

**ADDENDUM #1 KINGSTON FIRE DISTRICT
SPECIFICATIONS FOR NON WALK-IN HEAVY RESCUE**

Intent of Specifications

It is the intent of these specifications to cover the furnishing and delivery to the purchaser of a complete vehicle equipped as hereinafter specified. With a view to obtaining the best results and the most acceptable apparatus, these specifications cover minimum requirements as to the type of construction, finish, and tests to which the apparatus must conform, together with certain details as to equipment and appliances to be furnished. Minor details of construction and materials, where not otherwise specified, are left to the discretion of the contractor, who shall be solely responsible for the design and construction. The apparatus shall conform to the requirements of the current (at the time of bid) NFPA Standard for Rescue Fire Apparatus to the extent as specified herein.

BIDDERS ARE ADVISED THAT THIS SECTION OF THE SPECIFICATIONS WILL BE EVALUATED BEFORE THE APPARATUS TECHNICAL SPECIFICATIONS. BIDS THAT DO NOT COMPLY WITH OUR BONDING, INSURANCE, DELIVERY, BIDDER QUALIFICATIONS, SERVICE, AND WARRANTY REQUIREMENTS WILL BE IMMEDIATELY DEEMED NON-RESPONSIVE AND SHALL BE IMMEDIATELY REJECTED WITHOUT FURTHER REVIEW OF THE TECHNICAL SPECIFICATIONS.

Qualification of Bidders

Bids will only be considered on vehicles constructed in the continental United States, whose manufacturers have an established reputation of permanency and reliability in the field of fire apparatus construction. Each manufacturer shall furnish satisfactory evidence of their ability to construct the apparatus as specified, and shall state the location of the factory where the complete apparatus will be built.

- ◆ How long has the manufacturer been building chassis at this location?

Number of years_____

- ◆ How long has the manufacturer been building bodies at this location?

Number of years_____

Bidders must state the location of at least 10 (ten) communities in New England using similar all aluminum apparatus supplied by them.

The solvency of manufacturers is a prime concern of the Purchaser. Each bid must include a certified financial statement from a nationally recognized accounting firm. Failure to submit such a statement shall result in immediate rejection of a proposal.

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Service Requirements

It is the intent of the purchaser to assure that parts and service are readily available for the apparatus specified. SERVICE CAPABILITIES WILL BE A MAJOR CRITERIA FOR AWARD OF THIS BID. To insure proper service, no bid will be accepted unless the bidder owns or offers facilities within seventy-five (75) miles where complete parts and service are available. The facility must be staffed by full time personnel who are factory trained and EVT certified in the operation and repair of the fire apparatus with full authorization of the manufacturer. In addition, in order to ensure prompt service, the facility must be solely dedicated to the service/repair of emergency vehicles. The facility shall maintain a complete inventory including body components, electrical items, fire apparatus hardware, etc., and shall offer on-site services including pump overhaul, body fabrication, collision repair, and a paint shop complete with a cross flow booth with air makeup and bake options to insure the highest quality paint finish available. Bids from manufacturers who use third party service people or facilities, or who do not offer a service center will be immediately rejected. Furthermore, due to a concern over having vehicles "out-of-service" for extended periods of time as a result of having to be sent back to the original manufacturer's location for repairs, any bidder who cannot guarantee that all future repairs will be handled at a local level will not be acceptable.

Emergency Vehicle Technician Qualifications

Due to the highly specialized nature of fire apparatus repair, emergency vehicle technicians employed by the bidder shall be in conformance with NFPA standards 1915 and 1071. The bidder shall employ at least one (1) technician certified as a "Master Mechanic" (having amassed every EVT certification). Proof of current certification shall be supplied with the bid. There shall be no exceptions to this requirement. Bids from organizations that do not meet these requirements shall be immediately rejected.

Service Questionnaire

The bidder shall include the following information with their bid.

- ◆ Number of miles from the purchaser to the nearest staffed service facility owned and operated by the bidder

Number of miles _____

- ◆ The number of service bays and square feet of service space at the bidder's service facility.

Number of bays _____ Square feet _____

- ◆ The length of time the service facility has been in business as an emergency vehicle dealer.

Number of years in business _____

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- ◆ How long has the dealer been selling the brand of emergency vehicle being proposed?

Number of years _____

- ◆ Has the dealer/distributor represented other manufacturers of emergency vehicles in the past?

Yes _____ No _____

If yes, why was the change made? _____

- ◆ Number of emergency vehicles that have been delivered by the dealer/distributor since it has been in business representing its current "brand(s)" of emergency vehicles?

Number of vehicles delivered _____

- ◆ Is the dealership strictly dedicated to selling and servicing emergency vehicles and equipment, or do they sell and service other products?

Strictly dedicated to emergency vehicles and equipment? Yes _____ No _____

- ◆ Number of EVT Certified personnel employed? EVT "Master Mechanics"?

EVT certified personnel ____ EVT "Master Mechanics" ____

- ◆ Number of full-time mechanics employed by the bidder that are solely dedicated to servicing emergency vehicles?

Number solely dedicated to emergency vehicle service _____

- ◆ Full body/collision repair, fabrication, and paint booth on-site?

Yes _____ No _____

- ◆ Over \$400,000 in parts inventory available at all times?

Yes _____ No _____

- ◆ Does the local service facility accept work on other vehicles (i.e., DPW, oil, concrete, etc..) or fleet trucks in addition to emergency vehicles on a regular basis?

Yes _____ No _____

- ◆ If yes, what percentage of repair work is non emergency vehicle related?

% _____

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- ◆ Does the possibility exist that the emergency vehicle may have to go back to the original manufacturer's location for warranty work?

Yes _____ No _____

If yes, please describe some example _____

- ◆ Does the dealer/distributors service facility perform ALL warranty work for the products they represent?

Yes _____ No _____

If no, please describe where work may be performed _____

Delivery

The apparatus shall be delivered under its own power to assure adequate break-in while under warranty. It shall first be transported to the local service facility, where final inspection and preparation will be performed, including mounting of related equipment. The apparatus will then be delivered to the Purchaser's location.

Post-Delivery Training

On one (1) mutually agreeable date after delivery, a certified delivery engineer shall familiarize those persons designated by the Fire Chief with the basic operation of the apparatus and its components. Such training must be coordinated by a fire department officer with a minimum of 20 years of "hands on" experience on the fire ground. This shall be a full instructional program including both classroom and practical or "hands on" training. Limited programs or "drop-off" type deliveries are unacceptable.

Construction Time

The completed apparatus shall be delivered within two hundred seventy (270) calendar days after the signing of the contract. In the interest of public safety, this delivery date is an extremely important consideration.

Insurance Certificate

A Manufacturer's Certificate of product liability and facility insurance equal to or exceeding \$25,000,000.00 must be provided with the bid. The certificate must be in original form (no photocopies or fax copies) and shall name the Fire Department or the city/town as the certificate holder.

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Bid Bond

Each bid shall be accompanied by a bid bond in the amount of ten (10) percent of the bid price. Bids submitted without a bond will not be read. The bid bond must be issued by an Insurance Company registered with the Insurance Commissioner of this State. Bonds must be signed by an Officer of the Bidder's Company. Bonds issued by non-registered or foreign Insurance Companies will be immediately rejected.

Contract

These specifications, together with any documents required herein, shall be included in the final contract. Each bidder shall submit a copy of their proposed contract form. Optional prepayment programs in exchange for overall savings will be considered.

Warranty

Each bidder shall submit a copy of their standard Warranty in compliance with State and Federal regulations. It shall provide coverage for a minimum of a one (1) year period. The bidder must also submit a ten (10) year body corrosion perforation warranty, a ten (10) year body limited paint warranty, a lifetime frame warranty, and a ten (10) year cab and body structural warranty. Warranty forms must be submitted with the bid package.

Exceptions

Substitutions, deviations, clarifications, or exceptions to the technical specifications must be listed on a separate page marked, "EXCEPTIONS", and must be accompanied by adequate supportive data to allow the Fire Chief to determine acceptability. Proposals that are found to have deviations without listing them will be rejected. Components identified by brand names are available to all prospective bidders and exceptions shall not be allowed on these items.

Cab Crashworthiness Requirement

The apparatus cab shall meet and/or exceed relevant NFPA 1901 load and impact tests required for compliance certification with the following:

Side Impact Dynamic Pre-Load per SAE J2422 (Section 5).

Testing shall meet and/or exceed defined test using 13,000 ft-lbs of force as a requirement. The cab shall be subject to a side impact representing the force seen in a roll-over. The cab shall exhibit minimal to no intrusion into the cab's occupant survival space, doors shall remain closed and cab shall remain attached to frame.

Cab testing shall be completed using 13,776 ft-lbs of force **exceeding** testing requirements.

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Quasi-static Roof Strength (proof loads) per SAE J2422 (Section 6) / ECE R29, Annex 3, paragraph 5.

Testing shall meet and/or exceed defined test using 22,046 lbs of mass as a requirement. Testing shall be completed using platen(s) distributed uniformly over all bearing members of the cab roof structure.

Cab testing shall be completed using 23,561 lbs of mass **exceeding** testing requirements. The cab shall exhibit minimal to no intrusion into the cab's occupant survival space and doors shall remain closed.

Additional cab testing shall be conducted using 117,336 lbs of mass **exceeding** testing requirements by **over five (5) times**. The cab shall exhibit minimal to no intrusion into the cab's occupant survival space and the doors shall remain closed.

Frontal Impact per SAE J2420.

Testing shall meet and/or exceed defined test using 32,549 ft-lbs of force as a requirement. The cab shall be subject to a frontal impact as defined by the standard. The cab shall exhibit minimal to no intrusion into the cab's occupant survival space, doors shall remain closed and cab shall remain attached to frame.

Cab testing shall be completed using 34,844 ft-lbs of force **exceeding** testing requirements.

Additional cab testing shall be conducted using 65,891 ft-lbs of force **exceeding** testing requirements by **over two (2) times**.

A copy of a certificate or letter verifying compliance to the above performance by an independent, licensed, professional engineer shall be provided upon request.

For any or all of the above tests, the cab manufacturer shall provide either photographs or video footage of the procedure upon request.

ISO Compliance

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

Approval Drawings

A detailed drawing depicting the vehicles appearance shall be provided. The drawing shall consist of left side, right side, front, and rear elevation views.

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Electronic Manuals

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

Operating Instructions, descriptions, specifications, and ratings of the cab, chassis, body, installed components, and auxiliary systems.

Warnings and cautions pertaining to the operation and maintenance of the fire apparatus and fire fighting systems.

Charts, tables, checklists, and illustrations relating to lubrication, cleaning, troubleshooting, diagnostics, and inspections.

Instructions regarding the frequency and procedure for recommended maintenance.

Maintenance instructions for the repair and replacement of installed components.

Parts listing with descriptions and illustrations for identification.

Warranty descriptions and coverage.

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

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

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

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

NOTE: Engine overhaul, engine parts, transmission overhaul, and transmission parts manuals are not included.

Manufacturing Trips

An all expense paid (transportation, lodging, and meals) trip to the manufacturing facility for an engineering meeting, and a final inspection trip shall be provided for three (3) Fire Department representatives.

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Bumper

A heavy duty 10" high steel channel type front bumper shall be provided. The front corners of the bumper shall be angled at 45 degrees to reduce swing clearance. The bumper shall be painted job color.

Front Bumper Extension

The bumper shall be extended approximately 20" from the face of the cab as required.

Bumper Gravel Shield

The extended front bumper gravel shield shall be made of 1/8" (.125") aluminum treadplate material.

Bumper Tray - Driver Side

A hose tray constructed of 1/8" aluminum shall be recessed into the front bumper extension. The tray shall be located on the driver side of the bumper outboard of the frame rail and be approximately 14" deep (13" to the top of the slats). One inch thick aluminum slats shall be included in the bottom of the hose tray to aid in the dissipation of water from the tray.

Bumper Tray - Officer Side

A hose tray constructed of 1/8" aluminum shall be recessed into the front bumper extension. The tray shall be located on the officer side of the bumper outboard of the frame rail and be approximately 14" deep (13" from the top of the slats). One inch thick aluminum slats shall be included in the bottom of the hose tray to aid in the dissipation of water from the tray.

Tray Lids

The bumper trays shall each have a diamond plate lid. The lid shall be hinged and shall be secured in the closed position by a latch and held open with a pneumatic shock.

Lighted Bumper Guides

One (1) pair of Bores Manufacturing model 848211 lighted bumper guides shall be provided. The guides shall be installed one (1) each side of front bumper extension and include an angled support bracket.

Winch

A Warn Series 16,000 lb. electric reversible winch with 75` of 1/2" galvanized aircraft type cable and a replaceable clevis hook shall be mounted to the chassis frame extension centered at the front bumper area. The winch shall be controlled with a 30` remote control switch. An access

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door with a quarter turn latch and spring hold open shall be provided in the front bumper extension gravel shield to allow for maintenance of the winch components.

A 4-way roller cable guide shall be provided through the front bumper.

Winch Control Receptacle Location

The winch control receptacle shall be located in the gravel shield driver's side.

Frame Rail Construction

The frame shall consist of two (2) C-channel frame rails with heavy-duty cross-members. Each frame rail shall have the following minimum specifications in order to minimize frame deflection under load and thereby improve vehicle ride and extend the life of the frame:

Dimensions: 10-1/4" x 3-1/2" x 3/8"

Material: 110,000-psi minimum yield strength, high strength, low alloy steel

Section Modulus: 16.61 cu. in.

Resistance to Bending Moment (RBM): 1,827,045 in. lbs.

If larger rails are provided, the maximum height of each frame rail shall not exceed the 10-1/4" dimension by more than 1/2" in order to ensure the lowest possible body height for ease of access as well as the lowest possible vehicle center of gravity for maximum stability.

There shall be a minimum of six (6) cross-members joining the two (2) frame rails in order to make the frame rigid and hold the rails/liners in alignment. The cross-members shall be a combination of a formed steel C-channel design along with heavy duty steel fabricated designs as required for the exact chassis configuration. The cross-members shall be attached to the frame rails with not less than four (4) bolts at each end arranged in a bolt pattern to adequately distribute the cross-member load into the rail/liner and minimize stress concentrations.

All frame fasteners shall be high-strength Grade 8, flanged-head threaded bolts and nuts for frame strength, durability, and ease of repair. The nuts shall be Stover locknuts to help prevent loosening. The frame fasteners shall be tightened to the proper torque at the time of assembly.

The frame rails and frame liners shall be finished with black paint. The frame cross-members and frame mounted components (suspensions, axles, air tanks, battery boxes, fuel tank, etc.) shall be painted black.

The apparatus manufacturer shall supply a full lifetime frame warranty including cross-members against defects in materials or workmanship. Warranties that provide a lifetime warranty for only the frame rails, but not the cross-members, are not acceptable.

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The custom chassis frame shall have a wheel alignment in order to achieve maximum vehicle road performance and to promote long tire life. The alignment shall conform to the manufacturer's internal specifications. All wheel lug nuts and axle U-bolt retainer nuts shall be tightened to the proper torque at the time of alignment. The wheel alignment documentation shall be made available at delivery upon request.

Frame Liner

A 9-3/8" x 3-1/8" x 3/8" channel frame liner shall be bolted to each frame rail for added strength and rigidity. Frame liners shall be made of 110,000 psi minimum yield, high strength, low alloy steel. Each frame rail with liner shall have the following minimum characteristics:

Section Modulus: 28.74 cu. in.

RBM: 3,161,400 in. lbs.

The frame liners shall be inserted inside the open portion of the frame rails and shall run continuously from the rear of the frame to the centerline of the front axle to provide maximum frame strength at all critical load points.

Front Axle

The vehicle shall utilize an ArvinMeritor FL-941 front axle with a rated capacity of 18,700 lbs. It shall have "easy steer" knuckle pin bushings and 68.5" kingpin centers. The axle shall be of I-beam construction and utilize grease-lubricated wheel bearings. The vehicle shall have a nominal cramp angle of 45 degrees, plus two (+ 2) degrees to minus three (- 3) degrees including front suction applications.

The front axle hubs shall be made from ductile iron and shall be designed for use with 10 hole hub-piloted wheels in order to improve wheel centering and extend tire life.

The front springs shall be parabolic tapered, minimum 4" wide x 54" long (flat), minimum 3 leaf, progressive rate with bronze bushings and a capacity of 20,000 lbs. at the ground.

Tapered leaf springs provide a 20% ride improvement over standard straight spring systems. Supporting documentation/data shall be provided upon request.

The vehicle shall be equipped with a Sheppard model M-110 integral full power steering gear used in conjunction with a model 292 slave gear. The steering assembly shall be rated to statically steer up to a maximum front axle load of 18,700 lbs. Relief stops shall be provided to reduce system pressure upon full wheel cut. The system shall operate mechanically should the hydraulic system fail.

A 2-year/unlimited miles parts and 2-year labor axle warranty shall be provided as standard by ArvinMeritor Automotive.

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In order to achieve maximum vehicle road performance and to promote long tire life, there shall be a wheel alignment. The alignment shall conform to the manufacturer's internal specifications. All wheel lug nuts and axle U-bolt retainer nuts shall be tightened to the proper torque at the time of alignment. The wheel alignment documentation shall be made available at delivery.

Shock Absorbers Front

Koni Model 90 shock absorbers provided for the front axle. The shocks shall be three way adjustable.

The shocks shall be covered by the manufacturer's standard warranty.

Rear Axle

The vehicle shall utilize an ArvinMeritor RS-30-185, 31,000 lb. single rear axle with single reduction hypoid gearing and a manufacturer's rated capacity of 31,000 lbs. The axle shall be equipped with oil-lubricated wheel bearings with ArvinMeritor oil seals.

The rear axle hubs shall be made from ductile iron and shall be designed for use with 10 hole hub piloted wheels to improve wheel centering and extend tire use.

A 2-year/unlimited miles parts and 2-year labor rear axle warranty shall be provided as standard by ArvinMeritor Automotive.

Rear Suspension

The rear suspension shall be a Reyco model 79KB. The suspension shall include linear-rate slipper type leaf springs that eliminate spring eyes and shackles. The suspension shall also include one (1) fixed torque arm, one (1) adjustable torque arm and cast spring hangers. The suspension shall be rated for the maximum axle capacity.

Front Wheels

The front wheels shall be steel hub-piloted disc sized appropriately for the tires.

Rear Wheels

There shall be four hub-piloted steel disc wheels sized appropriately for the tires.

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Front Tires

The front tires shall be two (2) Michelin 385/65R22.5 tubeless type 18 PR radial tires with XFE highway tread.

The tires with wheels shall have the following weight capacity and speed rating:

18,740 lbs. @ 65 MPH.

The wheels and tires shall conform to the Tire and Rim Association requirements.

Rear Tires

The rear tires shall be Michelin 315R22.5 tubeless type radial tires with XDN2 mud and snow tread.

The tires with wheels shall have the following weight capacity:

33,080 lbs. (dual) @ 75 MPH.

The wheels and tires shall conform to the Tire and Rim Association requirements.

Tire Pressure Monitor

The apparatus shall be provided with tire pressure indicating valve stem caps. The indicators shall be installed on each tire and be a heavy duty design manufactured specifically for trucks. When tire is properly inflated, the indicator inside the cap shall be green, and when the tire is underinflated by 10%, the indicator inside the cap shall be red.

Front Brakes

The front axle shall be equipped with Meritor DiscPlus EX225H 17 inch disc brakes.

The brakes shall be covered by the manufacturer`s standard warranty which is three years, unlimited mileage and parts only.

Rear Brakes

The rear axle shall be equipped with ArvinMeritor 16-1/2" x 7" Q-Plus (up to 24K) or P-Type (over 24K) S-cam brakes with cast brake drums. The brakes shall be furnished with ArvinMeritor automatic slack adjusters.

A 3 year/unlimited miles parts and 3 year labor rear brake warranty shall be provided as standard by ArvinMeritor Automotive. The warranty shall include bushings, seals, and cams.

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Brake System

The vehicle shall be equipped with air-operated brakes and an anti-lock braking system (ABS). The brake system shall meet or exceed the design and performance requirements of the current Federal Motor Vehicle Safety Standard (FMVSS)-121, and the test requirements of the current NFPA 1901 Standard.

A dual-treadle brake valve shall correctly proportion the braking power between the front and rear systems. The air system shall be provided with a rapid pressure build-up feature, designed to meet current NFPA 1901 requirements, to allow the vehicle to begin its emergency response as quickly as possible.

A pressure-protection valve shall be installed to prevent use of the air horns or other air-operated devices should the air system pressure drop below 85 psi. This feature is designed to prevent inadvertent actuation of the emergency/parking brakes while the vehicle is in motion.

Two (2) air pressure needle gauges, one (1) each for front and rear air pressure, with a warning light and buzzer shall be installed at the driver`s instrument panel.

The braking system shall be provided with a minimum of three (3) air tank reservoirs for a total air system capacity of 5,214 cu. in. One (1) reservoir shall serve as the wet tank and a minimum of one (1) tank shall be supplied for each of the front and rear axles. The total system shall carry a sufficient volume of air to comply with FMVSS-121.

Tank Capacities in Cubic Inches:

Wet	Front	Rear	Total
1,738	1,738	1,738	5,214

Spring-actuated emergency/parking brakes shall be installed on the rear axle.

A Bendix-Westinghouse SR-1 valve, in conjunction with a double check valve system, shall provide automatic emergency brake application when the air brake system pressure falls below 40 psi in order to safely bring the vehicle to a stop in case of an accidental loss of braking system air pressure.

A four-channel Wabco ABS shall be provided to improve vehicle stability and control by reducing wheel lock-up during braking. This braking system shall be fitted to both front and rear axles. All electrical connections shall be environmentally-sealed for protection against water, weather, and vibration.

The system shall constantly monitor wheel behavior during braking. Sensors on each wheel transmit wheel speed data to an electronic processor, which shall detect approaching wheel lock-up and instantly modulate (or pump) the brake pressure up to five (5) times per second to prevent wheel lock-up. Each wheel shall be individually controlled. To improve field performance, the

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system shall be equipped with a dual-circuit design configured in a diagonal pattern. Should a malfunction occur in one circuit, that circuit shall revert to normal braking action. A warning light at the driver's instrument panel shall signal a malfunction.

The system shall also be configured to work in conjunction with all auxiliary engine, exhaust, or driveline brakes to prevent wheel lock-up.

To improve maintenance troubleshooting, provisions in the system for an optional diagnostic tester shall be provided. The system shall test itself each time the vehicle is started, and a dash-mounted light shall go out once the vehicle is moving above 4 MPH.

A 3 year/300,000 mile parts and labor Anti-Locking Braking System (ABS) warranty shall be provided as standard by Meritor Automotive.

Park Brake Release

One (1) Bendix-Westinghouse PP-5 parking brake control valve shall be supplied on the lower dash panel within easy reach of the driver.

Parking Brake Front Axle

A front axle parking brake system shall be provided. Utilizing a separate dash mounted activation switch, the system shall apply the front axle service brake. The system shall be interlocked to the main axle rear axle parking brake system control, so as to be operational only when the main system brakes are applied. A dash mounted warning tag shall be provided, stating; "Low air system pressure reduces or eliminates braking force."

Electronic Stability Control

The apparatus shall be equipped with a G4 4S4M Electronic Stability Control (ESC) system that combines the functions of Roll Stability Control (RSC) with the added capability of yaw - or rotational – sensing.

RSC focuses on the vehicle's center of gravity and the lateral acceleration limit or rollover threshold. When critical lateral acceleration thresholds are exceeded, RSC intervenes to regulate the vehicle's deceleration functions. The added feature of ESC is to automatically intervene to reduce the risk of the vehicle rotating while in a curve or taking evasive action, prevents drift out through selective braking, and controlling and reducing vehicle speed when lateral acceleration limits are about to be exceeded.

Intervention by the system occurs in three forms - engine, retarder and brake control. The ESC system uses several sensors to monitor the vehicle. These include a steering wheel angle sensor, lateral accelerometer, and yaw position sensor. ESC constantly monitors driving conditions and intervenes if critical lateral acceleration is detected or if the vehicle begins to spin due to low friction surfaces. The system provides control of engine and retarder torque as well as automatically controlling individual wheels to counteract both over steer and under steer.

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To further improve vehicle drive characteristics, the unit shall be fitted with Automatic Traction Control (ATC). This system shall control drive wheel slip during acceleration from a resting point. An extra solenoid valve shall be added to the ABS system. The system shall control the engine and brakes to improve acceleration slip resistance. The system shall have a dash mounted light that shall come on when ATC is controlling drive wheel slip.

3 year/300,000 miles parts and labor warranties for ESC, RSC, and ATC shall be provided as standard by Meritor Automotive.

Air Dryer

The chassis air system shall be equipped with a Bendix-Westinghouse AD-9 air dryer to remove moisture from the air in order to help prevent the air lines from freezing in cold weather and prolong the life of the braking system components.

Air Inlet

A 1/4" brass quick-release air inlet with a male connection. The inlet shall allow a shoreline air hose to be connected to the vehicle, discharging air directly into the wet tank of the air brake system. It shall be located driver door jamb.

Air Lines

Wire braided air hose with oil and scuff resistant cover shall be supplied for all undercarriage hoses. The hose shall have a working temperature range of -55 degrees Fahrenheit to 250 degrees Fahrenheit.

Air Horns

Dual Grover air horns shall be provided, connected to the chassis air system. The horns shall be mounted through the front bumper. The front bumper shall have two (2) holes punched to accommodate the horns. A pressure protection valve shall be installed to prevent the air brake system from being depleted of air pressure.

Air Horn Lanyard

There shall be a "Y" style lanyard mounted in the center of the cab that allows the driver and officer to operate the air horns. The lanyard shall activate an electrical air switch.

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Engine/Transmission Package

Engine

The vehicle shall utilize a Cummins ISL 2010 electronic engine as described below:

- 450 gross bhp at 2200 rpm
- 1250 lb.-ft. peak torque at 1400 rpm
- Six (6)-cylinder, charge air cooled, 4-cycle diesel
- 543 cu. in. displacement -- 4.49 in bore x 5.69 in stroke (8.9 liters)
- 16.6:1 compression ratio
- Interact System Controlled Viable Geometry Turbocharged
- Engine shall be equipped with Full-Authority Electronics
- Electronic Timing Control fuel system
- Fuel cooler (when equipped with a fire pump)
- Fleetguard FS1022 fuel filter with integral water separator and water-in-fuel sensor approved by Cummins for use on the ISL engine
- Fleetguard LF9009 Venturi Combo combination full-flow/by-pass oil filter approved by Cummins for use on the ISL engine
- Engine lubrication system, including filter, shall have a minimum capacity of 25 quarts
- Delco-Remy 39 MT-HD 12-volt starter
- Cummins 18.7 cubic foot per minute (cfm) air compressor
- Corrosion inhibitor additive for coolant system
- After treatment system consisting of a oxidation catalyst and diesel particulate filter and selective catalyist reduction system
- Ember separator compliant with 2009 NFPA 1901 standard
- The engine shall be compliant with 2010 EPA Emission standards

The engine air intake shall draw air through the front cab grill. The intake opening shall be located on the officer (right) side behind front cab face with a plenum that directs air to the air filter. The air cleaner shall be a 11" diameter dry type that is easily accessed for service. Air cleaner intake piping shall be made from aluminized steel tubing with flexible rubber hoses. Air cleaner intake piping clamps shall be heavy-duty, constant-torque, T-bolt clamps to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine.

The engine exhaust piping shall be a minimum of 4" diameter welded aluminized steel tubing. The muffler shall be mounted horizontally under the right-hand frame rail in back of the cab in order to minimize heat transmission to the cab and its occupants. The exhaust shall be directed away from the vehicle on the right side ahead of the rear wheels in order to keep exhaust fumes as far away as possible from the cab and pump operator position.

A 5-year/100,000-miles parts and labor warranty shall be provided as standard by Cummins Bulletin 3381161.

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A copy of the Engine Installation Review stating the engine installation meets Cummins recommendations shall be provided as requested. The engine installation shall not require the operation of any type of "power-down" feature to meet engine installation tests.

Transmission

The vehicle shall utilize an Allison EVS3000P, electronic, 5-speed automatic transmission.

A push button shift module shall be located right side of the steering column, within easy reach of the driver. The shift position indicator shall be indirectly lit for after-dark operation. The shift module shall have a "Do Not Shift" light and a "Service" indicator light that are clearly visible to the driver. The shift module shall have means to enter a diagnostic mode and display diagnostic data.

A transmission oil temperature gauge with warning light and buzzer shall be installed on the cab instrument panel to warn the driver of high oil temperatures that may damage the transmission.

The transmission shall have a gross input torque rating of 1250 lb.-ft. and a gross input power rating of 450 HP.

The gear ratios shall be as follows:

1 - 3.49

2 - 1.86

3 - 1.41

4 - 1.00

5 - .75

R - 5.03

The transmission shall have an oil capacity of 23 quarts and shall be equipped with a fluid level sensor (FLS) system, providing direct feedback of transmission oil level information to the driver.

A water-to-oil transmission oil cooler shall be provided to ensure proper cooling of the transmission when the vehicle is stationary (no air flow). Air-to-oil transmission oil coolers, which require constant air flow, are not acceptable.

The transmission shall be provided with two (2) engine-driven PTO openings located at the 4 o'clock and 8 o'clock positions for flexibility in installing pto-driven equipment.

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The automatic transmission shall be equipped with a power lock-up device. The transmission lock-up shall prevent down shifting of the transmission when the engine speed is decreased during pump operations, thereby maintaining a constant gear ratio for safe operation of the pump. The transmission lock-up shall be automatically activated when the pump is engaged in gear. The transmission lock-up shall be automatically deactivated when the pump is disengaged for normal road operation.

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

Transmission Programming

The transmission shall be re-programmed so that when "D" is selected, the transmission will shift from 1st through 4th gear and pressing "MODE" will allow the transmission to shift up to 5th gear. Downshift pre-select will remain as standard (4th gear).

Transmission Selector

A push-button transmission shift module, Allison model 29538373, shall be located to the right side of the steering column within easy reach of the driver. The shift position indicator shall be indirectly lit for after dark operation. The shift module shall have a "Do Not Shift" light and a "Service" indicator light. The shift module shall have means to enter a diagnostic mode and display diagnostic data including oil life monitor, filter life monitor, transmission health monitor and fluid level. A transmission temperature gauge with warning light and buzzer shall be installed on the cab instrument panel.

Transmission Fluid

The transmission fluid shall be TransSynd synthetic.

Vehicle Speed

The maximum speed shall be electronically limited to 68 MPH as required by NFPA 1901.

Note: Maximum speed may be set at 65 MPH due to tire rating.

Jacobs Engine Brake

One (1) Jacobs engine brake shall be installed to assist in slowing and controlling the vehicle as required by NFPA 1901 for vehicles with gross vehicle weight ratings (GVWR) of 36,000 lbs. or greater. An on-off control switch and a high-medium-low selector switch shall be mounted in the cab.

When activated, the Jacobs engine brake shall cut off the flow of fuel to the cylinders and alter the timing of the exhaust valves. This shall transform the engine into a high-pressure air

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compressor, driven by the wheels, and the horsepower absorbed by the engine in this mode shall slow the vehicle. The selector switch allows the driver to select the amount of retarding power.

When the on-off switch is in the "on" position, the engine brake shall be automatically applied whenever the accelerator is in the idle position and the automatic transmission is in the lock-up mode. If the accelerator is depressed or if the on-off switch is placed in the "off" position, the engine brake shall immediately release and allow the engine to return to its normal function.

Exhaust End Modification

The end of the exhaust tail pipe shall be modified to accommodate a Plymovent in-house exhaust extraction system. The tail pipe will be at 90 degrees and straight out below the side of body. A stop ring shall be provided on the tail pipe to properly position the Plymovent nozzle.

Engine Cooling Package

Radiator

The cooling system shall include an aluminum tube-and-fin radiator with a minimum of 1,408 total square inches of frontal area to ensure adequate cooling under all operating conditions. There shall be a drain valve in the bottom tank to allow the radiator to be serviced. A sight glass shall be included for quick fluid level assessment. The radiator shall be installed at the prescribed angle in order to achieve the maximum operational effectiveness. This shall be accomplished according to established work instructions and properly calibrated angle measurement equipment.

Silicone Hoses

All radiator and heater hoses shall be silicone. Pressure compensating band clamps shall be used to eliminate hose pinching on all hoses 3/4" diameter and larger. All radiator hoses shall be routed, loomed, and secured so as to provide maximum protection from chafing, crushing, or contact with other moving parts.

Coolant

The cooling system shall be filled with a 50/50 mixture of water and antifreeze/coolant conditioner to provide freezing protection to minus 40 (- 40) degrees F for operation in severe winter temperatures.

Coolant Recovery

There shall be a coolant overflow recovery system provided.

Charge Air Cooler System

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The system shall include a charge air cooler to ensure adequate cooling of the turbocharged air for proper engine operation and maximum performance.

Charge Air Cooler Hoses

Charge air cooler hoses shall be made from high-temperature, wire-reinforced silicone to withstand the extremely high temperatures and pressures of the turbocharged air. The hoses shall incorporate a flexible hump section to allow motion and misalignment of the engine relative to the charge air cooler. Charge air cooler hose clamps shall be heavy-duty, constant-torque, T-bolt clamps to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine.

Fan/Shroud

The fan shall be 30" in diameter with eleven (11) blades for maximum airflow and dynamic balance. It shall be made of nylon for strength and corrosion resistance. The fan shall be installed with grade 8 hardware which has been treated with thread locker for additional security. A fan shroud attached to the radiator shall be provided to prevent recirculation of engine compartment air around the fan in order to maximize the cooling airflow through the radiator. The fan shroud shall be constructed of fiber-reinforced high temperature plastic. The shroud shall be specifically formed with curved surfaces which improves air flow and cooling.

Transmission Cooler

The cooling system shall include a liquid-to-liquid transmission cooler capable of cooling the heat generated from the transmission. When a transmission retarder is selected, the cooler shall have an increased capacity to handle the additional heat load.

Fuel System

One (1) 65 gallon fuel tank shall be provided. The tank shall be of an all-welded, aluminized-steel construction with anti-surge baffles and shall conform to all applicable Administration (FHWA) 393.65 and 393.67 standards. The tank shall be mounted below the frame rails at the rear of the chassis for maximum protection. The tank shall be secured with two (2) wrap-around T-bolt type stainless steel straps. Each strap shall be fitted with protective rubber insulation and shall be secured with Grade 8 hardware. This design allows for tank removal from below the chassis.

The fuel tank shall be equipped with a 2" diameter filler neck. The filler neck shall extend to the rear of the vehicle behind the rear tires and away from the heat of the exhaust system as required by NFPA 1901 Standard for Automotive Fire Apparatus. The open end of the filler neck shall be equipped with a twist-off filler cap with a retaining chain.

The tank shall be plumbed with top-draw and top-return fuel lines in order to protect the lines from road debris. Bottom-draw and/or bottom-return fuel lines are not acceptable. A vent shall be provided at the top of the tank. The vent shall be connected to the filler neck to prevent

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splash-back during fueling operations. A .50" NPT drain plug shall be provided at the bottom of the tank.

The tank shall have a minimum useable capacity of 65 gallons of fuel with a sufficient additional volume to allow for thermal expansion of the fuel without overflowing the vent.

A mechanical fuel pump shall be provided and sized by the engine manufacturer as part of the engine.

Fuel Shut-Off

A shut-off valve shall be supplied to prevent drain back of fuel into the main supply line during filter changes. The valve(s) shall be located: one (1) at fuel tank.

Fuel Line Hose

Wire braided fuel hose meeting SAE J-1402 shall be provided for the chassis fuel system. The hose shall have a working temperature rating of -55 degree F to 300 degree F.

The ends of the hose shall have connections that shall allow the hose to be reattached if removed.

320 AMP Alternator

There shall be a 320 amp Leece Neville alternator installed as specified. The alternator shall be a Leece Neville 7890JB series brushless type with integral rectifier and adjustable voltage regulator with an output of 275 amps per NFPA 1901 rating (320 amps per SAE J56).

Battery System

The manufacturer shall supply four (4) heavy duty Group 31 12-volt maintenance-free batteries. Each battery shall be installed and positioned so as to allow easy replacement of any single battery. Each battery shall be equipped with carrying handles to facilitate ease of removal and replacement. There shall be two (2) steel frame mounted battery boxes, one (1) on the left frame rail and one (1) on the right frame rail. Each battery box shall be secured to the frame rail with Grade 8 hardware. Each battery box shall hold (2) batteries. The batteries shall have a minimum combined rating of 4,000 (4 x 1000) cold cranking amps (CCA) @ 0 degrees Fahrenheit and 820 (4 x 205) minutes of reserve capacity for extended operation. The batteries shall have 3/8-16 threaded stud terminals to ensure tight cable connections. The battery stud terminals shall each be treated with concentrated industrial soft-seal after cable installation to promote corrosion prevention. The positive and negative battery stud terminals and the respective cables shall be clearly marked to ensure quick and mistake-proof identification.

Batteries shall be placed on non-corrosive rubber matting and secured with hold-down brackets to prevent movement, vibration, and road shock. The hold-down bracket J-hooks shall be cut to fit and shall have all sharp edges removed. The batteries shall be placed in plastic trays to provide preliminary containment should there be leakage of hazardous battery fluids. There shall

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be two (2) plastic trays, each containing (2) batteries. Each battery tray shall be equipped with a rubber vent hose to facilitate drainage. The rubber vent hose shall be routed to drain beneath the battery box. The batteries shall be positioned in well-ventilated areas.

One (1) positive and one (1) negative jumper stud shall be provide below the front driver side of body/pump module.

Batteries shall have a warranty of twelve (12) months that shall commence upon the date of delivery of the apparatus.

Engine Fan Clutch

The engine shall be equipped with a thermostatically controlled engine cooling fan. The fan shall be belt driven and utilize a clutch to engage when the engine reaches a specified temperature and / or the water pump is engaged (if equipped).

When disengaged, the fan clutch shall allow for improved performance from optional floor heaters, reduced cab interior noise, increased acceleration and improved fuel economy.

The fan shall be equipped with a fail safe engagement so that if the clutch fails the fan shall engage to prevent engine overheating.

Drivelines

Drivelines shall have a heavy duty metal tube and shall be equipped with Spicer 1710HD universal joints to allow full-transmitted torque to the axle(s). Drive shafts shall be axially straight, concentric with axis and dynamically balanced.

Front Tow Eyes

Two (2) 3/4" thick heavy duty steel tow eyes shall be securely attached to the chassis frame rails at the front of the apparatus. They shall be mounted down below the bumper / cab.

Rear Tow Eyes

Two (2) heavy duty tow eyes made of 3/4" (0.75") thick steel having 2-1/2" diameter holes shall be mounted below the body at the rear of the vehicle to allow towing (not lifting) of the apparatus without damage. The tow eyes will be welded to the lower end of a 5" steel channel that is bolted at the end of the chassis frame rails. The tow eyes shall be painted chassis black.

Class III Hitch Receivers

A side underbody Class III hitch receiver shall be provided one (1) each side of rear body behind rear wheels.

The hitch receivers shall be of an integral construction to the underbody support assembly.

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Each side facing hitch receiver shall include a 12 volt electrical connection for a portable winch application. Each portable winch connection shall be rated for a maximum of 5,000 pounds.

Class IV Rear Hitch Receiver

A Class IV hitch receiver shall be provided at the rear of the body, attached to the chassis frame.

The trailer wiring shall be terminated with a 7 pin connector. The connector shall be fully wired to the stop/turn/tail/reverse and electric brake controller. A 12 volt hot, ground circuits shall be provided.

Automatic Chassis Lubrication

A Vogel Automatic Lubrication System shall be installed to provide automatic grease application, with recommended dosages, per system interval cycle, to the following lubrication wear points:

- Spring Pins and Spring Hanger Pins @ 0.6 CCM
- King Pins, Upper and Lower @ 0.4 CCM
- Steering Linkage @ 0.2 CCM
- Tie Rod Ends @ 0.2 CCM
- Brake S-Cams @ 0.1 CCM (Rockwell will not warrant application to caliper slide pins)
- Steering Assist Cylinder (If applicable) @ 0.2 CCM
- Drag Link @ 0.2 CCM
- Automatic Slack Adjusters @ 0.1 CCM
- Steering Miter Box @ 0.1 CCM
- Tilt Cab Lift Assembly (If applicable) @ 0.05 CCM

The lubrication system shall utilize the post lubrication principle and shall be powered by an electrically driven, 12V gear pump. The gear pump shall be top mounted to a reservoir assembly with a capacity of 2.716 lbs grease liters. The electronic control unit shall be connected through the ignition and park brake circuits to provide power to the pump when the engine is running and the park brake is released.

The gear pump and reservoir shall be located in an accessible location.

The electronic control module shall include system monitoring capabilities for the main line and operating cycle with a visual indicator for the vehicle operator, located in the overhead console. The control module shall have LED's and a system reset button to initiate a lube cycle for diagnostic purposes and/or reset the control module in the event a system fault has occurred. Upon a fault, the system shall be inoperable until the fault has been corrected and a system reset has been initiated by the operator or serviceman.

DEF Tank

A diesel exhaust fluid (DEF) tank with a five (5) gallon capacity shall be provided.

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The DEF tank shall include a heater fed by hot water directly from the engine block to prevent the DEF from becoming too cool to operate correctly per EPA requirements. The tank shall include a temperature sensor to control the heater control valve that controls the feed of hot water from the engine to the DEF tank heater.

A sender shall be provided in the DEF tank connected to a level gauge on the cab dash.

The tank shall be located left side below rear of cab.

Cab

The vehicle shall be distinguished by an all-welded aluminum and fully enclosed tilt cab. The cab shall be designed exclusively for fire/rescue service and shall be pre-engineered to ensure long life. It shall incorporate an integral welded substructure of high-strength aluminum alloy extrusions that creates an occupant compartment that is essentially a protective perimeter. The end result is a distinctive structure that is aesthetically appealing, functionally durable, and characterized by increased personnel safety.

The cab shall be constructed from 3/16" (0.188") 3003 H14 aluminum alloy plate roof, floor, and outer skins welded to a high-strength 6063-T6 aluminum alloy extruded subframe. Wall supports and roof bows are 6061 T6 aluminum alloy. This combination of a high-strength, welded aluminum inner structure surrounded on all sides by load-bearing, welded aluminum outer skins provides a cab that is strong, lightweight, corrosion-resistant, and durable.

The inner structure shall be designed to create an interlocking internal "roll-cage" effect by welding two (2) 3" x 3" x 0.188" wall-thickness 6063-T5 aluminum upright extrusions between the 3" x 3" x 0.375" wall-thickness 6061-T6 roof crossbeam and the 2.25" x 3" x 0.375" wall-thickness 6063-T6 subframe structure in the front. An additional two (2) aluminum upright extrusions within the back-of-cab structure shall be welded between the rear roof perimeter extrusion and the subframe structure in the rear to complete the interlocking framework. The four (4) upright extrusions -- two (2) in the front and two (2) in the rear -- shall be designed to effectively transmit roof loads downward into the subframe structure to help protect the occupant compartment from crushing in a serious accident. All joints shall be electrically seam welded internally using aluminum alloy welding wire.

The subframe structure shall be constructed from high-strength 6061-T6 aluminum extrusions welded together to provide a structural base for the cab. It shall include a side-to-side C-channel extrusion across the front, with 3/4" x 2-3/4" (.75" x 2.75") full-width crossmember tubes spaced at critical points between the front and rear of the cab.

The cab floor shall be constructed from 3/16" (0.188") 3003 H14 smooth aluminum plate welded to the subframe structure to give the cab additional strength and to help protect the occupants from penetration by road debris and under-ride collision impacts.

The cab roof shall be constructed from 3/16" (0.188") 3003 H14 aluminum treadplate supported by a grid of fore-aft and side-to-side aluminum extrusions to help protect the occupants from

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penetration by falling debris and downward-projecting objects. Molded fiberglass or other molded fiber-reinforced plastic roof materials are not acceptable.

The cab roof perimeter shall be constructed from 4" x 6-5/8" (4" x 6.625") 6063-T5 aluminum extrusions with integral drip rails. Cast aluminum corner joints shall be welded to the aluminum roof perimeter extrusions to ensure structural integrity. The roof perimeter shall be continuously welded to the cab roof plate to ensure a leak-free roof structure.

The cab rear skin shall be constructed from 3/16" (0.188") 3003 H14 aluminum plate. Structural extrusions shall be used to reinforce the rear wall.

The left-hand and right-hand cab side skins shall be constructed from 3/16" (0.188") 3003 H14 smooth aluminum plate. The skins shall be welded to structural aluminum extrusions at the top, bottom, and sides for additional reinforcement.

The cab front skins shall be constructed from 3/16" (0.188") 3003 H14 smooth aluminum plate. The upper portion shall form the windshield mask, and the lower portion shall form the cab front. Each front corner shall have a full 9" outer radius for strength and appearance. The left-hand and right-hand sides of the windshield mask shall be welded to the left-hand and right-hand front door frames, and the upper edge of the windshield mask shall be welded to the cab roof perimeter extrusion for reinforcement. The cab front shall be welded to the subframe C-channel extrusion below the line of the headlights to provide protection against frontal impact.

Cab Exterior

The exterior of the cab shall be 94" wide x 139.5" long to allow sufficient room in the occupant compartment for up to six (6) fire fighters. The cab roof shall be approximately 101" above the ground with the flat roof option. The back-of-cab to front axle length shall be a minimum of 67.5".

Front axle fenderette trim shall be brushed aluminum for appearance and corrosion resistance. Bolt-in front wheel well liners shall be constructed of 3/16" (0.188") composite material to provide a maintenance-free, damage-resistant surface that helps protect the underside of the cab structure and components from stones and road debris.

The cab windshield shall be of a two-piece replaceable design for lowered cost of repair. The windshield shall be made from 1/4" (0.25") thick curved, laminated safety glass with a 75% light transmittance automotive tint. A combined minimum viewing area of 2,700-sq. in. shall be provided. Forward visibility to the ground for the average (50th percentile) male sitting in the driver's seat shall be no more than 11 feet 7 inches from the front of the cab to ensure good visibility in congested areas.

The front cooling air intake grille shall be constructed of stainless steel mesh and supported by a 0.80" polished stainless steel frame providing no less than 81% open area for excellent cooling performance.

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Cab Mounts and Cab Tilt System

The cab shall be independently mounted from the body and chassis to isolate the cab structure from stresses caused by chassis twisting and body movements. Mounting points shall consist of two (2) forward-pivoting points, one (1) on each side; two (2) intermediate rubber load-bearing cushions located midway along the length of the cab, one on each side; and two (2) combination rubber shock mounts and cab latches located at the rear of the cab, one (1) on each side.

An electric-over-hydraulic cab tilt system shall be provided to provide easy access to the engine. It shall consist of two (2) large-diameter, telescoping, hydraulic lift cylinders, one (1) on each side of the cab, with a frame-mounted electric-over-hydraulic pump for cylinder actuation.

Safety flow fuses (velocity fuses) shall be provided in the hydraulic lift cylinders to prevent the raised cab from suddenly dropping in case of a burst hydraulic hose or other hydraulic failure. The safety flow fuses shall operate when the cab is in any position, not just the fully raised position.

The hydraulic pump shall have a manual override system as a backup in the event of an electrical failure. Lift controls shall be located in a compartment to the rear of the cab on the right side of the apparatus. A parking brake interlock shall be provided as a safety feature to prevent the cab from being tilted unless the parking break is set.

The entire cab shall be tilted through a 42-45 degree arc to allow for easy maintenance of the engine, transmission and engine components. A positive-engagement safety latch shall be provided to lock the cab in the full tilt position to provide additional safety for personnel working under the raised cab.

In the lowered position, the cab shall be locked down by two (2) automatic, spring-loaded cab latches at the rear of the cab. A "cab ajar" indicator light shall be provided on the instrument panel to warn the driver when the cab is not completely locked into the lowered position.

Cab Interior

The interior of the cab shall be of the open design with an ergonomically-designed driver area that provides ready access to all controls as well as a clear view of critical instrumentation.

The engine cover between the driver and the officer shall be a low-rise contoured design to provide sufficient seating and elbow room for the driver and the officer. The engine cover shall blend in smoothly with the interior dash and flooring of the cab. An all-aluminum subframe shall be provided for the engine cover for strength. The overall height of the engine enclosure shall not exceed 23" from the floor at each side and 27" in the center section. The engine cover shall not exceed 41" in width at its widest point.

The rear portion of the engine cover shall be provided with a lift-up section to provide easy access for checking transmission fluid, power steering fluid, and engine oil without raising the cab. The engine cover insulation shall consist of 3/4" dual density fiberglass composite panels

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with foil backing manufactured to specifically fit the engine cover without modification to eliminate "sagging" as found with foam insulation. The insulation shall meet or exceed DOT standard MVSS 302-1 and V-0 (UI subject 94 Test).

All cab floors shall be covered with a black rubber floor mat that provides an aggressive slip-resistant surface in accordance with current NFPA 1901.

A minimum of 57.25" of floor-to-ceiling height shall be provided in the front seating area of the cab and a minimum of 55.25" floor-to-ceiling height shall be provided in the rear seating area. A minimum of 36" of seated headroom at the "H" point shall be provided over each fenderwell.

The floor area in front of the front seat pedestals shall be no less than 20.5" side to side by 25.0" front to rear for the driver and no less than 20.5" side to side by 26.0" front to rear for the officer to provide adequate legroom.

Battery jumper studs shall be provided to allow jump-starting of the apparatus without having to tilt the cab.

All exposed interior metal surfaces shall be pretreated using a corrosion prevention system.

The interior of the cab shall be insulated to ensure the sound (dba) level for the cab interior is within the limits stated in the current edition of NFPA 1901. The insulation shall consist of 2 oz. wadding and 1/4" (0.25") foam padding. The padding board shall be backed with 1/4" (0.25") thick reflective insulation. The backing shall be spun-woven polyester. Interior cab padding shall consist of a rear cab headliner, a rear wall panel, and side panels between the front and rear cab doors.

The overhead console and heater cover shall be covered with thermoformed, non-metallic, non-fiber trim pieces to provide excellent scuff and abrasion resistance, as well as chemical stain resistance. The thermoformed material shall comply with Federal Motor Vehicle Safety Standard (FMVSS) 302 for flammability of interior materials.

The vehicle shall use a seven-position tilt and telescopic steering column to accommodate various size operators. An 18" padded steering wheel with a center horn button shall be provided.

A full-width overhead console shall be mounted to the cab ceiling for placement of siren and radio heads, and for warning light switches. The console shall be made from a thermoformed, non-metallic material and shall have easily removable mounting plates.

Storage areas, with hinged access doors, shall be provided below the driver and officer seats. The driver side compartment shall be approximately 20" x 12" x 3.5" high and the officer side compartment shall be approximately 20.25" x 22.75" x 11" high (20" x 12" x 3.5" high w/ air ride).

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The front cab steps shall be a minimum of 8" deep x 24" wide. The first step shall be no more than 24.0" above the ground with standard tires in the unloaded condition per NFPA 1901 standards. The rear cab steps shall be a minimum 12" deep x 21" wide. The first step shall be no more than 24.0" above the ground with standard tires in the unloaded condition per NFPA 1901 standards. The rear steps shall incorporate intermediate steps for easy access to the cab. The step surfaces shall be aluminum diamond plate with a multi-directional, aggressive gripping surface incorporated into the aluminum diamond plate in accordance with current NFPA 1901.

A black rubber grip handle shall be provided on the interior of each front door below the door window to ensure proper hand holds while entering and exiting the cab. An additional black rubber grip handle shall be provided on the left and right side windshield post for additional handholds.

Cab Doors

There shall be reflective signs on each cab door in compliance with all NFPA requirements.

Four (4) side-opening cab doors shall be provided. Doors shall be constructed of a 3/16" (0.188") aluminum plate outer material with an aluminum extruded inner framework to provide a structure that is as strong as the side skins.

Front cab door openings shall be approximately 36" wide x 63" high, and the rear cab door openings shall be approximately 33.75" wide x 63" high. The front doors shall open approximately 75 degrees, and the rear doors shall open approximately 80 degrees. All doors shall be barrier style.

The doors shall be securely fastened to the doorframes with full-length, stainless steel piano hinges, with 3/8" (0.375") diameter pins for proper door alignment, long life, and corrosion resistance. Mounting hardware shall be treated with corrosion-resistant material prior to installation. For effective sealing, an extruded rubber gasket shall be provided around the entire perimeter of all doors.

Stainless steel paddle-style door latches shall be provided on the interiors of the doors. The latches shall be designed and installed to protect against accidental or inadvertent opening as required by NFPA 1901.

The front door windows shall provide a minimum viewing area of 530 sq. in. each. The rear door windows shall provide a minimum viewing area of 500 sq. in. each. All windows shall have 75% light transmittance automotive safety tint. Full roll-down windows shall be provided for the front cab doors with worm gear drive cable operation for positive operation and long life. Scissors or gear-and-sector drives are not acceptable.

Cab Instruments and Controls

Two (2) pantograph-style windshield wipers with two (2) separate electric motors shall be provided for positive operation. Air-operated windshield wipers are not acceptable because of

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their tendency to accumulate moisture, which can lead to corrosion or to freezing in cold weather. The wipers shall be a wet-arm type with a one (1) gallon washer fluid reservoir, an intermittent-wipe function, and an integral wash circuit. Wiper arm length shall be approximately 28", and the blade length approximately 20". Each arm shall have a 70 degree sweep for full coverage of the windshield.

An overhead mounted heater and defroster with a minimum capacity of 60,000 Btu/hr and all necessary controls shall be mounted in the cab. The airflow system shall consist of two (2) levels, defrost and cab, and shall have fresh air and defogging capabilities.

Cab controls shall be located on the cab instrument panel in the dashboard on the driver's side where they are clearly visible and easily reachable. Emergency warning light switches shall be installed in removable panels for ease of service. The following gauges and/or controls shall be provided:

- Master battery switch/ignition switch (rocker with integral indicator)
- Starter switch/engine stop switch (rocker)
- Heater and defroster controls with illumination
- Marker light/headlight control switch with dimmer switch
- Self-canceling turn signal control with indicators
- Windshield wiper switch with intermittent control and washer control
- Master warning light switch
- Transmission oil temperature gauge
- Air filter restriction indicator
- Parking brake controls with red indicator light on dash
- Automatic transmission shift console
- Electric horn button at center of steering wheel
- Cab ajar warning light on the message center enunciator

Controls and switches shall be identified as to their function by backlit wording adjacent to each switch, or indirect panel lighting adjacent to the controls.

Fast Idle System

A fast idle system shall be provided and controlled by the cab-mounted switch. The system shall increase engine idle speed to a preset RPM for increased alternator output.

Electrical System

The cab and chassis system shall have a centrally located electrical distribution area. All electrical components shall be located such that standard operations shall not interfere with or disrupt vehicle operation. An automatic thermal-reset master circuit breaker compatible with the alternator size shall be provided. Automatic-reset circuit breakers shall be used for directional lights, cab heater, battery power, ignition, and other circuits. An access cover shall be provided for maintenance access to the electrical distribution area.

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A 6 place, constantly hot, and 6 place ignition switched fuse panel and ground for customer-installed radios and chargers shall be provided at the electrical distribution area. Radio suppression shall be sufficient to allow radio equipment operation without interference.

All wiring shall be mounted in the chassis frame and protected from impact, abrasion, water, ice, and heat sources. The wiring shall be color-coded and functionally-labeled every 3" on the outer surface of the insulation for ease of identification and maintenance. The wiring harness shall conform to SAE 1127 with GXL temperature properties. Any wiring connections exposed to the outside environment shall be weather-resistant. All harnesses shall be covered in a loom that is rated at 280 degrees F to protect the wiring against heat and abrasion.

A Vehicle Data Computer (VDC) shall be supplied within the electrical system to process and distribute engine and transmission Electronic Control Module (ECM) information to chassis system gauges, the message center, and related pump panel gauges. Communication between the VDC and chassis system gauges shall be through a 4 wire multiplexed communication system to ensure accurate engine and transmission data is provided at the cab dash and pump. The VDC shall be protected against corrosion, excessive heat, vibration, and physical damage.

Two (2) dual rectangular sealed beam halogen headlights shall be installed on the front of the cab, one (1) on each side, mounted in a polished chrome-plated bezel. The low beam headlights shall activate with the release of the parking brake to provide daytime running lights (DRL) for additional vehicle conspicuity and safety. The headlight switch shall automatically override the DRL for normal low beam/high beam operation.

Raised Roof

The rear portion of the cab roof shall be raised 16". This will provide at least 5'-11" standing room. The front of the vista hood shall be sloped at 45 degrees from vertical. The slope shall begin slightly in front of the centerline of the front axle to leave room for warning lights and air conditioning in front of the vista. The main roof extrusion shall extend up into the vista to strengthen the roof perimeter. All raised roof windows shall be deleted.

The rear door shall have an 89" vertical dimension for improved ingress/egress characteristics. The door shall be equipped with a dual striker bolt system.

Cab Door Locks

Each cab door shall have a manually operated door lock actuated from the interior of each respective door. Exterior of each cab door shall be provided with a barrel style keyed lock below the cab door handle.

The cab shall have 1250 keyed door locks provided on exterior doors to secure the apparatus.

Cab Door Windows

ADDENDUM #1 KINGSTON FIRE DISTRICT SPECIFICATIONS FOR NON WALK-IN HEAVY RESCUE

The front and rear cab door windows shall be electrically controlled. Each window shall have a switch on the door to control operation. The driver door shall have a switch panel to control each door window individually.

Cab Door Panels

The inner door panels shall be made from 14 gauge brushed finish stainless steel for increased durability. The cab door panels shall incorporate an easily removable panel for access to the latching mechanism for maintenance or service.

Cab Door Exterior Latches

All cab doors shall have "L" style exterior door latches.

Cab Door Area Lighting

There shall be four (4) clear LED lights provided to illuminate the cab step well area. Each light shall be located in the cab step well area. Each light shall be activated by the cab door ajar circuit.

Cab Door Reflective Material

Reflective Yellow/Red material striping shall be supplied on each of the lower cab doors. The stripes shall run from the lower outer corner to the top upper corner of the panel, forming an "A" shape when viewed from the rear. The reflective material shall meet NFPA 1901 requirements.

Cab Mirrors

Two (2) Ramco model 6001FFR remote controlled heated aluminum mirrors shall be installed. The mirrors shall incorporate a full face main section with a convex mirror with housing model CAS750, mounted to the top. The adjustment of main sections shall be through dash mounted switches. Location: mounted on front corners of cab.

Cab Canopy Windows

There shall be a fixed window provided between the front and rear doors on the driver and officer's side of the cab.

Front Mud Flaps

Black linear low density polyethylene (proprietary blend) mud flaps shall be installed on the rear of the cab front wheel wells. The design of the mud flaps shall have corrugated ridges to distribute water evenly.

**ADDENDUM #1 KINGSTON FIRE DISTRICT
SPECIFICATIONS FOR NON WALK-IN HEAVY RESCUE**

Handrails

Cab door assist handrails shall consist of two (2) 1.25" diameter x 18" long 6063-T5 anodized aluminum tubes mounted directly behind the driver and officer front and rear door openings one each side of the cab. The handrails shall be machine extruded with integral ribbed surfaces to assure a good grip for personnel safety. Handrails shall be installed between chrome end stanchions and shall be positioned at least 2" from the mounting surface to allow a positive grip with a gloved hand.

Rear Cab Wall Construction

The rear cab wall shall be constructed using formed 3/16" aluminum smooth plate interlocking in aluminum extrusions. The smooth plate shall match the cab paint scheme.

Air Conditioning

An overhead air-conditioner / heater system with a single radiator mounted condenser shall be supplied.

The unit shall be mounted to the cab interior headliner in a mid cab position, away from all seating positions. The unit shall provide ten (10) comfort discharge louvers, four (4) to the back area of the cab and six (6) to the front. These louvers will be used for AC and heat air delivery. Two (2) additional large front louvers shall be damper controlled to provide defogging and defrosting capabilities to the front windshield as necessary.

The unit shall consist of a high output evaporator coil and heater core with one (1) high output dual blower for front air delivery, and two (2) high performance single wheel blowers for rear air delivery.

The control panel shall actuate the air-distribution system with air cylinders, which are to be separated from the brake system by an 85-90 psi pressure protection valve. A three-speed blower switch shall control air speed.

The condenser shall be radiator mounted and have a minimum capacity of 65,000 BTU's and shall include a receiver drier.

Performance Data: (Unit only, no ducting or louvers)

AC BTU: 55,000

Heat BTU: 65,000

CFM : 1300 @ 13.8V (All blowers)

The compressor shall be a ten-cylinder swash plate type Seltec model TM-31HD with a capacity of 19.1 cu.in. per revolution.

ADDENDUM #1 KINGSTON FIRE DISTRICT SPECIFICATIONS FOR NON WALK-IN HEAVY RESCUE

The system shall be capable of cooling the interior of the cab from 100 degrees ambient to 75 degrees or less with 50% relative humidity in 30 minutes or less.

Supplemental Cab Heat

A single 40,000 BTU water heater shall be supplied in the front area of the cab. The unit shall heat the lower section of the driver`s and officer`s footwell.

Dual 23,000 BTU water heaters with diamond plate covers shall be supplied in the rear of the cab to heat the rear cab lower section.

Dual climate control will be achieved via dual switches installed on a front instrument panel.

Cab Seating

All cab seats shall be Bostrom brand with durawear gray seat material.

One (1) H. O. Bostrom 400 Series Sierra Air- 100RX4 suspension seats with high back styling shall be supplied for the driver position.

Features shall include:

- Air-100 suspension assembly with weight, height and ride adjustment.
- Built in lumbar support.
- 4” vertical suspension motion.
- 5” fore and aft adjustment.

One (1) H. O. Bostrom 400 Series Sierra Air- 100RX4 suspension seats with high back styling shall be supplied for the officer position.

Features shall include:

- Air-100 suspension assembly with weight, height and ride adjustment.
- Built in lumbar support.
- 4” vertical suspension motion.
- 5” fore and aft adjustment.

One (1) Bostrom 400 Series tanker 450 SCBA high back SCBA storage seat shall be provided in the rear facing position over the driver side wheel well.

Features shall include:

- Removable ”Store-All” side cushions.
- Auto-pivot and return headrest to open for improved exit with SCBA.
- 12.5” wide SCBA cavity to store leading SCBA Brands.

ADDENDUM #1 KINGSTON FIRE DISTRICT SPECIFICATIONS FOR NON WALK-IN HEAVY RESCUE

- Built in lumbar support.
- Replaceable seat, side and headrest cushions.

One (1) Bostrom 400 Series tanker 450 SCBA high back SCBA storage seats shall be provided in the rear facing position over the officer side wheel well.

Features shall include:

- Removable "Store-All" side cushions.
- Auto-pivot and return headrest to open for improved exit with SCBA.
- 12.5" wide SCBA cavity to store leading SCBA Brands.
- Built in lumbar support.
- Replaceable seat, side and headrest cushions.

Two (2) fold down seat with Bostrom Res-Q-Back seat back with SCBA storage. Location on the rear wall to be driver's side outboard, officer's side outboard.

Features shall include:

- Seat bottom constructed of high density foam with a heavy wear resistant covering
- Automatically fold up when not in use to provide increased room in the rear of the cab.
- Removable "Store-All" side cushions.
- Auto-pivot and return headrest to open for improved exit with SCBA.
- 12.5" wide SCBA cavity to store leading SCBA Brands.
- Built in lumbar support.
- Replaceable seat, side and headrest cushions.

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.

Seating Capacity Tag

A tag that is in view of the driver stating seating capacity of six (6) personnel shall be provided.

Medical Cabinets

There shall be a medical storage cabinet provided at the back wall of the interior of the cab, between specified outboard seats. The medical cabinet shall be constructed of 1/8" smooth aluminum plate. The medical cabinet shall be approximately 55" high x 40" wide x 20" deep interior. There shall be a side hinged door in the lower area on the officer's side.

Three (3) vertically adjustable shelves shall be provided and installed in the medical cabinet. The shelves shall be constructed of 1/8" smooth aluminum plate. Each shelf shall have a 1" front for added strength and reinforcement. The shelves shall be sized to the interior dimensions of the

ADDENDUM #1 KINGSTON FIRE DISTRICT SPECIFICATIONS FOR NON WALK-IN HEAVY RESCUE

medical cabinet. The shelves shall be mounted with extruded aluminum adjustable shelf tracking attached to the cabinet walls and the shelves to be secured with aluminum brackets to the tracks to allow for vertical height adjustment. As necessary a 3/4" x 2-3/4" aluminum extrusion shall be mounted to the underside of the shelves to provide additional reinforcement as needed.

There shall be a locking roll up door provided to secure contents.

There shall also be an upper medical cabinet on the rear wall of the cab. The cabinet shall be constructed of 1/8" (.125) smooth aluminum and shall included three (3) horizontally hinged lift-up doors. The cabinet shall be approximately 88" wide x 16" high x 10" deep. The compartment openings shall be approximately 12" wide (outboard on each side) and 50" wide (center). The interior of the cabinet shall be open from left to right side.

All medical storage cabinets shall have a Zolatone gray finish.

Map Box

An aluminum map/storage box shall be installed in the cab. The map box shall be constructed of 1/8" (.125) inch smooth aluminum. Hinged drop-down doors with push button latches, shall be installed on the front of the box for the access to the driver and officer side storage areas. Each storage area shall have two (2) fixed shelves for storage of ring binders, map books, etc. Each latch shall have a 50 lb. rating.

The map box shall be mounted on the vertical uprights in the center of the cab between the driver and officer seating positions. The map box shall be secured and tested to meet with current NFPA requirements.

Approximate overall dimension: 34" W x 9.50" H x 12" D.

Cab Interior Color

Cab instrument panel, overhead console, trim panels, headliner, and door panels shall be gray.

Sun Visors

Padded sun visors shall be provided for the driver and officer matching the interior trim of the cab and shall be flush mounted into the underside of the overhead console.

Cab Dash - Severe Duty

The center and officer side dash shall be constructed from .125" smooth aluminum plate painted to match the cab interior. A hinged access panel shall be provided on top of the center dash to provide easy access to components within.

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The lower kick panels below the dash to be constructed from .125" aluminum diamond plate. The panels shall be removable to allow for servicing components that may be located behind the panels.

Engine Cover

The engine cover shall blend in smoothly with the interior dash and flooring of the cab. The upper left and right sides shall have a sloped transition surface running front to rear providing increased space for the driver and officer.

The engine cover and engine service access door cover shall be molded 18 lb/cu. ft. (+/-0.5) flexible integral skinned polyurethane foam at a Durometer of 60 (+/- 5.0) per ASTM F1957-99 and with a minimum skin thickness of 0.0625 inches and shall be provided to reduce the transmission noise and heat from the engine. The cover shall be black and feature a pebble grain finish for slip resistance.

Cab Door Warning Lights

One (1) Whelen model PSR00FRR LED red flashing strip light shall be provided on each interior cab door panel. The lights shall be horizontally mounted on the lower kick panels and wired through the door switch.

Cab Dome Lights

A Weldon LED dome light assembly with one (1) white lens and one (1) red lens and plastic housing shall be installed. The red light activates with appropriate cab door and light assembly switch, the white light activates with light assembly mounted switch only.

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

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

Radio

The unit shall be equipped with an AC Delco model XTA2300 AM/FM stereo CD with weather band. Two (2) Prestige model 2525 5-1/4" radio speakers and antenna shall be supplied mounted in padding adjacent to driver and officer seats.

Unit shall be suppressed from engine noise to provide clear sound through respective speakers.

Location: center overhead.

Auto-Eject Battery Charger Receptacle

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The battery charger receptacle shall be a Kussmaul 20 Amp NEMA 5-20 Super Auto-Eject #091-55-20-120 with a cover. The super auto-eject receptacle shall be completely sealed and have an automatic power line disconnect.

The receptacle shall be located outside driver's door next to handrail and the cover color shall be Red.

Switch Horn Button Two Position

A two (2) position rocker switch shall be installed in the cab dash and properly labeled to enable operator to activate one of the following from the steering wheel horn button: OEM Traffic horn or air horn.

Auto Transfer Switch

An automatic transfer switch shall be installed to allow all interior household type receptacles to be powered either by the shore power receptacle or the on-board generator.

The system shall include an eight (8) place breaker box for the interior receptacles.

DPF Regeneration Override

An override switch shall be provided for the Diesel Particulate Filter (DPF) regeneration. The switch will inhibit the regeneration process until the switch is reset or the engine is shut down and restarted. The switch shall be located within reach of the driver.

English Dominant Gauge Cluster

The cab operational instruments shall be located in the dashboard on the driver side of the cab and shall be clearly visible. The gauges in this panel shall be English dominant and shall be the following:

- Speedometer/Odometer
- Tachometer with integral hour meter
- Engine oil pressure gauge with warning light and buzzer
- Engine water temperature gauge with warning light and buzzer
- Two (2) air pressure gauges with a warning light and buzzer (front air and rear air)
- Fuel gauge
- Voltmeter
- Transmission oil temperature gauge

This panel shall be backlit for increased visibility during day and night time operations.

Speedometer for Officer

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An electronic speedometer shall be mounted on the passenger's side of the cab, mounted in the overhead console.

Cab Turn Signals

There shall be a pair of Whelen 600 LED (Light Emitting Diode) turn signal light heads with populated arrow pattern and amber lens mounted upper headlight bezel and wired with weatherproof connectors.

Headlights

The front of the cab shall have four (4) headlights. The headlights shall be mounted on the front of the cab in the lower position. The headlights shall be day time operational.

Air Compressor and Battery Conditioner

A Supersmart microprocessor controlled battery charging system shall be installed and Kussmaul Auto Pump 120.

The battery charging system shall have a 110 volt 60 hertz input with a 20 amp DC output.

The system shall provide a signal by a remote charge indicator panel if battery voltage drops below 11.5 volts. The remote panel shall be located next to the auto-eject receptacle.

The microprocessor is continuously powered from the battery to provide charge status. Equalization charge only occurs when necessary, not with every cycle.

The system will fully charge batteries while allowing up to 8 amps of parasitic load.

The air compressor shall be a Kussmaul O91-9B-1 powered by 120 volt 60 hertz input from the auto-eject receptacle with an output of .76 cfm at 100 psi. Includes a miniature air filter with transparent bowl and pressure switch that senses the system pressure and operates the compressor whenever the pressure in the air brake system drops below a pre-determined level.

The battery charger shall be located behind driver's seat. The air compressor shall be located behind officer's seat.

Cornering Light Circuit

There shall be a circuit to activate the scene light with the chassis turn signal.

Cab 12 Volt Outlet

A plug-in type receptacle for hand held spotlights, cell phones, chargers, etc. shall be installed in cab officer side on 3 x 3 post rear facing just above engine cover, officer side dash, center rear wall of center rear medical compartment up high. The receptacle shall be wired battery hot.

**ADDENDUM #1 KINGSTON FIRE DISTRICT
SPECIFICATIONS FOR NON WALK-IN HEAVY RESCUE**

Non Walk-in Rescue Body

Apparatus Body

The apparatus body shall be constructed entirely of aluminum plate and extrusions. The interlocking framework, constructed from beveled 6061T5, 6061T6 and 6063T5 extrusions, shall be electrically seam welded both internally and externally at each joint using 5356 aluminum alloy welding wire. The entire exterior body shall be completely sanded and deburred to assure a smooth finish prior to painting. All horizontal surfaces, rear steps, and the rear body surface shall be constructed from aluminum fire apparatus quality diamond plate.

Each body corner rail shall be a 5" X 5" aluminum 6063T5 alloy corner section with 1/8" (.125) wall thickness and shall be welded as an integral part of the body. The corner extrusions shall have a 1-1/2" (1.5) outside radius and a full length 1/8" (.125) internal extruded gusset. The non walk-in body shall utilize a 5" x 5" aluminum 6063T5 alloy corner extrusion as the apparatus top rail. The horizontal body side extrusions shall be 1.5" x 4" 6063T6 aluminum tube with 3/16" (.187) wall thickness and 3/16" (.187) outside corner radius. The frame crossmember extrusions shall be 3" x 3" 6061T6 aluminum with 3/8" (.375) wall thickness. These crossmembers shall extend the full width of the body to support the compartment framing, and shall be welded to a 1-3/16" (1.187) x 3" solid aluminum, 6061T5 frame sill extrusion that shall be shaped to contour with the chassis frame rails. The wheel well frame, constructed from 1.5" x 4" 6063T5 aluminum extrusions shall be slotted the full length to permit an internal fit of 1/8" (.125) aluminum diamond plate. The front exterior of the body shall be constructed of 3/16" (.187) and the roof of the body shall be constructed of 1/8" (.125) fire apparatus quality diamond plate. All of the smooth aluminum plate and fire apparatus quality diamond plate shall be 3003 H-14 aluminum alloy.

The rear tailboard step, formed from 3/16" (.187) treadplate and reinforced with a 1.5" x 3" aluminum extrusion and .5" x 3" aluminum flatbar, shall be bolted on to the body from the underside, thereby assuring a clean surface.

Body handrails shall consist of two (2) 36" length of 1.25" O.D. anodized aluminum installed between chrome end stanchions on each side of B1 opening. The handrail extrusion shall be ribbed to assure a good grip for personnel safety.

All body compartment shall be constructed from 1/8" (.125) formed aluminum 3003 H-14 alloy plate. All compartment floors shall be constructed of 1/8" (.125) aluminum fire apparatus quality diamond plate welded in place. Compartment floors shall be supported by a minimum 3/16" (.187) walled aluminum extrusions. The compartment seams shall be sealed by using a permanent pliable silicone caulking. The compartments shall be machine louvered for adequate ventilation.

The three (3), four (4) or five (5) compartments on each side of the body, along with the rear compartment, shall be provided with Robinson brand roll-up doors. The door slats shall be a double wall box frame design, and shall be manufactured from unpainted, anodized aluminum.

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Each door slat shall have interlocking joints with a pvc/vinyl inner seal to prevent any metal to metal contact and to inhibit moisture and dust penetration.

The door track shall be anodized aluminum with a finishing flange around the perimeter of the door. The track shall have a replaceable side seal to prevent water and dust from entering the compartment. The doors shall be counterbalanced for ease of operation.

A full width latch bar shall be provided along with a positive latch device. A magnetic type switch, integral to the door, shall be supplied for door ajar indication and compartment light activation.

The body shall have a body side protection rubrail along the length of the body on each side and at the rear. The rubrail shall be constructed of minimum 3/16" (.187) thick anodized aluminum 6463T6 extrusion. The rubrail shall be constructed of minimum .1875" thick 6463T6 aluminum extrusion. The rubrail shall be a minimum of 2.75" high X 1.25" deep and shall extend beyond the body width to protect the compartment doors and the body side. The design of the rubrail shall protect any specified marker lights that are mounted inside its C-channel. The top surface of the rubrail shall have 5 serrations raised a minimum of 0.1" high with cross grooves designed to provide a slip resistant edge for the rear step and running boards. The rubrail shall be spaced away from the body using .1875" nylon spacers. The ends of each section shall be provided with a rounded corner piece. The area inside the rubrail C-channel shall be inset with a black reflective material for increased visibility.

A plastic wheel well liner shall be provided for each wheel well. Liner shall be constructed of ABS plastic. The wheel well liner is bolted in. SAE chain clearance shall be provided.

The upper rear compartment doors shall be constructed of 1/8" (.125) fire apparatus quality treadplate with the inner door pans being constructed of smooth aluminum plate. The latches and hinges shall be of the same make and model as the side compartments. The door springs shall be gas shock style for ease of operation.

The apparatus body structure shall be securely fastened to the chassis with 5/8" (.625) O.D. steel U-bolts. Chassis frame rails shall be lined with 5/16" (.312) x 2" fiber reinforced rubber strips to protect the body frame sills from contact with the rails.

A permanent plate mounted in the driver's compartment shall be supplied. It shall specify the quantity and type of the following fluids used in the vehicle: engine oil, engine coolant, chassis transmission fluid, and drive axle lubrication.

There shall be four (4) compartments per side, and will be labeled L1, L2, L3, L4 on the driver's side, and R1, R2, R3, R4 on the officer's side.

All step surfaces will be non slip, either with Gator Grip stepping surface or embossed diamond plate.

Side Body Compartments

ADDENDUM #1 KINGSTON FIRE DISTRICT SPECIFICATIONS FOR NON WALK-IN HEAVY RESCUE

L1/R1: There shall be one (1) compartment, each side of the body, at the forward most portion of the body. This compartment shall be a transverse compartment from the left side to the right side. The lower section shall be approximately 20" high x 26" deep on each side. The compartment door opening shall be approximately 36" wide x 70" high. These compartments shall contain a total of 119 cubic feet of storage space. The door hinges shall be reversed on these compartments.

L2/R2: There shall be one (1) compartment, each side of the body, directly ahead of the rear wheels. This compartment shall be a transverse compartment from the left side to the right side. The lower section shall be approximately 20" high x 26" deep on each side. The compartment door opening shall be approximately 48" wide x 70" high. These compartments shall contain a total of 159 cubic feet of storage space. The transverse floors in these compartments shall be extended to the door opening. The floors are made from 1/8" 3003 H230 Diamond Plate. Floors are welded in place.

The compartment floors in L1/R1 and L2/R2 shall be raised approximately 11" to allow clear ladder storage from the rear staircase compartment.

L3/R3: There shall be one (1) compartment, each side of the body, over the rear wheels. This compartment shall be a transverse compartment from the left side to the right side. The compartment door opening shall be approximately 60" wide x 39" high x 26" deep. These compartments shall contain a total of 35 cubic feet of storage space.

L4/R4: There shall be one (1) compartment, each side of the body, directly behind the rear wheels. The compartment shall be approximately 48" wide x 70" high x 26" deep. The compartments shall each contain 50 cubic feet of storage. The door opening shall be 48" wide x 70" high.

Stainless Steel Trim

A stainless steel trim plate shall be located at the bottom edge of each side body compartment opening. The trim shall provide added protection of painted surface of the body when equipment is removed from the compartment.

Roof Compartments

The roof compartments are made from 1/8" 3003 H230 Diamond Plate. Hinged Diamond plate lid with turn latches cover each compartment.

Each roof compartment will have an LED strip light, and the lights will be mounted along the interior edge of the compartment lid. Each lid shall be wired to the door ajar indicator in the cab.

The roof compartments will be 69" long x 24" wide x 20" deep. There will be an area approx 60" long x 88" wide at the front of the perimeter roof where the light tower will be located..

**ADDENDUM #1 KINGSTON FIRE DISTRICT
SPECIFICATIONS FOR NON WALK-IN HEAVY RESCUE**

Rear Body Staircase Compartments

The rear of the apparatus shall be equipped with three (3) compartments over the frame rails and (1) compartment between the frame rails. These compartments shall be “stepped forward” to form three (3) 32” wide x 10” deep steps for access to the top of the apparatus body.

The bottom step shall be between the frame rails and the next step over the end of the chassis frame rails. The upper steps shall be divided equally to the upper body walkway. Railings shall be installed from the rear step to top of body, on each side of the step and compartment assembly for access to top of body. The step areas shall be lighted with recessed lights. The step surfaces, railings, and lighting shall be compliant to NFPA standards.

B1: The uppermost compartment shall be approximately 16” high x 32” wide x 82” deep and shall accommodate (4) Paratech struts.

B2: The center compartment shall be approximately 16” high x 32” wide x 92” deep and shall accommodate a stokes basket.

B3: The lower compartment over the frame rails shall be approximately 16” high x 32” wide x 200” deep and shall accommodate a 24’ 2-section extension ladder, 14’ roof ladder, 10’ folding ladder, and (3) hooks.

B4: The lowest compartment between the frame rails shall have approximate dimensions of 16” high x 24” wide x 26” deep.

Each staircase compartment shall be equipped with an aluminum plate hinged drop down door.

Tailboard

10" tailboard made out of 1/8" diamond plate, supported by T6 extrusions. Tailboard is gator grip and runs full width of the body. The tailboard is bolted to the body.

Rear Body Platework

The rear body platework shall be 3/16” aluminum smooth plate painted job color.

Front Body

The head board platework shall be painted 3/16” aluminum smooth plate.

Single Compartment Vertically Hinged Doors

A single compartment door shall be constructed using a box pan configuration. The outer door pan shall beveled and shall be constructed from 3/16” (0.188”) aluminum plate. The inner door pan shall be constructed from 1/8” (0.125”) smooth aluminum plate and shall have nutsert

ADDENDUM #1 KINGSTON FIRE DISTRICT SPECIFICATIONS FOR NON WALK-IN HEAVY RESCUE

fittings to attach hold-open hardware. The inner pan shall have a 95-degree bend to form an integral drip rail.

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

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

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

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

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

The door(s) shall be installed in the following location(s): L1, R1.

Double Compartment Doors

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

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

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

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

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

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with a dielectric barrier. The doors shall be attached with machine screws threaded into the doorframe. The doors shall have a gas shock-style hold-open device.

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

The door(s) shall be installed in the following location(s): L2, L4, R2, R4.

Single Compartment Lift-Up Door

A single compartment door shall be constructed using a box pan configuration. The outer door pan shall beveled and shall be constructed from 3/16" (0.188") aluminum plate. The inner door pan shall be constructed from 1/8" (0.125") smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pan shall have a 95-degree bend to form an integral drip rail.

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

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

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

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

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

The door(s) shall be installed in the following location(s): L3, R3.

Unistrut Tracking

Unistrut will be installed in all compartments unless inapplicable.

All transverse compartments will have up to 6 pieces of Unistrut locations on front and rear wall. All rescue style compartments, (single depth) will have up to a total of 4 pieces in each, and B1 will have up to 6 pieces, 3 each side. All storage items, trays and / or shelves in compartments will be attached to the Unistrut.

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Roll-Out Trays

There shall be a floor mounted roll-out tray and adjustable roll-out tray provided in compartment L1.

The roll-out tray shall be constructed of 3/16" (.187") smooth aluminum plate with a sanded finish and welded corners for increased strength and rigidity. The tray shall be sized in width and depth as applicable.

For greater tray accessibility, the drawer slides shall feature one hundred percent extension. The tray shall utilize a pneumatic shock to secure the tray in the open or closed position.

Each tray shall have a total capacity of 500 lbs.

Pac Trac

Aluminum Pac Trac shall be installed on the rear wall of L3, L4, R3, R4.

Folding Steps

Dual lighted LED folding step(s) shall be located (1) one each side of staircase for access to staircase. The folding step(s) shall meet current NFPA in step height and surface area.

Dual lighted LED folding step with LED lights integral to the step on the top to provide NFPA requirements of 2 FC on the stepping surface. Folding step shall also have a LED light integral to the bottom of the step to meet NFPA requirements of a stepping surface up to 18" below the step. The folding step shall sustain a minimum static load of 500LB. The folding step shall also meet NFPA slip resistance qualifications.

One (1) handrail shall be installed in compliance with current NFPA. The handrail shall be constructed of 6063T5 1.25" OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, mounted between chrome stanchions.

Rear Mud Flaps

The rear tires shall have a set of black mud flaps mounted behind the rear chassis wheels.

Floor Matting

This unit shall have all applicable compartment floors, shelves, and trays covered with a heavy duty Turtle Tile brand Black floor matting.

Speedy Dry Hopper

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An aluminum speedy dry hopper with a capacity for two hundred (200) pounds shall be provided and located roof top compartment above R4. The hopper shall have a discharge chute with a shut-off valve that extends down into the interior compartment directly below the roof compartment, with an extension hose for ground level dispensing.

Hydraulic Hose Reels

Three (3) Hannay model EF2016-17-18 hydraulic hose reels with stainless steel discs, all polished construction with roller assembly shall be provided. The reel shall be for use with Hurst brand low pressure tools. The reel shall include 100` of 1/4" ID twin Blue, Green, Orange hose. The reel shall be wired directly to a 12 volt battery system with a wall-mounted push-button rewind switch.

The reel shall be located L1 ceiling mounted offset forward, R1 ceiling mounted offset forward, R1 ceiling mounted offset rearward.

12` lead/supply line shall be provided for the hydraulic reel to be plumbed to the hydraulic power unit. The supply line shall be rated for 5,000 PSI hydraulic reels.

Low Pressure Air Reel

A low pressure air reel with 100` of 1/2" air hose and quick-disconnect couplings shall be supplied. The reel shall be plumbed to a department supplied compressor located in the upper storage area. The reel will have a panel with a control valve, relief valve, regulator, and a pressure gauge located near each reel. The reel shall located in the specified compartment and shall be wired directly to the truck 12 volt battery system, with remote mounted finger push button rewind switch. Rollers will be provided.

SCBA/Wheel Chock Storage

The body wheel well area shall store up to five (5) SCBA bottles- four (4) on the officer side and one (1) on the driver side. The bottles shall be secured in each storage area by a vertically hinged door which shall be secured in the closed position by a push button latch. The doors shall match the wheel well area material and finish.

One (1) wheel chock storage compartments shall be provided. The compartment shall be located one forward in the driver side body wheel well area. Each compartment shall be capable of holding two (2) Ziamatic model SAC-44-E wheel chock.

The wheel chock shall be secured in each storage area by a vertically hinged door which shall be secured in the closed position by a push button latch. The doors shall match the wheel well area material and finish.

Multiplex Electrical System

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The following specifications describe the low voltage electrical system on the specified fire apparatus. The electrical system shall include all panels, electrical components, switches and relays, wiring harnesses and other electrical components. The electrical equipment installed by the apparatus manufacturer shall conform to current automotive electrical system standards, the latest Federal DOT standards, and the requirements of the applicable NFPA 1901 standards.

The apparatus shall have a multiplexing system to provide diagnostic capability. The system shall have the capability of delivering multiple signals via a CAN bus, utilizing specifications set forth by SAE J1939. The electrical system shall be pre-wired for computer modem accessibility to allow service personnel to easily plug in a modem to allow remote diagnostics, troubleshooting, or program additions.

For superior system integrity, the networked system shall meet the following minimum requirement components:

- Power management center
- Load shedding power management
- Solid-state circuitry
- Switch input capability
- Responsible for lighting device activation
- Self-contained diagnostic indicators
- Power distribution module

All wiring shall be stranded copper or copper alloy conductors of a gauge rated to carry 125 percent of the maximum current for which the circuit is protected. Voltage drops in all wiring from the power source to the using device shall not exceed 10 percent. The wiring and wiring harness and insulation shall be in conformance to applicable SAE and NFPA standards. The wiring harness shall conform to SAE J-1128 with GXL temperature properties. All exposed wiring shall be run in a loom with a minimum 289 degree Fahrenheit rating. All wiring looms shall be properly supported and attached to body members. The electrical conductors shall be constructed in accordance with applicable SAE standards, except when good engineering practice requires special construction.

The wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection and shall be installed in accordance with the device manufacturer's instructions. Electrical connections shall be with mechanical type fasteners and large rubber grommets where wiring passes through metal panels.

The wiring between the cab and body shall be split using Deutsch type connectors or enclosed in a terminal junction panel area. This system will permit body removal with minimal impact on the apparatus electrical system. All connections shall be crimp-type with heat shrink tubing with insulated shanks to resist moisture and foreign debris such as grease and road grime. Weather-resistant connectors shall be provided throughout to ensure the integrity of the electrical system.

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Any electrical junction or terminal boxes shall be weather-resistant and located away from water spray conditions. In addition, the main body junction panel shall house the automatic reset breakers and relays where required.

There shall be no exposed electrical cabling, harnesses, or terminal connections located in compartments, unless they are enclosed in an electrical junction box or covered with a removable electrical panel. The wiring shall be secured in place and protected against heat, liquid contaminants and damage. Wiring shall be uniquely identified at least every two feet (2') by color coding or permanent marking with a circuit function code and identified on a reference chart or electrical wiring schematic per requirements of applicable NFPA 1901 standards.

The electrical circuits shall be provided with low voltage overcurrent protective devices. Such devices shall be accessible and located in required terminal connection locations or weather-resistant enclosures. The overcurrent protection shall be suitable for electrical equipment and shall be automatic reset type and meet SAE standards. All electrical equipment, switches, relays, terminals, and connectors shall have a direct current rating of 125 percent of maximum current for which the circuit is protected. The system shall have electro-magnetic interference suppression provided as required in applicable SAE standards.

The electrical system shall include the following:

- a) Electrical terminals in weather exposed areas shall have a non-conductive grease or spray applied. A corrosion preventative compound shall be applicable to all terminal plugs located outside of the cab or body.
- b) The electrical wiring shall be harnessed or be placed in a protective loom.
- c) Heat shrink material and sealed connectors shall be used to protect exposed connections.
- d) Holes made in the roof shall be caulked with silicone. Large fender washers shall be used when fastening equipment to the underside of the cab roof.
- e) Any electrical component that is installed in an exposed area shall be mounted in a manner that will not allow moisture to accumulate in it.
- f) A coil of wire must be provided behind an electrical appliance to allow them to be pulled away from mounting area for inspection and service work.
- g) All lights that have their sockets in a weather exposed area shall have corrosion preventative compound added to the socket terminal area.

The warning lights shall be switched in the chassis cab with labeled switching in an accessible location. Individual rocker switches shall be provided only for warning lights provided over the minimum level of warning lights in either the stationary or moving modes. All electrical equipment switches shall be mounted on a switch panel mounted in the cab convenient to the

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operator. For easy nighttime operation, an integral indicator light shall be provided to indicate when the circuit is energized. All switches shall be appropriately identified as to their function.

A single warning light switch shall activate all required warning lights. This switch will allow the vehicle to respond to an emergency and "call for the right of way". When the parking brake is activated, a "blocking right of way" system shall be automatically activated per requirements of NFPA #1901. All "clear" warning lights shall be automatically shed on actuation of parking brake.

NFPA Required Testing of Electrical System

The apparatus shall be electrical tested upon completion of the vehicle and prior to delivery. The electrical testing, certifications, and test results shall be submitted with delivery documentation per requirements of NFPA #1901. The following minimum testing shall be completed by the apparatus manufacturer:

1. Reserve capacity test:

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged. The engine shall be shut off and the minimum continuous electrical load shall be activated for ten (10) minutes. All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a test fail.

2. Alternator performance test at idle:

The minimum continuous electrical load shall be activated with the engine running at idle speed. The engine temperature shall be stabilized at normal operating temperature. The battery system shall be tested to detect the presence of battery discharge current. The detection of battery discharge current shall be considered a test failure.

3. Alternator performance test at full load:

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of two (2) hours. Activation of the load management system shall be permitted during this test. However, an alarm sounded by excessive battery discharge, as detected by the system required in NFPA #1901 Standard, or a system voltage of less than 11.7 volts dc for a 12 volt nominal system, for more than 120 seconds, shall be considered a test failure.

4. Low voltage alarm test:

Following the completion of the above tests, the engine shall be shut off. The total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates. The battery voltage shall be measured at the battery terminals. With

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the load still applied, a reading of less than 11.7 volts dc for a 12 volt nominal system shall be considered a test failure. The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure.

NFPA Required Documentation

The following documentation shall be provided on delivery of the apparatus:

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

Vehicle Data Recorder

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

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

Occupant Detection System

There shall be a visual and audible warning system installed in the cab that indicates the occupant buckle status of all cab seating positions that are designed to be occupied during vehicle movement.

The audible warning shall activate when the vehicle's park brake is released and a seat position is not in a valid state. A valid state is defined as a seat that is unoccupied and the seat belt is unbuckled, or one that has the seat belt buckled after the seat has been occupied.

The visual warning shall consist of a graphical display that will continuously indicate the validity of each seat position.

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

The display panel shall be located officer's overhead.

Forward Light Bar

A Whelen Freedom series model FN72QLED 72" all LED light bar shall be installed. The light bar shall have clear lenses and contain two (2) front corner mounted red LED modules and ten (10) front LED modules, six (6) red and four (4) white, and two (2) end mounted red LED modules. The light bar shall be equipped with MK8 mounts.

The white LEDs shall be switched off in blocking right of way mode. The light bar shall be installed centered on the front cab roof.

Side Light Bars

A pair of Whelen 24" Mini-Freedom LED light bars (Model FT8RRRRF) with MK8H high mounts shall be provided. The light bars shall have of clear domes with red LEDs.

The clear LEDs (if applicable) shall be switched off in blocking right of way mode. The lightbars shall be installed each side over front cab doors.

Lower Level Warning Light Package

Ten (10) Whelen 600 series Super LED light heads with red lenses shall be provided.

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

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

The side facing lights shall be located at forward most position, in rear wheelwell offset to front, and on tailboard mounted light box above rear tailboard..

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

Upper Side Body Warning Lights

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Whelen 900 Series Super LED model 90RRF5RR light heads with red lens shall be provided two (2) each side at the upper most forward, rearward point (as practical) on the side body.

Upper Rear Body Warning Lights

Two (2) Whelen 900 Series Super LED model 90RRF5RR light heads with red lenses shall be provided one (1) each side on the upper rear panel of the body.

All upper 900 Series Super LED lights shall include chrome flanges where applicable. All warning devices shall be mounted in compliance with NFPA standards.

Hazard (Door Ajar) Light

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

The light shall be located center overhead.

Directional Traffic Warning Light

One (1) Whelen model TA-4437L LED Traffic Advisor with two (2) 22.75" (split) light bars and amber lenses shall be provided. The units shall be controlled by a TACTLD1 control mounted in the chassis cab.

The lights shall be installed one each side on the rear panel of the body to direct traffic around the vehicle. The directional light bar control head shall be located in the driver's overhead.

Electronic Siren

A Powercall model DX5200 siren shall be installed in the cab. The siren shall feature an illuminated control panel with rotary switch for mode selection, three (3) push button switches for air horn, phaser and intersection modes, and a noise cancelling PA microphone. The electronic siren control shall be located in the center overhead console offset to officer side.

Operating modes include Manual, Radio, Stand By, Wail, Yelp, Intersection Tone, Powercall, Powercall Plus and shall include a Tap feature.

Speaker

One (1) Federal model BP-200EF 200 watt speaker shall be recessed behind the front bumper. The speaker shall meet NFPA requirements for sound output producing a minimum 120 dB of sound at 10 feet. A polished stainless steel E-ONE grille shall be installed on the outside of the bumper to prevent road debris from entering the speaker.

The speaker shall be located officer side front bumper inboard of frame.

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Mechanical Siren

A chrome plated and pedestal mounted Federal Q2B-P coaster siren shall be installed on top of the front bumper extension. An electric siren brake switch shall be located on the main cab switch panel.

The siren shall be located driver side front bumper.

A heavy duty metal floor mounted foot switch shall be installed to operate the Q2B siren from the driver and officer's side.

License Plate Light

One (1) Truck-Lite model 15905 white LED license plate light mounted in a Truck-Lite model 15732 chrome plated plastic license plate housing shall be mounted at the rear of the body.

LED Marker Lights

LED clearance/marker lights shall be installed as specified.

Upper Cab:

- Five (5) amber LED clearance lights on the cab roof.

Lower Cab:

- One (1) amber LED side turn/marker each side of cab ahead of the front door hinge.

Upper Body:

- One (1) red Trucklite LED clearance light each side, rear of body to the side.
- One (1) red Trucklite LED clearance light each side, rear of body to the rear.
- One (1) amber Trucklite LED clearance light each side, front of body to the side.
- One (1) amber Trucklite LED clearance light each side, front of body to the front (if applicable).

Lower Body:

- Three (3) red Trucklite LED clearance lights centered at rear, recessed in the rubrail.
- One (1) red Trucklite LED clearance light each side at the trailing edge of the apparatus body, recessed in the rubrail.
- One (1) amber Trucklite LED clearance light each side front of body, recessed in the rubrail.
- One (1) amber Trucklite LED clearance/auxiliary turn light each side front of body, recessed in the rubrail.

Tail Lights

Three (3) Whelen model 600 series LED (Light Emitting Diode) lights shall be installed in a Cast 4 housing in a vertical position each side at the rear and wired with weatherproof connectors.

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Light functions shall be as follows:

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

A one-piece polished aluminum trim casting shall be mounted around the three (3) individual lights in a vertical position. The lower space will be used by the 6" x 4" lower NFPA warning light.

Marker Lights

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

An additional pair of amber LED "bubble" type marker lights shall be installed one (1) each side in the lower forward area of the rear wheel well.

Medical Cabinet Lighting

One (1) ROM V3 LED compartment light strip shall be mounted in each medical cabinet(s).

The light bar shall include super bright white LEDs mounted to circuit boards that have acrylic conformal coating for corrosion protection. The LED circuit boards shall be mounted to an extruded aluminum base with lexan lens.

The light shall be controlled by a compartment door switch.

Compartment Light Package

Two (2) R.O.M. V3 compartment light strips shall be mounted in each body compartment greater than 4 cu ft. Transverse compartments shall have four (4) lights, located two (2) each side.

Each light bar shall include sixteen (16) super bright white LEDs per foot mounted to circuit boards that have acrylic conformal coating for corrosion protection. The LED circuit boards shall be mounted to an extruded aluminum base with lexan lens. The lights shall be waterproof up to 1 meter (3.3 feet).

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

The wiring connection for the compartment lights shall be made with a weather-resistant plug in style connector. A single water- and corrosion-resistant switch with a polycarbonate actuator and

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sealed contacts shall control each compartment light. The switch shall allow the light to illuminate if the compartment door is open.

Step Lights

The apparatus shall be equipped with a sufficient quantity of lights to properly illuminate the steps around the apparatus in accordance with current NFPA requirements. The lights shall be 4" circular LED (Light Emitting Diode) with clear lenses (2" if space is limited) mounted in a resilient shock absorbent mount for improved bulb life. The wiring connections shall be made with a weather resistant plug in style connector.

The step lights shall be switched from the cab dash with the work light switch.

Ground Lights

The apparatus shall be equipped with a sufficient quantity of lights to properly illuminate the ground areas around the apparatus in accordance with current NFPA requirements. The lights shall be 4" circular LED (Light Emitting Diode) with clear lenses mounted in a resilient shock absorbent mount for improved bulb life. The wiring connections shall be made with a weather resistant plug in style connector.

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

One (1) ground light shall be supplied under each side of the front bumper extension if equipped.

Lights in areas under the driver and crew area exits shall be activated automatically when the exit doors are opened.

Additional Step Lights

Additional recessed 4" LED lights with clear lens shall be provided to illuminate the catwalk and rear staircase.

Deck/Scene Light Wired to Back-Up Lights

The rear deck or scene lights shall be activated when the chassis is placed in reverse to provide additional lighting, in addition to the back-up lights, when backing the vehicle.

Cab Scene Lights

Two (2) Whelen model 60C0ELZR 600 series Super LED clear scene lights shall be provided.

Each shall have 12 Super LED diodes with internal light deflecting optics. The internal light deflecting optics shall redirect the light from 8 - 32 degrees.

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Lights shall be located (1) each side of cab behind front doors as high as possible. The lights shall be switched separately in the cab.

Rear Body Scene Lights

Two (2) Whelen 900 Series model 90C0ENZR Super LED Opti-Scenelights shall be provided.

Each light head shall contain twenty-four (24) diodes producing 3,000 lumens. The lights heads shall be equipped with lenses that have gradient optics to enhance light output.

Lights shall be located (1) on each side up high rear of body and switch in cab (side facing lights switched separately).

Engine Compartment Light

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

Backing Lights

A pair of Zico #ZQL-SS-H7614 sealed beam backing lights shall be provided. The lights shall have a polished stainless steel housing. Each light shall provide additional lighting for backing the vehicle and shall operate when the vehicle is placed in reverse.

The lights shall be located rear wheelwell offset to rear.

Additional Back-Up Lighting

Innovative Lighting backing light (PR) with polished housing model #580-0200-1. Location: (1) each side of cab over wheel offset forward.

Additional programming shall be provided for these lights to be wired through the turn signals.

Cab Tilt Switch

The cab tilt shall be controlled by a Ramsey weatherproof momentary action push-button switches connected to a cord. The cord shall control tilting and lowering functions of the cab and have an extended length of 36”.

The plug-in for the control shall be located next to manual cab tilt pump.

Alternating Headlights

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

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Back-Up Camera

A Safety Vision back-up camera model SV-625B-Kit, color monitor model SV-CLCD70B, and the control box model SV-CBB56-70 shall be installed. The monitor shall be installed on the front console area visible at night and in bright sunlight to the driver. The camera shall be mounted up high at the rear of the vehicle to provide a wide angle rear view. The system shall include a cable with metallic waterproof threaded o-ring seal connectors to ensure positive connection between video cable and camera to prevent unplugging due to vibration resulting in video loss to vehicle operator.

A diamond plate protective shield shall be provided for the top and sides of the rear back-up camera. The shield shall be designed not to impede in the operational envelope of the camera.

Back-Up Alarm

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

Electrical Location

Locate electrical components on the rear facing side wall of the L2 compartment.

Electrical components on a multiplex system will include:

1. All PDM's
2. Relay Panel
3. Strobe Packs
4. Flashers

Electrical components on a non-multiplex system will include:

1. Relay Panel
2. Strobe Packs
3. Flashers

12 Volt DC Power Distribution Module

There shall be a 12 place 12 volt DC power distribution module installed behind the officer's seat.

The module will have six (6) circuits wired directly to the battery and have six (6) circuits wired through the master battery switch with 12 positions for grounds. Connection to the power module circuit will be through a .250 female spade connector. Each buss will be protected with a 50 amp circuit breaker for overload protection. The module will accept ATC blade type fuses or 22X series circuit breakers.

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25KW Direct Drive Generator

The apparatus shall be equipped with an ONAN YD two (2) bearing direct drive power take off driven generator. The generator shall be mounted on a heavily reinforced steel frame in the chassis frame rail area providing adequate road clearance, and service accessibility. The generator shall be protected from direct road spray with underside 1/8" aluminum bolt-on protection guard.

Rating and Capacity

Rating: 25,000 watt continuous duty rating: 100% of nameplate rating

Volts: 120/240 (with voltage control of +3%)

Amps: 208/104

RPM: 1800

Cycles: 60 (with frequency control of + 1%)

Phase: Single

Data Plate: shall be installed on the generator instrument panel with the above electrical generator information, including engine speed and all information noted above on generator performance.

Driveline

The generator shall be driven from a 10 bolt power-take-off from the automatic transmission. A "PTO control" shall be located at driver's position. Generator shall be equipped with a means to prevent the unintended movement of the control device from its set position. An interlock shall prevent PTO engagement unless the parking brake is engaged. An interlock shall be installed to prevent engine speed control from any other source while the generator is operating. A nameplate indicating the chassis transmission shift selector position to be used for generator operation shall be provided in the driving compartment and located so that it can easily be read from the driver's position.

Generator Controls

A green indicator light shall be located in the driving compartment. The light shall be energized when the PTO drive has been engaged and shall be marked "GENERATOR PTO ENGAGED." A second green light shall be energized when generation is engaged, transmission is in neutral, and parking brake is set and marked "OK TO OPERATE GENERATOR". A green indicator light shall be located on the operator's panel. The green light shall be energized when both the PTO drive has been engaged, chassis transmission is in neutral, and parking brake engaged. The green light shall be marked "GENERATOR PTO ENGAGED."

Gauge Panel

A generator gauge panel shall be provided that displays the following information:

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- A) Amp meter for each leg
- B) Volt meter
- C) Frequency meter
- D) Generator hour meter

3rd Party Generator Testing

The generator shall be tested at the manufacturer`s facility by an independent, third-party testing service. The conditions and testing of the generator shall be as outlined in current NFPA 1901.

The test shall include operating the generator for two hours at 100% of the rated load. Power source voltage, amps, frequency shall be monitored. The prime mover`s oil pressure, water temperature, transmission temperature (if applicable) and power source hydraulic fluid temperature (if applicable) shall be monitored during testing.

The results of the test shall be recorded and provided with delivery documentation.

Breaker Panel

A twenty (20) place breaker box with up to twenty (20) appropriately sized ground-fault interrupter circuit breakers shall be supplied. The breaker box will include a master breaker sized according to the generator output. The breaker box will be located in the specified compartment, not to exceed 12` run of wire.

The panel shall be located in the L2 compartment on the rear facing side wall in the upper area.

Pioneer Lights

A Whelen Pioneer model PFP2 LED scene light with PBA203 recess mount shall be provided. Includes switch in driver side overhead console. Location: Forward upper body panel officer side (inboard of warning lights if equipped), Forward upper body panel driver side (inboard of warning lights if equipped), Rearward upper body panel officer side (inboard of warning lights if equipped), Rearward upper body panel driver side (inboard of warning lights if equipped).

Command Light Tower

A Command Light model CL615HM light tower shall be provided. The light tower shall be a two-stage articulating device with a lighting bank on top of a second stage capable of 360 degrees continuous rotation. The light shall be elevated by electric linear actuators, one (1) actuator shall elevate the light bank, and one (1) actuator shall adjust the light bank angle from 0 to 110 degrees. The overall extended height from the base to the top pair of lights shall be 120`.

The light bank shall have four (4) weatherproof 1,500 watt output, quartz halogen lights and two (2) weatherproof 1,000 watt output, Halide Metal lights. Light heads shall be mounted in three (3) pairs, giving two (2) vertical lines of three (3) when the lights are in the upright position. Halide Metal lights will be located in between the two(2) Quartz light heads each side. Power for

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light bank shall be transmitted through power collecting rings thus allowing 360+ degrees rotation in either direction, NO EXCEPTIONS.

Light tower shall be controlled with a hand-held umbilical line remote control. The storage station for the remote control unit shall be equipped with a button to activate the "Auto-Park" automatic nesting feature. The controls on the remote box shall be:

1. Three (3) switches, one (1) for each light bank.
2. One (1) light bank rotation switch.
3. One (1) switch for elevating lower stage.
4. One (1) switch for elevating upper stage.
5. One (1) indicator light to indicate when light bank is out of roof nest position.
6. One (1) indicator light to indicate when light bank is rotated to proper nest position.
7. One (1) on/off switch for the top mounted strobe.

The controls shall be located next to the break box.

The tower base shall have a light that illuminates the envelope of motion during any movements of the light tower mast.

A green strobe light shall be supplied with the light tower mounted at the highest position. A switch shall be provided on hand held control head for strobe light.

The Command Light assembly shall be all aluminum construction, with stainless steel shafts and bronze bushings for long life and low maintenance.

The overall size of nested light tower shall be approximately 40" wide x 73-1/4" long x 13" high and weigh approximately 310 lbs.

The light tower shall be located on forward roof of body.

Receptacles

A 15 amp/110 volt NEMA L5-15 twist lock receptacle with a weatherproof cover plate shall be installed in the upper storage area offset to the officer's side for a department supplied air compressor.

Interior Cab Receptacles

A 15 amp/110-volt 3-prong straight blade (NEMA #5-15) duplex receptacle with weatherproof cover plate shall be installed in cab on 3 x 3 post rear facing just above engine cover on officer's side, and in lower area of the EMS cabinet, and upper center rear wall of EMS cabinet.

Electric Cord Reels

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Two (2) Hannay electric rewind cord reel(s) (ECR 1616-17-18) shall be installed and located L2 offset forward, R2 offset forward.

The reel(s) shall include 200` of yellow 10 gauge 3 conductor type SOWA cord. The cord shall be rated at 30 amps @ 110 volts. The end of the cord shall be terminated for the installation of a department required connector.

Stainless steel cord reel rollers shall be installed and located on the reel. The rollers shall facilitate smooth removal of the electric cord.

A heavy duty rubber covered electric reel rewind button shall be installed on wall near each cord reel.

DOT Required Drive Away Kit

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

Cab Paint

The apparatus cab shall be painted Akzo-Nobel FLNA3225 Red. The paint process shall meet or exceed current State regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The aluminum cab exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body. Any vertically or horizontally hinged smooth-plate compartment doors shall be painted separately to assure proper paint coverage on body, door jambs and door edges.

Paint process shall feature Akzo-Nobel's high solid LV products and be performed in the following steps:

- Corrosion Prevention - all raw material shall be pre-treated with the Weather Jacket Corrosion Prevention system to provide superior corrosion resistance and excellent adhesion of the top coat.
- Akzo-Nobel Sealer/Primer LV - acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- Akzo-Nobel High Solid LV (Top coat) - a lead-free, chromate-free high solid acrylic urethane top coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- Akzo-Nobel High Solid LV (Clear coat) - high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

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Any location where aluminum is penetrated after painting, for the purpose of mounting steps, hand rails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment. The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, hand rails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter.

Two-Tone Cab Paint

The two-tone cab shall be Akzo-Nobel lead-free, chromate-free high solid LV acrylic urethane paint color FLNA4145 Black applied to the upper section of the cab.

Body Paint

The apparatus body shall be painted Akzo-Nobel FLNA3225 red with the upper body area to be painted two-tone FLNA4145 black. The paint process shall meet or exceed current State regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The aluminum body exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body. Any vertically- or horizontally-hinged smooth-plate compartment door shall be painted separately to assure proper paint coverage on body, door jambs and door edges.

Paint process shall feature Akzo-Nobel's high solid LV products and be performed in the following steps:

- Corrosion Prevention - all raw material shall be pre-treated with the Weather Jacket Corrosion Prevention system to provide superior corrosion resistance and excellent adhesion of the top coat.
- Akzo-Nobel Sealer/Primer LV - acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- Akzo-Nobel High Solid LV (Top coat) - a lead-free, chromate-free high solid acrylic urethane top coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- Akzo-Nobel High Solid LV (Clear coat) - high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

Any location where aluminum is penetrated, after painting, for the purpose of mounting steps, handrails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment. The pre-treatment shall be applied to the aluminum

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sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, handrails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter.

Paint Wheels

The interior and exterior chassis wheels shall be painted red. The paint shall be of the highest quality finish for low maintenance, long life, and attractive appearance. The finish shall consist of a corrosion-resistant primer, urethane high build primer, and high performance durable color coat.

The paint process shall meet or exceed current State regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water and soil. Manufacturer shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

Paint process shall feature Akzo-Nobel's high solid LV products and be performed in the following steps:

- Corrosion Prevention - all raw material shall be pre-treated with the Weather Jacket Corrosion Prevention system to provide superior corrosion resistance and excellent adhesion of the top coat.
- Akzo-Nobel Sealer/Primer LV - acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- Akzo-Nobel High Solid LV (Top coat) - a lead-free, chromate-free high solid acrylic urethane top coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- Akzo-Nobel High Solid LV (Clear coat) - high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

Chassis Wheel Stripe

A silver painted trim stripe shall be applied to the outer wheel of each axle.

Lettering and Striping

A 6" NFPA compliant scotchlite cab/body stripe, up to (100) gold scotchlite letters, and rear chevron striping shall be applied per Fire Department design.

The reflective stripe in the body rubrail shall be black.

Additional Equipment

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The following additional equipment shall be supplied and installed on the apparatus.

- On Spots
- Two (2) poly storage racks for (10) SCBA cylinders each
- \$4,000 allowance to mount department supplied hydraulic tools
- Aluminum storage rack to hold (4) department supplied air bags and controller
- Aluminum rack to hold (3) department supplied backboards
- \$10,000 mounting allowance
- Install (3) department supplied radios and (4) antennas
- Install electric trailer brake controller in cab
- Plumb department supplied air compressor to low pressure air reel in L2
- Fabricate diamond plate box for department supplied air compressor
- Two (2) Akron junction boxes with 15 amp twistlock receptacles

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Standard Warranty

The apparatus manufacturer shall provide a full 1-year standard warranty. All components manufactured by the apparatus manufacturer shall be covered against defects in materials or workmanship for a 1-year period. All components covered by separate suppliers such as engines, transmissions, tires, and batteries shall maintain the warranty as provided by the component supplier. A copy of the warranty document shall be provided with the proposal.

Lifetime Frame Warranty

The apparatus manufacturer shall provide a full lifetime frame warranty. This warranty shall cover all apparatus manufacturer designed frame, frame members, and cross-members against defects in materials or workmanship for the lifetime of the covered apparatus. A copy of the warranty document shall be provided with the proposal. Frame warranties that do not cover cross-members for the life of the vehicle shall not be acceptable.

10 Year/100,000 Mile Structural Warranty

The apparatus manufacturer shall provide a comprehensive 10-year/100,000-mile structural warranty. This warranty shall cover all structural components of the cab and/or body manufactured by the apparatus manufacturer against defects in materials or workmanship for 10 years or 100,000 miles, whichever occurs first. Excluded from this warranty are all hardware, mechanical items, electrical items, or paint finishes. A copy of the warranty document shall be provided with the proposal.

10 Year Paint and Corrosion Warranty

The apparatus manufacturer shall provide a 10-year limited paint and corrosion perforation warranty. This warranty shall cover paint peeling, cracking, blistering, and corrosion provided the vehicle is used in a normal and reasonable manner.

The paint shall be prorated for 10 years as follows:

Topcoat & Appearance: Gloss, Color Retention, Cracking		Coating System, Adhesion & Corrosion: Includes Dissimilar metal corrosion, Flaking, Blistering, Bubbling	
0 to 72 months	100%	0 to 36 months	100%
73 to 120 months	50%	37 to 84 months	50%
		85 to 120 months	25%

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

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The warranty period shall begin upon delivery of the apparatus to the original user-purchaser. A copy of the warranty document shall be provided with the proposal.

UV paint fade shall be covered in a separate warranty supplied by Akzo Nobel (Sikkens) and shall be for a minimum of 10 years.