

Tennessee Fire Service and Codes Academy

Specification

1250 GPM Commercial Fire Department Pumper

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Section 01.1: General Information

It is the intent of these specifications to provide design and functional criteria for the purchase of one (1) Commercial Chassis Fire Department Pumper for use by the Tennessee Fire and Codes Academy (TFACA) for the purpose of training firefighters in the use and operation of a Fire Department Pumper Apparatus. The apparatus must be of new construction and designed and constructed with due consideration to the nature and distribution of the load to be sustained.

These specifications detail the requirements for general design criteria of the cab and chassis components, fire pump and related components, water tank, fire body, electrical components, painting and equipment.

The completed vehicle, as well as any and all specified equipment and capabilities, shall meet or exceed the design and operational requirements of the latest edition of the National Fire Protection Associations Standard 1901, Standard for Automotive Fire Apparatus whether specifically noted or not .

All items listed in the specifications are to be considered mandatory. The apparent silence of this specification as to any details or the omission from it of a detailed description concerning any point shall be regarded as meaning that only the best commercial practices are to prevail and that only materials of first quality and correct type, size and design are to be used. All workmanship is to be of the highest quality. The unit herein specified shall be constructed throughout of new parts and materials which shall have seen no service other than that necessary for the factory tests. The unit bid must be the latest model.

No prototype or experimental apparatus shall be bid. The builder must demonstrate that he has successfully produced and sold apparatus of the same design and of the same material in the past two years. Total exception to bid specifications will be cause for immediate rejection.

Section 01.2: Instructions to Bidders

Only one (1) bid will be submitted by each manufacturer that meets or exceeds the minimum requirements as specified herein. Prototypes, demo units, or other vehicles that do not meet these specifications shall not be bid.

The bid document should not have erasures, strike over's and/or changes to prices or other responses and should any be included, they must be initialed by the bidder. Failure to initial may be cause to reject the bid as irregular and disqualified from consideration.

Section 01.3: Exceptions

Any exception or variation in construction, performance, tests, or items of equipment between the purchaser's specifications and the bidder's proposal shall be detailed and submitted on sheets provided along with the bidder's proposal, in bid sequence, and citing page and paragraph number. The bidder must explain

in detail, and with full supporting data, how the proposed deviation meets or exceeds the specifications and why it is necessary. The purchaser reserves the right to determine which (if any) deviations are acceptable. Bids that contain “Clarifications” that are inconsistent with the specifications shall be considered exceptions to the bid and must be documented as previously described.

Section 01.4: Service and Parts

The manufacturer must have a 24 hour/ 7 day a week service center. The manufacturer must be capable of providing both in-house and on-site service for the specified fire apparatus. The bidder shall include the location and capabilities of their service department in their bid proposal. Each bidder must be able to display that they are currently maintaining an established service center and parts depot capable of satisfying the warranty service requirements and parts requirements for the model and quantity of units bid. The bidder must be capable of submitting a current parts list covering all parts for the model of unit bid.

In order to maintain this complex piece of fire apparatus, the experience and reliability of the factory authorized service center is of major concern to the State of Tennessee. The service facility must comply with the following criteria in order to be considered:

- The facility must have a minimum of five (5) years of experience repairing and maintaining fire apparatus of the make and type of apparatus being bid.
- ASE and /or EVT certified factory trained technicians shall perform all repairs and testing.
- Fully equipped mobile service trucks must be maintained for the purpose of performing service and repair work at purchaser’s facility/s

The bidder shall submit the location, description, and recent photos of the service center and mobile service unit(s) along with the bid.

It is the desire of the State of Tennessee that, where possible, the apparatus be constructed using parts commonly used by heavy-duty truck manufacturers and available on the open market so that replacement parts are more readily available so as to reduce down time and replacement part costs.

The bidder must ensure that a stock of routine repair parts is maintained at the service center location. The State of Tennessee reserves the right to reject bids of vendors who cannot produce satisfactory evidence that this inventory is available and that they can furnish all other parts needed for service or repair of the equipment herein specified in a timely manner.

Section 01.5: Testing and Certification

Prior to delivery, all NFPA required testing shall be completed and documentation shall be provided upon delivery of the vehicle which confirms successful completion of all required and specified testing. Vehicles that

have not been tested, or have not successfully passed said testing will not be accepted. Conditional, temporary, or partial certification test results shall not be acceptable.

A road test shall be conducted with the apparatus fully loaded and a continuous run of no less than ten (10) miles. During that time the apparatus will show no loss of power nor will it overheat. The transmission drive shafts and the axles shall run quietly and be free of abnormal vibration or noise. The apparatus shall meet the NFPA 1901 acceleration and braking requirements. The apparatus when fully loaded will not have less than 25% or more than 50% on the front axle and not less than 50% or more than 75% on the rear axles.

The NFPA 1901 electrical system tests requirements shall be performed and recorded including reserve capacity, alternator test, and low voltage alarm test.

The road and pump tests required in NFPA 1901 shall also be conducted at the time of delivery as part of the acceptance testing process. In the event the apparatus fails to meet the test requirements on the first trials, second trials may be made at the option of the bidder within thirty (30) days of the date of the first trials. Such trials shall be final and conclusive, and failure to comply with these requirements a second time shall be cause for rejection.

Permission to keep or store the apparatus in any building owned or occupied by the purchaser during the above specified period, with the permission of the bidder, shall not constitute acceptance. Insurance covering loss, theft, or liability shall remain the responsibility of the bidder until formal acceptance is completed

Section 01.6: Delivery and Acceptance

The completed vehicle shall be delivered to the Tennessee Fire and Codes Academy in Bell Buckle, Tennessee within _____ days from receipt of purchase order. Each bidder shall state the complete apparatus delivery time in calendar days, from receipt of the purchase order to delivery at the TFACA. The apparatus shall be delivered by the bidder under its own power with all equipment specified.

Acceptance of the delivered apparatus and equipment will be made at completion of all required tests, inspections, and receipt of all specified equipment and documentation. Equipment items not delivered at time of the tests, or construction not in conformance with the proposal, will be cause for the accepting authority to withhold payment until delivery is complete and acceptable. Deviations will not be tolerated and will be cause for rejection of apparatus unless they were originally listed in the bidder's proposal or previously approved.

Section 01.7: Contractor Specifications and Drawings

A complete set of contractor specifications of the proposed apparatus shall be submitted with the bid. The purpose of these contractor specifications is for the vendor to provide detail as to how they intend to build and supply the vehicle herein specified. Simply copying and submitting the State's specification will not meet this requirement. Discrepancies found in the contractor's specifications will be considered noncompliance.

The purchaser's specifications shall, in all cases, govern the construction of the apparatus, unless a properly documented exception or deviation was approved. Any bid indicating that the manufacturer's proposal shall supersede the purchaser's specifications will be considered a complete substitute specification and will be rejected.

Detailed drawing/s of the apparatus being bid shall be included in the bid proposal. These drawings shall be computer generated "C" size and shall clearly indicate cab design, pump location and intakes and discharges, ground ladder storage, and dimensions and compartmentation. Drawings shall be provided that show both sides, front, and rear of the vehicle. Drawings of the completed vehicle shall be provided at the time of delivery that reflect the completed vehicle and include all of the aforementioned components. All drawings shall be of the vehicle being bid. Drawings of similar units or demo units shall not be acceptable.

Section 01.8: Manuals and Documentation

The manufacturer shall deliver with each apparatus at least two sets of complete operation and service manuals covering the completed apparatus as delivered and accepted. Documentation will be accepted in electronic format. The documentation shall include, at a minimum, the inspection, service, and operation of the fire apparatus and all major components thereof. The manufacturer shall also deliver with each fire apparatus the following documentation for the entire apparatus and each major operating system or major component of the apparatus:

1. Manufacturer's name and address
2. Country of manufacture
3. Source for service and technical information
4. Parts replacement information
5. Descriptions, specifications, and ratings of the chassis, and pump
6. Wiring diagrams for low voltage and line voltage systems to include the following information:
 - a. Pictorial representations of circuit logic for all electrical components
 - b. Circuit identifications
 - c. Connector pin identification
 - d. Zone location of electrical components
 - e. Safety interlocks
 - f. Alternator-battery power distribution circuits
 - g. Input/output assignment sheets or equivalent circuit logic implemented in multiplexing systems

7. Lubricating charts
8. Operating instructions for the chassis and all major components
9. Instructions regarding the frequency and procedure for recommended maintenance
10. Overall apparatus operating instructions
11. Safety considerations
12. Limitations of use
13. Inspection procedures
14. Recommended service procedures
15. Troubleshooting guide
16. Apparatus body, chassis, and other component manufacturer's warranties
17. Paint information including primary and secondary paint color
18. Special data required by the NFPA 1901 standard
19. A material safety data sheet (MSDS) for any fluid that is specified for use on the apparatus

Section 01.9: Pre-Bid Conference

A non-mandatory pre-bid conference will be held at _____ on _____ at _____. The purpose of the Pre-bid conferences is to provide specific project information, explain any unusual aspects of the project and address any potential bidder questions. Written minutes for the pre-bid conference will be recorded and a copy of these minutes shall be made available to all attendees to all conference attendees and bidders.

Section 01.10: Pre-Construction Conference and Inspection trips

A pre-construction conference shall be conducted at the apparatus manufacturer's factory at which time all final design and equipment mounting locations will be approved, prior to the beginning of construction. A factory design engineer shall be present during the pre-construction conference to answer any design, and/or engineering questions relating to the layout of the apparatus. At the Pre-construction conference, the State's specifications shall be discussed page by page. After careful review and agreement, approval to begin construction will be granted. The State shall send a maximum of two (2) representatives to the Pre-construction conference. All costs for the travel related to the Pre-Construction Conference and Inspection trips shall be the responsibility of the Stater of Tennessee and therefore shall not be included in the bid price for the vehicle.

The manufacturer shall provide approval drawings which shall be reviewed at the pre-construction conference and, if correct, approved by the Purchaser. These drawings shall be signed and kept on file for future reference. The drawings shall be as detailed as possible, and shall include the following:

- a) The apparatus including a front, rear, top, views of both sides, and measurements
- b) Pump panel payout
- c) Interior of the cab showing seating positions, and measurements
- d) The dash showing switch positions and a description of their function
- e) Ladder storage area showing configuration of ladders.
- f) Lettering and striping configuration

In addition to the pre-construction conference, two (2) factory inspection trips to the apparatus manufacturer's facility for two (2) people shall be completed. All costs for these trips shall be the responsibility of the State. The first factory visit shall be a pre-paint inspection and the other shall be a final pre-delivery testing and inspection factory visit.

Section 01.11: Apparatus Information

The bidder shall include with their bid, the following exact measurements:

- a) Overall length
- b) Width
- c) Height
- d) Wheelbase
- e) Rear G.A.W.R.
- f) Total G.A.W.R.

Section 01.12: Warranties

The entire completed vehicle shall have a bumper to bumper warranty of not less than two (2) years. This warranty shall be non-prorated. In addition, the following components and systems shall be warranted as follows:

- a) Apparatus Body – 20 year
- b) Chassis Frame Rails – 20 years
- c) Corrosion – 5 year
- d) Electrical / Electronic Systems – 5 year
- e) Engine – 5 year
- f) Fire Pump – 5 year
- g) Front and Rear Axles – 3 year
- h) Paint – 10 year

- i) All Plumbing, Including Valves – 5 year
- j) Transmission – 5 year
- k) Water Tank – Lifetime

Section 01.13: Performance Bond

A performance bond in the amount of one hundred percent (100%) of the bid shall be furnished by the successful bidder within fourteen (14) days after receiving the official notice of award of contract. Failure of the contractor to complete delivery according to the contract and specifications will be cause to begin action for forfeiture of performance bond.

Section 01.14: Bid Bond

A bid bond or certified check in the amount of ten percent (10%) of the bid (not to exceed \$20,000) shall be furnished with the bidder’s proposal. The bond will ensure that the bidder will enter into contract and submit a performance bond within 14 days of notice of award of contract. The successful bidder’s bid bond will be returned or released after a contract is executed and an acceptable performance bond has been delivered. In case of failure to comply within the stated time, the bid bond will be forfeited as liquidated damages because of the default. The bid bonds or checks of all unsuccessful bidders will be returned after bids are opened and award is made to the successful bidder.

The bonds furnished by the successful bidder shall be from a surety company authorized to underwrite surety bonds in the State of Tennessee with a minimum A.M. Best rating of A. The purchaser may review the financial condition of the surety and accept or reject any surety at its discretion. Sureties must submit bonds in a form that will be subject to the approval of the purchaser.

Section 01.15: Product Liability Insurance

Product liability insurance of not less than \$5,000,000 shall be supplied by the bidder. Documentation of the amount of product liability carried by the manufacturer and the name of the insurance carrier shall be provided by the bidder at the time of bid submission. The successful bidder shall defend any and all suits and assume liability for the use of patented device or article forming a part of the apparatus furnished under the contract. Failure to supply a copy of the Certificate of Insurance with the bid will be cause for immediate rejection of the bid.

Section 01.16: Manufacturer Solvency

The solvency of the manufacturer is a prime concern to the State of Tennessee. Each bid must include a financial statement from Dun and Bradstreet or another nationally recognized accounting firm.

Section 01.17: Payment

The State of Tennessee will not accept any bid that requires down payments, progressive payments during construction, or contracts with escalator clauses. Terms of payment shall be 100 percent payment after

acceptance of the vehicle. No other terms shall be acceptable. All certificates of origin are to be transferred to the State of Tennessee with the title in the name of the State of Tennessee by the vendor and delivered with the apparatus.

Section 01.18: Training

Fire Academy personnel shall be properly instructed as to the proper use of the entire apparatus including, but not limited to, chassis, fire pump system, and all equipment. The training shall be conducted by a factory trained Delivery Engineer who shall be responsible for complete instruction as to operation and maintenance of the completed vehicle. The Delivery Engineer shall conduct the delivery training over a three (3) day period allowing participation of various personnel.

Section 02.0: General Design Specifications, Commercial Chassis Pumper Fire Apparatus

The cab and chassis shall be a commercial fire apparatus model. The cab and chassis shall be a of a single rear axle design and be designed for the use herein specified. The chassis shall be manufactured for heavy-duty service with the strength and capacity to support a fully laden apparatus, at all times. The vehicle shall include a fire pump of not less than 1250 gpm, a water tank of not less than 750 gallons, a full NFPA compliment of ground ladders, and rescue style compartmentation.

The apparatus manufacturer shall calculate the load distribution for the apparatus, and that load distribution plan shall be delivered with the fire apparatus. The manufacturer shall engineer the fire apparatus to comply with the gross axle weight ratings (GAWR), the overall gross vehicle weight rating (GVWR), and the chassis manufacturer's load balance guidelines. The apparatus, when loaded to its estimated in-service weight, shall have a side-to-side tire load variation of no more than 7 percent of the total tire load for that axle.

The vehicle shall be geared and engine governed for a top speed of 65 mph.

Section 03.0: Commercial Chassis

The cab and chassis shall be a new current year model two (2) wheel drive, 4 door Freightliner M2 106 and include all standard and optional equipment and features specified herein. To include:

- a) 154 inch BBC high-roof aluminum conventional crew cab
- b) 120" cab to axle and a wheelbase of approximately 233 inches
- c) Frame Liner, 1/4" c-channel frame inner reinforcement
- d) Extreme climate thermal insulation
- e) Firewall and hood liner insulation
- f) Dual, electric horns
- g) LED marker lights
- h) Daytime running lights
- i) Tinted windshield
- j) Tinted door glass with operating wing windows

- k) Door-mounted down-view mirror
- l) Left hand and right hand exterior grab handles with single rubber insert
- m) Chrome front grille
- n) Clear fog lights, mounted in or under bumper
- o) Door-activated dome lights
- p) Overhead console with additional center storage
- q) Dual reading lights mounted in the overhead console
- r) Two cup holders molded into lower dash
- s) Washer fluid level indicator
- t) Trip odometer, tachometer, transmission temperature and air pressure gauges
- u) Heater, defroster and heavy duty air conditioner
- v) West Coast bright heated & remote mirrors with convex
- w) Tilt & telescoping steering
- x) Tilting, Fiberglass, hood with halogen headlights
- y) Side of hood air intake with NFPA compliant ember screen and fire retardant Donaldson air cleaner
- z) Magnetic drain plugs, engine drain, transmission drain, axle(s) fill and drain
- aa) Standard front turn signal lamps
- bb) Professional image package including a chrome hood-mounted air intake grille, a hood-mounted chromed plastic grille, and chrome headlight bezels.
- cc) Chassis mounted battery box with three (3) 12 volt batteries of not less than 950 CCA each. Batteries to be mounted on a heavy duty slide out tray to aid in servicing and replacement.

The chassis shall have the battery box, fuel tank and all cab and crew cab steps overlaid with .125" aluminum tread plate.

NFPA compliant cab entry steps, grab handles, and illumination shall be provided on all cab entry doors. All lighting fixtures shall be recess mounted so as to not interfere with cab access or be damaged by contact with personnel or equipment.

Two-(2) 3/4" thick rear tow eyes constructed of A-36 steel shall be mounted below the frame at the rear of the vehicle. The tow eyes shall be attached to steel weldments that are mounted to the apparatus. The eyes shall have a minimum dimension of three-(3) inches. The tow eyes shall be used for towing, not lifting the vehicle.

One (1) heavy duty Class IV Custom Trailer Hitch Receiver shall be provided and installed on the rear of the vehicle.

One (1) heavy duty Class IV Custom Trailer Hitch Receiver shall be provided and installed on the front of the vehicle and extend out to the lower surface of the front bumper. This hitch shall be utilized for rescue and rope training and therefore will not require trailer lighting.

The Class IV hitch shall be rated to 10,000 lbs. gross trailer weight (GTW) with a maximum trailer tongue weight (TW) of 1000 lbs. One (1) 7-Way Trailer Wiring Harness shall be connected to the vehicle electrical system and shall include a 7 pin trailer electrical connected mounted near the receiver hitch under the rear tailboard. The hitch assembly shall be securely mounted to the vehicle and shall not be mounted to the tailboard.

Two-(2) air horns shall be installed in compliance with NFPA on the front fenders one-(1) each side and plumbed to the chassis air supply system thru an air protection valve. The horns shall be manufactured from spun brass material with an easily separated die cast sounding unit for serviceability.

The air horns shall be active in both the "Scene" and "Response Mode".

A driver controlled horn/air horn selector switch shall be installed in the cab and operate either air horn(s) or chassis electric horn through the horn ring button.

Section 03.1: Cab and Chassis Electrical Components

The following capabilities and devices shall be provided and installed:

The chassis shall include a Freightliner Smartplex multiplex electrical system featuring Smart Switches that do not require reprogramming after installation, eliminating the need to remove the dashboard to install. The electrical system shall include expansion capabilities that allows custom programming for unique requirements, with no software to buy or additional tools required. The electrical system shall include diagnostic capability and diagnostic tools and standard interfaces for engine, transmission, chassis lighting and trailer towing.

The system shall include:

- Automatic Headlights when Wipers Engaged
- Park Brake Not Set Warning System
- Exterior Regen Notification
- Automatic Slowest Wiper Speed with Park Brake
- Pre-Trip Light Inspection
- Alternating Flashing Headlights (Wig Wag) NFPA 1901 compliant headlight warning system
- Smart Switches

All cab, chassis and body electrical devices and controls, not included in the Smartplex system shall utilize a multiplex electrical system specifically designed for use on vehicles of this type. This system shall include:

- Short and Open Circuit Detection
- Eliminate Electromechanical Relays
- On-Board Service Information

- On-Board Diagnostics
- Reduce Splices by 75%
- Reduce connections by 25%
- Increase Reliability and Minimize Downtime
- Simplify Troubleshooting and Repairs
- Peer-to-Peer System
- Nodes Hold their Own Configurations
- Nodes can Operate Independently for Improved Reliability
- Integrated Load Shedding and Sequencing
- Dimming Controls
- OEM can Configure all of the Displays/Screens
- Easy to Use, Windows® Based Programs
- Reverse Polarity Protection
- Modules Operate from -40° to +85° C.
- RF Testing to 100V/meter
- Shall meets or exceed SAE and NFPA Standards for Electronics
- 100% Solid-State Technology

The multiplex system shall include a cab mounted display with the following features:

- Touch screen
- 800 x 480 resolution
- Four video ports
- Operates in 12V and 24V applications
- Virtual switches
- Display inside and outside temperature
- Automatic climate control
- 100% Configurable (OEM Level)
- Field re-programmable
- Peer to peer network
- On-board diagnostics / service information
- Colors change to indicate button status
- Video Ready for Backup camera

Load Manager and Sequencing: As part of the multiplex electrical system, the apparatus shall be equipped with a Load Manager System for performing electrical load management. The Load Manager shall have two (2) modes of operation, a "Calling Right of Way" mode, and a "Blocking Right of Way" mode. The "Blocking Right of Way" mode shall be activated only when the park brake is set. Load shedding may occur "only" in the "Blocking Right of Way" mode also when the battery voltage level reaches your programmed shed level.

This system shall be designed to activate a fast idle system with low voltage alarm that activates at the NFPA required 11.8 volts.

The multiplex electrical system shall also provide electrical system sequencing that switches electrical loads on and off one at a time to reduce alternator load.

Back-up Camera System: A back-up camera system shall be provided and installed. The rear facing color camera shall be mounted on the rear of the vehicle and shall activate when the vehicle is placed in reverse. The system shall display the camera on the cab mounted multiplex display.

Vehicle Data Recorder: The Apparatus shall be equipped with a "Vehicle Data Recorder and Seat Belt Warning System" that shall be displayed on the cab mounted multiplex display. The system shall monitor and record:

- Vehicle Speed, Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Switch
- Park Brake
- Service Brake
- Time, Date and Engine Hours.
- Shall be Password Protected by the customer
- Six (6) seat position inputs for occupied and belts buckled
- Shall easily interface with traditional wiring, V-MUX or other multiplexing systems
- Data to be extracted by a standard, mini USB cable

Master Light Switch Panel: All warning lights shall be switched from a master light switch panel located in the multiplex cab mounted display and shall include a master light cutoff switch.

Light, Battery On: A 1/2" green battery on pilot light shall be located on the cab dash visible from the driver's position. This light shall be wired to the master battery switch.

Light, Ignition On: A 1/2" green ignition on light shall be located on the cab dash and wired to indicate power to the ignition.

Master Load Disconnect: A master load disconnect shall be provided between the starter solenoid and the remainder of the electrical loads on the apparatus. The batteries shall be connected directly to the starter solenoid.

Electronic Siren: One (1) Whelen Model 295SL100 electronic siren shall be provided and installed in the cab within easy reach of the Driver and include a microphone hard-wired to the unit and a microphone mounting clip. The siren shall be wired through the vehicle horn circuit which will allow the siren to be operated from the vehicle horn ring.

Two (2) SP123BMC 100 watt siren speakers shall be recess mounted in the front bumper and wired to the in cab siren control unit. The siren speakers shall be mounted in the front face of the bumper, one (1) on each side and include chrome front grills. These speakers shall be specifically designed for recess mounting in front bumpers. Speaker shall be easily removable for servicing.

Light, Door Ajar Indicator : A red door ajar LED flashing light shall be mounted in the cab within view of the driver. The light circuit shall be wired so that the light circuit is deactivated when the parking brakes of the apparatus are applied. A label shall be applied adjacent to the light 'DOOR OPEN'.

Lights, Engine Maintenance: Two-(2) white 4" LED round lights shall be mounted under the cab. The lights shall automatically activate when the cab is tilted.

Section 03.2: Signage and Placards

In accordance with NFPA 1901, any device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved shall be displayed as a "Do Not Move" caution message when the parking brake is disengaged and include the following:

Seating Capacity Plate: A permanently attached Seating Capacity Plate shall be mounted in the cab in plain view that reads "Seating Capacity – 5 People".

Occupancy/Seat Belt Plate: Occupancy / Seat Belt plates shall be provided and installed visible from each seated position, which reads: "OCCUPANTS MUST BE SEATED AND BELTED WHEN THE APPARATUS IN MOTION"

"Do Not Wear Helmet" Plate: A plate shall be installed visible from each seating position that states: "DO NOT WEAR HELMET WHILE SEATED"

Overall Height/Length/Weight Plate: An Overall Height/Length/Weight information plate shall be installed that can be clearly identified and visible to the driver while in the seated position showing the apparatus completed overall height, length, (in feet and inches) and gross vehicle weight (in tons) current to the apparatus manufactured date.

Fluid Capacity Plate: A permanently affixed fluid data plate shall be installed in the driving compartment to indicate the type and quantities of the following fluid used in the vehicle.

- a) Engine Oil
- b) Engine Coolant
- c) Chassis Transmission Fluid
- d) Pump Transmission Lubrication Fluid (if applicable)
- e) Pump Primer Fluid (if applicable)
- f) Drive Axle Lubrication Fluid
- g) Air Conditioning Refrigerant
- h) Air Conditioning Lubrication Oil
- i) Power Steering Fluid
- j) Transfer Case Fluid
- k) Air Compressor System Lubricant
- l) Front Tire Pressure - Cold
- m) Rear Tire Pressure - Cold

The following information shall also be supplied on the Fluid Data Plate:

- a) Chassis Manufacturer
- b) Production Number
- c) Paint Number
- d) Year Built
- e) Date Shipped
- f) Vehicle Identification Number

Movement Warning Plate: A permanently affixed Movement Warning plate shall be installed near the door ajar light that reads: "DO NOT MOVE APPARATUS WHEN LIGHT IS ON".

"Do Not Ride" Plate : A permanently affixed "DO NOT RIDE" warning plate shall be installed located on the stepping areas of the vehicle warning personnel that riding on or in these areas while the vehicle in motion is prohibited.

Section 03.2: Front Axle and Front Suspension

The front axle shall be of an I beam design and have a rated capacity of not less than 12,000-lb. No drilling or welding to the front axle "I" beam is permissible. Synthetic 75w-90 front axle lube shall be utilized.

The front axle shall include Skf Scotseal plus XL front oil seals and vented front hub caps with window, center and side plugs.

Mud flaps constructed from hard black rubber shall be provided and installed behind the front axle.

The front suspension shall be dual Taper Leaf with a capacity of not less than 12,000 pounds and include maintenance free rubber bushings with heavy duty double acting shock absorbers.

Section 03.3: Rear Axle, Single

The vehicle shall have a single rear drive axle with a rated capacity of not less than 26,000 pounds.

The rear suspension shall be a flat leaf spring rear suspension with helper and radius rod for fire/emergency service. The rear suspension shall have a rated capacity of not less than 26,000 pounds and include Skf Scotseal plus XL rear oil seals.

Under no circumstances may any brackets or any other component be welded to the rear axle housing.

Rear axle mud flaps shall be constructed from hard black rubber and installed at the rear of the body fenders.

Section 03.4: Wheels and Tires

The front and rear tires shall have a rated capacity of not less than that of the axle and suspension on which they are mounted and shall be not less than 14 ply radial tires. Tires shall over the road type tread. All tires and wheels shall be balanced.

All tires shall be mounted on polished Aluminum Wheels and include stainless steel lug nut covers. Valve stem extensions shall be provided (4).

Each tire installed on the apparatus shall be equipped with a tire pressure monitoring device. The device shall consist of a valve stem cap to with an LED tire alert to indicate tire pressure conditions. The LED shall flash when the tire drops 8 psi below the factory setting.

One (1) spare tire with rim for the front axle shall be provided and shipped loose with the vehicle.

Section 03.5: Front Bumper

The vehicle shall be equipped with a chrome plated three (3) piece front bumper.

Section 03.6: Air Brake System

The vehicle shall be equipped with an FMVSS-121 compliant dual air system with antilock brake system (ABS) and automatic traction control.

The air brake system shall include:

- a) Air brake package

- b) Wabco 4s/4m Antilock Brake System with traction control
- c) Reinforced nylon, fabric braid and wire braid chassis air lines
- d) Fiber braid parking brake hose
- e) Standard brake system valves
- f) Standard air system pressure protection system
- g) Standard U.S. front brake valve
- h) Relay valve with 5-8 psi crack pressure, no rear proportioning valve
- i) BW AD-9 brake line air dryer with heater. Air dryer to be frame mounted
- j) Steel air tanks mounted aft inside and/or below frame just forward of rear suspension Clear frame rails from back of cab to front rear suspension bracket, both rails outboard
- k) BW DV-2 auto drain valve without heater - wet tank

The front brake system shall include:

- a) Meritor 16.5x5 q+ cast spider cam front brakes, double anchor, fabricated shoes
- b) Fire and emergency severe service, non-asbestos front lining
- c) Cast iron front brake drums
- d) Meritor automatic front slack adjusters.

The rear brake system shall include:

- a) Meritor 16.5x7 q+ cast spider heavy duty cam rear brakes, double anchor, fabricated shoes
- b) Fire and emergency severe service non-asbestos rear brake lining
- c) Brake cams and chambers on forward side of drive axle
- d) Conmet cast iron rear brake drums
- e) Haldex goldseal longstroke 1-drive axle spring parking chambers
- f) Automatic rear slack adjusters

Section 03.7: Cab Interior Devices and Components

The cab interior shall include:

- a) Opal gray vinyl interior
- b) Molded plastic door panel
- c) Black mats with single insulation
- d) Forward ceiling mounted console with upper storage compartments without netting
- e) In dash storage bin
- f) (2) cup holders left hand and right hand dash
- g) Gray/charcoal flat dash
- h) Smart switch expansion module
- i) Heater, defroster and air conditioner

- j) Main HVAC controls with recirculation switch
- k) Standard heater plumbing
- l) Denso heavy duty air conditioner compressor
- m) Premium insulation
- n) Solid-state circuit protection and fuses
- o) 12v negative ground electrical system
- p) Door activated dome/red map lights, ceiling mounted, in the area of each seating position. Total 4
- q) Cab door latches with manual door locks
- r) (2) 12 volt power receptacles mounted in dash
- s) Left Hand and Right Hand integral door panel armrests
- t) Adjustable steering column with 4-spoke 18 inch (450mm) steering wheel
- u) Driver and passenger interior sun visors

Section 03.8: Cab Seating

The cab seating configuration shall include one (1) high back Driver Seat with air suspension, one (1) high back officers seat (right front) with recessed SCBA and two (2) rear facing passenger seats with recessed SCBA. The seating shall be as follows:

One (1) Seats Inc 911 universal series high back air suspension driver seat with NFPA 1901 compliant seat sensor

One (1) Seats Inc 911 universal series SCBA non suspension passenger seat with underseat storage and NFPA compliant seat sensor

Two (2) Seats Inc 911 high back non suspension left hand, right hand rear passenger seats with under seat storage and NFPA compliant seat sensors

All seats shall be upholstered in high-strength, wear-resistant, waterproof Black Durawear material.

All seats are to be equipped with 3 point high visibility orange seat belts with retractors and NFPA compliant sensor and dash harness.

All SCBA seats (3) shall be equipped with EZ-Loc SCBA brackets that feature:

- a) Easy grip and effortless bottle release
- b) An integrated SCBA bracket built into the seat.
- c) Bracket allows on-the-fly adjusts to fit most brands and sizes of SCBA without needing extra parts
- d) Must not interfere with the Heads-Up display modules
- e) Must require only light downward pressure to insure the SCBA is locked. Slamming the cylinder to lock the SCBA in place will be accepted.

All SCBA seats to be equipped with padded parade panels.

Section 03.9: Cab Controls and Devices

The following controls and devices shall be included within the cab:

- a) Gray instrument panels
- b) Engine remote interface with park brake interlock
- c) Black gauge bezels
- d) Low air pressure light and buzzer
- e) 2 inch primary and secondary air pressure gauges
- f) Engine compartment mounted air restriction indicator with graduations, with warning light in dash
- g) Electronic cruise control with switches in left hand switch panel
- h) Ignition switch with removable key
- i) Odometer/trip/hour/diagnostic/voltage display: 1x7 character, 26 warning lamps, data linked, icu3
- j) Diagnostic interface connector, 9 pin, sae j1939, located below dash
- k) 2 inch electric fuel gauge
- l) Engine remote interface for remote throttle
- m) Engine remote interface connector at back of cab
- n) Electrical engine coolant temperature gauge
- o) 2 inch transmission oil temperature gauge
- p) Engine and trip hour meters integral within driver display
- q) PTO controls
- r) Electric engine oil pressure gauge
- s) Overhead instrument panel
- t) Electronic mph speedometer with secondary kph scale, with odometer
- u) Standard vehicle speed sensor
- v) Electronic 3000 rpm tachometer
- w) Ignition switch controlled engine stop
- x) Digital voltage display integral with driver display
- y) Single electric windshield wiper motor with delay
- z) Marker light switch integral with headlight switch
- aa) One valve park brake system with dash valve control auto-neutral and warning indicator
- bb) Self-canceling turn signal switch with dimmer, washer/wiper and hazard in handle
- cc) Integral electronic turn signal flasher with hazard lamps overriding stop lamps

Section 03.10: Diesel Engine

The engine shall be a Cummins ISL rated at not less than 350 horsepower @ 2000 RPM, 2200 GOV RPM, 1000 LB/FT @ 1400 RPM. The engine shall include:

- a) Engine compression brake
- b) Cruise control,
- c) Magnetic drain plug,

- d) Engine fuel water separator,
- e) Air cleaner restriction gauge,
- f) Fan manual override,
- g) Low coolant level alarm.
- h) Cummins aftertreatment system
- i) Fleetguard® fuel filters, lube filters and DEF from Cummins filtration
- j) Single high-capacity electronic control module (ECM)
- k) 2-year/250,000-mile warranty providing coverage for all 100 percent parts and labor on warrantable failures to include travel or towing when the engine is disabled by a warrantable failure. There shall be no deductible and the warranty shall include the aftertreatment system.
- l) Power Steering

Section 03.11: Exhaust System

The exhaust system shall include a diesel particulate filter (DPF) and a selective catalytic reduction (SCR) device to meet current EPA standards. The exhaust shall terminate horizontally behind the passenger side rear wheels. Heat deflector shields shall be provided to isolate chassis and body components from the heat of the tailpipe.

The exhaust system shall terminate in a tailpipe that is configured for the _____ Station Exhaust Removal System.

Section 03.12: Automatic Transmission

The vehicle shall be equipped with an Allison 3000EVS, 5-Speed automatic transmission with power takeoff and cab mounted push-button type shifter.

A transmission cooler shall be provided and installed.

An electronic lockup relay system shall be installed between the engine and transmission and the fire pump. The lock-up shall place the transmission into the 1:1 gear automatically for pump operations

Section 03.13: Fuel Tank and Fuel System

The fuel tank and system shall include:

- a) 50 gallon/189 liter short rectangular aluminum fuel tank - Left Hand
- b) Fuel tank cap(s)
- c) Alliance fuel filter/water separator
- d) Equiflo inboard fuel system
- e) Auxiliary fuel supply and return ports located on left hand fuel tank
- f) High temperature reinforced nylon fuel line
- g) "Diesel Fuel Only" placard.

Section 03.14: Cab Intercom System

A Firecom 5000D Series Digital Intercom system shall be provided which allow users to connect up to four radios for simulcast interoperability with mutual aid or other agencies to improve operational efficiencies and responder safety. The intercom system shall be provided in the cab with one headset at each seating position. (total 4). The intercom base station shall be provided that utilizes a 12 volt nominal power supply. The unit shall have a touch pad adjustable volume control and have advanced noise reducing circuitry.

Firecom FHW-57 wireless headsets with all-in-one design providing complete freedom of movement while maintaining hands-free, full-duplex communication shall be provided for each seating position. (total 4) The headsets shall include noise attenuating features that provide protection from hearing loss that can occur from exposure to high noise levels, while also providing each firefighter clear communication with the other crew members. The Intercom system shall include advanced circuitry that effectively suppresses distracting background noise and eliminates clipping without affecting communication.

Section 03.15: Battery Charging and Air System

One (1) Kussmaul "Auto Charge Pump" high output battery charger and air compressor system shall be installed in the apparatus and shall charge the batteries and maintain air pressures in the air brake system when plugged into a 120 volt shoreline.

The Auto Charge Pump system shall include a Charger, a Display, an Auto Pump AC and a WP Auto Eject with Weatherproof Cover and Mating Connector.

The battery charger shall be fully automatic and shall maintain the apparatus' batteries at a full charge level when connected to a 120 VAC source. The unit shall include front panel connections for a remote display and Auto Charge Deluxe Watertight Status Center which shall be mounted in a location to be determined at the pre-construction conference. The system shall have a built-in sense circuit to check battery voltage and shall compensate for voltage drop in charging wires and provide quick recharging with no overcharging. The charger shall include an exterior bar graph display and shall have the following operational specifications:

- a) 120 volts AC input at 10 amps
- b) 12 volts DC output at 40 amps

The Auto Air Pump shall maintain air pressure in the vehicle's air system while it is plugged into the Shoreline system and include the following:

- a) 100 PSI Max Rating, 120V, 4A
- b) Vehicle mount compressor shall insure air brake system is properly pressurized
- c) Pressure switch regulated operation shall automatically senses low pressure in air system and restore proper pressure, preventing brake lock-up
- d) Shall not interference with engine mounted air compressor
- e) Shall include factory set PSI actuation points: 75 "On", 95 "Off"

- f) Shall include sealed ball bearings for long service life
- g) Shall include auto drain feature
- h) Shall include system pressure gauge.

Section 3.16: Cab Auxiliary Air Conditioner System

One (1) 12 volt auxiliary air conditioning system shall be provided and installed in the rear cab crew compartment. This system shall provide additional cooling in the rear cab area and shall include a roof mounted condenser.

Section 3.17 Cab Map box

One (1) map box shall be provided between the Driver's and Officer's seats. This box shall be constructed of aluminum plate and shall house the multiplex display as well as provide store for maps and other equipment. The box shall extend rearward from the lower dash area to the back of the front seats. The box shall be painted to match the grey vehicle interior.

Section 3.18 Radio and Antenna Installation

A suitable location shall be provided in dash, on dash, or on the engine cover between the driver and officer for the installation of a 2-way radio. This area shall include a 12v power point and antenna wired for the installation of 2-way radio. The radio and antenna shall be provided to the manufacturer who shall install the radio and antenna during the manufacturing process. Location of the radio and antenna shall be determined at pre-construction conference.

Section 3.19: Portable Hand Lights

Four (4) portable hand lights shall be provided and mounted in brackets in convenient locations within the cab with chargers wired to the vehicle electrical system. Actual mounting locations to be determined at the pre-construction conference. These lights shall be LED and shall be mounted in vehicle charging racks and include the following features:

- a) Six (6) C4® LEDs, impervious to shock with a 50,000 hour lifetime
- b) Toggle switch and two (2) user programmable ultra bright blue tail-light LEDs
- c) 6 wide pattern parabolic reflectors that produce a smooth flood pattern
- d) Each light shall have 2 levels of lighting:
 - High: 4,000 candela (Peak Beam Intensity), 615 lumens, up to 8 hrs.
 - Low: 2,150 candela (Peak Beam Intensity), 330 lumens, up to 18 hrs.
- e) Each light shall include shoulder strap, AC and DC charge cords and charge rack

Section 04.0: Fire Pump and Associated Devices and Equipment

Section 04.1: Pump Enclosure

The pump shall be mounted directly behind the vehicle cab within a suitably designed pump enclosure. The pump enclosure superstructure shall be constructed of aluminum tubing, channel, angle, and break-formed

components. The framework shall be formed by aluminum alloy extrusions and electrically seam welded both internally and externally at each joint using aluminum alloy welding wire. The main frame work shall be constructed of not less than 3.00 x 3.00 aluminum. The break-formed components shall be constructed from 3/16" (1.875) aluminum.

The cross members support the substructure and the exterior panels independently from the cab and body. The cross members shall be isolated from the frame rails using torsion mounts. The pump enclosure shall be supported at the top of the frame rails. The module shall be secured with angle brackets bolted to both the pump enclosure support cross rails and the side of the chassis frame rails.

The front of the pump module shall be covered with aluminum tread plate to provide resistance to damage from road debris.

The pump enclosure shall provide an area above the pump for the installation of crosslays and/or dunnage area.

Section 04.2: Pump Panels

The operator's controls and gauges shall be installed on pump panels using a side mount configuration. The pump panels shall be constructed of 1/8" (.125) black anodized, non-glare aluminum or stainless steel. Vinyl coverings shall be not be acceptable.

The operator's master gauge panel shall be vertically hinged with latches for access to gauges and auxiliary controls.

The operator's control panel shall be located below the master gauge panel and constructed of 1/8" (.125) black anodized, non-glare aluminum or stainless steel.

All gauges and controls shall be properly identified with color-coded metal tags. The tags shall be affixed with 3M brand industrial adhesive or screwed in place. The gauges shall be functionally grouped above each control.

The right side upper panel shall be vertically hinged with double doors and latches for pump compartment access. The doors shall be constructed of .125" aluminum tread plate.

The right side lower panel shall be removable for serviceability. The panel shall be constructed of 1/8" (.125) black anodized, non-glare aluminum or stainless steel.

All instruments and controls shall be provided and installed as a group at the pump panel. The central midpoint or centerline of any valve control shall be no more than 72" vertically above the ground or platform that is designed to serve as the operator's standing position. The instruments shall be placed to keep the

pump operator as far as practical from all discharge and intake connections and in a location where they are readily visible and operationally functional while the operator remains stationary.

Section 04.3: Pump Panel Lighting

One (1) individual OnScene Access LED pump panel light with on/off switch shall be mounted under the light shield on the left and right sides above the pump panels. For optimum visibility during nighttime operations, the light shall be mounted as high as possible. Total 2.

One (1) LED compartment light shall be installed in the pump compartment for inspection or routine maintenance wired to the pump panel light switch.

Section 04.4: Pump Panel Mounted Running Boards

Running board constructed of anodized aluminum extrusion slotted, punched, and raised to provide superior traction during inclement weather operations shall be provided on each side of the vehicle directly below the pump panels.

Hose trays capable of holding 20 feet of 3 inch supply hose shall be constructed of aluminum and recessed in the running boards. The bottom of the hose trays shall consist of slats or slotted material to aid in drainage. FireFly LED lights shall be installed, one (1) each side in the compartment front facing the pump panels to illuminate the running board hose trays. Total (2). They shall be switched from the Driver's side pump panel. Each hose tray shall include an NFPA compliant hose restraint device.

The running boards shall be bolted to the pump modules substructure and spaced out 1/4" from the module for additional run off. The running board stepping surface shall comply with the latest version of NFPA 1901.

Section 04.5: Above the Pump Panel Handrails

One-(1) pair of 12" handrails shall be installed above the pump panels, one-(1) each side. The handrails shall be constructed from 1-1/4" knurled aluminum. The handrails shall be mounted with chrome plated end stanchions. The handrails shall meet or exceed NFPA 1901 requirements.

Section 04.6: Master Gauges, 4-1/2"

One compound 4-1/2" master intake gauge shall be provided and installed on the pump operator's panel. One compound 4-1/2" master discharge gauge shall be provided and installed on the pump operator's panel. The intake and discharge gauges shall be liquid filled with a solution to assure visual readings and reduce inner lens condensation. The body of the gauges shall be constructed of Zytel nylon with chrome-plated bezels. The face of the gauges shall be Spun Metal with white background and black markings accurate within 1%.

The pressure gauges shall maintain performance of all features and be free from defects in material and workmanship which includes fluid fill leakage and discoloration for seven years.

Section 04.7: Pressure Governor, Throttle And Engine Monitoring Display

Note: As this vehicle shall be utilized for training firefighters, both an electronic pressure governor and a pressure relief valve shall be provided.

One (1) Sentry Pressure Governor System shall be provided and installed on the pump panel and include a Sentry display, Twister throttle, pressure transducers and associated wiring. The Sentry shall monitor engine RPM and other pertinent data directly from the engine ECU. The display shall include a 4.3 inch, full color LCD display with 8 buttons and the following capabilities and devices:

- Pump Intake Pressure
- Pump Discharge Pressure
- Engine RPM
- Engine Oil Pressure
- Engine Coolant Temperature
- Transmission Temperature
- System Voltage
- Throttle Ready Interlock Status
- Pump Engaged Interlock Status
- OKAY to Pump Interlock Status
- Operating Mode Status (RPM or Pressure)
- Target Pressure Indication (when in pressure mode)
- Direct Sunlight Visible
- Sealed to IP67 Front and Rear
- J1939 or Analog Engine Control
- Flexible Mounting Options
- Vertical or Horizontal Orientation
- Multilingual
- Check engine warning
- Stop engine warning
- Advanced diagnostics
- Target pressure indication
- Multi – Station control
- Advanced cavitation and water supply operation
- Static or pressurized water source routines

The pressure governor and monitoring pressure display shall be programmed at installation for the specified engine.

Section 04.8: Pressure Relief Valve System

In addition to the Pressure Governor System, the apparatus pump shall be equipped with a Hale Total Pressure Master variable relief valve system designed to automatically relieve excessive pump pressure when operating from draft per NFPA 1901. The system shall self-restore to the non-relieving position when excessive pressure is no longer present. The relief valve system shall be totally mechanical and consist of an internal relief valve to bypass water to the suction side of the pump and a panel mounted control valve to provide control of pump pressure to the pump operator. A single panel mounted control shall permit the pump operator to “set” a desired relief pressure. The panel control shall have an easy to read and easy to set adjustment. The relief valve system shall function by monitoring and controlling pump pressure by utilizing the internal relief valve (returning flow to the pump suction). One amber light shall illuminate when the internal relief valve is open. The relief valve shall be designed to open into discharge flow which provides the advantage that in a normally closed position the relief valve is maintained in a closed position by virtue of pump discharge pressure. The TPM Total Pressure Master Relief Valve System shall include:

- a) Monitors and responds to pressure variations on both the suction (inlet) and discharge sides of the pump. Protects Pump from overpressure.
- b) Shall monitor and control pressure changes on both sides of the pump, and shall be responsive to small and large changes in pressure automatically.
- c) Shall meets or exceed NFPA 1901 specifications.
- d) Must be a totally mechanical system, relief valves operate on water pressure.
- e) Must provide total protection throughout the pump and hose lines utilizing automatic sensing device.
- f) Must not interfere with priming.
- g) Shall include a dump valve that is mounted on the discharge not the suction thereby providing protection from excess inlet pressure during relay and hydrant operation.
- h) Excess pressure shall be dumped to the atmosphere from the discharge side. Shall include a single panel-mounted pressure control valve with easy to read and set pressure adjusting scale.

Section 04.9: Color Coded Pump Panel

All gauge bezels, controls, trim rings, pump panel labels, and drains shall be color coded.

Section 04.10: Discharge Pressure Gauges

All discharges shall be provided with combination pressure gauges and flow meters that meet the following requirements:

- Displays GPM and PSI Directly
- All Aluminum Housing
- Display Module Identification and Program Access Modes
- Datalink Interface - for remote displays and summing or accumulating of flow from all discharges
- Linearizer Feature - Multiple Flow Rate Calibration Points
- Pressure Scale Expands Between 100 and 250 PSI

- Safeflow Feature - High and Low Flow Warnings
- NFPA Color Coded Bezel
- External Totalizing Button
- Backlighting
- Paddlewheel Style Flow Sensor

Section 05.1: Fire Pump System and Associated Components

The fire pump shall be a Hale Qflo Single Stage with a rated capacity of not less than 1250 gallons per minute at 150 psi.

The entire pump shall be cast, manufactured, and tested at the pump manufacturer's factory.

The pump shall be painted black including all intakes, discharges, manifolds, and associated valves.

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

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

The pump body and related parts shall be of fine grain, cast iron alloy, with a minimum tensile strength of 30,000 PSI. All moving parts in contact with water shall be of high quality bronze or stainless steel. Pumps utilizing castings made of lower tensile strength cast iron are not acceptable.

The pump body shall be vertically split, on a single plane, for easy removal of entire impeller assembly including wear rings and bearings without disturbing piping or the mounting of the pump in chassis.

The pump shaft shall be rigidly supported by three bearings for minimum deflection. The bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated.

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

Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and of wraparound double labyrinth design for maximum efficiency.

The pump shaft shall be heat-treated, electric furnace, corrosion resistant stainless for longer shaft life. Pump shaft must be sealed with double lip oil seal to keep road dirt and water out of drive unit.

Section 05.2: Pump Drive Unit

The drive unit shall be cast and completely manufactured and tested at the pump manufacturer's factory.

The pump drive unit shall be of sufficient size to withstand up to 16,000 ft. Lbs. Torque of the engine in both road and pump operating conditions. The drive unit is designed with ample capacity for lubrication reserve to maintain proper operating temperature.

The gearbox drive shafts shall be of heat-treated chrome nickel steel and at least 2-3/4" in diameter, on both the input and output drive shafts. They shall withstand the full torque of the engine in both road and pump operating conditions.

All gears drive and pump, shall be of highest quality electric furnace, chrome nickel steel. Bores shall be ground to size and teeth integrated, crown-shaved and hardened, to give an extremely accurate gear for long life, smooth, quiet running, and higher load carrying capability. An accurately cut spur design shall be provided to eliminate all possible end thrust.

The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected.

An in-cab control for rapid shift shall be provided that locks in road or pump.

Three warning lights with plates shall be provided to alert the operator when the drive unit has fully shifted from road to pump position. Two lights shall be located on the cabs instrument panel and the other on the pump panel adjacent to the throttle.

Section 05.3: Mechanical Seal

The midship pump shall be equipped with a high quality, spring loaded, and self-adjusting mechanical seal capable of providing a positive seal to atmosphere under all pumping conditions. This positive seal to atmosphere must be achievable under vacuum conditions up to 26 Hg (draft) or positive suction pressures up to 250 PSI.

The mechanical seal assembly shall be 2 inches in diameter and consist of a carbon sealing ring, stainless steel coil spring, Viton rubber boot, and a tungsten carbide seat, with a Teflon backup seal provided.

Only one mechanical seal shall be required, located on the first stage suction (inboard) side of the pump and be designed to be compatible with a one-piece pump shaft. A continuous cooling flow of water from the pump shall be directed through the seal chamber when the pump is in operation.

Section 05.4: Pump Shift

An air operated pump shift shall be installed in the chassis cab to engage the fire pump. Provisions shall be made for placing the pump drive system in operation using controls and switches that are clearly identified and within convenient reach of the operator while in the cab.

A green indicator light in the driving compartment and a green indicator light located at the pump operator's position shall be provided and shall be energized when both the pump shift has been completed and the chassis transmission is engaged in pump gear.

The light in the driving compartment shall be labeled "OK TO PUMP". The light on the pump operator shall be positioned adjacent to and preferably above the throttle control and shall be labeled "Warning: DO NOT OPEN THROTTLE UNLESS LIGHT IS ON". The green light on the pump operator's panel shall be energized when the pump is engaged, the transmission is in drive, and the parking brake is set.

Section 05.5: Pump Priming System

One (1) automatic air operated priming system shall be provided and installed. The unit shall be of all brass and stainless steel construction and designed for fire pumps of 1,250 GPM (4,690 LPM) or more. Due to corrosion exposure no aluminum or vanes shall be used in the primer design. The primer shall be three-barrel design with ¾" NPT connection to the fire pump.

The primer shall be mounted above the pump impeller so that the priming line will automatically drain back to the pump. The primer shall also automatically drain when the panel control actuator is not in operation. The inlet side of the primer shall include a brass 'wye' type strainer with removable stainless steel fine mesh strainer to prevent entry of debris into the primer body.

The priming system shall be capable of a vertical lift to 22 inches of mercury and shall be fully compliant to applicable NFPA standards for vertical lift. The system shall create vacuum by using air from the chassis air brake system through a three-barrel multi-stage internal "venturi nozzles" within the primer body. The noise level during operation of the primer shall not exceed 75 Db.

The primer shall require a minimum of 15.6 cubic foot per minute air compressor and shall be capable of meeting drafting requirements at high idle engine speed. The air supply shall be from a chassis supplied 'protected' air storage tank with a pressure protection valve. The air supply line shall have a pressure protection valve set between 70 to 80 PSIG.

The 12 volt primer control shall be an "automatic" type, with a pump panel three-way switch to operate an air solenoid valve. The air valve shall direct air pressure from the air brake system to the primer. To prevent freezing, no water shall enter the primer valve control.

A vacuum gauge 2" in diameter, with graduations from zero to 30 feet, shall be installed in the primer control panel. The gauge shall be physically connected to the vacuum side of the primer and read only when the primer is running so it will never see or be subject to damage from high pump intake pressures

The automatic priming switch shall have three positions as follows:

- "Prime" – the lower position shall be a momentary "push to prime". The "Prime" position shall allow the operator to "ramp" test the primer without the fire pump being engaged.
- "Off" -- center position
- "Auto-Prime" – in the upper position, a "green" LED pilot light shall be illuminated when the switch is in the auto-prime position. The "Auto-Prime" operates automatically when the pump pressure drops below 20 PSIG. The primer shuts "off" automatically when the pump pressure is re-established and exceeds 20 PSIG. The "Auto" mode only operates when the fire pump is engaged.

Section 05.6: Master Drain Valve

There shall be a master drain valve recessed mounted below the pump module under the side running board, connecting all drain lines, with the capacity to discharge water simultaneously from all locations to below the chassis frame rails.

Section 05.7: Thermal Relief Valve

A thermal protection device shall be included on the pump that monitors pump water temperature and opens to relieve water to cool the pump. The thermal protection device shall be set to relieve water when the temperature of the pump water exceeds 120o F (49 C). The components of the thermal protection device shall be manufactured of brass and stainless steel and be compatible with most foam concentrates. The thermal protection device shall have 1-1/4 inch NPT threads for easy adaptability to existing pump discharge openings. The discharge line shall be 3/8 inch diameter tubing vented to atmosphere or back to the booster tank. The thermal protection device shall have a hydrostatic test rating of 600 PSIG.

The thermal protection device shall include a chrome panel placard with warning lamp and lamp test button and a pump panel mounted buzzer that provides audible warning of an overheat occurrence of the pump.

Section 05.8: Pump Anode System

The Fire Pump shall be equipped with replaceable anodes. The pump shall have one anode on each intake section and one anode on the discharge section of the Fire Pump.

Section 05.9: U.L. Test Points

An Underwriters Laboratories approved engine speed counter shall be located on the pump panel to provide a means to certify the tachometer. In addition, two (2) U.L. test plugs shall be pump panel mounted for testing of vacuum and pressures.

Section 05.10: U.L. Certification, 1250 Gpm

The vehicle shall be third party tested and certified by Underwriters Laboratories, Inc. The testing organization must not represent, be associated with, or in the manufacture or repair of automotive fire apparatus and must be nationally recognized testing laboratory recognized by OSHA.

The pump shall meet and perform the following test to receive a U.L. Certification.

- 100% of rated capacity at 150 PSI net pump pressure
- 100% of rated capacity at 165 PSI net pump pressure
- 70% of rated capacity at 200 PSI net pump pressure
- 50% of rated capacity at 250 PSI net pump pressure

Section 05.11: Pump Test Certification Plate

A permanently affixed plate shall be installed at the pump operator's panel. It shall provide the rated discharge and pressures together with the speed of the engine as determined by the certification test for each unit. It shall also provide the position of the parallel/series pump used and the no load governed speed of the engine as stated by the engine manufacturer on a certified brake horsepower curve.

A label shall be provided on the pump operator's panel that states the following:

"Warning: Death or serious injury might occur if proper operating procedures are not followed". The pump operator as well as individuals connecting supply or discharge hoses to the apparatus must be familiar with water hydraulics hazards and component limitations.

Section 05.12: Pump Suction Headers

A 6" NST non-gated suction header with removable screen, and long handled cap shall be provided on the left side of the pump.

A 6" NST non-gated suction header with removable screen, and long handled cap shall be provided on the right side of the pump.

Section 05.13: Intake Relief Valve

An Akron Model 59 suction side relief valve provided and installed within the pump system. The relief valve shall be adjustable from 50-175 psi and set at the factory at 125 psi.

Section 05.14: Tank To Pump

One (1) 3" ball valve shall be installed between the pump and the water tank. The tank to pump valve shall be a quarter turn fixed pivot design constructed from bronze. The valve shall be controlled by a chrome push/pull locking "T" handle installed at the left pump panel.

A clapper check valve shall be installed between the suction side of the pump and the tank-to-pump valve. This clapper valve shall eliminate the possibility of a pressure surge expanding the water tank.

Section 05.15: Tank Fill

There shall be a 1-1/2" pump to tank fill line installed, with a 1-1/2" inline bronze valve and high-pressure flexible hose tested to 1200 PSI. The valve shall be push-pull (locking "T" handle) controlled from the pump operator's panel.

Section 05.16: Engine Cooler

The engine cooler shall be installed in-line from the discharge side of the pump, and installed in the engine cooling system. There shall be a 1/2", quarter turn valve installed thru the pump panel and shall be clearly labeled.

Section 05.17: Pump Cooler

The pump shall have a 3/8" line installed from the pump discharge, to the water tank to cool the pump during long periods of pumping when water is not being discharged. The pump cooler shall be controlled from the pump operators panel by a 3/8" valve consisting of a cast bronze body with 1/4 turn chrome plated bronze ball, reinforced Teflon seals, and blow-out-proof stem rated to 600 PSI. The valve shall be installed thru the pump panel and clearly labeled.

Section 05.18: Plumbing System

All suction and discharge lines of 2" or larger shall be constructed of a minimum of Schedule 40 galvanized steel or stainless steel pipe where vibration or chassis flexing may damage or loosen threaded pipes, Victaulic or Roustabout couplings shall be used. All suction and discharge outlets shall have National Standard Threads (NST) and designed for 500 PSIG including, valves, drain cocks, lines, intake, and outlet closures, excluding the tank fill and tank to pump lines (tank side of the valves).

The Pump system shall utilize an integral discharge manifold system that allows a direct flow of water to all discharge valves.

Section 05.19: Valve Controls

All discharge valves shall be heavy-duty swing-out with stainless steel ball and shall be controlled from the pump operator's panel unless otherwise specified.

The heavy-duty valves shall be designed for operating pressures to 250 psi (17 bars) and include the following:

- 10-year warranty against manufacturer's defects
- Available in 1" to 4" sizes
- 90° handle travel 316 stainless steel ball with Hydromax technology
- Improved sealing & increased gating ability
- Flow optimization reduces turbulence while in the gated position and requires lower operating forces
- No lubrication or regular maintenance required
- Simple two seated design (no O-Rings to cut or lose during assembly or maintenance)
- Designed and tested to exceed NFPA requirements
- Cast, machined and assembled in the US

All valves shall meet current NFPA 1901 Standards for valve operating speeds when controlled by gear, electric actuator, or slow close device.

Section 05.20: Intake (suction) Valve 2-1/2 inch Pump Panel

One-(1) 2-1/2" swing operated ball valve shall be installed at the pump panel, left rear plumbed to the suction side of the pump with 2-1/2" piping, 2-1/2" FNST chrome inlet swivel, brass inlet strainer, chrome plug with chain, and 3/4" drain valve.

One-(1) 2-1/2" swing operated ball valve shall be installed at the pump panel, right rear plumbed to the suction side of the pump with 2-1/2" piping, 2-1/2" FNST chrome inlet swivel, brass inlet strainer, chrome plug with chain, and 3/4" drain valve.

A warning plate permanently affixed in close proximity of the suction inlet shall be installed stating:

"WARNING - SERIOUS INJURY OR DEATH COULD OCCUR IF INLET IS SUPPLIED BY A PRESSURIZED SOURCE WHEN THE VALVE IS CLOSED".

Section 05.21: Discharge Elbows

All 2-1/2" side discharge outlets shall terminate with chrome-plated 30-Degree elbows with 2-1/2" MNST threads, chrome vented cap and chain.

Section 05.22: Crosslays, 1-3/4 inch

Two (2) pre-connected crosslay compartments shall be provided above the side mount operator's panel accommodating 200' of 1-3/4" double jacket hose each. Stainless steel nylon guided rollers shall be installed at each end of each tray with stainless steel scuff plates around the perimeter to protect the painted surface.

One-(1) 2" ball valve with mechanical swivel shall be installed controlling each crosslay. The valve shall be plumbed to the crosslay with 2" high-pressure flexible hose and stainless steel couplings. The high pressure

hose shall be tested to 1200 PSI. The crosslay valves shall be push-pull controlled at the pump operator's panel.

Each discharge is equipped with a 3/4 quarter-turn drain valve.

The crosslays shall be labeled

“Pre-connect 1”

“Pre-connect 2”

Section 05.23: Crosslay, 2-1/2 inch

One-(1) pre-connected crosslay compartment shall be provided above the side mount operator's panel accommodating 200' of 2-1/2" double jacket hose. Stainless steel nylon guided rollers shall be installed at each end with stainless steel scuff plates around the perimeter to protect the painted surface.

One-(1) 2-1/2" ball valve with mechanical swivel shall be installed. The valve shall be plumbed to the crosslay with 2-1/2" high-pressure flexible hose and stainless steel couplings. The high pressure hose shall be tested to 1200 PSI. The crosslay valve shall be push-pull controlled at the pump operator's panel.

Each discharge is equipped with a 3/4 quarter-turn drain valve.

The 2.5 inch crosslay shall be labeled: “Pre-connect 3”

Section 05.24: Crosslay Dividers

Two-(2) adjustable crosslay hose bed dividers shall be provided manufactured from 1/4" (.250") smooth aluminum plates, extruded aluminum bases mounted in an extruded track for horizontal adjustment, with radius corners, and DA sanded to prevent damage to the hose.

Section 05.25: Crosslay Cover

There shall be a crosslay cover provided with the apparatus secured along the top closures and ends which protects the crosslay hose. The cover shall prevent hose from deploying during normal operations meeting the current NFPA requirements. The cover shall consist of heavy duty black nylon webbing in a weave pattern covering the hose beds and extending down to the sides of the pump panel. The webbing shall be secured at the top and bottom edges with easily removable components.

Section 05.26: Discharges, 2-1/2 inch

Two (2) 2-1/2" Heavy-Duty ball valve with 3/4" drain shall be installed at the pump panel left front plumbed to the discharge side of the pump and controlled from the pump operator's panel.

One-(1) 3" Heavy-Duty (Slo-Close) ball valve with 3/4" drain shall be installed on the right pump panel, right and shall be plumbed to the discharge side of the pump and equipped with 3" NST threads chrome cap and

chain and controlled at the pump operator's panel. One (1) 3" FNST rocker lug x 5" Storz, adapter with 30 degree turn down shall be supplied with the apparatus and connected to the right side 3" discharge and include one (1) 5" Storz cap with chain.

One-(1) 2-1/2" Heavy-Duty ball valve with 3/4" drain shall be installed on right pump panel and plumbed to the discharge side of the pump and controlled from the pump operator's panel.

One-(1) 2-1/2" Heavy-Duty ball valve with 3/4" drain shall be plumbed to the upper right rear of the apparatus terminating in a 2-1/2" FNPT x 2-1/2" MNST with chrome cap and chain and controlled at the pump operator's panel. This discharge shall be positioned so that a 2 ½ inch attack hose could be loaded in the hose bed or used as a supply to other vehicles from the rear of the apparatus.

Section 05.27: Deck Gun Plumbing and Deck Gun

One-(1) Akron 3" Heavy-Duty (Slo-Close) inline valve with 3/4" drain shall be plumbed to the Deck Gun discharge outlet with 3" pipe terminating in a 3" FNPT x four-(4) bolt flange controlled from the pump operator's panel.

A removable Task Force Tips Crossfire monitor shall be provided and installed on the deck gun discharge flange and include a TFT Extend-a-Gun mounting device and include the following:

- a) Crossfire Monitor
- b) STOW-A-WAY
- c) Extend-A-Gun
- d) Master Stream Automatic Nozzle rated at 1250 GPM
- e) Quad Stack Tips
- f) Stream Straightener
- g) Monitor not stowed warning light and buzzer.

Section 06.0: Water Tank

The tank shall have a capacity of 750 U.S. gallons and shall be constructed of polypropylene material. This material shall be a non-corrosive stress relieved thermoplastic and UV stabilized for maximum protection. Tank shell thickness may vary depending on the application and may range from ½ to 1" as required. Internal baffles are generally 3/8" in thickness.

The water tank shall be of a specific configuration and is so designed to be completely independent of the body and compartments. Joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method shall provide a liquid barrier offering leak protection in the event of a weld compromise. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal. The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" PT3™ polypropylene. All partitions shall be equipped

with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow.

All swash partitions interlock with one another and shall be completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength.

Section 06.1: Water Fill Tower and Cover

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" PT3™ polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. The tower shall be located in the left front corner of the tank unless otherwise specified by the tank manufacturer to the purchaser. The tower shall have a 1/4" thick removable polypropylene screen and a polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid. Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of 4" that is designed to run through the tank, and shall be piped to discharge water behind the rear wheels as required in NFPA 1901 so as to not interfere with rear tire traction.

The tank cover shall be constructed of 1/2" thick polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels shall extend through the covers and shall assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall accommodate the necessary lifting hardware.

Section 06.2: Sump

One (1) sump shall be provided in the bottom of the water tank. The sump shall be constructed of a minimum of 1/2" polypropylene and be located in the left front quarter of the tank. The sump shall have a minimum 3" NPT threaded outlet on the bottom for a drain plug per NFPA 1901 that shall be used as a combination clean-out and drain. Tank shall have an anti-swirl plate located approximately 3" above the inside floor.

Section 06.3: Tank Outlets

There shall be two (2) standard tank outlets: one for the tank-to-pump suction line, which shall be sized to provide adequate water flow to the pump; and, one for tank fill line, which shall be sized according to the NFPA minimum size chart for booster tanks. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates of up to 1000 GPM. All auxiliary outlets and inlets must meet all NFPA guidelines in effect at the time of manufacture.

Section 06.4: Tank Mounting

The tank shall rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40 inches, cross member spacing must be decreased to allow for not more than 400 square inches of unsupported area. The tank must be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of 1/4" x 1". The rubber must be installed so it shall not become dislodged during normal operation of the vehicle. Additionally, the tank must be supported around the entire bottom outside perimeter and captured both in the front and rear as well as side to side to prevent tank from shifting during vehicle operation. A picture frame type cradle mount with a minimum of 2" x 2" x 1/4" mild steel, stainless steel, or aluminum angle shall be provided or the use of corner angles having a minimum dimension of 4" x 4" x 1/4" by 6" high are permitted for the purpose of capturing the tank. The tanks shall include adequate vertical hold down restraints to minimize movement during vehicle operation. Equipment shall not be mounted directly to the tank top unless provisions have been designed into the tank for that purpose. The tank shall be completely removable without disturbing or dismantling the apparatus structure.

Section 06.5: Capacity Certification

The water tank shall be tested and certified as to capacity. Each tank shall be weighed empty and full to provide precise fluid capacity. The tank shall include a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight. The manufacturer shall certify the capacity of the water tank prior to the delivery of the apparatus. This capacity shall be recorded on the manufacturer's record of construction and the certification shall be provided when the apparatus is delivered.

Section 06.6: Tank Water Level Gauges

LED tank indicators shall be installed on each pump panel. Total two (2) and shall include an electronic indicator module, a pressure sensor, chrome bezel, and a 10' sensor cable. The indicator shall show the volume of water in the tank on nine (9) super bright LED's. A wide view lens over the LED's shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of aluminum, and have a distinctive blue label.

Program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, and a data link to connect remote indicators. Low water warnings shall include flashing LED's at 1/4 tank, down chasing LED's when the tank is almost empty, and an output for an audio alarm.

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

Section 07.0: Heavy Duty Extruded Aluminum Fire Body

The apparatus body and subframe shall be constructed entirely of marine grade aluminum plate and extrusions.

Section 07.1: Apparatus Body Subframe

The main body support cross member extrusions shall be aluminum alloy, double "I" beam with a wall thickness of not less than 7/16" (.438"). These cross members shall extend the full width of the body to support the compartment framing. The cross members shall be welded aluminum extrusions. The frame rail extrusion shall be shaped in contour with the chassis frame rails. The frame rail extrusion shall be mounted over a 1/2" (.5") thickness, reinforced rubber cushion to isolate the aluminum subframe from the chassis steel frame rails. The apparatus body structure shall be securely fastened to the chassis frame rails with a minimum of six (6) 5/8" (.625") cross member OD, steel U-bolts. The main body support cross member shall have a gusset above and below each cross member. The gussets shall be constructed of aluminum alloy extrusion with a .190" wall thickness. The gussets shall be continuously welded with aluminum alloy welding wire to add support to the body sidewalls. The main body supports and the longitudinal double "I" beam supports shall have a "C" shaped rubber tank cushion installed on the top of each member. This rubber extrusion shall conform to the shape of the double "I" beam extrusion to keep the tank cushion in place. This method is used to prevent damage to the tank.

Absolutely no pop-rivets, screws or any other hardware shall be used to hold the rubber tank cushion in place.

Section 07.2: Body Construction

The complete apparatus body structure shall be an all welded construction and be free from nuts, bolts and other fasteners. Upon completion of the weldments, the body shall be completely sanded and deburred for removal of all sharp edges.

The body framework shall be formed from beveled aluminum alloy extrusions and electrically seam welded at each joint using aluminum alloy welding wire. Body sides shall be formed from smooth aluminum plates. The horizontal surfaces above the compartment tops shall be constructed from aluminum tread plate.

The horizontal and vertical frame member extrusions shall be 2.0" x 4.0" with a .190" wall thickness. The extrusion shall be made from aluminum alloy with extrusion outside radius corners. The longitudinal frame member, below the lower compartments shall be aluminum alloy extrusion with .190" radius corners. Each body corner shall be a extruded aluminum section and shall be welded as an integral part of the body. This extrusion shall have a 1" corner radius.

The wheel well shall be constructed with a minimum .190" wall thickness. The extrusion shall be made from aluminum alloy and have .190" outside radius corners. The extrusion shall be slotted the full length to permit an internal fit of 1/8" (.125") aluminum tread plate panels. The wheel well liners shall be constructed of

smooth aluminum plates and shall be bolted in place for ease of maintenance. Wheel well fenderettes shall be provided and of constructed of a #304 Stainless steel with a polished finish.

A deflection shield shall be mounted to the body subframe to keep road debris from entering the water tank area.

Section 07.3: Primary Hose Bed

A primary hose bed shall be constructed on top of the rear portion of that apparatus body and shall be sized to store not less than 1500 feet of DJRL 2.5 inch fire hose.

The hose bed sides shall be constructed of 3/16" (.1875") smooth aluminum plate welded to the extruded framework. There shall be an aluminum extrusion with .190" wall thickness running the entire length of the hose bed at the top for structural rigidity. The hose bed decking shall be constructed from anodized aluminum extrusions forming a one-piece grid. The entire deck shall be removable, in one piece, to allow ease of serviceability to the tank. The hose bed shall include an extrusion across the front and rear of the compartment for the installation of adjustable hose bed dividers.

A hose bed shall be provided that is not less than 67.5" wide and shall contain a minimum of 79 cubic feet of storage.

Two (2) adjustable hose bed divider(s) shall be manufactured from 1/4" (.250") smooth aluminum plate with an extruded aluminum base welded to the bottom. The divider shall have an extruded track to slide in to allow the hose bed to adjust for different hose capacities. One end of the divider shall have a 3" radius corner. The divider shall be sanded to prevent damage to hose.

A hose bed cover constructed of 16 oz. heavy-duty Hypalon shall be provided. Cover shall be fire retardant and installed over hose bed. The cover shall have chrome twist-locks and Velcro installed around the perimeter of the hose bed. The end of the hose bed cover shall be secured and cover the hose bed opening. The cover shall completely protect the hose in the hose bed and prevent hose from inadvertently deploying during normal operation.

The hypalon end flaps shall be secured at the bottom using snaps and Velcro. The end flaps shall completely protect the hose and prevent the hose from inadvertently deploying during normal operation.

The cover shall meet the NFPA requirement and be red in color.

Section 07.4: Compartment Construction

The compartment sidewalls shall be of one-piece construction. The walls shall be formed from 3/16"(.1875") smooth aluminum plate. All compartment floors shall be formed from 3/16"(.1875") aluminum tread plate.

The floors shall be welded in place with a continuous weld all around the perimeter to insure maximum strength.

The external compartment tops shall be constructed of 1/8" (.125") aluminum tread plate. The tops shall have a formed edge, which serves as a drip rail for the compartments below. The compartment tops shall be secured with stainless steel screws to allow for ease of removal for access to the bodies wiring harnesses.

The compartment seams shall be sealed with permanent pliable silicone caulking.

Each compartment shall be vented through a 3"W x 15"H louver that is machined stamped in a panel located in each body corner extrusion. The panel shall be removable to provide access to service wiring and other mounted components.

Section 07.5: Compartmentation

Full height rescue style compartments shall be utilized on both sides of the apparatus body.

Compartmentation, Street Side

One (1) full height compartment shall be provided forward of the rear wheels, measuring not less than 64" high x 39" wide with a single vertically hinged door opening of not less than 60" high x 39" wide.

One (1) full height compartment shall be provided behind the rear axle, measuring not less than 64" high x 55" wide with a double vertically hinged door opening of not less than 60" high x 55" wide.

One (1) equipment compartment shall be provided above the rear wheels, measuring not less than 29-1/2" high x 58" wide with a horizontally hinged lift up door opening of not less than 27-1/2" high x 58" wide.

The street side body compartments shall be not less than 26" deep for the full height of the compartments.

Compartmentation, Curb Side

One (1) full height compartment shall be provided forward of the rear wheels, measuring not less than 64" high x 39" wide with a single vertically hinged door opening of not less than 60" high x 39" wide.

One (1) full height compartment shall be provided behind the rear axle, measuring not less than 64" high x 55" wide with a double vertically hinged door opening of not less than 60" high x 55" wide.

One (1) equipment compartment shall be provided above the rear wheels, measuring not less than 29-1/2" high x 58" wide with a horizontally hinged lift up door opening of not less than 27-1/2" high x 58" wide.

The curb side body compartments shall be not less than 26" deep for the full height of the compartments.

Compartmentation- Center Rear Compartment

There shall be one-(1) compartment installed at the center rear of the apparatus. This compartment shall have two-(2) vertically hinged doors. The interior dimensions shall be approximately 46"W x 28"H x 47" deep. The compartment shall have a useable door opening of approximately 46"W x 28"H. This compartment shall be transverse including the area inside the left rear and right rear side compartments.

Section 07.6: Wheel Well Compartments

The body shall include compartments in the wheel well area capable of storing SCBA cylinders and wheel chocs as follows:

SCBA cylinder compartments shall be located in front of the rear axle and wheel chock storage shall be provided behind the rear axle in the wheel wells.

Street side:

One (1) SCBA cylinder compartment capable of holding two (2) SCBA cylinders
One (1) Wheel choc compartment capable of holding one (1) wheel choc.

Curb Side:

One (1) SCBA cylinder compartment capable of holding two (2) SCBA cylinders
One (1) Wheel choc compartment capable of holding one (1) wheel choc.

The SCBA cylinders and wheel chocs shall be externally secured in each storage area by a hinged door which shall be secured in the closed position by a push button latch. The doors shall have a brushed stainless steel finish. A dielectric barrier shall be provided between the door hinge, hinge fasteners and the aluminum apparatus body.

Each storage area shall provide individual storage and shall not allow forward or rearward movement of the equipment within the compartment. The SCBA cylinders and wheel chocs shall be removable from the storage area without coming into contact with any surface area of the wheel well.

So as to prevent cylinder damage, the bottom of each SCBA cylinder wheel well compartment shall be lined with a ribbed rubber matt.

Wheel choc compartments shall include NFPA compliant wheel chocs. Undersized chocs may fail to restrain vehicle. The vehicle may either roll over or crush an undersized choc, possibly resulting in bodily injury or property damage, therefore Zico aluminum chocs or equal meeting the following salient characteristics shall be provided and stored within the specified compartments:

- a) High-tensile strength aluminum construction
- b) Large rear-opening hand grip
- c) Double row of rugged teeth to grip virtually any firm surface.
- d) Recommended for tires up to 32" in diameter.
- e) NFPA compliant
- f) SAEJ348 compliant
- g) Third-party tested
- h) Must fit within the specified compartments.

Section 07.7: Internal Ladder and Pike Pole Storage Compartment

A compartment shall be provided on the rear of the apparatus for the storage of the NFPA required ground ladders. Each ladder shall be stored within the body on polished aluminum extrusions with polymer material on the base to aid in loading and off-loading the ladders. Each ladder and pike pole shall be separated by aluminum plate and/or extrusions so as to protect the ladders and pike poles. If any components of the ladder compartment extend into the pump module, those components must be bolted on so as to be removable for servicing of the fire pump. The following ladders and pike poles shall be provided and installed within the ladder compartment:

- one-(1) 24 foot aluminum extension ladder with 1/2" diameter halyard
- one-(1) 14 foot aluminum roof ladder with hooks and with reinforcing braces for increased rigidity
- one (1) 10 foot aluminum folding attic ladder
- one (1) 6 foot I beam pike pole
- one (1) 8 foot I beam pike pole

Extension and roof ladders must have field repairable factory parts and be equipped with high strength steel butt spurs and rounded aluminum top caps for increased durability.

All ladders must meet NFPA 1931. All ladders to be Alcolite. All pike poles to be Zico I Beam.

Section 07.8: Compartment Doors

The body compartment doors shall be constructed entirely from smooth aluminum plate using a box pan configuration. The outer panel shall be constructed from 3/16" (.1875") smooth aluminum plate and the inner pan stitch welded in place from 1/8" (.125") smooth aluminum plate.

There shall be a 1/4" (.250") hole installed in the lower corners of the inside door pans for drainage. The doors shall have a closed cell neoprene rubber gasket installed around the perimeter of the door to remove water.

Exterior compartment door latch shall incorporate a Trimark D type handle buffed copper-nickel-chrome plated or equal meeting the following salient characteristics:

- a) For ease of operation, the D-handle opening shall be large enough to accommodate a gloved hand.
- b) Must be designed and approved for Emergency vehicle compartment doors
- c) Must be stainless steel
- d) All compartment door handles must be locking
- e) May be orientated at 90° intervals with the paddle depending on application
- f) Gasket for flange of housing to provide resistance to water and dirt infiltration
- g) Easy drop-in installation

The doors shall be securely fastened to the apparatus body with full-length stainless steel piano hinges using 1/4-20 stainless bolts and locking nuts. The hinges shall be slotted to allow for adjustments.

Absolutely no self-tapping screws or pop rivets shall be acceptable to mount the door mechanisms or slam latch assemblies.

Section 07.9: Compartment Shelving

Adjustable shelves shall be constructed from 3/16" (.1875) smooth aluminum. The adjustable track shall be made from aluminum extrusions. The shelf shall have a 2" lip on all sides, vertically welded in the corners, for additional strength.

Fully adjustable shelves shall be provided as follows:

There shall be two (2) adjustable shelves provided in the L1 and R1 compartments

There shall be two (2) adjustable shelves provided in the L3 and R3 compartments

Section 07.10: Compartment Lighting

All compartments shall be fully illuminated using not less than two (2), 2 5/8" diameter Firefly LED compartment lights wired to the door ajar system activated when the door is in the open position. Each light shall have not less than four (4) white LEDs that generate a rated 650 lumens at 12 vdc/0.8amps or 24 vdc /0.4 amps. The lens shall produce a flood beam for wide illumination. The light housing shall be aluminum with a chrome colored bezel.

Section 07.11: Compartment Door Ajar Switches

All apparatus body doors shall be provided with an auto door switch. These switches shall operate the compartment interior lights and activate the door ajar indicator on each side of apparatus body when the door

is opened. There shall be a red LED door ajar light mounted in the cab, in view of the driver to indicate an unsecured door. There shall be a buzzer mounted in the cab that shall alert the driver.

Section 07.12: Compartment Interior Finish

The interior of all body compartments shall be a natural aluminum finish.

Section 08.0: Body Trim, Steps, and Associated Components

The following body trim and components shall be provided and installed:

Drip Rails:

- A drip rail shall be located over each compartment door. This drip rail shall form a lip over the exterior door pans to prevent water from running into a compartment.

Aluminum Rub Rail:

- An aluminum rub rail shall be installed on both sides of the lower body compartments. The rub rail shall be constructed from "C" channel extrusion. The aluminum rub rail shall be bolted in place with stainless steel bolts, and spaced from the fire body to provide body protection. The rub rail shall serve as protection to the side doors when encountering close objects. Tread plate rub rails or welded on shall not be acceptable.

Steps: NFPA compliant steps shall be provided as follows:

- Three (3) large chrome-folding steps with a minimum surface area of thirty-five (35) square inches shall be mounted on the front face of the left side forward compartments. These steps shall be utilized to provide access to the deck gun area.
- A full width intermediate step shall be provided on the rear below the hose bed. NFPA compliant embossed aluminum diamond plate, shall be utilized. The step shall be 8" deep x full width.
- Two (2) rear lighted steps installed on the apparatus, one each side below the intermediate rear step. The steps shall have a minimum of thirty-five (35) square inches of surface area to conform to the NFPA 1901 standards. The steps shall include a 12-volt LED light to illuminate the area below. These steps shall be utilized to access the hose bed.
- All running board and step surfaces shall comply with NFPA 1901.

Handrails: NFPA compliant handrails shall be provide to include the following:

- Two-(2) handrails shall be located on the rear of the apparatus, one-(1) handrail per side. Each handrail shall be constructed of 1-1/4" knurled aluminum. The handrails shall be mounted with chrome plated end stanchions. Each handrail shall be sufficient in length to meet all standard requirements.
- An intermediate handrail shall be installed on the apparatus below the hose bed. The handrail shall be constructed of 1-1/4" knurled aluminum. The handrail shall be mounted with chrome plated end stanchions.

Rear Tailboard and Beavertails:

- A rear mounted tailboard of not less than 20 inch in width shall be provided and installed and constructed with anodized aluminum extrusion/s. The tailboard shall be slotted punched and raised to provide superior traction during wet and cold weather operations. The rear tailboard shall be a two-piece design. The rear tailboard shall bolt on with stainless steel nuts and bolts for replacement. The rear tailboard shall have a space of approximately 1/4" from the rear of the body to allow water runoff.
- Slanted beavertails shall be provided at the rear of the body. The beavertails shall be constructed of 2" x 2" x .190" thickness aluminum alloy extrusions with .190" radius corners. There shall be a removable panel on either side of the extrusion that is constructed of 1/8" (.125") aluminum tread plate.
- Two-(2) stanchions shall be mounted at the rear of the apparatus hose bed, one (1) each side. The stanchions shall be 11" long x 3-3/4" wide and manufactured out of polished cast aluminum. Stainless steel scuff plates shall be installed in the hose bed area to prevent deploying hose from damaged on stanchion supports. The stanchions shall provide mounting positions for the Zone C warning lights and additional hose bed lighting. All wiring for the upper rear lighting shall be concealed inside the stanchions.

Section 08.1: Trays, Hard Suction Hose

Two-(2) aluminum suction hose storage trays shall be installed, one-(1) each side above the body compartments. Each tray shall hold one-(1) 10' section of six (6) inch hard suction hose and have spring latches to hold hose in position.

Suction hose trays shall include light weight PVC Suction Hose with NH Long Handle Female x Rocker Male with clear webbing that allows for visual monitoring and enhanced ribbing to eliminate collapse. One (1) 6 inch aluminum barrel strainer shall also be provided and attached to the hard suction hose. The strainer shall be constructed of 6061-T6 lightweight aluminum and hardcoated to MIL-A-8625 Type III, Class 1 spec to resist corrosion and abrasion.

Section 09.1: Apparatus Body Electrical System

The cab and body electrical system shall be a multiplex system and designed as an integrated electrical package specifically engineered for fire apparatus application.

All chassis wiring shall be type "GXL" in accordance with S.A.E. J1128 and NFPA-1901. Wiring shall be color coded and include function codes every three (3) inches on both sides.

All electrical wiring harnesses shall be covered by a black split convoluted loom, rated at a minimum of 275° F.

All electrical nodes and other components must be housed in an easily accessible location that is water resistant and protected from damage.

All internal wire end terminals, including locking bulkhead connectors, shall be mechanically affixed to the wire ends by machine terminal crimping presses. No hand-crimped terminals shall be acceptable.

All internal splices shall be ultrasonically welded connections - no butt style connections shall be acceptable. All internal wiring shall be of the high temperature GXL type wire and shall be protected by wiring duct wherever possible.

The complete body electrical system shall be 100% documented and contain independent circuit diagrams with point to point wiring information, as shall as a general component diagram included in the apparatus manual.

Section 09.2: 12-Volt Testing

The apparatus low voltage system shall be tested and certified. A copy of certification shall be provided with the apparatus.

Reserve Capacity Test: The unit shall be run until all engines, engine compartment temperatures are stabilized and the battery system is fully charged. The engine shall be shut off and the minimum continuous electrical load be activated for ten-(10) minutes. All electrical loads shall be shutoff after ten-(10) minutes and the battery system shall then be capable of restarting the engine.

Alternator Performance Test at Idle: Minimum continuous electrical loads shall be activated while the unit is at idle speed.

Alternator Performance Test at Full Load: The total continuous electrical load shall be activated with the engine running up to the 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 the test. If however, an alarm is sounded by excessive battery discharge as detected by the system or a system voltage of less than 11.8 volts DC for a 12-volt nominal system for more than 120 seconds, shall be considered a test failure.

Low Voltage Alarm Test: The engine shall be shut off and the total continuous electrical load shall be activated and continue to be applied until the excessive battery discharge alarm activates. The test shall be considered a failure if the alarm has not sounded within 140 seconds after the voltage drops to 11.8 volts.

Section 09.3: EMI/RFI Protection

The apparatus shall be manufactured to incorporate the latest designs in the electrical system with components that are state of the art to insure electromagnetic interference (EMI) and radio frequency interference (RFI) emissions are suppressed at the source.

The apparatus shall have the ability to operate in typical fire and rescue situations with no adverse effects from EMI and/or RFI.

The apparatus shall utilize components that are fully protected and wiring that utilizes shielding and loop backgrounds where required to control EMI/RFI susceptibility. The apparatus shall be bonded through ground straps. Relays and solenoids that are suspect to generating spurious electromagnetic radiation are diode and/or resistor protected to prevent transient voltage spikes.

In order to prevent the radio frequency interference completely the purchaser shall be requested to provide a listing of the type, power output, and frequencies of all radio and bio medical equipment that is proposed to be used on the apparatus.

Section 09.4: Back-Up Alarm

There shall be one-(1) electronic back-up alarm installed at the rear of the apparatus. The alarm shall be wired to the transmissions output signal and is automatically activated when the transmission is shifted into reverse.

Section 10.0: Lighting and Associated Equipment

All lighting shall be LED and shall be of the same brand. M series LED lighting shall be utilized wherever possible. All lighting shall be securely mounted and all associated wiring must be concealed and/or protected from damage. All lighting shall meet NFPA 1901, latest edition.

Section 10.01: Warning Lights, Zone A Upper

One (1) NFPA Low Current Linear Super-LED Lightbar 60 inches in length shall be provided and installed on the cab roof facing forward. The lightbar shall provide 360 degree two level light pattern and shall meet the requirements of NFPA 1901. All lenses shall be clear. The lighting configuration shall be:

- Corners: Four (4) red LED
- Front: 2 Red 2 White
- Back: All red LED
- Ends: Red, Square Ends.

The light bar shall be controlled in the following manner:

Calling for Right of Way - All Positions

Blocking Right of Way - Clear shall not be Active

The lights shall be activated by a single emergency light switch located on the master light switch panel in the cab.

Section 10.02: Lights, Zone C Upper

One (1) pair of super-LED lights shall be installed one each side on the upper rear outer corners of the apparatus. The combination tailboard light shall incorporate a rotobeam series beacon and a M7 series super LED warning light in a polished aluminum housing. All lens shall be clear and all LEDs shall be red in color.

Section 10.03: Lights, Zone A Lower

Two-(2) TIR6 Series Super-LED shall be installed, one-(1) each side front of the apparatus. The warning lights shall incorporate red Linear Super-LEDs, a clear optic hard coated polycarbonate lens. The surface mount module shall include include a chrome flange and hardware for horizontal mounting.

Section 10.04: Lights, Zone B/D Front Lower

Two-(2) TIR6 Series Super-LED lights shall be installed, one-(1) each side forward portion of the apparatus. The warning lights shall incorporate red Linear Super-LEDs, a clear optic hard coated polycarbonate lens. The surface mount module includes a chrome flange and hardware for horizontal mounting.

Section 10.05: Lights, Zone B/D Midship Lower

Two-(2) TIR6 Series Super-LED lights shall be installed, one-(1) each side midship of the apparatus. The warning lights shall incorporate red Linear Super-LEDs, a clear optic hard coated polycarbonate lens. The surface mount module includes a chrome flange and hardware for horizontal mounting.

Section 10.06: Lights, Zone B/D Rear Lower

Two-(2) TIR6 Series Super-LED lights shall be installed, one-(1) each side rearward portion of the apparatus. The warning lights shall incorporate red Linear Super-LEDs, a clear optic hard coated polycarbonate lens. The surface mount module includes a chrome flange and hardware for horizontal mounting.

Section 10.07: Lights, Zone C Lower

Two-(2) M Series Super-LED shall be installed, one-(1) each side on the lower rear of the apparatus. The warning light shall incorporate red Linear Super-LEDs, a clear optic hard coated polycarbonate lens, and utilize a metalized reflector with integrated TIR hybrid optics for maximum output. The hard coated lens shall provide extended life/luster protection against UV and chemical stresses. The encapsulated lens/reflector assembly and conformal coated PC board shall provide additional protection against environmental elements. The solid state warning lights shall be vibration resistant. The self-contained flashing light shall have 14 Scan-

Lock flash patterns including synchronize feature and steady burn. The warning light is covered by a five year factory warranty.

Section 10.08: Stop, Turn and Back-Up Lights

Stop, turn and backup lights shall be 600 series LED mounted in 3 lamp polished aluminum housing for Vertical Mounting. Fixtures shall be surface mounted on each rear face of the body and include LED light heads for the red stop light, the turn light amber with directional arrow, and a clear LED backup light.

Section 10.09: Lights, Swivel Mount Deck

Two-(2) LED deck lights with low profile Pedestal/Swivel Mount shall be installed one-(1) each side at the rear of the apparatus. The deck lights shall also serve as rear work lights to illuminate the rear of the apparatus to meet NFPA-1901 requirements. Each light shall be manually operated and switched on and off at the light. Each light shall include:

- Flood light shall produce not less than 3,700 usable lumens
- Each light head shall include not less than 12 super LEDs
- Pedestal Mount with Removable handle
- White rugged die cast aluminum, powder coated housing
- Combination floodlight and spotlight
- Instant On/Off
- Solid-state electronics

Section 10.10: Clearance Lights and Reflectors

Clearance lights and reflectors shall be LED lights, which include (2) red marker lights, (4) red rectangular reflectors, (2) amber rectangular reflectors and (1) red three light cluster recessed in the rear step.

Section 10.11: LED License Plate Light

One (1) LED light shall be provided at the rear of the apparatus to illuminate the license plate and meet SAE J592 requirements. The steady burn illumination light shall incorporate three clear LED and a clear non-optic hard coated polycarbonate lens.

Section 10.12: LED Perimeter Illumination

Eight (8) 3" Round Super-LED® perimeter illumination light(s) shall be provided for underbody lighting. The lights shall be mounted one each side under the cab steps, one each side under the pump panel/front body corner and two under the rear tailboard.

The steady burn illumination light shall incorporate six clear Super-LED and a clear non-optic hard coated polycarbonate lens for maximum output. The hard coated sealed lens shall provide extended life/luster protection against UV and chemical stresses. The light shall be wet sealed and vacuum tested to ensure proper sealing. The conformal coated PC board, powder coated die cast housing, and exterior rubber gasket shall

provide additional protection against environmental elements. The light shall provide not less than 360 usable lumens. The solid state illumination light shall be vibration resistant. The light shall include a 6" unterminated pigtail.

Section 10.13: LED Step Illumination

Two (2) 3" Round Super-LED® perimeter illumination light(s) shall be provided as specified to light the folding steps on the left front body corner.

The steady burn illumination light shall incorporate six clear Super-LED and a clear non-optic hard coated polycarbonate lens for maximum output. The hard coated sealed lens shall provide extended life/luster protection against UV and chemical stresses. The light shall be wet sealed and vacuum tested to ensure proper sealing. A conformal coated PC board, powder coated die cast housing, and exterior rubber gasket shall provide additional protection against environmental elements. The light shall provide not less than 360 usable lumens. The solid state illumination light shall be vibration resistant. The light shall contain a 6" pigtail.

All lighting fixtures shall be recess mounted so as to not present a trip hazard and to not interfere with cab access or be damaged by contact with personnel or equipment.

Section 11.0: Body Paint Finish

The body exterior shall have no mounted components prior to painting to assure full coverage of metal treatments. Box pan compartment doors shall be painted separately to assure proper paint coverage on body, doorjambs, and door edges.

All painting shall be in accordance with the paint manufacturer's recommendations so as to provide a lasting and high quality gloss finish and include:

- Metal surfaces shall be sanded to remove all burrs and imperfections, before etching and treatment.
- A wax & grease solvent shall be used to clean and prep the aluminum surface. The surface shall then be rinsed with fresh water. This step removes wax, grease and other surface contaminants, thus leaving a bright, clean, and conditioned surface.
- A self-etching, metal primer shall be applied next. The self-etching primer shall fill all of the minor imperfections, scratches, etc. in the metal. This step produces a corrosion resisting conversion coating that prevents off oxidation and other surface contaminants leaving a surface that gives excellent paint adhesion.
- A sandable primer shall be sprayed on the metal that seals the surface for the polyurethane paint. A minimum coating thickness of 2 MIL shall be applied. Primer is then sanded smooth leaving the best surface for topcoat.
- The apparatus body shall then be painted with a minimum of three-(3) coats of color.

The body and components shall be thoroughly protected against corrosion and/or oxidation caused by contact between dissimilar metals. These areas shall be protected by the use of corrosion resistant primers, gaskets and "ECK" (electrolytic corrosion material) or any equivalent material.

Section 11.1: Paint Colors

The cab shall be shall be painted in a two tone paint pattern. It shall be painted white from the bottom of the window line up and red from the bottom of the window line down. The body shall be painted red. Exact colors shall be chosen at the pre-construction conference from manufacture supplied color chips.

One quart of touch-up paint in each selected color shall be provided and delivered with the vehicle.

The frame rails and associated components shall be high gloss black.

Section 12.1: Scotchlite Striping

Cab and Body Stripe: A 4" wide stripe of white retro-reflective material shall be provided and installed completely around the front and both sides of the apparatus. A 1/2 inch stripe of the same material shall be applied directly above and below the 4 inch stripe. The stripe shall be installed in accordance with current NFPA 1901 requirements.

Cab Doors Interior Reflective Material: There shall be not less than 96 square inches of a yellow/red color chevron reflective material installed on the inside lower panel of each cab door in accordance with NFPA 1901.

Rear Chevron Stripe: The rear vertical surface of the unit shall be overlaid with a reflective material, installed in an alternating "Chevron" pattern (sloping down and away from the centerline) at a 45-degree angle. Each stripe shall be 6" wide and the colors of stripping shall be in compliance, with the current edition of NFPA 1901. Chevron striping design and coverage to be approved at the pre-construction conference.

The Chevron striping shall be 3M red and lime green.

Section 13.1: Vehicle Lettering

The apparatus shall be lettered using imitation gold leaf vinyl letters. So that the lettering can be proportional in size and appearance, the font and size shall be determined at the pre-construction conference. Lettering shall be as follows:

Cab Doors: Tennessee Fire and Codes Academy

ADDITIONAL SPECIFICATIONS

(A) DELIVERY - ALL DELIVERIES ARE TO BE MADE BETWEEN THE HOURS OF 8:00 A.M. AND 3:00 P.M. MONDAY THROUGH FRIDAY. VENDOR SHOULD NOTE THE DELIVERY ADDRESS ON THE PURCHASE ORDER AS MOST UNITS NO LONGER SHIP TO THE MOTOR VEHICLE MANAGEMENT OFFICE LOCATION.

(B) ACCEPTANCE - DELIVERY DOES NOT MEAN ACCEPTANCE. ALL VEHICLES ARE SUBJECT TO INSPECTION TO ESTABLISH CONFORMITY TO SPECIFICATIONS PRIOR TO ACCEPTANCE.

INVOICING OF VEHICLES & EQUIPMENT

AFTER RECEIPT OF A PURCHASE ORDER, THE VENDOR WILL BE REQUIRED TO SUPPLY AN INVOICE TO ORDERING AGENCY WHEN THE UNIT SPECIFIED IS BEING DELIVERED. FAILURE TO SUPPLY AN INVOICE MAY RESULT IN THE UNIT BEING RETURNED TO THE VENDOR UNTIL AN INVOICE CAN BE SUPPLIED.

THE SUCCESSFUL BIDDER SHALL SUPPLY THE "MSO" (MANUFACTURERS STATEMENT OF ORIGIN) AND AN ODOMETER STATEMENT WITH EACH APPLICABLE UNIT AT THE TIME OF DELIVERY. Back of MSO must be completed as follows: motor vehicle management,. 6500 Centennial Blvd. Nashville, TN 37243-0543

1) MINIMUM OF 1/4 TANK OF FUEL (BY FUEL GAUGE) UPON DELIVERY

2) SUCCESSFUL BIDDER TO SUPPLY THREE (3) SETS OF IGNITION KEYS AND THREE (3) SETS OF OTHER COMPONENT KEYS PER UNIT

3) PRE-DELIVERY ACCORDING TO MANUFACTURER'S STANDARD REQUIREMENTS

4) INVOICE TO INCLUDE IGNITION AND ALL OTHER KEY NUMBERS.

5) VEHICLE TO BE CLEAN INSIDE AND OUT WITH ALL APPLICABLE STICKERS REMOVED. PROTECTIVE COVERINGS AND PLASTIC TO BE REMOVED FROM SEATS.

6) WARRANTY: WILL BEGIN ON DATE VEHICLE IS PLACED IN SERVICE NOT TO EXCEED SIX (6) MONTHS FROM DELIVERY DATE.

7. DELIVERY MILEAGE – MAXIMUM ALLOWABLE MILES AT TIME OF DELIVERY IS 300 MILES. MILEAGE WARRANTY WILL BEGIN AT THIS MILEAGE AND THE FULL MANUFACTURER STANDARD WARRANTY WILL BE ADDED TO THE DELIVERY MILEAGE. i.e. 36,000 MILE WARRANTY PLUS 300 DELIVERY MILES EQUALS 36,300 MILES OF WARRANTY PERIOD.