KILLINGWORTH VOL FIRE COMPANY

GENERAL SPECIFICATIONS

Max Length---------- 30ft

Max Height---------- 9’ 6”

Pump---------- 1500 GPM

Water Tank---------- 1000 Gallons

COMPONENT SIZE REQUIREMENTS

It is the responsibility of the bidder to ensure that all components required to complete apparatus are of adequate size and weight rating to meet all applicable laws in the State of Connecticut.

WARRANTY SERVICE

Please provide location of factory service center for any work that needs to be performed on apparatus. The KVFC requires, for any warranty service that can’t be performed in station, that the apparatus be picked up and delivered to our site.

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Chassis Specification

MODEL

The chassis shall be a Metro Star model. The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit and maneuverability. The chassis shall be manufactured for heavy duty service with the strength and capacity to support a fully laden apparatus, one hundred (100) percent of the time.

MODEL YEAR

The chassis shall have a vehicle identification number that reflects a 2017 model year.

COUNTRY OF SERVICE

The chassis shall be put in service in the country of United States of America (USA).

The chassis will meet applicable U.S.A. federal motor vehicle safety standards per CFR Title 49 Chapter V Part 571 as clarified in the incomplete vehicle book per CFR Title 49 Chapter V Part 568 Section 4 which accompanies each chassis. Spartan Chassis is not responsible for compliance to state, regional, or local regulations. Dealers should identify those regulations and order any necessary optional equipment from Spartan Chassis or their OEM needed to be in compliance with those regulations.

CAB AND CHASSIS LABELING LANGUAGE

The cab and chassis shall include the applicable caution, warning, and safety notice labels with text to be written in English.

APPARATUS TYPE

The apparatus shall be a pumper vehicle designed for emergency service use which shall be equipped with a permanently mounted fire pump which has a minimum rated capacity of 1500 gallons per minute (5678 L/min). The apparatus shall include a water tank and hose body whose primary purpose is to combat structural and associated fires.

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VEHICLE TYPE

The chassis shall be manufactured for use as a straight truck type vehicle and designed for the installation of a permanently mounted apparatus behind the cab. The apparatus of the vehicle shall be supplied and installed by the apparatus manufacturer.

AXLE CONFIGURATION

The chassis shall feature a 4 x 2 axle configuration consisting of a single rear drive axle with a single front steer axle.

GROSS AXLE WEIGHT RATINGS FRONT

The front gross axle weight rating (GAWR) of the chassis shall be 20,000 pounds.

This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

GROSS AXLE WEIGHT RATINGS REAR

The rear gross axle weight rating (GAWR) of the chassis shall be 31,000 pounds.

This rear gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

PUMP PROVISION

The chassis shall include provisions to mount a drive line pump in the middle of the chassis, behind the cab, more commonly known as the midship location.

WATER TANK CAPACITY

The chassis shall include a water carrying capacity of 1000 gallons.

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CAB STYLE

The cab shall be a custom, fully enclosed, MFD model with a flat roof over the driver, officer, and crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. This style of cab shall offer up to eight (8) seating positions.

The cab shall incorporate a fully enclosed design with side wall roof supports, allowing for a spacious cab area with no partition between the front and rear sections of the cab. To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side wall panels shall be assembled using a combination of welds and proven industrial adhesives designed specifically for aluminum fabrication for construction.

The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate, which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.

All interior and exterior seams shall be sealed for optimum noise reduction and to provide the most favorable efficiency for heating and cooling retention.

The cab shall be constructed of 5052-H32 corrosion resistant aluminum plate. The cab shall incorporate tongue and groove fitted 6061-T6 0.13 & 0.19 inch thick aluminum extrusions for extreme duty situations. A single formed, one (1) piece extrusion shall be used for the “A” pillar, adding strength and rigidity to the cab as well as additional roll-over protection. The cab side walls and lower roof skin shall be 0.13 inch thick; the rear wall and raised roof skins shall be 0.09 inch thick; the front cab structure shall be 0.19 inch thick.

The exterior width of the cab shall be 94.00 inches wide with a minimum interior width of 88.00 inches. The overall cab length shall be 131.10 inches with 54.00 inches from the centerline of the front of the axle to the back of the cab.

The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab.

The cab shall offer an interior height of 57.50 inches from the front floor to the headliner and a rear floor to headliner height of 55.00 inches at a minimum. The cab shall offer an interior measurement at the floor

level from the rear of the engine tunnel to the rear wall of the cab of 51.88 inches. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface.

The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The front doors shall offer a clear opening of 40.25 inches wide X 53.50 inches high, from the cab floor to the top of the door opening. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel in full firefighting gear. The rear doors shall offer a clear opening of 32.25 inches wide X 51.00 inches high, from the cab floor to the top of the door opening.

The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely.

The first step for the driver and officer area shall measure approximately 11.50 inches deep X 31.13 inches wide. The intermediate step shall measure approximately 8.50 inches deep X 32.50 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches.

The first step for the crew area shall measure approximately 11.50 inches deep X 20.44 inches wide. The intermediate step shall measure approximately 10.25 inches deep X 22.75 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.80 inches.

OCCUPANT PROTECTION

The vehicle shall include the Advanced Protection System™ (APS) which shall secure belted occupants and increase the survivable space within the cab. The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The system components shall include:

- Driver steering wheel airbag
- Driver dual knee air bags (patent pending) with energy management mounting (patent pending) and officer knee airbag.
- Large driver, officer, and crew area side curtain airbags

- APS advanced seat belt system - retractor pre-tensioners tighten the seat belts around the occupants, securing the occupants in seats and load limiters play out some of the seat belt

- webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries

- Heavy truck Restraints Control Module (RCM) - receives inputs from the outboard sensors, selectively deploys APS systems, and records sensory inputs immediately before and during a detected qualifying event

- Integrated outboard crash sensors mounted at the perimeter of the vehicle - detects a qualifying front or side impact event and monitors and communicates vehicle status and real time diagnostics of all critical subsystems to the RCM

- Fault-indicating Supplemental Restraint System (SRS) light on the driver's instrument panel

Frontal impact protection shall be provided by the outboard sensors and the RCM. In a qualifying front impact event the outboard sensors provide inputs to the RCM. The RCM activates the steering wheel airbag, driver side dual knee airbags (patent pending), officer side knee airbag, and advanced seat belts for each occupant in the cab.

The APS frontal impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 208. Frontal impact into a rigid barrier at 25 mph shall be conducted by an independent third party test facility using belted 95^{th} percentile Hybrid II test dummies.

Rollover, side impact, and ejection mitigation shall be provided by the outboard sensors and the RCM. In qualifying rollover or side impact events the outboard sensors provide inputs to the RCM. The RCM activates the side curtain airbags and advanced seat belts for each occupant in the cab. The RCM measures roll angle, lateral acceleration, and roll rate to determine if a rollover event or side impact event is imminent or occurring.

In the event of a qualifying offset or other non-frontal impact, the RCM shall determine and intelligently deploy the front impact protection system, the side impact protection system, or both front and side impact protection systems based on the inputs received from the outboard crash sensors.

The APS side impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 214. Side impact

from a moving barrier at 17 mph shall be conducted by an independent third party test facility using belted 50th percentile ES-2re test dummies.

CAB FRONT FASCIA

The front cab fascia shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate which shall be an integral part of the cab.

The cab fascia will encompass the entire front of the aluminum cab structure from the bottom of the windshield to the bottom of the cab and shall be the "Classic" design.

The front cab fascia shall include two (2) molded plastic modules on each side accommodating a total of up to four (4) Hi/Low beam headlights and two (2) turn signal lights or up to four (4) warning lights. A chrome plated molded plastic bezel shall be provided on each side around each set of four lamps.

FRONT GRILLE

The front fascia shall include a box style, 304 stainless steel front grille 44.45 inches wide X 33.50 inches high X 1.50 inches deep. The grille shall include a minimum free air intake of 732.00 square inches. The upper portion of the grille shall be hinged to provide service access behind the grille.

CAB UNDERCOAT

There shall be a rubberized undercoating applied to the underside of the cab that provides abrasion protection, sound deadening and corrosion protection.

CAB SIDE DRIP RAIL

There shall be a drip rail along the top radius of each cab side. The drip rails shall help prevent water from the cab roof running down the cab side.

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CAB PAINT EXTERIOR

The cab shall be painted prior to the installation of glass accessories and all other cab trim to ensure complete paint coverage and the maximum in corrosion protection of all metal surfaces.

All metal surfaces on the entire cab shall be ground by disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once the surface is machine ground a high quality acid etching of base primer shall be applied. Upon the application of body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The maximum thickness of the primer coat shall be 2.00 mils.

The entire cab shall then be coated with an intermediate solid or epoxy surfacing agent that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be a sanding of the cab with 360 grit paper followed by sealing the seams with SEM brand seam sealer.

The cab shall then be painted the specific color designated by the customer with an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene. The paint shall have a minimum thickness of 2.00 mils, followed by a clear top coat not to exceed 2.00 mils. The entire cab shall then be baked at 180 degrees for one (1) hour to speed the curing process of the coatings.

CAB PAINT MANUFACTURER

The cab shall be painted with PPG Industries paint.

CAB PAINT PRIMARY/LOWER COLOR

The primary/lower paint color shall be: Green (Matching KVFC Apparatus)

CAB PAINT SECONDARY/UPPER COLOR

The secondary/upper paint color shall be: White

CAB PAINT EXTERIOR BREAKLINE

The upper and lower paint shall meet at a breakline on the cab which shall be located approximately 1.00 inch below the door windows on each side of the cab. The breakline shall curve down at the front cab corners to approximately 5.00 inches below the windshields on the front of the cab.

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CAB PAINT PINSTRIPE

Where the upper and lower paint colors meet a temporary 0.50 inch wide black pinstripe shall be applied over this break line to offer a more finished look prior to the final pinstripe being installed by the OEM.

CAB EXTERIOR ROLL-UP DOOR FINISH

The roll-up doors on the exterior of the cab shall have a painted finish. Paint shall match apparatus paint breaks.

CAB PAINT WARRANTY

The cab and chassis shall be covered by a limited manufacturer paint warranty which shall be in effect for ten (10) years from the first owner's date of purchase or in service or the first 100,000 actual miles, whichever occurs first.

CAB PAINT INTERIOR

The visible interior cab structure surfaces shall be painted with a multi-tone silver gray texture finish.

CAB ENTRY DOORS

The cab shall include four (4) entry doors, two (2) front doors and two (2) crew doors designed for ease of entering and egress when outfitted with an SCBA. The doors shall be constructed of extruded aluminum with a nominal thickness of 0.13 inch. The exterior skins shall be constructed of 0.13 inch aluminum plate.

The doors shall include a double rolled style automotive rubber seal around the perimeter of each door frame and door edge which ensures a weather tight fit.

All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab. Each door hinge shall be piano style with a 0.38 inch pin and shall be constructed of stainless steel.

All Cab Entry door windows shall be controlled electronically with a switch at each door and the driver shall be able to operate all four windows.

CAB ENTRY DOOR TYPE

All cab entry doors shall be full length in design to fully enclose the lower cab steps.

CAB INSULATION

The cab ceiling and walls shall include 1.00 inch thick foam insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

LH EXTERIOR MID EMS COMPARTMENT

The cab shall include a compartment located in the middle of the wall above the left side wheel well. This compartment shall measure 17.00 inches wide X 43.00 inches high X 23.00 inches deep. The compartment shall be accessible from the outside of the cab through a ROM roll up door. The compartment shall have a clear door opening of 14.50 inches wide X 37.50 inches high. There shall be a switch to activate a light inside the compartment and the open compartment warning light in the cab in the event the door is left ajar. The compartment shall include four (4) pieces of aluminum Unistrut. Two (2) pieces of aluminum Unistrut shall be welded to both the forward and rearward compartment walls.

LH EXTERIOR MID EMS COMPARTMENT INTERIOR ACCESS

The left hand exterior EMS compartment shall include access from inside the cab. The compartment shall be accessible from the inside of the cab via an aluminum framed Lexan® hinged door with one (1) locking latch. The interior access door shall face the rear of the cab and shall feature a clear door opening of 14.50 inches wide X 32.00 inches high.

LH EXTERIOR MID EMS COMPARTMENT LIGHTING

There shall be one (1) SoundOff Signal brand LED strip light installed to illuminate the exterior mid EMS compartment on the left side of the cab above the wheel well. The strip light shall be 32.00 inches long and shall include nine (9) bright white Gen3 LEDs.

LH EXTERIOR MID EMS COMPARTMENT INTERIOR SHELVING

The left hand mid EMS compartment located in crew area of the cab shall include one (1) aluminum shelf which shall be secured using Unistrut channel on two (2) sides of the interior walls of the compartment. The shelf shall include a 1.00 inch lip around the edges. The shelf shall be finished the same as the interior of the compartment.

EXTERIOR MID EMS COMPARTMENT EXTERIOR FINISH

The mid EMS compartment surfaces that are exposed to the interior of the cab shall be painted with a multi-tone silver gray texture finish.

EXTERIOR MID EMS COMPARTMENT INTERIOR FINISH

The EMS compartment interior shall feature a DA sanded finish.

CAB STRUCTURAL WARRANTY

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE STATEMENT OF THE SPARTAN MOTORS USA LIMITED WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.

The cab structure shall be warranted for a period of ten (10) years or one hundred thousand (100,000) miles which ever may occur first. The warranty period shall commence on the date the vehicle is delivered to the first end user.

CAB TEST INFORMATION

The cab shall have successfully completed the preload side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5.

The above tests have been witnessed by and attested to by an independent third party. The test results were recorded using cameras, high speed imagers, accelerometers and strain gauges. Documentation of the testing shall be provided upon request.

ELECTRICAL SYSTEM

The chassis shall include a single starting electrical system which shall include a 12 volt direct current system, suppressed per SAE J551. The wiring shall be appropriate gauge cross link with 311 degree Fahrenheit insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by 275 degree Fahrenheit minimum high temperature flame retardant loom.

OEM WIRING

The wiring system shall include a custom interface harness provided by the chassis manufacturer designed to meet the requirements provided by the OEM. The harness shall include eight (8) 14 gauge Wires which shall be routed from under the center dash area to the frame area behind the cab. There shall be a coil provided at the back of the cab with a minimum of 15.00 feet of additional wire provided.

APPARATUS WIRING PROVISION

An apparatus wiring panel shall be installed in the center dash area behind the rocker switch panel which shall include eight (8) open circuits consisting of three (3) 20 amp, one (1) 30 amp, three (3) 10 amp, and one (1) 15 amp circuit, with relays and breakers with trigger wires which shall be routed to the rocker switch panel.

LOAD MANAGEMENT SYSTEM

The apparatus shall be equipped with a Class 1 Total System Manager (TSM) for performing electrical load management. The TSM shall have sixteen (16) programmable outputs to supply warning and load switching requirements. Outputs one (1) through twelve (12) shall be independently programmable to activate during the scene mode, the response mode, or both. These outputs can also be programmed to activate with the ignition or master warning switch, or to sequence and shed along with the priority. Output thirteen (13) shall be designated to activate a fast idle system. Output fourteen (14) shall provide a low voltage warning for an isolated battery. Output fifteen (15) is a user configurable output and shall be programmable for activating between 10.50 and 15.00 volts. Output sixteen (16) shall provide a low voltage alarm that activates at the NFPA required 11.80 volts. The TSM shall have a digital display to indicate system voltage in normal operation mode and also indicate the output configuration during programming mode. The TSM shall be protected against reverse polarity and shorted outputs and be enclosed in a metal enclosure to enhance EMI/RFI protection

DATA RECORDING SYSTEM

The chassis shall have a Weldon Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901. The following information shall be recorded:

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- Service Brake
- Engine Hours
- Time
- Date

Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system. The laptop connection shall be a panel mounted female type B USB connection point, remotely mounted in the left side foot well of the cab.

ACCESSORY POWER

The electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40 amp battery direct load. One (1) power stud shall be capable of carrying up to a 15 amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud. A 225 amp battery direct power and ground stud shall be provided and installed on the chassis near the left hand battery box for OEM body connections.

AUXILIARY ACCESSORY POWER

An auxiliary set of power and ground studs shall be provided and installed behind the electrical center cover with a 40 amp breaker. The studs shall be 0.38 inch diameter and capable of carrying up to a 40 amp battery direct load.

ADDITIONAL ACCESSORY POWER

An additional ten (10) position blade type fuse panel shall be installed behind the officer's seat. The fuse panel shall be protected by a 40 amp fuse located at the batteries. The panel shall be capable of carrying up to a maximum 40 amp battery direct load.

EXTRA ACCESSORY POWER

An auxiliary ten (10) position blade type fuse panel shall be installed behind the officer's seat. The fuse panel shall be protected by a 40 amp fuse located at the batteries. The panel shall be capable of carrying up to a maximum 40 amp master switched load.

EXTERIOR ELECTRICAL TERMINAL COATING

All terminals exposed to the elements will be sprayed with a high visibility protective rubberized coating to prevent corrosion.

ENGINE

The chassis engine shall be a Cummins ISL9 engine. The ISL9 engine shall be an in-line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 450 horse power at 2100 RPM and shall be governed at 2200 RPM. The torque rating shall feature 1250 foot pounds of torque at 1400 RPM with 543 cubic inches (8.9 liters) of displacement.

The ISL9 engine shall feature a VGT™ Turbocharger, a high pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2013 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent SAE 15W40 CJ4 low ash engine oil which shall be utilized for proper engine lubrication.

A wiring harness shall be supplied ending at the back of the cab. The harness shall include a connector which shall allow an optional harness for the pump panel. The included circuits shall be provided for a tachometer, oil pressure, engine temperature, hand throttle, high idle and a PSG system. A circuit for J1939 data link shall also be provided at the back of the cab.

CAB ENGINE TUNNEL

The cab interior shall include an integrated engine tunnel constructed of 5052-H32 Marine Grade, 0.19 of an inch thick aluminum. The tunnel shall be a maximum of 41.50 inches wide X 25.50 inches high.

DIESEL PARTICULATE FILTER CONTROLS

There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit. Each switch shall include a guard.

ENGINE PROGRAMMING HIGH IDLE SPEED

The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.

ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output. This device shall operate only when the master switch is activated and the transmission is in neutral with the parking brake set. When automatically engaged the high idle shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually or automatically re-engage when the brake is released, or when the transmission is placed in neutral.

ENGINE PROGRAMMING ROAD SPEED GOVERNOR

The engine shall include programming which will govern the top speed of the vehicle.

AUXILIARY ENGINE BRAKE

A compression brake, for the six (6) cylinder engine shall be provided. A cutout relay shall be installed to disable the compression brake when in pump mode or when an ABS event occurs. The engine compression brake shall activate upon 0% accelerator when in operation mode and actuate the vehicle’s brake lights.

The engine shall utilize a variable geometry turbo (VGT) as an integrated auxiliary engine brake to offer a variable rate of exhaust flow, which when activated in conjunction with the compression brake shall enhance the engine's compression braking capabilities.

AUXILIARY ENGINE BRAKE CONTROL

An engine compression brake control device shall be included. The electronic control device shall monitor various conditions and shall activate the engine brake only if all of the following conditions are simultaneously detected:

- A valid gear ratio is detected.
- The driver has requested or enabled engine compression brake operation.
- The throttle is at a minimum engine speed position.
- The electronic controller is not presently attempting to execute an electronically controlled final drive gear shift.

The compression brake shall be controlled through an on/off switch and a low/medium/high selector switch.

ELECTRONIC ENGINE OIL LEVEL INDICATOR

The engine oil shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal. The warning shall activate in a low oil situation upon turning on the master battery and ignition switches without the engine running.

FLUID FILLS

The front of the chassis shall accommodate fluid fill for the engine oil through the grille. This area shall also accommodate a check for the engine oil. The transmission, power steering, and coolant fluid fills and checks shall be under the cab. The windshield washer fill shall be accessible through the front left side mid step.

ENGINE DRAIN PLUG

The engine shall include an original equipment manufacturer installed oil drain plug.

ENGINE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.

REMOTE THROTTLE CONTROL

A Fire Research In-Control 400 pressure sensor governor shall be provided for the electronic engine. It shall include a remote mountable control head.

The In Control shall regulate the pump pressure and monitor all essential engine parameters.

LED readouts shall display RPM, PSI, pump discharge and intake pressure, engine oil pressure, engine temperature, transmission temperature and battery voltage. An audible alarm output shall also be part of the system.

The rpm increase and decrease will be controlled by control knob on the face of the In Control 400.

REMOTE THROTTLE HARNESS

An apparatus interface wiring harness for the engine shall be supplied with the chassis. The harness shall include a connector for connection to the chassis harness which shall terminate in the left frame rail behind the cab for reconnection by the apparatus builder. The harness shall contain connectors for a Fire Research In Control 300/400 pressure governor and a multiplexed gauge. Separate circuits shall be included for pump controls, “Pump Engaged” and “OK to Pump” indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, customer ignition, air horn solenoid switch, high idle switch and high idle indication light. The harness shall be designed for a side mount pump panel.

An apparatus interface wiring harness shall also be included which shall be wired to the cab harness interface connectors and shall incorporate circuits with relays to control pump functions. This harness shall control the inputs for the transmission lock up circuits, governor/hand throttle controls and dash display which shall incorporate “Pump Engaged” and “OK to Pump” indicator lights. The harness shall contain circuits for the apparatus builder to wire in a pump switch.

ENGINE PROGRAMMING REMOTE THROTTLE

The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required.

ENGINE PROGRAMMING IDLE SPEED

The engine low idle speed will be programmed at 700 rpm.

ENGINE FAN DRIVE

The engine cooling system fan shall incorporate a thermostatically controlled, Horton clutched type fan drive.

When the clutched fan is disengaged it shall facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan clutch design shall be fail safe so that if the clutch drive fails the fan shall engage to prevent engine overheating due to the fan clutch failure.

ENGINE COOLING SYSTEM

There shall be a heavy-duty aluminum cooling system designed to meet the demands of the emergency response industry. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The complete cooling system shall be mounted to isolate the entire system from vibration or stress. The individual cores of the cooling system shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining cores.

The cooling system shall utilize a charge air cooler to radiator serial flow package that provides the maximum cooling capacity for the specified engine as well as serviceability. The main components shall include a surge tank, an air to air charge air cooler bolted to the front of the radiator, recirculation shields, a shroud, a fan, and required tubing.

The radiator shall be a down-flow design constructed with aluminum cores, plastic end tanks, and a steel frame. The radiator shall be equipped with a drain cock to drain the coolant for serviceability.

The cooling system shall include a one piece injection molded polymer eleven (11) blade fan with a fiberglass fan shroud.

The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and sight glass to monitor the level of the coolant. The surge tank shall have a dual seal cap that meets the engine manufacturer's pressure requirements, and allows for expansion and recovery of coolant into a separate integral expansion chamber.

All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from re-entering the cooling package and affecting performance.

The charge air cooler shall be a cross-flow design constructed completely of aluminum with cast tanks. All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel "constant torque" style clamps meeting the engine manufacturer's requirements.

ENGINE COOLING SYSTEM PROTECTION

The engine cooling system shall include a recirculation shield designed to act as a light duty skid plate below the radiator to provide additional protection for the engine cooling system from light impacts, stones, and road debris. The skid plate shall be painted to match the frame color.

ENGINE COOLANT

The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. The coolant shall contain a 50/50 mix of ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -34 degrees Fahrenheit.

Proposals offering supplemental coolant additives (SCA) shall not be considered, as this is part of the extended life coolant makeup.

ELECTRONIC COOLANT LEVEL INDICATOR

The instrument panel shall feature a low engine coolant indicator light which shall be located in the center of the instrument panel. An audible tone alarm shall also be provided to warn of a low coolant incident.

ENGINE PUMP HEAT EXCHANGER

A single bundle type coolant to water heat exchanger shall be installed between the engine and the radiator. The heat exchanger shall be designed to prohibit water from the pump from coming in contact with the engine coolant. This shall allow the use of water from the discharge side of the pump to assist in cooling the engine.

COOLANT HOSES

The cooling system hoses shall be silicone heater hose with rubber hoses in the cab interior. The radiator hoses shall be formed silicone coolant hoses with formed aluminized steel tubing. All heater hose, silicone coolant hose, and tubing shall be secured with stainless steel constant torque band clamps.

ENGINE AIR INTAKE

The engine air intake system shall include an ember separator behind the right side headlamp. This ember separator shall be designed to protect the downstream air filter from embers using a combination of unique flat and crimped metal screens packaged in a heavy duty galvanized steel frame. This multilayered screen shall trap embers and allow them to burn out before passing through the pack.

The engine air intake system shall also include an air cleaner mounted to the frame beneath the cab on the right side of the vehicle. This air cleaner shall utilize a replaceable dry type filter element designed to prevent dust and debris from being ingested into the engine. A service cover shall be provided on the bottom of the housing, reducing the chance of contaminating the air intake system during air filter service.

The air intake system shall include a restriction indicator light in the warning light cluster on the instrument panel, which shall activate when the air cleaner element requires replacement.

AIR INTAKE PROTECTION

A light duty skid plate shall be supplied for the engine air intake system below the right front side of the cab. The skid plate shall provide protection for the air intake system from light impacts, stones, and road debris. The skid plate shall be painted to match the frame color.

ENGINE EXHAUST SYSTEM

The exhaust system shall be mounted below the frame in the outboard position with the SCR canister in line rearward of the DPF. The exhaust system shall utilize a 90-degree bend in the exhaust tubing from the turbo into a side inlet DPF canister that allows the entire system to be pulled forward. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires.

The exhaust system shall include a diesel particulate filter (DPF), a diesel oxidation catalyst, and a selective catalytic reduction (SCR) catalyst to meet current EPA standards. The selective catalytic reduction catalyst utilizes a diesel exhaust fluid solution consisting of urea and purified water to convert NOx into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be injected into the system through the decomposition tube between the DPF and SCR.

The system shall utilize 0.07 inch thick stainless steel exhaust tubing between the engine turbo and the DPF. Zero leak clamps seal all system joints between the turbo and DPF.

The DPF, the decomposition tube, and the SCR canister through the end of the tailpipe shall be connected with zero leak clamps.

DIESEL EXHAUST FLUID TANK

The exhaust system shall include a molded cross linked polyethylene tank for Diesel Exhaust Fluid (DEF). The tank shall have a capacity of six (6) usable gallons and shall be mounted on the left hand side of the chassis frame behind the batteries below the frame.

The DEF tank shall be designed with capacity for expansion in case of fluid freezing. Engine coolant, which shall be thermostatically controlled, shall be run through lines in the tank to help prevent the DEF from freezing and to provide a means of thawing the fluid if it should become frozen.

The tank fill tube shall be routed under the rear of the cab with the fill neck and splash guard accessible in the top rear step.

ENGINE EXHAUST ACCESSORIES

An exhaust temperature mitigation device shall be shipped loose for installation by the body manufacturer on the vehicle. The temperature mitigation device shall lower the temperature of the exhaust by combining ambient air with the exhaust gasses at the exhaust outlet.

A Nederman magnetic mount (KVFC Supplied) shall be installed on the apparatus as per the KVFC. Final location to be determined.

A Nederman transmitter (KVFC Supplied) shall be installed on the key ignition for use with our in-house exhaust system

As per the in-house Nederman exhaust system, the apparatus shall have the exhaust tip extended outside of the body, final location and amount to be extended shall be reviewed with the KVFC during construction.

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ENGINE EXHAUST WRAP

The exhaust tubing between the engine turbo and the diesel particulate filter (DPF) shall be wrapped with a thermal cover in order to retain the necessary heat for DPF regeneration. The exhaust wrap shall also help protect surrounding components from radiant heat which can be transferred from the exhaust.

TRANSMISSION

The drive train shall include an Allison model EVS 3000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters and Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

The transmission gear ratios shall be:

1st	3.49:1
2nd	1.86:1
3rd	1.41:1
4th	1.00:1
5th	0.75:1
6th	0.65:1 (if applicable)
Rev	5.03:1

TRANSMISSION MODE PROGRAMMING

The transmission, upon start-up, will automatically select a four (4) speed operation. The fifth speed over drive shall be available with the activation of the mode button on the shifting pad.

TRANSMISSION FEATURE PROGRAMMING

The Allison Gen V-E transmission EVS group package number 127 shall contain the 198 vocational package in consideration of the duty of this apparatus as a pumper. This package shall incorporate an

automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override.

This package shall be coupled with the use of a split shaft PTO and incorporate pumping circuits. These circuits shall be used allowing the vehicle to operate in the fourth range lockup while operating the pump mode due to the 1 to 1 ratio through the transmission, therefore the output speed of the engine is the input speed to the pump. The pump output can be easily calculated by using this input speed and the drive ratio of the pump itself to rate the gallons of water the pump can provide.

A transmission interface connector shall be provided in the cab. This package shall contain the following input/output circuits to the transmission control module. The Gen V-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

Function ID	Description	Wire assignment
Inputs		
C	PTO Request	142
J	Fire Truck Pump Mode (4th Lockup)	122 / 123
Outputs		
C	Range Indicator	145 (4th)
G	PTO Enable Output	130
	Signal Return	103

ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR

The transmission fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

TRANSMISSION SHIFT SELECTOR

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall have a graphical Vacuum Florescent Display (VFD) capable of displaying two lines of text. The shift selector shall provide mode indication and a prognostic indicator (wrench symbol) on the digital display. The prognostics monitor various operating parameters and shall alert you when a specific maintenance function is required.

TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE

When the auxiliary brake is engaged, the transmission shall automatically shift to second gear to decrease the rate of speed assisting the secondary braking system and slowing the vehicle.

TRANSMISSION COOLING SYSTEM

The transmission shall include a water to oil cooler system located in the cooling loop between the radiator and the engine. The transmission cooling system shall meet all transmission manufacturer requirements. The transmission cooling system shall feature continuous flow of engine bypass water to maintain uninterrupted transmission cooling.

TRANSMISSION DRAIN PLUG

The transmission shall include an original equipment manufacturer installed magnetic transmission fluid drain plug.

TRANSMISSION WARRANTY

The Allison EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.

LH PTO

A Spartan supplied ten (10) bolt standard duty clutched drive PTO shall be installed on the transmission. Installation shall include mounting of the PTO and wiring the unit with a control switch.

LH PTO MODEL

A ten (10) bolt Chelsea model 278-XSFJP-B3RA heavy duty transmission driven PTO shall be installed. The clutched shifted PTO is designed specifically for the Allison world transmission and shall provide torque ranges from 250 to 335 pound feet.

PTO LOCATION

The transmission shall have two (2) power take off (PTO) mounting locations, one (1) in the 8:00 o'clock position and one (1) in the 4:00 o'clock position.

PTO CONTROL

The left hand power take off shall be controlled by the transmission. The power take off shall be activated by a locking on/off rocker switch with generator legend which contains an integral light which shall illuminate upon a positive engagement of the power take off. This switch shall be located on dash.

Required operating conditions for enabling this function are:

- Throttle position is low
- Engine speed is within customer specified constant limits

Transmission output speed is within customer specified constant limits

PTO PROGRAMMING

The power take off shall be programmed for operator control such that it shall only engage at or below 900 RPM and operate in a range up to 4000 RPM. The PTO programming shall provide for automatic disengagement set at a specified engine speed of 4000 RPM which shall protect equipment driven from the power take off.

DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with Spicer 1710 series universal joints. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat®.

DRIVELINE GUARDS

One (1) driveline guard loop shall be provided and installed to support the driveline shaft for routine maintenance and in the event of a driveline component failure.

MIDSHIP PUMP / GEARBOX

A pump as specified shall be supplied by the apparatus manufacturer and installed by the cab and chassis manufacturer.

MIDSHIP PUMP / GEARBOX MODEL

The midship pump/gearbox provisions shall be for a Waterous Single Stage pump.

MIDSHIP PUMP RATIO

The ratio for the midship pump shall be 2.28:1 (23).

MIDSHIP PUMP LOCATION C/L SUCTION TO C/L REAR AXLE

The midship pump shall be located so the dimension from the centerline of the suction to the centerline of the rear axle is 95.00 inches.

PUMP YOKES PROVIDER

The pump yokes shall be provided by Spartan Chassis. The yokes shall be 1710 companion type to match the pump and the driveline series.

PUMP SHIFT CONTROLS

One (1) pump shift control panel shall be located on the left hand side of the steering column. The following shall be provided on the panel: a three (3) position locking toggle switch; an engraved PUMP ENGAGED identification light; and an engraved OK TO PUMP identification light. The pump shift control panel shall be black with a yellow border outline. One (1) label indicating pump instructions and the transmission shift selector position used for pumping shall be provided and located so it can be read from the driver's position per NFPA **16.10.1.3**. The road mode shall be selected when the switch is in the up position and pump mode shall be selected when the switch is in the down position.

The center switch position shall exhaust air from both pump and road sides of the pump gear box shift cylinder.

PUMP SHIFT CONTROL PLUMBING

Air connections shall be provided from the air supply tank to the pump shift control valve and from the pump shift control valve to the frame mounted bracket. The frame mounted bracket shall include labeling identifying the pump and road connection points with threaded 0.25 inch NPT fittings on the solenoid for the customer installed pump to the air shifter system. The "Pump Engaged" switch shall be connected. The air supply shall be pressure protected from service brake system.

FUEL FILTER/WATER SEPARATOR

The fuel system shall have a Fleetguard FS1003 fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve.

A water in fuel sensor shall be provided and wired to an instrument panel lamp and audible alarm to indicate when water is present in the fuel/water separator.

A secondary fuel filter shall be included as approved by the engine manufacturer.

FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be black textile braided lines which are reinforced with braided high tensile steel wire. The fuel lines shall be connected with reusable steel fittings.

FUEL SHUTOFF VALVE

A fuel shutoff valve shall be installed in the fuel draw line at the primary fuel filter to allow the fuel filter to be changed without loss of fuel to the fuel pump.

A second fuel shutoff valve shall be installed in the fuel draw line, near the fuel tank to allow maintenance to be performed with minimal loss of fuel.

ELECTRIC FUEL PRIMER

Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.

FUEL TANK

The fuel tank shall have a capacity of fifty (50) gallons and shall measure 35.00 inches in width X 15.00 inches in height X 24.00 inches in length. The baffled tank shall be made of 14 gauge aluminized steel. The exterior of the tank shall be painted with a PRP Corsol™ black anti-corrosive exterior metal treatment finish. This results in a tank which offers the internal and external corrosion resistance.

The tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw.

The tank is designed with dual draw tubes and sender flanges. The tank shall have 2.00 inch NPT fill ports for right or left hand fill. A 0.50 inch NPT drain plug shall be centered in the bottom of the tank.

The fuel tank shall be mounted below the frame, behind the rear axle. Two (2) three-piece strap hanger assemblies with “U” straps bolted midway on the fuel tank front and rear shall be utilized to allow the tank to be easily lowered and removed for service purposes. Rubber isolating pads shall be provided between the tank and the upper tank mounting brackets. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

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FUEL TANK MATERIAL AND FINISH

The fuel tank shall be constructed of 14 gauge stainless steel. The exterior of the fuel tank shall be polished.

FUEL TANK STRAP MATERIAL

The fuel tank straps shall be constructed of #304 stainless steel.

FUEL TANK FILL PORT

The fuel tank fill ports shall be offset with the left fill port located in the rearward position and the right fill port located in the middle position on the fuel tank.

FUEL TANK SERVICEABILTY PROVISIONS

The chassis fuel lines shall have additional length provided so the tank can be easily lowered and removed for service purposes. The additional 3.00 feet of length shall be located above the fuel tank and shall be coiled and secured. The fuel line fittings shall be pointed towards the right side (curbside) of the chassis.

FUEL TANK DRAIN PLUG

A 0.5 inch NPT drain plug shall be centered in the bottom of the fuel tank.

FRONT AXLE

The front axle shall be a Meritor Easy Steer Non drive front axle, model number MFS-20. The axle shall include a 3.74 inch drop and a 71.00 inch king pin intersection (KPI). The axle shall include a conventional style hub with a standard knuckle.

FRONT AXLE WARRANTY

The front axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.

FRONT WHEEL BEARING LUBRICATION

The front axle wheel bearings shall be lubricated with oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.

FRONT SHOCK ABSORBERS

Two (2) Bilstein inert, nitrogen gas filled shock absorbers shall be provided and installed as part of the front suspension system. The shocks shall be a monotubular design and fabricated using a special extrusion method, utilizing a single blank of steel without a welded seam, achieving an extremely tight peak-to-valley tolerance and maintains consistent wall thickness. The monotubular design shall provide superior strength while maximizing heat dissipation and shock life.

The ride afforded through the use of a gas shock is more consistent and shall not deteriorate with heat, the same way a conventional oil filled hydraulic shock would.

The Bilstein front shocks shall include a digressive working piston assembly allowing independent tuning of the compression and rebound damping forces to provide optimum ride and comfort without compromise. The working piston design shall feature fewer parts than most conventional twin tube and "road sensing" shock designs and shall contribute to the durability and long life of the Bilstein shock absorbers.

Proposals offering the use of conventional twin tube or "road sensing" designed shocks shall not be considered.

FRONT SUSPENSION

The front suspension shall include a nine (9) leaf spring pack in which the longest leaf measures 54.00 inch long and 4.00 inches wide and shall include a military double wrapped front eye. Both spring eyes shall have a case hardened threaded bushing installed with lubrication counter bore and lubrication land off cross bore with grease fitting. The spring capacity shall be rated at 21,500 pounds.

STEERING COLUMN/ WHEEL

The cab shall include a Douglas Autotech steering column which shall include a seven (7) position tilt, a 2.25 inch telescopic adjustment, and an 18.00 inch, four (4) spoke steering wheel located at the driver's position. The steering wheel shall be covered with black polyurethane foam padding.

The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.

ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR

The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when fluid level falls below normal.

POWER STEERING PUMP

The hydraulic power steering pump shall be a TRW PS and shall be gear driven from the engine. The pump shall be a balanced, positive displacement, sliding vane type.

FRONT AXLE CRAMP ANGLE

The chassis shall have a front axle cramp angle of 48-degrees to the left and 44-degrees to the right.

POWER STEERING GEAR

The power steering gear shall be a TRW model TAS 65 with an assist cylinder.

CHASSIS ALIGNMENT

The chassis frame rails shall be measured to insure the length is correct and cross checked to make sure they run parallel and are square to each other. The front and rear axles shall be laser aligned. The front tires and wheels shall be aligned and toe-in set on the front tires by the chassis manufacturer.

REAR AXLE

The rear axle shall be a Meritor model RS-25-160 single drive axle. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity of 31,000 pounds.

The axle shall be built of superior construction and quality components to provide the rugged dependability needed to stand up to the fire industry's demands. The axle shall include rectangular shaped, hot-formed housing with a standard wall thickness of 0.63 of an inch for extra strength and rigidity and a rigid differential case for high axle strength and reduced maintenance.

The axle shall have heavy-duty Hypoid gearing for longer life, greater strength and quieter operation. Industry-standard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage will be used.

REAR DIFFERENTIAL LOCK

A rear differential lock, if available, activated from a dash mounted switch.

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR AXLE WARRANTY

The rear axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

VEHICLE TOP SPEED

The top speed of the vehicle shall be approximately 65 MPH +/-2 MPH at governed engine RPM.

REAR SUSPENSION

The single rear axle shall feature a Reyco 102AR air suspension with a single air bag on each side attached to a tapered forged drop leaf spring with one adjustable and one fixed torque rod.

The suspension shall feature dual air height control valves which shall be installed to ensure equal frame height on both sides of the vehicle regardless of the load. The suspension shall also include two premium shock absorbers, one each side.

The rear suspension capacity shall be rated at 31,000 pounds to meet the rear axle rating selected.

REAR SHOCK ABSORBERS

Shock absorbers shall be supplied by the suspension manufacturer and installed on the rear axle suspension.

FRONT TIRE

The front tires shall be Goodyear 385/65R-22.5 18PR "J" tubeless radial G296 MSA mixed service tread.

Front tires must be stamped with load capacity matching axle weight rating requirements.

The Goodyear Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

REAR TIRE

The rear tires shall be Goodyear 12R-22.5 16PR "H" tubeless radial G661 HSA mixed service tread.

Rear tires must be stamped with load capacity meeting axle rating requirements.

The Goodyear Intermittent Service Rating maximum speed capacity shall match the nominal speed rating.

The Goodyear Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

REAR AXLE RATIO

The rear axle ratio shall be 5.38:1.

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TIRE PRESSURE EQUALIZATION SYSTEM

There shall be a voucher provided with the chassis for Crossfire dual tire equalization system provided on both sets of dual tires on the rear axle. The Crossfire pressure system shall equalize and monitor tire pressure through the valve which is mounted between the dual tires. This shall bolt easily to the drive axle end allowing air to flow freely from one tire to the other, maintaining equal tire pressure and load distribution. The Crossfire system shall maximize tire life, decrease rolling resistance for increased fuel mileage and improve stability braking and overall safety.

The Crossfire dual tire equalization system shall be redeemed upon the vehicle manufacture's receipt of the voucher along with the vehicle in-service weight for each axle.

TIRE PRESSURE INDICATOR

There shall be a voucher provided with the chassis for a pop up style tire pressure indicator at the front tire valve stem. The indicator shall provide visual indication of pressure in the specific tire.

The tire pressure indicators shall be redeemed upon the vehicle manufacturer's receipt of the voucher for installation by the customer.

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.50 inch X 12.25 inch LvL One™ polished aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall feature one-piece forged strength and shall include Alcoa's Dura-Bright® finish with XBR technology as an integral part of the wheel surface. Alcoa Dura-Bright® wheels keep their shine without polishing. Brake dust, grime and road debris are easily removed by simply cleaning the wheels with soap and water.

REAR WHEEL

The rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch LvL One™ aluminum wheels with a polished outer surface and Alcoa Dura-Bright® wheel treatment with XBR® technology as an integral part of the wheel. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

BALANCE WHEELS AND TIRES

All of the wheels and tires, including any spare wheels and tire assemblies, shall be dynamically balanced.

WHEEL TRIM

The front wheels shall include stainless steel lug nut covers and stainless steel baby moons shipped loose with the chassis for installation by the apparatus builder. The baby moons shall have cutouts for oil seal viewing when applicable.

The rear wheels shall include stainless steel lug nut covers and band mounted spring clip stainless steel high hats shipped loose with the chassis for installation by the apparatus builder.

The lug nut covers, baby moons, and high hats shall be RealWheels® brand constructed of 304L grade, non-corrosive stainless steel with a mirror finish. Each wheel trim component shall meet D.O.T. certification.

WHEEL GUARDS

The rear dual wheels shall include a plastic isolator approximately 0.04" thick installed between the inner and outer wheel to help prevent corrosion caused by metal to metal contact.

TIRE CHAINS

Onspot brand six (6) strand automatic ice chains shall be installed on the rear axle of the chassis to provide instant traction while traveling on ice and snow at speeds below 35 MPH.

TIRE CHAINS ACTIVATION

The tire chain system shall be activated by a locking switch on the dash to deter accidental activation. The light on the switch shall illuminate when the tire chains are engaged. The tire chains shall be interlocked with the transmission and shall engage only if the vehicle is traveling 30 MPH or less. After traveling over 30 MPH, the vehicle must be reduced to a speed below 5 MPH for the tire chains to be engaged or re-engaged.

BRAKE SYSTEM

A rapid build-up air brake system shall be provided. The air brakes shall include a two (2) air tank, three (3) reservoir system with a total of 4152 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve

shall be installed to provide a service brake application in the unlikely event of primary air supply loss. All air reservoirs provided on the chassis shall be labeled for identification.

The rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall designate when the system air pressure is below 60 PSI.

A four (4) sensor, four (4) modulator anti-lock braking system (ABS) shall be installed on the front and rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

Additional safety shall be accommodated through Automatic Traction Control (ATC) which shall be installed on the single rear axle. The ATC system shall apply the ABS when the drive wheels loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

A momentary rocker style switch shall be provided and properly labeled “mud/snow”. When the switch is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition the ATC light and the light on the rocker switch shall blink continuously notifying the driver of activation. Pressing the switch again shall deactivate the mud/snow feature.

The Electronic Stability Control (ESC) unit is a functional extension of the electronic braking system. It is able to detect any skidding of the vehicle about its vertical axis as well as any rollover tendency. The control unit comprises an angular-speed sensor that measures the vehicle’s motion about the vertical axis, caused, for instance, by cornering or by skidding on a slippery road surface. An acceleration sensor measures the vehicle’s lateral acceleration. The Controller Area Network (CAN) bus provides information on the steering angle. On the basis of lateral acceleration and steering angle, an integrated microcontroller calculates a theoretical angular speed for the stable vehicle condition.

FRONT BRAKES

The front brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00 inch vented rotors.

REAR BRAKES

The rear brakes shall be Meritor 16.50 inch X 7.00 inch S-cam drum type. The brakes shall feature a cast iron shoe.

PARK BRAKE

Upon application of the push-pull valve in the cab, the rear brakes will engage via mechanical spring force. This is accomplished by dual chamber rear brakes, satisfying the FMVSS parking brake requirements.

In addition to the mechanical rear brake engagement, the front service brakes will also engage via air pressure, providing additional braking capability.

PARK BRAKE CONTROL

A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake.

The parking brake actuation valve shall be mounted to the left side of the engine tunnel integrated into the transmission shift pod console within easy access of the driver.

REAR BRAKE SLACK ADJUSTERS

The rear brakes shall include Meritor automatic slack adjusters installed on the axle which features a simple, durable design offering reduced weight. The automatic slack adjusters shall feature a manual adjusting nut which cannot inadvertently be backed off and threaded grease fittings for easy serviceability.

REAR BRAKE DUST SHIELDS

The rear brakes shall be equipped with brake dust shields.

AIR DRYER

The brake system shall include a Wabco System Saver 1200 air dryer with an integral heater with a Metri-Pack sealed connector. The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the compressor "unload" cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure. The air dryer shall be mounted behind the battery box on the left hand side.

FRONT BRAKE CHAMBERS

The front brakes shall be provided with MGM type 24 long stroke brake chambers.

REAR BRAKE CHAMBERS

The rear axle shall include TSE 30/30 H.O.T. (High Output Technology) brake chambers shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake shoes against the brake drum. The TSE 30/30 H.O.T. chambers are designed to provide the same performance as 30/36 chambers in a smaller package.

AIR COMPRESSOR

The air compressor provided for the engine shall be a Wabco® SS318 single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine RPMs. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life.

AIR GOVERNOR

An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be located on the air dryer bracket on the left frame rail behind the battery box.

MOISTURE EJECTORS

An automatic moisture ejector with a manual drain provision shall be installed on the wet tank of the air supply system. Manual pet-cock type drain valves shall be installed on all remaining reservoirs of the air supply system.

AIR SUPPLY LINES

The air system on the chassis shall be plumbed with color coded reinforced nylon tubing air lines. The primary (rear) brake line shall be green, the secondary (front) brake line red, the parking brake line orange and the auxiliary (outlet) will be blue.

Brass compression type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.

AIR TANK SPACERS

There shall be spacers included with the air tank mounting. The spacers shall move the air tanks 1.50 inches inward towards the center of the chassis. This shall provide clearance between the air tanks and the frame for body U-bolt clearance.

REAR AIR TANK MOUNTING

If a combination of wheel base, air tank quantity, or other requirements necessitate the location of one or more air tanks to be mounted rear of the fuel tank, these tank(s) will be mounted perpendicular to frame.

WHEELBASE

The chassis wheelbase shall be approximately 178.00 inches.

REAR OVERHANG

The chassis rear overhang shall be approximately 47.00 inches.

FRAME

The frame shall consist of double rails running parallel to each other with cross members forming a ladder style frame. The frame rails shall be formed in the shape of a "C" channel, with the outer rail measuring 10.25 inches high X 3.50 inches deep upper and lower flanges X 0.38 inches thick with an inner channel of 9.44 inches high X 3.13 inches deep and 0.38 inches thick. Each rail shall be constructed of 110,000 psi minimum yield high strength low alloy steel. Each double rail section shall be rated by a Resistance Bending Moment (RBM) minimum of 3,213,100 inch pounds and have a minimum section modulus of 29.21 cubic inches. The frame shall measure 35.00 inches in width.

Proposals calculating the frame strength using the “box method” shall not be considered.

Proposals including heat treated rails shall not be considered. Heat treating frame rails produces rails that are not uniform in their mechanical properties throughout the length of the rail. Rails made of high strength, low alloy steel are already at the required yield strength prior to forming the rail.

A minimum of seven (7) fully gusseted 0.25 inch thick cross members shall be installed. The inclusion of the body mounting, or bumper mounting shall not be considered as a cross member. The cross members shall be attached using zinc coated grade 8 fasteners. The bolt heads shall be flanged type, held in place by distorted thread flanged lock nuts. Each cross member shall be mounted to the frame rails utilizing a minimum of 0.25 inch thick gusset reinforcement plates at all corners balancing the area of force throughout the entire frame.

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Any proposals not including additional reinforcement for each cross member shall not be considered.

All relief areas shall be cut in with a minimum 2.00 inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point.

The frame and cross members shall carry a lifetime warranty to the original purchaser. A copy of the frame warranty shall be made available upon request.

Proposals offering warranties for frames not including cross members shall not be considered.

FRAME WARRANTY

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE STATEMENT OF THE SPARTAN MOTORS USA LIMITED WARRANTY. SPARTAN’S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.

The frame and cross members shall carry a limited lifetime warranty to the original purchaser. The warranty period shall commence on the date the vehicle is delivered to the first end user.

FRAME PAINT

The frame shall be powder coated black prior to any attachment of components.

All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 shall not have a fail of more than ten (10) squares. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794 shall have an impact resistance of 120.00 inches per pound at 2 mils.

There shall be an RTV type sealant applied to the seams between the frame rail and the frame liner(s) to help prevent water intrusion between the frame rails. The sealant shall be applied to all seams along the length of the frame and at the front and rear ends of the liner(s). The sealant shall be applied after the frame rails have been assembled and painted.

Any proposals offering painted frame with variations from the above process shall not be accepted. The film thickness of vendor supplied parts shall also be sufficient to meet the performance standards as stated above.

The chassis undercarriage consisting of frame, axles, driveline running gear, air tanks and other chassis mounted components shall be painted black in color. Paint shall be applied prior to airline and electrical wiring installation.

FRONT BUMPER

The chassis shall be equipped with a severe duty front bumper constructed from structural steel channel. The bumper material shall be 0.38 thick ASTM A36 steel which shall measure 12.00 inches high with a 3.05 inch flange and shall be 99.00 inches wide with angled front corners.

The bumper shall be primed and painted as specified.

FRONT BUMPER EXTENSION LENGTH

The front bumper shall be extended approximately 12.50 inches ahead of the cab.

FRONT BUMPER PAINT

The front bumper shall be painted the same as the lower cab color. The front bumper will have Chevron striping applied matching rest of vehicle.

FRONT BUMPER APRON

The 12.50 inch extended front bumper shall include an apron constructed of 0.19 inch thick embossed aluminum tread plate.

The apron shall be installed between the bumper and the front face of the cab affixed using stainless steel bolts attaching the apron to the top bumper flange.

FRONT BUMPER COMPARTMENT CENTER

The front bumper shall include a compartment with hinged lid in the bumper apron located in the center between the frame rails which may be used as a hose well, capable of holding 150 feet of 1 ¾" hose with nozzle. Lid will be notched to allow hose to pass through to be connected to front bumper discharge. The compartment shall be constructed of 0.13 inch 5052-H32 grade aluminum and shall include drain holes in the bottom corners to allow excess moisture to escape. The compartment shall be 7.25 inches long X 38.00 inches wide X 12.38 inches deep.

MECHANICAL SIREN

The front bumper shall include an electro mechanical Federal Q2B™ siren, which shall be streamlined, chrome-plated and shall produce 123 decibels of sound at 10.00 feet. The Q2B™ siren produces a distinctive warning sound that is recognizable at long distances. A unique clutch design provides a longer coast down sound while reducing the amp draw to 100 amps. The siren shall measure 10.50 inches wide X 10.00 inches high X 14.00 inches deep. The siren shall include mounting hardware designed to recess or flush mount.

MECHANICAL SIREN LOCATION

The siren shall be recess mounted on the left side of the front fascia of the bumper approximately in the center of the flat surface between the bumper radius and the frame rail.

AIR HORN

The front bumper shall include two (2) Grover Stuttertone air horns which shall measure 21.00 inches long with a 6.00 inch round flare. The air horns shall be trumpet style with a chrome finish on the exterior and a painted finish deep inside the trumpet.

AIR HORN LOCATION

The air horns shall be recess mounted in the front bumper face on the right side of the bumper in the inboard and outboard positions relative to the right hand frame rail.

AIR HORN RESERVOIR

One (1) air reservoir, with a 1200 cubic inch capacity, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

ELECTRONIC SIREN SPEAKER

There shall be one (1) Cast Products Inc. model SA4301, 100 watt speaker provided. The speaker shall measure 6.20 inches tall X 7.36 inches wide X 3.06 inches deep. The speaker shall include a flat mounting flange which shall be polished aluminum.

ELECTRONIC SIREN SPEAKER LOCATION

The electronic siren speaker shall be located on the front bumper face between the frame rails in the left side inboard position.

FRONT BUMPER TOW HOOKS

Two (2) heavy duty chrome plated tow hooks shall be installed in the rearward position out of the approach angle area, bolted directly to the side of each chassis frame rail with grade 8 bolts.

FRONT BUMPER TOW EYES

The bumper shall include two (2) painted tow eyes shall be installed through the front bumper. The tow eyes shall be fabricated from 0.75 inch thick #1020 ASTM-36 hot rolled steel. The inside diameter of the tow eye shall be 2.00 inch and have a chamfered edge. The tow eyes shall be painted to match the frame.

CAB TILT SYSTEM

The entire cab shall be capable of tilting approximately 45-degrees to allow for easy maintenance of the engine and transmission. The cab tilt pump assembly shall be located on the right side of the chassis above the battery box.

The electric-over-hydraulic lift system shall include an ignition interlock and red cab lock down indicator lamp on the tilt control which shall illuminate when holding the “Down” button to indicate safe road operation.

It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab. As a third precaution the ignition switch must be turned off to complete the cab tilt interlock safety circuit.

Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks.

Two (2) cab tilt cylinders shall be provided with velocity fuses in each cylinder port. The cab tilt pivots shall be 1.90 inch ball and be anchored to frame brackets with 1.25 inch diameter studs.

A steel safety channel assembly, painted safety yellow shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety channel assembly shall fall over the lift cylinder when the cab is in the fully tilted position. A cable release system shall also be provided to retract the safety channel assembly from the lift cylinder to allow the lowering of the cab.

CAB TILT LIMIT SWITCH

A cab tilt limit switch shall be installed. The switch will effectively limit the travel of the cab when being tilted. The limit adjustment of the switch shall be preset by the chassis manufacturer to prevent damage to the cab or any bumper mounted option mounted in the cab tilt arc. Further adjustment to the limit by the apparatus manufacturer shall be available to accommodate additional equipment.

CAB TILT CONTROL RECEPTACLE

A six (6) pin Deutsch receptacle that includes a cap shall be installed in the front bumper tail on the right hand side to provide a place to plug in the cab tilt remote control pendant.

The remote control pendant shall include 20.00 feet of cable with a mating Deutsch connector. The remote control pendant shall be shipped loose with the chassis.

CAB WINDSHIELD

The cab windshield shall have a surface area of 2825.00 square inches and be of a two (2) piece wraparound design for maximum visibility.

The glass utilized for the windshield shall include standard automotive tint. The left and right windshield shall be fully interchangeable thereby minimizing stocking and replacement costs.

Each windshield shall be installed using black self-locking window rubber.

GLASS FRONT DOOR

The front cab doors shall include a window which is 27.00 inches in width X 26.00 inches in height. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished electronically on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

There shall be an irregular shaped fixed window which shall measure 2.50 inches wide at the top, 8.00 inches wide at the bottom X 26.00 inches in height, more commonly known as “cozy glass” ahead of the front door roll down windows.

The windows shall be mounted within the frame of the front doors trimmed with a black anodized ring on the exterior.

GLASS TINT FRONT DOOR

The windows located in the left and right front doors shall have a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS REAR DOOR RH

The rear right hand side door shall include a window which is 27.00 inches in width X 26.00 inches in height. This window shall roll up and down electronically on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

GLASS TINT REAR DOOR RIGHT HAND

The window located in the right hand side rear door shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS REAR DOOR LH

The rear left hand side door shall include a window which is 27.00 inches in width X 26.00 inches in height. This window shall roll up and down electronically on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

GLASS TINT REAR DOOR LEFT HAND

The window located in the left hand side rear door shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS SIDE MID RH

The cab shall include a window on the right side behind the front and ahead of the crew door which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self-locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted.

GLASS TINT SIDE MID RIGHT HAND

The window located on the right hand side of the cab between the front and rear doors shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

CLIMATE CONTROL

The cab shall include a 57,500 BTU @ 425 CFM front overhead heater/defroster which shall be provided and installed above the windshield between the sun visors.

The cab shall also include a combination heater air-conditioning unit mounted on the engine tunnel. This unit shall offer eight (8) adjustable louvers, four (4) forward facing and four (4) rearward facing, a temperature control valve and two (2) blowers offering three (3) speeds which shall be capable of circulating 550 cubic feet of air per minute. The unit shall be rated for 42,500 BTU/Hr of cooling and 36,000 BTU/Hr of heating. The temperature and blower controls shall be located on the heater/air conditioning unit.

All defrost/heating systems shall be plumbed with one (1) seasonal shut-off valve at the front corner on the right side of the cab.

The air conditioner lines shall be a mixture of custom bend zinc coated steel fittings and Aero-quip GH 134 flexible hose with Aero-quip EZ clip fittings.

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CLIMATE CONTROL DRAIN

The climate control system shall include a gravity drain for water management. The gravity drain shall remove condensation from the air conditioning system without additional mechanical assistance. The gravity drain hose shall be held at seven (7) degree angle without a guide tube.

CLIMATE CONTROL ACTIVATION

The heating and defrosting controls shall be located on the front overhead climate control unit. There shall be additional heating and air conditioning controls located on the engine tunnel mounted climate control unit.

HEATER HOSE INSULATION

The heater hoses leading from the engine to the cab shall include a foam insulation wrap which runs the length of the hose improving heating in extreme cold climates. The heater hoses which shall be routed inside the cab shall not be insulated.

A/C CONDENSER LOCATION

A roof mounted A/C condenser shall be installed centered on the cab, forward. The A/C condenser shall include a full cover.

A/C COMPRESSOR

The air-conditioning compressor shall be a belt driven, engine mounted, open type compressor that shall be capable of producing a minimum of 32,000 BTU at 1500 engine RPMs. The compressor shall utilize R-134A refrigerant and PAG oil.

UNDER CAB INSULATION

The underside of the cab tunnel surrounding the engine and the underside of the entire cab floor shall be lined with multi-layer insulation, engineered for application inside diesel engine compartments.

The insulation shall act as a noise barrier, absorbing noise thus keeping the decibel level in the cab well within NFPA recommendations. As an additional benefit, the insulation shall assist in sustaining the desired temperature within the cab interior.

The engine tunnel insulation shall measure approximately 0.75 inch thick including a vertically lapped polyester fiber layer, a 1.0 lb/ft² PVC barrier layer, an open cell foam layer, and a moisture and heat reflective foil facing reinforced with a woven fiberglass layer. The foil surface acts as protection against moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test.

The cab floor insulation shall measure .56 inch thick including a 1.0#/sf PVC barrier and a moisture and heat reflective foil facing, reinforced with fiberglass strands. The foil surface acts as protection against moisture and other contaminants. The insulation shall meet or exceed MVSS 302 flammability test.

The insulation shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation shall be held in place by 3 mils of acrylic pressure sensitive adhesive and

Aluminum pins with hard hat, hold in place fastening heads. In addition, the insulation on the underside of the cab floor shall have an expanded metal overlay to assist in retaining the insulation tight against the cab.

INTERIOR TRIM FLOOR

The floor of the cab shall be covered with a multi-layer mat consisting of 0.25 inch thick sound absorbing closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The covering shall be held in place by a pressure sensitive adhesive and aluminum trim molding. All exposed seams shall be sealed with silicone caulk matching the color of the floor mat to reduce the chance of moisture and debris retention.

INTERIOR TRIM

The cab interior shall include trim on the front ceiling, rear crew ceiling, and the cab walls. It shall be easily removable to assist in maintenance. The trim shall be constructed of insulated vinyl over a hard board backing.

REAR WALL INTERIOR TRIM

The rear wall of the cab shall be trimmed with vinyl.

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HEADER TRIM

The cab interior shall feature header trim over the driver and officer dash constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum.

TRIM CENTER DASH

The main center dash area shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate. There shall be four (4) holes located on the top of the dash near each outer edge of the electrical access cover for ventilation.

TRIM LH DASH

The left hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate for a perfect fit around the instrument panel. For increased occupant protection the extreme duty left hand dash utilizes patent pending break away technology to reduce rigidity in the event of a frontal crash. The left hand dash shall offer lower vertical surface area to the left and right of the steering column to accommodate control panels.

TRIM RH DASH

The right hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate and shall include a glove compartment with a hinged door and a Mobile Data Terminal (MDT) provision. The glove compartment size will measure 14.00 inches wide X 6.38 inches high X 5.88 inches deep. The MDT provision shall be provided above the glove compartment.

ENGINE TUNNEL TRIM

The cab engine tunnel shall be covered with a multi-layer mat consisting of 0.25 inch closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The mat shall be held in place by

pressure sensitive adhesive. The engine tunnel mat shall be trimmed with anodized aluminum stair nosing trim for an aesthetically pleasing appearance.

POWER POINT DASH MOUNT

The cab shall include one (1) 12 volt cigarette lighter type receptacle installed in the switch panel to provide a power source for 12 volt electrical equipment. The receptacle shall be wired battery direct.

STEP TRIM

Each cab entry door shall include a three step entry. The first step closest to the ground shall be constructed of 14 gauge 304 stainless steel with indented perforations. The perforations shall allow water and other debris to flow through rather than becoming trapped within the stepping surface. The stainless steel material shall have a number 7 mirror finish. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed in 0.08 inch thick 3003-H22 embossed aluminum tread plate.

UNDER CAB ACCESS DOOR

The cab shall include an aluminum access door in the left crew step riser painted to match the cab interior paint with a push and turn latch. The under cab access door shall provide access to the diesel exhaust fluid fill.

INTERIOR DOOR TRIM

The interior trim on the doors of the cab shall consist of an aluminum panel constructed of Marine Grade 5052-H32 0.13 of an inch thick aluminum plate. The door panels shall include a black painted finish. Their shall also be Chevron type reflective striping matching that of all other Chevron reflective striping installed on each interior door, final design shall be approved by KVFC prior to installing.

DOOR TRIM CUSTOMER NAMEPLATE

The interior door trim on the front doors shall include a customer nameplate which states the vehicle was custom built for their Department.

CAB DOOR TRIM REFLECTIVE and LIGHTING

The interior of each door shall include high visibility reflective tape. A white reflective tape shall be provided vertically along the rear outer edge of the door. The lowest portion of each door skin shall

include a reflective tape chevron with red and white stripes and a Spartan logo. The chevron tape shall measure 6.00 inches in height. All doors will be provided with Spartan optional LED warning lights activated when doors are open.

INTERIOR GRAB HANDLE "A" PILLAR

There shall be two (2) rubber covered 11.00 inch grab handles installed inside the cab, one on each “A” post at the left and right door openings. The left handle shall be located 7.88 inches above the bottom of the door window opening and the right handle shall be located 2.88 inches above the bottom of the door window opening. The handles shall assist personnel in entering and exiting the cab.

INTERIOR GRAB HANDLE FRONT DOOR

Each front door shall include one (1) ergonomically contoured 9.00 inch cast aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish to assist personnel entering and exiting the cab.

INTERIOR GRAB HANDLE REAR DOOR

A black powder coated cast aluminum assist handle shall be provided on the inside of each rear crew door. A 30.00 inch long handle shall extend horizontally the width of the window just above the window sill. The handle shall assist personnel in exiting and entering the cab.

ADDITIONAL INTERIOR GRAB HANDLE REAR DOOR

Each interior rear door shall include an additional grab handle. The handle shall be an ergonomically contoured 9.00 inch long cast aluminum grab handle. Each handle shall be mounted horizontally on the upper interior door trim panel. Each handle shall be textured and feature a black powder coat finish and shall assist personnel entering and exiting the cab.

INTERIOR SOFT TRIM COLOR

The cab interior soft trim surfaces shall be black in color.

INTERIOR TRIM SUNVISOR

The header shall include two (2) sun visors, one each side forward of the driver and officer seating positions above the windshield. Each sun visor shall be constructed of Masonite and covered with padded vinyl trim.

INTERIOR FLOOR MAT COLOR

The cab interior floor mat shall be black in color.

CAB PAINT INTERIOR DOOR TRIM

The inner door panel surfaces shall be painted and Reflective striping shall be installed as per KVFC final approval, see Interior Door Trim above.

HEADER TRIM INTERIOR PAINT

The metal surfaces in the header area shall be coated with multi-tone black texture finish.

TRIM CENTER DASH INTERIOR PAINT

The entire center dash shall be coated with multi-tone black texture finish. Any accessory pods attached to the dash shall also be painted this color.

TRIM LH DASH INTERIOR PAINT

The left hand dash shall be painted with a multi-tone black texture finish.

TRIM RIGHT HAND DASH INTERIOR PAINT

The right hand dash shall be painted with multi-tone black texture finish.

DASH PANEL GROUP

The main center dash area shall include three (3) removable panel's located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The center panel shall be within comfortable reach of both the driver and officer.

SWITCHES CENTER PANEL

The center dash panel shall include twelve (12) rocker switch positions in a six (6) over six (6) switch configuration in the left portion of the panel.

A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided

SWITCHES LEFT PANEL

The left dash panel shall include eight (8) switches in a single row configuration. Five (5) of the switches shall be rocker type and the left three (3) shall be the headlight switch, the instrument lamp dimmer switch and the windshield wiper/washer control switch.

A rocker switch with a blank legend installed directly above shall be provided for any position not designated by a specific option. The non-designated switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.

SWITCHES RIGHT PANEL

The right dash panel shall include switches to control Mechanical siren/brake and air horns with legends.

SEAT BELT WARNING

A Weldon seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall activate an indicator light in the instrument panel, a digital seat position indicator with a seat position legend in the switch panel, and an audible alarm.
The warning system shall activate when any seat is occupied with a minimum of 60 pounds and the corresponding seat belt remains unfastened. The warning system shall also activate when any seat is occupied and the corresponding seat belt was fastened in an incorrect sequence. Once activated, the visual indicators and audible alarm shall remain active until all occupied seats have the seat belts fastened.

SEAT MATERIAL

The seats shall include a covering of high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear.

SEAT COLOR

All seats supplied with the chassis shall be gray in color. All seats shall include red seat belts.

SEAT BACK LOGO

The seat back shall include the "Spartan" logo. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

SEAT DRIVER

The driver's seat shall be an H.O. Bostrom Firefighter Sierra model seat. The seat shall feature eight-way electric positioning. The eight positions shall include up and down, fore and aft with 8.00 inches of travel, back angle adjustment and seat rake adjustment. The seat shall feature integral springs to isolate shock.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt, automatic retractor and buckle as an integral part of the seat assembly.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches measured with the seat height adjusted to the lowest position of travel.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK DRIVER

The driver's seat shall include a standard seat back incorporating the all belts to seat feature (ABTS). The seat back shall feature a contoured head rest.

SEAT MOUNTING DRIVER

The driver's seat shall be installed in an ergonomic position in relation to the cab dash.

OCCUPANT PROTECTION DRIVER

The driver's position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The driver's seating area APS shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the driver, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Large side curtain airbag - protects the driver's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the driver in a qualifying event by covering the window and the upper portion of the door.

- Dual knee airbags (patent pending) with energy management mounting (patent pending) - protects the driver's lower body from dangerous surface contact injuries, acceleration injuries, and from intrusion as well as locks the lower body in place so the upper body shall be shall be slowed by the load limiting seat belt.

Steering wheel airbag - protects the driver's head, neck, and upper torso from contact injuries, acceleration injuries, and contact points with intrusive surfaces as a result of a collision.

SEAT OFFICER

The officer's seat shall be a H.O. Bostrom Firefighter series. The seat shall feature a tapered and padded seat, and cushion. The seat shall be a non-adjustable type seat.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat

assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK OFFICER

The officer’s seat back shall include an IMMI brand SmartDock® Gen 2 hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT MOUNTING OFFICER

The officer’s seat shall be installed in an ergonomic position in relation to the cab dash.

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OCCUPANT PROTECTION OFFICER

The officer's position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The officer's seating area APS shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the officer, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Large side curtain airbag - protects the officer's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the officer in a qualifying event by covering the window and the upper portion of the door.

Knee airbags - protects the officer's lower body from dangerous surface contact injuries, acceleration injuries, and from contact points with intrusive surfaces as a result of a collision as well as locks the lower body in place so the upper body shall be slowed by the load limiting seat belt.

POWER SEAT WIRING

The power seat or seats installed in the cab shall be wired directly to battery power.

SEAT BELT ORIENTATION CREW

The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard hip.

SEAT REAR FACING OUTER LOCATION

The crew area shall include one (1) rear facing crew seat located directly behind the right side front seat.

SEAT CREW REAR FACING OUTER

The crew area shall include a seat in the rear facing outboard position which shall be a H.O. Bostrom Firefighter series. The seat shall feature a tapered and padded seat, and cushion.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK REAR FACING OUTER

The crew area seat backs shall include an IMMI brand SmartDock® Gen 2 hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT MOUNTING REAR FACING OUTER

The rear facing outer seats shall offer special mounting positions which shall be 2.00 inches towards the rear wall offering additional space between the front seats and the outer rear facing seats.

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The rear facing outer seat position(s) shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

Each rear facing outer seating position APS shall include:

- APS advanced seat belt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

Side curtain airbag - protects each occupant's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to each seating position with an airbag custom designed for each cab configuration.

CAB FRONT UNDERSEAT STORAGE ACCESS

The left and right under seat storage areas shall have a solid aluminum hinged door with non-locking latch.

SEAT COMPARTMENT DOOR FINISH

All under seat storage compartment access doors shall have a multi-tone silver gray texture finish.

HELMET STORAGE SHIPLOOSE QUANTITY

The ship loose items shall include four (4) helmet storage brackets.

HELMET STORAGE SHIPLOOSE

The ship loose items shall include Ziamatic model UHH-1 helmet storage designed to meet current NFPA regulations. The UHH-1 shall securely fasten fire helmets to flat cab surfaces. The UHH-1 utilizes a helmet hook and an adjustable strap to accommodate nearly any helmet size or configuration.

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WINDSHIELD WIPER SYSTEM

The cab shall include a dual arm wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers which shall be affixed to a radial wet arm. The system shall include a single motor which shall initiate the arm in which both the left hand and right hand windshield wipers are attached, initiating a back and forth motion for each wiper. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's position.

ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR

The windshield washer fluid level shall be monitored electronically. When the washer fluid level becomes low the yellow "Check Message Center" indicator light on the instrument panel shall illuminate and the message center in the dual air pressure gauge shall display a "Check Washer Fluid Level" message.

CAB DOOR HARDWARE

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of a fiber reinforced plastic composite with a black matt finish.

The interior exit door handles shall be flush paddle type with a black finish, which are incorporated into the upper door panel.

All cab entry doors shall include locks which are keyed alike. The door locks shall be designed to prevent accidental lockout.

DOOR LOCKS

Each cab entry door shall include a manually operated door lock. Each door lock may be actuated from the inside of the cab by means of a red knob located on the paddle handle of the respective door or by using a TriMark key from the exterior. The door locks are designed to prevent accidental lock out.

DOOR LOCK LH EMS COMPARTMENT

The left hand side EMS compartment shall feature a manual door lock.

GRAB HANDLES

The cab shall include one (1) 18.00 inch three-piece extruded aluminum anti-slip exterior grab handle with rubber inserts behind each cab door. The Hansen number 4000 Series Lit Anti-Slip Rails shall be mounted in bright anodized aluminum 4000 Series II stanchions, complete with weep holes to prevent the buildup of moisture.

The grab rails shall include a 12 volt, 17.00 inch long clear LED light to provide an increased margin of safety for night time cab entry and egress. The lights shall only be activated when the parking brake is set and the marker lights are on.

REARVIEW MIRRORS

Retrac Aerodynamic West Coast style mirror heads shall be provided and installed each of the front cab doors.

The mirrors shall be mounted via 1.00 inch diameter tubular stainless steel arms to provide a rigid mounting to reduce vibration.

The mirrors shall measure 8.00 inches wide X 19.00 inches high and shall include a single view mirror head. The flat mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver. A separate 8” convex mirror shall be mounted below flat mirror. The flat and convex mirrors shall be heated for defrosting in severe cold weather conditions.

The mirror backs shall be constructed of vacuum formed chrome plated ABS plastic housings that are corrosion resistant and shall include an amber marker light. The mirrors shall be manufactured with the finest quality non-glare glass.

REARVIEW MIRROR HEAT SWITCH

The heat for the rear-view mirrors shall be controlled through a rocker switch on the dash in the switch panel.

FRONT BUMPER CONVEX MIRROR

A Convex mirror shall be mounted on passenger side at top of front cab corner to allow better visibility of front bumper area to driver.

EXTERIOR TRIM REAR CORNER

There shall be mirror finish stainless steel scuff plates on the outside corners at the back of the cab. The stainless steel plate shall be affixed to the cab using two sided adhesive tape.

CAB FENDER

Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. Each two-piece liner shall consist of an inner liner 16.00 inches wide made of vacuum formed ABS composite and an outer fenderette 3.50 inches wide made of 14 gauge 304 polished stainless steel.

MUD FLAPS FRONT

The front wheel wells shall have mud flaps installed on them.

CAB EXTERIOR FRONT & SIDE EMBLEMS

The cab shall include three (3) Spartan emblems. There shall be one (1) installed on the front air intake grille and one (1) emblem on the exterior of the cab on the lower forward portion of the front driver and officer side doors. The cab shall also include one (1) Advanced Protection System shield emblem just rear of the Spartan emblem on each front door.

IGNITION

A master battery system with a keyless start ignition system shall be provided. Each system shall be controlled by a one-quarter turn Cole Hersee switch, both of which shall be mounted to the left of the

steering wheel on the dash. A chrome push type starter button shall be provided adjacent to the master battery and ignition switches.

Each switch shall illuminate a green LED indicator light on the dash when the respective switch is placed in the “ON” position.

The starter button shall only operate when both the master battery and ignition switches are in the “ON” position.

BATTERY

The single start electrical system shall include six (6) Harris BCI 31 925 CCA batteries with a 210 minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541.

BATTERY TRAY

The batteries shall be installed within two (2) stainless steel battery trays located on the left side and right side of the chassis, securely bolted to the frame rails. The battery trays shall be coated with the same material as the frame.

The battery trays shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat made by Dri-Dek shall be installed in the bottom of the trays to allow for air flow and help prevent moisture build up. The batteries shall be held in place by non-conducting phenolic resin hold down boards.

BATTERY BOX COVER

Each battery box shall include a stainless steel cover which protects the top of the batteries. Each cover shall include flush latches which shall keep the cover secure as well as a black powder coated handle for convenience when opening.

BATTERY CABLE

The starting system shall include cables which shall be protected by 275 degree F. minimum high temperature flame retardant loom, sealed at the ends with heat shrink and sealant.

BATTERY JUMPER STUD

The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure.

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ALTERNATOR

The charging system shall include a 320 amp Leece-Neville 12 volt alternator. The alternator shall include a self-exciting integral regulator.

BATTERY CONDITIONER

A Kussmaul Auto Charge 40/20 battery conditioner shall be supplied. The battery conditioner shall provide a 40 amp output for the chassis batteries and a 20 amp battery saver output. The battery conditioner shall be mounted in the cab behind the driver's seat.

BATTERY CONDITIONER DISPLAY

A Kussmaul battery conditioner display shall be supplied. The battery conditioner display shall be mounted in front of the left side door just below the windshield.

AUXILIARY AIR COMPRESSOR

A Kussmaul Auto Pump 120V air compressor shall be supplied. The air compressor shall be installed behind the officer's seat. The air compressor shall be plumbed to the air brake system to maintain air pressure.

ELECTRICAL INLET

A Kussmaul 20 amp super auto-eject electrical receptacle shall be supplied. It shall automatically eject the plug when the starter button is depressed.

A single item or an addition of multiple items must not exceed the rating of the electric inlet that it's connected to.

Amp Draw Reference List:
Kussmaul 1000 Charger - 3.5 Amps
Kussmaul 1200 Charger - 10 Amps
Kussmaul 35/10 Charger - 10 Amps
1000W Engine Heater - 8.33 Amps

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1500W Engine Heater - 12.5 Amps
120V Air Compressor - 4.2 Amps

ELECTRICAL INLET LOCATION

An electrical inlet shall be installed on the left hand side of the cab behind the front door.

ELECTRICAL INLET CONNECTION

The electrical inlet shall be connected to the battery conditioner and the air pump.

ELECTRICAL INLET COLOR

The electrical inlet connection shall include a yellow cover.

HEADLIGHTS

The cab front shall include four (4) rectangular LED headlamps with separate high and low beams mounted in bright chrome bezels.

FRONT TURN SIGNALS

The front fascia shall include two (2) Whelen model M6 4.00 inch X 6.00 inch amber LED turn signals which shall be installed in a chrome housing above and outboard of the front warning and head lamps.

HEADLIGHT LOCATION

The headlights shall be located on the front fascia of the cab directly below the front warning lights.

SIDE TURN/MARKER LIGHTS

The sides of the cab shall include two (2) LED round side marker lights which shall be provided just behind the front cab radius corners.

MARKER AND ICC LIGHTS

In accordance with FMVSS, there shall be five (5) LED cab marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level.

HEADLIGHT AND MARKER LIGHT ACTIVATION

The headlights and marker lights shall be controlled through a rocker switch within easy reach of the driver. There shall be a dimmer switch within easy reach of the driver to adjust the brightness of the dash lights. The headlamps shall be equipped with the "Daytime Running" light feature, which shall illuminate the headlights to 80% brilliance when the battery master switch is in the "On" position and the parking brake is released.

GROUND LIGHTS

Each door shall include an LED NFPA compliant ground light mounted to the underside of the cab step below each door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life. The ground lighting shall be activated by the opening of the respective door as well as being activated when the parking brake is set.

LOWER CAB STEP LIGHTS

The middle step located at each door shall include a recess mounted 4.00 inch round LED light which shall activate with the opening of the respective door.

INTERMEDIATE STEP LIGHTS

The intermediate step well area at each door shall include an LED light within a chrome housing. The Egress step lights shall provide visibility to the step well area for the first step exiting the vehicle. The Egress step lights shall activate with Entry step lighting.

UNDER BUMPER LIGHTS

There shall be two (2) 4.00 inch round LED ground lights mounted under the bumper. The lights shall include a polycarbonate lens, a housing which is vibration welded, and LEDs which shall be shock mounted for extended life. The under bumper ground lighting shall be interlocked with the park brake.

ENGINE COMPARTMENT LIGHT

There shall be an LED NFPA compliant light mounted under the engine tunnel for area work lighting on the engine. The light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life. The light shall activate automatically when the cab is tilted.

LIGHTBAR PROVISION

There shall be one (1) light bar installed on the cab roof. The light bar shall be provided and installed by Spartan Chassis. The light bar installation shall include mounting and wiring to a control switch on the cab dash.

CAB FRONT LIGHTBAR

The light bar provisions shall be for one (1) Whelen brand Freedom IV LED light bar mounted centered on the front of the cab roof. The light bar shall be 72.00 inches in length. The light bar shall feature twelve (12) red LED light modules and two (2) clear LED light modules. The entire light bar shall feature a clear lens. The clear lights shall be disabled with park brake engaged. The cable shall exit the light bar on the right side of the cab.

LIGHTBAR SWITCH

The light bar shall be controlled by a rocker switch located on the switch panel. This switch shall be clearly labeled for identification.

FRONT SCENE LIGHT

The front of the cab shall include a Whelen Pioneer model PCP2 contour roof mount scene light installed on the brow of the cab.

Each lamp head shall have two (2) 12 volt high intensity LED panels. One side of each lamp head shall include a flood light and the other side shall include an 8-degree spotlight. Each lamp head shall draw 12.0 amps and generate 14,000 lumens total. Each lamp head shall measure 4.25 inches in height X 14.00 inches in width. The lamp heads and brackets shall be powder coated white.

FRONT SCENE LIGHT ACTIVATION

The front scene lighting shall be activated by a dash mounted rocker switch

FRONT SCENE LIGHT LOCATION

There shall be one (1) scene light mounted center on the front brow of the cab.

SIDE SCENE LIGHTS

The cab shall include two (2) Whelen model Pioneer PSP1 radius mount lights installed one (1) on each side of the cab.

Each lamp head shall have one (1) 12 volt high intensity LED panel. Each light shall draw 6.0 amps and generate 7,000 lumens. Each lamp head shall be adjustable up to 20-degrees in the radius mount bracket. Each lamp head shall measure 4.25 inches in height X 8.18 inches in width. The lamp heads shall be powder coated white.

SIDE SCENE LIGHT LOCATION

The scene lighting located on the left and right sides of the cab shall be mounted on the upper side radius of the cab above the mid crew area with the rear of the light in line with the center of the front axle.

SIDE SCENE ACTIVATION

The scene lights shall be activated by two (2) rocker switches located in the switch panel, one (1) for each light, and by opening the respective side cab door

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INTERIOR OVERHEAD LIGHTS

The cab shall include a two-section, red and clear Weldon LED dome lamp located over each door. The dome lamps shall be rectangular in shape and shall measure approximately 7.00 inches in length X 3.00 inches in width with a black colored bezel. The clear portion of each lamp shall be activated by opening the respective door and both the red and clear portion can be activated by individual push lenses on each lamp.

An additional incandescent three (3) light module with dual map lights shall be located over the engine tunnel which can be activated by individual switches on the lamp.

LIGHT TOWER PROVISION

The cab roof shall include reinforcement for a light tower. The reinforcement shall consist of four (4) aluminum pads mounted to the exterior of the cab roof and additional internal cab roof structure. The entire reinforcement shall be integral with the roof for rigidity. The light tower shall be provided and installed by the body manufacturer.

LIGHT TOWER MODEL

The light tower provisions shall be for a Will-Burt Nightscan model 3.0 (NS-10) light tower with four (4) 240 volt 230 watt LED Fire Research Spectra light heads.

LIGHT TOWER ORIENTATION

The roof reinforcement shall be installed perpendicular to the rear wall of the cab.

LIGHT TOWER HORIZONTAL JUSTIFICATION

The roof reinforcement shall be justified to the center of the cab left to right.

LIGHT TOWER LIGHT HEAD ORIENTATION

The roof reinforcement shall be oriented in order for the light head on the light tower to be towards the front of the cab while in the stored position.

LIGHT TOWER FORE/AFT ORIENTATION

The roof reinforcement shall be oriented on the roof of the cab towards the rear wall of the cab.

DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include three (3) flashing Whelen TIR3™ LED lights clearly labeled "Do Not Move Apparatus". In addition to the flashing red lights, an audible alarm shall be included which shall sound while either light is activated.

Each flashing light shall be 3.50 inches long X 1.25 inches wide X 1.12 inches high and shall be located centered left to right for greatest visibility.

One (1) red light shall be interlocked for activation when a left side door is not firmly closed when the parking brake is released, and one (1) red light shall be interlocked for activation when any right side door is not firmly closed when the parking brake is released. One (1) orange light shall be interlocked in between the two red lights and shall be interlocked with the Light Tower for activation when the Light Tower is not in the proper travel position.

MASTER WARNING SWITCH

A master switch shall be included in the main rocker switch panel, far left on bank of switches. The switch shall be a rocker type, red in color and labeled “Master” for identification. The switch shall feature control over all devices wired through it. Any warning device switch left in the “ON” position shall automatically power up when the master switch is activated.

INBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the front fascia of the cab within a chrome bezel

INBOARD FRONT WARNING LIGHTS COLOR

The warning lights mounted on the cab front fascia in the inboard positions shall be red.

OUTBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right outboard positions. The lights shall feature multiple flash patterns including steady burn for solid

colors and multiple flash patterns for split colors. The lights shall be mounted to the front fascia of the cab within a chrome bezel.

OUTBOARD FRONT WARNING LIGHTS COLOR

The warning lights mounted on the cab front fascia in the outboard position shall be red.

FRONT WARNING SWITCH

The front warning lights shall be controlled via rocker switch on the panel. This switch shall be clearly labeled for identification.

INTERSECTION WARNING LIGHTS

The chassis shall include two (2) Whelen M6 series Super LED intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn.

INTERSECTION WARNING LIGHTS COLOR

The intersection lights shall be red.

INTERSECTION WARNING LIGHTS LOCATION

The intersection lights shall be mounted on the side of the bumper in the rearward position.

SIDE WARNING LIGHTS

The cab sides shall include two (2) Whelen M6 Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the sides of the cab within a chrome bezel.

SIDE WARNING LIGHTS COLOR

The warning lights located on the side of the cab shall be red.

SIDE WARNING LIGHTS LOCATION

The warning lights on the side of the cab shall be mounted over the front wheel well forward from the center of the front axle.

SIDE AND INTERSECTOR WARNING SWITCH

The side and intersector warning lights shall be controlled by a rocker switch on the switch panel. This switch shall be clearly labeled for identification.

INTERIOR DOOR OPEN WARNING LIGHTS

The interior of each door shall include one (1) red 4.00 inch diameter Truck-Lite LED warning light located on the door panel. Each light shall activate with a flashing pattern when the respective door is in the open position to serve as a warning to oncoming traffic.

Each door shall also include one (1) 15.87 inch long X 0.73 inch tall amber Weldon LED warning light. The light shall be located on the upper portion of the door frame to be visible when a person is standing in front of the door while entering or exiting the cab. Each light shall activate with a scrolling directional flash pattern which moves from inside to outside when the door is in the open position. This shall serve as an additional warning to oncoming traffic.

SIREN CONTROL HEAD

A Whelen 295HFS2 electronic siren control head with remote amplifier shall be provided and flush mounted in the switch panel with a location specific to the customer's needs. The siren shall feature 200-watt output, hands free mode and shall be in "standby" mode awaiting instruction. The siren shall offer radio broadcast, public address, wail, yelp, or piercer tones and hands free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected.

HORN BUTTON SELECTOR SWITCH

A rocker switch shall be installed in the switch panel between the driver and officer to allow control of either the electric horn or the air horn from the steering wheel horn button. The electric horn shall sound by default when the selector switch is in either position to meet FMCSA requirements.

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AIR HORN ACTIVATION

The air horn activation shall be accomplished by the steering wheel horn button for the driver and a right hand side DASH mounted switch for the officer. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.

MECHANICAL SIREN ACTIVATION

The mechanical siren shall be actuated by two (1) Linemaster model SP491-S81 foot switch mounted in the front section of the cab for use by the driver and a right side DASH mounted switch for officer. A red momentary siren brake rocker switch shall be provided in the switch panel on the dash.

The siren shall only be active when master warning switch is on to prevent accidental engagement.

BACK-UP ALARM

An ECCO model 575 backup alarm shall be installed at the rear of the chassis with an output level of 107 dB. The alarm shall automatically activate when the transmission is placed in reverse.

INSTRUMENTATION

An ergonomically designed instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor movements shall drive all gauges. The instrumentation system shall be multiplexed and shall receive ABS, engine, and transmission information over the J1939 data bus to reduce redundant sensors and wiring.

A twenty eight (28) icon light bar message center with integral LCD odometer/trip odometer shall be included. The odometer shall display up to 9,999,999.9 miles. The trip odometer shall display 9,999.9 miles. The LCD message center screen shall be capable of custom configuration by the users for displaying certain vehicle status and diagnostic functions.

The instrument panel shall contain the following gauges:

One (1) three-movement gauge displaying Diesel Exhaust Fluid (DEF) level, fuel level, and electronic speedometer shall be included. The scale on the DEF and fuel level gauges shall read from empty to full as a fraction of full tank capacity. An amber indicator light shall indicate low fuel at 25% tank level. An amber indicator light shall indicate low levels of DEF, as well as a message on the LCD screen and an

audible alarm. The primary scale on the speedometer shall read from 0 to 100 MPH, and the secondary scale on the speedometer shall read from 0 to 160 KM/H.

One (1) three-movement gauge displaying primary system, and secondary system air volumes and electronic tachometer shall be included. The scale on the tachometer shall read from 0 to 3000 RPM. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI) with a red line scale indicating critical levels of air pressure. The air pressure scales shall be linear to operate with an accuracy of 1 degree of the measured data with a red indication zone on the gauge showing critical levels of air pressure. A red indicator light in the gauge shall indicate a low air pressure, as well as a message on the LCD screen.

One (1) four-movement gauge displaying engine oil pressure, coolant temperature, voltmeter, and transmission temperature. The scale on the engine oil pressure gauge shall read from 0 to 100 pounds per square inch (PSI) with a red line zone indicating critical levels of oil pressure. The engine oil pressure scale shall be linear to operate with an accuracy of 1 degree of the measured. A red indicator light in the gauge shall indicate a low engine oil pressure, as well as a message on the LCD screen. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (F) with a red line zone indicating critical temperature reading. The coolant temperature scale shall be linear to operate with an accuracy of 1 degree of the measured data. A red indicator light in the gauge shall indicate high coolant temperature, as well as a message on the LCD screen. The scale on the voltmeter shall read from 9 to 18 volts with a red line zone indicating critical levels of battery voltage. A red indicator light shall indicate high or low system voltage, as well as a message on the LCD screen. The scale on the transmission temperature gauge shall read from 100 to 300 degrees Fahrenheit (F) with a red line zone indicating critical temperature reading. The transmission temperature scale shall be linear to operate with an accuracy of 1 degree of the measured data. A red indicator light in the gauge shall indicate a high transmission temperature reading, as well as a message on the LCD screen.

The light bar portion of the message center shall include twenty eight (28) LED backlit icon/decals with clear LED and colored lenses. The light bar shall be split with fourteen (14) back lit indicators on each side of the LCD message screen. The light bar shall contain the following backlit indicators and produce the following audible alarms when supplied in conjunction with applicable configurations:

RED LENS

Stop Engine-indicates critical engine fault
Air Filter Restricted-indicates excessive engine air intake restriction
Park Brake ISO icon-indicates parking brake is set
Seat Belt ISO icon-indicates when a seat is occupied and corresponding seat belt remains unfastened
Low Coolant-indicates engine coolant is required

AMBER LENS

Malfunction Indicator Lamp (MIL) ISO icon-indicates an engine emission control system fault

Check Engine ISO icon-indicates engine fault
Check Trans ISO icon-indicates transmission fault
High Transmission Temperature ISO icon-indicates excessive transmission oil temperature
ABS ISO icon-indicates anti-lock brake system fault
High exhaust system temperature ISO symbol icon
Water in Fuel ISO icon-indicates presence of water in fuel filter
*DPF restriction ISO icon indicates a restriction of the diesel particulate filter
*Regen Inhibit-indicates regeneration has been postponed due to user interaction
Range Inhibit-indicates a transmission operation is prevented and requested shift request may not occur.
*SRS-indicates a problem in the supplemental restraint system
Check Message icon indicates a vehicle status or diagnostic on the LCD display requiring attention.
Check Message-Turn Signal On
Check Message-Door Ajar
Check Message-Cab Ajar
*Check Message-ESC Active
*Check Message-DPF Regen Active
Check Message-No Engine Data
Check Message-No Transmission Data
Check Message-No ABS Data
Check Message-No Data All Communication With The Vehicle Systems Has Been Lost
Check Message-Check Engine Oil Level
Check Message-Check Washer Fluid Level
Check Message-Check Power Steering Fluid Level
Check Message-Low Transmission Fluid Level
Check Message-Check Coolant Level

GREEN LENS

Left and Right turn signal ISO icons
*ATC ISO icon-indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system
High Idle-indicates engine high idle is active.
Cruise Control-indicates cruise control is active
OK to Pump-indicates the pump engage conditions have been met
Pump Engaged-indicates the pump is currently in use
Auxiliary Brake-indicates secondary braking device is active

BLUE LENS

High Beam ISO icon

CLEAR LENS
Wait to Start-indicates active engine air preheat cycle

AUDIBLE ALARMS FROM GAUGE PACKAGE
High Trans Temp
High or Low Voltage
Check Engine
Check Transmission
Stop Engine
Low Air Pressure
Fuel Low
Water in Fuel
*ESC
High Coolant Temperature
Low Engine Oil Pressure
Low Coolant Level
Low DEF Level
Air Filter Restricted
Extended Left and Right Turn Remaining On
Cab Ajar
Door Ajar
ABS System Fault
Seatbelt Indicator

EXTERNAL AUDIBLE ALARM
Air Filter
Cab Ajar
Door Ajar
Check Engine
Stop Engine
Low Air Pressure
Low Engine Oil Pressure
Water in Fuel
*Low DEF
ABS System Fault
Seatbelt Indicator
*Items marked with an asterisk are provided only in applicable configurations.

LCD MESSAGES
Transmission Temperature

Battery Voltage
Engine Hours
Vehicle Speed
Engine RPMs
Fuel Level
DEF Level
Engine Oil Pressure
Ammeter (If equipped)
Auxiliary Ammeter (If equipped)
Engine Coolant Temp
Primary System Air Pressure
Secondary System Air Pressure
Turbo Boost Pressure
Exhaust Temperature
Engine Load
Engine Torque
Instant Fuel Economy
Average Fuel Economy

BACKLIGHTING COLOR

The instrumentation gauges and the switch panel legends shall be backlit using red LED backlighting.

APPARATUS PANEL INSTRUMENTATION

A fuel level gauge and a diesel exhaust fluid (DEF) gauge shall be shipped loose with the cab and chassis for the body builder to install. The DEF gauge shall display the diesel exhaust fluid level as a bar graph which shall provide a yellow warning indication once the level has dropped below 12.5 percent and a red warning indication once the level has dropped below to 5 percent.

RADIO

A Panasonic radio with weather band, AM/FM stereo receiver, compact disc player, and four (4) speakers shall be installed in the cab. The radio shall be installed above the driver position. The speakers shall be installed inside the cab with two (2) speakers recessed within the headliner of the front of the cab just behind the windshield and two (2) speakers on the upper rear wall of the cab.

AM/FM ANTENNA

A small antenna shall be located on the left hand side of the cab roof for AM/FM and weather band reception.

SPARTAN MOBILE GATEWAY

A vehicle mobile gateway router shall be provided. The device, once supplied with a customer provided USB aircard(s) and data plan SIM card(s), shall produce a mobile Wi-Fi hotspot in and around the vehicle using a cellular data connection. The vehicle router also enhances the vehicle's effective cellular data coverage and range. This option comes with free access to remote configuration software for a year. The mobile data hotspot shall be mounted in the cab, in the overhead above the officer's seating position within a removable bracket for ease of access.

MOBILE GATEWAY ANTENNA

A mobile gateway Wi-Fi hotspot antenna shall be provided. The antenna shall be mounted on the right hand mid area of the cab roof above the "B" pillar so not to interfere with light bars or other roof mounted equipment installed by Spartan Chassis.

CAMERA

An Audiovox Voyager heavy duty rear-view camera system, complete with an LCD display monitor, shall be supplied. One (1) box shaped camera shall be shipped loose for OEM installation in the body to afford a clear view to the rear of the vehicle, one (1) camera with a teardrop shaped chrome plated housing shall be mounted on the driver's side and one (1) on the officers side below the windshield ahead of each front door at approximately the same level as the cab door handles.

The cameras shall be wired to a 7.00 inch flip down monitor which shall include a color display and day and night brightness modes installed above the driver position. The rear camera shall activate when the transmission is placed in reverse, the left and right cameras shall activate with the activation of the respective side turn signal.

The camera system shall include a one- way communication device that shall be an integral part of the rear camera for the use of voice commands directly to the driver.

COMMUNICATION ANTENNA

An antenna base, for use with an NMO type antenna, shall be mounted on the right hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by Spartan Chassis. The antenna base shall be an Antenex model MABVT8 made for either a 0.38 inch or 0.75 inch receiving hole in the antenna and shall include 17.00 foot of RG58 A/U cable with no connector at the radio end of the cable. The antenna base design provides the most corrosion resistance and best power

transfer available from a high temper all brass construction and gold plated contact design. The antenna base shall be provided by Spartan.

COMMUNICATION ANTENNA CABLE ROUTING

The antenna cable shall be routed from the antenna base mounted on the roof to the area inside the center rocker switch console.

AUXILIARY COMMUNICATION ANTENNA

An auxiliary antenna base, for use with an NMO type antenna, shall be installed on the cab. The antenna base shall be an Antenex model MABVT8 and shall include 17.00 foot of RG58 A/U cable with no connector at the radio end of the cable. The antenna shall be mounted on the left hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by Spartan Chassis. The antenna base shall be provided by Spartan.

AUXILIARY COMMUNICATION ANTENNA CABLE ROUTING

The auxiliary antenna cable shall be routed from the antenna base mounted on the roof to the area inside the center rocker switch console.

CAB EXTERIOR PROTECTION

The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer.

FIRE EXTINGUISHER

A 2.50 pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.

DOOR KEYS

The cab and chassis shall include a total of four (4) door keys for the manual door locks.

DIAGNOSTIC SOFTWARE OCCUPANT PROTECTION

Diagnostic software for the Spartan Advanced Protection System shall be available for free download from the Spartan Chassis website to Spartan authorized OEMs, dealers and service centers, as well as the vehicle owner.

The software has been validated to be compatible with the following RP1210 interface adapters:

- Dearborn Group DPA4 Plus
- Noregon Systems JPRO® DLA+
- Cummins INLINE5
- Cummins INLINE6
- NexIQ™ USB-Link™

The software and adapter utilize the SAE J1939-13 heavy duty nine (9) pin connector which is located below the driver's side dash to the left of the steering column.

WARRANTY

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE STATEMENT OF THE SPARTAN MOTORS USA LIMITED WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.

The chassis manufacturer shall provide a limited parts and labor warranty to the purchaser of the custom built cab and chassis for a period of thirty-six (36) months, or the first 50,000 miles, whichever occurs first. The warranty period shall commence on the date the vehicle is delivered to the first end user.

CHASSIS OPERATION MANUAL

There shall be two (2) digital copies of the chassis operation manual provided with the chassis. The digital data shall include a parts list specific to the chassis model.

ENGINE AND TRANSMISSION OPERATION MANUALS

The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items:

(2) Hard copies of the Engine Operation and Maintenance manual with CD

(2) Digital copies of the Transmission Operator's manual

(2) Digital copies of the Engine Owner's manual

ENGINE SERVICE MANUALS

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There shall be one (1) printed hard copy set of Cummins ISC/ISL engine service reference manuals which shall be provided with the chassis.

TRANSMISSION SERVICE MANUALS

There shall be one (1) printed hard copy set of Allison 3000 transmission service manuals included with the chassis.

CAB/CHASSIS AS BUILT WIRING DIAGRAMS

The cab and chassis shall include two (2) digital copies of wiring schematics and option wiring diagrams.

AS BUILT FUEL PLUMBING DIAGRAM

The cab and chassis shall include one (1) digital copy of the as built fuel system plumbing diagram.

PAINT CONFIRMATION

There shall be a paint confirmation letter sent to the body manufacturer with paint spray outs to confirm the cab primary paint color or primary and secondary paint color as specified by the paint options.

DRIVELINE LAYOUT CONFIRMATION

During the design phase of the chassis the Spartan Chassis driveline engineer shall submit the driveline layout to an OEM engineer to review the chassis design for any potential problems integrating the OEM body to the chassis. The OEM engineer shall provide approval to the driveline engineer prior to driveline bills of materials being released.

STORAGE COMPARTMENT IN THE CAB CREW AREA

There will be a storage compartment fabricated out of aluminum and painted to match the specified interior color. This cabinet will include a vinyl mesh cover with hold downs. There also will be LED lighting in the cabinet.

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SPARE SCBA STORAGE

Two (2) SCBA packs will be mounted to the rear interior floor of the cab. These packs are to be supplied by the Killingworth Fire Company. Brackets will be a traditional pull cord style. These SCBA's will be mounted, one at each rear door, accessible from ground level, not impeding cab access.

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FIRE PUMP – WATEROUS "CSU":

The pump shall be a mid-ship mounted, single stage pump that complies with all applicable requirements of the latest "Standard for Automotive Fire Apparatus", NFPA Pamphlet 1901, And has a rated capacity of 1,500 GPM.

The pump shall be a Class "A" type and shall deliver the percentage of rated discharge at pressure indicated:

100% of rated capacity at 165 PSI
100% of rated capacity at 150 PSI
70% of rated capacity at 200 PSI
50% of rated capacity at 250 PSI

Pump shall be free from objectionable pulsation and vibration under all normal operating conditions.

PUMP CONSTRUCTION:

The entire pump shall be assembled and tested at the pump manufacturer's factory. The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to the performance specs as outlined by the latest NFPA Pamphlet No. 1901. Pump shall be free from objectionable pulsation and vibration.

The pump shall be driven by a driveline from the truck transmission. The engine shall provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance.

PUMP BODY:

The pump body will be a two-piece, horizontally-split, high tensile, close grained gray iron casting with all passageways being carefully matched to assure the very best hydraulic flow characterizes. The horizontally-split will allow easy removal of the entire impeller shaft assembly, and designed for complete servicing from the bottom of the truck without disturbing the setting of the pump in the chassis or apparatus piping which is connected to the pump. Pump body halves shall be bolted together on a single horizontal face to minimize leakage and facilitate reassembly.

Bronze, reverse-flow, labyrinth-type replaceable wear rings will increase pump life and keep maintenance costs to a minimum.

The Waterous CSU pump meets or exceeds all requirements of the NFPA standard.

IMPELLER:

The pump impeller will be a bronze impeller, balanced both mechanically and hydraulically for vibration-free operation. Flame-plated impeller hubs are standard to assure longer life despite the presence of abrasives in the water supply.

IMPELLER SHAFT:

Heat-treated stainless steel is ground at all critical areas, polished under packing. An exclusive two-piece impeller shaft allows separation of the transmission from the pump without disassembling either component. This simplifies repair procedures, resulting in less down time.

BEARINGS AND SEALS:

Three deep-grove, anti-friction ball bearings, located outside the pumping chamber, give support and proper alignment to the impeller shaft assembly. Bearings are oil or grease lubricated, completely separated from the water being pumped, and protected by seal housing, flinger rings and oil seals.

Seal housings on packed pumps are equipped with braided flexible graphite (BFG) rings held in place by a split bronze gland which is fully removable and adjustable. BFG packing improves heat dissipation, reduces maintenance and minimizes shaft wear. Self-adjusting, spring-loaded mechanical seals are available which eliminate leakage and routine maintenance.

Located on the impeller shaft between seal housings and bearing housings, flinger rings provide added protection and keep water and foreign matter out of the bearings.

Oil seals are standard lip type for lubrication and additional bearing protection from dirt and water.

OVERHEAT PROTECTION MANAGER (OPM):

The Waterous Overheat Protection Manager (OPM) shall act as a safety device by releasing hot water from the discharge area of the pump to the ground. The OPM shall consist of a valve that opens when the water in the pump reaches 140° F (60° C) and a warning light on the pump panel that is triggered by a thermal switch when the water in the pump reaches 180° F (82° C).

PUMP GEARBOX “C20 SERIES”:

The pump transmission shall be rigidly attached to the pump body assembly and be of latest design incorporating a high strength, involute tooth form Morse™ HV chain drive capable of operating at high speeds to provide smooth, quiet transfer of power. The shift engagement shall be accomplished by a free-sliding collar to maintain ROAD or PUMP position.

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PUMP SHIFT:

Pump shift engagement shall be made by a two-position free sliding collar, air controlled from the cab. An internal locking mechanism shall be provided that insures the collar shall be maintained in ROAD or PUMP position. A spring-loaded locking collar shall be mounted over the valve lever in the cab to prevent accidental shifting. Two (2) indicator lights shall be located in the cab adjacent to the pump shift switch. One (1) light, labeled "O.K. TO PUMP" and one to indicate "PUMP ENGAGED".

Another indicator light shall be installed on the pressure governor.

PRIMER:

A Trident #31.001.0 3 barrel air primer with automatic control designed for use in 1250 GPM or larger pumps shall be supplied and fabricated into the pump assembly. This primer shall be directly plumbed into the air system of the apparatus and shall use air from the body tanks supplied. No lubrication is needed with this unit. Once activated, only water shall be seen discharged from the unit when prime is achieved. The body of the primer is made from cast bronze along with all moving parts. The unit has a high corrosion resistance based on its brass construction and offers a long life when properly maintained.

The pump when dry, shall be capable of taking suction and discharge water with a lift of ten (10) feet in not more than 60 seconds, through forty (40) feet of hard suction hose.

REDUNDANT PRIMER

An identical priming system as described above shall be installed as a redundant back up in the event the primary system fails.

PUMP INTAKE STRAINERS AND ANODES:

The pump intake strainers shall be removable, die cast zinc screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump. Anodes are normally mounted on the pump intake piping, but they may also be installed in the discharge piping if no intake mounting locations were available. Physical mounting of the anode may be via an NPT tap or bolt-on flange.

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PIPING:

All suction and discharge lines over 2" in diameter are to be heavy duty Schedule 40 stainless steel pipe. Victaulic couplings shall be used wherever chassis flexing or vibration may loosen or damage piping, or where necessary to improve maintainability.
All suction and discharge valves shall be Elkhart quarter-turn ball type and be designed to seal for vacuum/pressure. All pump lines shall drain through either the master pump drain valve or be equipped with individual drain valves. All drain valve controls shall be extended to the pump panel and shall be located on the lower portion of the side panels. All individual drain lines shall be extended, with rubber hose, to drain below the chassis frame.

2 ½" SUCTION

Two (2) 2 ½" auxiliary suction inlets shall be supplied on side pump panels. One (1) on each side of apparatus. Piping shall be 2 ½" with a 2 ½" valves with nylon ball, chrome plated swivel, strainer and chrome plated plug. The valve shall be located behind the pump panel with Elkhart electronic valves. They shall be controlled by Elkhart UBEC1 electric controllers on the left side pump panel.

MONARCH INTAKE VALVE:

Two (2) Waterous Monarch Intake Valve shall include an extra short intake fitting, an intake butterfly valve and an intake nipple with integral relief valve mounting pad, all designed to fit behind the pump panel. The Waterous Monarch shall feature a Jamesbury Wafer Sphere high performance butterfly valve. The Monarch valve shall also feature a provision for a pre-valve relief valve and an electric actuator. They both shall be controlled by an electric controller on the left pump panel.

Two (2) suction inlets shall be provided one (1) on each side of the apparatus. The suction fittings shall include a removable die cast screen to provide cathodic protection for the pump thus reducing corrosion.

Short style suction tubes shall be used to prevent excessive overhang of valves and pump mounted accessories.

REAR SUCTION:

One (1) Waterous Monarch Intake Valve shall be provided with a 5" suction intake. The connection shall be placed on the right side of the rear of the apparatus. It will be controlled by an electric controller on the left side pump panel.

The suction fitting will include a removable die cast screen to provide cathodic protection for the pump, thus reducing corrosion.

Short style suction tubes shall be used to prevent excessive overhang of valves.

DISCHARGE OUTLETS:

One (1) 2” discharge with an Elkhart 2” electric valve shall be supplied to the front bumper with a Class 1 2” high pressure hose. It shall have a 2” X 1 ½”, 90 degree chrome plated brass mechanical swivel. The discharge shall be controlled from the left side pump operator’s panel with an Elkhart UBEC2 electric controller with a digital read out. The box shall hold 150’ of 1 ¾” hose with a nozzle. 300’ of 1 ¾” hose shall be supplied with the apparatus. (Color to be determined) Flow rate of 200GPM

Six (6) 2 ½" discharges shall be supplied, two (2) on the left side pump panel, one (1) on the right side pump panel and three (3) 2 ½” discharges piped to the right side of apparatus hose bed with 3” piping. Two (2) shall be fitted with 2 ½” adapter and one (1) shall be fitted with a 3” adapter.

All 2 ½” discharges shall have 2 ½" electric full-flow Elkhart valves. Six (6) shall be controlled by an Elkhart UBEC2 electric controller with a digital pressure reading on the controller on the left side pump panel Discharges shall also include 30-degree chrome elbows with caps and chains.

One (1) Elkhart, 3” electric valve with 3” piping shall be piped over the top of the pump with an 8-bolt flange for a Task Force Tips deck gun. The valve shall be controlled from the left side operator’s panel with an Elkhart UBEC3 electric controller and shall include a digital pressure and flow read out.

One (1) Elkhart 3” electric valve with 3” piping will be provided and piped to the rear face of the apparatus. A 3” male connection will be provided and installed with a cap. The valve shall be controlled from the left side operator’s panel with an Elkhart UBEC2 electric controller and shall include a digital pressure read out. Discharge shall be capable of pump capacity discharge.

One (1) Task Force Tips Hurricane RC series monitor will be provided and installed. This monitor will be a remote controlled stationary monitor with two (2) controllers provided. One (1) Automatic 1250 Nozzle will be provided. One (1) mounting bracket will be provided. Flow rate of 500 GPM

One (1) Task Force Tips Extend-a-Gun will be provided and installed. Extender will be electric with a controller wired to the left side operator’s panel. It will have a raised height of 18 inches.

One (1) Elkhart, 3.5” electric valve shall be piped to the right side pump operator’s panel. This discharge shall have 3.5” piping with a 3.5” N.S.T. chrome adapter with 5” storz x 4”storz, 30 degree storz elbow with a cap. The discharge shall be controlled from the left side pump operator’s panel by an Elkhart UBEC3 controller. Discharge shall be capable of pump capacity discharge.

Three (3) crosslay hose beds shall be furnished above the pump. Each shall have a capacity of 250 ft. of 1 ¾" double-jacketed hose in a single stacked formation. Each 1 ¾” crosslay shall be supplied with a 2” electric Elkhart valve. Each shall be controlled by an Elkhart UBEC1 electric controller. Each of these

hose beds shall be furnished with a 2” by 1 ½” mechanical swivel.Flow Rate of 200GPM minimum

The crosslay hose beds shall be constructed of stainless steel with slatted aluminum flooring. The crosslay hose beds shall have an aluminum tread plate hinged cover and restraint straps on the open ends to meet the current NFPA Standard.

PUMP WARRANTY:

The Five-Year Limited Warranty with Total Protection Package (TPP-5) is a comprehensive warranty that increases your standard warranty to include labor expenses to dismantle, remove and reinstall covered products or parts.

DRAINS:

MASTER DRAIN:

The pump shall be equipped with a manifold drain assembly consisting of a stainless steel plunger in a bronze body with multiple ports. The valve shall be designed so that the pump discharge pressure is used to force the plunger closed. The drain valve control shall be cable operated from the pump operator’s panel and is identified as PUMP DRAIN. A master drain valve shall be supplied that shall drain the main pump. The control shall be push-pull on operator's panel. The valve shall be manufactured by Hale.

LINE DRAINS:

One (1) ¾" drain valve shall be furnished for each 1 ½" or larger discharge. The valves shall be located along the bottom of the pump panels, both sides. The valves shall have ¼ turn control knobs and shall also be color-coded and numbered.

AUTOMATIC DRAINS:

Class-1 #34 A.D. automatic drains shall be supplied on mattydales and rear discharges.

PUMP COOLER:

One (1) ½" pump cooler line with ¼ turn-type control on operator's panel shall be supplied. The line shall run from the discharge side of pump back to the booster tank to cool the pump during sustained periods of pump operation when water is not being discharged. A check valve shall be supplied.

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TANK SUCTION VALVE:

The Tank to Pump valve is a full flow 3.5 inch diameter ball valve which is attached directly to the pump. The valve is operated by an Elkhart UBEC 3 electronic actuator controller. Must be capable of allowing pump to flow at rated capacity.

TANK FILL:

A 2" pump to tank refill line shall be supplied with Elkhart UBEC1 controller on operator's panel. The piping shall be 2" I.D. with a Hale 2" full flow valve. All plumbing shall be stainless steel. This valve shall a 2 ½" pressure gauge on it.

PUMP OPERATORS' CONTROL PANEL:

The operator's panel shall be located on left side and shall include all valves, controls, and gauges, unless otherwise specified. Both right side and left side panels shall be removable for pump access. Polished stainless steel trim rings shall be installed around all inlets, outlets and control rod openings. Both pump panels shall measure 50" width.

Each right and left pump panel controls and gauges shall be illuminated by Luma Bar LED lights mounted under a stainless steel hood.

Both pump panels shall be stainless steel, with all pump controls installed for the best operation. Panels will be finished with a black coating.

PUMP ACCESS DOOR:

The right side pump panel shall have a pump access door approximately 16" x 22" for inspection and service of the pump and controls. Door to be flat type vertically hinged with "D" ring latch. Perimeter of opening to be trimmed with polished aluminum moldings.

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PUMP AND GAUGE PANEL LABELS:

All gauges, discharge outlets, discharge controls, and drains shall be labeled for ease of identification. Vision Mark etched labels shall be used.

The Vision Marks labels shall be color-coded, function I.D. and have a clear coat finish.

All labels shall be fastened to the body surfaces using mechanical fasteners and/or attached by adhesive materials. The lettering shall be etched on a color-coded matte surface within the bezel opening around all discharge gauges.

GAUGE HEATER:

One (1) MC Products gauge heater shall be installed

PUMP CONTROLS:

ELECTRONIC PRESSURE GOVERNOR:

A Fire Research "IN-CONTROL" 400 Governor System designed to control the engine to maintain a desired pump pressure or engine speed setting shall be provided. This unit shall work with the electronically controlled engine via an electrical control signal to the engine control module.

The unit shall include an "RPM" mode, "PSI" mode, "Idle" mode, "Preset" mode, and "High Idle" mode. Switching between the modes shall be achieved by pressing and holding the mode switch, which shall change the controller between modes without loss of speed or pressure. The display shall change accordingly. The control shall be on the pump operator's panel.

The following gauges and controls shall be furnished on the gauge panel and pump panel:

Six (6)	Elkhart UBEC1 Valve controllers
Eight (8)	Elkhart UBEC2 Valve controllers
Three (3)	Elkhart UBEC3 Valve controllers
One (1)	Fire Research Corp. In-Control 400 governor
One (1)	¼" plugged test outlets, one (1) for suction, one for discharge.
One (1)	Pump cooler control valve.
One (1)	Auxiliary engine cooler control valve.
One (1)	Pump primer control
One (1)	Master drain control and hose line drains.

Two (2)	Fire Research “Tank Vision” model #WL2000 water level indicators. (One on each pump panel)
One (1)	Momentary switch to activate the chassis air horns.
One (1)	MC Products gauge heater
One (1)	Auto Direct Tank Fill w/ electric valve.
One (1)	6” Master Inlet Pressure Gauge
One (1)	6” Master Outlet Pressure Gauge

BOOSTER TANK: UPF POLY TANK II E:

Tank shall be constructed of Amoco-ACCTUF resin. The tank shall have a capacity of 1000 U.S. gallons complete with a lifetime warranty. The purpose of the markings and notice is to inform department personnel who store, stock, or use the tank that the unit is under warranty. Markings may be brief but should include a short statement that a warranty exists, the substance of the warranty, its duration, and who to notify if the tank is found to be defective.

CONSTRUCTION:

The UPF Poly-Tank II E shall be constructed of 1/2" thick PT2E polypropylene sheet stock. This material shall be a non-corrosive stress relieved thermo-plastic, natural in color, and U.V. stabilized for maximum protection.

The booster and/or foam tank shall be of a specific configuration and is so designed to be completely independent of the body and compartments. All joints and 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 easy removability. The transverse swash partitions shall be manufactured of 3/8" PT2E polypropylene (natural in color) and extend from approximately 4" off the floor to just under the cover. The longitudinal swash partitions shall be constructed of 3/8" PT2E

polypropylene (natural in color) and extend from the floor of the tank through the cover to allow for positive welding and maximum integrity. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and shall be welded to each other as well as to the walls of the tank.

FILL TOWER AND COVER:

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" PT2E polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. 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 PT2E polypropylene hinged-type cover. Inside the fill tower, approximately 4" down from the top, shall be fastened a combination vent overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of 6" that is designed to run through the tank, and shall be piped behind the rear wheels as to maximize traction.

The tank cover shall be constructed of 1/2" thick PT2E polypropylene, natural in color, and UV stabilized, to incorporate a multi three-piece locking design, which allows for individual removal and inspection if necessary. The tank cover shall be recessed 3/8" from the top of the tank and shall be welded to both sides and longitudinal partitions for maximum integrity.

Each one of the covers shall have hold-downs consisting of 2" polypropylene dowels spaced a maximum of 30" apart. These dowels shall extend through the covers and shall assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall be drilled and tapped 1/2" x 13" to accommodate the lifting eyes.

SUMP:

The sump shall be at the front of the tank and shall be large enough to accommodate two (2) 4" diameter polypropylene tanks to pump pipes that incorporate a dip tube from the front of the tank to the sump location. The sump shall have a 3" threaded outlet on the bottom for a drain plug. Anti-swivel devices are located above sump.

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MOUNTING:

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

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

Although the tank shall be designed on a free floating suspension principal, and shall have the required hold down restraints to minimize movement during vehicle operation. A restraint system shall be located on top of the tank, half way between the front and the rear on each side of the tank. These stops shall be constructed of stainless steel angle having minimum dimensions of 3" x .250 and shall be approximately 6 to 12 inches long. These brackets must incorporate a hard rubber isolating pad with a minimum thickness of .250 inch affixed on the underside of the angle.

The angle shall then be bolted to the body sidewalls, of the vehicle, while extending down to rest on the top outside edge of the upper sidewall of the tank.

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

AUTO DIRECT TANK FILL SYSTEM:

A Fire Research “Wise” Auto Fill system shall be supplied and installed. This system shall control a 2 ½” Elkhart electric valve direct tank filler mounted on the left pump panel. It shall be controlled by the Fire Research water tank gauge allowing water to automatically fill the water tank when need. It shall have a manual mode to allow the valve to be opened manually. The control shall be on the operators pump panel. Piping shall be 2 ½” with a 2 ½” chrome plated swivel, strainer and chrome plated plug.

TANK GAUGES:

One (1) Fire Research model #WLA400-A00 “Tank Vision” Pro model kit for water shall be installed. The kit shall include an electronic indicator module, a pressure sensor, and a 10’ sensor cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright LEDs. A wide view lens over the LEDs shall provide a viewing angle of 180 degrees. The indicator case shall be water proof, manufactured of Polycarbonate/Nylon material, and have a distinctive blue label.

The program features shall be accessed from the front of the indicator module. The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, six (6) programmable colored light patterns to display tank volume, adjustable brightness control levels and a datalink to connect remote indicators. Low water warnings shall include flashing LEDs at ¼ tank, down chasing LEDs when the tank is almost empty. The indicator shall have an output for an audio alarm, warning indicator signal, valve/actuator, control signal and an input for a silence button.

The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the water tank near the bottom. NO probe shall be placed on the interior of the tank. Wiring shall be weather resistant and have automotive plug in connectors.

Three (3) Fire Research model #WLA280-A00, large remote water level gauges shall be supplied. Two shall be mounted on the cab (that are included in the chassis section), one each side and one on the rear of the apparatus. The remote indicators shall receive input information over a datalink from a Fire Research TankVision primary indicator. The remote indicator shall indicate the level as a single color in Red for 25% or less, Amber color for up to 50% volume, Blue color for up to 75% volume and Green color for up to 100% volume. When the level reaches 25%, the red LEDs shall begin flashing. When the level is empty, the red LEDs shall scroll in a down chasing motion and then flash three times. It shall have the program capability to adjust the brightness level for day time and nighttime viewing.

Water Level lights will only activate with Apparatus parking brake activated.

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BODY DESIGN:

This body shall be designed to meet all current N.F.P.A. 1901, requirements. Consideration shall be given to access for service, repair and maintenance of the apparatus.

PUMP MODULE:

A separate pump house module shall be fabricated and attached to the chassis frame rails at four (4) points. The material shall be stainless steel tubing, angles and channels. Front and rear of the enclosure shall be 1/8" bright finished aluminum tread plate, attached to the framing material with stainless steel bolts and nuts.

Two (2) service doors shall be located on the front of pump enclosure module. The doors shall be fabricated from same material and coatings as pump panel with latching system.

The pump module shall not be attached to the cab or the body.

BODY SUBFRAME

All framing material shall be stainless steel, 3” x 3” x ¼" wall tubing shall be used for the main support rails and cross members. The sub-frame shall be fastened to the chassis rails with Grade 8 steel bolts. All material for attachment brackets, running boards and compartments shall be stainless steel.

BODY FABRICATION AND ASSEMBLY

The fabrication of the pumper body shall be entirely 12-gauge type #304 stainless steel. The compartments are fabricated as separate modules and welded to the stainless steel tubing cross members.

All left side compartments shall be 24" deep. The first and third right side compartments shall be 24” deep up until a height of approx. 40”. The remaining depth shall be 12” to full height of the compartments.

Rear lower side-mounted compartments shall be thru compartment integrated with the rear most compartment.

No "stud welding" shall be used in the assembly of any of the parts of the body.

The compartments shall be formed from one (1) piece of material with the ends being welded on. This reduces welding to a minimum. All welding performed is to be done with the "TIG" or

"MIG" process.

Each compartment door opening is flanged around the entire perimeter for strength. All seams in the compartments are welded continuously.

As a result of the full depth, exterior side compartments, special enclosures shall be fabricated around the chassis spring hangers and springs in the compartments located fore and aft by of the rear wheels. Provisions shall be made for access to grease fittings and the spring hanger pins and bushings.

WHEEL WELL EXTERIOR PANEL:

The 12-gauge stainless steel exterior panel shall be integral with the compartments and should be continuously welded where it meets the compartments. The wheel well opening shall be equipped with a round radius polished stainless steel fenderette bolted in place.

The fenderette shall have beaded silicon or welting between fenders and wheel well panel. Three (3) S.C.B.A. cylinder compartments manufactured by “Signature” that hold two (2) cylinders each shall be supplied in the wheel well panels of the body. Each compartment shall include an N.F.P.A. compliant brushed stainless steel doors, hardware and cylinder retainer straps.

WHEEL WELL FENDER LINER:

The inner fender above the tires shall be an integral stainless steel liner bolted in place. Prior to installation, the complete wheel well area shall be undercoated.

RUB RAIL CONSTRUCTION:

The protection of the apparatus body full length along the side of the vehicle is of critical importance. The rub rail assembly shall be of polished 1" x 1" x 16 gauge stainless steel tubing. Rails are spaced out from the body with nylon washers and fastened to the body with stainless steel bolts and nuts. Rails are polished to a mirror finish. This assembly shall blend into the front and rear corners of the body, and rolled radius of the wheel well assembly.

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HOSE BODY:

The 12 gauge Type #304 stainless steel body side panels shall be of one piece construction from front to rear of apparatus, with a triple channel break on upper section.

Hose bed floor shall be 3" X 1" aluminum channels with proper spacing for good air ventilation. The floors shall be made in two pieces for easy removal.

Three (3) hose body dividers shall be supplied using ¼" thick 5152 aluminum plate. These dividers shall be infinitely adjustable by means of a Unistrut channel welded in the hose body floor, front and rear. Rounded corners shall be furnished at rear. Dividers shall be secured at top rear to prevent movement.

Hose bed capacity shall be 2,000 feet of 5 hose, 600 feet of 2 ½" hose separated into two sections, and 400 ft of 3" hose.

HOSE BED COVER:

A heavy duty, black vinyl hose bed cover shall be supplied and attached to the front, right, left sides of the hose body with rope cords to meet the NFPA Standard. The rear flap of the cover shall have alternating 6" reflective chevrons matching apparatus patterns, and "ENGINE #" in white reflective letters. The rear flap shall be attached with buckles.

RUNNING BOARDS:

These shall be fabricated using 1/8" polished stainless steel diamond plate with grip-strut, with a double break on the outer edge, "down and in".

Running boards shall be furnished on each side under the pump panels. These running boards shall be approximately 60" L x 10" D.

Each step shall have a stainless steel tray fabricated to accommodate short sections of 5" hose. Trays shall be positioned as to affect the stepping surface as little as possible.

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STAINLESS STEEL TREADPLATE OVERLAY:

The stainless steel tread plate shall be 1/8” diamond plate.

The walkways over the high side compartments shall be polished stainless steel tread plate both sides. The tread plate shall be bent-up on hose body sides and down over compartments to act as a drip rail, fastened with stainless steel bolts and nuts. Where the tread plate meets the body sides, beaded silicon caulking shall be applied.

The surfaces of the compartments, each side at the rear that extend out to rear of the step, shall be covered with stainless steel tread plate with grip strut.

Brushed stainless steel shall be used, where ever possible, to fabricate corner accents.

STEPS:

Eight (8) Signature 4, N.F.P.A. compliant, folding steps with integrated top and bottom LED lights shall be furnished, four (4) on the rear panel for access to hose bed, two (2) on front face of the street side compartment, and two (2) on the front face of curb side compartment.

HAND RAILS:

Rails, Matching the Hansen brand as provided on cab shall be provided. Rails are furnished as follows on the body: one (1) each side on the rear of the compartments, one (1) full width across rear panel below hose bed floor and one (1) on top of the street side pump panel. Rail ends shall be squared to create a surface to hang items.

COMPARTMENTS:

Type 304 stainless steel sheet 12 gauge thick shall be used for the compartments. To insure maximum strength and durability each compartment shall be formed from a single piece of material, broken top and bottom with the sides being the only welded portion of the module. All compartment seams are continuously welded. Compartments shall be bolted to the tubing frame using 2" x 2" x ¼" stainless steel angle gussets.

The bottom of all compartments shall be reinforced with stainless steel channels.

Compartments are located as follows:

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DRIVER'S SIDE:

One (1) compartment ahead of the wheel approximately 40" W x 72" H. Compartment depth shall be 24" up to a 40” height. The remaining height shall have a depth of 12”.

One (1) compartment over the rear wheel approximately 60" W x 36" H. Compartment depth shall be 24” up to a height of 6”. The remaining height shall have a depth of 12”.

One (1) compartment to the rear of the wheel approximately 56" W x 72" H. Compartment shall be a transverse compartment up to a height of 40”. The remaining height shall have a depth of 12”.

PASSENGER'S SIDE:

One (1) compartment ahead of the wheel approximately 40" W x 60" H. Compartment depth shall be 24" up to a height of 40". The remaining 20" shall be 12" deep.

One (1) compartment over the rear wheel approximately 60" W x 24" H. Compartment depth shall be 24" up to a height of 12”. The remaining 12" shall be 12" deep

One (1) compartment to the rear of the wheel approximately 56" W x 60" H. Compartment shall be a through compartment up to a height of 40". The remaining 20" shall be 12" deep.

COMPARTMENT AHEAD OF THE REAR STEP

One (1) compartment ahead of the rear step approximately 45”W x 26”D x 40”H. Compartment shall be a transverse compartment integrated with both left and right rear compartment. Rear compartment shall be flush with the rear of the apparatus. Provisions will be made in rear roll up door to allow 5” hose to pass through into compartment. All open door provisions shall function.

COMPARTMENT – DOORS (ROLL-UP STYLE):

All compartments shall have roll-up style doors.

All compartment doors shall be manufactured by Amdor and include a powder coating or wet paint to match the body paint color, except for the rear door, no paint, which will utilize apparatus chevron.

Replacement parts shall be available in two (2) to three (3) working days.

The slats shall be double wall box frame extrusion. The exterior surface shall be flat, interior surface shall be concave to prevent loose equipment from jamming the door.

Slats shall be anodized to eliminate oxidation and include inner locking end shoes on every slat secured by Punch-Dimple process.

The slats shall have interlocking joints with a folding locking flange.

Between each slat shall be a PVC/Vinyl inner seal to prevent metal to metal contact.

Door tracks shall be one-piece aluminum, which shall include an attaching flange and finishing flange incorporated into its design, which facilitates installation and provides a finished look to installation without additional trim and caulking. Track shall have replaceable side seal. The slide seal prohibits water and dust intrusion into the compartments.

Drip rail shall have built in replacement wiper seal. Drip rail shall be made of aluminum.

Roll-up doors shall have a 4” diameter counter balance to assist in lifting and eliminate risk of accidental closing.

Doors shall be secured with a full width lift bar, to be operable by one hand, even with heavy gloves. Securing methods shall be a positive latch device.

These doors shall be provided on all compartments.

ADDITIONAL COMPARTMENT FEATURES:

All compartments shall have sweep out style floors.

All compartments shall have two (2) LED full height Amdor LumaBar light strips operated by a door switch.

All compartments shall have 6" x 6" louvered vents in the rear walls and the compartment floors shall be covered with black "Turtle Tile".

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Stainless steel Unistrut shelf tracks shall be installed in the all compartments, six (6) per compartment.

Rear most compartment shall be flush with the rear of the apparatus, giving the apparatus a flat back panel.

Compartments will be all wired for 120 volt receptacles in upper corner of compartments.

COMPARTMENT SHELVES:

Four (4) compartment adjustable shelves shall be provided where specified and shall be fabricated of 12-gauge stainless steel. The shelf shall have a 2" flange around perimeter either up or down whichever is most practical.

These shelves shall be fitted accordingly and held in place on the shelf tracks with stainless steel bolts and spring loaded with cam-lock fasteners.

SLIDING TRAYS:

FIVE (5) sliding trays shall be provided where specified and each shall be equipped with heavy duty triple track ball bearing slides that allow the tray to slide completely out of the compartment for easy access to equipment. Trays shall have a capacity of 500 lbs. Trays shall be equipped with a "lock in" and "lock out" device.

The tray shall be a box pan fabricated from 12-gauge stainless steel with a 2" flange up or down whichever is most practical. Size of pan shall vary with placement. Innovative Industries “Slide-Master” triple track slide shall be furnished with the trays. The trays shall have adjustable dividers.

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SLIDING PULL OUT STEPS:

Pull out steps shall be mounted under fore and aft of rear wheels to aid in reaching objects in upper compartments. Steps will be manufactured with sliding mechanism that resists the abuse of road debris. Steps will be of adequate size and weight rating to support firefighter standing on it.

HARD SUCTION HOSE:

Hard suction hose storage areas shall be fabricated into the hose bed. Two (2) 12ft sections shall be stored in the hose bed. Two (2) 12ft sections shall be mounted to the space above the left side compartments. One (1) section will contain a Kochek 6" Big water floating strainer connected and securely mounted. The Suction hose will be Kochek 6" hard type suction and shall be bidder supplied.

LADDERS AND STORAGE:

Three-(3) ladders shall be mounted on the right side hose body panel in a 12-Volt power operated drop down bracket assembly model LAS-XT-1200 manufactured by the Ziamatic Company. All necessary safety and warning devices shall be supplied. The fourth ladder, the 20ft extension, shall be mounted in a compartment through the right side of the water tank standing on its rail. Two (2) Duo Safety (875-A) 16ft roof ladders, one (1) Duo Safety (1200-A) two section 28ft extension ladder, one (1) Duo Safety (900-A) 20ft extension ladder, and one (1) closet ladder shall be bidder supplied

PIKE POLES:

One (1) 10-foot and two (1) 6-foot pike pole with fiberglass handles and a "D" handle shall be furnished and mounted on the ladder rack. Model to be determined by KVFC.

REAR STEP, BUMPER AND TOWING DEVICE:

The rear step support assembly, which also contains the rear-towing device, shall consist of 4" x 1" thick steel flat bars that are bolted to the chassis rails and extend down to the rear step level. 3" x 3" x 3/8" steel tubing is welded to the flat bars to form a rigid support for the "step-bumper". In addition, two (2) tow eyes are welded to this framework. The tow eyes must be capable of flat towing the apparatus.

The rear step shall be 12” deep and the width of the apparatus. Fabrication materials shall be stainless steel grate material with a stainless steel diamond plate wrap.

WHEEL CHOCKS:

Two (2) Ziamatic N.F.P.A. approved wheel chocks shall be supplied and installed per Fire Department direction.

MUD FLAPS:

Heavy-duty mud flaps shall be provided and installed to the rear of each front wheel and to the rear of each pair of dual rear wheels. All mud flaps shall be an adequate width to protect apparatus from wheel debris.

A Full Width mud flap with stainless weights will be mounted under rear step area.

Mud flaps shall be made of heavy duty, semi-flexible vinyl to prevent “sailing”.

EQUIPMENT MOUNTING:

All equipment mounting, new and customer supplied, to be mounted as directed by the Killingworth Fire Department. A full list of equipment to be mounted shall be provided to the successful bidder and additional funds shall be allotted for mounting. There shall be a $10,000.00 mounting allowance included for any mounting not specified in descriptions. Any monies deducted from this allowance will be in writing upon agreement with KVFC. Any surplus will be deducted from end cost of apparatus.

SCBA MOUNTING:

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It is the intentions of the KVFC to carry Nine (9) SCBA on this apparatus. Four (4) will be located in cab area, as described. The remaining Five (5) will be securely carried in the Driver's side high side compartments forward and over wheel well. Model of SCBA will be identified prior to construction.

SCBA SPARE BOTTLES

Eighteen (18) Spare SCBA bottles are to be mounted on apparatus. Must be accessible from ground level, preferably in same area of apparatus. Model of SCBA bottle will be identified prior to construction.

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ELECTRICAL:

All the electrical equipment installed in the body shall conform to the National Electrical Code. Wiring installed by the manufacturer shall be run in heat resistant plastic convoluted loom split along its entire length and shall be protected by automatic reset circuit breakers.

All wiring shall be number and/or color-coded. Grommets shall be used wherever wires or loom pass through holes in metal.

All necessary clearance, marker and back-up lights along with a lighted license plate bracket shall be furnished and shall meet Federal Standards. Rear cluster marker lights shall be recess mounted in the rear step flange for protection.

All electrical and electronic components shall be selected to minimize electrical loads, thereby not exceeding the vehicle's generating system capacity. The electrical system components and wiring shall be readily accessible through panels for checking and maintenance.

12 VOLT LIGHTING:

EXTERIOR LIGHTS:

Clearance, marker and license plate lights, shall be L.E.D. type, Weldon model 9186-1500-10, red marker/clearance lights, along with reflectors shall be mounted along the length of the body and at the rear of the body and shall be wired in accordance with federal regulations.

A rear marker light shall be furnished at each side, outermost practical mounting location at the top of the body.

A secondary turn signal/clearance light, WHELEN amber LED, shall be provided below each side of the body, in the area forward of the rear axle.

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The following lights shall be mounted in a #M6FCV4 four light housing, mounted on each side on the rear of the compartments.

1. Two (2) Whelen model #M6BTT, M6 series, LED rectangular, Red stop/tail lights.

2. Two (2) Whelen model #M6T, M6 series, LED, left & Right rectangular amber directional signal lights.

3. Two (2) Whelen model #M6BUW, M6 series, LED rectangular, Automatically operated clear back-up lights.

Three (3) LED type hose loading lights, mounted on stanchion brackets shall be supplied and installed. These lights shall be both flood. Two (2) lights shall be mounted on the rear of the hose bed and one (1) flood light shall be mounted on the front of the hose bed. All these lights shall be controlled from the cab and pump panel.

Pump panel lighting as previously mentioned shall be supplied and installed as specified in the PUMP OPERATOR'S CONTROL PANEL section.

Six (6) ground lights, three (3) each side, LED strips, shall be installed and controlled by switch in cab. These lights shall be Luma-Bar by Amdor.

Six (6) Whelen model #M6ZC, 12-volt clear LED scene lights shall be furnished and installed with M6FC flanges. These scene lights shall be mounted as follows; two (2) on the left side, two (2) on the right side and two (2) on the rear. The rear lights and one (1) light off each side shall activate when the transmission is placed in reverse.

Stainless steel step lights, Truck-lite model #80345, shall be provided and located to properly illuminate all body steps, walkway areas and hose bed.

D/C SCENE LIGHTING:

Two (2) Fire Research Corp. Optimum Model #Q20 LED lights on telescopic poles shall be supplied and mounted in the pump housing. All light heads shall be equipped with a rubber bumper. Lights shall be controlled from the pump panel with individual switches.

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WARNING LIGHT SYSTEM:

Listed below is a Whelen Engineering flashing LED lighting system that shall be provided which consist of the following:

Zone "A" Upper, (cab roof): One (1) Whelen model FN72QLED Edge "Ultra Freedom" lightbar, length 72", with red/clear lenses to the front. The lightbar shall include two front corner Red LED's, six front LED's, two Red and four White LED's and two Red end LED's. Two (2) Mini-Edge bars shall be installed above each rear cab door. Color RED

Zone "B" Upper & Zone "D" Upper, (left & right, front & rear corners): Both upper front zones shall be covered by the side modules of the lightbar.

Zone "C" Upper, (upper rear body): Two (2) Whelen Micro Edge LFL Liberty LED lights, color red.

Zone A Lower, (front of cab): See Cab section for description.

Zone B Lower, (right lower side of apparatus): Two (2) Whelen model #M6R LED warning lights shall be supplied. One (1) shall be mounted in the front side on the cab radius and One (1) shall be mounted on the cab side. Two (2) Whelen model #M2R, surface mounted LED flashers, color red. Light heads shall be mounted as follows: one (1) in the middle of the apparatus and one (1) on the side of the body at the rear of the apparatus in the rub rail area. Each light head shall be mounted in a chrome bezel with a gasket.

Zone C Lower, (lower rear body): Two (2) Whelen model #60R00FRR, 600 series surface LED flashers, color red. Each light head shall be mounted in the cast aluminum quad housing that the brake and turn signals are mounting in.

Zone D Lower, (left lower side of apparatus): Two (2) Whelen model #M6R LED warning lights shall be supplied. One (1) shall be mounted in the front side on the cab radius and One (1) shall be mounted on the cab side. Two (2) Whelen model #M2R, surface mounted LED flashers, color red. Lightheads shall be mounted as follows: one (1) in the middle of the apparatus and one (1) on the side of the body at the rear of the apparatus in the rub rail area. Each light head shall be mounted in a chrome bezel with a gasket.

One (1) Whelen model TAL85 LED traffic advisor with controller shall be furnished and installed. The controller shall be installed on the dash in a location to be determined. The traffic advisor shall be installed

on the rear of the body.

WARNING LIGHT CERTIFICATION:

The warning light systems specified shall have a total amperage draw of 45 AMPS with all lights activated in either the "Calling for Right of Way" or the "Blocking Right of Way" mode.

This warning light system shall be certified by the light system manufacturer, to meet all of the requirements as noted in chapter 13 of the 2016 edition of the NFPA 1901 fire Apparatus Standard.

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GENERATOR:

A Harrison hydraulic driven A/C electric generator system shall be installed, model 10 MAS-16R, 120/240, 10,000 watt capacity. This unit shall be powered by a P.T.O. from the transmission. The PTO control shall be on the cab dash with all the necessary lights to alert the operator that the generator is running. The generator shall be mounted over the pump in an aluminum tread plate enclosure.

A circuit breaker panel shall be installed in the left front equipment compartment on front wall and shall contain ten (10) breakers with a main breaker. All circuits shall be identified on the inside cover of the box. Final mounting location to be approved by KVFC

A Fire Research FROG meter shall be supplied and connected to the generator and mounted adjacent to the circuit breaker panel.

Generator shall have full rated power from high idle to maximum engine R.P.M.

ELECTRIC CABLE REEL (240 VOLTS):

The apparatus shall be equipped with two (2) electrical cable reel, connected directly to the generator system.

Two (2) Hannay Model ECR 1616-17-18 electric rewind cable reels shall be provided, equipped with fully enclosed 30 amp three conductor collector rings. Rollers and guides shall be supplied on the reel for easy rewind of the cables.

The reels shall be equipped with 200 feet of 10/3 Type SO yellow electrical cable and a Akron model # EJB Junction Box with two (2) 20 amp GFI duplex outlet and two (2) 20 amp twist-lock outlets. The junction boxes shall have rubber feet and be powder coated yellow. One (1) reel shall be mounted in the pump compartment above the running board on the right side. One (1) reel shall be mounted in the pump compartment above the running board on the left side.

The reels shall be wired directly to the chassis battery system with heavy duty stranded copper cable, with guarded finger type rewind button at the electrical reel frame.

The wiring from the generator system shall be through electrical weatherproof loom, with stranded copper wiring. The wiring shall terminate in a sealed conduit box at the reel with mechanical type connectors for quick removal of wiring.

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LIGHT TOWER:

One (1) Will-Burt “Night-Scan 3.0 (Powerlite 10)” cab roof mounted light tower complete with four (4) Whelen Pioneer LED Spot/Flood combo light heads that shall be provided and installed on the rear crew area of the chassis cab roof. Night-Scan Model #NS3.0-6000 shall include a 10-foot mast with stowed dimensions of 72.5” x 43” x 12” stowed height. The Night-Scan shall feature a hand held pistol grip remote control with a 30 foot cable, which shall feature RCP pan & tilt positioner and a one button “Auto Stow” in which all light heads shall shut off automatically when stowed.

The total weight of the Night-Scan is 150 pounds. Erection time approximately 60 seconds.

A 3/16” aluminum box shall be fabricated and painted white and installed around the light tower on the cab roof.

A separate warning light system will be installed in conjunction with open compartment system to warn if tower is left in the up position. As well as not allowing transmission to function.

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PAINT, PREPARATION AND FINISH

The PPG Delta, low VOC polyurethane finishing system shall be utilized.

All exposed welds shall be ground smooth for final finishing of areas to be painted. After final bodywork is completed, grinding (36 and 80 grit), and finish sanding shall be used in preparation for priming.

Priming shall be a two-stage process. First stage shall be coating with a two-part component, self-etching, and corrosion resistant primer to chemically bond the surface of the metal for increased adhesion. Second stage shall be multiple coats of a catalyzed two-component polyurethane, primer surfacer, applied for leveling of small imperfections and topcoat sealing.

Three (3) color coats of PPG Delta low VOC polyurethane shall be applied with two (2) to three (3) coats of clear polyurethane over the color coats. The clear coats are sanded and buffed to a mirror finish.

All removable items such as brackets, etc. shall be painted separately to insure finish paint behind mounted items.

The inside and underside areas of the complete body assembly shall be painted black with a polyurethane base paint prior to the installation of the body on the chassis.

All compartment-unwelded seams exposed to high moisture environments shall be sealed using permanent pliable caulking. One (1) pint of each exterior color of paint for touch-up purposes shall be supplied to the Fire Department.

The interior of the firebody compartments shall have a "swirled" stainless steel finish.

The inside of the hose body panels and hose bed partitions shall have a "DA" brushed finish.

The chassis frame rails, suspension and axles shall be painted job color BLACK with a polyurethane base paint.

The fire body and cab shall be painted to match the Fire Department’s existing apparatus.

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PAINT FINISH WARRANTY:

The finish paint on the unit shall be provided with a ten (10) year paint finish guarantee, matching cab warranty, which shall cover the finish for the following items:

1. Peeling or delamination of the topcoat and/or other layers of paint.
2. Cracking or checking.
3. Loss of gloss caused by defective PPG Fleet Finishes, which are covered by this guarantee.

A copy of this warranty shall be submitted with the proposal.

RUST PROOFING:

Rust proofing shall be applied during the assembly process. The only area to be rustproofed is the entire underside of cab. All other areas are to be painted.

LETTERING:

All gold leaf lettering and striping, and fire department seal, shall be computer generated gold leaf. Lettering and striping shall be of a design that matches Killingworth Fire Departments apparatus.

SCOTCHLITE STRIPE:

A wide white reflective stripe shall be provided around the perimeter of the apparatus. . The stripe shall be applied on a minimum of 50% of each side of the unit, and 25% on the front of the unit.

REAR CHEVRONS:

Retro reflective chevrons shall be applied to the rear of the apparatus covering at least 50 % of the rear facing vertical surface. Each stripe shall be a single color alternating between red and yellow. Each stripe shall be 6 inches in width. Each stripe shall slope downward at a 45 degree angle away from the center line of the apparatus. Final design and colors to be approved by KVFC.

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CAB PAINT BREAK TRIM:

A chrome style trim shall be applied to the paint break between the white and green on the chassis.

OPTIONAL EQUIPMENT

Include an itemized price list for the following optional equipment. For each item, provide the price to supply, mount and, if applicable, wire that item. Each item ultimately selected by the KVFC will be supplied, mounted and, if applicable, wired by the vendor.

HURST S-700E2 EDRAULIC CUTTER
HURST SP555E2 EDRAULIC SPREADER
SIX (6) EXL LITHIUM ION BATTERIES
HURST 12V DC BATTERY BANK CHARGER
HURST 110V WIRED ADAPTER
Thermal Imaging Camera & Charger – MSA Evolution 6000 plus, model # 10145951 & charging station, model # 10145771
Multi Gas Meter – Gas Alert Micro Clip XT from BW Technologies. Model # XXYY-MC2
Flash Light & Charger – Fire Vulcan LED Rechargeable Lantern, model # 44454, and vehicle mounting/charging rack, model # 44131. (1 hand light and 1 charger for each SCBA)
Rescue 42 Struts - TeleCrib Truck Kit model # CTC-6002 & TeleCrib Strut Jack model # CTC-503.
Fire hose – 600’ of 1.75” hose with 1.5” couplings, 600’ of 2.5” hose with 2.5” couplings, 600’ of 3” hose with 2.5” couplings. (All NST) The manufacturer is Key Hose and the series is big-10.
Nozzle - 2 Elkhart brass smooth bore nozzles with 15/16” tip.
Gated Wye – Elkhart brass gated wye. 2.5” to dual 1.5” outlets.
Reciprocating Saw – Dewalt 36v cordless li-ion reciprocating saw kit. Model # DC305k.
Portable Monitor – Task Force Tips Blitzfire monitor combination package with max force and stacked tips. Inlet size is 2.5” female NST coupling.
Saw – Cutters edge ventilation saw.
PPV Fan – Ramfan EV420, 110 volt option.

INSPECTION TRIPS (OPTIONAL)

Inspection trips for six (6) members will be provided by successful bidder. Price will include Transportation, Lodging and Meals for up to 3 factory trips. Price will be provided on front page of bid.

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