed pivot design to allow easy operation at all pump pressures. The 1.5" (3.81cm) valve outlet shall terminate with a 1.5" (3.81cm) grooved connection. The valve shall be controlled with a chrome-plated push/pull locking "T" handle mounted on the pump panel.

TANK-TO-PUMP LINE

One (1) 3.0" (7.62cm) stainless steel ball valve shall be installed between the water tank and the pump with an inline rubber connection hose to prevent damage from vibration. The valve shall be a quarter-turn ball type and shall be controlled with a chrome-plated push/pull locking "T" handle mounted on the pump panel.

TANK-TO-PUMP CHECK VALVE

There shall be a one-way check valve between the pump intake and the water tank-to-pump valve. The check valve shall prevent pump discharge water from back flowing into the water tank when the pump is connected to a pressurized source.

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DISCHARGE VALVES

The valve and ball shall be manufactured of 304 alloy stainless steel. The valve shall be bi-directional with full flow capability. The valve shall incorporate fixed pivot ball design with a flow pressure rating to meet NFPA-1901 standards. Valves shall have a single piece seat and seal design and shall have an operating pressure of 400 psi.
All 3.0” (7.62cm) discharge valves shall be supplied with a mechanical slow-close mechanism, operating per NFPA specifications.
The valve shall be warranted by the pump manufacturer against defects in design and manufacturing processes on all stainless steel components, for a period of ten (10) years

LEFT SIDE FORWARD DISCHARGE

One (1) 2.5" (6.35cm) discharge with a stainless steel ball valve shall be located on the front of the left side panel. The valve shall be a quarter-turn ball type and fixed pivot design to allow easy operation at all pump pressures. The 2.5" (6.35cm) outlet shall be equipped with an integral, stainless steel, 30-degree elbow terminating with 2.5" (6.35cm) MNST threads. A vented chrome cap with chain shall also be supplied. The valve shall be controlled at the side panel with a push/pull control. There shall be a Class 1 2.5” pressure gauge mounted on the panel adjacent to the control to indicate pressure. The discharge shall also be equipped with a quarter-turn .75" drain valve.

LEFT SIDE REARWARD DISCHARGE

One (1) 2.5" (6.35cm) discharge with a stainless steel ball valve shall be located on the rear area of the left side panel. The valve shall be a quarter-turn ball type and fixed pivot design to allow easy operation at all pump pressures. The 2.5" (6.35cm) outlet shall be equipped with an integral, stainless steel, 30-degree elbow terminating with 2.5" (6.35cm) MNST threads. A vented chrome cap with chain shall also be supplied. The valve shall be controlled at the side panel with a push/pull control. There shall be a Class 1 2.5” pressure gauge mounted on the panel adjacent to the control to indicate pressure. The discharge shall also be equipped with a quarter-turn .75" drain valve.

RIGHT SIDE FORWARD DISCHARGE

One (1) 3.0" (7.62cm) discharge with a stainless steel ball valve shall be located on the front of the right side panel. The valve shall be a quarter-turn ball type and fixed pivot design to allow easy operation at all pump pressures. The 3.0" (7.62cm) outlet shall be equipped with an integral, stainless steel, 30-degree elbow terminating with 3.0" (7.62cm) MNST threads. A vented chrome cap with chain shall also be supplied. The valve shall be controlled at the side panel with a push/pull control. There shall be a Class 1 2.5” pressure gauge mounted on the panel adjacent to the control to indicate pressure. The discharge shall also be equipped with a quarter-turn .75" drain valve.

CROSSLAY HOSEBEDS and DISCHARGE

One double crosslay hosebed shall be installed on the apparatus on the top of the pump module. Each section of the crosslay shall hold 200' of 1.75" double jacket fire hose. A 1.5" mechanical swivel hose connector shall be used in each crosslay to provide access to hose lines from either side. Each crosslay shall have one (1) 2.0” (5.08cm) stainless steel ball valve. The valve shall be a quarter turn ball type fixed pivot design to provide easy operation at all pump pressures. The 2.0" (5.08cm) valve outlet shall terminate with a 2.0" (5.08cm) grooved connection. The discharge shall be plumbed to the crosslay hosebeds with 2.0” (5.08cm) schedule 10 stainless steel pipes. The pipe shall terminate in a stainless steel swivel with 1 .0” (3.81cm) NH thread. The swivel shall allow the hose to be pulled from either side of the apparatus. The pipes shall be held in place by a 2-piece stainless steel bracket. Each valve shall be controlled with a chrome-plated push/pull

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locking "T" handle mounted on the pump panel. There shall be a Class 1 2.5” pressure gauge mounted on the panel adjacent to each control to indicate pressure. Each discharge shall also be equipped with a quarter-turn .75" drain valve. Each discharge shall be foam capable.

DUNNAGE BOX

The area behind the crosslay hose beds shall be walled in with .125” polished aluminum treadplate to provide an open top dunnage storage area above the pump module, even in height with the crosslays.

DUNNAGE AREA GRAB RAILS

Handrails made from 1.250” diameter knurled aluminum extrusion and anchored with chromed zinc end stanchions shall be installed horizontally on the top outside face of the pump module dunnage area, one (1) on each side to provide assistance for crew members accessing the dunnage area and the crosslay hose beds.

CROSSLAY COVER

A crosslay hose bed cover shall be provided with full width end flaps and shall be made of 18 oz. vinyl reinforced with nylon cord. The cover shall be attached to the crosslay hosebed with industrial Velcro attached to the crosslay and pump house side panels.
The crosslay cover shall be Black.

MASTER INLET VALVE

There shall be no integral valve installed on the master pump inlets.

AUXILIARY ENGINE COOLING

The apparatus shall be equipped with a heat exchanger for supplementary chassis engine cooling during fire pump operations. A manually opened valve, mounted at the operator's panel, shall direct water from the fire pump to the heat exchanger that is mounted in the engine radiator cooling hose line. The system shall provide water from the fire pump to circulate around the engine radiator coolant without mixing or coming in direct contact with the engine coolant. The unit shall be installed by the chassis manufacturer and connected to the plumbing system by the apparatus manufacturer.
A nameplate label shall be installed on the pump panel noting "Auxiliary Engine Cooler"

PUMP ENCLOSURE HEATER

A Visionaire model 2210 coolant based 30,000 btu space heater shall be installed in the pump module to prevent freezing of pump and plumbing in extreme cold weather. It shall circulate 400 CFM air flow with dual fans. A three speed resistor shall allow on/off and variable speed control from the pump panel. The heater shall be mounted in a position convenient for service access. The heater shall be mounted vertically, high on the street side of the pump enclosure interior providing easy access for on/off and fan speed control. The heater shall re-circulate water from the chassis engine’s cooling system and shall contain a shut-off valve for summer operation. Premium heater hose, stainless steel clamps and stainless steel hardware shall be used to install the heater.

Manufacturer’s specifications are as follows:

Model 2210	
BTU's	30,000 BTU/Hr

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Air Flow	400 CFM
Current Draw	7.4 Amps @ 13 VDC 3.7 Amps @ 24 VDC
Model	442-2210-1112 5/8" Fittings, Floor Exit 12V
Included Options	Three Speed Rotary Switch & Knob Automotive Hose and Clamp Kit
Dimensions	6.3" Tall x 16.4" Wide x 5.5" Deep

PUMP OVERHEAT PROTECTION

A Hale's Thermal Relief Valve model TRV-L 120 shall be installed on the fire pump to monitor pump water temperature and shall automatically protect the pump from overheating that may be caused by extended periods of “standby” with the pump engaged. The relief valve shall minimize the need for operator attention to overheating during pumping operations by automatically dumping a controlled amount of water to atmosphere or back to tank when the pump water temperature exceeds the preset value (120^{o}F/49^{o}C), and then automatically closes when the water cools. An indicator light installed on the operator’s control panel shall provide a visual warning when the TRV valve is open.

The TRV-L 120 shall provide the following features:

- Protects pump by Automatically Monitoring Water Temperature
- Resets Automatically
- Compatible with Foam Concentrates
- Discharges to Atmosphere or Tank through 3/8” tubing
- Free of Contamination with Integral Strainer
- Exceeds NFPA hydrostatic testing requirements; 600 PSIG (41.4 BAR)

PUMP PANEL RUNNING BOARD - LEFT SIDE

An integral running board shall be installed on the left side of the pump compartment module and shall be formed from .125” embossed aluminum treadplate with sufficient support to form a non-deflecting step area for crew members.
Then inside edge of the running board shall be formed up and spaced away from the pump panel, allowing for water run-off. The outside edge of the running board shall be flush with the rub rail installed on the body, maintaining a uniform appearance.

PUMP PANEL RUNNING BOARD - RIGHT SIDE

An integral running board shall be installed on the right side of the pump compartment module and shall be formed from .125” embossed aluminum treadplate with sufficient support to form a non-deflecting step area for crew members.
Then inside edge of the running board shall be formed up and spaced away from the pump panel, allowing for water run-off. The outside edge of the running board shall be flush with the rub rail installed on the body, maintaining a uniform appearance.

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HOSE THREADS

All inlets and discharges shall terminate in National Hose Threads (NHT) per the standards of the current edition of NFPA pamphlet 1901. Special thread adapters to match existing apparatus and hose couplings are not required.

FOAM CAPABLE DISCHARGES

The following discharges shall be plumbed for Foam as well as water:
1. Crosslay #1
2. Crosslay #2
3. Left Side Forward 2.5” Discharge

PUMP PANEL LABELING AND NAMEPLATES

Discharge and intake valve controls shall be color coded in compliance to guidelines of the applicable sections of the current NFPA pamphlet 1901 standards. Permanent type nameplates and instruction panels shall be installed on the pump panels for safe operation of the pumping equipment and controls.

F O A M S Y S T E M

FOAM SYSTEM

The apparatus shall be equipped with a Hale FoamLogix automatic, direct injection foam proportioning system. Foam proportioning operation shall be based on direct electronic measurement of water flow, and shall remain consistent within the specified flows and pressures.
A 12-VDC powered variable-speed electronic direct-injection foam-concentrate proportioning system with a 2.1-gpm (7.5 LPM) foam concentrate pump shall be integrated into the apparatus to provide foam proportioning. The pump shall be capable of handling Class A foam concentrate only and shall be operated by a full-function electronic control panel with digital display.

Foam capable discharges shall be Crosslay 1, Crosslay 2 and Left side forward 2.5" discharge.

FOAM CELL

There shall be one (1) 15-gallon foam cell built integral with the polypropylene water tank. The foam cell shall have a cover attached with mechanical fasteners to allow access for inspection and cleaning. It shall be equipped with a manual fill tower with a removable filter screen. The fill tower shall have a tethered cover to prevent loss. The tower shall be located at the front center area of the water tank, adjacent to the water tank fill tower. There shall be a manual fill pipe installed inside, 2" down from the top. The fill pipe shall be 3" schedule-40 polypropylene pipe extending to the bottom of the foam cell to allow foam to fill the cell without aeration.
A 2" pressure/vacuum vent shall be installed in the cover.
There shall be two (2) 1/2" FNPT suction connections located on the same plain of the foam cell wall.
A 1/2" shut-off valve shall be installed between the foam cell and the foam system for maintenance.

FOAM TANK LEVEL GAUGE

The apparatus shall be equipped with a Class1 Model 4-Light ITLF tank gauge for indicating foam level. The tank level gauge shall indicate the liquid level on a quick read LED (4) light display and showing foam level increments of 1/8 of a

tank. An audible low level alarm, programmable night dimming and built-in self diagnostics shall be included in the installation.
Each tank level gauge system shall include an industrial pressure transducer with weather resistant connections mounted on the outside of the tank in a readily accessible area in lieu of mechanical probes; and a super bright LED 4-light display with a visual indication at nine (9) accurate levels. [Sealed foam tanks shall include a zero pressure vacuum vent]

W A T E R T A N K

WATER TANK

The water tank shall have a capacity of **300** U.S. gallons (1,136L). Certification of the tank capacity shall be recorded on the manufacturer's record of construction details and shall be provided to the purchaser upon delivery of the apparatus.

TANK CONSTRUCTION

The UPF Poly-Tank ® III shall be constructed of 1/2" thick PT3™ Black polypropylene sheet stock. This material shall be a non-corrosive stress relieved thermoplastic for maximum protection and U. V. stabilized

TANK DESIGN

The booster tank shall be of a specific configuration and shall be so designed to be completely independent of the body and compartments. All tank wall joints shall have a PolyProSeal and all seams shall be nitrogen welded and tested for maximum strength and integrity. The top of the booster tank shall be fitted with removable lifting eyes designed with a 3-to-1 safety factor to facilitate ease of installation and removal.

TANK BAFFLES

The transverse swash partitions shall be manufactured of 3/8" PT3™ polypropylene (natural in color) and extend up from approximately 4" above the floor to just under the top cover. The longitudinal swash partitions shall be constructed of 3/8" PT3 polypropylene (natural in color) and extend from the floor of the tank up through the top cover to provide positive perimeter welding and maximum integrity. All partitions shall be equipped with vent and air passages to permit movement of air and water between baffled compartments. The partitions shall be designed to provide maximum water flow to the tank sump. All swash partitions shall interlock with one another and shall be welded to each other as well as to the walls of the tank.

TANK SUMP

There shall be one (1) sump in the bottom of the water tank. The sump shall be constructed of 1/2" polypropylene and shall be located in the left front quarter of the tank. On all tanks that require a front suction intake, a 4.0" 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 be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 2" above the sump to prevent air from being entrained in the water and whirlpooling while pumping.

TANK FILL CONNECTION

All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and each shall be capable of withstanding sustained fill rates of up to 1,000 GPM.

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TANK LID

The tank top cover shall be constructed of 1/2" thick PT3™ Blue polypropylene to incorporate a multi three-piece locking design that allows for individual removal and inspection, if ever necessary. The tank top cover shall be recessed 3/8" down from the top of the tank and shall be welded to front, rear, both sides and longitudinal partitions for maximum integrity. Each of the top cover sections shall have hold- downs consisting of 2" diameter polypropylene dowels spaced a maximum of 30" apart. These dowels shall extend through the top covers and shall assist in providing rigidity under fast filling conditions. A minimum of two (2) lifting dowels shall be drilled and tapped 1/2" x 13" to accommodate the lifting eyes.

TANK MOUNTING

The UPF Poly-Tank III shall rest on the body cross members in conjunction with such additional cross members, as required by UPF.

The tank shall be isolated from the cross members through the use of hard rubber strips with, a minimum Rockwell Hardness of 60 durometer. Additionally, the tank shall be supported around the entire perimeter and captured at the front and rear as well as side to side to prevent the tank from shifting during vehicle operation.

The tank shall be installed on the free-floating suspension design principle and it shall have sufficient embedded bottom mounted bolting plates to minimize movement during vehicle operation and prevent exit from the tank cavity in the event of a roll-over accident.

The tank shall be completely removable without disturbing or dismantling the pump or body structures.

WATER TANK FILL TOWER

A combination vent and manual fill tower shall be located in the left front corner of the tank. The fill tower shall be constructed of 1/2" PT3 polypropylene and shall minimum dimensions of 8" x 8" at the outer perimeter and be no higher than the hosebed walls. The tower shall be located in the left front corner of the tank. The tower shall have a 1/4" thick removable polypropylene screen and a PT3 polypropylene hinged-type cover, labeled "WATER FILL".

TANK OVERFLOW

The tank shall be equipped with a minimum 4.0" schedule-40 polypropylene overflow/air vent pipe. The pipe shall be installed in the fill tower and extend down through the tank and dump to the rear of the rear axle.

TANK CAPACITY CERTIFICATION

After construction, the tank shall be weighed dry on certified scales, by the tank manufacturer with dry weight recorded. The tank shall then be filled to capacity and re-weighed on the same scale, with wet weight recorded. Exact gallon capacity of the tank shall be obtained by dividing the total water only weight by 8.3. A drawing of the tank with dimensions and weights and capacity shall be delivered to the apparatus builder who shall provide a copy to the apparatus purchaser.

TANK WARRANTY

The tank shall have a lifetime warranty from UPF against leakage due to defects in materials and workmanship.

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B O D Y D E S I G N

MINI-PUMPER BODY

An all aluminum heavy-duty truck body shall be constructed with six (6) side equipment storage compartments: three (3) accessible from the left side and three (3) accessible from the right side. One (1) rear compartment shall be located behind the water tank and forward of the rear platform step. The body shall be formed of 5052-H32 marine grade smooth aluminum alloy. All Compartments shall be sweep-out design with no bottom lip. Compartment access doors shall be roll-up.

BODY DIMENSIONS

Overall length including bumper	123.5” (111.5” + 12” Bumper)
Overall width	96”
Overall height	72”

BODY CONSTRUCTION DETAILS

The body construction shall feature the following standards:
5052- H32 formed aluminum design with continuous welded body sides.

The body sub-frame shall consist of front and rear master cross members of 2” x 4” x .250” wall 6063 structural aluminum tubing. Additional cross members shall be 2” x 4” x .180” 6061-T6 structural aluminum channel, evenly spaced on nominal 12" centers, ahead of and behind the wheelwell.
A center sub-frame reinforcement (short cross member) placed at the centerline of the wheel well shall be 2” x 4” x .250” wall 6061-T6 structural aluminum tubing.
Cross members shall be welded to the underside of a 3/16” smooth aluminum center body floor.

The body shall be fabricated of .125” and .1875" smooth aluminum with no interlocking seams to trap moisture or promote corrosion. All compartment floors, walls and ceilings shall be .1875” smooth aluminum plate with a 500 lb. load rating. All joined seams shall be machine caulked, inside and outside.

The entire front of the body shall be overlaid with .125" bright aluminum treadplate.

BODY SIDES

Body sides shall incorporate a 10” header with formed full length drip rail for upper zone emergency lighting and graphics as specified.
Seamless wheel well panels shall have full circular aluminum inner liners and polished stainless steel fenderetts with a rubberized vinyl separation bead.
Anodized aluminum channel rub rails shall be installed along the bottom of the body sides, spaced out from the body to provide scuff protection for the body and doors.

BODY MOUNTING

The body sub-frame shall be securely bolted to the chassis on each side of the chassis frame, at the front, center and the rear. Mounting brackets shall be offset structural steel angles with dual bolt rigid mounts at the rear and dual bolt spring loaded mounts at the front and center, allowing the mounts to absorb torsional frame stresses during travel.

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The body structure and sub-frame shall carry a Ten (10) year structural warranty.

ALUMINUM BODY MATERIAL THICKNESS

Center Front Bulkhead	.188”
Compartment End Panels (front & rear)	.188”
Compartment Tops	.188”
Compartment Bottoms	.188”
Fender Panels	.125”
Front / Rear Service Panels	.125"

OVERALL COMPARTMENT DIMENSIONS

Front Compartments	72.0” h x 22.0” w x 23.0"d
Center Side Compartments	47.0” h x 50.0” w x 23.0"d
Rear Side Compartments	72.0” h x 34.0” w x 23.0"d
Rear Compartment	53.0" h x 50.0" w x 34.0"d

COMPARTMENTATION DETAILS w/ ROLL-UP DOORS

The following compartments shall be supplied on the apparatus:

Compartment **“L1":** There shall be one (1) full height compartment ahead of the rear wheels, directly behind the chassis cab on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 22” wide by 72.0” high with the lower 18” of the compartment being 23.0” deep to the frame and the upper section shall be 51.0" high x 23.0" deep. The minimum door opening area shall be 17.5" wide x 53.0" high. The usable (closed door) depth shall be 21.5".

Compartment **"L2":** There shall be one (1) compartment located directly over the rear wheels on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 50.0” wide by 23.0” deep and 39.0” high.
The minimum door opening area shall be 47.0" wide x 28.0" high. The usable (closed door) depth shall be 21.5".

Compartment **"L3"**: There shall be one (1) full height compartment behind the rear wheels on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 36.5” wide x 18.0" high x 23.0” deep below floor line and 54.0” high x 23.0” deep above the floor line.
The minimum door opening area shall be 34.0" wide x 53.0" high. The usable (closed door) depth shall be 21.5".

Compartment **"R1":** There shall be one (1) full height compartment ahead of the rear wheels, directly behind the chassis cab on the right side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 22.0” wide by 72.0” high with the lower 18” of the compartment being 23.0” deep to the frame and the upper section shall be 51.0" high x 23.0" deep.
The minimum door opening area shall be 17.5" wide x 53.0" high. The usable (closed door) depth shall be 21.5".

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Compartment **"R2":** There shall be one (1) compartment located directly over the rear wheels on the right side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 50.0" wide by 23.0" deep and 39.0" high.
The minimum door opening area shall be 47.0" wide x 28.0" high. The usable (closed door) depth shall be 21.5".

Compartment **"R3":** There shall be one (1) full height compartment behind the rear wheels on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 36.5" wide x 18.0" high x 23.0" deep below floor line and 23.0" deep x 54.0" high above the floor line.
The minimum door opening area shall be 34.0" wide x 53.0" high. The usable (closed door) depth shall be 21.5".

REAR COMPARTMENT

Compartment **"RR1":** There shall be one (1) compartment located directly ahead of the rear platform step centered on the rear of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 50.0" wide by 34.0" deep and 39.0" high.
The minimum door opening area shall be 47.0" wide x 34.0" high. The usable (closed door) depth shall be 32.5".

FENDER PANELS

Side fender panels above the rear wheels shall be .125" 5052-H32 smooth aluminum. Fender panels shall be painted the same color as the exterior body and trimmed with polished stainless steel fenderetts installed with black welting to eliminate corrosion between dissimilar metals.
Full depth, circular fender liners shall be bolted into each wheel well to prevent road debris from damaging body panels during travel.

COMPARTMENT ROLL-UP DOORS

Seven (7) body compartments shall have ROM brand Series IV roll-up doors with 34-mm width aluminum slats that roll onto a spool at the top of the compartment. Each slat shall have interlocking end shoes to prevent each slat from moving side-to-side and binding the door. Between every slat shall be a co-extrusion PVC & Rubber inner seal to prevent metal-to-metal contact and to prevent dirt and moisture from entering the compartment. The inner seal shall be hidden to provide a consistent stacked shutter appearance on the exterior of the closed door.

Each individual roll-up door shall have a four-inch diameter counter-balanced door operator drum to assist with raising the door. A two-inch wide finger pull-bar shall be integrated as part of the bottom door rail extrusion allowing easy one-hand opening and closing of the door. Nylon wear shoes shall be installed on both ends of every slat to assure consistent, easy door operation without constant lubrication.

The door slats, track and trim-frame shall have an anodized satin finish to eliminate oxidation and rusting. The top pf each door shall have a drip channel while the bottom of each door frame shall have a "V" shape sill to ensure a positive water tight seal.
The door latch system shall be a full-width, one-piece, non-locking lift bar, easily operable by one gloved hand. When necessary, the drum operator shall be adjustable for tension assist with basic hand tools.

TREADPLATE AND TRIM

All tread plate shall be 3003-H14 bright aluminum. All horizontal surfaces suitable for walking or stepping shall be embossed .125" bright aluminum Treadbrite and shall meet NFPA requirements for non-slip surfaces.

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REAR VERTICAL GRAB RAILS

Handrails made from 1.250” diameter knurled aluminum extrusion and anchored with chromed zinc end stanchions shall be installed vertically on the rear of the apparatus, one on each side to provide assistance for crew members accessing the top area of the body. Vertically mounted bottom stanchions shall have a drain hole to prevent freezing.

FRONT BODY ASSIST STEPS

Four (4) LED lighted, heavy-duty folding steps meeting current NFPA standards shall be provided and mounted two (2) on the driver's side and two (2) on the passenger's side body front to provide ease of access to the crosslay hosebeds and to items located in/or on the upper body (water tank fill stack).

REAR BODY ASSIST STEPS

Heavy-duty cast aluminum folding steps meeting current NFPA standards shall be provided at the rear of the apparatus. Each step shall have a surface area of 35-square inches and shall be load rated at 1,000 lbs. Steps shall have two large open slots to prevent buildup of ice or mud and the slots shall be of sufficient size and shape to be used as hand holds. Steps shall be illuminated with LEDs.

The steps shall be mounted vertically and may be staggered as necessary to provide easy climbing access.
LOCATION: 3 steps at rear of body, staggered on left side.

STOKES BASKET STORAGE

A storage rack made of .125" aluminum treadplate shall be installed on the right side compartment tops to accommodate one (1) Fire Department furnished Ferno Washington Stokes basket. The storage rack shall be installed in a manner that allows access to the Stokes basket from either side of the vehicle. A retaining strap with a quick-release buckle shall be installed at each end of the rack to prevent the basket from contacting the body compartment doors.

LOCATION:
[The exact location shall be as directed by the Fire Department during the Pre-construction conference.]

COMPARTMENT TOP PROTECTION

There shall be bright aluminum treadplate overlays installed on the apparatus in areas designated as walking areas or where additional scuff protection for the apparatus finish is required.

The compartment top overlays shall be .125" embossed aluminum treadplate mounted with the outer edges formed down at an angle to provide a drip eave above the compartment doors. Inner edges shall be formed up, providing a scuff flange for the side panels.

Overlays shall be totally insulated from the apparatus with nylon shoulder washers that extend into the hole that is drilled into the body. Stainless steel cap nuts shall be employed where bolts may damage equipment or cause injury. Flush seam edges shall be caulked to prevent moisture from seeping between the wall and the overlay.

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HINGED TANK AREA ROOF

There shall be a 2-piece hinged aluminum treadplate roof installed on the apparatus, fully covering the water tank and rear compartment area, between the side compartments. Each roof panel shall be held in the open and closed positions by dual gas charged pneumatic cylinders. A chrome finish grip handle shall be installed on the rear top edge of each panel to assist in raising the panels from the rear step.

The roof shall be .125" embossed aluminum treadplate supported by perimeter framing, hinged on the outside edges, along the side compartments. The front edge of the roof shall be formed down, adding strength to the roof panel and providing a rain cap across the front roof line. The rear of the roof panels shall be supported by a bolted, removable cross bar header. The removable header shall permit easy access to the water tank for maintenance when required. A top opening for each tank fill tower shall be placed in the appropriate roof panel to allow rapid filling of the tanks from an outside source.

REAR BODY FENDERETTES

A roll-formed, polished stainless steel fenderette shall be installed around the outboard edge of the rear wheel well openings to protect the body sides from road debris. They shall be bolted to the body and shall be replaceable.

REAR MUD FLAPS

The rear body wheel area shall be equipped with hard rubber/vinyl mud flaps to limit debris and road spray being transferred from the rear tires onto the rear body sides and rear step. Mud flaps shall be easily replaceable and held in position with stainless steel hardware.

12” REAR PLATFORM STEP

A modular bolt-on rear platform step made of .188” embossed aluminum Treadbrite shall be installed on the rear of the apparatus to provide a full width step area with sufficient support to prevent deflection when in use by several crew members. The outside edges of the rear platform shall be flush with the side body rub rails to maintain a uniform appearance.

The step shall protrude twelve (12) inches back from the rear of the body and shall be spaced away from the body to allow water run-off.

REAR TRAILER HITCH ACCESS

The center section of the rear platform step shall be hinged and shall fold-up, allowing clear access to the hitch receiver. The outside edges of the rear platform shall be flush with the side body rub rails to maintain a uniform appearance.

BODY SIDE RUB RAILS

Replaceable extruded aluminum channel rub rails, designed to help protect the lower body against accidental contact, shall be installed below the lower side compartments. Each rub rail shall be spaced out from the body with solid black rubber stand-offs. All rub rail ends shall be angle cut, back toward the body to eliminate the possibility of snagging crew clothing or equipment.

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COMPARTMENT FLOOR LINING

Four (4) compartment floors shall be furnished with Black interlocking Dri-Dek floor lining made of .75” thick re-cycled PVC with a grid style surface to maximize traction and drainage.

Floor lining shall be installed in all body compartments excluding compartments utilizing a pump, booster reel and/or floor mounted roll-out tray. All factory installed trays and shelves, when specified by the Purchaser, shall also be provided with Black Dri-Dek tiles.

COMPARTMENT VENTS and DRAINS

Each body compartment shall be properly vented in a manner that will minimize the possibility of moisture and road dirt entering the compartment. Venting shall be to atmosphere rather than into another compartment. Each compartment shall also be equipped with floor drains to allow water to exit below the chassis frame.

ADJUSTABLE SHELVING TRACKS

All six (6) side compartments shall be furnished with Adjustable shelving track installed. The shelving track shall include a minimum of four (4) aluminum Uni-strut style channel tracks, mounted vertically on compartment side walls or vertical partitions. There shall be one (1) formed aluminum shelf angle bracket per shelving track to mount each shelf, tray, or adjustable storage module. Shelving hardware shall be heavy-duty commercial quality, providing unlimited vertical position adjustments.

WALL MOUNTED TOOL BOARD - REMOVABLE

Two (2) compartments shall have PAC-TRAC tool mounting slats shall installed on the back wall as directed by the Fire Department. The PAC TRAC shall be constructed of 7/8" thick 6063-T5 extruded aluminum and shall hold and organize a variety of tool mounts.
LOCATION: L2 and R2

ADJUSTABLE TRAYS

Four (4) vertically adjustable trays shall be installed as directed by the Purchaser. Trays shall be made of .188” smooth aluminum with a 2” high perimeter retaining lip with welded corners. Trays shall have a rated capacity of 400-lbs. and shall be supported by a minimum of four (4) heavy-duty shelf brackets. Trays shall have a maintenance free mill finish.
LOCATION: 1-each in L1, L2, L3, R1, R2 and R3.

FLOOR MOUNTED SLIDE-OUT TRAY - 600 lbs

One (1) heavy-duty SlideMaster AM3 slide-out equipment tray with 100% extension shall be provided in an exterior compartment as required by the Purchaser.

The tray shall be fabricated from .188" 5052-H32 aluminum alloy smooth plate with a 4" high perimeter lip having welded corners to form a box type tray surface. The tray shall be mounted on a slide frame constructed of anodized aluminum extrusions. The frame shall be assembled using stainless steel fasteners (no welds). Each slide shall use a three-extrusion rail design utilizing multiple urethane rollers.

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Each roller shall contain two (2) precision roller bearings mounted in an aluminum hub with a molded urethane cover. The rollers shall not lose contact with the rail extrusion during operation of the slide unit.
Each slide shall have a cable operated, spring-loaded latch complimented by a large hand opening and a Red pull handle (Pull-to-Release).
The slide shall lock in the closed and full extension positions.
The slide shall be rated for a maximum distributed load of 600-lbs. and a 250-lbs.end load.
LOCATION: RR1

TOW HOOKS – REAR

Two (2) heavy duty cast iron tow hooks, shall be installed at the rear of the body above the rear step. The tow hooks shall be installed, one on each side, bolted to the chassis frame rails.

DIESEL EXHAUST FLUID TANK ACCESS PANEL

The left side body mounted Diesel Exhaust Fluid fill shall be accessed through a flush-fit cast aluminum door with a spring tensioned retaining hinge. The door shall be labeled "Diesel Exhaust Fluid".

FUEL TANK FILL ACCESS PANEL

The left side body mounted fuel fill shall be accessed through a flush-fit cast aluminum door with a spring tensioned retaining hinge. The door shall be labeled for fuel type.

NAMEPLATES AND INSTRUCTION PLATES

All controls, switches, gauges and indicators shall be labeled with a permanent nameplate.

All nameplates and instruction plates shall be metal or plastic with the information engraved, stamped or etched on the plate. If metal, they shall be made of non-corrosive material.
Equipment Instruction Nameplates shall show make, model, serial number(s) and other such data necessary to positively identify the items.

All plates shall be mounted in a conspicuous location with stainless steel screws and bolts where possible.
Nameplates shall include all NFPA 1901/1906 requirements for this type of apparatus.

HARD SUCTION HOSE STORAGE

A pair of “V” shape troughs, each designed to support a Nine (9) foot section of hard suction hose, shall be horizontally stacked above the side compartments on the left side of the body, adjacent to the hose bed. The troughs shall be formed of .125” smooth aluminum and shall have a sanded grain finish. Each trough shall have two (2) retention straps affixed at each end via footman's loop attached to the trays.

ATTIC LADDER MOUNTING BRACKET

One (1) chrome Quic-Mount attic ladder mounting bracket set shall be installed on the apparatus as directed by the Fire Department.
LOCATION: Top of left side compartments.

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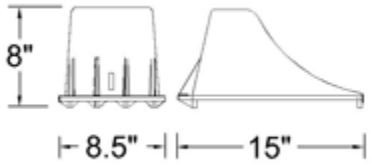
HARD SUCTION HOSE

Two (2) lengths of Kochek clear PVC hard suction hose for drafting only, shall be provided with a black helix wrapper spine to provide tube support while the material remains flexible in cold weather/water conditions to -40 degrees F. Anodized hardcoat aluminum couplings shall be leak proof with a large poly lock 2-bolt sealing clamp to the hose. The hose bore shall be ultra smooth to promote unrestricted flow.
Each Hose shall be 6” in diameter x 9’ in length.
Female Long Handle swivel connection shall be 6” NH threads.
Male Rocker Lug rigid connection shall be 6” NH threads.

WHEEL CHOCKS

A pair of molded aluminum Worden model HWG dynamic gripper wheel chocks shall be installed as directed by the Fire Department using Worden model U815 underbody mounting brackets.
Wheel chocs shall weigh 7.5 lbs. each with measurements of 8.0” high x 15.0” long x 8.5” wide and shall meet SAE 4905 specifications.
Dimensions



E L E C T R I C A L

12-VOLT ELECTRICAL SYSTEM

The apparatus body manufacturer shall supply two (2) complete sets of electrical drawings/schematics at time of completion for all added electrical equipment that is not provided by the chassis OEM. Drawings shall detail any connections or taps to OEM wiring harnesses and note their locations. Drawings shall detail fuse locations and functions for all added equipment.

All added electrical equipment shall be served by circuits separate and distinct from the chassis circuits. All vehicle 12VDC wiring shall be copper cross link polyethylene jacket wiring, rated to 272 degrees Fahrenheit, and shall conform to all SAE J1128 requirements. The wiring shall be color-coded, numbered, or function imprinted for permanent identification and correspondence with the vehicle schematics. The harnesses shall include factory-installed plugs/receptacles for standard fixture installation and for common add-on type devices.

All wiring devices, switches, outlets, etc. except circuit breakers, shall be rated to carry 125% of the maximum ampere load for which the circuit is protected. All vehicle electrical wiring originating at any of the system operating components shall include circuit protection to sense a short and shut down the affected circuit.

Any circuits protected below 6-amps shall use an ATC type fuse and holder. All circuits requiring larger than 10-gauge wire shall include crimped and soldered copper lugs. All major power distribution components shall be located in the cabinet electrical panel.

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The emergency lighting harness and associated cables shall be a part of the standard wiring harness, shall have the component plugs factory installed and shall not be add-on cables. The wiring shall terminate at all standard required lighting locations. Termination points used to provide power for fixtures exposed to the elements shall include Deutsch weatherproof connectors.

All heavy gauge power distribution cables shall conform to SAE J1127 and shall be enclosed in fire retardant nylon convoluted split loom. These cables shall be routed separate of the main wiring harness, secured independently on the interior of the module with rubber protected coated steel cable clamps and/or HD cable ties. Battery cables in the engine compartment and routed through the fire wall shall be protected with pass-through grommets, secured with cable straps, and shall run un-broken from the battery location to the main power distribution panel.

All wires passing from the compartment door frame to the door shall be grommeted, encased in a protective flexible loom, routed and anchored to prevent the wires from being pinched in the door. Externally mounted wiring that is visible when the door is closed and not hidden in the door frame shall not be permitted or accepted.

A minimum 6-inch service loop of wire shall be provided at all electrical devices (lighting, door switches, chargers, 110-VAC, switch panels, etc.). There shall be sufficient length for two (2) terminal changes on components in the power distribution panel.

There shall be a minimum of one (1) spare switch at the front switch panel with corresponding output located in the power distribution panel. The spare output shall be designed to allow the end user/owner to make switch controlled additions to the standard system with no modifications to the chassis OEM wiring. There shall be two (2) additional grounding straps installed one (1) on each side of the body, behind the rear axle to augment the chassis OEM provided chassis ground and the 3/0 battery cabling ground.

ELECTRICAL TESTING

To ensure proper balance of the electrical system output and vehicle draw, the vehicle proposed shall be provided with a post production detailed electrical load analysis generated by the apparatus manufacturer.

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

The vehicles low voltage electrical system shall be tested and certified by the manufacturer. The certified test results shall be delivered with the completed vehicle. Tests shall be performed when the air temperature is between 0°F and 110°F (–18°C and 43°C).

TEST SEQUENCE

The following three (3) tests shall be performed in the order in which they appear below. Before each test, the batteries shall be fully charged until the voltage stabilizes at the voltage regulator set point and the lowest charge current is maintained for 10-minutes. Failure of any of these tests shall require a repeat of the sequence.

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 10-minutes.

All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of re-starting the engine. Failure to re-start the engine shall be considered a test failure of the battery system.

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2. ALTERNATOR PERFORMANCE TESTS

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.

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 2 hours. Activation of the load management system shall be permitted during this test.

An alarm sounded by excessive battery discharge, as detected by the warning system required in 13.3.4, or a system voltage of less than 11.8-vdc for a 12-vdc nominal system, 23.6-vdc for a 24-vdc nominal system, or 35.4-vdc for a 42-vdc nominal system for more than 120-seconds shall be considered a test failure.

3. LOW VOLTAGE ALARM TEST

The following test shall be started with the engine off and the battery voltage at or above 12-vdc for a 12-vdc nominal system, 24-vdc for a 24-vdc nominal system, or 36-vdc for a 42-vdc nominal system.

With the engine 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.

The test shall be considered a failure if the alarm does not sound in less than 140-seconds after the voltage drops to11.7-vdc for a 12-vdc nominal system, 23.4-vdc for a 24-vdc nominal system, or 35.1-vdc for a 42-vdc nominal system.

The battery system shall then be able to re-start the engine. Failure to re-start the engine shall be considered a test failure.

DOCUMENTATION

The manufacturer shall deliver the following with the fire apparatus:

(1) Documentation of the electrical system performance tests

(2) A written electrical load analysis, including the following:

(a) The nameplate rating of the alternator

(b) The alternator rating

(c) Each of the component loads specified that make up the minimum continuous electrical load

(d) Additional electrical loads that, when added to the minimum continuous electrical load, determine the total continuous electrical load

(e) Each individual intermittent electrical load.

ELECTRICAL SYSTEM (CHASSIS OEM)

The commercial chassis electrical system shall be furnished and installed by the chassis manufacturer and shall not be altered in any way so as to void or diminish the manufacturer's warranty responsibilities. Body builder wiring interface harnesses shall be specific to the chassis being utilized and the apparatus specifications with all such harnesses, circuits and connections being documented by the body builder and made part of the electrical schematics provided with the completed apparatus.

ALTERNATOR (OEM)

The alternator shall be installed by the chassis OEM only and shall not be modified or upgraded by the apparatus manufacturer. The charging system shall not be modified in any way so as to void its chassis OEM warranty.

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BATTERIES (OEM)

The chassis shall be ordered to include chassis OEM installed Maintenance Free batteries. Batteries shall be disconnected during the apparatus build process to prevent premature failure due to excessive cycling during the manufacturing process. Batteries shall be re-connected at the end of the build process as the unit becomes ready for testing and delivery. There shall be no exception to this requirement.

ELECTROMAGNETIC INTERFERENCE PROTECTION

The apparatus shall incorporate modern electrical system design, installation procedures, grounding techniques and wave generating components to provide the highest level of protection against electromagnetic interference (EMI) and radio wave frequency interference (RFI). The apparatus shall be designed to operate and correctly function in congested municipal environments as well as industrial or concentrated commercial scenes without adverse effects from either EMI or RFI. Communications equipment installed after the apparatus is delivered shall be immediately tested by the installer for reception and transmission signal quality.

REAR LICENSE PLATE HOLDER

A bright finish cast aluminum license plate holder with (3) grommet mounted Red LED lights shall be installed on the rear of the vehicle, centered at the top of the step riser panel. The license plate shall not interfere with warning, scene or directional lights and shall also serve as the ICC DOT required 3-light cluster.

BODY MARKER LIGHTS AND REFLECTORS

The side body panels shall be furnished with LED marker lights installed as follows:
(1) TecNiq S33-AA9B-1 Amber marker light on each side at front top corner of the body.
(1) TecNiq S33-AA9B-1 Amber marker light on each side at front bottom corner of the body.
(1) TecNiq S33-RR9B-1 Red marker light on each side at rear top corner of body
(1) TecNiq S33-RR9B-1 Red marker light on each side at rear bottom corner of body

The rear body panel, centered above the bumper, shall be furnished with LED marker lights installed as follows:
(1) TecNiq S33-RR9B1 Red marker light on each side of rear body wall, at upper corners.
(3) TecNiq S33-RR00-1 red marker lights recessed with rubber grommet.
Lights shall carry the manufacturer's lifetime warranty.

Red and Amber reflectors with chrome bezels shall be installed and located per FMVSS requirements.

BODY STEP LIGHTS

There shall be four (4) TecNiq model EON linear LED lights installed; two (2) above the rear body platform step and one (1) on each side of the body on the front compartment wall to provide night time visibility for personnel when climbing on and off of the rear body and pump module. Lights shall be 0.9” wide x .5" high x 2.9" long with a diffused polycarbonate lens to maximize the light pattern. The lights shall have fully encapsulated electronics; a gasket mounted polished stainless steel case and shall draw 1.9 watts. Lights shall be wired to illuminate when the Park Brake or Park Gear is set and the running lights / headlights are switched on.
Lights shall carry the manufacturer’s Lifetime warranty.

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DO NOT MOVE VEHICLE - WARNING SYSTEM

A .75" diameter [Red] flashing LED light shall be installed in the cab center console to warn the driver "DO NOT MOVE VEHICLE" whenever one of the apparatus doors is ajar or open. The warning light shall be interlocked to the parking brake and shall only alert the driver when the parking brake is released. The light shall also be used to signal that other ancillary equipment such as racks light towers etc. are not in their “ready for transport” position.

EMERGENCY LIGHT SWITCH CONSOLE

A TST six (6) position TouchTek model TTSP2-6TST lighted rocker switch console shall be provided and installed within easy reach of the driver and officer. A master pre-select power switch shall be provided that shall automatically sequence on all the Fire Department pre-selected warning lights. Each switch shall be Single Pole / Single Throw, rated for 25-amps, labeled and backlit for ease of use.

TAIL LIGHTS

Rear body tail lights shall be 4" x 6” and vertically mounted on each side of the rear of the vehicle per Federal Motor Vehicle Safety Standards. The following lights shall be furnished:

- Two (2) TecNiq K-60 Series model K60-AAAO-1 Amber Arrow LED Sequential turn signal lights
- Two (2) TecNiq K-60 Series model K60-STRO-1 Red LED stop/tail lights
- Two (2) TecNiq K-60 Series model K60-WBUO-1 Clear LED back-up lights with clear lens

Lights shall carry the manufacturer's lifetime warranty.

TAIL LIGHT MOUNTINGS

A chrome mounting trim ring shall be provided for each tail, turn and back-up light mounted on the rear of the apparatus body, for the specified lights.

DIRECT GROUNDING STRAPS

The body and pump module shall be independently and directly grounded to the chassis frame. The body shall be directly grounded on each side, to the chassis frame, behind the rear axle. Bolted connections shall be used at each end of the ground straps. Connection points shall be treated with PPG ECK anti-corrosion formula gel.

ELECTRICAL DISTRIBUTION PANEL

The vehicle shall be equipped with a sealed Transportation Safety Technologies model TTPC2-10 body electrical power distribution panel providing electrical systems engineering to the fire apparatus body. The design shall provide a standardized platform for a reliable and repeatable electrical system which shall be documented and easily maintained. The distribution panel/controller shall increase electrical reliability, serviceability and user confidence in the overall apparatus electrical system.

The electrical distribution panel shall incorporate wiring harnesses that meet or exceed NFPA standards while providing centralized circuitry for right and left body harnesses, pump module harness as well as cab and engine harnesses. All harnesses entering and exiting the distribution panel shall be protected by locking bulkhead connectors with sealing collars.

Internal wiring terminals shall be machine crimped to the wire ends and all splices shall be electronically welded.

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The circuit relay board shall be sized to provide the amount and type of relays necessary for the apparatus specifications. Diagnostic LEDs shall indicate switch activation and therefore aid in troubleshooting any electrical service issues that may arise.
The distribution panel including all circuits shall be documented and made part of the apparatus Owner's Manual.

AUXILIARY BODY 12-VDC POWER

Two (2) fused 20-Amp 12-VDC circuits shall be provided; one (1) down each side of the body, with accessible 24" service loops labeled and installed in L2 and R2 side compartments for future installation of hand lights and or other similar equipment.

W O R K L I G H T I N G

COMPARTMENT LIGHTING

Fourteen (14) Buyer's 48" LED lighting strip shall be installed in the door mounting track or jamb providing 120 degree viewing. The cool white light strip shall be protected from impact by a polycarbonate lens and produce 940 lumens from 72 LEDs.
The light strip shall be controlled by an automatic door switch that turns light on when compartment door is opened and immediately off when compartment door is latched.

DECK LIGHTS

Two (2) TecNiq model P06-WWFP-1 rectangular heavy-duty SteelHead rear facing work lights shall be installed at the front of the body to provide illumination per current NFPA pamphlet 1901 standards. The rectangular steel housing shall contain six (6) high output LEDs producing 1900 Lumens through a sealed flood pattern optics lens. The lights shall be switched with the step lights' switch in the cab. The lighthead shall overall dimensions of 6.2" wide x 3.1" high x 2.0" deep and shall mount on a 5/8" 1/4-20 stud with a 1" high dual plane swivel bracket.

TRAFFIC LIGHT CONTROL EMITTER

A Whelen model 795DM self contained LED IR GTT Opticom Emitter shall be dash mounted for driver/officer control of traffic lights in the area served by the Fire Department.
The purchaser shall furnish their traffic light control number code in writing, at the Pre-Construction conference.

S C E N E L I G H T S (12-VOLT)

SCENE LIGHTS - TELESCOPIC

Two (2) Fire Research Corporation (FRC) Evolution low profile LED lamp heads shall be installed on telescopic poles located as directed by the Fire Department. Each lamp shall generate 15,000 lumens of ultra bright white light. Light output shall be instant-on at full intensity and shall provide immediate restarts with no warm-up time required.

The lamp head's parabolic reflector shall project the light directly onto the action area and also illuminate the immediate working area around the vehicle.

Lights shall be 12-volt powered, drawing 6.5-amps each and shall be rated for 50,000 hours usage. They shall be installed on an FRC model FCA530 V-15 aluminum telescoping pole which shall allow the lamp head to rotate 360 degrees and shall also be NFPA compliant for use as a handrail. Lights shall be permanently wired through extra heavy-duty retractile

cord and shall be controlled by a switch mounted on the lamp head. The push-up pole and lightheads shall carry the manufacturer's 5-year warranty.

S I R E N

ELECTRONIC SIREN / SPEAKER

A Whelen 295SLSA1 single unit 200-watt electronic siren with a hard wired noise canceling microphone, Radio Rebroadcast and Public Address functions shall be installed in the cab as directed by the Fire Department. The siren shall produce 17 scan-lock tones and shall draw a maximum of 18-amps. It shall measure 3-5/16” high x 6.0” wide x 7.0” deep. It shall have a 100-watt / 200-watt selector switch and shall perform self-diagnostics, should a malfunction occur.

(1) Whelen model SA315P composite Hi-Performance 100-watt siren speaker shall be mounted behind the front bumper.

The siren amplifier shall carry a manufacturer’s 5-Year warranty against defects in materials and workmanship.

W A R N I N G L I G H T S

NFPA CERTIFIED WARNING LIGHTING REQUIREMENTS

The fire apparatus' optical warning system shall be capable of two (2) separate signaling modes during emergency run deployment.
The first (primary or response) mode shall be "Calling for the Right-of-Way"
The second (on-scene or stand-by) mode shall be "Blocking the Right-of-Way"
Through the use of interlock circuits, the pre-selection of optical warning devices may be modified for each mode.

WARNING LIGHT OPERATION

The following warning lights shall meet the minimum warning light standard as presented in the current edition of NFPA pamphlet 1901Standard for Automotive Fire Apparatus. The below specified warning lights shall meet the standards for "Calling for the Right-of-Way" - signaling drivers and pedestrians that the apparatus is responding to an emergency and for "Blocking the Right-of-Way" signaling to drivers and pedestrians that the apparatus is stopped and active.

Switching between the two modes shall be accomplished automatically by a sensor on the transmission's "Park" selection or on the air brakes' system Park Brake control circuit. When the sensor operated switch is closed and the Transmission Park mode is de-selected or when the Air Park Brake is released, then the optical warning devices used for "Calling for the Right-of-Way" shall be powered.
When the sensor operated switch is closed and the Transmission Park mode is selected or when the Air Park Brake is activated, then the optical warning devices used for "Blocking the Right-of-Way" shall be powered.

The warning light system shall be activated by a single control switch located in the cab and convenient to Driver and Officer.

Warning lights shall be certified by their respective manufacturer to be in compliance with the minimum requirements of the NFPA standard for this type apparatus.

Warning light visibility shall be divided into Zones around the vehicle and each Zone shall have an Upper and a Lower component.

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EMERGENCY WARNING LIGHT PACKAGE

The following lighting package shall be installed in compliance with the current edition of the National Fire Protection Association (NFPA) Pamphlet 1901 Fire Apparatus Standard. All warning and signal light switches shall be located inside the cab and each shall be provided with an on/off indicator light.

UPPER ZONE WARNING LIGHTS

ZONE A (FRONT)
LIGHTBAR
One (1) Whelen Engineering Justice model JE2NFPA 56" LED light bar shall be installed on the cab roof with a permanent mounting bracket.
The lightbar shall be configured as follows:

four (4) corner mounted Red LIN6 LED lightheads
two (2) JDCR Red CON3 Super-LED lightheads in the outboard positions
two (2) JDCC White CON3 Super-LED lightheads in the second forward positions
two (2) JDCR Red CON3 Super-LED lightheads in the third forward positions
two (2) rear facing JDCA Amber CON3 Super-LED lightheads in the outboard positions

All forward facing White emergency lights in the light bar shall be deactivated when the parking brake is engaged in the "Blocking Right of Way" mode as required by NFPA.

ZONE C (REAR)
Two (2) Whelen LINZ6 Super-LED lights shall be installed at the rear of the apparatus, one on each side with a chrome mounting flange. The Left Side shall be Blue and the Right Side shall be Red. The lights shall be mounted as high as possible and shall have Red LEDs and Clear lens covers.

LOWER ZONE WARNING LIGHTS

ZONE A (FRONT)
Two (2) Whelen LINZ6R Super-LED Red lights shall be installed at the front of the apparatus, one on each side of the grille, with a chrome mounting flange. The lights shall have Red LEDs and Clear lens covers.

ZONES B and D (SIDES)
One (1) Whelen LINZ6R Super-LED Red lights shall be installed on the right side and left of the apparatus on the side of the cab fender, with a chrome mounting flange. The lights shall have Red LEDs and Clear lens covers.
One (1) Whelen LINZ6R Super-LED Red light shall be installed on the right side and left side of the body at the front of the rear fender with a chrome mounting flange. The lights shall have Red LEDs and Clear lens cover.

ZONE C (REAR)
Two (2) Whelen LINZ6R Super-LED Red lights shall be installed at the lower rear wall of the apparatus, one on each side under the back-up light, with a chrome mounting flange. The lights shall have Red LEDs and Clear lens covers.

All LEDs shall carry a manufacturer's five (5) Year warranty

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B O D Y P R E P & F I N I S H

PRE-PAINT PREPARATION

After the body and components have been fabricated and assembled they shall then be disassembled prior to painting to achieve finish paint protection beneath the removable components. The body shall be totally removed from the chassis during the painting process to ensure the entire unit is covered. The apparatus body and components shall be metal finished as follows to present a superior substrate for painting.

All aluminum sections of the body shall undergo a four-step cleaning process starting with a Zirconium based wash to begin the cleaning and etching process. A phosphatizer shall then be applied to complete the etching process and deposit a protective film on the metal surface. The final step shall consist of a non-chromatic rinse to seal the protective film and to rinse away any excess phosphate solution.
After the cleaning process, the body components shall be primed with a High Solids primer and the compartment and exterior panel seams shall be machine caulked.

PAINT PROCESS

The paint process shall follow the strict standards as set forth by PPG Fleet Finish Guidelines.

The body shall go through a three-stage paint process: primer coat, base coat (color), and clear coat. In the first stage of the paint process, the body shall be coated with PPG F3980 Low VOC / High Solids primer to achieve a total thickness of 2-4 mils. In the second stage of the paint process, the body shall be painted with PPG FBCH Delfleet™ High Solids Polyurethane Base Coat. A minimum of two coats of color paint shall be applied to achieve hiding. In the final stage of the paint process, the body shall be painted with PPG DCU-2002 Clear Coat. A minimum of two coats shall be applied to achieve a total dry film thickness of 4 to 6-mils.

As part of the curing process, the painted body shall go through a Force Dry / Bake Cycle process. The painted components shall be baked at 185-degrees F for 3-hours to achieve a complete coating cure on the finished product.

FINAL FINISH

After the force dry / bake cycle and ample cool down time, the exterior coated surface shall be sanded using 3M 1000, 1200, and/ or 1500-grit sandpaper to remove surface defects. In the final step, the exterior surfaces shall be buffed with 3M super-duty compound to add extra gloss to the coated surface. No more than .5- mil of clear shall be removed in this process.

PAINT - ENVIRONMENTAL IMPACT

The contractor shall meet or exceed all of their State’s current regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water and soil. PPG Delfleet® Evolution paint shall be free of all heavy metal (lead & chromate) components. Paint emissions from sanding and painting shall be filtered and collected. All paint wastes shall be disposed of in an environmentally safe manner. Solvents used in cleanup operations shall be collected and sent offsite for distillation for reuse.

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PAINT COLOR

The PPG finish paint color of the body shall match the chassis OEM paint color of the cab. [RACE RED]
A sample spray-out panel shall be furnished to the Purchaser for signature approval, prior to paint application.

EXTERIOR ROLL-UP DOOR FINISH

The roll-up doors shall have a satin aluminum finish on the door slats and the door trim components.

COMPARTMENT INTERIOR FINISH

The compartment interior side and back walls shall be cleaned and left in a natural mill finish.

COMPARTMENT TRAY FINISH

The specified compartment trays/shelves/tool boards shall be natural mill finish with all welds cleaned and dressed.

OEM PAINTED CHASSIS CAB

The chassis cab shall be painted and warranted by the chassis manufacturer.

CHASSIS WHEEL FINISH

The chassis wheels shall be painted steel or bright aluminum, as furnished by the chassis OEM. No additional finishes shall be provided by the apparatus manufacturer.

PUMP MODULE FINISH

The pump enclosure interior shall be natural mill finish aluminum.
The pump enclosure exterior shall have a uniform fine grain DA sanded finish.

The pump body shall be painted the standard color by the pump OEM.
Stainless steel plumbing, high pressure hose lines, pressure gauge lines, electrical wiring harnesses, foam system components, valve control linkage joints and lighting shall not be painted.

PUMP STEAMER AND INLET VALVES
The exposed portion of the pump steamer(s) and gated inlet valve(s) shall be painted with PPG polyurethane enamel paint. The paint color shall match the apparatus body.

ANTI-CORROSION PROTECTION

Where dissimilar metals must be joined, overlaid, share perforations or otherwise come in contact with each other to achieve construction, performance or aesthetic requirements, such items shall be separated by a continuous contact, non-conductive coating or film to prevent or otherwise mitigate the effects of electrolysis.
Only stainless steel hardware and fasteners shall be used in the construction of the apparatus. Where stainless steel fasteners pass through an aluminum component, the fastener contact surfaces, including the head, washer and nut shall be coated with ECK anti-corrosion material.

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BODY and CAB UNDERCOATING

The body and cab underside, including the sub-frame and the inside of the wheel wells shall be thoroughly coated with SWT commercial automotive undercoat and sound deadening material to protect the body module against corrosion. The coating shall be black and shall be tested to ASTM B117 Salt Spray test for 1,000 hours at 10-mils.

G R A P H I C S

LETTERING AND STRIPING

Lettering shall be provided by the Fire Department through a local graphics artist so that the Fire Department may make design detail decisions directly with the graphics provider. All striping shall be completed by the apparatus builder prior to final inspection and delivery of the vehicle to the apparatus Dealership.

REFLECTIVE STRIPING - SCOTCHLITE

4" wide 3M Scotchlite retro reflective [White] striping shall be affixed to the cab and body sides of the apparatus.

The striping design shall be installed by a graphics artist, as directed by the Fire Department. All striping reflective material and installation shall comply with current NFPA standards. Reflective material to be installed according to manufacturer's recommendations and any cut edges of the material shall be sealed with 3M edge sealer. A striping design layout drawing shall be provided to the Fire Department for approval, prior to graphics installation.

REFLECTIVE STRIPING - REAR

The back of apparatus less the compartment door shall be covered with 3M Diamond Grade™ reflective material in an alternating color, chevron pattern. Chevron stripes shall each be 6" wide, alternating Red and Yellow, configured in an "A" pattern and shall not be applied to the cargo access door.

All reflective material and installation shall comply with current edition NFPA pamphlet 1901 standards. Reflective material shall be installed in compliance with manufacturer's recommendations. All cut edges of the reflective striping material shall be sealed with 3M edge sealer. The rear striping layout shall be pre-approved by the Fire Department.

REFLECTIVE STRIPE - CAB DOOR INTERIOR

Each cab door interior panel shall have a 4" wide White reflective stripe meeting the requirements of the current NFPA standards.

W A R R A N T Y

BASIC WARRANTY

The apparatus body manufacturer shall warrant its products to be free from defects in materials and workmanship.
A One (1) Year parts and labor limited warranty shall be provided by the apparatus body manufacturer to the first purchaser/user of the apparatus per the terms and conditions stated in the apparatus body manufacturer's warranty certificate. This warranty shall pertain only to apparatus body manufacturer's parts and accessories and installation only

of trade components and systems. All product warranties by OEM component and system manufacturers shall be extended to the Purchaser and documented by the apparatus body manufacturer.

STRUCTURAL WARRANTY

The apparatus body manufacturer shall warrant its Aluminum body structure, including panels and sub-frame, against bending, cracking, twisting or otherwise deforming for a period of Ten (10) Years from date of shipment per the terms and conditions stated in the apparatus body manufacturer's warranty certificate.

PAINT WARRANTY

The apparatus body manufacturer shall warrant the paint and primer for a period of Five (5) Years from the date of delivery to the original purchaser, per the terms and conditions stated in the apparatus body manufacturer's warranty certificate. The warranty shall cover labor and materials deemed necessary by the apparatus body manufacturer to repair or repaint any area of the vehicle painted by the apparatus body manufacturer which shows evidence of peeling, cracking, blistering, significant loss of gloss, or perforation due to defects in preparation, materials or workmanship.

CORROSION WARRANTY

The apparatus body manufacturer shall warrant the body material for a period of Ten (10) Years from the date of delivery to the original purchaser, per the terms and conditions stated in the apparatus body manufacturer's warranty certificate. The warranty shall cover labor and materials deemed necessary by the apparatus body manufacturer to repair any area of the body and sub-frame undercoated and painted by the apparatus body manufacturer which corrodes to the point of perforation due to improper undercoating, paint preparation, paint application, materials, fabrication or workmanship.

PLUMBING WARRANTY

The apparatus manufacturer shall warrant its stainless steel piping and high pressure hose with stainless steel fittings, against leakage or burst failure for a period of Ten (10) Years from date of delivery to the first purchaser per the terms and conditions stated in the apparatus manufacturer's warranty certificate.

PUMP WARRANTY

EXPRESS WARRANTY: Hale Products, Incorporated (“Hale”) hereby warrants to the original buyer that products manufactured by Hale are free of defects in material and workmanship for a period of five (5) years from the date the product is first placed into service. Hale, whichever period shall be first to expire. Within this warranty period Hale will cover parts and labor for the first two (2) years and parts only for years three (3) through five (5).

KUSSMAUL ELECTRONICS WARRANTY

All products manufactured by Kussmaul Electronics Company Inc. are warranted to be free of defects in material and/or workmanship. Kussmaul Electronics shall repair or replace without charge, any material or defects which become apparent in normal use within the specified warranty period.
All Electronic items are warranted for Three (3)-years except that-
Auto and Air Ejects are warranted for Two (2)-years and
Auto Pumps are warranted for One (1)-year

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COMPARTMENT ROLL-UP DOOR WARRANTY

The "R•O•M" compartment doors and integral LED strip lighting shall be warranted to be free from manufacturing defects for a period of seven (7) years from date of purchase provided that the products are used under conditions of normal use.

FIRE RESEARCH PRODUCTS WARRANTY

Warranty Policy (Except LED Lighting Products)
All Fire Research Corporation (FRC) products, shall be warranted against defects in material and workmanship for a period of two (2) years from the original date of delivery. (For products not put immediately into service, a 90 day grace period from the original date of purchase shall apply.) Any product proven to be defective during the warranty period and covered by the terms of this warranty shall be repaired or replaced (at the discretion of FRC) without charge.

Warranty Policy LED Lighting Products
All Fire Research Corporation (FRC) LED lighting products are warranted against defects in material and workmanship for the period of five (5) years from the original date of delivery. (For products not put immediately into service, a 90 day grace period from the original date of purchase shall apply.) Any product proven to be defective during the warranty period and covered by the terms of this warranty shall be repaired or replaced (at the discretion of FRC) without charge.

MARCO LIVE DRIVE WARRANTY

Marco Equipment Sales LLC, ("Marco") hereby warrants to the original and subsequent buyer(s) that above mentioned products manufactured by Marco are free of defects in material and workmanship for a period of five (5) years from the date of shipment by Marco or 60,000 miles, whichever occurs first. Within this warranty period, Marco will cover both parts and labor.

TECNIQ AUTOMOTIVE LED LIGHT WARRANTY

TECNIQ INC. shall provide a Lifetime Limited Warranty to the original purchaser/user stating that the TECNIQ INC. LED Lamps purchased are free from defects in workmanship and/or materials only. TECNIQ INC. shall replace any TECNIQ INC. LED lamp to the original consumer/purchaser if the lamp fails due to defects in workmanship and/or materials only.

WARNING LIGHT / SIREN WARRANTY

Whelen products shall be covered by a direct warranty for up to a maximum two (2) years from date of purchase (not to exceed three years from date of manufacture), with proof of purchase. In accordance with the policy statement described herein, the unit may be returned directly to the factory or to an Authorized Whelen Repair Center† for warranty consideration. Whelen siren speakers, when used with a Whelen siren amplifier, are covered by a 2 year warranty from the date of manufacture. Heavy-Duty motor assemblies (so marked) are covered by a direct warranty for up to three years from date of manufacture. For warranty consideration, both the siren speakers and motor assemblies are subject to the conditions and steps described herein.

HDP® / 5 YEAR WARRANTY
Whelen Automotive Non-Lightbar Strobe Power Supplies, LED Ballasts and LED Products bearing the official HDP label and manufactured to HDP standards shall be covered by a direct warranty for up to five (5) years from date of

manufacture. In accordance with the policy statement described herein, the unit may be returned directly to the factory or to an Authorized Whelen Repair Center† for warranty consideration.

TANK WARRANTY

United Plastic Fabricating, Inc. (hereinafter called "UPF") warrants each POLY-TANK®, Booster/Foam Tank POLYSIDE® Wetside Tank, Integrator Tank/Body, ELLIPSE™ Elliptical Tank, Ellip-T-Tank Tank and DEFENDER™ Skid Tank to be free from defects in material and workmanship for the service life of the original vehicle (vehicle must be actively used in an emergency response for fire suppression). All UPF Tanks must be installed and operated in accordance with the UPF Installation and Operating Guidelines.

M A N U A L S

APPARATUS MANUALS

Two (2) sets of the apparatus manufacturer's Operation and Maintenance manuals shall be delivered with the completed vehicle. Manuals shall cover the completed apparatus as delivered, including but not limited to the chassis, pump, tank, on-board systems, wiring diagrams, and any other documents or technical data referencing the apparatus.
All contributing OEM warranties and/or guarantees shall also be included with the manuals.

CHASSIS MANUAL

One (1) chassis OEM provided Owner's Manual shall be delivered with the completed unit.
The manual shall include detailed warranty coverage information and chassis warranty claim procedure.