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Finance Director  
City Clerk/Treasurer  
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## **City of Orangeburg South Carolina**

January 14, 2011

### Invitation for Quote 2011-0114

The City of Orangeburg is soliciting quotes for a Fire Pumper Apparatus, specifications are attached.

The City will collect all sealed bids, these can be mailed or delivered to: City of Orangeburg, P.O. Box 1183, 979 Middleton Street, Orangeburg, SC 29116, to the attention of Carrie Johnson/Connie McMichael. The bid opening is scheduled for Tuesday, February, 22, 2011, at 3 pm in Council Chambers next door to City Hall.

Once the bids are tallied and reviewed, all bidders will be notified to the results within ten days.

The City reserves the right to do any inspections on the said apparatus during times being constructed at the vendor's site.

If you have any questions in regards to the specifications, please contact Danny Dantzler at 803-533-5941.

If you have any questions on the bid requirements, please call me at 803-539-3713.

Sincerely,

Carrie W. Johnson  
Finance Director



P.O. BOX 1183 • 979 MIDDLETON STREET • ORANGEBURG, S.C. 29116-1183  
WWW.ORANGEBURG.SC.US

## **INVITATION TO BID**

### **INSTRUCTIONS TO BIDDERS**

Sealed bids will be received by \_\_\_\_\_ until \_\_\_\_\_ A.M. / P.M., at the City of Orangeburg, 979 Middleton Street, P.O. Box 1183 Orangeburg, SC 29115 for the furnishing of all necessary labor, equipment and material for the Fire Apparatus, and other equipment as outlined in the following specifications.

Bids will be addressed and submitted in accordance with the instructions provided above. The type of bid, bid opening date and time will be stated on the front of the bid envelope.

All specifications herein contained are considered as minimum. No exceptions to these minimum standards will be allowed relating to gauge, alloy, and type of metal, size of compartments and overall design. Bidders must state the brand of any item provided which is a substitute for the brand or model specified for evaluation by the bidder. The buyer reserves the right to require a bidder to provide proof in each case that a substituted item is equal to that specified. The buyer will be the sole judge in determination of acceptable substitutes.

Submit only one (1) bid that meets or exceeds the minimum specifications. No substitutes, stock units, or alternates will be permissible unless such units are requested later in the specifications. If this is done, the bidder will be automatically disqualified.

This apparatus will conform to the current edition of the National Fire Protection Association Pamphlet No. 1901.

All bids must be signed. Failure to do so will cause the bid to be non-responsive and rejected.

The competency and responsibility of Bidders will be considered in making the award. The Fire Department reserves the right to reject any or all bids, or to reject the bid of the bidder who, in the judgment of the buying authority is not in a position to perform the Contract. These specifications, together with any other documents required herein, will be included in the final contract. Each bidder will submit a copy of his proposed contract form. The purchaser reserves the right to reject a bid based on unacceptable provisions of a bidder's contract and does not obligate itself to accept the lowest or any bid.

It will be the responsibility of the bidder to assure that their proposal arrives at the proper location by the time indicated. Late proposals, telegrams, facsimile, or telephone bids will not be considered. Bids will not be considered from firms, individuals or the same owners of separate companies submitting more than one bid.

Any erasures, strike over's and/or changes to prices written in numerals should be initialed by the bidder. Failure to initial may be cause to reject the bid as irregular and disqualified from consideration.

A written review of the company, in chronological order, detailing the background of the manufacturer shall be provided as part of the Bid proposal.

If a vendor represents more than one Fire Apparatus Company, they will only bid the top of the line product that meets specifications.

The body is to be completely built, painted, and installed by the prime body manufacturer, which minimizes third party involvement on engineering, design, service, and warranty issues. Apparatus using a subcontracted body will not be acceptable.

THE PURCHASER WILL NOT ACCEPT ANY BIDS, WHICH DO NOT MEET THESE SPECIFICATIONS AND IS THE SOLE DECIDER TO DEEM WHICH BID IS IN THE BEST INTEREST OF THE PURCHASER.

### **INFORMATION REQUIRED WITH BID**

The fire apparatus and equipment to be furnished in meeting these specifications must be the product of an established reputable fire apparatus manufacturer of ten-(10) years or more. Each bidder will furnish satisfactory evidence of the manufacturer's ability to construct, supply service, parts and technical assistance for the apparatus specified. The bidder must state the location of the factory and full service center.

The general construction of the apparatus will give due consideration to the nature and distribution of the load to be sustained and the general character of the service to which the apparatus is to be subjected when placed in service. The body will be modular in design and construction of the latest modern type, for transfer of body to another chassis without cutting or welding.

Each bidder must submit a detailed proposal, which accurately specifies the construction method to be used in the apparatus. The purchaser will utilize this proposal to compare the unit proposed with the specifications. To facilitate comparison all bid proposal specifications will be submitted in the same sequence as the advertised specification. Any bidder who fails to submit a set of construction specifications, or who photocopies and submits these specifications as their own construction details will be considered non-responsive. Thus, render such proposal ineligible for award.

For the purpose of evaluation of the construction methods, components, and materials from various vendors the make up the apparatus body, the Fire Department may request each bidder to supply a cross section of a side body compartment no smaller than 1/4" in scale using full size components including the compartment door and hardware.

Sample will remain with the fire department for a minimum of fourteen-(14) days after the bid opening.

### **PAYMENT TERMS**

All bidders will be required to detail in exact terms the payment for said apparatus in their fire apparatus proposal.

### **EXCEPTIONS**

These specifications are based upon design and performance criteria, which have been developed by the fire department because of extensive research and careful analysis. Subsequently these specifications reflect the only type of fire apparatus that is acceptable at this time. Therefore, major exceptions to specifications will not be accepted.

The bidder will make accurate statements as to the apparatus weight and dimensions. All bids will include a complete set of detailed manufacturer's specifications. The Purchaser's standards for bidding Automotive Fire Apparatus must be strictly adhered to, and all bid forms and questions must be complete and submitted with the bid. Omissions and variations will result in immediate rejection of the bid.

Certified engineering performance information and thickness of materials used will be furnished in the bidder specifications.

To the right side of each paragraph of the fire department specifications, the bidder will state "YES" or "NO" indicating compliance with the specifications. All deviations, no matter how slight, will be clearly explained on a separate cover sheet entitled "EXCEPTIONS TO SPECIFICATIONS". Any exceptions or variations to these specifications must be set forth on separate sheets, indicating page number (s) of the specifications, and must be submitted with the bid. Any bids deemed as taking total exception to these published specifications will result in immediate rejection of the bid.

Proposals that are found to have deviations without listing them will be rejected. No Exceptions

No prototype apparatus will be considered and all design, operational and material features must fully comply with the State and Federal Motor Vehicle Safety Standards.

### **VEHICLE STABILITY**

A.

The height of the fully loaded is vehicle center of gravity will not exceed the chassis manufacturer maximum.

B.

The front to rear weight distribution of the fully loaded vehicle will be within the limits set by the chassis manufacturer. The front axle loads will not be less than the minimum axle loads specified by the chassis manufacturer, under full load and all other loading conditions.

C.

The difference in weight on the end of each axle, from side to side, when the vehicle is fully loaded and equipped shall not exceed 7%.

### **PERFORMANCE TEST AND REQUIREMENTS**

A.

The apparatus will meet the performance requirements at elevations of 2000 feet (610m) above sea level.

B.

The apparatus will meet the performance requirements while stationary on any grade of up to and including 6% in any direction.

C.

From a standing start, the vehicle will attain a true speed of 35 mph (56 kmph), within 25 seconds on a level road.

D.

The apparatus will obtain a minimum top speed of 50 mph (80 kmph) on a level road.

E.

The apparatus will be able to maintain a speed of at least 20 mph (32 kmph), on any grade up to and including 6%.

F.

The apparatus will be tested and approved by Underwriters Laboratories Incorporated in accordance with the standard practices for pumping engines.

### **ROAD TEST**

Each manufacturer will conduct road test to verify that the complete apparatus is capable of compliance:

A.

The test will be conducted on a dry, level, paved road that is in good condition. The engine will not operate in excess of the maximum no load governed speed.

B.

Acceleration test will consist of two runs in opposite direction over the same route.

C.

The vehicle will attain a true speed of 35 mph (56 kmph) from a standing start within 25 seconds.

D.

The vehicle will attain a minimum top speed of not less than 50 mph (80 kmph).

E.

If the apparatus is equipped with an auxiliary braking system, the apparatus manufacturers will road test the system to confirm that the system is functioning as intended by the auxiliary braking system manufacturer.

F.

The service brakes will bring the fully laden apparatus to a complete stop from an initial speed of 20 mph (32 kmph) in a distance not exceeding 35 feet (10.7M) by actual measurement, on a substantially hard, level surface road that is free of loose material, oil, or grease.

### **FAILURE TO MEET TEST**

In the event the apparatus fails to meet the test requirements of these specifications on the first trials, second trials may be made at the option of the manufacturer within thirty-(30) days from the date of the first trials. Such trials will be final and conclusive and failure to comply with changes, as the purchaser may consider necessary to conform to any clause of the specifications within thirty-(30) days after notice is given to the manufacturer of such changes will also be cause of rejection of the apparatus. Permission to keep or store the apparatus in any building owned or occupied by the purchaser or its use with the permission of the manufacturer will not constitute acceptance.

### **PRODUCT LIABILITY**

Each bidder will supply proof of product liability and facility insurance equal to or exceeding \$26,000,000.00.

### **WARRANTIES**

TO INSURE SINGLE POINT SERVICE SUPPORT, THE MANUFACTURER WILL CERTIFY THAT IT IS THE SINGLE SOURCE CONTACT FOR WARRANTY ON THE ENTIRE PRODUCT.

The following warranties will be provided:

- A. Chassis
- B. Chassis Frame Rails- Lifetime -Custom chassis only
- B. Chassis Frame Rails- Five Years- Commercial chassis only
- C. Engine
- D. Transmission
- E. Fire Pump
- F. Water Tank
- G. Apparatus Body
- H. Rust
- I. Paint

The warranty times will be defined later in the specification.

### **APPARATUS DELIVERY TIME**

All bidders will provide delivery of the pumper apparatus within 240 calendar days.

### **INFORMATION/CERTIFICATIONS**

The following information and original certifications will be required at time of delivery. The apparatus manufacturer will supply this information:

- (1) The manufacturer's record of apparatus construction details, including the following information:
  - (a) Owner's name and address
  - (b) Apparatus manufacturer, model, and serial number
  - (c) Chassis make, model, and serial number
  - (d) GAWR of front and rear axles
  - (e) Front tire size and total rated capacity in pounds (kilograms)
  - (f) Rear tire size and total rated capacity in pounds (kilograms)
  - (g) Chassis weight distribution in pounds (kilograms) with water and manufacturer mounted equipment (front and rear)
  - (h) Engine make, model, and serial number, rated horsepower, related speed, and governed speed
  - (i) Type of fuel and fuel tank capacity
  - (j) Electrical system voltage and alternator output in amps
  - (k) Battery make, model, and capacity in cold cranking amps (CCA)
  - (l) Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
  - (m) Pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
  - (n) Pump transmission make, model, serial number, and gear ratio
  - (o) Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
  - (p) Water tank certified capacity in gallons or liters
  - (q) Aerial device type, rated vertical height in feet (meters), rated horizontal reach in feet (meters), and rated capacity in pounds (kilograms)
  - (r) Paint manufacturer and paint number(s)
  - (s) Company name and signature of responsible company representative

- (2) Certification of slip resistance of all stepping, standing, and walking surfaces
- (3) If the apparatus has a fire pump or an industrial supply pump, the pump manufacturer's certification of suction capability
- (4) If the apparatus has a fire pump or an industrial supply pump, a copy of the apparatus manufacturer's approval for stationary pumping applications
- (5) If the apparatus has a fire pump or an industrial supply pump, the engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum governed speed
- (6) If the apparatus has a fire pump or an industrial supply pump, the pump manufacturer's certification of the hydrostatic test
- (7) If the apparatus has a fire pump or an industrial supply pump, the certification of inspection and test for the fire pump or the industrial supply pump
- (8) If the apparatus has an aerial device, the certification of inspection and test for the aerial device
- (9) If the apparatus has an aerial device, all the technical information, required inspections to comply with NFPA 1914, Standard for Testing Fire Department Aerial Devices
- (10) If the apparatus has a fixed line voltage power source, the certification of the test for the fixed power source
- (11) If the apparatus is equipped with an air system, test results of due air quality, the SCBA fill station, and the air system installation
- (12) Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall fire apparatus (with the water tank full but without personnel, equipment, and hose)
- (13) Written load analysis and results of the electrical system performance tests required in Chapter 13
- (14) When the apparatus is equipped with a water tank, the certification of water tank capacity

The Fire Apparatus Manufacturer will also provide documentation of the following items 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, pump (if applicable), and aerial device (if applicable)
- (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 and wiring
  - (b) Circuit identification

- (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) Lubrication charts
- (8) Operating instructions for the chassis, any major components such as a pump or aerial device, and any auxiliary systems
- (9) Precautions related to multiple configurations of aerial devices, if applicable
- (10) Instructions regarding the frequency and procedure for recommended maintenance
- (11) Overall apparatus operating instructions
- (12) Safety considerations
- (13) Limitations of use
- (14) Inspection procedures
- (15) Recommended service procedures
- (16) Troubleshooting guide
- (17) Apparatus body, chassis, and other component manufacturer's warranties
- (18) Special data required by this standard
- (19) Copies of required manufacturer test data or reports, manufacturer certifications, and independent third-party certifications of test results
- (20) A material safety data sheet (MSDS) for any fluid that is specified for use on the apparatus

The Fire Apparatus Manufacturer will deliver with the apparatus all manufacturers' operations and service documents supplied with components and equipment that are installed or supplied.

### **LETTER OF AUTHORIZATION**

A dealer/agent in the name of a particular manufacturer submits the bid, the bidder will include in the bid proposal, a copy of the appropriate Letter of Authorization, authorizing the dealer/agent to sign on behalf of the manufacturer.

### **LICENSES**

Each proposal must have all current licenses required by State law to do business in the State. This is to include BOTH the automotive manufacturer and automotive dealer licenses if required by State law. If the proposed is a manufacturer, bidding direct and not through a dealer or distributor, then the proposal will include copies of their manufacturer and automotive dealer licenses. If the proposed is a dealer or distributor, then they will submit a copy of the appropriate dealer license. Proposals failing to meet this

legal requirement cannot be considered.

### **LIABILITY**

The bidder, if his bid is accepted will defend against all suits, and assume all liability for the use of any patented process, advice or article forming a part of the apparatus of any appliance furnished under contact.

### **TILT TABLE**

The manufacturers shall possess and maintain the equipment required to perform the SAE J2180 standard (A Tilt Table Procedure for Measuring the Static Rollover Threshold for Heavy Trucks) in compliance with the latest addition of NFPA 1901, Section 4.13.1.1. In addition, all the equipment required for meeting current testing guidelines shall be located at the manufacturer's facility and actual testing performed and certified by an independent third party testing company. The bidder shall provide evidence that they comply with this requirement.

### **VIRTUAL MANUFACTURING**

The manufacturer shall have a web site available for the customers to 'watch' their unit being produced. The "Trucks in Production" shall be updated a minimum of three-(3) times per week.

The web site shall also include documentation of cab and body crash tests, take a virtual tour of the production facility, videos of both current and new innovative products, updates on trade shows, photos of new deliveries and the opportunity to include customer 'Action Photo's'.

Customer shall be able to access the web site without the requirement of a password.

### **CERTIFIED WELDERS**

The manufacturer shall employ individuals that are certified aluminum and stainless steel welders. The welders shall be certified by an outside testing laboratory. The certifications shall be available for viewing through the Human Resources office upon request.

### **BODY WEIGHT DOCUMENTATION**

The manufacturer shall body weigh each body prior to mounting on the chassis. The information shall be included in the documentation of the finished vehicle. Each body produced by the manufacturer shall be weighed, not just one body per model.

### **MANUFACTURER SERVICE CONTACTS**

The manufacturer must have a 24 hour/ 7 day a week, toll-free emergency hot line. The manufacturer must be capable of providing both in-house and on-site service for the apparatus. The service technicians shall be EVT certified in compliance with NFPA 1071 classifications F2 through F6. On-site service and maintenance shall be the primary function, to eliminate the vehicle having to leave the fire department jurisdiction. Copies of the certifications shall be made available through the Human Resources office.

### **SERVICE VEHICLES**

The manufacturer shall have a minimum of 10 full time, company owned, service vehicles. The vehicles shall be available 24 hours a day, seven days a week to respond to customer needs. The Service Vehicles shall be operated by full time EVT Certified Technicians.

### **REPLACEMENT PARTS**

Replacement parts shall be available directly from the manufacturer, and not through a dealer or a third party.

### **BID BOND**

A bid bond for 5% of the total bid amount shall be furnished with your bid. The manufacturer of the apparatus shall provide all bonds. The appropriate Surety agent shall countersign the bond.

### **PROPOSAL DRAWING**

There shall be a proposal drawing submitted to the Fire Department. This drawing shall be a visual interpretation of the apparatus proposed.

### **APPROVAL DRAWING**

Prior to construction, the successful bidder shall provide three approval drawings of the apparatus for the fire department's review. The drawings shall show such items as the chassis being utilized, lights, horns, sirens, pump panels, and all compartment locations and dimensions. The blueprint shall be a visual interpretation of the unit as it is to be constructed. The buying authority shall sign all drawings. One print shall be retained by the Fire Department, the dealer shall retain one print, and one print, shall be returned to the manufacturer.

### **CUSTOM FIRETRUCK CHASSIS**

The chassis shall be designed and manufactured by a custom chassis manufacturer. The manufacturer shall demonstrate evidence of manufacturing similar custom vehicles for at least fifty (50) years.

The chassis shall be designed and manufactured for heavy duty fire service with adequate strength and capacity for all components as detailed within these specifications.

### **CHASSIS FRAME**

The frame shall be designed to industry standards. The manufacturer shall provide a life time frame side rail warranty to the original purchaser of the chassis. The frame rails shall be 10.5" x 3.5" x .375" heat treated steel.

A 3/4 length inner frame side rail liner with dimensions of 9.687" x 3.125" x .3125" shall be provided for additional strength and reduce deflection. The frame liner shall extend from the centerline of the front axle and taper 45 degrees forward and shall extend to the rear of the main frame rail.

The frame side rails shall be 110,000 psi minimum yield and shall have a minimum section modulus of 30.38 cu. in., in the frame liner area, calculated by using the square corner shape method. The resulting frame rail resistance to bending moment shall be 3,341,800 in. lb. per rail.

To insure the maximum clamp load for the fastener prevailing torque the crossmembers shall be bolted in place using grade 8 bolts, hardened washers, and grade "C" distorted thread locknuts. Flanged head fasteners shall not be acceptable. The top of the frame rails shall be free of bolt heads.

Frame engine cutouts shall be made with a plasma torch to minimize the heat affected zone of the cut. All cutouts shall have a minimum of 6 inch transitions between rail flange cut depths to reduce the stress concentrations throughout the cutout area. The root of all transition areas shall have a minimum of a 2 inch radius to reduce stress concentrations at the root.

The frame rails shall be powder coated prior to chassis painting to reduce the effect of harsh road chemicals.

### **CAB MAIN FRAME CROSSMEMBER**

In addition to the rear cab support crossmember there shall be a main frame cross member mounted in the rear cab area. This cross member shall be a wide base flanged design to provide frame spacing and excellent strength to prevent frame paralleling. Every frame cross member shall be bolted in place using grade 8 bolts, hardened washers, and grade "C" distorted thread locknuts.

### **FRONT AXLE**

The front axle shall be a MERITOR model "MFS-18-133A-N" with a 18,740 lb. capacity.

### **CRAMP ANGLE**

The chassis shall have a turning cramp angle of 52-degrees. Both left and right turns have a full 52° cramp angle with tires and wheels mounted on the axle and installed in the chassis. The 52° cramp angle is achieved irrespective of options such as front suctions and disc brakes.

### **FRONT AXLE OIL SEALS**

The front axle shall be equipped with oil bath type oil seals as supplied on the axle from the axle manufacturer. The spindles shall be equipped with transparent covers for oil level inspection.

### **FRONT AXLE BRAKES**

The front brakes shall be Cam-Master Q Plus, 16-1/2" X 6" (419 x 152), S-Cam, air operated heavy duty brakes for increased stopping power and brake life in severe braking applications.

The "S" cam brakes shall incorporate a double anchor pin design, for stability and smooth consistent stopping. The camshafts shall be heat treated with rolled spline construction.

The front axle shall be equipped with automatic slack adjusters (ASA) to provide optimum brake performance.

### **FRONT SUSPENSION**

The front suspension shall be a pin and shackle design. Front springs shall be a minimum of ten (10) leaf elliptical type, 53" x 3-1/2" x .499" forged steel. The front springs shall have a military wrapper for safe operation. For a smooth ride the spring rate shall not exceed 3,000 lbs/in deflection.

All front spring pins shall be ground heat treated steel with grease fittings for lubrication.

The entire front suspension shall be designed for heavy duty custom fire apparatus with a capacity at ground of 18,740 lbs.

Double acting hydraulic shock absorbers are to be installed.

### **STEERING SYSTEM**

The steering shall be equipped with a single SHEPPARD M110 integral power steering gear. The engine shall be equipped with a gear driven pump.

A remote steel reservoir shall be provided with the ability to check the fluid level when the cab is in the lowered position.

### **FRONT TIRES**

The front tires shall be 315/80R22.5-20PR (L) GOODYEAR G-291 all weather tread, tubeless radial tires. These tires shall be mounted on 22.5" x 9.00" rims.

### **STANDARD LOAD RATING**

The front axle GAWR using these tires shall be 18,180 lbs. @ 130 psi.

### **TIRE SPEED RATING**

The maximum tire speed rating is 68 MPH.

### **ALUMINUM WHEELS**

Two (2) polished aluminum wheels shall be supplied and installed on the front axle. The 22.5" x 9.00" wheels shall be highly polished on the outboard side.

### **FRONT WHEEL TRIM**

The front axle shall be trimmed with mirror finish, 304L grade, non-corrosive stainless steel 'baby moon' hub caps with an opening for viewing the oil seal cover, and bright finished nut covers.

### **SINGLE REAR AXLE**

The rear axle shall be a MERITOR model "RS-25-160" with a 27,000# capacity for the fire service.

### **MERITOR DIFFERENTIAL**

The rear axle shall contain a Meritor 160 Series differential with an 18 inch diameter ring gear utilizing hypoid-Generoid gearing and a 2-1/4 inch diameter axle shaft.

### **AXLE DIFFERENTIAL LUBE**

The axle shall have the initial factory fill made with non-synthetic axle lube meeting the axle manufacturer's recommendations.

### **REAR AXLE OIL SEALS**

The rear axle shall be equipped with premium oil bath type oil seals as supplied on the axle from the axle manufacturer.

### **REAR AXLE BRAKES**

The rear brakes shall be Cam type, 16-1/2" X 7" (419 x 178), S-Cam, air operated heavy duty brakes for increased stopping power and brake life in severe braking applications.

The "S" cam brakes shall incorporate a double anchor pin design, for stability and smooth consistent stopping. The camshafts shall be heat treated with rolled spline construction.

The rear axle shall be equipped with automatic slack adjusters (ASA) to provide optimum brake performance.

### **VEHICLE TOP SPEED**

The rear axle shall be geared for a top speed of 65 to 68 mph at engine governed RPM.

### **NFPA TOP SPEED STATEMENT**

NFPA-1901, 2009 Edition - 4.15.2 The maximum top speed of fire apparatus with a GVWR over 26,000 lb (11,800 kg) shall not exceed either 68 MPH (105 km/hr) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

NFPA-1901, 2009 Edition - 4.15.3 If the combined water tank and foam agent tank capacities on the fire apparatus exceed 1250 gal (4732 L), or the GVWR of the vehicle is over 50,000 lb (22,680 kg), the maximum top speed of the apparatus shall not exceed either 60 MPH (105 km/hr) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

The speed selected on this apparatus exceeds 60 MPH (105 km/hr) and the customer is aware of NFPA-1901 and the top speed that will be achieved with the finished apparatus.

### **SINGLE AXLE REAR SUSPENSION**

The rear springs shall be a minimum of seventeen (17) main including four (4) auxiliary leaves. The rear suspension shall have a rating of 27,000 lbs. Capacity. The rear suspension shall be a "self-leveling" slipper type with a main torque leaf that contains a military wrapper. The torque leaf shall contain a bronze bushing for long service life.

The rear hangers are to be of the slipper design. For a smooth ride the rear suspension deflection rate shall not exceed 3,790 lbs. per inch.

One (1) inch diameter rear suspension U-bolts are required.

Two (2) main frame cross members shall be mounted in the rear suspension area, bolted to the frame rail as a rear suspension support member. Each cross member shall be a wide base flanged design to provide frame spacing and excellent strength to prevent frame paralleling. Each cross member shall be bolted in place using grade 8 bolts, hardened washers, and grade "C" distorted thread locknuts.

### **AIR SYSTEM**

An air brake system meeting the requirements of the FMVSS-121 shall be provided. The system shall consist of three (3) reservoirs with a 4,362 cu. in. volume. The air system shall consist of the following components:

Dual air system with dual gauges and a warning light and buzzer. A spring actuated parking brake built into the rear axle brakes with a manual control and warning light the in cab. These shall automatically apply in case of air system failure. A mechanical means of releasing the spring brake shall be provided in the event of total loss of air pressure.

A quick build up system shall be provided, capable of building enough air pressure to release the spring brake in less than thirty (30) seconds, when starting with the entire air system at zero pounds pressure.

The brake system shall be a split system. One (1) system serving the rear brakes and one (1) system serving the front brakes. The two (2) systems shall be connected with a double check valve that shall automatically shuttle air from the front system to the rear system should loss of air pressure occur. This system shall also modulate the amount of air so the spring brakes shall apply in direct relationship to the amount of pressure applied to the treadle valve.

The brake system shall be equipped with a Bendix SR-1 valve to provide modulated spring brakes in the event there is low air pressure in the rear axle air supply reservoir.

The spring brakes shall be piped in such a manner that if the treadle valve is depressed while the spring brakes are applied, the spring brakes shall release and remain released as long as the treadle valve is depressed. They shall reapply immediately when the treadle valve is released.

The piping in the air system shall be 2-ply nylon reinforced color coded tubing for all stationary lines.

### **AIR DRYER**

The air system shall include a BENDIX AD-SP air dryer.

The air dryer shall have a spin off desiccant cartridge.

The air dryer shall incorporate an integral turbo cutoff valve. The turbo cutoff valve shall close the path between the air compressor and the air dryer purge valve during the compressor "unload" cycle. This shall allow the air dryer to purge the water and contaminants without any loss of turbo boost or engine horsepower.

A 12 volt watt heated moisture ejector shall be an integral part of the air dryer. This heater shall be thermo- statically controlled. The electrical connection for the heater shall use a sealed electrical connector to protect against moisture and corrosion.

### **MANUAL AIR TANK DRAINS**

All air reservoirs shall have manual 1/4 turn drain valves. The drain valves shall be supplied with rubber seats to reduce air system leaks. The reservoir drain valves shall allow the accumulation of contaminants that are collected in the reservoirs to be drained off to the atmosphere.

### **MERITOR/ROCKWELL/WABCO ABS BRAKE SYSTEM**

A four channel, single rear axle model, MERITOR/ROCKWELL/WABCO ABS Braking System shall be supplied.

A frame mounted electronic control unit (ECU) shall monitor and control wheel speed during braking. Wheel sensors, constantly monitoring wheel speed, send information to the ECU. If a wheel begins to lock the ECU transmits an electrical impulse to modulator valves that can apply, release or hold the air pressure in the brake chambers. The rapid modulation of air pressure prevents wheel lock-up and increases driver control.

This ABS system shall be a 4S/4M system with four (4) wheel speed sensors and four (4) modulator valves.

If a fault occurs in one wheel, that wheel shall have normal (non-ABS) brake function. The other wheels shall continue to provide the ABS function. If the ABS system should fail completely, the brake control shall be returned to normal (non-ABS) braking.

An ABS warning light shall be installed on the driver's dash message center. This warning light shall cycle through a test stage at the point of ignition turn on and remain illuminated until the vehicle reaches approximately four (4) MPH. The light shall illuminate in other conditions to warn of an ABS system failure and shall illuminate when the diagnostic function is activated.

### **MERITOR/WABCO STABILITY ENHANCEMENT SYSTEM**

A Meritor / Wabco Roll Stability Control (RSC) System shall be provided on the apparatus chassis. The RSC shall assist in managing road conditions that may result in a vehicle rollover.

The RSC shall intervene to regulate the vehicle's deceleration functions. by automatically reducing engine torque, engage the vehicle retarder and apply pressure to the brakes.

Electronic Stability Control (ESC) shall be included building upon the established RSC system by sensing the tendency of the vehicle to spin around and automatically applying the brakes to reduce that risk.

This system conforms to the requirements of NFPA-1901 4.13.1.2 - If the apparatus is equipped with a stability control system, the system shall have, at a minimum, a steering wheel position sensor, a vehicle yaw sensor, a lateral accelerometer, and individual wheel brake controls.

### **REAR TIRES**

The rear tires shall be 12R22.5-16PR (H) GOODYEAR UNISTEEL G622 RSD traction tread, tubeless radial tires. These tires shall be mounted on 22.5" x 8.25" rims.

Single rear axle GAWR using these tires shall be 27,000 lbs. @ 120 psi.

### **TIRE SPEED RATING**

The maximum tire speed rating is 75 MPH.

### **ALUMINUM WHEELS**

Four (4) polished aluminum wheels shall be supplied and installed on the single rear axle. The 22.5" x 8.25" wheels shall be highly polished on the outboard side.

### **REAR WHEEL TRIM**

The rear axle(s) shall be trimmed with mirror finish, 304L grade non-corrosive stainless steel "Lincoln Hat" hub cover and bright finished nut covers.

### **LASER ALIGNMENT**

The chassis shall have a laser alignment performed at the factory before delivery.

**Toe In Front Axle** - The toe in on a vehicle is set to reduce tire wear and to insure that the vehicle shall steer in a straight line. Toe in measurements are set to a positive 2.5 millimeters total, giving the vehicle 1.25 millimeters from side to side.

**Toe In Rear Axle** - The toe in on the rear wheels is set up slightly different in that the axle and wheels are set to ride the "crown" of the road. This is achieved by adjusting the toe to a measurement of no less than 1 millimeter, but no more than 2 millimeters. The ideal measurement is 1.5 millimeters total for both sides.

**Cramp Angle** - Cramp angle is set to achieve the greatest turning radius possible with the selected components of the vehicle. Each front wheel is set to zero degrees. The wheel is then turned until it reaches the steering stops. This measurement is the cramp angle.

### **TIRE PRESSURE MONITORING DEVICE**

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 will flash when the tire drops 8 psi below the factory setting.

### **DIESEL ENGINE**

The chassis shall be powered by a Cummins diesel engine as described below:

MODEL: ISC  
NUMBER OF CYLINDERS: Six  
BORE AND STROKE: 4.49" x 5.31"  
DISPLACEMENT: 506 cu. in. (8.3L)  
RATED BHP: 330 @ 2000 RPM  
                  320 @ 2200 RPM  
TORQUE: 1000 @ 1300 RPM

COMPRESSION RATIO: 16.6:1  
GOVERNED RPM: 2200

Standard Equipment on the engine to include the following:

GOVERNOR: Limiting speed type

TURBOCHARGER: Wastegate design for increased boost at lower engine speed.

INJECTORS: Electronically controlled.

FUEL PRIMING PUMP: High capacity fuel lift pump for C Series engines.

AIR CLEANER: Farr or equal with fresh air intake.

OIL FILTER: A full flow / by-pass combination

LUBE OIL COOLER: Non-drainback, thermostatically controlled with full flow cooling.

FUEL FILTER: One fuel filter providing 10 micron absolute filtration with check valve.

STARTER: A DELCO, 12 volt, 38 MT-HD starter motor.

AIR COMPRESSOR: A Wabco 18.7 cfm compressor shall be provided.

### **EMISSION CONTROLS**

The engine shall be supplied with a Cooled Exhaust Gas Recirculation (EGR) system and with a Cummins Particulate Filter exhaust after treatment system.

### **EMISSION CERTIFICATION COMPLIANCE**

The Cummins engine is certified 2007 EPA 07 Compliant

### **QUOTE/BID CONDITIONS**

*A 2007 Federal EPA emission compliant engine has been selected. These engines are in a limited supply and inventories could be depleted at any time.*

*This quote / bid is a conditional quote subject to engine availability on hand at the time an order is submitted to HME, Incorporated (HME). At the time an order is submitted to HME, the order must be a complete and clean order for processing. Only if the order is complete will HME determine engine availability and confirm the order or contact the purchaser regarding engine availability issues. Only after HME has confirmed the order can the engine be considered reserved for the order. All orders requesting a 2007 Federal EPA emission compliant engine must take delivery as stated in HME's order confirmation or the order will be rejected.*

*If at the time of purchase from HME the selected engine is no longer available, HME cannot be held responsible for any bid bond penalties resulting from the failure to convert the bid/quote into an order. Additionally, if at the time of purchase from HME the selected engine is no longer available, HME cannot be held responsible for nor participate in any additional charges to modify the order to provide a viable alternative.*

*Any order placed and confirmed by HME with a 2007 Federal EPA emission compliant engine that is canceled by the buyer is subject to a cancellation charge.*

*This statement replaces all prior representations made regarding 2007 Federal EPA emission compliant engines and subject to future modification from HME.*

### **ENGINE COOLANT RADIATOR**

The engine coolant radiator shall have sufficient capacity to perform under the engine manufacturer installation requirements. The chassis manufacturer shall demonstrate the ability to meet this requirement with the submittal of an approved EPQ to the fire department for the apparatus.

The engine coolant radiator shall have a minimum core area of 989 square inches.

This radiator shall have drawn steel top and bottom tanks. These tanks shall have a material thickness of 16 gauge.

The tanks shall be bolted to the radiator header assemblies.

The header plates shall be made of 16 gauge brass.

The radiator tubes shall be constructed of .0068 inch thick brass and have a dimensional size of .076 inch x .625 inch. These radiator tubes shall have welded tube seams.

The radiator shall contain four (4) rows of tubes arranged in an inline profile across the radiator core. The entire radiator shall contain (184) tubes. These tubes shall have a smooth bore to allow for radiator cleaning.

In the critically stressed area, where the radiator tubes are attached to the header plates, this joint shall be accomplished with a welding process on the coolant side. In addition to the welded joint a solder fillet joint shall occur on the air side of the core creating a continuous dual bond.

The radiator shall have a louvered serpentine type core that contains fins constructed of .003 inch thick copper. These fins shall be spaced to a maximum density of 14 fins per inch of radiator tube. Each fin shall have a louvered surface for high cooling efficiency.

The radiator shall contain an integral coolant de-aeration tank. This tank shall be designed to remove entrapped air or gas from the coolant side of the radiator.

The bottom tank of the radiator shall have a drain valve for coolant removal.

The bottom tank of the radiator shall have a transmission cooler with a plate-type design. The plates shall have internal turbulators to break up laminar oil flow across the surface. The cooler shall have 1175 square inches of surface area for water surface contact and heat transfer.

All radiator hoses shall be attached to the cooling system with stainless steel worm drive clamps.

The radiator system shall be pressurized with a cap rated per the cooling system requirements of the specific engine manufacturer.

The high efficiency engine fan shall be encompassed with a radiator shroud to provide the proper air flow from the fan blade to the radiator.

The radiator shall have recirculation baffles to eliminate the possibility of recirculation of "hot" air to the face of the radiator core. The bottom of the radiator shall have a recirculation baffle from the radiator to the frame rails.

### **COOLANT RECOVERY SYSTEM**

A coolant recovery system shall be installed on the chassis. This tank is designed to capture coolant overflow when the engine coolant warms and expands. As the engine cools the overflow is then pulled out of the tank and back into the radiator, thus maintaining proper coolant levels.

### **CHARGE AIR COOLER RADIATOR**

The engine charge-air cooler shall have sufficient capacity to perform under the engine manufacturers installation requirements. The chassis manufacturer shall demonstrate the ability to meet this requirement with the submittal of an approved EPQ to the fire department for the apparatus.

This radiator shall have cast aluminum side tanks. These tanks shall have a material thickness of .200. These tanks shall be attached to the charge-air core with the ALBRAZE construction technique.

The external air fins shall be louvered serpentine and constructed of .006 inch thick aluminum.

The internal air fins shall be of the lance-and-offset design for greater air turbulence and higher efficiency. The internal fins are to be constructed of .010 inch thick aluminum.

The charge-air cooler shall be mounted directly in front of the engine coolant radiator. To reduce vibration rubber "iso" mounts shall be used for mounting of the charge-air cooler to the engine radiator.

The charge air cooler shall contain (12) rows of internal fins within a .313 x 2.632 aluminum tube assembly. This tube assembly shall be constructed of .025 thick aluminum.

The charge-air cooler shall contain thermal expansion slots to allow the expansion and contraction of the charge-air core over the wide range of temperatures that are expected in operation.

The charge air piping between the engine and charge-air cooler shall be aluminum tubing with a wall thickness of .065 inch. The system shall utilize four (4) ply silicone rubber woven Nomex hoses with stainless steel pressure bands. These bands are designed to maintain the hose shape under the pressure of the turbocharger boost air. All clamps used on the charge air piping are to be stainless steel constant torque and shall be installed at each joint.

### **COOLANT**

The coolant system shall contain an ethylene glycol and water mixture to keep the coolant from freezing to a temperature of -34 degrees F.

### **COOLANT HOSES**

The entire chassis cooling system shall have premium rubber hoses. All clamps to be stainless steel worm drive type clamps.

### **COOLANT SYSTEM CLAMPS**

Constant torque, shielded, hose clamps shall be used for all cooling system hoses larger than 1/2 inch on the chassis.

### **RADIATOR SKID PLATE**

To protect the radiator a 1/4 inch thick steel skid plate shall be installed under the radiator.

### **ENGINE OIL**

The engine shall have the initial factory fill made with a non-synthetic engine oil meeting the engine manufacturer's recommendations.

### **ENGINE BRAKE**

An engine Compression Brake shall be supplied.

The Driver's dash shall include the engine brake control switch.

Activation of the engine brake shall occur at zero throttle position. The transmission ECU shall be programmed to operate in the pre-select downshift mode to maximize the retarding power of the engine brake.

The brake lights shall illuminate when the Jacobs Brake is in operation.

The Jacobs Brake shall be inoperative when the chassis is in pump mode.

The engine brake shall be covered under the standard five year Cummins engine warranty.

### **ENGINE FAST (HIGH) IDLE**

The chassis shall be equipped with an Electronic Idle Control (EIC) for the electronic engine. Preset speed is factory adjustable.

The fast idle provision shall only function when the parking brake is set and the transmission is in neutral. Manual selection of the fast idle shall be controlled by a driver's momentary switch.

Automatic activation of the fast idle shall occur when a low voltage condition exists, the truck is in neutral and the parking brakes are applied.

Cancellation of the fast idle shall be achieved by resetting the manual switch or by depressing the service brake pedal.

### **ENGINE COOLANT FILTER**

A precharged spin-on corrosion inhibitor/water filter shall be installed in the cooling system. Shut off valves shall be supplied on both sides of the filter to facilitate element changing with out loss of cooling system fluid.

### **AUXILIARY ENGINE COOLER**

The cooling system shall have one (1) SENDURE auxiliary engine cooler mounted in the upper radiator water pipe. The apparatus shall have the fire pump water circulated to the cooler from a valve located on the apparatus pump panel.

### **SPARK ARRESTOR**

A spark arrestor shall be installed in the chassis air intake system. This arrestor shall be mounted behind the intake grille to filter out airborne embers.

### **HORTON FAN**

A HORTON fan clutch shall be installed on the engine. A manual switch shall be provided in the dash, to over ride the fan control in event of fan failure or conditions that may result in overheating of the engine.

### **EXHAUST SYSTEM**

A single exhaust pipe shall be provided for the engine. The exhaust pipe shall be supplied with a heat wrap. The wrap shall extend from the engine turbo charger to just below the frame rail.

The exhaust tubing from the turbocharger to the exhaust aftertreatment device shall be stainless steel.

### **DIESEL PARTICULATE FILTER**

Replacing the conventional muffler the exhaust system shall have an After Treatment Device (ATD) located under the frame on the right side of the apparatus immediately behind the cab. The ATD shall include a Diesel Oxidation Catalyst (DOC) to trap particulate matter in the exhaust gas.

### **TAILPIPE**

The tailpipe shall extend from the exhaust muffler/aftertreatment device to the rear of the vehicle making a 90° bend to exit the vehicle ahead of the rear tires on the curbside of the vehicle. The end of the pipe shall be cut at a 45° to the exhaust pipe centerline.

The pipe shall be unpolished stainless steel.

### **TRANSMISSION**

The transmission shall be an Allison 3000EVS automatic transmission with electronic controls.

The transmission shall be equipped with a lock-up control circuit that shall automatically shift the transmission into 4th gear lock-up when the pump is shifted into gear.

### **TRANSMISSION COOLER**

An automatic transmission cooler shall be provided as an integral part located in the bottom tank of the radiator. It shall be designed to withstand 165 psi working pressure and an intermittent pressure of 250 psi. The cooler shall be of sufficient size to maintain the operating temperature within the recommended limits of the transmission manufacturer.

### **TRANSMISSION FLUID**

The transmission shall be provided with heavy-duty transmission fluid meeting Allison specification TES-389.

### **FIVE SPEED PROGRAMMING**

The transmission shall be programmed for five speeds.

First - 3.49  
Second - 1.86  
Third - 1.41  
Fourth - 1.00  
Fifth - 0.75  
Reverse - 5.03

The transmission shall be able to shift from first through fifth gear without operator intervention. The chassis shall be geared for the top speed in 5th gear.

### **DRIVELINES**

Universal joints and driveshafts shall be SPICER 1710 series or equal. The driveshaft tube shall be a minimum of 4.0" diameter with a .134" tube wall thickness. The driveshaft slip joints shall be coated to reduce sliding friction and thrust under high torque loads. Permanent driveline installations shall be balanced to prevent vibration.

### **TEMPORARY DRIVELINE INSTALLATION**

The drivelines and driveline center bearing supports shall be a temporary installation for completion by the apparatus manufacturer.

### **FUEL TANK**

The fuel tank shall have a capacity of 50 gallons (US) and be D.O.T. certified. It shall be mounted with straps bolted to the bottom frame flange to allow for easy removal. The tank construction shall be of 12 gauge steel with single fuel pickup and return tubes. The baffled tank shall be vented to prevent low vacuum and facilitate rapid filling.

The tank shall have a 2" NPT fill to the driver's side of the chassis.

The fuel tank sending unit is to be mounted to the driver's side of the fuel tank for easy replacement without removing body panels.

### **FUEL LINES**

Polyamide fiber, nylon braided, reinforced tubing with push-on reusable fittings shall be provided for the chassis fuel lines.

### **FUEL/WATER SEPARATOR**

The Cummins engine shall be equipped with an integrated fuel / water separator with a self venting bottom drain valve. This filter shall be able to remove up to 95% of dissolved water and up to 99% of free standing water.

### **ALTERNATOR**

A LEECE-NEVILLE model LN4867J 270 Amp alternator shall be installed on the engine. This alternator is internally rectified and regulated.

## **FIRETRUCK CAB**

The apparatus shall be designed to operate in emergency conditions. These conditions require the apparatus to maneuver into areas at a high rate of speed. To facilitate in these operations a cab-over-engine design is required in order to reduce the overall length of the apparatus thus increasing the maneuverability.

The cab design must be such to provide safe and efficient transport of emergency personnel. The cabin shall be designed with four (4) side doors of the largest size possible and with a grab handle and step arrangement to provide ease of entry and egress.

There shall be up to six (6) positions available for occupant transport with a minimum of four (4) forward facing seating positions in the cab. The number of seats and seating locations are described in detail later in this document.

The apparatus cab shall be of the latest in automotive design, styling and appearance.

## **CAB MATERIALS AND CONSTRUCTION**

The extruded aluminum *x*/ cab shall have the following material gauges as a minimum:

- Cab floor - 3/16" (.190") aluminum
- Front skin - 3/16" (.190") aluminum
- Cab side panels - 3/16" (.190") aluminum
- Cab rear wall - 3/16" (.190") aluminum
- Cab driver's floor - 3/16" (.190") aluminum
- Cab officer's floor - 3/16" (.190") aluminum
- Cab crew area floor - 3/16" (.190") aluminum
- Cab roof - 3/16" (.190") aluminum
- Cab doors - 3/16" (.190") aluminum

*Roof Rail Section* Extending from the front to the rear of the cab above the doors the cab shall have an extruded aluminum section. This section shall be designed to interlock with the roof sheet and incorporate the door drip molding in one single piece.

*Upper Transverse Member* Amid ship in the cab there shall be a boxed beam header assembly located transverse in the cab from left to right.

*Front Door B-Post* This vertical box section of the cab located behind each of the front doors provides the slam post for the door latch assembly. This section also is a main member in the cab skeletal system. The B-Post ties into the Upper Transverse Member to provide torsional stiffness in the open space design of the cab.

*Rear Door B-Post* The box assembly design of the rear door B-post provides an anchor for the rear door latch assembly. This section is the main vertical support at the cab rear corner providing the anchor point for the rear wall structural lattice network.

*Roof Panel Rails* - The roof panel sub-assembly shall have extruded hat section supports bonded to the roof skin. These roof hat sections shall be joined to the Cab Roof Rail Section to complete the upper cab skeletal structure. These completed Roof Panel Rails shall provide a grid for maximum roof crush and deflection strength. The roof shall support a minimum weight of 250 lbs. / sq. ft. without permanent roof deformation.

*Rear Wall Rails* - The rear wall assembly shall have extruded hat section supports bonded to the wall skin. These sections shall be joined to the Roof Panel Rails and to the rear door slam post and floor provide a rear wall grid structure with maximum strength.

*Cab Front Wall* - The front wall of the cab shall be designed with a double wall construction to reduce the effects of exterior noise in the crew and operator compartment.

## **CAB DIMENSIONS**

The cab shall have the following overall dimensional requirements:

- Overall Width - 100 inches
- Roof - 12" Raised
- Center of front axle to back of cab - 60 inches
- Center of front axle to front of cab - 74 inches
- Windshield area - 3,756 sq. in. minimum
- Front grille opening - 478 sq. in. minimum
- Combined side grille opening - 84 sq. in. each minimum
- Cab full tilt angle - 45 degrees minimum
- Cab full tilt height - 185 inches maximum

Cab interior dimensions shall be provided as a minimum in the following chart:

- Drivers side floor width 25-1/2 inches minimum
- Floor to the ceiling in the driver and officers area of the cab 59-1/2 inches minimum
- Floor to the top of the doghouse 28-1/2 inches maximum
- Officers side floor width 24-1/2 inches minimum
- The measurement across the floor from the rear wall to the first vertical portion of the engine enclosure 39 inches
- Floor to the ceiling in the rear of the cab 65-3/4 inches minimum

## **CAB DOORS**

The cab entry and egress shall be designed for a firefighter in full turnout gear. Each door shall open a minimum of ninety degrees to afford the firefighter maximum space.

The doors shall be of a flush design each having exposed, one-piece, polished stainless steel hinges. The hinge shall be made of 12-gauge material with a minimum hinge pin diameter of 1/4 inch.

The door windows shall have interior and exterior glass weather seals to prevent the influx of exterior air.

The doors shall have exterior and interior paddle type latches for ease of opening with a gloved hand. The paddle latches are to have a rubber gasket, on the outside, separating the handle from the finished painted surface.

## **FRONT DOORS**

The cab front doors shall be of the full-length design enclosing the entire step area of the cab. The door shall be a minimum of 38-1/2 inches wide and 74 inches tall. The front door windows shall have a minimum of 712 square inch area of viewing glass per door. There shall be a fixed piece of forward glass in each of the front doors.

## **REAR CAB DOORS**

The rear cab doors shall be similar to the forward doors and shall be located directly behind the front wheel well area. These doors shall be 86 inches high x 34 inches wide. Each door shall have a roll down rear window with a minimum glass viewing area of 670 square inches.

## **INTERIOR DOOR LOCKS**

All doors shall have door locks with interior controls and exterior keyed door locks. The installation shall be in conformance with FMVSS 206, with specific adherence to 49 CFR 571.206 Section 4.1.3 requiring that "Each door shall be equipped with a locking mechanism with an operating means in the interior of the vehicle". All doors shall be keyed alike. The doors shall be equipped with appropriate safety interlocks to

prevent accidental locking of the doors when closed.

### **DASH TRIM**

The drivers cab dash console shall be made of black ABS with an appearance of the latest in automotive design, styling. Accompanying the dash console in the forward section of the cab shall be an officers side flat dash for the mounting of a mobile data terminal.

### **CAB GLASS**

AS-1 safety laminate glass shall be used in a two piece, wrap around design with a minimum 3760 square inches of windshield area for maximum visibility. The windshield shall have the style of a one-piece assembly with the practical installation of two pieces for lower replacement cost. The windshield shall be readily available from a nationally recognized automotive glass manufacturer that maintains local distribution outlets.

All glass shall be tinted.

All fixed glass shall be installed with a one-piece triple locked rubber lacing material. Due to long term appearance two-piece chrome trim lock lacing is not desired.

### **SUNVISORS**

The driver and officer side of the cab shall be equipped with a sun visor. The vinyl covered visors shall be a minimum of 17-1/2" by 9".

### **DRIVER SIDE ELECTRICAL CABINET**

Beneath the drivers seat there shall be an electrical cabinet designed to house the main battery electrical disconnect and facilitate the installation of an onboard battery charger or battery conditioner. A bolt on limited access; aluminum diamond plate hatch shall be installed on the front side of the seat box. The access hatch shall have a louvered section to provide air circulation to the cabinet. This cabinet shall not be used for casual storage.

### **WINDSHIELD WIPERS**

Two speed electric pantograph wipers shall be installed. These wipers shall have minimum 24" blades and have 28 1/2" wet arm electric pump washers. A 70 oz. Minimum windshield washer reservoir shall be furnished.

### **STEERING WHEEL AND COLUMN**

The steering column shall be a DOUGLAS tilt / telescopic type with an integral high beam / turn signal control switch. The column shall have self-canceling design for the turn signal switch. A 4-way warning "Hazard" light switch shall be mounted on the column. For safety, a rubber boot shall be installed to cover the steering shaft from the dash to the floor.

The steering wheel shall be a minimum of 18-inch diameter, covered with a padded absorbite finish. A lever on the left side of the steering column shall control the telescopic feature of the steering column.

### **FASTENERS**

All cab exterior fasteners shall be stainless steel type fastened to the cab with nutserts.

### **BATTERY ACCESS**

The rear cab steps shall have a removable kick panel, providing access to the batteries for routine maintenance and inspection.

## **CAB CORROSION TREATMENT**

The cab shall have a corrosion preventative material conforming to Mil Spec C-16173-C, Grade 1, applied during and after construction. A 10-year warranty against perforation due to rust or corrosion shall be furnished for the cab.

## **TRANSMISSION RANGE SELECTOR**

The transmission shall be controlled by an electro-mechanical lever type shift control. It shall be internally illuminated for night operation and have an internal lock (hold override button) to securely hold the shifter in the position selected.

## **TRANSMISSION OIL LEVEL SENSOR**

The transmission shall be equipped with the oil level sensor (OLS). This sensor shall allow the operator to obtain an indication of the fluid level from the shift selector. The sensor display shall provide the following checks, correct fluid level, low fluid level and high fluid level.

## **EMI/RFI PROTECTION**

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

The apparatus proposed shall have the ability to operate in the environment typically found in fire ground operations with no adverse effects from EMI/RFI.

EMI/RFI susceptibility is controlled by utilizing components that are fully protected and wiring that utilizes shielding and loop back grounds where required. The apparatus shall be bonded through wire braided ground straps. Relays and solenoids that are suspect to generating spurious electromagnetic radiation are diode protected to prevent transient voltage spikes.

In order to fully prevent the radio frequency interference 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.

## **BATTERY BOX TRAY - PAINTED STEEL**

The battery box trays shall be painted steel. The battery hold down brackets hardware shall be black powder coated to resist corrosion.

## **BATTERY BANK**

A single battery system shall be provided, utilizing four (4) high cycle type Group 31 batteries.

This system shall be capable of engine start after sustaining a continuous 150 amp load for 10 minutes with the engine off (NFPA-1901).

A battery disconnect switch (Rated at not less than 450 amps continuous) shall be used to activate the system and provide power to the power panel. A green pilot light shall illuminate to indicate that the battery bank is activated.

## **BATTERY CABLES**

All battery wiring shall be "GXL" battery cable capable of handling 125% of the actual load. It shall be run through a heat resistant flexible nylon "HTZL" loom rated at a minimum of 300 degrees Fahrenheit. All cable connections shall be machine crimped and soldered.

## **STARTING CIRCUIT**

One (1) engine start button is to be located on the lower right dash panel. It shall be wired to heavy duty solenoid rated at not less than 1100 amps. The battery indicator light is to be located directly above the start button to indicate that the battery bank is on.

### **ON-BOARD ELECTRICAL AIR COMPRESSOR PUMP PLUS CHARGER**

A KUSSMAUL AUTO AIR model 091-9-1200 air compressor with a 40 amp automatic battery charger shall be supplied on the chassis. A pressure switch senses when the system pressure drops and starts the compressor which then runs until pressure is restored. All ball bearing construction, lubricated for life, assures reliable operation and requires no servicing. Compressor Output: 0.30 CFM@80 PSI; 0.35 CFM@60 PSI. Pressure Switch: Adjustable Set Point-Factory set to 75 PSI Cut-in, 95 PSI Cut-out.

The Pump Plus 1200 charger senses the batteries in the vehicle and recharges exactly as much as required. When the batteries are fully charged, all charging stops. The state of charge of the batteries is indicated on a remotely located bar graph display whenever power is applied to the vehicle.

A selector switch is provided on the charger to operate the compressor either as a D.C. compressor or as an A.C. compressor. In either switch position the compressor operates from the vehicle's battery. When "D.C." is selected, the compressor operates whenever the pressure switch senses low system pressure. This is useful when parking the vehicle away from the 120 volt input power. For those operators who wish to limit compressor operation to the times when the shoreline is connected to the vehicle, the Selector Switch should be placed in the "A.C." position. This will operate the compressor when the A.C. power is available, but shuts off the compressor when the shoreline is removed. In either switch position the compressor is operated by the vehicle's battery.

The compressor shall be located in the officer's side front step well with a bolt on style access panel. As installed in the chassis the compressor power selector switch will be placed in the A.C. position.

The remote charge indicator shall be located on the driver's seat box adjacent to the master battery switch.

### **SHORELINE AUTO-EJECT**

A KUSSMAUL Super Auto Eject, model 091-55-20-120, with weatherproof cover shall be provided.

The Super Auto Eject is to be completely sealed to prevent internal contamination of the working components.

The internal switch arrangement of the Super Auto Eject shall be designed to close and open the 120-volt AC circuit after the mating connector is inserted and before the connector is removed. This design shall prevent arcing at the connector contacts to provide long life.

The electrical connection shall be provided as a 120-volt AC - 20 amp type using a NEMA 5-20P connector.

The Auto-Eject cover shall be a Kussmaul 091-55YW, yellow in color.

The Auto Eject assembly shall be mounted on the exterior of the cab behind the driver's door.

### **BATTERY JUMPER STUDS**

Battery jumper studs shall be provided on the chassis. The jumper studs shall be mounted underneath the cab, on the rear of the driver's side battery box. The studs shall be connected to the chassis batteries with 1/0 color coded cables, red for the positive cable and black for the negative cable. The studs shall be protected with color coded plastic covers when not being used.

### **ENGINE DOGHOUSE**

The engine doghouse inside the cab will be padded with a layer of sound and heat absorbing foam and

covered with heavy duty vinyl trim upholstery to match or accent the interior of the cab.

The under side of the engine enclosure shall be covered with a sandwiched material for interior cab noise and heat rejection. This sandwiched acoustical material shall have one layer of 1/8" foam, a 3/16" single barrier septum and a 7/8" layer of foam to provide an overall thickness of 1-3/16". The sandwich material shall be chemically bonded to prevent layer separation. A finished surface treatment of metalized film shall be provided on the engine side of the barrier. The acoustical barrier shall be held in place with mechanical fasteners in addition to adhesive.

The insulation for protection from heat and sound shall keep the dBa level within the limits stated in the current edition of NFPA 1901.

### **ACCESS FOR FLUID SERVICING**

The engine enclosure shall have a hinged and latched panel to provide access to the engine lubricating oil dipstick, power steering fluid reservoir dipstick and engine coolant recovery reservoir. This access shall allow that these fluid levels can be checked and topped off, if required, without raising the cab.

### **CAB DOORS - INTERIOR TRIM**

To provide durability the interior of the cab doors shall be finished with full length aluminum panel that is finished with Zolatone high abuse paint.

### **INTERIOR CEILING PADDING AND TRIM**

The cab front interior ceiling shall have a one-piece, removable, vinyl headliner to cover all wiring and tubing used for lights and antenna leads.

### **REAR WALL COVERING**

The rear interior wall of the cab shall have a two-piece, removable, wall covering to finish the interior trim, cover all wiring and tubing used for lights and antenna leads.

### **FLOOR COVERING**

The front and rear floor areas of the cab shall be covered with "HUSHCLOTH" sound barrier floormats. This floormat shall be a three ply material with a 3/16" thick open cell isolation barrier of Polyurethane, a 3/32" thick closed cell Nitrile mid barrier for section reinforcement, and a 1/16" thick embedded pebbled grain wear surface.

### **INTERIOR CAB STEP TRIM**

The cab steps shall be completely enclosed behind each door. The top surface of the steps shall be covered with non-skid aluminum treadplate trim.

### **GRAB HANDLES**

One (1) additional molded grab handle shall be installed inside the cab. The handle shall be located on the officer's side on the A Post.

### **RADIO COMPARTMENT**

Beneath the officer's seat there shall be a radio compartment with an interior dimensions of 19-1/2" wide x 17" long x 7" high.

### **CAB STEP DIMENSIONS**

The front cab steps shall have the following overall dimensional requirements:

- Driver's lower step size 10-1/4 inches deep minimum

- Driver's lower step size 29-1/2 inches front to back
- Officer's lower step size 10-1/4 inches deep minimum
- Officer's lower step size 29-1/2 inches front to back

### **INTERMEDIATE CAB STEP**

The cab shall have a full width intermediate "LaserGrip" anti slip inside step. The intermediate step shall be approximately 9 inches from the top of the lower step to the top of the intermediate step.

### **INTERIOR CAB STEP TRIM**

The cab steps shall be completely enclosed behind each door. No portion of the cab entrance step shall be exposed when the door is in the closed position. The lower step shall be sealed from the under side of the cab to eliminate road splash from entering the step area while the vehicle is driving. The horizontal step surfaces shall be covered with bright aluminum tread plate meeting the requirements of NFPA-1901.

The vertical toe kick surface area of the cab step wells shall be covered with aluminum tread plate.

### **COMPARTMENT OPEN LIGHT**

A Red Open Compartment Flashing Light, Whelen OS Series LED shall be mounted on the driver's side face of the overhead panel. A chrome flange is to be supplied with the light.

This light is wired with a flasher to the power panel for completion to circuit on the body.

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'.

Interior Lighting Group - Intruder Series

### **LED WHITE DOME LIGHT**

One (1) Weldon model 8047 LED, 7" diameter white LED interior dome light shall be provided. Light shall be surface mounted and draw 0.85 amps at 12 volts. Lamp shall have V-LED technology LED's. The lamp shall have field serviceable and upgradeable LED's and lenses, and carry a 5 year warranty from the manufacturer.

This dome light will be in front of the cab centered over the engine doghouse and shall be operated by opening any cab door.

### **LED WHITE/RED DOME LIGHTS**

Four (4) 6" diameter combo color LED interior dome lights shall be provided. Each light shall be surface mounted and draw 0.65 amps at 12 volts. Lamp shall have high output white LED's with a light output of 450 lumens. The light shall be rated for 50,000 hours and have a 10 year warranty from the manufacturer.

Two (2) lights shall be installed in the front of the cab, one each adjacent to the driver and officer. Two (2) lights shall be installed in the rear crew area. All white LED's shall be operated by opening any cab door.

The same lights shall be provided with a red LED mode where the driver has switched control of the officer and crew area red lighting.

### **HEATER / DEFROSTER**

A 57,600 BTU heater with a three speed fan shall be mounted in the front of the cab, centered over the

windshield. This heater shall have six (6) adjustable vents to assure windshield defogging.

### **45,000 BTU AIR CONDITIONING**

A climate control system shall be furnished in the cab. The system shall consist of a 45,000 BTU air conditioning evaporator centrally located on the rear of the engine doghouse.

The system is to have a 12.6 cu. in. minimum compressor mounted on the engine to provide the compressed refrigerant to the system. The compressor is to be plumbed to a heavy duty truck, dual fan air conditioning condenser mounted on the cab roof. The condensing unit shall have an aerodynamic shroud that is painted to match the color of the cab roof. There shall be an extended life filter receiver/dryer with a pressure relief valve installed to protect the system from contaminants, moisture, and high pressure. It is to have a sight glass for visual inspection and ease of service.

The evaporator shall have an externally equalized expansion valve and be thermostatically protected to prevent freeze up. Dual high performance 3-speed blowers shall provide a minimum of 700 CFM air flow. Each blower is to be controlled separately. Four (4) forward facing and three (3) rear facing full adjustable diffusers with shutoff capability shall be utilized to direct the air flow through the cab.

The air conditioning on/off switch, thermostat control, and blower switches shall be located on the evaporator unit.

The air conditioning system shall use R134A freon.

### **36,000 BTU SUPPLEMENTAL HEATER**

A 36,000 BTU auxiliary heater shall be furnished inside the conditioning evaporator unit to provide additional cab heating during cooler weather. The heater core is to be plumbed to the water lines of the engine cooling system.

### **CAB INSULATION**

Foam rubber type insulation shall be installed in the rear wall and the cab ceiling to provide a better sound and heat barrier. The insulation shall be a minimum of 1" thick. The material shall be compliant with FMVSS-302.

### **DRIVER INSTRUMENTATION AND CONTROLS**

The cab dash panel shall have black textured anti-glare surface. The gauges shall have red LED back lighting for enhanced visibility. Upon an initial ignition sequence a lamp check function shall illuminate the warning light telltales, the self diagnostic message center shall sequence the warning light telltales if data link communications are lost. The instrument panel shall include the following gauges and indicators.

- Electronic speedometer with LCD odometer
- Tri cluster gauge that includes:
  - Electronic tachometer
  - Engine coolant temperature gauge, with warning light and buzzer
  - Engine oil pressure gauge, with warning light and buzzer
- Transmission fluid temperature gauge, with warning light and buzzer
- Two air pressure gauges, with warning light and buzzer
- Voltmeter, with low voltage warning light and buzzer
- Fuel level gauge

- High beam indicator light
- Parking brake set light
- Turn signal indicator lights

The lighting control panel is to be located to the left side of the instrument panel. This panel shall have a black textured anti-glare surface. The lighting control panel shall include the following:

Headlight control switch  
Dash rheostat for instrumentation lighting control  
Wiper and washer control switches

The engine control panel is to be located beneath the instrument panel on the driver's right hand side. The panel shall have a black textured anti-glare surface. The engine control panel shall include the following:

Keyless ignition switch with a green pilot light

The apparatus control panel is located beneath the instrument panel on the driver's left hand side. The panel shall have a black textured anti-glare surface. The apparatus control panel is designed for the location of pump shift controls.

#### **AUDIBLE TURN SIGNAL REMINDER**

There shall be an audible alarm that shall sound when the turn signal remains flashing for a distance greater than one mile. The reminder shall not sound when the hazard lights are operating.

#### **AUDIBLE LIGHTS ON REMINDER**

There shall be an audible alarm that shall sound when the headlight switch is left in the on position and the ignition is off. The alarm shall self cancel after 2 minutes of operation.

#### **AUDIBLE PARKING BRAKE REMINDER**

There shall be an audible alarm that shall sound when the parking brakes are NOT set and the ignition is turned off. This alarm shall self cancel after 2 minutes.

The Parking Brake reminder shall sound an audible alarm when the parking brakes are set and an indicated speed of over two miles per hour occurs.

#### **DUAL TRIP ODMETERS**

There shall be two (2) trip odometers in the driver's information center. Each shall be capable of independent operation and reset. They shall be labeled Trip1 and Trip2 when the trip mileage is shown in the LCD panel.

#### **SPEEDOMETER ACTIVATED IN PUMP MODE**

The speedometer and odometer shall be activated while in pumping mode.

#### **LOW FUEL LIGHT**

A "Low Fuel" warning light and alarm shall be installed in the dash message center. This light shall illuminate when the apparatus fuel level reaches 25% of the fuel remaining.

#### **TRANSMISSION OVERHEAT WARNING LIGHT**

A transmission oil temperature light with alarm shall be provided on the dash message center.

#### **LOW VOLTAGE WARNING**

A low voltage indicator light shall be installed on the dash message center. An alarm and the dash indicator light shall activate when the system voltage drops below 11.8 volts.

#### **AIR CLEANER RESTRICTION INDICATOR**

An air cleaner restriction indicator shall be installed in the driver's message center. The indicator shall provide visual warning when a high air restriction condition exists for a minimum of 4 seconds.

## **LOW COOLANT WARNING**

Low coolant warning shall be accomplished through the engine electronics to provide driver warning via the engine stop warning light.

## **INTERMITTENT WIPER CONTROL**

A rotary combination intermittent electric wiper / washer switch shall be provided on the left hand side of the driver's dash.

## **DRIVERS SIDE OVERHEAD SWITCH PANEL**

The apparatus warning light panel shall be mounted above the driver in the overhead console. The panel shall have a black anti-glare surface, and be angled for easy viewing of the driver. The panel shall include the following switches:

One (1) lighted master control switch to allow for preselection of the other switches.

Thirteen (13) lighted individual lighting control and chassis option switches.

Each switch shall have back-lit legends with a 100,000 hour lamp for illumination.  
Body Flasher

The master lighting control switch shall be wired to three (3) 30 amp circuit breakers and three (3) 40 amp relays. Three (3) 10 gauge wires are powered by this circuit and run to the roof for light bar power. The remaining switches shall be wired to 20 amp circuit breakers and relays.

## **PARKING BRAKE CONTROL VALVE**

The parking brake control valve shall be located in the driver's dash engine control panel.

## **CHASSIS ELECTRICAL SYSTEM**

The apparatus "Electrical Distribution System" (EDS) shall be mounted inside the cab to prevent moisture from entering the area. It shall be mounted under the dash on the officer's side behind a diamond plate cover.

The EDS shall be fed by one power stud:

One (1) battery positive

The battery positive stud is to be controlled by the master disconnect switch mounted on the lower right dash panel. A green light shall indicate when the ignition circuit(s) are energized.

## **EDS MODULE**

The EDS system shall be designed with locally available **plug-in** circuit breakers and **plug-in** relays. Each component position shall be labeled to indicate it's function. All electrical connections shall be insulated and secured behind the panel face to eliminate the chance of accidental electrical shorts while performing electrical system service.

The EDS shall control a minimum of thirteen (13) low voltage, analog switched, high amperage electrical loads.

Provision for a minimum of thirty-one (31) automatic reset circuit breakers is required to protect the vital circuits of the apparatus.

The EDS system shall be removable with only four (4) fasteners for major electrical service or modifications.

The EDS panel shall have one (1) lamp for illumination of the panel during service.

### **CHASSIS COLOR CODED WIRING**

All chassis wiring shall be type "GXL" in accordance with S.A.E. J1128 and NFPA-1901. ALL wiring shall be **COLOR CODED** and continuously marked with the circuit number and function.

All wiring to be covered in nylon heat resistant "HTZL" loom rated at a minimum of 300 degrees F exceeding the heat requirements of NFPA-1901.

A battery "loop back" ground circuit shall be supplied for the EDS system to reduce the possible effects of Electromagnetic and Radio Frequency Interference.

The chassis cab, engine and transmission shall be electrically bonded to the chassis frame rails with braided ground straps.

### **ELECTRICAL SYSTEM CONNECTORS**

All multiple conductor electrical connections shall be made with Packard electrical connectors. The Packard connectors shall become mechanically locked when mated.

All single wire terminations requiring special connectors with a ring or spade terminal shall be crimped, and wrapped with heat shrink tubing.

### **RADIO ANTENNA MOUNT WIRING**

One (1) NMO mount shall be roof mounted, on the officer's side of the cab.

The antenna mount shall be located 34 inches from the front face of the cab and 18 inches from the cab side.

The unterminated coax is to be routed in the cab to the radio power circuit termination or officer's seat box if no radio power circuit is requested.

The antenna wiring shall terminate in the center of the cab on top of the engine doghouse.

### **CAB CRASHWORTHINESS TEST**

Dynamic tests shall be performed to evaluate the crashworthiness of the proposed vehicle cab configuration to the requirements of NFPA 1901-09 section 14.3.2.

Cab roof strength shall be tested utilizing the dynamic preload criteria from SAE J24221 paragraph 5 specifications and procedures.

Front impact strength integrity shall be tested utilizing SAE J24202 with ECE R293 Annex 3 paragraph 4 equivalent energy.

Quasi-static roof strength shall be based on SAE J2422 paragraph 6 and ECE R293, paragraph 5 specifications and procedures.

A letter of certification shall be provided upon request by the department.

### **EXTERIOR GRAB HANDLES**

The cab shall have a bright anodized extruded aluminum 24" grab handles at each door position. The aluminum shall be bright anodized for long service. Molded rubber gaskets shall be installed under the grab handles to protect the painted surface of the cab.

## **FRONT GRILLE - THREE DIMENSIONAL**

A stainless steel square, three dimensional bright polished stainless steel front grille shall be installed on the front cab face. The front grille shall have a radiator rock guard to assist in preventing damage to the radiator core.

The cab shall have one (1) engine "hot" air exhaust and one (1) engine air cleaner intake, on each side of the cab. These openings shall be covered with a honey comb wire screen and shall have a bright polished stainless steel outer grille.

## **CAB GROUND LIGHTING**

One (1) light shall be mounted beneath each door. These lights shall be designed to provide illumination on areas under the driver and crew riding area exits. All cab ground lights shall be switchable and shall automatically activate when any cab exit door is opened.

## **MIRRORS**

MOTO-MIRROR 16 1/2" X 7" stainless steel heated, remote control mirror heads shall be mounted on spring loaded retractable mirror arms. Includes a 5-1/2" x 8.5" convex mirror head.

## **CAB SIDE WINDOWS**

Two AS-2 tempered glass, fixed side windows, 26-1/2" high x 16" wide shall be furnished, one on each side behind the forward doors. All glass shall be tinted. These windows shall be installed with a one-piece triple locked rubber lacing material.

## **UNDER CAB ENGINE MAINTENANCE LIGHTS**

Two (2) engine maintenance lights shall be supplied beneath the cab. These lights shall illuminate automatically when the cab is tilted to the full tilt position.

## **WHEEL WELL LINERS**

To reduce road splash and allow for easy cleaning, bolt in front wheel well liners are to be installed. Stainless steel material is to be used for the liner for ease of cleaning and eliminate corrosive action created by road debris. The wheel well liners are to be a minimum of 22 inches in width.

## **STAINLESS CAB FENDERETTES**

To reduce road splash on the cab sides, polished stainless steel fenderettes shall be installed around each the wheel opening.

## **EXTERIOR REAR WALL DIAMOND PLATE OVERLAY**

The cab exterior rear wall shall be covered with a single sheet of bright aluminum tread plate to protect the back of the cab from scratches.

## **CAB TILT SYSTEM**

The cab shall tilt a minimum of 45 degrees for ease of serving. Tilting shall be accomplished by means of a tilt pump connected to two (2) heavy duty lift cylinders. It shall be equipped with a positive locking mechanism (service lock) to hold the cab in the full tilt position. Release of the service lock shall be by means of a pull type cable assembly. The cylinders shall have a velocity fuse at the base to prevent the cab from falling in the event of a hydraulic hose failure. The cab shall be capable of tilting 90 degrees for major engine service, if necessary. The 90 degree cab tilt shall be accomplished by removing the cab cylinder pins, removing one bolt in the steering shaft, and removing the front bumper and treadplate.

The cab shall have a three (3) point cab locking system. To prevent undue stresses in the cab, the cab mounting shall incorporate a five (5) point load mounting system.

The front cab pivot/lock assemblies shall utilize four (4) radially loaded, bonded rubber, axial mounts. These mounts shall have a maximum radial load rating of 925 pounds each and a torsional rating of 25 lbs-in/deg. Two one (1) inch diameter cab pivot pins shall be installed at the front of the cab.

The rear cab lock shall be center point mounted to prevent normal twist of the chassis from affecting the cab mounting, cab structure and windshield areas of the cab. This rear cab lock shall be mounted on a chassis crossmember to provide a stable platform for the locking system. The cab lock shall be mounted to a baseplate that is fastened to rubber isolators to reduce road noise and provide additional movement of the cab lock. This locking system shall automatically open prior to the cab tilting and automatically relatch when the cab is lowered completely into the travel position.

Two (2) outboard frame mounted urethane "V" blocks shall be provided at the rear of the cab. These dual purpose mounts shall align the cab upon lowering as well as provide non-latching support for the cab in the down position. With this system, extreme chassis twist shall allow the cab to move independently of the rear cab supports, reducing the structural stress damage often caused by outboard dual cab locking systems.

An electric-over-hydraulic cab tilt pump shall be supplied. This pump shall have a remote control for cab tilting operation. The control shall be "safety-yellow" in color.

A manual backup shall be provided for use in the event of electrical failure.

### **CAB TILT INTERLOCK**

The cab lift system shall have a cab tilt interlock. The cab tilt shall not be able to be activated unless the master battery switch is in the on position with the parking brake set.

### **CHASSIS PAINT**

The frame and running gear shall be painted gloss black enamel. The running gear shall consist of the axles, drivelines, air tanks, steering gear, frame mounted brackets, draglink(s), and fuel tank.

The air system piping and electrical harnesses shall not be installed in the frame at the time of the frame painting. This shall insure complete coverage of paint behind those areas, as well as to insure that the air piping and wiring harnesses do not have paint applied to them, hindering troubleshooting.

### **INTERIOR FINISH**

The entire interior of the cab shall be painted with spatter paint, gray in color. Gray spatter paint is selected for ease of repairs when the interior is scratched.

The cab metal finish shall be covered with one coat of base self-etching primer to fill the small surface imperfections.

Then the interior of the cab is to be blocked and a coat of sealer-primer is to be sprayed to the interior finish.

Next a sealer primer is applied and shall be sanded to a smooth finish ready for final color coat application.

Two (2) coats of finished paint are to be applied to a final thickness of 4 mills.

The following interior components shall be finished in black:

- Overhead console
- Sun visors

The interior headliner of the cab shall be gray in color.

The interior rear wall covering of the cab shall be gray in color.

The interior flooring material of the cab shall be gray in color.

The doghouse covering material in the cab shall be gray in color.

The dash housing, doghouse console; when so equipped; and the officer's glove box or console shall be black in color.

### **CAB EXTERIOR FINISH**

The exterior doors and all fixed cab glass are to be removed from the cab prior to the paint and body process beginning.

The two tone, final finish of the cab shall be to fire apparatus standards; exhibiting excellent gloss durability and color retention properties.

### **PREPARATION**

The removal of all contaminates and oxidation is essential to the final effect of a finish system, the cab shall be precleaned with a Wax and Grease Remover and prior to evaporation, towel dried.

To remove all oxidation and foreign materials, the cab shall be sanded with a 180 grit abrasive using an orbital type disc sander.

All weld marks and other major surface imperfections shall be filled with a polyester type body filler, prior to body filler application special attention shall be given to the areas requiring filler again sanding and cleaning.

The body fillers shall be thoroughly mixed in accordance with the manufacturers directions.

After the final coat of filler is sanded a spray polyester shall be applied in sufficient amounts as to provide a final base and sanded with an abrasive paper.

### **PRECLEAN**

Within 45 minutes of pretreat the cab must be again washed with a Wax and Grease Remover using a "Scotch brite pad". Towel dry prior to evaporation.

Special precaution shall be taken NOT to saturate any polyester body fillers with the cleaning solvents.

### **PRETREAT AND PRIMERS**

The pretreat and primer applications shall be made in two independent steps. A combined pretreat/primer one product application shall not be allowed as a substitute.

The prepared substrate shall be pretreated with an acid curing 2-component Transparent Primer. This pretreat shall be designed to provide corrosion protection and to create an adhesive bond between the substrate and the surface applications.

It is critical that the body fillers not receive a saturation of solvents associated with the pretreat application. Only the pretreat over spray resulting from product application to the adjacent metal areas should be allowed to come in contact with the body fillers.

All polyester body fillers are porous, and shall absorb liquids. Solvents when absorbed not only soften but shall create swelling of the polyester filler. After sanding and later shrink the fillers shall create

blemishes in the painted surfaces.

Prior to complete primer application, each area with applied body fillers be precoated with a 2-dry applications of primer (sander surfacer) of which shall be allowed to "Touch Dry" between coats. This procedure shall isolate the filled areas and protect them from subsequent product applications.

The primer (sander surfacer) shall be a poly-acrylic resin, zinc and chromate free surfacer that is designed to create a superb surface smoothness, increase the depth of color, and insure top coat gloss.

The cab after pretreat and precoat shall be primed with a 3 to 4 medium applications of a Hi-Build Tintable Surfacers.

To create a finish base that meets the rigid requirements of the fire and emergency service; the primed surface shall be dry sanded smooth thus removing all texture and surface imperfections with a 320 grit (minimum) sanding abrasive.

### **FINISH AND COLOR COATS**

The color coat application shall consist of two to three applications of acrylic urethane color coat. After the color coat has been applied, the cabs shall be sprayed with 1.5 to 2.0 mills of clear coat finish. The clear coat finish is then sanded and buffed to remove any imperfections that can occur during the application of the color coat.

The final finish shall be free of dirt and sags and shall meet a minimum grade of 7 when compared to the "ACT" general orange peel standards by "ACT" Laboratories, Inc. Of Hillsdale, MI.

The final sanding and buffing of the clear coat shall result in a flat / glass like finish. The clear coat shall also provide a UV barrier to prevent fading and chalking.

Dupont Imron will be used for the cab exterior material.

### **5 YEAR CAB PAINT LIMITED WARRANTY**

The bidder, shall warrant only to the original purchaser and the first purchaser who places the motor vehicle in service that the painted cab (the "cab"), shall under normal use and with normal maintenance remain free from paint defects for a period of five (5) years from the date that the motor vehicle was first placed in service. A painted cab shall be considered to have "paint defects" if it is found by the manufacturer to have any loss of gloss, color retention, cracking, blistering, bubbling or flaking under normal use and with normal maintenance. The warranty shall provide for repair or replacement, at the manufacturer's option, any claim in accordance with the following terms and conditions.

### **WHAT IS COVERED**

**Warranty Applies** - This warranty is for all new fire and rescue cabs and is extended only to the original user-purchaser. The warranty registration must be received by the cab & chassis manufacturer within 30-days of the in-service date for the warranty to apply.

**Repairs Covered** - The warranty covers repair or replacement, at the manufacturer's option. Repairs shall be made at the manufacturer's factory or an approved service facility at the manufacturer's option.

**Obtaining Repairs** - The original user-purchaser must notify the cab & chassis manufacturer in writing within 30 days after any claimed defect has appeared. Transportation costs to and from the service center shall be the responsibility of the user-purchaser. In the case of warranty claim, repair of all non-warranty blemishes shall be negotiated prior to the warranty refinish or repair. Transportation of the vehicle to the factory authorized repair center shall be the responsibility of the owner.

**Warranty Period** - The warranty period shall begin upon delivery of the apparatus to the original user-purchaser. The following percentages apply:

Top Coat and Appearance Gloss, Color Rentention, Cracking	Coating System, Adhesion, Flaking, Blistering, Bubbling
--	--

0 to 60 months	100%	0 to 36 Months	100%
		37 to 60 Months	50%

## **WHAT IS NOT COVERED**

- Damage caused by fire, misuse, negligence or accident.
- Damage caused by theft, vandalism, riot or explosion.
- Damage caused by lightening, earthquake, windstorm, hail, flood or use in acidic environment.
- Any repairs, modifications, alterations, or after market parts added after manufacture without the authorization of the cab & chassis manufacturer.
- Damage from lack of or poor maintainance and cleaning.
- Gold leaf or striping except that which is affected by repair. (Gold leaf or striping must have been installed during manufacture to be covered under this limited warranty.)
- Loss of time, loss of use of the product, inconvenience, lodging, food or other consequential or incidental loss that may result from failure.
- UV Paint Fade
- Components not painted by the cab & chassis manufacturer are covered by the respective manufacturers warranty.

## **SIMULATED GOLD STRIPE**

A 1/2" wide simulated gold stripe in small engine turn with a black shading shall be added to the cab, two tone paint scheme. This stripe shall be applied at the breakline.

## **DRIVER'S SEATING POSITION**

The seat shall be Seats, Inc. 911, non-suspension, high back seat with a 4" double locking fore and aft slide adjustment.

A red 3-point, shoulder harness type seat belt shall be supplied for the seat.

## **OFFICER'S SEATING POSITION**

The seat shall be Seats, Inc. 911, Series Self-Contained Breathing Apparatus (SCBA) type seat with a fixed bottom cushion and a split head rest. The seat shall contain a SCBA filler pad for when the bottle is not in use.

A red 3-point, shoulder harness type seat belt shall be supplied for the seat.

## **SCBA SEAT BRACKET**

There shall be a Zico walkaway self-contained breathing apparatus brackets mounted into the seat cavity. A Zico collision restraint strap (CRS) shall be supplied with each bracket for compliance with NFPA-1901.

## **CREW AREA - REAR FACING LEFT OUTBOARD SEAT POSITION**

The seat shall be Seats, Inc. 911, Series Self-Contained Breathing Apparatus (SCBA) type seat with a fixed bottom cushion and a split head rest.

A red lap type, metal to metal quick release seat belt, with automatic seat belt retractor shall be provided for the seat.

## **SCBA SEAT BRACKET**

There shall be a Zico walkaway self-contained breathing apparatus brackets mounted into the seat cavity. A Zico collision restraint strap (CRS) shall be supplied with each bracket for compliance with NFPA-1901.

## **CREW AREA - REAR FACING RIGHT OUTBOARD SEAT POSITION**

The seat shall be Seats, Inc. 911, Series Self-Contained Breathing Apparatus (SCBA) type seat with a fixed bottom cushion and a split head rest.

A red lap type, metal to metal quick release seat belt, with automatic seat belt retractor shall be provided for the seat.

### **SCBA SEAT BRACKET**

There shall be a Zico walkaway self-contained breathing apparatus brackets mounted into the seat cavity. A Zico collision restraint strap (CRS) shall be supplied with each bracket for compliance with NFPA-1901.

### **CREW AREA - FORWARD FACING LEFT OUTBOARD SEAT POSITION**

### **CREW AREA - FORWARD FACING LEFT INBOARD SEAT POSITION**

No seat was selected to be mounted in this position.

### **CREW AREA - FORWARD FACING RIGHT INBOARD SEAT POSITION**

No seat was selected to be mounted in this position.

### **CREW AREA - FORWARD FACING RIGHT OUTBOARD SEAT POSITION**

### **FORWARD FACING SEAT RISER**

The center forward facing seat(s) shall be installed on a powder coated aluminum riser. The front of the seat riser will be open without a restraint system to provide a location for storage of small lightweight gear.

The seats shall be gray in color.

### **TUFF TEX FABRIC**

The chassis seats shall have Tuff Tex, woven tweed cloth, material in lieu of the standard vinyl. The seats shall have the Tuff Tex material in the following applicable areas.

- Seat Base Top
- Seat Base Sides
- Seat Back Support Face
- Seat Back Support Sides
- Seat Headrests

### **SEAT BELT WARNING LABELS**

The cab shall be equipped with two (2) seat belt warning labels. These labels are to be in full view of the occupants in the seated position.

### **VEHICLE DATA RECORDER**

Apparatus shall be equipped with a Class1 "Vehicle Data Recorder and Seat Belt Warning System" (VDR/SBW) that is connected to the power train CAN (Controller Area Network) bus consisting of transmission (TCM), engine control (ECM) and antilock brake (ABS) modules mounted on the apparatus. The VDR/SBW will function per NFPA 1901-2009 sections 4.11 (Vehicle Data Recorder) utilizing the power train's J1939 data and 14.1.3.10 (Seat Belt Warning) using the Class1 "Seat Belt Input Module" for seat occupied and belt status information.

The VDR data shall be downloadable by USB cable to a computer using either Microsoft™ or Apple™ Operating Systems using Class 1/ O.E.M. supplied reporting software.

## **SEAT BELT WARNING SYSTEM**

There shall be a seat belt indicator system supplied in the cab. The indicator system shall indicate seat belt use for each individual seating position when the seat is occupied, the seat belt remains unfastened and the parking brake is released.

A display panel shall be supplied in the dash area. The panel shall have an audible indicators and a red light display to indicate that a seat belt has not been fastened.

## **SEAT BELT WARNING SYSTEM - MONITOR**

Mounted in the overhead console in the driver's area the indicator system shall indicate seat belt use for each individual seating position when the seat is occupied, the seat belt remains unfastened and the parking brake is released.

## **FRONT BUMPER**

A 12" high heavy-duty 10 gauge, polished stainless steel, wrap around, 2-rib front bumper shall be provided the full width of the cab.

## **BUMPER EXTENSION**

The front frame extension shall be bolted directly to the main rail. The extension and main rail joint shall have a 3/8" thick side plate for reinforcement. The completed apparatus must be able to be lifted at the front bumper without structural damage to the front extension for towing of a disabled vehicle.

The front bumper face shall extend 24 inches ahead of the front face of the cab skin.

## **TOW HOOKS**

Two (2) chromed tow hooks shall be provided and shall be attached directly to the front frame extension under the bumper. These tow hooks shall be attached with two Grade 8 bolts with hardened washers and Grade "C" distorted thread locknuts.

## **GRAVELSHIELD**

A gravelshield shall be installed filling the area above the extension rails. This gravelshield shall be constructed of .125" thick NFPA non-skid, bright, non skid, aluminum treadplate. The gravelshield shall be supported at the front by the top flange of the stainless steel bumper. At the rear, the gravelshield shall be supported by a steel substructure.

## **CENTER HOSEWELL**

A hosewell shall be installed in the center of the gravelshield. The hosewell shall be constructed of .125" aluminum. The upper edges of the hose well shall be tapered to allow for smooth, snag free removal of the hose. The hosewell shall be 26-1/2" wide x bumper depth deep x (extension - 6") front to back. The hosewell shall be mounted between the bumper extension rails.

## **STRAPS, HOSEWELL**

Two (2) straps shall be provided to secure the contents of the hosewell.

## **AIR HORNS**

Dual stutter tone air horns shall be recessed into the front bumper, one each side outboard of the frame rails.

## **AIR HORN IGNITION CONTROL**

To eliminate inadvertent operation the chassis air horns shall be operable only when the battery selector and ignition switch are in the "ON" position.

## **AIR HORN CONTROL SWITCHES**

One (1) foot switch for the air horns shall be provided on the left side of the driver's side cab floor and one (1) on the right side of the officer's side cab floor.

## **AIR HORN OPERATION**

The air horn and the electric horn shall be sounded simultaneously by depressing the horn button in the steering wheel.

## **ELECTRONIC SIREN**

A Whelen electronic siren control, model 295SLSA1 full feature with 17 Scan-Lock siren tones including Radio Rebroadcast, Public Address, Manual, Wail, Yelp, Air Horn, Electronic Mechanical Siren tones and Piercer tones and hard wired microphone, shall be provided.

The siren shall be wired to provide hands free operation from the steering wheel button.

The siren control shall be mounted on top of the engine doghouse within reach of the driver and officer.

## **SIREN SPEAKER**

There shall be one (1) Cast Products polished aluminum 100 watt speaker provided. The speaker shall be recessed into the left (driver's) side of the front bumper immediately outboard of the chassis frame rails.

## **CHASSIS OPERATOR'S MANUAL**

Operator's Manual w/Parts List - Two Sets shall be provided with the chassis.

An electronic Electrical System Manual shall be provided.

- This manual shall provide complete wiring schematics for the vehicle.
- The manual shall be provided with diagrams of the vehicle showing the wiring harness routing within the vehicle. Each of these diagrams shall include the connectors between the harnesses that provide a hyperlink to a drawing of the actual connector where pin functions can be examined.
- Schematics for each system of the vehicle shall be provided with hyperlinks to the connectors for pin designations and to the vehicle drawings for harness location within the vehicle.

An electronic Air System Manual shall be provided.

- This manual shall provide complete air system schematics for the vehicle.
- The manual shall be provided with diagrams of the vehicle showing the air tubing routing within the vehicle.
- Schematics for each system of the vehicle shall be provided with hyperlinks to the tanks and valves and to the vehicle drawings for exact location within the vehicle.

## **CAB ICC MARKER LIGHTING**

Five (5) amber Whelen OS Series LED cab face mounted clearance lights shall be supplied, mounted above the windshield. These lights are to be mounted in a chrome flange.

Two (2) amber Whelen OS Series LED side clearance lights shall be supplied, one (1) each side mounted ahead of the front door. These lights are to be mounted in a chrome flange.

An amber diamond shaped reflector shall be mounted on the lower corner of each cab front door adjacent to the door hinge.

### **HEADLIGHTS**

Four (4) rectangular halogen headlights shall be supplied.

When the parking brake is released and the master battery switch is in the on position, the head lamps shall be illuminated to 80% brilliance.

### **TURN SIGNALS**

Two (2) rectangular Federal Signal, model QL64Z-TURN, LED turn signal lamps shall be mounted outboard of the front headlights on each side. These lights shall be amber in color.

### **ALTERNATING HEADLIGHT WARNING**

The headlights shall be provided with an alternating headlight feature.

When the High Beam is selected the headlights shall become a standard high beam.

Any clear warning light(s) shall be disabled automatically for the "Blocking Right of Way" mode.

A cut off switch shall be supplied to turn off the alternating headlight function.

### **LOW LEVEL WARNING LIGHTS**

Two (2) Whelen warning lights, 600 Series, Super-LED light heads shall be mounted on the front of the chassis above the headlights, in a second headlight style module, located in the inner position on each side.

The light heads shall include an internal flasher with 14 flash patterns, steady-burn and Hi/Low power. The warning lights shall be programmed for Hi-power with the same flash pattern for both the right and left light head.

These two (2) lights fulfill the requirements for Lower Zone A lower level warning devices.

Both warning light lenses shall be red in color.

Chassis Discount

### **MANUALS AND DOCUMENTATION ON CD**

The following manual guides and parts information CD shall be required with the delivery of the apparatus.

Two-(2) sets of the following shall be supplied:

- Operator Manual
- Parts List
- Electrical Wiring Diagrams
- Electrical Troubleshooting Guide
- Air System Diagram
- Hydraulic System Diagram

### **CARRYING CAPACITY PLATE**

There shall be a permanently attached plate mounted in plain view of the driver in accordance with NFPA

1901 Standards.

The tag shall include the following:

- Overall height
- Overall length
- GVWR
- Seating capacity

### **SEATING CAPACITY PLATE**

There shall be a permanently attached plate mounted in plain view in the cab. The plate shall read "Seating Capacity - 4 People".

Each seating position that is not, intended to be used during transit shall be individually labeled as follows:

Warning: This seat is not to be occupied while vehicle is in motion.

### **OCCUPANCY/SEAT BELT PLATE**

There shall be provided and installed plate(s), which read, "Occupants must be seated and belted when the apparatus is in motion". This plate(s) shall be visible from each seated position.

### **LABEL "DO NOT WEAR HELMET"**

A label stating "DO NOT WEAR HELMET WHILE SEATED" shall be installed in the visible from each seating position.

### **OVERALL HEIGHT/LENGTH/WEIGHT PLATE**

An overall height, length and weight plate shall be mounted in the driving compartment and clearly identified and visible to the driver while in the seated position. The plate shall show the completed apparatus overall height, length, (in feet and inches) and gross vehicle weight (in tons) current to the apparatus manufactured date.

If changes of the vehicle occur while in service, the fire department must revise the overall height-length-weight plate.

### **FLUID CAPACITY PLATE**

A permanently affixed fluid date 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(s) Lubrication Fluid
G.	Air Conditioning Refrigerant
H.	Air Conditioning Lubrication Oil

I.	Power Steering Fluid
J.	Cab Tilt Mechanism Fluid
K.	Transfer Case Fluid
L.	Equipment Rack Fluid
M.	Air Compressor System Lubricant
N.	Generator System Lubricant
O.	Front Tire Pressure - Cold
P.	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

### **APPARATUS MOVEMENT WARNING PLATE**

A permanently affixed warning plate shall be installed near the door ajar light. The plate shall read:

"DO NOT MOVE APPARATUS WHEN LIGHT IS ON".

### **DO NOT RIDE PLATE**

A permanently affixed warning plate shall be installed stating "DO NOT RIDE". The plate shall be located on the apparatus at the rear step area, and at any cross walks if they exist. The plate is to warn personnel that riding on or in these areas while the vehicle in motion is prohibited.

### **LOCK UP - EVS3000**

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

### **FRONT MUD FLAPS**

Mud flaps shall be made from black hard rubber and installed at the rear of the front cab fenders.

### **REAR MUD FLAPS**

Mud flaps shall be made from black hard rubber and installed at the rear of the rear body fenders.

Four (4) "Stop" signs shall be installed on the vehicle, one-(1) each side front and rear lower door panels.

### **EMS COMPARTMENT**

One (1) EMS compartment constructed of 1/8" smooth aluminum shall be mounted in the cab. This cabinet shall be installed on the back wall replacing the two center forward facing seats. The compartment

shall be 40"W x 40"H x 20"D. Aluminum (7/8") unistruts shall be provided for future installation of storage trays. The cabinet shall be finished with a spray on polyurethane liner, color to match the interior.

One-(1) interior roll-up compartment door shall be installed on the EMS compartment.

#### Lath Section:

The roller shutter lath, latch lath, guide channels, weather top seal, and all exposed aluminum components shall be constructed entirely of aluminum extrusion (6000) series. The face portion of the lath shall be a minimum of 1-1/2" and a maximum of 1-5/8" in width. The lath material shall maintain a wall thickness of 0.060" with a maximum overall thickness of .375"

The curtain for the roll-up door shall incorporate a mechanical hinge that shall interlock lath extrusion to form a complete curtain. The mechanical hinge area shall remain protected from weather, road debris or other exterior exposures through the incorporation of a special hinge sealing section. This sealing section shall be flexible in design and constructed of a flexible elastomer material (Ethylene Propylene Diene Monomer) rubber. Sealing sections of any other type shall not be acceptable. This construction shall insure that a flexible weather resistant seal shall be maintained. The interior surface of roll-up lath assembly shall be smooth in finish.

#### Guide Channel and Seal:

The extruded aluminum guide channels shall have the ability of being fastened to body with the incorporation of raised head fasteners inside the tracking area with no interference in the operation of the door. Guide channels shall be fully independent of each other and not attached in any way to the counterbalance mounting mechanism. The guide channels shall incorporate a weather seal also constructed of E.P.D.M. Rubber and both channel and sealing section shall be installed as one component. There shall be nylon flocking applied to the opposing surface to the roll-up door to enhance operation and eliminate any periodic maintenance.

#### Top Seal / Drip Rail:

The drip rail shall be constructed of 6000 series aluminum and have a protective anodized finish. The overall height shall be 1.375" with a maximum aluminum width not to exceed .437". The drip rail shall have a provision to secure top seal for the roll-up door. The top seal shall not be able to be separated from drip rail by any way other than means of installation.

#### Lighting

One (1) Truck-Lite model 80351 5" diameter light shall be installed in the roof of the cabinet and operated by the automatic door switch.

#### Shelf

One (1) vertically adjustable shelf shall be installed in the EMS cabinet. The shelf shall be constructed of smooth aluminum and have a 2" lip at the front and rear of the shelf.

#### Lighting

One (1) Truck-Lite model 80351 5" diameter light shall be installed under the shelf and operated by the automatic door switch.

## 120V Outlet

One (1) 120V dual outlet shall be installed in the EMS compartment. The outlet shall be a household type with straight blade plugs. The outlet shall be located in the lower left corner of the cabinet. This outlet shall be powered via the shore line connection.

## **BACK-UP CAMERA - HANSCOM**

There shall be one Hanscom back-up camera system model 7211 installed on the vehicle consisting of the following components wired to the chassis electrical system.

- One 7" LED color monitor with remote controlling the brightness, contrast, day/night, and camera input
- One color camera model HC-IR250 with wide viewing angle, infra-red Led cluster, and water proof housing
- 35' to 70' extension cable

The system shall be installed in a location provided by the customer with engineering approval.

## **LOAD MANAGER**

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 is activated only when the park brake is set. Load shedding may occur "only" in the "Blocking Right of Way" mode and 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.

## **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.

## **PUMP ENCLOSURE - TOP MOUNT - EXTRUDED**

The pump enclosure superstructure shall be constructed of aluminum tubing, channel, angle, and break-formed components. All break formed components shall be constructed from 3/16" (.1875) aluminum. The crossmembers support the substructure and the exterior panels independently from the cab and body. The front of the pump module shall be covered with aluminum treadplate to keep road debris from the front of the pump. The crossmembers shall be isolated from the frame rails using torsion mounts.

The pump enclosure shall be supported at the top of the frame rails, in a minimum of four-(4) places. 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. This design is required to eliminate shifting and stress on the pump enclosure, pump panels, and running boards.

The pump enclosure shall provide an area for the installation of crosslays or a dunnage area.

Any pump enclosure constructed using any material other than aluminum or utilizing any other mounting method is not acceptable.

## **DUNNAGE AREA W/ TREADPLATE WALLS**

There shall be an open area above the pump enclosure for equipment storage trimmed with 1/8" (.125) aluminum treadplate on all vertical interior walls.

## **PUMP PANELS**

The operator's controls and gauges shall be mounted on pump panels constructed of 1/8" (.125) black anodized, non-glare aluminum. No vinyl coverings shall be acceptable as these surfaces are subjected to rough service and vinyl is susceptible to tearing.

The pump controls shall be located at the top of the enclosure. This panel shall be removable for access to gauges and auxiliary controls. The top mount Master gauge panel shall be hinged with quarter-turn latches at each end.

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

Two-(2) access doors shall be provided below the operator's panel for inspection or service of the pump. The doors shall be constructed of 3/16" (.1875") aluminum treadplate with D-ring handles on each panel.

The upper portion of the right side pump panel shall have hinged double doors for access to the pump compartment and primer reservoir. The doors shall be constructed of .125" aluminum treadplate.

The following 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 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.

1. Master intake pressure-indicating device
2. Master discharge pressure-indicating device
3. Tachometer
4. Engine (coolant) temperature indicator
5. Engine oil pressure indicator
6. Voltmeter
7. Pump pressure controls
8. Engine throttle control
9. Primer control
10. Tank to pump control
11. Tank Fill control
12. Water level indicator

Two (2) vertically hinged pump panels with push style latches shall be installed and constructed of the same material as stated in the pump module specifications. The hinged panels replace the current left and right hand lower removable panels for ease of access to the pump compartment from either side of the apparatus during routine maintenance.

#### **LIGHT SHIELD - TOP CONSOLE**

A polished aluminum extruded light shield shall be provided above the pump operators control panel.

#### **LIGHT SHIELD - LEFT SIDE**

A polished aluminum extruded light shield shall be provided above the left side pump panel.

#### **LIGHT SHIELD - RIGHT SIDE**

A polished aluminum light shield extrusion shall be provided above the right side pump panel.

#### **PUMP PANEL LIGHTS LED - TOP CONSOLE**

Three (3) individual Whelen LED Strip Lights, Model PSC00FCR with on/off switch shall be mounted under the light shield above the operator's control panel. For optimum visibility during nighttime operations, the lights shall be mounted as high as possible.

#### **PUMP PANEL LIGHTS LED - LEFT SIDE**

Three (3) individual Whelen LED Strip Lights, Model PSC00FCR light fixtures with on/off switch shall be mounted under the light shield left side. For optimum visibility during nighttime operations, the lights shall be mounted as high as possible.

#### **PUMP PANEL LIGHTS LED - RIGHT SIDE**

Two (2) individual Whelen LED Strip Lights, Model PSC00FCR light fixtures with on/off switch shall be mounted under the light shield right side. For optimum visibility during nighttime operations, the lights shall be mounted as high as possible.

A single pump panel light located on the operator's panel shall be activated when the pump is shifted into gear.

#### **PUMP COMPARTMENT LIGHT**

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

#### **TOP MOUNT WALKWAY W/ TOOL COMPARTMENTS**

A 20" wide walkway shall be provided for the pump operator. The walking surface shall be manufactured from 3/16" non-skid aluminum treadplate. The walkway shall be accessible from either side of the apparatus utilizing running board steps. The distance from the top surface of the running boards to the top

surface of the walkway shall not exceed NFPA standards. A crosswalk warning sign shall be installed centered on the exterior wall of the cab per NFPA standards

Tool compartments shall be installed one-(1) each side of the walkway. The compartments shall be constructed from 3/16" (.1875") smooth aluminum plate and be as large as possible. Each compartment shall have a door constructed from aluminum treadplate, with stainless steel (piano) hinges and D-Ring latches.

### **STEPS BETWEEN WALKWAY AND RUNNING BOARD**

Individual diamond plate steps shall be mounted one (1) each side between the top mount walkway and the running boards.

These steps shall meet all NFPA 1901 requirements.

### **SLOTTED RUNNING BOARD - LEFT SIDE**

A running board shall be provided on the left side of pump module constructed of anodized aluminum extrusion slotted, punched, and raised to provide superior traction during inclement weather operations. Bolted to the pump modules substructure the running board shall be 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.

### **SLOTTED RUNNING BOARD - RIGHT SIDE**

A running board shall be provided on the right side of pump module constructed of anodized aluminum extrusion slotted, punched, and raised to provide superior traction during inclement weather operations. Bolted to the pump modules substructure the running board shall be 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.

### **TOP MOUNT WALKWAY HANDRAILS**

One (1) pair of handrails shall be installed at the front of the pump module. The handrails shall be mounted vertically one-(1) each side near the top mount walkway. The handrails shall be constructed from 1-1/4" extrusion with chrome-plated stanchions. The handrails shall be approximately 30" inches in length.

The handrails shall meet or exceed NFPA 1901 requirements.

### **PUMP PANEL TAGS**

All discharges, gauges, and controls will be properly identified by color-coded metal tags. The metal tags will be affixed with 3m industrial adhesive.

### **PUMP MOUNTING**

Extra heavy-duty mounting brackets shall be bolted to the chassis frame rails for the installation of the fire pump. The mounting brackets shall be positioned aligning the pump insuring the angular velocity of

the driveline joints are the same at each end allowing for full capacity performance with minimal vibration.

## **PUMP SYSTEM - HALE OMAX SINGLE STAGE**

### **PUMP ASSEMBLY**

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

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. The 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. Pump utilizing castings made of lower tensile strength cast iron not acceptable.

Pump body shall be horizontally split, on a single plane, in two sections, for easy removal of entire impeller assembly including wear rings and bearings from beneath the pump without disturbing piping or the mounting of the pump in chassis.

The pump shall have one double suction impeller. The pump body shall have two opposed discharge volute cutwaters to eliminate radial unbalance.

Pump shaft to be rigidly supported by three bearings for minimum deflection. One high lead bronze sleeve bearing shall be located immediately adjacent to the impeller (on side opposite the drive unit). The sleeve bearing is to be lubricated by a force-fed, automatic oil lubricated design, pressure balanced to exclude foreign material. The remaining 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.

The 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 steel, to be super-finished under packing with galvanic corrosion (zinc separators in packing) protection for longer shaft life. Pump shaft must be sealed with double lip oil seal to keep road dirt and water out of drive unit.

### **DRIVE UNIT**

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

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 both 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 thrusts.

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

If drive unit is equipped with a power shift, the shifting mechanism shall be a heat-treated, hard-anodized aluminum power cylinder, with stainless steel shaft. 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.

A 3" clapper check valve shall be installed between the suction side of the pump and the tank-to-pump valve. This 3" clapper valve shall remove the possibility of a water surge expanding the booster tank.

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

The pump system and piping shall be engineered for side panel operations. The relief valve control and other control devices shall be located on side-mounted operator's pump panel.

### **PACKING GLANDS**

The pump shaft shall have only one packing gland located on the inlet side of the pump. It shall be of split design for ease of repacking. The packing gland must be a full circle threaded design to exert uniform pressure on packing and to prevent "cocking" and uneven packing load when it is tightened. It shall be easily adjusted by hand with rod or screwdriver, with no special tools or wrenches required. The packing rings shall be of a unique, permanently lubricated, long life graphite composition and have sacrificial zinc foil separators to protect the pump shaft from galvanic corrosion.

### **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 shall be installed on the cab dash and labeled "Pump Engaged".

Where an automatic chassis transmission is provided, 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.

## **PRIMER**

A Hale model ESP 12 volt positive displacement vane primer shall be installed. The primer shall be electrically driven and conform to the standards outlined in the current NFPA Pamphlet. The system is an oil-less system and environmentally safe. It contains an electric rotary vane type positive displacement primer that operates off 12V or 24V power. The primer motor is totally enclosed to prevent dust, dirt and water from penetrating. The unit is constructed of heat-treated anodized aluminum, specially coated for wear and corrosion resistance. The control shall be pump panel mounted to operate the priming valve and start the priming motor.

## **PUMP ANODES**

Pump anodes shall be installed on the pump for corrosion protection.

## **U.L. TEST POINTS**

An Underwriters Laboratories approved 1/2-speed engine 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.

## **U.L. CERTIFICATION (1500 GPM)**

The vehicle shall be third party tested and certified by Underwriters Laboratories, Inc. UL testing is recognized as a leading, third party, product safety certification organization for over 100 years. UL has served on the NFPA (National Fire Protection Association) technical committee for over thirty-(30) years.

The testing organization must meet the following minimum requirements:

- Must be nationally recognized testing laboratory recognized by OSHA
- Must comply with the ASTM (American Society for Testing Materials) standard E543 "Determining the qualifications for nondestructive testing agencies"
- Must have more than forty (40) years of Automotive Fire Apparatus safety testing experience and more than fifteen (15) years of factory aerial device testing and Certification experience
- Must not represent, be associated with, or in the manufacture or repair of automotive fire apparatus
- Must provide proof of ten-(10) million dollars in excess liability insurance for bodily injury and property damage combined

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

## **PUMP CERTIFICATION TEST 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.

## **WARRANTY - HALE**

### **EXPRESS WARRANTY:**

Hale Products, Incorporated ("Hale") hereby warrants to the original buyer that products manufactured by Hale are free of defects in material and workmanship for a period of five (5) years from the date the product is first placed into service or five and one-half (5-1/2) years from date of shipment by Hale, whichever period shall be first to expire. Within this warranty period Hale will cover parts and labor for the first two (2) years and parts only for years three (3) through five (5).

### **LIMITATIONS:**

HALE'S obligation is expressly conditioned on the Product being:

- Subjected to normal use and service
- Properly installed and maintained in accordance with HALE'S Instruction Manual and Industry Standards as to recommended service and procedures
- Not damaged due to abuse, misuse, negligence, or accidental causes
- Not altered, modified, serviced (non-routine), or repaired other than by an Authorized Service facility
- Manufactured per design and specifications submitted by the original buyer
- Used with an appropriate engine as determined by the engine manufacturers published data
- Excluded are normal wear items identified as but not limited to packing, strainers, anodes, filters, light bulbs, intake screens, wear rings, mechanical seals, etc.

## **MANUALS**

There shall be two copies of pump manuals provided to the department.

## **6" SUCTION HEADERS**

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

There shall be a Hale Model MIV-Manually operated intake valve constructed with a bronze body, sealed gear drive, and built in pressure relief valve provided on the suction of the pump with an indicator light package installed on the pump panel and one (1) air bleeder valve provided.

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

### **RELIEF VALVE - HALE TRV W/ LIGHT**

The pump shall be equipped with a Hale TRV-L thermal relief valve. The valve automatically monitors water temperature and is preset to open 120 degrees Fahrenheit. The TRV-L 120 display shall be provided on the pump panel.

### **RELIEF VALVE - AKRON 59**

There shall be an Akron model 59 suction side relief valve provided in the pump system. The relief valve is adjustable from 50-175 psi and set at the factory at 125 psi.

### **PRESSURE GOVERNOR - MONITOR and MASTER PRESSURE DISPLAY**

Fire Research In-Control model TGA300-A00 pressure governor and monitoring display kit shall be installed. The kit shall include a control panel, intake pressure sensor, discharge pressure sensor buzzer, and cables. The control panel case shall be waterproof and have dimensions not to exceed 4 3/4" high by 9 3/4" wide by 2 3/4" deep. The panel shall have LED lights to indicate PSI mode, RPM mode, OK TO PUMP, and IDLE RPM.

The following continuous displays shall be provided:

- Pump discharge; shown with four daylight bright LED digits more than 1/2" high
- Pump Intake; shown with four daylight bright LED digits more than 1/2" high
- PSI/RPM setting; shown on an LED bar graph display
- Engine RPM; shown with four daylight bright LED digits more than 1/2" high, updated in 10 RPM increments
- Oil pressure; shown on an LED bar graph display
- Engine coolant temperature; shown on an LED bar graph display
- Battery voltage is shown on an LED bar graph display.

Inputs to the control panel from the pump discharge and intake pressure sensors shall be electrical. The discharge pressure display shall show pressures from 0-600 psi. The intake pressure display shall show pressures from -30 in. Hg to 600 psi.

There shall be two control modes, pressure, and RPM. No discharge pressure or engine RPM variation shall occur when switching between pressure and RPM modes. When the pump engaged interlock signal is recognized an OK TO PUMP LED shall light to indicate throttle ready and the governor shall be in pressure mode, with the engine RPM set to idle. In pressure mode, the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode, the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi.

The program features shall be accessed via push buttons located on the front of the control panel. The program shall support manual control of pump discharge pressure and RPM settings, field programmable presets, and diagnostic capabilities. Safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

The pressure governor, monitoring, and master pressure display shall be programmed for Cummins engines.

### **PRESSURE GAUGES - 2-1/2" STANDARD**

The discharges shall be provided with 2-1/2" pressure gauges. The gauges shall be installed above each

discharge control on the pump operator's panel. The discharge gauges shall be liquid filled with a silicone 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 white with black markings reading from zero to 600 PSI.

**STANDARD COLOR BEZELS**

Pressure gauge bezels shall be FFA standard colors discharge specific.

COLOR BEZELS STANDARD		
Location	Description	Color
#1	Discharge	Blue
#2	Discharge	Purple
#3	Discharge	Green
#4	Discharge	White
#5	Discharge	Pink
#1	Crosslay / Speedlay	Red
#2	Crosslay / Speedlay	Yellow
#3	Crosslay / Speedlay	Grey
2.5	Crosslay / Speedlay	Green
PS Large	Discharge	Brown
Right Rear	Discharge	Brown
Left Rear	Discharge	Orange
1.5	Front Jump Line	Orange
2.5	Front Jump Line	Purple
N/A	Deck Gun	Burgundy
N/A	Pre-Connects	Black

**MASTER DRAIN**

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.

**TANK TO PUMP - 3"**

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 a (twist lock) lever controlled from the pump operator's control panel.

**TANK FILL**

There shall be a 2" pump to tank fill line installed, with a 2" inline bronze valve, high-pressure flexible hose tested to 1200 PSI. The valve shall be (twist lock) lever controlled from the pump operator's panel.

**REAR DIRECT TANK FILL - 2-1/2"**

There shall be one-(1) 2-1/2" rear direct tank fill provided at the right rear of the apparatus. A 2-1/2" brass ball valve with electric actuator shall be vertically mounted and controlled in two (2) places, one (1) at the valve and one (1) at the pump operators panel.

## **2.5" CHROME PLATED 30 DEGREE ELBOW**

There shall be one (1) chrome-plated elbow, Kochek KE30, supplied with the apparatus. The elbow shall have a 30-degree turn and 2.5" MNST x 2.5" FNST threads.

## **2.5" CHROME PLUG**

There shall be one (1) Kochek model K Chrome RL, 2.5" chrome plug with a chain supplied with the apparatus.

## **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.

## **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.

## **PLUMBING - SUCTION INLETS & DISCHARGE OUTLETS**

All suction and discharge lines of 2" or larger shall be constructed of a minimum of Schedule 40 galvanized 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).

## **PUMP & PLUMBING PAINTING**

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

## **AKRON LEVER CONTROL VALVE PACKAGE**

All side suction / discharge valves installed shall be Akron lever controlled from the pump operator's panel unless otherwise specified.

The Akron Swing-Out Heavy-Duty valves are designed for operating pressures to 250 psi (17 bars) and meet the current NFPA 1901 Standards for valve operating speed when controlled by gear, electric actuator, or slow close device.

- 10-year warranty against manufacturer's defects
- Available in 1" to 3 1/2" sizes
- 90° handle travel 316 stainless steel ball for longer valve life
- 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)
  - Wide range of available adapters
  - Designed and tested to exceed NFPA requirements
  - Cast, machined and assembled at our facilities in Wooster, Ohio

### **2-1/2" SUCTION - LEFT PANEL FRONT**

One-(1) 2-1/2" lever operated ball valve shall be installed at the pump panel, left front 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".

### **2-1/2" SUCTION - RIGHT PANEL FRONT**

One-(1) 2-1/2" lever operated ball valve shall be installed at the pump panel, right front 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".

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

### **FRONT BUMPER DISCHARGE**

There will be one-(1) front discharge installed in the front bumper, center hosewell.

The front bumper discharge shall terminate 2" NPT x 1-1/2" NST with a 90-degree swivel and treadplate stop preventing the swivel from incidental contact with the cab.

One-(1) 2" bronze valve with 3/4" drain shall be installed on the discharge side of the pump plumbed to the front swivel with flexible high-pressure hose and victaulic stainless steel couplings tested to 1200 PSI, the front discharge shall be lever controlled at the pumps operator's panel.

### **NO. 1 SPEEDLAY 1-3/4" DOUBLE LAY**

One-(1) pre-connected speedlay compartment shall be provided below the top mount operator's panel accommodating 200' of 1-3/4" double jacket hose, with stainless steel nylon guided rollers installed at each end, and stainless steel scuff plates around the perimeter of the speedlay protecting the painted surfaces.

One-(1) 2" ball valve with 3/4" drain and Chicksan swivel shall be provided plumbed to the speedlay with 2" high-pressure flexible hose stainless steel couplings tested to 1200 PSI, the valve shall be lever

controlled at the pump operator's panel.

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

### **NO. 2 SPEEDLAY 1-3/4" DOUBLE LAY**

One-(1) pre-connected speedlay compartment shall be provided below the top mount operator's panel accommodating 200' of 1-3/4" double jacket hose, with stainless steel nylon guided rollers installed at each end, and stainless steel scuff plates around the perimeter of the speedlay protecting the painted surfaces.

One-(1) 2" ball valve with 3/4" drain and Chicksan swivel shall be provided plumbed to the speedlay with 2" high-pressure flexible hose stainless steel couplings tested to 1200 PSI, the valve shall be lever controlled at the pump operator's panel.

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

### **SLIDE-OUT SPEEDLAY HOSE TRAYS**

There shall be two-(2) slide-out, speed lay hose trays provided with the apparatus constructed of 3/16" smooth aluminum with handles at each end held in place by horizontal bulkheads at each end of the compartments.

### **SPEEDLAY COVERS**

Two-(2) Hypalon speedlay covers shall be provided one each side of the apparatus secured with Velcro sides and stainless steel bottom pushpins preventing hose from inadvertently deploying during normal operations meeting the current NFPA requirements.

The end flaps shall be red in color.

### **2-1/2" DISCHARGE LEFT PANEL FRONT**

One-(1) Akron 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 lever controlled from the pump operator's panel.

### **2-1/2" DISCHARGE LEFT PANEL REAR**

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

### **3" DISCHARGE RIGHT PANEL FRONT**

One-(1) Akron 3" Heavy-Duty ball valve with 3/4" drain shall be installed at the pump panel, right front, plumbed to the discharge side of the pump equipped with 3" NST threads chrome cap and chain lever controlled at the pump operator's panel.

### **2-1/2" DISCHARGE RIGHT PANEL REAR**

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

### **3" DECK GUN PLUMBING**

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

### **TFT EXTEND A GUN SYSTEM**

There shall be one (1) Task Force Tips model XG-18 Extend a Gun manually operated system installed on the apparatus. A warning light indicator system shall be provided through the door-ajar system to indicate if the Extend a Gun is in the extended position. The 3" waterway shall be capable of being extended to a height of 18".

### **2-1/2" LEFT REAR DISCHARGE**

One-(1) Akron 2-1/2" Heavy-Duty ball valve with 3/4" drain shall be plumbed to the left rear of the apparatus terminating 2-1/2" FNPT x 2-1/2" MNST with chrome cap and chain lever controlled at the pump operator's panel.

### **2.5" CHROME PLATED 45 DEGREE ELBOW**

There shall be one (1) chrome-plated elbow, Kochek KE45, supplied with the apparatus. The elbow shall have a 45-degree turn and 2.5" MNST x 2.5" FNST threads.

### **2.5" CHROME PLUG**

There shall be one (1) Kochek model K Chrome RL, 2.5" chrome plug with a chain supplied with the apparatus.

### **REAR TOW EYES**

There shall be two-(2) 3/4" thick rear tow eyes constructed of A-36 steel 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.

### **PUMP PANEL MICROPHONE BOX**

There shall be an aluminum box mounted on the pump panel for future installation of a radio microphone. The box shall have a hinged door with latch and shall be fully gasketed to protect the microphone.

### **PUMP PANEL SPEAKER**

There shall be a weatherproof speaker mounted on pump panel. The speaker shall be mounted with protective grille and shall be 3-1/2" minimum in diameter. Engineering and the customer shall determine the exact location.

### **TANK VISION GAUGE**

The water level gauge shall be a Tank Vision Model WLA200-A00, with nine super bright LED's to show the tank volume. The display shall use a two-dimensional, two-element lens to refract the light from the LED's and to provide full 180-degree visibility for the level indications. The gauge shall use a pressure transducer installed near the bottom of the water tank to determine the correct volume in the tank.

### **WHELEN PS TANK STRIPLIGHT**

There shall be a pair of PS TANK Status Lights, with 96 LED's steady burn green, blue, amber, and red. The light provides bright, easy to identify indication of water status. The unit is surface mounted, has low current consumption, fully encapsulated, and carries a five (5) year warranty from Whelen. The lights shall be mounted per customer requirements, typically one each side on or near the cab. The unit shall work in conjunction with the Master on the pump panel.

### **APPARATUS BODY**

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

#### **SUBFRAME**

The main body support crossmember extrusions shall be 3" x 4" 6061T6 aluminum alloy, double "I" beam with a wall thickness of 7/16" (.438"). These crossmembers shall extend the full width of the body to support the compartment framing. The crossmembers shall be welded to a 3/4" (.750") x 3" solid aluminum, 6061T6 aluminum (alloy frame rail) extrusion. 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") crossmember OD, steel U-bolts. The main body support crossmember shall have a gusset above and below each crossmember. The gussets shall be constructed of 2.0" x 4.0" 6063T6 aluminum alloy extrusion with a .190" wall thickness. The gussets shall be continuously welded with 5356 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.

#### **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 5356 aluminum alloy welding wire. Body sides shall be formed from 5052 H-32 (marine grade) smooth aluminum plates. The horizontal surfaces above the compartment tops shall be constructed from aluminum treadplate.

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 6063T6 aluminum alloy. This extrusion shall have .190" outside radius corners. The longitudinal frame member, below the lower compartments shall be a 2.0" x 4.0" 6063T6 aluminum alloy extrusion with .190" radius corners. Each body corner shall be a 3.5" x 9.75" 6063T6

extruded aluminum section with .210" wall thickness, 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 from 2" x 4" x .190" wall thickness. The extrusion shall be made from 6063T6 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 treadplate panels. The wheel well liners shall be constructed of 3003 H-14 smooth aluminum plates. They shall be bolted in place for ease of maintenance. The wheel well fenderettes shall be constructed of #304 Stainless steel with a #7 polished finish.

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

The hosebed sides shall be constructed of 3/16" (.1875") 5052 H-32 (marine grade) smooth aluminum plate welded to the extruded framework. There shall be a 3" x 3.5" 6063T6 aluminum extrusion with .190" wall thickness running the entire length of the hosebed at the top for structural rigidity. The hosebed decking shall be constructed from anodized aluminum extrusions. The extrusions shall be 3/4" (.750") x 8.125" and have 3/4" (.750") x 3.00" hat channel attached to the underside to form a one-piece grid. The entire deck shall be removable, in one piece, to allow ease of serviceability to the tank. The hosebed shall include an extrusion across the front and rear of the compartment for the installation of adjustable hosebed dividers.

The fire apparatus hose body shall be 67.5" wide and shall contain a minimum of 79 cubic feet of storage.

There shall be slanted beavertails provided at the rear of the body. The beavertails shall be constructed of 2" x 2" x .190" thickness, 6063T6 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 treadplate.

## COMPARTMENT CONSTRUCTION

The compartment sidewalls shall be of one-piece construction. The walls shall be formed from 3/16"(.1875") 5052 H-32 (marine grade) smooth aluminum plate. All compartment floors shall be formed from 3/16"(.1875") aluminum treadplate. 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 treadplate. 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.

## COMPARTMENTATION

There shall be a minimum of 200 cubic feet of total storage capacity.

### LEFT SIDE:

There shall be one (1) left front compartment installed ahead of the rear axle. This compartment shall have one (1) roll-up door. The interior compartment dimensions shall be approximately 44"W x 69"H x 25"D in the lower compartment and 15" D in the upper compartment. The compartment shall have a useable door opening of approximately 41"W x 51"H. There shall be approximately 28.8 cubic feet of

storage capacity.

There shall be one (1) compartment installed above the wheel well. This compartment shall have one (1) roll-up door. The interior compartment dimensions shall be approximately 58"W x 37"H x 15"D. The compartment shall have a useable door opening of approximately 55"W x 19"H. There shall be approximately 12.9 cubic feet of storage capacity.

There shall be one (1) left rear compartment installed behind the rear axle. This compartment shall have one (1) roll-up door. The interior dimensions shall be approximately 49"W x 69"H x transverse in the lower compartment and 15"D in the upper compartment. The compartment shall have a useable door opening of approximately 46"W x 51"H. There shall be approximately 98.3 cubic feet of storage capacity.

#### CENTER REAR:

There shall be one (1) compartment installed at the center rear of the apparatus. This compartment shall have two (2) vertically hinged doors. The compartment shall have a useable door opening of approximately 46"W x 28"H.

#### RIGHT REAR:

There shall be one (1) right rear compartment installed behind the rear axle. This compartment shall have one (1) roll-up door. The interior dimensions shall be approximately 49"W x 69"H x transverse in the lower compartment and 15"D in the upper compartment. The compartment shall have a useable door opening of approximately 46"W x 51"H.

There shall be one (1) compartment installed above the wheel well. This compartment shall have one (1) roll-up door. The interior compartment dimensions shall be approximately 58"W x 37"H x 15"D. The compartment shall have a useable door opening of approximately 55"W x 19"H. There shall be approximately 12.9 cubic feet of storage capacity.

There shall be one (1) right front compartment installed ahead of the rear axle. This compartment shall have one (1) roll-up door. The interior compartment dimensions shall be approximately 44"W x 69"H x 25"D in the lower compartment and 12" D in the upper compartment. The compartment shall have a useable door opening of approximately 41"W x 51"H. There shall be approximately 28.8 cubic feet of storage capacity.

#### COMPARTMENT DOOR CONSTRUCTION

Six-(6) roll-up doors shall be installed on the side compartments of this apparatus.

Slats are to double-wall (box frame) aluminum extrusion. Exterior surfaces are to be flat. Interior surfaces are to be concave to prevent loose equipment from jamming doors. The slats must be anodized to eliminate oxidation. The slats are to have inner-locking end shoes on every slat secured by a Punch-Dimple process. The slats are to have interlocking joints with a folding locking flange. Between each slat shall be a PVC/vinyl inner seal to prevent any metal-to-metal contact.

The track shall be one-piece aluminum, which has an attaching flange and finishing flange incorporated into its design, which provides a finish look to installation without additional trim or caulking. The track is to have a replaceable side seal. The side seal shall prevent water and dust intrusion into the compartment.

There shall be an aluminum drip rail above each compartment door with a built in replaceable wiper seal.

Each roll up door shall have a counter balance to assist in lifting and eliminate the risk of accidental closing.

A full width lift bar, operable by one hand, shall be used as a positive latch device for securing each individual compartment door in the closed position.

The outside door shall have a natural finish.

There shall be an anodized aluminum sill plate installed over the compartment door.

#### CENTER REAR COMPARTMENT DOORS

The rear compartment doors shall be constructed of 3/16" (.1875") smooth aluminum plate with the inner pans stitch welded in place from 1/8" (.125") 5052-H32 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 to remove water.

Exterior door latches shall incorporate a polished D-paddle handle with rotary style latch. For ease of operation, the D-handle opening shall be large enough to accommodate a gloved hand. The D-paddle latching design shall be subjected to corrosion, water infiltration, and cycle testing to 35,000 cycles. Double doors shall utilize concealed rotary latches on the secondary door, actuated by a recessed stainless steel paddle handle. The door design shall not impede into the compartment opening when in the open position. The watertight door seal shall exceed the current KKK-1822 water infiltration standards. 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.

#### GROUND LADDER/PIKE POLE STORAGE

The apparatus shall be equipped with a rear, ladder access, storage compartment configured through the center of the water tank. This storage area shall be completely enclosed and designed to protect the contents of the ladder compartment.

The rectangular ladder tunnel shall be constructed entirely from a high impact polypropylene material. The top and sidewalls shall be constructed from 3/4" (.750) material while the floor is constructed from 1" thick material. All four sides shall be internally seam welded to the water tanks structure.

The equipment storage compartment shall be constructed of 3/16" (.1875") 5052-H52 marine grade aluminum and designed to accommodate the NFPA required equipment. The compartment shall house one (1) 24' extension ladder, one (1) 14' roof ladder, one (1) 10' folding ladder and up to four (4) pike poles. The compartment shall be supported externally both fore and aft and shall not touch the water tank sleeve at any point. The complete assembly shall be easily removable in the event that service to the water tank becomes necessary.

Individual storage compartments constructed from the same high-grade material as the outer structure shall be supplied. All partitioned floor areas shall be overlaid with 1/4" PVC flat stock to facilitate the removal of each component.

Individual pike pole tubes shall be manufactured from aluminum tubing and shall be designed with a slot securing each pike pole in place.

A horizontally hinged, lift up door, located at the rear of the apparatus shall be used to access the storage compartment. The outer skin shall be constructed of 3/16" (.1875") smooth aluminum plate with the inner pan stitch welded in place from 1/8" (.125") smooth aluminum plate. There shall be 1/4" (.250) holes located in the lower corners of the inside door pans for moisture drainage. The door shall have a closed

cell, neoprene rubber gasket installed around the perimeter of the door for the removal of excess water.

The door shall have one (1) D-paddle handle with rotary latch mechanism, and pneumatic door stay device. The door striker shall be offset to improve the storing and removal of equipment. The door shall have a continuous stainless steel piano hinge bolted to the body and door with stainless steel hardware.

To insure reliability and the ability to construct this type of storage system, the body manufacturer and the manufacturer of the water tank shall submit a rear view line drawing and a minimum list of 50 units with the ladder storage configuration in service. Failure to provide this information with the bid shall be reasonable cause for the rejection of the bid.

### **SEPARATE PUMP MODULE - ALUMINUM**

The pump module shall be a self-supported structure mounted independently from the body and chassis cab. The pump module shall be constructed entirely of extrusions and aluminum plate and shall be bolted to the chassis framrails. The framework shall be formed from beveled aluminum alloy extrusions and electrically seam welded both internally and externally at each joint using 5356 aluminum alloy welding wire. The main framework shall be constructed of 3.00 x 3.50, 6063-T6 aluminum extrusion. Aluminum angle shall be welded such that a recessed Duranodic Aluminum pump panel can be mounted inside the extrusion perimeter. The pump module design must allow normal frame deflection without imposing stress on the pump module structure or side running boards.

### **BOOSTER TANK - POLYPROPYLENE**

The booster tank shall be manufactured by UPF constructed of PT2E resin and copolymer shall be provided with the capacity to hold 1000 U.S. Gallons complete with a Lifetime Warranty. The tank manufacturer shall mark the tank and furnish notice that indicates proof of warranty. The purpose of the markings and notice is to inform department personnel who store, stock, or use the tank that the unit is under warranty. The markings indicate the substance and duration of the warranty. It also includes whom to notify if the tank is found to be defective.

### **CONSTRUCTION**

The tank shall be "T" shaped and constructed of 1/2" thick polypropylene sheet stock. This material shall be a non-corrosive stress relieved thermoplastic, natural in color and UV stabilized for maximum protection.

The booster tank shall be of a specified configuration and is designed to be completely independent of the body and compartments. All joints and seams are nitrogen welded and tested for maximum strength. The top of the tank is fitted with removable lifting eyes designed with a 3 to 1 safety factor to facilitate easy removable. The transverse swash partitions shall be manufactured of 3/8" polypropylene and extend from approximately 4" off the floor to just under the cover. The longitudinal swash partitions shall be constructed of 3/8" polypropylene and extend from the floor of the tank through the cover to allow for positive welding and maximum integrity. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are welded to each other as well as to the walls of the tank.

### **FILL TOWER AND COVER**

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" polypropylene and shall be a minimum dimension of 12" x 12" outer perimeter. The tower shall be located in the left front corner of the tank unless otherwise specified by the purchaser. The tower shall have a 1/4" thick removable polypropylene screen and a polypropylene hinged-type cover. Inside the fill

tower, approximately 4" down from the top shall be fastened a combination vent / overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum ID of 4" that is designed to run through the tank, and shall be piped behind the rear wheels to maximize traction.

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

## SUMP

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

## OUTLETS

There shall be two (2) standard tank outlets: one for the tank-to-pump suction line, which shall be a minimum of 3" NPT coupling; and, one for a tank fill line, which shall be a minimum of 1" NPT coupling. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates of up to 1,000 Gpm. The addition of rear suction fittings, nurse valve fittings, dump valve fittings, and through tank sleeves to accommodate rear discharge piping must be specified. All auxiliary outlets and inlets must meet all NFPA 1900 guidelines in effect at the time of manufacture.

## 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 .250" x 2" and a minimum Rockwell Hardness of 60 durometer. The tank shall be captured front and rear as well as side-to-side to prevent the tank from shifting during vehicle operation. The tank shall sit cradle mounted using four (4) corner angles of 4" x 4" x .250" thickness x 6" high welded directly to the body cross members. The entire perimeter of the bottom of the tank shall be supported. Although the tank is designed on the free-floating suspension principle, it shall be required that the tank have hold down restraints to minimize movement during vehicle operation. These restraints shall be mounted to the side walls of the hose bed and extend down so that they rest approximately 1/2" above the top of the tank. The foot of the restraint does not directly contact the top of the tank. Hosebed floors shall be designed so that the floor slat supports extend the full width of the hose body. The floor is not permitted to drop off the edge of the tank or in any way come in contact with the individual covers where punctures may occur. The flooring shall be capable of supporting up to 200 lbs per square foot and shall be evenly distributed whenever possible. The tank shall be completely removable without disturbing or dismantling the apparatus structure.

## **WATER TANK SIZE-NFPA CERTIFICATION**

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.

### **POLY TANK WARRANTY-LIFETIME**

The poly tank manufacturer warrants each tank to be free from manufacturing defects in material and workmanship for the service life of the original vehicle (vehicle must be actively used in fire suppression). The warrant is transferable, with written approval of the manufacturer. Each tank is inspected and tested for leaks prior to leaving the manufacturing facility. The tank shall be installed in the vehicle in accordance to the manufacture's guidelines.

There are no warranties, expressed or implied, which extend beyond the description of the face hereof. There is no expressed or implied warranty of merchantability or a warranty of fitness for a particular purpose. Additional, this warranty is in lieu of all other obligations or liabilities on the part of the Manufacturer.

### **VERTICAL LOAD TEST- BODY**

The fire body shall exceed a vertical load testing. The vertical load test to the fire body shall follow the same strict and detailed requirements of the Economic Commission for Europe Structural Standard, ECE-29R as applied to the cab.

The fire body shall be placed under a vertical load test to show structural integrity. There shall be 65,979 lbs (29.53 metric tons) applied to the fire body. There shall be no structure failures to the body and body compartments.

A complete photographic, video, data, and dimensional record of these tests shall be available and placed on record for customer evaluations.

### **BODY MODIFICATION - INCREASE**

A special engineering compartment height modification shall be determined in one-inch increments.

### **BODY MODIFICATION - INCREASE**

A special engineering body width modification shall be determined in one-inch increments.

### **ROLL UP DOOR**

All roll-up doors supplied on the apparatus shall have a Satin finish.

### **SUCTION HOSE COMPARTMENT**

A suction hose compartment shall be located in the hosebed. The compartment shall have a rear access door constructed of smooth aluminum plate. The door shall have a stainless steel piano type hinge and "D" ring latch mechanism. This compartment shall be designed to hold two (2) sections of hard suction hose.

### **WHEEL WELL AIR BOTTLE COMPARTMENTS - (2)**

There shall be two (2) air bottle compartments located in the rear wheel well left front. The compartments shall be fabricated from 1/8" (.125") smooth aluminum. The aluminum is rolled to form the air bottle tube and shall be supported at the opening by seam welding the tube to the wheel well. The bottom of the tube is also to be supported to eliminate breakage from vibration. The tubes are vented to facilitate moisture drainage. The compartment door shall be a cast aluminum door with a positive mechanical latch. The bottom of the compartment shall be lined with a material to protect the air bottle finish.

### **FUEL FILL- RECESSED WITH DOOR**

There shall be a cast aluminum recessed fuel fill assembly with a non-locking door mounted on the left side of the apparatus body. The fuel fill assembly shall be equipped with a fuel fill cap, retention ring and a CPI cast aluminum door. The assembly shall be properly labeled "DIESEL FUEL ONLY".

### **WHEEL WELL AIR BOTTLE COMPARTMENTS - (2)**

There shall be two (2) air bottle compartments located in the rear wheel well right front. The compartments shall be fabricated from 1/8" (.125") smooth aluminum. The aluminum is rolled to form the air bottle tube and shall be supported at the opening by seam welding the tube to the wheel well. The bottom of the tube is also to be supported to eliminate breakage from vibration. The tubes are vented to facilitate moisture drainage. The compartment door shall be a cast aluminum door with a positive mechanical latch. The bottom of the compartment shall be lined with a material to protect the air bottle finish.

### **WHEEL WELL AIR BOTTLE COMPARTMENTS - (2)**

There shall be two (2) air bottle compartments located in the rear wheel well right rear. The compartments shall be fabricated from 1/8" (.125") smooth aluminum. The aluminum is rolled to form the air bottle tube and shall be supported at the opening by seam welding the tube to the wheel well. The bottom of the tube is also to be supported to eliminate breakage from vibration. The tubes are vented to facilitate moisture drainage. The compartment door shall be a cast aluminum door with a positive mechanical latch. The bottom of the compartment shall be lined with a material to protect the air bottle finish.

### **PAINTED WHEEL WELL PANELS**

The wheel well panels shall be painted job color in place of aluminum treadplate.

One (1) brush stainless steel compartment door shall be installed over each wheel well storage compartment in lieu of the standard cast doors with a positive mechanical latch.

### **BODY TRIM**

The standard body trim shall include the following:

- There shall be 1/8" (.125") aluminum treadplate installed over all side compartment tops to provide a drip rail over the compartment door openings.
- 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.
- The vertical rear face of the body shall be covered with smooth aluminum plate.

- Two (2) handrails shall be located on the rear beavertails; one handrail per beavertail. Each handrail shall be constructed of 1-1/4" ribbed aluminum tubing, with chrome end stanchions. Each handrail shall be sufficient in length to meet all standard requirements.
- Two (2) stanchions shall be mounted at the rear of the apparatus hosebed, one (1) each side. The stanchions shall be 11"L x 3.75"W and manufactured out of polished cast aluminum. Stainless steel scuff plates shall be installed in the hosebed area to prevent deploying hose from damaged on stanchion supports. The stanchions shall provide mounting positions for the Zone C warning lights and additional hosebed lighting. All wiring for the upper rear lighting shall be concealed inside the stanchions.

### **ALUMINUM RUBRAIL**

There shall be an aluminum rubrail installed on both sides of the lower body compartments. The rubrail shall be constructed from "C" channel extrusion. The aluminum rubrail shall be bolted in place with stainless steel bolts, and spaced from the fire body to provide body protection. The solid rubrail shall serve as protection to the side doors when encountering close objects. Treadplate rubrails or welded on shall not be acceptable.

### **SLOTTED REAR STEP**

The rear step shall be constructed with an anodized aluminum extrusion. This extrusion shall be slotted punched and raised to provide superior traction during wet and cold weather operations. The rear step shall be a two-piece design. Each section of the rear step shall bolt on with stainless steel nuts and bolts for replacement. The rear step shall have a space of approximately 1/4" from the rear of the body to allow water run off.

All running board and step surfaces shall comply with NFPA 1901.

### **REAR COMPARTMENT BLOUSE**

There shall be an extension of the rear compartment between the beavertails to increase the lower compartment 8" in depth.

### **INTERMEDIATE HANDRAIL**

There shall be an intermediate handrail supplied and installed on the apparatus. The handrail shall be made out of 1-1/4" ribbed aluminum. The handrail shall be mounted below the hose bed and above the center rear compartment. The handrail shall be mounted with chrome plated end stanchions.

### **HOSE BED COVER**

A hose bed cover constructed of 16 oz. heavy-duty crisscrossed reinforced nylon shall be provided. Cover shall be fire retardant vinyl and installed over hose bed. The cover shall have chrome twist-locks 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 hosebed and prevent hose from inadvertently deploying during normal operation.

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

The cover shall meet the TIA 03-1 NFPA requirement.

The end flaps shall be red in color.

### **HOSE BED DIVIDER**

Two (2) hose bed divider 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.

### **HOSE BED CAPACITY**

The hosebed shall have the capacity to hold the following:

Quantity	Size of Hose	Brand Name of Hose
1000 ft	5"	Nitrile Rubber
400 ft	2.5"	Double Jacket Poly
200 ft	3"	Double Jacket Poly

Customer must specify hose to have the correct hoseload to meet the current NFPA.

### **COMPARTMENT UNISTRUTS**

Four (4) additional aluminum unistruts shall be installed in each compartment specified by the department.

### **ADJUSTABLE SHELF**

There shall be four (4) adjustable shelf(ves) made from .1875 smooth aluminum. The tray shall be approximately 37-48"W x 24"D. The adjustable track shall be made from aluminum extrusions and run the full height of the compartment. Each shelf shall have a 2" lip on all sides for added strength.

### **CHROME-FOLDING STEPS**

There shall be six (6) large chrome-folding steps with a minimum surface area of thirty-five (35) square inches. The step shall be mounted one-(1) on the front face of the forward compartment, or as directed by the customer.

### **REAR STEPS/ STEPS LIGHTED - (6)**

There shall be six (6) rear lighted steps installed on the apparatus. The steps shall be a cast products step and have a minimum of thirty-five (35) square inches of surface area to conform to the NFPA 1901 standards. The step(s) shall include a 12-volt incandescent light to illuminate the area below.

### **TURTLE TILE**

There shall be Turtle Tile in all the compartment floors. The color of the tile shall be black. The Turtle Tile shall be completely removable for cleaning.

## **ELECTRICAL SYSTEM**

### **BODY ELECTRICAL**

The body electrical system shall be designed as an integrated electrical package specifically engineered for fire apparatus application. The integrated electrical system shall be comprised of central power distribution panels, which interface with the body and chassis through an engineered harness system.

### **DISTRIBUTION PANELS**

The electrical distribution panels and circuits must be housed in each rear corner compartment or extrusion. The distribution panel shall incorporate a power and ground stud for connection to the internal circuits.

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.

Each side electrical distribution panel shall consist of fifteen - (15) power distribution relays. The power distribution relays shall be replaceable, SPDT automotive style, rated at a minimum of 30 amperes.

The power distribution relays shall incorporate separate inputs, which are able to accept outputs from a load management system. The load management inputs must allow for the addition of a load management system before, during, or after the time of delivery without requiring a rewiring of the existing distribution panel circuits.

Connections to the distribution panel shall utilize Deutsch style bulkhead connectors. Screw clamp type connections are not acceptable.

The distribution panel shall also contain circuit's ancillary to the required DOT signals and other body functions.

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.

The body electrical panel shall be capable of being completely disconnected and fully tested by a computerized circuit analyzer.

All electrical equipment switches shall be mounted on a switch panel mounted in the cab convenient to the driver. Light switches shall be of the marine grade rocker type with integral indicator light to show when lights are energized. All switches shall be appropriately identified.

### **12-VOLT TESTING**

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

### **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.

### **WHELEN PUMPER PACKAGE 4**

The fully compliant NFPA lighting package is a combination of Super LED and halogen rotating lights. This package meets all zone requirements of NFPA 1901 standards.

### **LIGHTBAR - WHELEN - MODEL FN72VLED**

A Whelen model FN72VLED LED lightbar shall be mounted on the cab roof. The lightbar shall measure 72" in length and positioned as far forward as possible. The lightbar shall have four-(4) corner Red Linear 12's and four-(4) front Linear 8's (2 Red / 2 White).

The lightbar 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.

The lightbar shall meet NFPA 1901 edition as configured.

#### **LIGHTS - WHELEN 600 SUPER LED - ZONE C - REAR LOWER**

There shall be a pair of Whelen Model 60R02FRR LED lights and mount provided. These lights shall be mounted on the rear face of the unit directly above the taillight assembly, one (1) each side of the apparatus, as recommended by NFPA. The color shall be Red.

#### **LIGHTS - WHELEN 600 SUPER LED - ZONE B & D - LOWER**

There shall be two (2) pair of Whelen Model 60R02FRR LED lights and mount provided. These mid ship optical warning devices shall be mounted on both the left and right lower sides of the apparatus with the optical center of the device at a distance of 18" to 62" above ground not to exceed 25' between optical warning devices. The color shall be red.

#### **LIGHTS - WHELEN 600 SUPER LED - (Pr.)**

There shall be a pair of Whelen Model 60R02FRR LED lights provided. This optical warning device shall be mounted in a location specified by the fire department. The color shall be Red.

#### **LIGHT - LED BEACONS**

There shall be a pair of Whelen Model L31HRFN LED lights mounted on the apparatus. Each light consists of four-(4) red Linear Super LED's.

The beacon shall meet NFPA 1901, 2003 edition as configured.

#### **LIGHTS - WHELEN TIR6 SUPER LED - ZONE B & D - REAR UPPER**

There shall be a pair of Whelen TIR6 Super LED Model 50R03ZRR lights provided and located one (1) each side upper rear corners of the body, as recommended by NFPA. The lens color shall be red.

#### **LIGHTS - WHELEN TIR6 SUPER LED - ZONE B & D - FRONT UPPER**

There shall be a pair of Whelen TIR6 Super LED Model 50R03ZRR lights provided and located one (1) each side on the upper front corners of the body, as recommended by NFPA. The lens color shall be red.

#### **DIRECTIONAL LIGHT - WHELEN TAL85 TRAFFIC ADVISOR**

There shall be one (1) Whelen model TAL85 directional indicator provided. The unit shall include eight (8) LED modules mounted in the extruded housing. There shall be dual parabolic reflectors with Lexan spreader lens to insure optimum wide angle warning signal projection from each light head assemble. Each LED module shall be individually replaceable. The lights shall be controlled from a control module located in the cab. The module shall be all solid state electronics and microprocessor controlled. The control unit shall have four (4) selectable operating modes: Left arrow, Right arrow, Center out, Flash

(In/Out, 2-step alternate pattern). The control module shall have an on/off switch, fused power lead, four function rotary switches, and an LED display to "echo" the flash pattern of the lights. The lights shall have a one second repetition rate for faster recognition time. The light shall be recessed mounted at the rear of the apparatus.

### **WHELEN STOP, TURN (LED) AND BACK-UP (HALOGEN) LIGHTS**

Stop, turn, and backup lights shall be Whelen 600 Series, individual fixtures. Fixtures shall be mounted on each rear face of the body recessed in model TH64, highly polished, aluminum trim ring. The red stop (LED) light shall be model 60R00BRR, turn light shall be a model 60A00TAR amber (LED) type with directional arrow, and the backup light shall be model 60J000CU clear halogen light type.

### **LICENSE PLATE LIGHT**

Chrome license plate light shall be installed on the rear of the vehicle.

### **Q2B SIREN**

There shall be one (1) Federal model Q2B electric siren provided. The siren shall be chrome plated and pedestal mounted outboard of the frame rail on the extended front bumper passenger's side. It shall be operated by a switch located in the cab. The park brake must be released for the siren switch to be active. There shall also be an electric brake switch located in the cab.

The activation switch shall be wired thru the chassis park brake and operate in the "Response Mode" only.

### **SIREN FOOT SWITCHES**

There shall be two floor mounted foot switches to operate the siren. The switches shall be mounted one (1) on the driver's side in the cab and one (1) mounted on the officer's side in the cab. The switches shall be mounted as high and as far outboard as possible.

### **PUMP PANEL MOUNTED AIR HORN SWITCH**

One (1) switch to activate the chassis air horns shall be mounted on the pump operator's panel.

### **COMPARTMENT LIGHT**

There shall be eight (8) 54" On Scene Solutions "Night Stik" model 70030 compartment light installed activated by the door ajar switch.

### **COMPARTMENT LIGHT**

There shall be two (2) 9" On Scene Solutions "Night Stik" model 7000 compartment light installed activated by the door ajar switch.

### **COMPARTMENT LIGHT**

There shall be two (2) 18" On Scene Solutions "Night Stik" model 70005 compartment light installed

activated by the door ajar switch.

### **COMPARTMENT LIGHT**

There shall be four (4) 27" On Scene Solutions "Night Stik" model 70015 compartment light installed activated by the door ajar switch.

### **DOOR AJAR SYSTEM**

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 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.

### **SCENE LIGHTS ACTIVATE IN REVERSE**

The rear scene lights shall be wired to activate the when the transmissions is shifted into reverse.

### **HYDRAULIC GENERATOR**

There shall be a Harrison MCR-6KW generator installed on the apparatus. The alternator is a 2-pole, 3600 rpm, capacitor controlled generator with class H insulation. The generator shall be a commercial type with heavy-duty bearing and of brushless design to ensure low maintenance. No brushes or slip rings shall be allowed. The reservoir shall include an oil level gauge, oil temperature gauge, fill cap, fill strainer, and a booster unit to provide a positive pressure to the pump suction port.

#### **SPECIFICATIONS:**

- Height - 18"
- Width - 33"
- Depth - 14"
- Weight - 230lbs
- Max kW - 6.0
- AMPS@120V - 50
- AMPS@240V - 25
- HP Required - 12
- Torque Required - 52.5
- Max System Pressure - 2350 psi

Manufacturer provides a Limited Lifetime Warranty when service requirements are met.

### **P.T.O. (POWER TAKE OFF) FOR GENERATOR**

There shall be a Chelsea PTO provided with the apparatus.

### **P.T.O. LIGHT INDICATOR FOR GENERATOR**

A green light to indicate that the PTO is in gear shall be mounted on the cab dash and on the pump panel.

### **240/120 VOLT BREAKER PANEL**

A General Electric breaker box with 240 main breaker and four (4) 120 volt circuit breakers shall be installed. The breaker box shall include a master breaker sized according to the generator output. The breaker box shall be located in a compartment as specified by the engineering department to meet the current NFPA specifications.

### **ELECTRICAL SYSTEM TESTING-120 VOLT**

The following 120 volt electrical wiring and associated equipment tests shall be performed.

- DIELECTRIC VOLTAGE

A dielectric voltage withstand test of 900 volts for one (1) minute.

- ELECTRICAL POLARITY VERIFICATION

There shall be an electrical polarity verification to determine that connections have been properly made.

- OPERATIONAL TEST - there shall be the following operational tests conducted.

A. CRANKING TIME

The cranking time until the prime mover (generator) starts and runs.

B. VOLTAGE, FREQUENCY, AMPERES

The voltage, frequency, and amperes are tested at continuous full rated load.

C. OPERATIONAL INDICATORS

The prime mover (generator) oil pressure, water temperature, transmission temperature, hydraulic temperature, and the battery charge rate, as applicable, the ambient temperature and altitude.

D. OPERATIONS TEST

The power source shall be operated at 100 % of its nameplate voltage for a minimum of two (2) hours.

### **120V HOUSEHOLD RECEPTACLE**

There shall be two (2) 120 volt, 15amp household receptacle installed on the apparatus. The receptacle shall be wired to the breaker box. The receptacle shall have a weatherproof cover and be a duplex outlet.

### **4 WAY JUNCTION BOX - AKRON**

There shall be one (1) Akron **EJB Electrical Junction Box**. The electrical junction box shall be a heavy-duty, cast aluminum that has at least one quarter of an inch ( $\frac{1}{4}$ " ) thick walls and the four corner edges shall be at least one half of a inch ( $\frac{1}{2}$ " ) thick to withstand the roughest of handling. The carrying handle shall be large enough to fit a fully gloved hand and be an integral part of the box casting. Each side of the electrical junction box shall be fitted with a quarter inch ( $\frac{1}{4}$ " ) thick polypropylene faceplates. Faceplates shall be backlit so that plug orientation to the receptacle is quick and easy to align. Each electrical junction box shall be equipped with four (4) electrical receptacles (two on each side) 15 AMP twist lock type. Each receptacle shall be equipped with a spring loaded snap cover that is marked in white lettering

with that receptacles voltage and ampere rating. All electrical receptacles, plugs, and snap type weather proof covers shall be UL Listed components. No junction box with a light on top of the box shall be acceptable. Any electrical junction box shall be manufactured by an ISO 9001 certified company. Box shall be hardwired to the cord reel.

### **JUNCTION BOX MOUNTING BRACKET**

One (1) mounting bracket(s) shall be installed in the compartment as directed by the Fire Department. The bracket(s) shall be installed on the shelf, tray, or side wall as directed by the department. The bracket shall be constructed of diamond plate that is cut, bent, and welded to meet the dimensions of the junction box. The box shall be lined with PVC material to protect the junction box. Specify the make and model of junction box to be supplied.

### **SCENE LIGHTS**

There shall be a pair of Whelen Model 90E000ZR Gradient Opti-Scene lights provided. Each scene light shall have a wide angle, directional halogen light head with snap-in field re-lampable assembly and chrome plated trim ring flange. The lights shall be controlled by a switch located in the cab. The lens color shall be clear.

### **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.

### **UNDERBODY LIGHTS**

Six underbody "Ground Effect" lights shall be installed at a location to be determined during the pre-construction conference. The underbody lights shall illuminate the ground beneath the fire apparatus. The lights shall have a clear lens.

### **ROOF MOUNTED 750 WATT FLOODLIGHT**

Fire Research Optimum model OPA800-S75, with contoured roof mounting brackets attached to the bottom of the lamp head. Wiring shall extend from a weatherproof strain relief at the rear of the lamp head.

The lamp head shall have one (1) quartz halogen 750-watt 120-volt bulb that draws 6.3 amps and generates 19,600 lumens. The bulb shall be accessible through the front incorporating a vacuum deposit polished reflector and two optimizing mirrors to produce a uniform beam that lights up an area 100° vertically by 150° horizontally. The lamp head shall have a heat dissipating curved front lens, with a radius of 5.16 inches to optimize light emission. The lamp head shall be no more than 4 3/4" deep by 5 1/8" high by 8 3/4" wide. Lamp head and brackets shall be powder coated white.

### **TELESCOPIC 750 WATT FLOODLIGHT**

The lamp head shall have one (1) quartz halogen 750-watt 120-volt bulb. The bulb shall draw 6.3 amps and generate 19,600 lumens. The bulb shall be accessible through the front. The lamp head shall direct 50 percent of the light onto the action area while providing 50 percent to illuminate the working area. The lamp head angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked

with a round knurled locking knob. The lamp head shall incorporate heat-dissipating fins and be no more than 5" deep by 3 3/8" high by 10" wide. Lamp head and mounting arm shall be powder coated white. The floodlight shall be UL listed as a scene light for fire service use.

*Location of floodlight shall be:*

### **TELESCOPIC POLE**

Two (2) Fire Research Focus top mount pull-up telescopic pole shall be installed. The pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall extend 4' and rotate 360 degrees. A square mounting flange shall be provided.

*Location of floodlight shall be:*

### **HAZARD LIGHT SWITCH**

A Fire Research FC-SW510 raised pole hazard light switch shall be installed. The magnetic switch shall be housed within the light pole mounting flange. A magnet shall be mounted in the extension pole. The switch contacts shall close when the pole is raised.

### **120 /240 VOLT LIGHT SWITCHES**

There shall be one (1) 12 volt switch with relay provided for the 120/240 volt lighting system. The switch shall be mounted as directed by the fire department.

### **ELECTRIC REWIND CORD REEL**

There shall be one (1) Hannay Model ECR1616-17-18, electric rewind electric cord reel(s) provided. The cord reel(s) shall have 200' of 10-3 wire cord. The reel shall be mounted as directed and shall be controlled by a 12-volt switch. The cord reel shall be wired to the breaker panel.

### **HOSE ROLLERS**

There shall be a set of four-(4) hose rollers installed on the apparatus. The rollers shall be used on reels, on cabinet door openings, and similar locations where sharp edges may cut or damage hose or cables.

### **CABLE STOPS**

There shall be one Hannay Cable Stop Model HS-3, attached on cable. Maximum single cable size is 1.875".

### **POWER REWIND REEL PLATE**

A permanently affixed plate shall be installed in a readily visible location adjacent to any permanently connected reel that indicates the following:

- Current Rating
- Current Type
- Phase
- Voltage

- Total Cable Length

## **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 painted surfaces shall follow the following procedure to insure a lasting finish:

- 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.

These steps are followed as recommended by the paint manufacturer to provide a lasting and high quality gloss finish. Dupont shall provide all paint products.

## **PAINT COLOR CODE**

The apparatus body paint code shall be Red, B8241 UM Alt 3.

## **SCOTCHLITE STRIPE**

There shall be a straight 4" wide Scotchlite stripe, with an additional 1" wide stripe located above and below. The stripes shall be located no higher than 60" from the ground installed on the apparatus cab and body. The stripes shall cover a minimum of sixty percent (60%) of each side of the apparatus and forty percent (40%) of the front and rear of the apparatus. The stripe shall be installed to meet the current NFPA requirements.

Striping shall be white in color.

Pin Stripe shall be blue in color.

## **STRIPE - REAR REFLECTIVE**

A minimum of fifty percent of 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, colors of stripping shall be in compliance, with the current edition of NFPA 1901.

### **LETTERING**

There shall be a maximum of sixty (60) 3" tall 23 Carat Gold leaf letters applied to the apparatus. The gold leaf letters shall have a Mylar overlay to protect the gold. The lettering shall also have a one color Mylar shade applied.

### **6" STRAINER BRACKET - KOCHEK**

There shall be a Kochek model MM60C bracket provided for the purpose of mounting one 6" strainer to the apparatus. There shall also be one (1) 6" Kochek model BS60C provided.

### **PIKE POLE TUBE STYLE - FOUR**

Four aluminum tubes shall be installed for storing a pike pole. One end shall be notched to allow the pole to be locked in place.

### **ZIAMATIC AIR PACK BRACKET**

Two (2) Ziamatic Model #ULLH air pack bracket(s) with strap (part # 1054-012-000) shall be provided with the apparatus. The bracket shall meet NFPA 1901.

Customer to specify location of the bracket.

### **STORZ ELBOW**

There shall be one (1) Kochek Model SKE 3" FNST 30 degree elbow X 5" Storz adapter provided with the apparatus.

### **CAP - 5" W/ CHAIN**

There shall be one (1) Kochek model 5" CC507 cap with chain provided on the apparatus.

### **10' FOLDING LADDER**

There shall be one (1) Alco-Lite Model FL-10, 10' folding ladder consisting of 1-section aluminum, ladder with rubber feet supplied with the vehicle. Ladder shall meet or exceed the latest NFPA standards.

### **14' ROOF LADDER**

There shall be one (1) Alco-Lite model PRL-14, 14' roof ladder of single section aluminum, with folding steel roof hooks on one end and steel spikes on the other end supplied with the vehicle. The ladder shall meet or exceed the latest NFPA standards.

### **24' EXTENSION LADDER**

There shall be one (1) Alco-Lite model PEL-24, 24' two-section, aluminum, extension ladder with steel spikes supplied with the vehicle. The ladder shall meet or exceed the latest NFPA standards.

### **HARD SUCTION FLEXIBLE HOSE**

There shall be two (2) Kocheck 10' X 6" lengths of hard suction supplied with the vehicle. The hard suction hose shall be the flexible type with lightweight long handle couplings, constructed of PVC compounds with high flexibility. The hoses shall have a smooth bore to reduce friction.

### **ONE-YEAR PARTS & LABOR WARRANTY**

There shall be a one-(1) year mechanical parts and labor warranty provided with the apparatus. The apparatus shall be free of defects in material and workmanship for a warranty period of one-(1) year after the date on which the apparatus is first delivered to the original purchaser.

### **TEN-YEAR BODY WARRANTY**

There shall be a ten-(10) year body warranty on each new fire body/heavy-duty rescue apparatus. The bodies are to be free of structural failures caused by defective design or workmanship for a warranty period of ten-(10) years after the date on which the vehicle is first delivered to the original purchaser or 100,000 miles, whichever occurs first.

### **FOUR-YEAR PAINT/CORROSION WARRANTY**

There shall be a four-(4) year paint/corrosion warranty provided. This warranty shall cover perforation, blistering, peeling, or any other adhesion defects caused by defective manufacturing methods, or material selections, for a warranty period of four-(4) years or 100,000 miles which occurs first, after the date of which the vehicle is first delivered to the original purchaser.

Chassis Surcharge - Custom Chassis

### **TRANSPORTATION**

To insure proper break-in of all components while still under warranty, the apparatus shall be delivered over the road under its own power. (Rail and/or truck freight shall not be acceptable)

### **EQUIPMENT INSTALLATION**

There shall be a two way radio and antenna supplied by the customer and installed by the apparatus body builder.

Dealer shall also mount all specified equipment as directed by the fire department.

### **LOOSE EQUIPMENT**

The following equipment package shall be provided as a part of the completed apparatus:

**Item**

**Qty**

Leader Fan Leader, 16.5" with 5.5 HP Honda, #160.10.042	1
Akron Nozzle Playpipe, 2.5", 2390	2
Akron 1420 Triple Stacked Tips	2
Akron 4820 1 1/2 Assault Nozzle with Pistol grip and Spinning Teeth	7
Akron Nozzle Mid- X Medium Expansion Foam Aeration Tube, #877	2
Akron 4826 Akron Assault 2.50" with pistol grip and spinning teeth	2
Akron Foam Eductor, 2.5 X 1.5", #3095	2
Akron 2285 2 1/2 gate valve	2
Akron 2581 Gated Wye Style 2581 2.50" X 2-1.50"	2
Kochek 2.5" Dbl ... 2.5' Double Female RL, #53R2525	2
Kochek 2.5 Dbl ... 2.5" Double Male RL, #36R2525	2
Kocheck Reducer, 2.5" X 1.5", #37R2515 1 16.00 16.00T	1
Akron PHY-6 PHY-6 6lb Pick head Axe 36" Fiberglass	3
Akron Parts Hydrant Spanner set, #443	2
Akron Parts Spanner Set, #448	1

Kocheck Storz spanner set, #KS3	1
Akron PPB-51 51" Pinch Point Bar	1
Akron PPBH Pinch Point Bar Holder Set	1
Akron Parts Trash Hook w/ D Handle, #PP-4-D-RH	2
Akron Parts Dry Wall Hook W/ D Handle,#PP-4-D-DWH	4
Akron AS-510 Axe Blade Bracket For Horizontal Mounting with 3/8" Poly Spacer	5
Akron AS-520 Akron AS-520 - Axe Handle Bracket	5
Akron Parts Cover, #P-APC	5
Akron 1088 Piercing Nozzle 36" with shut off #2115	2
Angus 1.75... 011303 Angus 1.75 Ultima II 50' RED	4
Angus 1.75... 011127 1.75" Ultima 50' White	4
Angus 1.75 011303 Angus 1.75 Ultima II 50' Yellow	2
Angus Red Chief 011077 Angus Yellow Chief 1.75" x 50'Yellow Rubber	4
Angus 3.0" 011305 3.0" Ultima II 50' White	4
Angus 2.5" 011304 2.5" Ultima II 50' White	8
011045 Angus 5" Hi-Vol LDH Yellow 100' with Storz	10
Akron 373 Akron 1.5" EZ-Lock Nozzle Holder	4
Akron 373 Akron 2.5" EZ-Lock Nozzle Holder	6
Akron Adapter Hose Jacket, 2.5", #772	1
Akron Adapter Akron Hose Jacket Bracket, #352	1
Akron 588 Hose Clamp 2.50-3.00 with 589 mounting bracket	1
Akron FSY-8 8# Sledge Hammer with 36" Fiberglass Handle	2
Akron Parts Sledge Bracket, #AS-570	2
Akron Parts Pole Bracket, #HM58	14
Akron Parts Pike Pole Ring, #PPR-60	2
Akron Parts Heat Sensor with Laser Light, #9011	2
Kocheck Ball Intake Valve, 6" X 5" Storz, #55K60105	1
K-12FD with Pira-12FD Blade, Sling	1
Garmin Nuvi GPS, 205W, 39445	1
TIC Evolution 5800 TIC,#10097333	1
TIC MSA Evoultion Truck Kit, 2 batteries, Retractable lanyard, #10096886	1
Miscellaneous Spring Cones, Viscon, 3lb, 5 cones with wire Tote,#Q5T50-28R	1
Medical AED, Phillips, FRX, with pads and child key, #861304	1
44451 Fire Vulcan LED Vehicle Mount with 12V DC (Orange)	4
011045 Angus 5" Hi-Vol LDH Yellow 25'	1
011045 Angus 5" LDH Hi-Vol Yellow 50' with Storz	1
Akron Lights Portable Light with Stonco Head, E-500PL w/ household plug	3
Kocheck Hydrant Ball Valve, #HBV25	1
Kocheck - 5" storz ... S54R525 - 5" storz x 2.5" RL	1
FireAde 2000 Foam 5-Gallon pail	5
Paratech Item Standard VSK, #22-796850	1
Paratech Item Square Hinged Base, #22-796140, 6"	2
Paratech Item Cone Base, #22-796080	2
Paratech Item Contour Base, #22-796270	2
Paratech Item Angle Base, #22-796092	2

Paratech Item Channel Base, 4", #22-796134	2
Altair 5 Altair 5 with LEL/O2/CO/H2S, color display, integral, pump & sampling probe. p/n 10094910	4
Altair 5 Galaxy Altair 5 Galaxy- Charging, Memory Card, Cylinder, Holder. p/n 10090592	1
Cal Gas 4 Calibration Gas for LEL/O2/CO/H2S p/n 10048280	1
MSA GAS Altair Single Pro, HCN,#10076729	2
MSA General MSA .25 lpm Regulator for Altair Pro Gas Meter	1
MSA GAS Cal Gas, HCN, #711072	1
Scott Airpack Complete - AP75 2.2 with carbon cylinder / AV3000 / Pack Alert and HUD	4
Scott - Spare Cylinders 2216 Carbon	4
Akron UL-6 6ft. Pike Pole	2
Akron UL-8 8ft. Pike Pole	2