

**City of Isle of Palms, South Carolina**  
**Request for Bids (RFB) 2018 - 01**  
**New 75' Ladder Truck and Equipment**

In compliance with the City of Isle of Palms Procurement Ordinance, the City is seeking bids to furnish the City with one (1) new 75' Ladder Truck and related equipment per the attached specifications. The truck shall be a 2018 Custom Chassis, 75' ladder truck with a fire pump and water tank. The request will be bid and awarded pursuant to the City's procurement ordinance. The City reserved the right to reject any and all bids and to waive irregularities.

Bids should be submitted to the following:

**Linda Lovvorn Tucker, City Administrator**  
**City of Isle of Palms**  
**1207 Palm Boulevard**  
**Post Office box 508**  
**Isle of Palms, South Carolina 29451**

**Deadline for Questions:** The deadline for questions is **5:00 p.m. Eastern Standard Time, February 16, 2018**. Bidders should send questions regarding this Request for Bids to Fire Chief Ann Graham in writing or email to [anngraham@iop.net](mailto:anngraham@iop.net). Questions received before this deadline will be answered via addendum posted on the City's website at <http://www.iop.net/requests-for-bids-proposals>. Questions received after this deadline will not be answered. If an addendum is issued, bidders must acknowledge receipt of the addendum with their bid.

**Deadline for Submissions:** The deadline for submission is **2:00 p.m., Eastern Standard Time, March 5, 2018**. Submissions must be received at 1207 Palm Boulevard, Isle of Palms, South Carolina 29451 in a sealed envelope, where they will be opened and read aloud. Sealed envelopes must be clearly marked "**RFP 2018- 01 New 75' Ladder Truck**" and include one (1) hard copy and one (1) electronic copy saved on a compact disc or flash drive. The City accepts no responsibility for electronic submissions, and it will be the responsibility of the proposers to verify receipt by the City. Any bids received later than the submission deadline will not be accepted or considered. Electronic bids will not be accepted.

Bids may be delivered by hand or by mail, but no bid shall be considered which is not actually received by the City at the place, date and time appointed by the City and the City shall not be responsible for any failure, misdirection, delay or error resulting from the selection by any bidder of any particular means of delivery of bids.

Bidders acknowledge and agree that the City will not be liable for any costs, expenses, losses, damages (including damages for loss of anticipated profit) or liabilities incurred by the respondent or any member of the respondent's organization as a result of, or arising out of, submitting a bid, negotiating changes to such bid, or due to the City's acceptance or non-acceptance of the bid or the rejection of any and all bids. Respondents are responsible for submission of accurate, adequate and clear descriptions of the information requests. Neither issuance of the RFB, preparation and submission of a response, nor the subsequent receipt and

evaluation of any response by the City of Isle of Palms will commit the City to award a contract to any respondent even if all the requirements in the RFB have been met.

Respondents must have or be able to procure an Isle of Palms Business License.

A 5% Bid Bond or Certified Check must accompany each bid submitted and will become the property of the City of Isle of Palms, if the successful bidder refuses or neglects to comply with the terms of the Contract. Bid deposits are to be made payable to the City of Isle of Palms. If the successful Bidder fails to execute a Contract within (10) days of the receipt of said contract, such security shall be retained by the city as liquidated damages. Unsuccessful bidders' deposits will be returned immediately following the award to said successful bidder.

If the Bidder is a corporation, state your correct corporate name and State of incorporation. If Bidder is a partnership, state names and addresses of partners. If Bidder is a trust or other legal entity, state correct names and addresses of trustees or names and address of those legally authorized to bid and enter into contracts.

Bidders should supply references for previous clients for which fire apparatus work has been executed. The City further reserves the right to make such investigation as it deems necessary to determine the capability of the bidders to furnish the required services, and bidders shall furnish all such information for this purpose as the City may request.

Bidders will be expected to have read and be prepared to enter into the attached contract, which is a part of this RFB. The contract requires provision of payment and performance bonds satisfactory to the City. The City of Isle of Palms reserves the right to reject any and all bids and to waive irregularities.

By signing its bid or proposal, Bidder certifies that it will comply with the applicable requirements of Title 8, Chapter 14 of the South Carolina Code of Laws and agrees to provide to the City upon request any documentation required to establish either: (a) that Title 8, Chapter 14 is inapplicable both to Bidder and its subcontractors or sub-subcontractors; or (b) that Bidder and its subcontractors or sub-subcontractors are in compliance with Title 8, Chapter 14. Pursuant to Section 8-14-60, "A person who knowingly makes or files any false, fictitious, or fraudulent document, statement, or report pursuant to this chapter is guilty of a felony, and, upon conviction, must be fined within the discretion of the court or imprisoned for not more than five years, or both." Bidder agrees to include in any contracts with its subcontractors language requiring its subcontractors to (a) comply with the applicable requirements of Title 8, Chapter 14, and (b) include in their contracts with the subcontractors language requiring the sub-subcontractors to comply with the applicable requirements of Title 8, Chapter 14.



the terms of this Agreement shall control. The Specifications and the Proposal are hereby incorporated into this Agreement as Exhibit "I" and Exhibit "II," respectively, and made a part of this Agreement by reference thereto (together the "Contract Documents").

1.2 Purchase Price. The purchase price for the Truck is exactly \_\_\_\_\_ and \_\_\_/ 100 (\$\_\_\_\_\_ . \_\_) Dollars, payable as set forth in Section 2 of this Agreement.

**2. Payment of Purchase Price: Payment and Performance Bond.**

2.1 Payment of the Purchase Price. The entire purchase price for the Truck shall be paid by City to Seller in full in cash upon delivery and acceptance of the Truck by City.

2.2 Payment and Performance Bond. Seller agrees to provide, at Seller's expense, payment and performance bonds, which shall be satisfactory to City, in an amount equal to the purchase price.

**3. Risk of Loss; Insurance.**

3.1 Risk of Loss. The risk of loss to the Truck shall remain with the Seller until the delivery and acceptance of the Truck by City. In the event of any loss prior to delivery and acceptance of the Truck by City which destroys or substantially damages the Truck, City has the option of terminating this Agreement without further liability or obligation or extending the delivery date for Seller's delivery of a new replacement truck.

3.2 Insurance. Seller agrees to purchase and maintain insurance for the Truck, which shall be satisfactory to City, at all times until the delivery and acceptance of the Truck by City.

**4. Representations and Warranties of Seller.** The Seller represents and warrants to City, which representations and warranties shall be true and correct at the time of delivery and acceptance of the Truck by City, as follows:

4.1 Organization, Power and Good Standing. That Seller is a corporation duly organized, validly existing and in good standing under the laws of the State of \_\_\_\_\_ with all requisite power and authority to own its properties and engage in the business in which it is currently engaged. Seller is not in violation of any terms of its Articles of Incorporation or Bylaws.

4.2 Powers and Authority Relative to Sale of Purchased Assets. That Seller has the full right, power and authority, and has taken all required action necessary to permit it to execute and deliver this Agreement and to perform all of the obligations contained herein (including the assignment, transfer, and conveyance of the Truck), and to execute, deliver, and perform all of the obligations contained in all other instruments or agreements required hereby or incident or collateral hereto, and none of such actions constitutes a default under or will result in any breach of any existing agreement applicable to Seller or by which Seller or the Truck may be bound, or will result in the imposition of any lien, encumbrance, charge or claim against any of the Purchased Assets.

4.3 Valid and Binding Obligation. That this Agreement constitutes, and each other agreement to be executed and delivered by Seller in accordance herewith will constitute, the valid and legally binding obligation of Seller enforceable against Seller in accordance with their respective terms, subject to applicable bankruptcy, insolvency and other general laws affecting the rights and remedies of creditors and except that the remedy of specific performance and injunctive and other forms of equitable relief may be subject to equitable defenses and to the discretion of the court before which any proceeding therefore may be brought.

4.4 Title to Truck: Absence of Liens and Encumbrances. That Seller will deliver to City a good and marketable title to the Truck, free and clear of all liens, charges or other encumbrances.

4.5 Condition of Truck. That the Truck will be built according to the City's Specifications. The Truck will be delivered to City in new and good operating condition as of the time of delivery and acceptance by City. All parts will be new. All other express warranties

regarding the condition and operation of the Truck and its components are set forth in City's Specifications and are given by Seller to City as fully and completely as if all of such warranties were set forth verbatim in this Agreement.

4.6 Necessary Information and Documentation. That Seller will provide to City all information and documentation which is necessary for City to operate the Truck.

4.7 Compliance with Laws. That the Truck will be manufactured in compliance with all applicable federal laws.

4.8 Patent and Other Intellectual Property Rights. That Seller warrants that it has the legal right to the use of all patents or other intellectual property rights which Seller or any component manufacturers utilize in connection with the manufacturing of the Truck.

#### **5. Delivery of Truck: Operational Training.**

5.1 Delivery Date. Subject to any extensions allowed in this Section 4, Seller agrees to deliver the Truck to City no later than **twelve (12) months after the execution of the contract.**

5.2 Place of Delivery. Seller agrees to deliver the Truck at Seller's expense to the City. The Truck shall be driven under its own power from the manufacturing site to the City's Public Safety Building located at 30 J.C. Long Boulevard, Isle of Palms, S.C. 29451.

5.3 Documentation. At the time of delivery of the Truck, Seller agrees to provide to City a bill of sale, manufacturer's certificate of origin and any other documents required in order for City to obtain a certificate of title to the Truck from the State of South Carolina.

5.4 Extension of Delivery Date. The parties agree that if Seller is delayed in the performance of its duties pursuant to this Agreement due to labor strike, fire, delays in deliveries of parts or materials, severe weather, catastrophe, riot, war, act of God, or any other act beyond the control of Seller and which, by the exercise of reasonable diligence, cannot be prevented by Seller, the delivery date shall be extended for such actual time as caused by the delay.

5.5 Operational Training. Seller agrees that upon delivery and acceptance by City, Seller's delivery engineer shall give comprehensive training to City's Fire Department personnel regarding the proper operation of the Truck, including but not limited to, driving and maintenance.

6. Survival of Representations and Warranties. The representations and warranties of Seller contained in this Agreement or in any other document delivered in connection herewith shall survive the delivery of the Truck for such periods as are set forth in City's Specifications.

7. City's Inspection Rights. City has the right to inspect the progress of the manufacturing of the Truck as set forth in the Specifications. Seller agrees to pay the expenses incurred by City for such inspections as set forth in City's Specifications.

8. Permits, Fees And Licenses. Seller agrees to apply for, obtain and pay for all necessary permits, fees, licenses and inspections by governmental agencies, including, but not limited to, a City of Isle of Palms business license.

9. Controlling Law. This Agreement is governed by and shall be construed in accordance with the law of the State of South Carolina, excluding any conflict-of-laws rule or principle that might refer the governance or the construction of this Agreement to the law of another jurisdiction.

10. Notices. All notices to a party hereunder shall be deemed to be properly given and received when personally delivered to the representatives of each party or when deposited in the United States mail, registered or certified, with return receipt requested, postage prepaid, and addressed to:

City of Isle of Palms:

Representative: Linda Lovvorn Tucker, City Administrator  
Address: 1207 Palm Blvd., Isle of Palms, SC 29451

[Seller], \_\_\_\_\_,

Representative: \_\_\_\_\_

Address: \_\_\_\_\_

(or such other address as Seller may hereafter designate in writing to City.)

**11. Miscellaneous Provisions.**

11.1 Section Headings. The headings of sections or paragraphs used in this Agreement have been inserted for convenience only and shall not control, limit, restrict or affect the meaning or construction of any provision of this Agreement.

11.2 Amendments and Waivers. This Agreement may be modified or amended only by a writing signed by each party hereto. No waiver of any term or provision hereof shall be effective unless in writing signed by the party waiving such term or provision.

11.3 Binding Affect and Benefits. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective heirs, successors and assigns; provided, however, that this Agreement may not be assigned, or performance of the duties hereunder delegated by Seller without the express written consent of City.

11.4 Mediation. Any claim, dispute, or controversy arising under or in connection with this Agreement shall be subject to mediation as a condition precedent to litigation. A request for mediation shall be made in writing, delivered to the other party to the Agreement, and filed with the proposed mediator. Mediation shall be conducted in Charleston County, South Carolina. The mediator shall be a member of the South Carolina Bar and shall be selected by mutual consent and agreement of the parties. If a party fails to object to the mediator proposed by the party requesting mediation within 30 days of the initial request for mediation, the mediator shall be deemed selected as proposed. If the parties fail to agree upon a mutually acceptable mediator within 60 days of the initial request for mediation, the mediator shall be selected from the official roster of active certified mediators in Charleston County, as provided by the South Carolina Supreme Court's Commission on Alternative Dispute Resolution and Board of Arbitrator and Mediator Certification, by choosing in alphabetical order the first available circuit court mediator from the roster. The parties shall



equally divide the mediator's fee and any filing fees. Agreements reached in mediation shall be enforceable as settlement agreements in any court of competent jurisdiction. Nothing contained herein shall preclude either party from seeking enforcement of the terms of mediation pursuant to this Paragraph through a court of competent jurisdiction, and the prevailing party shall also be entitled to reimbursement by the losing party for all reasonable fees and costs, including attorney's fees, incurred in the proceedings seeking enforcement.

11.5 Multiple Counterparts. This Agreement may be executed in any number of counterparts with the same effect as if each party had signed the same document. All counterparts shall be construed together and constitute the same Agreement.

11.6 Entire Agreement. This Agreement contains the entire agreement between the Seller and City with respect to the purchase and sale described herein and related transactions and supersedes all prior arrangements or understandings with respect thereto.

IN WITNESS WHEREOF, the City and Seller have hereunto set their hands and seals, by and through the undersigned officers, as of the day and year first above written.

WITNESS:

\_\_\_\_\_  
[Seller]

\_\_\_\_\_  
(#1 as to Seller)

By: \_\_\_\_\_

Title: \_\_\_\_\_

\_\_\_\_\_  
(#2 as to Seller)

The City of Isle of Palms, S.C.

\_\_\_\_\_  
(#1 as to City)

By: \_\_\_\_\_

Title: \_\_\_\_\_

\_\_\_\_\_  
(#2 as to City)

## **ISLE OF PALMS FIRE DEPARTMENT 75 FOOT LADDER TRUCK SPECIFICATIONS**

### **STATEMENT OF EXCEPTIONS TO NFPA 1901**

Must meet or exceed current NFPA 1901 standards when contract is awarded.

If, at the time of delivery, the apparatus manufacturer is not in compliance, a statement of exceptions must be provided as follows:

- The specific standard affected.
- A statement describing why the manufacturer is not in compliance.
- A description of the remedy, and who the responsible party is.

### **QUALITY AND WORKMANSHIP**

The design of the apparatus must embody the latest approved automotive engineering practices.

The workmanship must be the highest quality in its respective field. Special consideration shall be given to the following points: Accessibility to various areas requiring periodic maintenance, ease of operation (including both pumping and driving) and symmetrical proportions.

Construction must be rugged and ample safety factors must be provided to carry loads as specified and to meet both on and off-road requirements and speed as set forth under "Performance Test and Requirements."

### **PERFORMANCE TESTS AND REQUIREMENTS**

A road test shall be documented with the apparatus fully loaded and a continuous run of ten (10) miles or more shall be made under all driving conditions, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts, and rear axles shall run quietly and free from abnormal vibration or noise throughout the operating range of the apparatus. The apparatus, when loaded, shall be approximately 66% on the rear axle. The successful bidder shall furnish a weight certification showing weight on the front and rear axle, and the total weight of the completed apparatus at the time of delivery.

- The apparatus must be capable of accelerating to 30 MPH from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed engine RPM.
- The service brakes shall be capable of stopping the fully loaded vehicle within 35 feet from a speed of 25 MPH on a level concrete highway.

- The apparatus, fully loaded, shall be capable of obtaining a speed of 50 MPH on a level highway with the engine not exceeding 95% of its governed RPM (full load).
- The apparatus shall be tested and approved by a qualified testing agency in accordance with their standard practices for pumping engines.
- The contractor shall furnish copies of the Pump Manufacturer's Certification of Hydrostatic Test (if applicable), the Engine Manufacturer's current Certified Brake Horsepower Curve and the Manufacturer's Record of Construction Details.

### **FAILURE TO MEET TESTS**

In the event the apparatus fails to meet the test requirements of these specifications on the first trial, a second trial may be made at the option of the bidder within thirty (30) days of the date of the first trials. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Permission to keep and/or store the apparatus in any building owned or occupied by the purchaser shall not constitute acceptance of the same.

### **EXCEPTIONS TO SPECIFICATIONS**

The following specifications shall be strictly adhered to. Exceptions shall be considered if they are deemed equal to or superior to the specifications, provided they are fully explained on a separate page entitled "EXCEPTIONS TO SPECIFICATIONS." Exceptions shall be listed by page and paragraph.

**Failure to denote exceptions in the above manner shall result in immediate rejection of the proposal. In addition, a general statement taking "TOTAL EXCEPTION" to the specifications shall result in immediate reject of the bid.**

### **GENERAL CONSTRUCTION**

The apparatus shall be designed and the equipment mounted with due consideration to distribution of load between the front and rear axles so that all specified equipment, including filled water tank, a full complement of personnel and fire hose shall be carried without injury to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of the International Association of Fire Chiefs and National Fire Association (or American Insurance Association). Certified Laboratories certificate shall be submitted by the manufacturer. Weight of apparatus shall meet all federal axle load laws.

### **DELIVERY REQUIREMENTS**

The apparatus shall be completely equipped as per these specifications upon arrival and on completion of the required tests shall be ready for immediate service in the fire department of the purchaser. All alterations required at the scene of delivery to comply with these specifications must be done at the contractor's expense.

### **PURCHASER RIGHTS**

The Purchaser reserves the right to accept or reject any bid. The purchaser also reserves the right to award in their best interest and reserves the right to waive any formalities.

### **U.S.A. MANUFACTURER**

The entire apparatus shall be assembled within the borders of the Continental United States to insure more readily available parts (without added costs and delays caused by tariffs and customs) and service, as well as protecting the purchaser should legal action ever be required.

### **ELIMINATION OF DIVIDED RESPONSIBILITY**

It is required that each bidder produce both the chassis and complete apparatus. To eliminate divided responsibility and service, the chassis and body must be manufactured by the same Company. Manufacturer shall state the number of years the Company has been producing their own chassis and body. Manufacturer shall state compliance with the paragraph. **No Exceptions.**

### **FAMA COMPLIANCE**

Manufacturer must be a current member of the Fire Apparatus Manufacturer's Association.

### **PRE-CONSTRUCTION CONFERENCE**

After award of the contract, and prior to construction of the apparatus, a pre-construction conference shall be held at the facility of the manufacturer. A provision for three (3) fire department personnel shall be provided in the bid price for all travel, food and lodging.

### **INSPECTION TRIPS**

An inspection trip shall be provided at the manufacturer's facility, prior to delivery of the completed apparatus. A provision for two (2) fire department personnel shall be provided in the bid price for all travel, food and lodging. Travel by air for distances exceeding 400 miles.

Bidder shall specify the number of personnel included.

**\*\*\*Manufacturer must submit Corrosion Reduction Policy including actions against heavy salt environments\*\*\***

## **Apparatus Specifications**

### **DOUBLE FRAME RAILS/SINGLE AXLE**

The chassis frame shall be of a ladder type design utilizing industry accepted engineering best practices. The frame shall be specifically designed for fire apparatus use.

A lifetime warranty shall be provided, per manufacturer's written statement.

### **FRONT TOW EYES, BELOW BUMPER**

There shall be two front tow eyes with 3" diameter holes attached directly to the chassis frame, accessible below the front bumper.

### **TOW EYES, PAINTED FINISH**

The front tow eyes shall be painted to match the color of the chassis frame.

### **REAR TOW EYES**

There shall be two tow eyes attached directly to the chassis frame rail and shall be chromate acid etched for superior corrosion resistance and painted to match the chassis.

### **STEERING**

The steering system shall be a wheel to wheel steering type system that is tested and certified by manufacture of the unit, consisting of a heavy-duty power steering gear, heavy-duty steering pump, miter box, drag links, and a thermostatic controlled fan cooled system (set point 185 deg. F to 170 deg. F).

The steering gear shall be bolted to the frame at the cross-member for steering linkage rigidity. Four (4) turns from lock to lock with an 18" diameter slip resistant rubber covered steering wheel. Steering column shall have six-position tilt and 2" telescopic adjustment. The cramp angle shall be 45 degrees with 315mm tires or 43 degrees with 425mm tires providing very tight turning ability.

### **DRIVELINE**

The driveline shall consist of Spicer 1710 series dual grease fitting universal joints with "Half-Round" end yokes.

The drive shaft shall be built with a heavy-duty steel tube 4.095" outside diameter x .180 wall thickness. The shafts shall be dynamically balanced prior to installation into the chassis. A splined slip joint shall be provided in each shaft assembly. Universal joints shall be extended life. There shall be two (2) Zerk fittings in each universal joint assembly so the joint can be greased without turning the shaft.

## **ENGINE**

**Cummins Diesel ISL 9, 450 H.P. @ 2100 R.P.M.**, 1250 ft. lb. Torque @ 1400 R.P.M.

Displacement: 8.9-liter displacement.

Cylinders: 6

Bore: 4.49" (114mm)

Stroke: 5.69" (145mm)

The engine shall have a five year or 100,000-mile warranty and approval by Cummins Diesel for installation in the chassis.

The engine shall be equipped with the following:

- Air cleaner
- Air compressor - 18.7 CFM
- Exhaust - single with discharge right side, ahead of rear wheels
- Primary & secondary fuel filters (remoted mounted)
- Lube oil cooler
- Lube oil filter - full flow Starting motor - 12 volt

## **EXHAUST SYSTEM**

The engine exhaust system shall include the following components:

- Diesel Particulate Filter (DPF)
- Diesel Oxidation Catalyst (DOC) Diesel Exhaust Fluid (DEF)
- Selective Catalytic Reduction Filter (SCR)

The SCR catalyst utilizes the DEF fluid, which consists of urea and purified water, to convert NOx into nitrogen and water. This will meet or exceed 2013 EPA emissions requirements.

The engine exhaust system shall be horizontal design constructed from heavy-duty truck components. The exhaust tubing shall be stainless steel to the DPF through to the SCR aluminized steel from the SCR to the exhaust tip. A heavy duty stainless steel bellows tube shall be used to isolate the exhaust system from the engine. The system shall be equipped with single canister consisting of a Diesel Oxidation Catalyst (DOC) and a Diesel Particulate Filter (DPF), and shall be mounted under the right-side frame rail, meeting the specific engine manufacturer's specifications and current emission level requirements. The outlet shall be directed to the forward side of the rear wheels, exiting the right side with a heavy-duty heat diffuser. The heat diffuser shall prevent the exhaust temperature from exceeding 851 deg. F during a regeneration cycle. A heat- absorbing sleeve shall be provided on the exhaust pipe in the engine compartment area to reduce the heat, protect the alternator, and to protect personnel while servicing the engine compartment.

## **AFTER TREATMENT SYSTEM**

To meet EPA requirements of Particulate output, a DPF (Diesel Particulate Filter) is used. To meet EPA requirements of Nitrous Oxide output an SCR (Selective Catalytic Reduction) system utilizing DEF (Diesel Exhaust Fluid) is used.

## **ON-BOARD DIAGNOSTIC (OBD) SYSTEM**

The engine shall be equipped with an on-board diagnostic (OBD) system which shall monitor emissions- related engine systems and components and alert the operator of any malfunctions. The OBD system is designed to further enhance the engine and operating system by providing early detection of emission- related faults. The engine control unit (ECU) will manage smart sensors located throughout the engine and after-treatment system. The system shall monitor component verification and sensor operation. There shall be warning lights located in the dash instrument panel to alert the operator of a malfunction. A data port shall be provided under the driver's side dash for code reading and troubleshooting. All communication shall be provided through the J1939 data link.

## **AIR CLEANER/INTAKE**

The engine air intake and filter shall be designed in accordance with the engine manufacturer's recommendations.

It shall be 99.9% effective in removing airborne contaminants when tested per the industry standard SAE J726 procedure and offer a dirt holding capacity of at least 3.0 gm/cfm of fine dust (tested per SAE J726) offering superior engine protection.

The air filter shall be located at the front of the apparatus and shall be at above the framrails, air intake to be located at or above air filter to allow fording deep water in an emergency situation.

An ember separator shall be provided in the engine air intake meeting, the requirements of NFPA 1901.

An Air Restriction warning light shall be provided and located on the cab dash.

## **TRANSMISSION**

The chassis shall be equipped with a **Generation 5 Allison EVS3000** six (6) speed automatic transmission. It shall be programmed five (5) speed, sixth gear locked out, for fire apparatus vocation, in concert with the specified engine.

The transmission is communicated on the J-1939 through the communication port. The fifth gear shall be an overdrive ratio, permitting the vehicle to reach its top speed at the engine's governed speed. The dipstick is dipped in a rubber coating for ease in checking oil level when hot.

The chassis to transmission wiring harness shall utilize Metri-Pack 280 connectors with triple lip silicone seals and clip-type positive seal connections to protect electrical connections from contamination without the use of coatings.

Ratings: Max Input (HP) 450

Max Input (Torque) 1255 (lb ft)

Max Turbine (Torque) 1700 (lb ft)

Mechanical Ratios:

- 1st- 3.49:1
- 2nd- 1.86:1
- 3rd- 1.41:1
- 4th- 1.00:1
- 5th- 0.75:1
- Reverse - -5.03:1

### **ENGINE BRAKE**

The engine shall be equipped with a Jacobs compression engine brake. An “On/Off” switch shall be provided on the instrument panel within easy reach of the driver.

The engine brake shall interface with the Wabco ABS brake controller to prevent engine brake operations during adverse braking conditions.

A pump shift interlock circuit shall be provided to prevent the engine brake from activating during pumping operations.

The brake light shall activate when the engine brake is engaged.

### **TRANSMISSION COOLER**

The apparatus transmission shall be equipped with a Liquid-To-Liquid remote mounted cooler with aluminum internal components. The cooler shall be encased in an aluminum housing and mounted to the outside of the officer’s side frame rail for accessibility and ease of service.

### **TRANSMISSION FLUID**

The transmission shall come filled with Castrol TranSynd™ Synthetic Transmission Fluid or approved equal meeting the Allison TES-295 specification. NO EXCEPTION.



## **TRANSMISSION SHIFTER**

An Allison "Touch Pad" shift selector shall be mounted to the right of the driver on the engine cover accessible to the driver. The shift position indicator shall be indirectly lit for nighttime operation.

## **COOLING SYSTEM**

The cooling system shall be designed to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the engine and transmission manufacturer's requirements, and EPA regulations.

The complete cooling system shall be mounted in a manner to isolate the system from vibration and stress. The individual cores shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress to the adjoining core(s).

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

## **RADIATOR**

The radiator shall be a cross-flow design constructed completely of aluminum and **corrosion resistant to withstand high salt environments** with welded side tanks. The radiator shall be bolted to the bottom of the charge air cooler to allow a single depth core, thus allowing a more efficient and serviceable cooling system.

The radiator shall be equipped with a drain cock to drain the coolant for serviceability. The drain cock shall be located at the lowest point of the aluminum cooling system to maximize draining of the system.

## **CHARGE AIR COOLER**

The charge air cooler shall be of a cross-flow design and constructed completely of aluminum with extruded tanks.

The charge air cooler shall be bolted to the top of the radiator to allow a single depth core.

## **COOLANT**

The cooling system shall be filled with a 50/50 mix. The coolant makeup shall contain ethylene glycol and de-ionized water to prevent the coolant from freezing to a temperature of -34 degrees F and of type recommended by engine manufacture.

## HOSES & CLAMPS

Silicone hoses shall be provided for all engine coolant lines.

All radiator hose clamps shall be spring loaded stainless steel constant torque hose clamps for all main hose connections to prevent leaks. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance.

## FAN

The engine cooling system shall incorporate a heavy-duty composite 11- blade Z-series fan. It shall provide the highest cooling efficiently while producing the lowest amount of noise. This robust yet light-weight fan results in less wear and stress on motors and bearings.

A shroud and recirculation shield system shall be used to ensure air that has passed through the radiator is not drawn through again.

The fan tip to radiator core clearance shall be kept at a minimal distance to increase the efficiency of the fan and reduce fan blast noise.

## FAN CLUTCH

A fan clutch shall be provided that shall allow the cooling fan to operate only when needed. The fan shall remain continuously activated when the truck is placed in pump gear.

## SURGE TANK

The cooling system shall be equipped with an aluminum surge tank mounted to the officer's side of the cooling system core. The surge tank shall house a low coolant probe and sight glass to monitor the coolant level. Low coolant shall be alarmed with the check engine light. The surge tank shall be equipped with a dual seal cap that meets the engine manufacturer's pressure requirements, and system design requirements.

The tank shall allow for expansion and to remove entrained air from the system. There shall also be an extended fill neck to prevent system overflow and encroachment of expansion air space. Baffling shall be installed in the tank to prevent agitated coolant from being drawn into the engine cooling system.

## FUEL TANK

The chassis shall be equipped with a **50-gallon minimal stainless steel rectangular fuel tank secured with stainless steel straps and hardware**. The fuel tank shall be certified to meet FMVSS 393.67 tests. It shall also maintain engine manufacturer's recommended expansion room of 5%.

The tank shall be removable by means of six (6) bolted connections and dropped. One (1) tank baffle shall be used.

The fuel lines shall be nylon braid reinforced fuel hose with brass fittings. The lines shall be carefully routed along the inside of the frame rails. All fuel lines are covered in high temperature rated split plastic loom.

Single suction and return fuel lines shall be provided.

The fuel tank shall be mounted in a saddle with a barrier between the tank and the saddle. The bottom of the fuel tank shall contain a ½ inch drain plug.

### **FUEL FILL**

The fuel tank shall be equipped with a 2-1/4" filler neck assembly with a 3/4" vent located on the driver's side of the truck or center rear of truck dependent on ladder configuration. A fuel fill cap attached with a lanyard shall be provided.

### **FUEL COOLER**

Installed on the apparatus fuel system shall be an Air-To-Liquid aluminum fuel cooler. The fuel cooler shall be located in the lowest module of the cooling system.

### **DIESEL EXHAUST FLUID TANK**

The exhaust system shall include a molded cross-linked polyethylene tank. The tank shall have a capacity of 5 usable gallons and shall be mounted on the left side of the chassis frame.

The DEF tank fill neck shall accept only a 19mm dispensing nozzle versus the standard 22mm diesel fuel dispensing nozzle to prevent cross contamination. The DEF tank cap shall be blue in color to further prevent cross contamination.

A placard shall accompany fill location noting DEF specifications.

### **ALTERNATOR**

A **320 ampere Prestolite/Leece Neville alternator** with serpentine belt shall be provided the alternator shall generate 260 amperes at idle. Shall meet or exceed NFPA standard.

A low voltage alarm, audible and visual, shall be provided.

### **BATTERIES**

The battery system shall be a single system consisting of negative ground, 12-volt Interstate Group 31 MHD batteries, 185-minute reserve capacity with 25 amperes draw at 80 degrees Fahrenheit. Each battery shall have 114 plates. Warranty shall be accepted nationwide.

The batteries shall be installed in a vented 304 stainless steel battery box with a removable aluminum cover to protect the batteries from road dirt and moisture. The battery cover shall be secured with four "T" handle rubber hold downs to provide easy access for maintenance and

inspection. Stainless steel hardware will be used for installation. The batteries are to be placed on dri-deck and secured with a fiberglass hold down.

The batteries shall be wired directly to starter motor and alternator.

The battery cables shall be 3/0 gauge. Battery cable terminals shall be soldering dipped, color-coded and labeled on heat shrink tubing with a color-coded rubber boot protecting the terminals from corrosion.

There shall be a 350-ampere fuse protecting the pump primer and a 250-ampere fuse protecting the electric cab tilt pump and other options as required.

### **BATTERY JUMPER TERMINAL**

There shall be one set (two studs) of battery jumper terminals located by the battery box under the cab. The terminals shall have plastic color-coded covers. Each terminal shall be tagged to indicate positive/negative.

### **BATTERY CHARGING**

A Kussmaul Auto Charge 1200 battery system charger shall be provided. The Auto Charge 1200 is a fully automatic battery charger with a very high output for vehicles with a single battery system. A single bar graph display is provided to indicate the state of charge of the battery system. The rated output shall be 40 amps for the vehicle battery system.

A 120-volt Auto Pump air compressor shall also be provided to maintain air within the air brake system.

A miniature air filter that mounts in the output pressure line of the air pump to trap moisture shall be provided. The micron filter element removes contaminants from the air line. A transparent bowl permits easy monitoring of water collected and a manual purge valve allows the operator to conveniently drain the bowl. A Bendix DV2 heated automatic drain valve shall be provided.

### **SHORELINE**

A shoreline connection shall be provided and located on the driver's side of the cab between the front and rear doors.

### **AUTO-EJECT**

A Kussmaul Model 091-55-20-120 super electric auto-eject with weatherproof cover and power interrupt shall be provided.

## **FRONT AXLE**

The front axle shall be a drop beam with a capacity appropriate to the design. The axle shall be hub piloted, 10 studs, furnished with oil seals and come complete with assist cylinder, hoses, and mounting brackets.

## **SUSPENSION (FRONT)**

The front suspension shall be a variable rate taper-leaf design, 54" long and 4" wide. Long life, maintenance free, urethane bushed spring shackles shall be utilized. All spring and suspension mounting shall be attached directly to frame. Spring shackles and pins that require grease shall not be acceptable. **NO EXCEPTIONS.**

## **ENHANCED FRONT SUSPENSION SYSTEM**

The front suspension shall have the handling, stability, and ride quality enhanced by the use of a Ride Tech auxiliary spring system and Koni high performance shock absorbers.

This system shall utilize three stage, urethane auxiliary springs, and high performance gas filled shock absorbers to control the deflection of the leaf springs, and dampen vibration normally transmitted to the chassis. This maintenance free system will be custom tuned to the apparatus gross weight rating for maximum performance, while maintaining a soft compliant ride. **NO EXCEPTIONS.**

A minimum of (3) three year 360,000-mile warranty will be provided by the manufacturer.

## **FRONT TIRES**

Front tires shall be Goodyear, load range L, G296 highway tread, single tubeless type with a GAWR of 22,000 pounds. Wheels shall be disc type, hub piloted, 22.5 x 12.25 10 stud 11.25 bolt circle.

## **REAR AXLE**

The rear axle shall meet or exceed NFPA requirements and differential vent should be located above frame rails. Single reduction drive axle with a capacity sufficient for the engineered design. The axles shall be hub piloted, 10 studs, furnished with oil seals.

## **TOP SPEED**

The top speed shall be approximately 60 MPH.

## **SUSPENSION (REAR)**

### **AIR RIDE**

An air ride rear suspension shall be provided. The suspension shall be a dual air spring design equipped with dual height control valves to maintain proper ride height. To reduce axle stress

and maintain axle position and pinion angle the suspension design shall incorporate three torque rods. The ground rating of the suspension shall be sufficient for the engineered design.

### **REAR TIRES**

Rear tires shall be Goodyear, load range L, G291 highway tread, dual tubeless type with a GAWR sufficient for engineered design. Wheels shall be disc type, hub piloted, 22.5 x 9 10 stud with 11.25" bolt circle.

### **TIRE PRESSURE MONITOR**

A Real Wheels LED tire pressure sensor shall be provided for each wheel. The pressure sensor shall indicate if a particular tire is not properly inflated. A total of six (6) indicators shall be provided.

### **WHEELS**

The front and rear wheels shall be ACCURIDE® brand aluminum.

### **HUB COVERS**

Polished stainless-steel hub covers shall be provided for the front and rear axle.

### **LUG NUT CAPS**

Chrome plated lug nut caps shall be provided for the front and rear wheels.

### **FRONT MUD FLAPS**

Hard rubber mud flaps shall be provided for front tires.

### **REAR MUD FLAPS**

Hard rubber mud flaps shall be provided for rear tires.

### **BRAKES, Front**

The front brakes shall be appropriate to truck requirement as engineered. They shall also have quick-change shoes for fast easy brake relining or pads as applicable.

### **BRAKES, Rear**

The rear brakes shall be Meritor S-cam style. They shall be 16.5" x 8.625" with heavy-duty return springs, and a double anchor pin design. They shall also have quick-change shoes for fast easy brake relining. A disc brake equivalent would be acceptable. Must meet or exceed NFPA requirements.

A guard shall be provided over the parking brake knob.

## **AIR BRAKE SYSTEM**

The vehicle shall be equipped with air-operated brakes. The system shall meet or exceed the design and performance requirements of current FMVSS-121 and test requirements of current NFPA 1901 standards.

Each wheel shall have a separate brake chamber. A dual treadle valve shall split the braking power between the front and rear systems.

All main brake lines shall be color-coded nylon type protected in high temperature rated split plastic loom. The brake hoses from frame to axle shall have spring guards on both ends to prevent wear and crimping as they move with the suspension. All fittings for brake system plumbing shall be brass.

An air dryer shall be provided.

The air system shall be provided with a rapid build-up feature, designed to meet current NFPA 1901 requirements. The system shall be designed so the vehicle can be moved within 60 seconds of startup. The quick build up system shall provide sufficient air pressure so that the apparatus has no brake drag and is able to stop under the intended operating conditions following the 60-second buildup time. The vehicle shall not be required to have a separate on-board electrical air compressor or shoreline hookup to meet this requirement.

Four (4) supply tanks shall be provided. One air reservoir shall serve as a wet tank and a minimum of one tank shall be supplied for each the front and rear axles. A Schrader fill valve shall be mounted in the front of the driver's step well.

A spring actuated air release emergency/parking brake shall be provided on the rear axle. One (1) parking brake control shall be provided and located on the engine hood next to the transmission shifter within easy reach of the driver. The parking brake shall automatically apply at  $35 \pm 10$  PSI reservoir pressure. A Meritor WABCO IR-2 Inversion Relay Valve, supplied by both the Primary and Secondary air systems, shall be used to activate the parking brake and to provide parking brake modulation in the event of a primary air system failure.

Accessories plumbed from the air system shall go through a pressure protection valve and to a manifold so that if accessories fail they shall not interfere with the air brake system.

## **CENTRAL LOCATION FOR AIR TANK DRAINS**

The air brake system shall have all the air tank drain valves located in a customer specified location on the apparatus.

## **AIR OUTLET**

One (1) air chuck shall be provided at a customer specified location. The system shall tie into the wet tank of the brake system and include an 85-psi pressure protection valve in the outlet line to prevent the brake system from losing all air.

Note: Purchaser to specify type of hose fitting.

## **AIR BRAKING ABS SYSTEM**

A ABS system shall be provided to improve vehicle stability and control by reducing wheel lock-up during braking. This braking system shall be fitted to axles and all electrical connections shall be environmentally sealed from water and weather and be vibration resistant.

The system shall constantly monitor wheel behavior during braking. Sensors on each wheel transmit wheel speed data to an electronic processor, which shall sense approaching wheel lock and instantly modulate brake pressure up to 5 times per second to prevent wheel lock-up. Each wheel shall be individually controlled. To improve field performance, the system shall be equipped with a dual circuit design. The system circuits shall be configured in a diagonal pattern.

Should a malfunction occur, that circuit shall revert to normal braking action. A warning light at the driver's instrument panel shall indicate malfunction to the operator.

The system shall consist of a sensor clip, sensor, electronic control unit and solenoid control valve. The sensor clip shall hold the sensor in close proximity to the tooth wheel. An inductive sensor consisting of a permanent magnet with a round pole pin and coil shall produce an alternating current with a frequency proportional to wheel speed.

The unit shall be sealed, corrosion-resistant and protected from electro- magnetic interference. The electronic control unit shall monitor the speed of each wheel sensor and a microcomputer shall evaluate wheel slip in milliseconds.

## **MISCELLANEOUS CHASSIS EQUIPMENT**

- Fluid capacity plate affixed below driver's seat.
- Chassis filter part number plate affixed below driver's seat.
- Maximum rated tire speed plaque near driver.
- Tire pressure label near each wheel location.
- Cab occupancy capacity label affixed next to transmission shifter.
- Do not wear helmet while riding plaque for each seating position.
- NFPA compliant seat belt and standing warning plates provided.



## **ALUMINUM CAB**

The cab shall be a full tilt 6-person 10" rear raised roof cab designed specifically for the fire service and manufactured by the chassis builder. Rear of the cab shall be slanted forward at the top rear for mid-ship aerial use. The outside of the rear cab wall shall be smooth aluminum plate.

Apparatus cabs that are not manufactured by the apparatus manufacturer shall not be acceptable.

## **CAB DESIGN**

The apparatus chassis shall be of an engine forward, fully enclosed tilt cab design. There shall be four (4) side entry doors.

The cab shall be of a fully open design with no divider wall or window separating the front and rear cab sections. The cab shall be designed in a manner that allows for the optimum forward facing vision for crew. Cab designs that utilize roof mounted air conditioning units, are not desired.

The cab shall be constructed of high strength 5052H32 aluminum plate welded to 6061-T6 extruded aluminum framing.

The cab face extrusion framework shall be overlaid with 1/8" thick 5052H32 aluminum plate to allow for an aesthetically pleasing radiused cab face.

## **CAB SUB-FRAME**

The cab shall be mounted to a 4" x 4" x 3/8" galvanized steel or 304L stainless steel box tube sub-frame, and shall be isolated from the chassis, through the use of no less than six (6) elastomeric bushings. This substructure shall be completely independent of the apparatus cab. The sub frame shall be painted to match the primary chassis color.

The sub-frame shall be mounted to the chassis through the use of lubricated Kaiser Bushings for the front pivot point, and two (2) hydraulically activated cab latches, to secure the rear.

Cab mounting that does not include a sub-frame shall not be considered. **NO EXCEPTIONS.**

## **ROOF DESIGN**

The cab shall be of a 10" one-half rear raised roof design with side drip rails and shall satisfy the requirements for a 6 man cab.

## **FENDER CROWNS**

Polished stainless-steel front axle fenderettes with full depth radiused wheel well liners shall be provided.

### **CAB INSULATION**

The exterior walls, doors, and ceiling of the cab shall be insulated from the heat and cold, and to further reduce noise levels inside the cab. The cab interior sound levels shall not exceed 90 decibels at 45 mph in all cab seat positions. **NO EXCEPTIONS.**

### **EXTERIOR GLASS**

The cab windshield shall be of a two-piece curved design utilizing tinted, laminated, automotive approved safety glass. The window shall be held in place by an extruded rubber molding. The cab shall be finished painted prior to the window installation.

### **SUN VISORS**

The sun visors shall be made of solid material matching the seat material. There shall be a visor located at both the driver and officer positions, recessed in a molded form for a flush finish.

### **CAB STEPS**

The lower cab steps shall be no more than 22" from the ground. An intermediate step shall be provided, mid-way between the lower cab step, and the cab floor.

The intermediate step shall be slightly inset to provide for safer ingress and egress. All steps shall be covered with material that meets or exceeds the NFPA requirements for stepping surfaces.

### **STEP LIGHTS**

A white LED strip light shall illuminate each interior cab step. These lights shall illuminate whenever the battery switch is on and the cab door is opened.

### **CAB STRUCTURAL INTEGRITY**

The cab of the apparatus shall be designed and so attached to the vehicle as to eliminate, to the greatest possible extent, the risk of injury to the occupants in the event of an accident.

The apparatus cab shall be tested to specific load and impact tests with regard to the protection of occupants of a commercial vehicle.

A test shall be conducted to evaluate the frontal impact strength of the apparatus cab to conform to the test J2420 and the "United Nations Regulation 29, Annex 3, paragraph 4, (Test A). A second test shall be conducted to evaluate the roof strength of the apparatus cab to conform to the Society of Automotive Engineers (SAE) SAE J2422/SAE J2420 and "United Nations Regulation 29, Annex 3, paragraph 5, (Test B) and SAE J2420. The evaluation shall consist of the requirements imposed by ECE Regulation 29, Paragraph 5.

The test shall be conducted by a certified independent third-party testing institution.

A letter stating successful completion of the above test on the brand of cab being supplied shall be included in the bid. There shall be “no exception” to this requirement.

### **SEAT BELT TESTING**

The seat belt anchorage system shall be tested to meet FMVSS 207 Section 4.2a and FMVSS 210 section 4.2. Testing shall be conducted by an independent third-party product evaluation company.

A copy of the certification letter shall be supplied with the bid documents.

### **CAB TILT SYSTEM**

An electrically powered hydraulic cab tilt system shall be provided, and shall lift the cab to an angle of 45 degrees, exposing the engine and accessories for fluid checks and service work. The system shall be interlocked to only operate when the parking brake is set.

The lift system shall be comprised of two (2) hydraulic lift cylinders, an electrically driven hydraulic pump, and a control switch. The hydraulic pump shall be located on the exterior of the frame rail on the driver’s side of the chassis that can be easily accessible when the cab is tilted. A mechanical locking system consisting of an air operated actuator and a heavy radiused wall 3” x 3” aluminum extrusion will be provided to ensure the cab remains in the raised position in the event of a hydraulic failure. Additionally, each of the hydraulic lift cylinders shall incorporate a check valve, and velocity fuses that will activate should a sudden drop in pressure be detected. The cab tilt controls shall be interlocked to the parking brake to ensure the cab will not move, unless the parking brake is set. The cab tilt controls will consist of a momentary raise/lower switch and a two-position cab safety lock switch.

The hydraulic lift cylinders will be connected to a steel cab sub-frame, and not directly to the cab. **NO EXCEPTIONS**

### **MANUAL CAB LIFT**

There shall be a manually operated hydraulic pump for tilting the cab in case the main pump should fail. Access to the pump shall be located under the left corner of the front bumper.

### **CAB DOORS**

The cab doorframes shall be constructed from 6061 T6 aluminum extrusions fitted with a 5052 H32 aluminum sheet metal skin and shall be equipped with dual weather seals. The outside cab door window opening shall be framed by a black anodized aluminum trim, to provide a clean appearance. The cab doors shall be equipped with heavy-duty door latching hardware, which complies with FMVSS 206. The door latch mechanism shall utilize control cable linkage for positive operation. A rubber coated nylon web doorstop shall be provided. Power windows and door locks shall be installed.

The doors shall be lap type with a 10-gauge full-length stainless-steel flange and 3/8" diameter hinge pin and shall be fully adjustable.

All openings in the cab shall be grommeted or equipped with rubber boots to seal the cab from extraneous noise and moisture.

### **SIDE WINDOWS**

Fixed position side window shall be provided on each side of the cab between the forward cab area and the crew cab area. The windows shall be approximately 20.5" high x 16.50" wide to provide maximum visibility. The side windows shall be held in place by an extruded rubber molding with a chrome plated decorative locking bead.

### **WINDOW TINTING**

The crew cab windows and doors, with the exception of the driver's and officer's doors, and the windshield, shall be tinted with deep "limo" tint. The tint shall be incorporated into the window glass with eight percent (8%) light transmittance. Film tinting shall not be acceptable.

### **WINDSHIELD WIPERS**

Two (2) black anodized finish two speed synchronized electric windshield wiper system. Dual motors with positive parking. System includes large dual arm wipers with built in washer system. One (1) master control works the wiper, washer and intermittent wipe features. Washer bottle is a remote fill with a 4-quart capacity. Washer fill is located just inside of officer cab door.

### **CAB HANDRAILS**

There shall be a 24" long, handrail provided and installed, at each cab entrance. The handrails shall be constructed of type 304 stainless steel 1.25-inch diameter tubing with bright finish and knurled gripping surface. Mounting flanges shall be constructed from 7- gauge, .180 thick, stainless sheet. Each grab rail shall have 90 degree returns to flanges.

The ends of grab rail shall pass through the flanges and be welded to form one structural unit. The handrails shall be mounted using 1.25" SS Hex bolts, with a barrier rubber gasket at each flange.

Sufficient space shall allow for a gloved hand to firmly grip the rail.

There shall be two (2) rubber coated grab handles provided and mounted on the interior of the cab, one each side, on the windshield post for ingress assistance. The handrail on the driver's side shall be approximately 11" long and the handrail on the officer's side shall be approximately 18" long.

### **CAB DOOR HANDRAILS**

Two (2) 1.25" diameter knurled stainless steel handrails shall be provided on the inside of the rear crew doors just above the windowsill.

### **MIRRORS**

Two (2) Lang Mekra 300 Series smooth chrome plated Aero style main and convex mirrors shall be installed on each side of the vehicle. The main mirror shall be 4-way remote adjustable with heat, 7" x 16" 2nd surface chromed flat glass. The convex shall be 6" x 8" 2nd surface chromed 400 mm radius glass. Each mirror housing assembly shall be constructed of lightweight textured chrome ABS with on truck glass and housing back cover replacement. In the event the mirror breaks the glass shall be replaceable in (3) minutes or less.

The glass shall include a safety adhesive backing to keep broken glass in place. The mirror assembly shall be supported by a "C" loop bracket constructed of polished stainless-steel tube utilizing two-point mounting reducing vibration of mirror glass during normal vehicle operation. The lower section of the holder shall include a spring loaded single detent position 20 degrees forward with easy return to operating position without refocusing.

### **GRILLE**

The front of the cab shall be equipped with a polished stainless-steel grille with sufficient area to allow proper airflow into the cooling system and engine compartment. Plastic chrome plated grilles shall not be acceptable.

### **BUMPER**

There shall be a 12" high double rib painted and chevron steel wrap-around bumper provided at the front of the apparatus. Laser cut perforated grilles shall be incorporated into the bumper and located at the outboard section of the bumper for the air horns and at the center for the siren speaker. The bumper shall be mounted to a reinforcement plate constructed of 1/4" x 10" x 70" carbon steel. A gravel shield shall be provided, constructed of .188" aluminum diamond plate. The bumper extension shall be approximately 18".

### **STORAGE WELL COMPARTMENT**

There shall be a hose well compartment located in the center of the front bumper. The compartment shall be divided and run the full width of the bumper and measure approximately 75" wide x 10" long x 5" deep at the ends and 12" deep in the center. The compartment shall be constructed of .125" smooth aluminum plate.

### **DIAMOND PLATE BUMPER LID**

There shall be a painted 1/8" diamond plate cover with latches provided for the front bumper trough. The cover shall have a 2" rise to accommodate the storage well requirements. It shall be red in color.

### **AIR HORNS**

Two (2) Grover 1510 round, chrome plated, air horns shall be provided.

### **CONTROL FOR AIR HORNS**

The air horns shall be activated by foot switch on Officer side as well as by an overhead pull chain.

### **ELECTRONIC SIREN**

One (1) **Federal PA 300** 200-Watt electronic siren shall be installed at the cab instrument panel complete with noise canceling microphone specified by the fire department. One (1) **Federal Signal W-FS-Rumbler System** shall be installed in conjunction with siren.

### **SIREN SPEAKER**

A Federal weatherproof siren speaker shall be provided and mounted behind the perforated front bumper.

### **FEDERAL Q2B SIREN AND ROTO RAY**

There shall be a Federal Q2B-NN siren and Roto Ray emergency light installed in the center of the cab grille. The siren shall be securely mounted and activated by means of a solenoid and shall include a brake. Roto Ray will be LED type with two red and one white light.

### **SIREN WIRED TO STEERING WHEEL BUTTON**

The mechanical siren shall be wired through the steering wheel button. A selector switch shall be provided on the instrument panel to switch between functions.

### **MOMENTARY SWITCH ON DASH**

A momentary switch for the mechanical siren shall be provided on the officer's side dash.

### **LIGHTING CAB EXTERIOR**

Exterior lighting and reflectors shall meet or exceed Federal Motor Vehicle Safety Standards and National Fire Protection Association requirements in effect at this time.

### **LED HEADLIGHTS**

There shall be dual, sealed-beam LED, rectangular headlights in custom housings on each side of the front of the cab.

The lenses shall be hardened glass. The LEDs shall be long-lasting and able to withstand shock and vibration.

These headlights shall provide 850 effective lumens in high beam and 750 effective lumens in low beam. This installation shall be a 12V DC configuration and draw 3.6 Amps.

Headlight alignment shall conform to SAE J599 AUG. 1997

- DOT Approved FMVSS 108
- SAE J96 ECE Reg. 112
- Sealed to IP67

Manufacturer's warranty: 4-year limited warranty.

### **FRONT TURN SIGNALS**

There shall be two Whelen LED rectangular amber turn signal lights mounted one each side in the front of the headlight housing and one mounted on each side of the warning light housing.

### **CORNERING LIGHTS**

Two (2) Whelen LED cornering lights shall be mounted on the sides of the bumper, one each side. The lights shall come on steady, with their coordinating turn signal.

### **CAB REAR WALL COVERING**

The rear outside wall of the cab shall be covered with 1/8" aluminum diamond plate.

### **DIAMOND PLATE, CAB ROOF, FULL WIDTH**

The rear exterior section of the cab roof shall have a diamond plate overlay. The overlay shall be constructed of .125" aluminum serrated diamond plate and measure the full width of the cab roof and from the cab's back wall to the edge of the raised roof (if applicable), or to the mid-section of the cab roof (if flat roof).

### **CAB INTERIOR**

The metal surfaces of the cab interior shall be coated and sealed with MultiSpec gray speckle, urethane modified, and mar resistant paint. The textured coating shall provide paramount durability and wear resistance against foreign objects and normal wear and tear.

The front and rear headliners, as well as the rear cab wall, shall be finished in Gray-Black Durawear Plus covered padded panels.

### **REFLECTIVE MATERIAL, CHEVRON STRIPING, INTERIOR CAB DOORS, ORAFOL REFLEXITE**

The apparatus shall have reflective Orafol Reflexite Chevron striping affixed to the inside of each cab door. The striping shall be plainly visible to oncoming traffic when the doors are in the open position.

### **CAB FLOOR COVERING**

The cab interior floor shall be covered with a 5/16" thick, gray rubberized material to provide a rugged but cosmetically pleasing stepping surface throughout the cab. The floor covering shall provide superior durability and resistance against foreign objects as well as normal wear and tear.

### **ENGINE ENCLOSURE**

An integral, formed aluminum and composite engine enclosure shall be provided. The engine enclosure shall be contoured and blended in an aesthetically pleasing manner with the interior dash and flooring of the cab. The enclosure shall be kept as low as possible providing high strength, low weight, and superior heat and sound deadening qualities.

Additionally, the underside of the engine enclosure shall be insulated for heat and sound control.

### **ENGINE ENCLOSURE COVERING**

The top of the engine enclosure shall be covered with a textured coating to provide paramount durability and wear resistance against foreign objects and normal wear and tear as well as sound deadening and insulation. The rubberized cab floor covering shall extend up the lower exterior sides of the engine enclosure to aid in sound deadening and heat resistance.

### **CENTER CONSOLE**

There shall be a storage console installed on the engine enclosure between the driver and officer. The console shall be constructed from smooth aluminum and shall be coated with the same finish as the engine enclosure. The console shall measure approximately 23" long X 11.375" wide X 3.75" high. The console shall have a 13" long general storage area in the center that shall be divided into three (3) separate areas with two (2) fixed vertical dividers. A Velcro strap shall be installed front to rear over this area. Each outboard area of the console shall have one (1) stainless steel cup holder and one (1) approximately 5.5" long X 4.75" wide X 3.5" high open storage area.

### **ENGINE HOOD LIGHTS**

An LED work light shall be installed in the engine enclosure with an individual switch located on the base of the light.

### **COMPUTER TRAY**

There shall be a slide-out tray in front of the officer's seat for a laptop computer or other use. There shall be a Havis Mount (part #) to attach to the tray. A 12 volt DC source shall be available in the area of the tray.



### **GLOVE BOX HOLDERS**

A pair of glove box holders shall be provided in the upper cab crew door area, constructed of 3/16" smooth aluminum.

Each glove box holder shall be capable of holding (2) glove boxes.

### **INSTRUMENT PANEL**

The main dash shroud, which covers the area directly in front of the driver from the doorpost to the engine hood, shall be custom molded and covered with a non-glare black vinyl. The dash shall be a one-piece hinged panel that tilts outward for easy access to service the internal components. The gauge panel shall be constructed of durable aesthetically pleasing light gray polymer material, placed over a heavy-duty steel backing plate, for added strength and durability.

The gauges shall be Beede Instruments, NexSys Link gauges with built-in self-diagnostics and red warning lights to alert the driver of any problems. All gauges and controls shall be backlit for night vision and identified for function.

All main gauges and warning lights shall be visible to the driver through the steering wheel.

### **MASTER BATTERY & IGNITION SWITCH**

The vehicle shall be equipped with a keyless ignition, with a three (3)-position Master Battery rocker switch, "Off/ACC/On" and a two (2)-position Engine Start rocker switch, "Off/Start".

### **DIESEL PARTICULATE FILTER CONTROLS**

There shall be two (2) controls for the diesel particulate filter. One control shall be for regeneration and one control shall be to inhibit engine regeneration. These shall be located below the steering wheel in the kick panel.

### **INSTRUMENTATION & CONTROLS**

#### **Instrumentation on dash panel:**

- Tachometer/hour meter with built in high exhaust system regeneration temperature, and instrument malfunction indicators
- Speedometer/odometer with built in turn signal, high beam and re-settable trip odometer
- Voltmeter
- Diesel fuel gauge
- DEF (Diesel Exhaust Fluid) gauge
- Engine oil pressure
- Transmission temperature
- Engine temperature

- Primary air pressure
- Secondary air pressure

**Indicators and warning lights in front of the driver:**

- Parking brake engaged
- Low air with buzzer
- Antilock brake warning
- Check transmission
- Transmission temperature
- Upper power indicator
- Seat belt
- Engine temperature
- Low oil indicator
- Low voltage indicator
- Air filter restriction light
- Low coolant indicator
- High idle indicator
- Power on indicator
- Check engine
- Stop engine
- Check engine MIL lamp
- DPF indicator
- High exhaust temperature
- Wait to start

**Other indicator and warning lights (if applicable):**

- Differential locked
- PTO (s) engaged
- Auto-slip response
- Retarder engaged
- Retarder temperature
- ESC indicator
- Jacks out
- Jacks down

**Controls located on main dash panel:**

- Master power disconnect with ignition switch
- Engine start switch
- Headlight switch

- Windshield wiper/washer switch
- Differential lock switch (if applicable)
- Dimmer switch for backlighting

**Controls included in steering column:**

- Horn button
- Turn signal switch
- Hi-beam low-beam switch
- 4-way flasher switch
- Tilt-telescopic steering wheel controls

**CENTER CONTROL CONSOLE**

There shall be an ergonomically designed center control console. The console shall be constructed of 1/8" smooth aluminum and shall be mounted on the engine hood between the driver and officer. The console shall have a durable coating to match the color of the engine hood covering and shall feature surfaces on each side that are contoured to face the driver and the officer for easy viewing and accessibility. The switches and other customer specified electrical items shall be mounted in removable 1/8" smooth aluminum panels with a black wrinkle finish. The console shall have an aluminum lift-up lid with quick release latch. The lid shall be held in the open position with a gas strut to allow for easy access and serviceability.

**Controls located in the console conveniently accessible to the driver:**

- Transmission shifter
- Pump shift control with **OK TO PUMP** and **PUMP ENGAGED** lights
- Remote mirror control
- Illuminated rocker switches to control high idle, Jacob's brake, siren/horn, siren brake, master emergency, and other customer specified components
- 12V power point (if applicable)

**Controls located in the console conveniently accessible to the driver and the officer (center):**

- Parking brake control with a guard to prevent accidental engagement

**Controls located in the console conveniently accessible to the officer:**

Illuminated rocker switches to control customer specified components that are easily reachable to the officer and do not allow for compromise of the driver's view, and eliminate the need for foot switches

- Surface to recess siren head, radio head, or other desired items as space permits
- 12V power point (if applicable)

### **Driving compartment warning labels shall include:**

- HEIGHT OF VEHICLE
- OCCUPANTS MUST BE SEATED AND BELTED WHEN APPARATUS IS IN MOTION
- DO NOT USE AUXILIARY BRAKING SYSTEMS ON WET OR SLIPPERY ROADS
- EXIT WARNINGS

### **Additional labels included:**

- COMPUTER CODE SWITCH
- ABS CODE SWITCH
- FLUID DATA TAG
- CHASSIS DATA TAG

### **OVERHEAD CONTROL CONSOLE**

An ergonomically designed overhead console shall be provided above the driver and officer, running the full width of the cab. The overhead console shall be constructed from 1/8" aluminum plate and shall be painted with a durable finish to match the inside of the cab. There shall be seven (7) removable 1/8" smooth aluminum plates with a black wrinkle finish to house switches and other electrical items.

Directly above the driver there shall be two (2) panels with no cutouts, unless otherwise specified by the customer.

There shall be a panel located to the right of the driver that shall be designated for defroster, heat, and air conditioning controls (if specified).

The center overhead panel shall be designated for up to seven (7) door ajar indicators. Upon releasing the apparatus parking brake, one or more of these lights shall automatically illuminate (flash) when any of the following conditions occur that may cause damage if the apparatus is moved: cab or compartment door is open; ladder or equipment rack is not stowed; stabilizer system deployed; any other device has not been properly stowed.

There shall be a panel to the left of the officer as well as two (2) directly above the officer. These panels shall have no cutouts, unless otherwise specified by the customer.

### **ENGINE WARNING SYSTEM**

An engine warning system shall be provided to monitor engine conditions such as low oil pressure, high engine temperature and low coolant level. Warning indication shall include a **STOP ENGINE** (red) light with audible buzzer activation and a **CHECK ENGINE** (amber) light

**Note: (Some engine configurations may also include a fluid warning light.)**

There shall be a master information light bar with 24 lights located across the center of the dash panel that covers up to 24 functions. These are defined under Indicators and Warning Lights above.

### **CHASSIS WIRING**

All chassis wiring shall have XL high temperature crosslink insulation. All wiring shall be color-coded, and the function and number stamped at 3" intervals on each wire. All wiring shall be covered with high temperature rated split loom for easy access to wires when trouble shooting. All electrical connectors and main connectors throughout the chassis shall be treated to prevent corrosion. **\*\* All chassis wiring shall be wired at/or above the lower frame rail horizontal portion.**

### **MASTER ELECTRICAL PANEL**

The main chassis breaker panel shall be wired through the master disconnect solenoid and controlled by the three-position ignition rocker switch. The breaker panel shall be located in front of the officer on the interior firewall and shall be protected by a removable aluminum cover. The cover shall have an aluminum notebook holder on the exterior face accessible to the officer. The cover shall be painted with a durable finish to match the interior of the cab and shall be secured with two (2) thumb screws.

The breaker panel shall include up to 22 ground switched relays with circuit breaker protection. An integrated electrical sub-panel shall be provided and interfaced to the body and chassis through an engineered wire harness system.

Twelve (12) 20-ampere relays and one (1) 70-ampere relay shall be provided for cab light bar and other electrical items. If the option for a mechanical siren has been selected two (2) additional relays shall be provided.

Up to two (2) additional relay boards with circuit breaker protection shall be provided for additional loads as required.

Each board shall contain four (4) relays. The relay boards shall be configured to trip with input from switch of positive-negative or load manager by moving the connector on the board (no tools required). All relay boards shall be equipped with a power-on indicator light (red), input indicator light (green) and power output indicator light (red).

Up to twenty-three (23) additional automatic reset circuit breakers for non-switched loads that are remotely switched (i.e.: heater fans, hood lights, etc.) shall be provided.

All relays and circuit breakers on the relay boards shall be pull-out/push-in replaceable.

All circuit breakers on the relay boards shall be 20 ampere automatic reset which can be doubled or tripled for 40 or 60-ampere capacity.

The system shall utilize Deutch DRC weather resistant connectors at the breaker panel, toe board and main dash connections.

All internal wire end terminals, including locking connectors, shall be mechanically affixed to the wire ends by matching terminal crimping presses to assure the highest quality terminations.

All internal splices shall be ultrasonically welded connections and all internal wiring shall be high temperature GXL type wire that is protected by wiring duct wherever possible.

All switches shall be ground controlled; no power going through any rocker switch.

Any switch controlling a relay in the breaker panel shall be capable of being set to function only when the parking brake is set. All relays shall be tagged with the function that the relay is controlling.

### **PUMP SHIFT MODULE**

A pump shift module with indicating lights shall be located within easy reach of the driver. A gear lockup shall be provided to hold the transmission in direct drive for pump operation.

### **LOAD MANAGER**

Load manager shall have the ability to sequence loads on and off. It shall also be able to shed 8 loads when the vehicle is stationary, starting at 12.7 volts lowest priority load to be shed, then respectively at 12.6, 12.4, 12.2, 12.0, 11.8, 11.4 and 11.0 volts DC. Any load that has been shed shall be off for a minimum of five minutes, and then if voltage has rebounded above shed voltage, the shed load shall automatically come on. There shall also be an indicator panel alongside the rocker switches, which indicate power is on, battery warning and fast idle. Battery warning indicator shall flash at a rate proportional to the voltage discharge rate.

### **AUTOMATIC HIGH IDLE ACTIVATION**

The load management system shall be capable of activating the apparatus high idle system when the system voltage drops below 12.3 volts DC. The system shall raise engine speed for a minimum of five minutes until voltage exceeds 13.0-volt DC. The load management system shall activate the high idle feature before any devices are automatically shed OFF. The high idle function request from the load management device shall function only if the appropriate interlocks are present; that is, control of the high idle system is monitored and shall be superseded by the state of the interlock control module. The automatic high idle system shall be deactivated whenever the brake pedal is pressed, and shall remain inactive for two minutes thereafter to allow an operator to override the high idle function and return the engine to idle before PTO engagement.

### **HIGH IDLE**

The engine shall have a "high idle" switch on the dash that shall maintain an engine RPM of 1,000. The switch shall be installed at the cab instrument panel for activation/deactivation. The "high idle" mode shall become operational only when the parking brake is on and the truck transmission is in neutral.

### **AUXILIARY POWER POINTS**

Two (2) 12-volt 20-ampere auxiliary lighter socket type plug-ins, shall be provided in the cab, one near the driver and one near the officer. Four (4) USB ports shall also be available in the cab.

### **CAB ACCESSORY FUSE PANEL**

A fuse panel shall be located underneath the rear facing seat on the officer's side. The fuse panel shall consist of six (6) battery hot and six (6) ignition switch circuits. Each circuit shall be capable of 10-ampere 12-volt power and total output of 50-amps. The fuse panel shall be capable of powering accessories such as hand-held spotlights, radio chargers, hand lantern chargers and other miscellaneous 12-volt electrical components.

### **POWER & GROUND STUDS, OVERHEAD COMMAND CONSOLE**

There shall be a set three (3) threaded power studs provided in the cab's overhead Command Console for future installation of two-way radios.

The studs shall be wired as follows:

- One (1) 12-volt 60-amp, direct to the battery
- One (1) 12-volt 30-amp controlled by the ignition switch
- One (1) 12-volt 125-amp ground

### **VEHICLE DATA RECORDER**

An Akron / Weldon vehicle data recorder as required by the 2009 edition of NFPA 1901 shall be installed. Vehicle data shall be sampled at the rate of 1 second per 48 hours, and 1 minute per 100 engine hours.

Free software is available to allow the fire department to collect the data as needed.

### **LIGHTING CAB INTERIOR**

Interior lighting shall be provided inside the front of the cab for passenger safety. Two (2) ceiling mounted combination red/clear LED dome lights with a push button on/off switch in the light lens. One light shall be located over each the officer and driver's position. The lights shall also activate from the open-door switch located in each cab doorjamb.

### **LIGHTING CREW CAB INTERIOR**

Interior lighting shall be provided inside the crew cab for passenger safety. Two (2) ceiling mounted combination red/clear LED dome lights with a push button on/off switch in the light lens shall be provided. The lights shall also activate from the open-door switch located in each cab doorjamb.

### **HEAVY DUTY HEATER/DEFROSTER/AIR CONDITIONER**

There shall be sized to meet the demands of the truck in a single unit, heater/air conditioner mounted over the engine cover. The unit shall be mounted in center of the cab on the engine hood/enclosure. Unit shall have a shutoff valve at the right side of the frame, next to the engine. Airflow of the heater/air conditioner shall be a minimum 1200 CFM.

The defroster/heater shall be a minimum of 35,000 BTU and shall be a separate unit mounted over the windshield.

There shall be eight (8) louvers/diffusers to direct to windshield and door glass. Airflow of the defroster/heater shall be a minimum 350 CFM. The unit shall be painted to match the cab ceiling.

### **HEATER/DEFROSTER/AIR CONDITIONING CONTROLS**

The heater/defroster/air conditioning shall be located in the overhead console in the center of the apparatus cab within reach of the driver and officer. The controls shall be illuminated for easy locating in dark conditions. The controls shall be located in such a way that the driver will not be forced to turn away from the road to make climate control adjustments. Control of all heater/defroster/air conditioning functions for the entire apparatus cab shall be achieved through these controls.

### **DEFROSTER DIFFUSER**

A molded diffuser made of durable ABS plastic ductwork system shall be provided. It shall be form fitted and shall attach to the cab's overhead defroster unit to provide temperature controlled air to the windshields.

Air flow of up to 280 cfm is balanced and directed across the entire windshield for optimum defrosting capability in all types of weather.

### **TOOL MOUNTING PLATE**

There shall be a 3/16" smooth aluminum plate installed on top of the heat/ air conditioning unit for use in mounting of equipment. The plate shall measure approximately 25" wide x 19.5" long and shall be spaced up 1". The mounting plate shall feature beveled edges on the front and rear for a finished appearance. The plate shall be coated with the same finish as the heat/air conditioning unit and shall be secured with screws for easy replacement.



There shall also be two additional Tool Mounting plates located on either side of the Crew Seat-center forward facing seat. The plate shall cover the entire area on the back wall. Finish to match the previous mounting plate.

#### **DRIVER'S SEAT**

An H.O. Bostrom Sierra high back seat with air suspension shall be provided for the driver. The seat shall be equipped with a red 3-point shoulder harness with lap belt. The seat shall have fore/aft adjustment and shall be upholstered with heavy duty Durawear Plus material.

#### **OFFICER'S SEAT**

An H.O. Bostrom Tanker 450 ABTS SCBA seat with air suspension shall be provided for the officer. The seat back shall have a SCBA cavity and auto-pivot-and-return padded headrest. The seat shall be equipped with a red 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly. The seat shall be upholstered with heavy duty Durawear Plus material.

#### **CREW SEAT – DRIVER'S SIDE, REAR FACING**

One (1) H.O. Bostrom Tanker 450 ABTS SCBA fixed base seat shall be installed behind the driver. The seat back shall have a SCBA cavity and auto-pivot-and-return padded headrest. The seat shall be equipped with a red 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly. The seat shall be upholstered with heavy duty Durawear Plus material.

#### **CREW SEAT – OFFICER'S SIDE, REAR FACING**

One (1) H.O. Bostrom Tanker 450 ABTS SCBA fixed base seat shall be installed behind the officer. The seat back shall have a SCBA cavity and auto-pivot-and-return padded headrest. The seat shall be equipped with a red 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly. The seat shall be upholstered with heavy duty Durawear Plus material.

#### **CREW SEATING-DRIVERS SIDE FORWARD FACING**

One (1) H.O. Bostrom Tanker 400CT ABTS SCBA flip-up base seat shall be installed in the driver's side forward-facing outboard position. The seat back shall have a SCBA cavity and auto-pivot-and return padded headrest. The seat shall be equipped with a red 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly. The seat shall be upholstered with heavy duty Durawear Plus material.

#### **CREW SEATING-OFFICERS SIDE FORWARD FACING**

One (1) H.O. Bostrom Tanker 400CT ABTS SCBA flip-up base seat shall be installed in the officer's side forward-facing outboard position. The seat shall be equipped with a red 3-point

shoulder harness with lap belt and an automatic retractor built into the seat assembly. The seat shall be upholstered with heavy duty Durawear Plus material. No provisions for an SCBA are on this side.

### **MEDICAL STORAGE CABINET**

A cabinet constructed of aluminum shall be provided on the rear wall of passenger compartment. A roll up door on the forward section of cabinet shall provide access. Additionally a roll up compartment door will provide access to interior from the officer's side of compartment. Provisions for 12 volt DC and 110 volt AC power in compartment which are continuous when on shore power and 12 volt at all times. LED lighting shall be provided in compartment and shall operate with switch when doors are opened.

### **SEAT UPHOLSTERY COLOR**

The cab seat upholstery shall be gray in color.

### **SCBA BRACKETS**

Each SCBA seat in the cab shall feature an H.O. Bostrom Secure All self-contained breathing apparatus (SCBA) locking system. The seat back shall include a bracket which shall be capable of storing most U.S. and international SCBA brands and sizes while in transit or for storage. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters; adjustment points shall utilize similar hardware and adjustments shall be made with one tool. The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically. The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions. The locking system shall include a release handle integrated into the seat cushion for quick and easy release and to eliminate the need for straps or pull cords which might interfere with other SCBA equipment.

### **SEAT BELT WARNING SYSTEM**

An Akron / Weldon seat belt warning system shall be provided, and shall monitor each seating position. Each seat shall be supplied with a sensor that, in conjunction with the display module located on the dash, shall determine when the seat belt was fastened and if the seat is occupied. An icon shall represent that the seat is properly occupied. An audible and visual alarm shall be activated if the seat is occupied and/or the belt is not fastened in the proper sequence.

### **CREW SEAT COMPARTMENT**

A compartment shall be provided under the forward-facing crew seats on the back wall of the cab. The compartment shall be full through, with an access door on each side, accessible from the side of the crew cab doors.

### **ANTENNA MOUNTING**

The customer supplied radio antenna shall be installed in the cab roof with the coax cable run to the radio mounting area. The radio location shall be determined at the pre-construction meeting.

### **COMMUNICATION SYSTEM**

A five (5) position David-Clarke intercom system will be provided in the cab. The five positions include: driver, officer, and three crew seats. The driver and officer positions will be interfaced with radio. The system will be a wireless system.

#### **Items Provided:**

- One (1) Model 5100D Intercom
- Four (4) Model UH-51 Head sets

### **VOYAGER, 3 CAMERA SYSTEM**

Provided and mounted on the apparatus shall be One (1) HD Voyager® 7" Color Sealed, Weatherproof/Dustproof LCD Monitor (AOM713WP); One (1) Rugged Color Camera, 130° Viewing Angle, LED Low light Assist (VCCS130); One (1) Right Color Side Body Camera, 110° Viewing Angle w/ Housing (VCCSIDRCM); One (1) Left Color Side Body Camera, 110° Viewing Angle w/ Housing (VCCSIDLCM); One (1) 50' Camera Cable to LCD Monitor (CEC50); One (1) 15' Camera Cable to LCD Monitor (CEC15); One (1) 15' Camera Cable to LCD Monitor (CEC15); One (1) 6" Double Knuckle Monitor Mount (72706).

### **FIRE PUMP HALE QMAX-150**

Fire pump shall be midship mounted. The fire pump shall be of the double suction single stage centrifugal type, carefully designed in accordance with good modern practice.

The pump shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI.

The pump body shall be horizontally split, on a single plane, casing type with removable lower casing for easy removal of the entire impeller assembly including wear rings and bearings from beneath the pump without disturbing piping or the mounting of the pump in the chassis.

All moving parts in contact with water shall be of high quality bronze or stainless steel. Easily replaceable bronze labyrinth wear rings shall be provided. Discharge passage shall be designed

to accomplish uniform pressure readings as the actual pump pressure. The rated capacity of the fire pump shall be 1500 gallons per minute in accordance with NFPA# 1901.

The pump shaft shall be rigidly supported by three bearings for a minimum deflection. One high lead bronze sleeve bearing to be located immediately adjacent to the impeller (on side opposite the drive unit). The sleeve bearing shall be lubricated by a force fed, automatic lubrication system, pressure balanced to exclude foreign material. The remaining bearings shall be heavy duty type, deep groove ball bearings in the gear box and they shall be splash lubricated.

### **PUMP TRANSFER CASE – G SERIES**

The drive unit shall be designed of ample capacity for lubricating reserve and to maintain the proper operating temperature. Pump drive unit shall be of sufficient size to withstand up to 16,000 lbs. ft. torque of the engine in both road and pump operating conditions.

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

The engagement of the pump transmission shall be of such design so as to permit transfer of power from road to pump operation only after vehicle is completely stopped. The pump shift shall be air actuated from the cab and have both a green "Pump Engaged" light, and a green "O.K.-To-Pump" light. A third green light shall be provided on the pump operator's panel for "Throttle Ready".

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

### **MECHANICAL PUMP SEAL**

The pump seal shall be a maintenance free mechanical pump type seal.

### **PUMP TEST & CERTIFICATION**

The pump shall be tested and certified by Mistras Group, Inc., a third party independent testing agency, in accordance with NFPA 1901. A 3-hour pumping test from draft shall be conducted consisting of 2 hours of continuous pumping at 100% of rated capacity at 150PSI net pump pressure, followed by ½ hour of continuous pumping at 70% of rated capacity at 200PSI net pump pressure, and ½ hour of continuous pumping at 50% of rated capacity at 250PSI net pump pressure). The testing shall also include a pressure control system test, priming system test, vacuum test, a gauge/flowmeter test, and a pumping engine overload test. If the apparatus is equipped with a water tank, the water tank-to-pump test shall also be included.

### **AUXILIARY COOLER**

An auxiliary cooler shall be furnished to provide additional cooling to the engine under extreme pumping conditions.

Water from the pump is to be piped to the coils of the heat exchanger allowing the engine fluid to be cooled as required.

### **PUMP CONNECTIONS**

All suction and discharge lines (except pump manifolds) 1" and larger shall be heavy-duty stainless-steel pipe. Where vibration or chassis flexing may damage or loosen piping or where a coupling is necessary for servicing, a flexible connection shall be furnished. All lines shall be drained by a master drain valve or a separate drain provided at the connection. All individual drain lines for discharges shall be extended with a 90-degree fitting in order to drain below the chassis frame. All water carrying gauge lines shall utilize nylon tubing.

### **TANK TO PUMP**

The booster tank shall be connected to the intake side of the pump with a check valve. The 3" tank to pump line shall run from a bottom sump into the 3" valve. To prevent damage due to chassis flexing or vibration, a short 3" flexible rubber hose coupling shall be used to connect the tank to the intake valve.

### **VALVE**

The valve shall be an Akron Heavy-Duty swing out 8000 series brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall a 10- year warranty covered by Akron Brass.

### **VALVE ACTUATOR**

The valve shall be controlled by an Innovative Controls push/pull handle located at the operator's panel.

### **TANK FILL**

A 1.5" tank fill shall be provided, using a quarter turn full flow ball valve controlled from the pump operator's panel.

## **VALVE**

The valve shall be an Akron Heavy-Duty swing out 8000 series brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self- locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall a 10- year warranty covered by Akron Brass.

## **VALVE ACTUATOR**

The valve shall be controlled by an Innovative Controls push/pull handle located at the operator's panel.

## **PRESSURE GOVERNOR**

Apparatus shall be equipped with a Class1 Pressure Governor that is connected to the Electronic Control Module (ECM) mounted on the engine. The Governor will operate as a pressure sensor (regulating) governor (PSG) utilizing the engine's data for optimal resolution and response.

Programmable presets for RPM and Pressure settings shall be easily configurable using the menu structure. Engine RPM, system voltage, engine oil pressure and engine temperature with audible alarm output for all shall be provided.

## **INTAKE RELIEF**

There shall be an Elkhart Model 40 intake relief valve installed on the intake side of the pump. The surplus water shall be discharged away from the pump operator and terminate with Male NST hose thread. System is field adjustable.

## **LEFT SIDE 6" PUMP INLET**

A 6" diameter suction port with 6" NST male threads shall be provided, on the left side of vehicle. The inlet shall extend through the side pump panels and come complete with removable strainer and long handle chrome-plated cap.

## **LEFT SIDE AKRON REVOLUTION INTAKE VALVE**

There shall be one Akron Revolution Model #7982 intake valve provided with the apparatus. The inlet side shall be 6" NST female and the outlet side shall be 5" stortz.

### **2.5" LEFT SIDE INLET**

A 2.5" gated inlet valve shall be provided on the left side pump panel. The valve shall be supplied with chrome plate female swivel, plug, chain, and removable strainer. The valve shall attach directly to the suction side of the pump with the valve body behind the pump panel.

#### **VALVE**

The valve shall be an Akron Heavy-Duty swing out 8000 series brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self- locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall a 10- year warranty covered by Akron Brass.

#### **VALVE ACTUATOR**

The valve shall be controlled by a swing type handle located at the operator's panel. The handle shall have a full 90-degree movement.

#### **THREAD TERMINATION**

The above discharge shall terminate with National Standard Threads.

### **RIGHT SIDE 6" PUMP INLET**

A 6" diameter suction port with 6" NST male threads shall be provided, on the right side of vehicle. The inlet shall extend through the side pump panels and come complete with removable strainer and long handle chrome-plated cap.

#### **RIGHT SIDE AKRON REVOLUTION INTAKE VALVES**

There shall be one Akron Revolution model 7982 intake valve provided with the apparatus. The inlet side shall be 6" NST female and the outlet side shall be 5" stortz.

### **2.5" RIGHT SIDE INLET**

A 2.5" gated inlet valve shall be provided on the right-side pump panel. The valve shall be supplied with chrome plate female swivel, plug, chain, and removable strainer. The valve shall attach directly to the suction side of the pump with the valve body behind the pump panel.

#### **VALVE**

The valve shall be an Akron Heavy-Duty swing out 8000 series brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self- locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication

of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall a 10- year warranty covered by Akron Brass.

### **VALVE ACTUATOR**

The valve shall be controlled by a swing type handle located at the operator's panel. The handle shall have a full 90 degree movement.

### **THREAD TERMINATION**

The above discharge shall terminate with National Standard Threads.

### **DISCHARGE #1 - LEFT**

The discharge in position #1 on the left side of the apparatus shall include the following features.

A 2.5" discharge shall be provided on the left side of the apparatus.

### **VALVE**

The valve shall be an Akron Heavy-Duty swing out 8000 series brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self- locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall a 10- year warranty covered by Akron Brass.

### **VALVE ACTUATOR**

The valve shall be controlled by a swing type handle located at the operator's panel. The handle shall have a full 90-degree movement.

### **2.5" PRESSURE GAUGE**

An Innovative Controls liquid filled individual line pressure gauge shall be provided. The gauge shall be 2.5" in diameter with white faces and black lettering. The gauge shall have a pressure range of 0-400 psi.

### **THREAD TERMINATION**

The above discharge shall terminate with National Standard Threads.

### **DISCHARGE #2 - LEFT**

The discharge in position #2 on the left side of the apparatus shall include the following features.



A 2.5" discharge shall be provided on the left side of the apparatus.

**VALVE**

The valve shall be an Akron Heavy-Duty swing out 8000 series brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self- locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall a 10- year warranty covered by Akron Brass.

**VALVE ACTUATOR**

The valve shall be controlled by a swing type handle located at the operator’s panel. The handle shall have a full 90-degree movement.

**2.5" PRESSURE GAUGE**

An Innovative Controls liquid filled individual line pressure gauge shall be provided. The gauge shall be 2.5" in diameter with white faces and black lettering. The gauge shall have a pressure range of 0-400 psi.

**THREAD TERMINATION**

The above discharge shall terminate with National Standard Threads.

**DISCHARGE #3 - RIGHT**

The discharge in position #3 on the right side of the apparatus shall include the following features.

A 3" discharge shall be provided on the right side of the apparatus.

**VALVE, SLOW CLOSE**

The valve shall be an Akron slow close type Heavy-Duty swing out 8000 series brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall a 10-year warranty covered by Akron Brass.

**VALVE ACTUATOR**

The valve shall be controlled by a swing type handle located at the operator’s panel. The handle shall have a full 90-degree movement.

### **2.5" PRESSURE GAUGE**

An Innovative Controls liquid filled individual line pressure gauge shall be provided. The gauge shall be 2.5" in diameter with white faces and black lettering. The gauge shall have a pressure range of 0-400 psi.

### **THREAD TERMINATION**

The above discharge shall terminate with National Standard Threads.

### **DISCHARGE #4 - RIGHT**

The discharge in position #4 on the right side of the apparatus shall include the following features.

A 2.5" discharge shall be provided on the right side of the apparatus.

### **VALVE**

The valve shall be an Akron Heavy-Duty swing out 8000 series brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall have a 10-year warranty covered by Akron Brass.

### **VALVE ACTUATOR**

The valve shall be controlled by a swing type handle located at the operator's panel. The handle shall have a full 90-degree movement.

### **2.5" PRESSURE GAUGE**

An Innovative Controls liquid filled individual line pressure gauge shall be provided. The gauge shall be 2.5" in diameter with white faces and black lettering. The gauge shall have a pressure range of 0-400 psi.

### **THREAD TERMINATION**

The above discharge shall terminate with National Standard Threads.

### **FRONT BUMPER DISCHARGE**

A 2.5" discharge with 2" plumbing shall be provided at the front bumper. The valve shall be remote controlled at the pump panel.

## **VALVE**

The valve shall be an Akron Heavy-Duty swing out 8000 series brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self- locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall a 10- year warranty covered by Akron Brass.

## **VALVE ACTUATOR**

The valve shall be controlled by an Innovative Controls push/pull handle located at the operator's panel.

## **2.5" PRESSURE GAUGE**

An Innovative Controls liquid filled individual line pressure gauge shall be provided. The gauge shall be 2.5" in diameter with white faces and black lettering. The gauge shall have a pressure range of 0-400 psi.

## **THREAD TERMINATION**

The above discharge shall terminate with National Standard Threads.

## **CROSSLAYS**

**Three (3) crosslay hose beds shall be supplied as follows:**

- One crosslay with 2.5" piping, 2.5" valve, and 2.5" swivel with the capacity of 200' of 2.5" hose.
- Two crosslays with 2" piping, 2" valve, and 1.5" swivel with the capacity of 200' of 1.75" hose each.
- The valves shall be the "drop-out" style and controlled from the pump panel.

## **VALVE**

The valve shall be an Akron Heavy-Duty swing out 8000 series brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self- locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall a 10- year warranty covered by Akron Brass.

## **VALVE ACTUATOR**

The valve shall be controlled by an Innovative Controls push/pull handle located at the operator's panel.

## **2.5" PRESSURE GAUGE**

An Innovative Controls liquid filled individual line pressure gauge shall be provided. The gauge shall be 2.5" in diameter with white faces and black lettering. The gauge shall have a pressure range of 0-400 psi.

## **THREAD TERMINATION**

The above discharge shall terminate with National Standard Threads.

## **CROSSLAY COVER**

A vinyl crosslay cover shall be provided to enclose the top and sides of the crosslays, capable of being secured at the top and sides.

## **MASTER PUMP DRAIN**

A multiport master drain valve shall be provided and plumbed to multiple locations on the main pump body. The valve assembly shall be clearly marked as the Master Drain.

## **DRAIN VALVES LIFT UP STYLE**

Vertical lift up style, quarter turn style drain valves shall be provided for each suction inlet, or discharge outlet as specified. Each drain shall be clearly marked and color coded to match the corresponding suction or discharge.

## **WATERWAY VALVE AND ACTUATOR**

The waterway valve shall be an Akron 3" electric valve. The valve shall be controlled by an Akron Navigator 9325 electric actuator located at the operator's panel. The actuator shall be connected to both a flow sensor and a pressure sensor. The actuator shall display pressure, flow, and valve position on a full color LDC display.

## **PUMP AND GAUGE PANELS**

Pump panels on both sides shall be easily removable. The gauge and control panels shall be two separate panels for ease of maintenance. There shall be one (1) removable access door as large as possible on the right-side pump panel.

This door shall have 1/4 turn latching mechanisms for easy removal.

The pump controls and gauges shall be located at the left side of the apparatus and properly marked. The control panel shall be laid out in a user-friendly manner.

All valve controls shall have the corresponding discharge gauge located immediately adjacent to control handle to allow operator to view the discharge pressure without searching the panel.

### **PANEL FINISH**

The panels shall be constructed of steel and have a painted finish such as Lynex.

### **ESCUTCHEON PLATES**

The pump panel shall be equipped with color-coded removable escutcheon plates around the suction and discharge valves.

### **COLOR CODING**

Each discharge valve control, outlet, and corresponding line gauge shall be color-coded. The color-coding shall be (as applicable): Colors to be set at Pre-bid

### **PUMP PANEL LIGHTS, LED**

The driver's side pump panel controls and gauges shall be illuminated by a minimum of three (3) LED lights strips.

Specific kind to be discussed at Pre-Bid.

### **PUMP PANEL LIGHT**

A light shall be provided for the opposite side pump panel.

### **PUMP PANEL ILLUMINATION**

One pump panel illumination light shall be activated when the pump is engaged.

### **PUMP ENGAGED LIGHT**

A green light shall be provided on the pump operator's panel that shall illuminate when pump is engaged.

### **PUMP PANEL GAUGES AND CONTROLS**

The following gauges and controls shall be provided at the pump panel:

- Two (2) certified laboratory test gauge outlets.
- Pump primer control.
- Master drain control and additional drains as needed.
- Tank-fill and pump cooler valve controls.
- Tank to pump valve control.
- Pump capacity rating plate.
- All discharge controls.
- Two (2) master pump gauges.

- Gauges on all 1-1/2" and larger discharge lines.

### **PRIMING SYSTEM**

The priming pump shall be a Trident Emergency Products compressed air powered, high efficiency, multi-stage, venturi based Air Prime System. All wetted metallic parts of the priming system are to be of brass and stainless steel construction. A single panel mounted control will activate the priming pump and open the priming valve to the pump.

The priming system shall have a five-year warranty.

### **(1) PRIMER BUTTON - MAIN SUCTION**

A single panel mounted control will activate the priming pump and open the priming valve to the pump.

### **PUMP OVER HEAT INDICATOR**

A MC pump overheat indicator with buzzer alarm shall be provided.

### **AIR HORN BUTTON**

A push button switch shall be provided on pump operator's panel to activate the air horns.

### **4" MASTER GAUGES**

Innovative Controls liquid filled pump pressure and vacuum gauges shall be provided. The gauges shall be 4" in diameter with white faces and black lettering. The gauges shall have a pressure range of 30"-0-400 psi.

### **WATER TANK LEVEL GAUGE**

A Class1 Intelli-Tank water level gauge shall be provided. The gauge shall feature wide-angle viewing and four (4) ultra-bright LED's for high visibility even in direct sunlight. Water level sensing shall be through a pressure transducer, and capable of indicating nine (9) accurate levels. The gauge shall be located on the pump operator's panel. LED tank level lights on both sides of cab.

### **WATER TANK**

The tank shall be constructed of PT3™ polypropylene material by United Plastic Fabricating (UPF) and 500 gallons maximum. This material shall be a non-corrosive stress relieved thermoplastic and UV stabilized for maximum protection. Tank shell thickness may vary depending on the application and may range from ½ to 1" as required. Internal baffles are generally 3/8" in thickness.

The tank shall be of a specific configuration and shall be designed to be completely independent of the body and compartments. Joints and seams shall be fused using nitrogen gas

as required and tested for maximum strength and integrity. The tank construction shall include PolyProSeal™ technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The top of the booster tank shall be fitted with removable lifting assembly designed to facilitate tank removal. The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" PT3™ polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions shall interlock with one another and completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength as part of the tank's unique Full Floor Design™. The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" PT3™ polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall have a 1/4" thick removable polypropylene screen and a PT3™ polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid. Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of 4" that is designed to run through the tank, and shall be piped to discharge water behind the rear wheels as required in NFPA 1901 so as to not interfere with rear tire traction. The tank cover shall be constructed of 1/2" thick PT3™ polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall accommodate the necessary lifting hardware.

There shall be one (1) sump constructed of a minimum of 1/2" PT3™ 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 will incorporate a dip tube from the front of the tank to the sump location. The sump shall have a minimum 3" N.P.T. threaded outlet on the bottom for a drain plug per NFPA. This shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 3" above the inside floor. There shall be two (2) standard tank outlets: one for the tank-to-pump suction line, which shall be sized to provide adequate water flow to the pump; and, one for tank fill line, which shall be sized according to the NFPA minimum size chart for booster tanks. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates of up to 1000 G.P.M. All auxiliary outlets and inlets must meet all NFPA guidelines in effect at the time of manufacture. The UPF Poly-Tank® III shall rest on the body cross members in conjunction with such additional cross

members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40 inches, cross member spacing must be decreased to allow for not more than 400 square inches of unsupported area. The tank shall be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of 1/4" x 1". The rubber must be installed so it will not become dislodged during normal operation of the vehicle. Additionally, the tank must be supported around the entire bottom outside perimeter and captured both in the front and rear as well as side to side to prevent tank from shifting during vehicle operation. The tank shall be completely removable without disturbing or dismantling the apparatus structure. The tank shall be tested and certified as to capacity on a calibrated and certified tilting scale. Each tank shall be weighed empty and full to provide precise fluid capacity. The tank shall be delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight. Engineering estimates for capacity calculations shall not be permitted for capacity certification. A center of gravity and weight calculation for both empty and full conditions shall be required with each tank.

The tank shall have a limited Lifetime warranty that provides warranty service for the life of the fire apparatus in which the tank is installed. Warranties are transferable if the apparatus ownership changes by requesting the transfer from UPF. In applications where the tank will be subject to severe conditions, the tank may have a warranty unique to the application that is clearly defined for each such application.

### **WATER TANK**

The water tank shall have a capacity of 500 U.S. gallons.

### **APPARATUS BODY**

The apparatus body shall be constructed of #4 brushed finish **#304 stainless steel** and shall include brushed stainless-steel compartment interiors. Other scuff prone areas such as the area surrounding compartment openings, the rear inside beavertails, rear compartment door area and front and rear of the side compartments shall also be a brushed scuff resistant stainless steel finish. The apparatus body, including the running boards shall be supported by structural channel and angle. The rear design shall be strong enough to support the complete body. Each compartment shall be properly vented with louvers. Each compartment shall have drain holes for the release of moisture. Each compartment shall have sweep- out flooring with no obstructions at the floor bottom.

### **REAR STEP COMPARTMENTATION**

There shall be one compartment at the rear step, transverse to the sides with clear unobstructed opening with roll-up door.



### **COMPARTMENTATION LEFT SIDE**

The configuration of compartmentation of left side may vary as to ladder provided. All doors will be a roll-up type door if possible.

### **COMPARTMENTATION RIGHT SIDE**

The configuration of compartmentation of right side may vary as to ladder provided. All doors will be a roll-up type door if possible.

### **BODY SUBFRAME**

A stainless steel subframe/undercarriage shall be provided for the body compartments.

### **COMPARTMENT INTERIOR - L1**

The L1 compartment on the left side of the apparatus shall include the following features:

There shall be a roll out tray in the bottom of the Compartment. The tray shall have a distributed load capacity of 600lb.

### **COMPARTMENT INTERIOR - L2**

Only Turtle Tile in this Compartment.

### **COMPARTMENT INTERIOR - L3**

The L3 compartment on the left side of the apparatus shall include the following features:

Two (2) vertical tool boards the entire height of the compartment.

### **COMPARTMENT INTERIOR - R1**

The R1 compartment on the right side of the apparatus shall include the following features:

There shall be a roll out tray in the bottom of the Compartment. The tray shall have a distributed load capacity of 600lb.

### **COMPARTMENT INTERIOR - R2**

The R2 compartment on the right side of the apparatus shall include the following features:

There shall only be Turtle Tile in this compartment.

### **COMPARTMENT INTERIOR - R3**

The R3 compartment on the right side of the apparatus shall include the following features:

There shall be two (2) adjustable shelves provided and installed in the compartment.

### **TURTLE TILE**

All compartments will have black turtle tile with appropriate yellow edging.

### **UNISTRUT**

Each compartment shall come equipped with 1.625" x .875" x .125" aluminum Unistrut channel. The Unistrut shall be securely fastened to the interior walls of the compartment.

### **ROLL-UP COMPARTMENT DOORS**

The apparatus body shall be equipped with Hansen American doors. The door slats shall be double wall box frame, manufactured from anodized aluminum. The doors shall have the following features:

- Manufactured wholly in the United States.
- Concave individual slat design to prevent loose equipment from hindering door operation.
- Co-Extruded stretch resistant inner seal between slats to prevent metal-to-metal contact and inhibit moisture and dust penetration.
- Interlocking swaged/dimpled end shoes shall be utilized to provide a tight-fitting assembly and allow for easy removal in the event of damage.
- Effective counter balancing for ease of lifting and lowering the doors.
- One-piece side rail and track to provide an unobstructed slide area and reduce the risk of binding.
- Non-abrasive replaceable water and dust barrier to keep compartment equipment clean and dry.
- A magnetic type switch integral to the door shall be supplied for door ajar indication and compartment light activation.
- A full width positive latch bar shall be operable with one hand, even with heavy gloves.
- A door open indicator light shall be provided in the cab. **NON-PAINTED ROLL-UP DOORS**

Non-painted doors, aluminum finish only.

### **ROLL UP DOOR DRIP PAN/SPLASHGUARD**

Each roller shutter door shall be equipped with a drip pan with built in splashguard. The drip pan shall attach to the pennant plate with spring pins to allow for easy removal and cleaning. The construction of the pan shall be a corrosion resistant extruded and injection molded high impact styrene.

### **COMPARTMENT LIGHTING**

Each compartment shall be equipped with two (2) LED light strips which shall provide a consistent pattern to illuminate to entire compartment.

## **HOSE BED**

The rear hose bed shall be divided into two separate sections. Each hose bed section shall be completely wide open to allow for quick and easy loading and unloading of hose. Hose bed flooring shall be slatted extruded aluminum.

## **HOSE BED COVER**

There shall be a red nylon/vinyl hose bed cover for the main hose bed. The cover shall be capable of being securely fastened at the front, sides and rear.

## **BODY HANDRAILS**

Handrails shall be constructed of type 304 stainless steel 1.25-inch diameter tubing with bright finish and knurled gripping surface. Mounting flanges shall be constructed from 7 gauge, .180 thick, stainless sheet. Each grab rail shall have 90 degree returns to flanges. The ends of grab rail shall pass through the flanges and be welded to form one structural unit. The handrails, shall be mounted using 1.25" SS Hex bolts, with a barrier rubber gasket at each flange.

Sufficient space shall allow for a gloved hand to firmly grip the rail.

The rails shall be located in the following areas:

(Note: These are in addition to those previously mentioned in the cab section):

There shall be one (1) handrail on each side of the access steps to the ladder. These handrails are covered with ribbed rubber to prevent hand slipping when climbing the steps.

## **STEPS**

There shall be fold-down steps on each side of the front face of side compartments as required by NFPA.

There shall be fold-down steps at each side of the rear area if required by NFPA.

There shall be two (2) pull-out steps, approximately 25-3/4" wide x 11-3/4" deep, provided on the right side of the apparatus for ease of accessing side stacked ground ladders. These steps shall be located one ahead of the rear axle and one behind the rear axle. If required on specific ladder truck.

## **RUB RAILS**

The body shall be equipped with heavy extruded aluminum rub rails at the sides. Rub rails shall be spaced away from the body by 1/2" polymer spacers. The rub rails shall be polished to a bright finish and be fitted with custom cast end caps.

## **ALUMINUM TREADPLATE**

All load bearing aluminum treadplate running boards shall be .155 thick bright annealed with a serrated embossed finish. Running boards and rear step edges shall be flanged down for added strength. Running boards shall also be flanged up to form kick plates. All non-load bearing aluminum shall be .125" thick bright annealed finish. In areas where aluminum treadplate shall function as a load-bearing surface, there shall be a heavy steel sub-structure. This structure shall consist of 3" channel and 1-1/2" angle welded support. This shall assure that there shall be no flexing or cracking of running boards. The aluminum shall be insulated from the steel by closed cell foam body barrier material.

Treadplate locations:

1. The step at the cab entrance.
2. The jump seat steps.
3. The running boards.
4. The rear step.
5. The top of the compartments.

## **SCBA CYLINDER COMPARTMENTS**

There shall be four (4) at a minimum spare breathing air cylinder compartments recessed in the rear fender wells, two (2) left and two (2) right. The compartments shall have brushed stainless doors equipped with a weather resistant flush fitting thumb latch. The interior of the door shall incorporate a rubber seal to keep the compartment free of road debris and moisture. The interior compartment shall be constructed of a high-density polyethylene plastic.

## **GROUND LADDERS SHALL BE DUO SAFETY OR ALCOLITE**

The apparatus shall be equipped with heavy duty, box type "I" beam rail, ground ladders. The ladders shall meet the requirements of NFPA 1931 to ensure proper design and that sufficient strength is available for the service intended.

The ground ladders shall be constructed of aluminum with non-welded, field replaceable rung to rail connections to simplify field repairs and removable plated steel butt spurs for added strength. A full 1/2", non-rotting, poly rope shall be provided for easy ladder operation.

**The apparatus shall be capable of carrying minimum of 85 ft. ground ladders:**

- One (1) 10 ft. collapsible ladder, (mounted in fly section)
- One (1) 16 ft. (double ended) roof ladder with roof hooks
- One (1) 24 ft. 2-section extension ladder
- One (1) 35 ft. 3-section extension ladder

- The ladders shall have lifetime Warranty against manufacturing defects.

### **LADDER MOUNTING**

The ladders shall either be mounted on brackets on the side of the body and held in place by polished aluminum quick release spring locks or have provisions for internal storage with access from the rear of the apparatus.

### **LICENSE PLATE BRACKET**

A Cast Products LP0013 cast aluminum license plate bracket with LED light shall be provided at the rear of the apparatus.

### **MASTER ELECTRICAL PANEL**

The main breaker panel shall be wired through the master disconnect solenoid and controlled with a three- position ignition rocker switch. Circuit breakers and flashers shall be located at officer's right-side lower interior firewall with removable cover and schematic provided with notebook holder on outside cover.

A deluxe breaker panel with up to 22 ground switched relays with circuit breaker protection shall be provided.

An integrated electrical sub-panel shall be provided and interfaced to the body and chassis through an engineered wire harness system.

Twelve (12) 20-ampere and one (1) 70-ampere relay for cab lightbar and assemblies shall be provided. If the option for a mechanical siren has been selected two (2) additional relays shall be provided.

Additional four relay boards with circuit breaker protection for additional loads. Maximum two boards (8 relays) per breaker panel. All relay boards set up to trip with input from switch of positive-negative or load manager by moving connector on board (no tools needed to do this).

All relay boards shall be equipped with a power-on indicator light (red), input indicator light (green) and power output indicator light (red).

Up to 23 additional automatic reset circuit breakers for non-switched loads that are remotely switched (ie: heater fans, hood lights, etc.).

All relays and circuit breakers on the relay boards shall be pull-out/push-in replaceable.

All circuit breakers on the relay boards shall be 20 ampere automatic reset which can be doubled or tripled for 40 or 60-ampere capacity.

The system shall utilize Deutch DRC weather resistant connectors at the breaker panel, toe board and main dash connections.

All internal wire end terminals, including locking connectors, shall be mechanically affixed to the wire ends by matching terminal crimping presses to assure the highest quality terminations.

All internal splices shall be ultrasonically welded connections and all internal wiring shall be high temperature GXL type wire that is protected by wiring duct wherever possible.

All switches shall be ground controlled; no power going through any rocker switch.

Any switch controlling a relay in the breaker panel shall be capable of being set to function only when the parking brake is set. All relays shall be tagged with the function that the relay is controlling.

### **BODY ELECTRIC SYSTEM**

All body electrical wiring in the chassis will be XLP cross link-insulated type. Wiring is to be color-coded and include function codes every three (3) inches. Wiring harnesses will be routed in protective, heat resistant loom, securely and neatly installed. Two power distribution centers will be provided in central locations for greater accessibility. The power distribution centers contain automatic thermal self-resetting breakers, power control relays, flashers, diode modules, daytime driving light module, and engine and transmission data links. All breakers and relays are utilized in circuits which amp loads are substantially lower than the respective component rating thus ensuring long component life. Power distribution centers will be composed of a system of interlocking plastic modules for ease in custom construction. The power distribution centers are function oriented. The first is to control major truck function and the second controls overhead switching and interior operations. Each module is single function coded and labeled to aid in troubleshooting. The centers also have accessory breakers and relays for future installations. All harnesses and power distribution centers will be electrically tested prior to installation to ensure the highest system reliability.

All external harness interfaces will be of a triple seal type connection to ensure a proper connection. The cab/chassis and the chassis/body connection points will be mounted in accessible locations. Complete chassis wiring schematics will be supplied with the apparatus.

The wiring harness contained on the chassis shall be designed to utilize wires of stranded copper or copper alloy of a gauge rated to carry 125% of maximum current for which the circuit is protected without exceeding 10% voltage drop across the circuit. The wiring shall be uniquely identified by color code or circuit function code, labeled at a minimum of every three (3) inches. The identification of the wiring shall be referenced on a wiring diagram. All wires conform to SAEJ1127 (Battery Cable), SAEJ1128 (Low Tension Primary Cable), SAEJ1560 (Low Tension Thin Wall Primary Cable).

All harnesses shall be covered with moisture resistant loom with a minimum rating of 300 Degrees Fahrenheit and a flammability rating of VW-1 as defined in UL62. The covering of jacketed cable has a minimum rating of 289 degree Fahrenheit.

All harnesses are securely installed in areas protected against heat, liquid contaminants and damage. The harness connections and terminations use a method that provides a positive mechanical and electrical connection and are in accordance to the device manufacturer's instructions. No connections within the harness utilize wire nut, insulation displacement, or insulation piercing.

All circuits conform to SAE1292. All circuits are provided with low voltage over current protective devices. These devices are readily accessible and protected against heat in excess of component rating, mechanical damage, and water spray. Star washers are not used for ground connections.

**\*\*All chassis wiring shall be wired at/or above the lower frame rail horizontal portion.\*\***

**BACK-UP ALARM**

An Ecco model SA917 automatic self-adjusting electronic back-up alarm producing 87-112 db shall be installed at the rear between the frame rails. It shall operate whenever the transmission's reverse gear is selected.

**TAIL/STOP/TURN/BACKUP LIGHTS**

The taillights are to be Whelen 600 LED style. The brake/tail lights to be red and exceed SAE requirements. The turn signal shall be populated in an arrow pattern, amber in color. The backup lights shall also be LED. One opening shall be open to accept a 600-series warning light.

**LED ICC/MARKER LIGHTS**

Please see brow mounted LED scene light.

**STEP LIGHTS**

Step lights shall be provided, one each side on the front compartment face at pump panels. The lights shall be Whelen 2G Series LED lights.

Each step at the rear of the apparatus shall have a light to illuminate each step and the tailboard.

**GROUND LIGHTING**

The apparatus shall be equipped with lighting capable of illumination to meet NFPA requirements. Lighting shall be provided at areas under the driver and crew riding area exits and shall be automatically activated when the exit doors are opened. The ground lights shall be Truck-lite® LED model #44042C. Lighting required in other areas such as work areas, steps and walkways shall be activated when the parking brake is applied, provided the ICC lights are on.

## **WORK LIGHTS**

There shall be two LED 6" chrome plated sealed beam flood lights provided. The lights shall be securely mounted at the upper rear of the apparatus body. Each light shall be supplied with individual switches.

## **OPTICAL WARNING SYSTEM**

The optical warning system shall be capable of two separate signaling modes during emergency operations. One mode shall signal to drivers and pedestrians that the apparatus is responding to an emergency and is calling for the right-of-way and the other mode shall signal that the apparatus is stopped and is blocking the right-of-way. Switching shall be provided that senses the position of the parking brake.

A master optical warning device switch shall be provided to energize all of the optical warning devices provided.

All lights shall operate at not less than the minimum flash rate per minute as specified by NFPA.

## **UPPER LEVEL WARNING DEVICES**

The upper level is divided into zones A, B, C and D and the approved lighting package to be provided shall be as follows:

Zone A (front) shall have one (1) Whelen Model FN72QLED 12 LED Freedom Series 72" Lightbar.

Zone B (right side) shall be covered by the module from the lightbar and the right rear stanchion beacon.

Zone C (rear) shall have two (2) Whelen Model MCFLED2R Micro Edge Freedom LED light bars mounted on the rear stanchions. Drivers side to be amber in color.

Zone D (left side) shall be covered by the module from the lightbar and the left rear stanchion beacon.

## **LOWER LEVEL WARNING DEVICES**

The lower level is divided into zones A, B, C and D and the approved lighting package to be provided shall be as follows:

Zone A (front) shall have a stainless-steel warning light housing each side with Two (2) Whelen 600 Super LED red lights mounted in the front of each housing. The inboard pair of lights is in addition to the minimum NFPA warning system and shall be wired through a load-shedding device.

Zone B (right side) shall have four (4) Whelen 600 Series Super LED red lights mounted one on the side of the headlight housing, one at the middle of the apparatus, one on the body side at rear of apparatus, and one on the side of the aerial device.



Zone C (rear) shall have two (2) Whelen 600 Series Super LED, red lights mounted one each side of the rear of the apparatus. LED directional traffic arrow bar protected in aluminum housing.

Zone D (left side) shall have four (4) Whelen 600 Series Super LED, red lights mounted one on the end of the

headlight housing, one at the middle of the apparatus, one on the body side at rear of apparatus and one on the side of the aerial device.

### **LED WARNING LIGHTING**

There shall be one pair of Whelen Model 600 Series Super LED red lights mounted on the apparatus. The placement of the lights is to be determined by the fire department.

### **BROW MOUNTED LED SCENE LIGHT**

One (1) Firetech LED Brow Light Part# FT-B-72-MI shall be provided. The light shall operate on 12 volts DC, draw 21 amps and generate 21,000 lumens of light. The cab clearance and marker lights shall be incorporated into the light.

### **SURFACE MOUNTED LED SCENE LIGHT**

Two (2) Firetech Guardian Elite (FT-GESM) surface mounted LED scene lights shall be provided. The lamp head shall operate at 12 volts DC, draw 11 amps, and generate 12,000 lumens of light. The light shall be mounted on each side of the CAB at a specified location and shall be controlled from a switch in the cab.

### **GENERATOR**

The apparatus shall be equipped with a complete electrical power generation system.

A **Harrison hydraulic 10.0 KW generator model MAS – 16R/5A** shall be provided and installed. The generator and wiring shall conform to present National Electric Codes as outlined in the National Fire Protection Association Standards.

The output of the generator shall be controlled by an internal hydraulic system. An electrical instrument gauge panel shall be provided for the operator to monitor and control all electrical operations and output. The generator shall be powered by a transmission power take off unit, through a hydraulic pump and motor. The generator shall be operable anytime that the apparatus engine is running and meeting the minimum range of 900 RPM's.

- Height 14"
- Width 24"
- Depth 18"
- Weight 273
- Max kW 10.0
- AMPS@120V 80

- AMPS@240V 40
- HP Required 20
- Torque Required 82.9
- Maximum Pressure 2800 psi

### **BREAKER BOX**

A circuit breaker box shall be provided with eight (8) spaces for breakers which shall be provided as needed. All wiring shall be installed in liquid tight conduit.

### **BREAKER PANEL**

The breaker panel shall be located in the L1 Compartment and shall meet all requirements set forth by the National Electrical Code and NFPA guidelines.

### **CORD REEL**

There shall be a Hannay Model ECR1616-17-18 electric rewind cable reel furnished and mounted in a compartment. The reel shall come complete with 200 feet of 10/3 Seoprene Water-resistant (SOW) yellow jacketed cable. A Hannay Type "C" roller assembly and HS-3 cable stop ball shall be provided.

### **RECEPTACLES**

An additional receptacle will be provided by the rear wheel on drivers side.

### **FOUR WAY RECEPTACLE**

An Akron (GFE) four-way receptacle box with light shall be provided and hard wired to the end of the cable. The box shall be securely mounted in the immediate area of the cord reel. The mounting shall be a fabricated aluminum bracket equipped with a Velcro strap to secure the box. Outlets shall be L5-20 twist lock type.

### **FIXED MOUNT LED SCENE LIGHT**

Two (2) Fire Research Spectra SPA570-J20-ON fixed top mount LED scene light shall be provided. The lamp head shall operate at 240 volts DC, draw 1 amp, and generate 20,000 lumens of light. The pedestal shall allow the lamp head to rotate 450 degrees and have a self-adjusting friction brake to prevent arbitrary rotation. The light shall be mounted on each side of the body and shall be controlled from a switch on the lamp head.

### **TELESCOPIC LED SCENE LIGHT**

Two (2) Fire Research Spectra SPA530-J20-SR-ON telescopic LED scene light shall be provided. The lamp head shall operate at 240 volts AC, draw 1 amp, and generate 20,000 lumens of light. The light shall be installed on each side of the back of the cab with Steady Rest bottom bracket and shall be controlled from a switch located on the lamp head.

## **CLIMBING LADDER**

The aerial device and apparatus shall meet the requirements of NFPA Sections 19.2 through 19.6 and Sections 19.17 through 19.25 of NFPA 1901 Standards for Automotive Fire Apparatus.

An NFPA compliant climbing ladder with high handrails shall be provided for a continuous escape way and accessibility. Each section of the ladder shall be attached to a specific boom section allowing the ladder to extend automatically at the same rate as the boom.

The climbing area shall be free of cables, waterway and extension cylinders. The ladder climbing area shall be a continuous escape way free of all obstacles. Full length LED lighting to illuminate the walking area of the rungs.

Rung alignment indicator and bed alignment indicator shall be provided.

***The ladder shall have no less than 2.5:1 safety ratio on the ladder assembly with no exceptions.***

## **LIFTING CYLINDERS**

The raising and lowering mechanism shall consist of two hydraulic cylinders. The cylinders shall be attached to the boom assembly in a manner that requires only 50% of the lifting force of the boom.

The cylinders shall be capable of lifting the full rated load of 750 lb. at with the boom at full horizontal extension.

The power operated raising and lowering cylinders shall provide movement of the boom rapidly and smoothly without undue sway or vibration. A positive locking device shall be provided so the desired angle of elevation can be maintained indefinitely without dependence upon engine power.

As a safeguard feature, the lifting system shall be structurally and hydraulically designed and mounted to prevent rapid descent (lowering) of the aerial unit in the event of detachment, failure or hydraulic hose break. In the event of failure of any raising mechanism during operation, the gravity descent of the ladder shall be kept at a speed, which shall prevent damage to the equipment or danger to personnel. There shall be a single check valve (holding valve) with an orifice (in-line restrictor) attachment on each cylinder. This shall prevent any failure of the ladder by malfunction of cylinder check valves.

## **EXTENSION AND RETRACTION**

The boom shall be extended by a hydraulic ram mounted. The cylinder shall be mounted at the end of the base section and supported through the middle to accommodate the load stress of the boom.

As a safeguard feature, the system shall be structurally and hydraulically designed and mounted to prevent rapid descent (retraction) of the aerial unit in the event of a detachment, failure or hydraulic hose break. In the event of failure of an extension/retraction mechanism during operation, the gravity descent of the ladder shall be kept at a speed, which will prevent damage to the equipment and/or danger to personnel. Provisions shall be made to prevent damage at full extension/retraction. There shall be a single check valve with an orifice attachment on each cylinder.

This shall prevent any failure of the ladder by malfunction of cylinder check valves.

### **TURNTABLE**

The turntable shall be a minimum of 1/2" thick plate.

The turntable shall be equipped with a rotating mechanism with a steel balanced fly wheel connected at one end which shall rotate the turntable 360 degrees through a planetary gear box that shall handle torque loads imposed by water hammer and hose breakage. The rotating mechanism shall give the turntable and ladder built-in coast as an added safety precaution to avoid lateral ladder side-to-side deflection (reactionary whipping effect) caused by the ladder being stopped suddenly.

The power operated turntable shall provide continuous rotating of the aerial structure clockwise or counter clockwise, thus enabling the structure to be positioned in any segment through 360 degrees. The rotating mechanism shall also provide sufficient power to rotate the aerial sections in any direction at any angle, fully extended, while carrying the manufacturer's rated load capacity with the waterway in operation and discharging water at the tip of the aerial fly section.

Provisions shall be made for manual operation of the rotation system should loss of hydraulic power occur. This shall be done through manual rotation of the flywheel to rotate the ladder and turntable. There shall also be a manual means of retracting the ladder and an auxiliary bleed down valve for the hydraulic raise/lower cylinders.

There shall be one heavy-duty solid steel shaft that shall attach the base section of the ladder (at the top and very back) and the top portion of the turntable side plates together. The complete rotation system shall have built in relief to prevent damage from rotating the ladder into buildings or from overloaded water streams. Suitable indicators, clearly visible at all times, shall be provided to facilitate correct alignment of the turntable with the bed of the ladder. An automatic light shall be used to show correct alignment for bedding of the ladder from the turntable control station.

### **HYDRAULICS**

There shall be a hydraulic control valve for operating the outrigger jacks located at the pump panel station. The main hydraulic valve body shall be the four-way design and located near the

pump panel station. All hydraulic lines shall be of the double braided type, rated at 3,000 lb. pressure or above. A PTO hour meter shall be provided to record the time when the aerial hydraulic system is engaged.

There shall be a hydraulic power take-off pump activated from the cab dash to operate aerial ladder and outriggers.

The hydraulic tank shall be made of treated steel and shall be equipped with a strainer and return filter system.

Cooling of the hydraulic oil shall be accomplished through a built-in heat exchanger that constantly cools the oil, whenever the pump is operating.

### **AUXILIARY HYDRAULIC POWER**

An emergency auxiliary hydraulic motor shall be furnished to provide a backup hydraulic system, should the regular hydraulic system fail. An electric switch located inside the hydraulic compartment shall start the auxiliary hydraulic motor. The auxiliary hydraulic motor shall be installed in the left side compartment directly below the midship turntable for ease of access and maintenance.

### **INTERLOCK**

An interlock shall be provided that prevents operation of the aerial device until the chassis spring brakes have been set and the transmission has been placed in neutral or the transmission is in the drive position with the driveline to the rear axle disengaged.

An interlock shall be provided that allows operation of the engine speed control only after the chassis spring brakes have been set and the transmission is in neutral.

An interlock system shall be provided to prevent the lifting of the aerial device from the travel position until all the stabilizers are in a configuration to meet the stability requirements. The interlock system shall also prevent the moving of the stabilizers unless the aerial device is in the travel position.

One (1) limit switch shall be installed at the cradle to prevent operation of the stabilizer once the aerial has been elevated from the nested position.

### **OUTRIGGER JACKS**

Two (2) hydraulically operated stabilizing jacks shall be attached to the main frame assembly, one (1) jack on each side of vehicle with a minimum spread of 16 feet. Both jacks shall be operated by two (2) mounted hydraulic valve handles.

The hydraulic cylinders shall be enclosed in a protective heavy-duty tubular frame. A solid steel fail-safe pin shall be provided for each jack tube. Said pins shall be manually inserted through the tubes after the outrigger jacks have been positioned.

The outrigger jacks shall have a maximum spread of 16 feet from pad to pad. The control is electric over hydraulic with electric push button activation.

### **AERIAL CONTROLS**

There shall be an operator's position with four controls. The controls shall be spring loaded to bring any operation of the aerial controls back to a neutral position.

The four controls shall have the following functions:

1. Outrigger jack controls.
2. Raise and lower.
3. Extend and retract.
4. Rotation 360 degrees right and left.

The controls shall be equipped with a latching, hinged cover for protection. A hydraulic lockout shall be provided that shall prevent aerial operation until the outrigger jacks are set into position. Hydraulic power is transferred to aerial operation when outriggers are set. Power can be transferred back to the outriggers only after the aerial has been bedded.

There shall be a plaque located at the controls displaying functions.

A slide out step shall be provided at the controls for safety of the operator.

### **INCLINOMETER**

An illuminated inclinometer shall be provided and mounted in plain view of the pedestal operator location.

### **CENTRALIZED CONTROLS**

All outrigger jack controls, turntable controls and pump controls shall be located in one centralized area to:

- a) allow person(s) close proximity to all control stations of the truck
- b) allow faster set up time for all operations of the truck.

### **CAPACITY RATINGS**

The rated capacity of the aerial ladder is 500 lbs. minimum with no water in the water delivery system, in any position of operation and should meet or exceed NFPA requirements.

The rated capacity of the aerial platform is 750 lbs. with the water system charged or flowing water, in any position of operation.

The rated capacity of the aerial water delivery system is 1000 GPM from the platform nozzles at 100 psi nozzle pressure.

### **AERIAL DATA PLAQUES**

Load instruction plates shall be located at the turntable pedestal control station and the platform control station indicating the recommended safe load of the platform. The platform shall carry the rated load capacity indicated in the following manner: raise, extend, rotate, retract and lower without exceeding the hydraulic pressures prescribed by the manufacturer.

### **OPERATIONAL TEST**

After starting the engine, setting the jacks and transmitting power to the platform or sections, a complete cycle of the platform operation shall be carried out as follows: With one person operating the machine from the platform control station, raise the platform from the bedded position, rotate 90 degrees and extend to full specified height. This shall be completed in less than 150 seconds, smoothly without vibration. The platform shall then be retracted and lowered to its starting position after which a thorough inspection shall be made of all moving parts with special attention given to the platform leveling system.

This test shall be repeated employing the controls at the lower pedestal control station. The effectiveness of the lower control override shall be demonstrated.

### **WATERWAY**

The aerial waterway shall be constructed of heavy duty, light weight, telescopic, aluminum tubing. The water supply line shall come directly off the main pump discharge manifold and shall be piped through smooth high-pressure piping without the use of 90 degree chicksan joints, to reduce friction loss. The water flow shall be controlled by a full flow ball valve to eliminate any possibility of water hammer on the waterway.

A 1.5" waterway drain valve shall be provided, and controlled from the pump operator's panel.

The waterway shall have the capability of flowing a minimum of 1250 gallons per minute.

An automatic relief valve shall be provided in the waterway to eliminate any damage to the waterway by pressure shock or retracting the boom with the drain valve closed.

### **AERIAL SPOT LIGHTS**

Two (2) Unity P46FLC 6" LED spot lights shall be provided. One (1) shall be mounted on each side of the aerial base section to illuminate the aerial device for night time operation. The lights shall be activated by individual switches at each light head.

### **INCLINOMETER**

An illuminated inclinometer shall be provided and mounted in plain view of the aerial platform operator.

## **THE AERIAL SHALL BE CAPABLE OF CARRYING ITS RATED LOAD SAFELY IN ANY POSITION OF OPERATION AS OUTLINED IN NFPA #1901.**

### **MONITORS/NOZZLE**

There shall be one remotely operated monitor installed. This will be pinable to the tip section or the next ladder section toward the turntable. A means of operating the monitor shall be provided at the pump panel/pedestal and near ladder tip.

### **INTERCOM**

A Fire Research ACT Intercom model ICA900-112 two-way system shall be installed between the aerial operator's position and the ladder's tip. The intercom kit shall include two control modules, one that is hands free and one that has a push-to-talk button, two speakers, and cables. The interconnection between control modules shall require two wires. The control modules shall have an LED volume display and push- button volume control. The hands-free module shall constantly transmit to the other module unless the push-to-talk button is pressed.

The intercom shall be designed for exterior use. The control module shall be no more than 2 7/8" high by 5 1/8" wide by 1 7/8". The speaker shall be no more than 5 1/8" high by 5 1/8" wide by 1 1/2" deep. The power requirements for each control module with a speaker shall not exceed 1/2 amp at 12 VDC.

### **ELECTRIC UP THE LADDER**

A 110-volt circuit shall be provided up the ladder, complete with reel and junction box. L5-20 twist lock receptacles.

### **PAINTING**

All exposed metal surfaces not chrome plated, polished stainless steel or bright aluminum tread plate shall be thoroughly cleaned and prepared for painting. All irregularities in painted surfaces shall be rubbed down and all seams shall be caulked before the application of the finish coat.

All removable items such as brackets, compartment doors, door hinges, trim, etc. shall be removed and painted separately to insure finish paint behind all mounted items. Body assemblies that cannot be finish painted after assembly shall be finish painted before assembly. Both aluminum and steel surfaces to be painted shall be primed with a two (2)-component primer which is compatible with the finish coat. The apparatus shall be finish painted with a polyurethane base/clear system. "No Exception"



Utilizing the stainless-steel body fabrication, the interior of all compartments, inside hose bed, and surrounding areas adjacent to compartments doors shall remain a #4 brushed stainless steel finish. This practice shall eliminate the possibility of paint chipping, and electrolysis of aluminum which can cause corrosive action between dissimilar metals. Chassis and compartment doors shall be painted the color indicated.

Prior to reassembly and reinstallation of lights, handrails, door hardware and any miscellaneous items, an isolation tape or gasket material shall be used to prevent damage to the finish painted surfaces. A nylon washer shall be installed under each acorn nut or metal screw that is fastened directly to a painted surface.

**The following paint process shall be utilized:**

**Surface Preparation:**

- Wash surface thoroughly with mild detergent.
- Clean and de-grease with Prep-Sol 3812S.
- Sand and feather edge using 400 grit or finer on a dual action sander.
- Remove sanding dust with a cleaner compatible with polyurethane base coat/clear coat final finish.

**Substrate treatment:**

- Use a Metal Conditioner followed with a Conversion Coating product.

**Priming:**

- Use a priming 615S pretreatment.
- Use a self-etching primer applied to achieve a 1.5 mil dft minimum.
- Use Prime N Seal sealer compatible with polyurethane base coat.

**Color Coat:**

- Apply polyurethane base coat 1-2 mil dft minimum.
- Clear coat:
- Apply polyurethane clear coat 2 mil dft minimum.

**PAINT-TWO TONE CAB**

The cab exterior surfaces shall be two (2) colors. The paint break line shall be at the bottom of the windshield. County to supply Seals for doors. Bottom: FLNA 3626, Color Map: 405E5, Product: 65BSP5, Top: Dodge Granite Crystal Metallic AY111LAU

**PAINTED FRAME**

The frame rails, fuel beam, and body subframe shall be painted glossy black.

### **TURNTABLE PAINT**

The turntable, side plates and lift cylinders shall be painted silver.

### **LETTERING**

Forty (40) 3" 22KT Gold vinyl laminate gold-leaf letters, with left hand shading and right-hand outline to equal 3- 5/8" letter, shall be provided.

### **STRIPING**

A 6" Scotch lite stripe Black (Ghost) shall be provided across the front of the cab and along each side of the apparatus. Also a 1" Scotchlite Black (Ghost) shall be provided on both sides of 6" stripe with a 1" separation.

### **CHEVRON STRIPING, REAR BODY OUTBOARD, ORAFOL REFLEXITE**

The apparatus shall have 6" red and yellow reflective Orafol Reflexite Chevron style striping affixed to the outboard rear body panels. The striping will be set in a manner to have the effect of an inverted "V" shape. The stripe will travel low to high from the outside to the inside.

### **CHEVRON STRIPING, REAR PLATFORM FULL, ORAFOL REFLEXITE**

In addition to the outboard rear body panels, the rear platform panels shall also be covered with 6" red and yellow reflective Orafol Reflexite Chevron style striping.

### **BOOM SIGN**

A boom sign, approximately 63" x 10", shall be provided on each side of the boom. The background of the boom sign shall be painted primary truck color.

### **BOOM SIGN LETTERING**

Up to twenty-six (26) 8" 22KT Gold laminated gold-leaf letters, with left hand shading and right-hand outline to equal 8-5/8" letter, shall be provided on each boom sign.

### **MISCELLANEOUS EQUIPMENT FURNISHED**

A 1 pint container of touch-up paint. A bag of stainless steel nuts and bolts, as used in the construction of the apparatus shall be provided.

### **WHEEL CHOCKS**

Two (2) Ziamatic #SAC-44 folding wheel chocks with SQCH-44H holders shall be provided. The wheel chocks shall be located in an area close to the rear axles easily accessible from the side of the apparatus.

### **PIKE POLE STORAGE**

Three (3) storage tubes shall be recessed in the upper right corner of the driver's side body for pike pole storage. A spring-loaded clip shall be installed near each tube to secure the head of a standard pike pole.

### **PIKE POLE STORAGE**

Three (3) storage tubes shall be recessed in the upper left corner of the officer's side body for pike pole storage. A spring-loaded clip shall be installed near each tube to secure the head of a standard pike pole.

### **OPERATION AND SERVICE MANUALS**

Complete "Operation and Service" manuals shall be supplied with the completed apparatus, one (1) printed copy and one (1) CD. Service manual instructions shall include service, maintenance and troubleshooting for major and minor components of the truck. The apparatus manufacturer shall supply part numbers for major components (i.e. Engine, Axles, Transmission, Pump, etc.). A table of contents, hydraulic, air brake and overall apparatus wiring schematics shall be included. A video demonstration DVD on the operation of the truck shall be supplied with the manuals.

### **WARRANTIES**

The following warranties shall be supplied:

1. The apparatus shall be warranted to be free from mechanical defects in workmanship for a period of one (1) year. The apparatus shall be covered for parts and labor costs associated with repairs for a period one (1) year.
2. Life-time warranty on the frame.
3. Minimum of seven (7) year warranty on paint.
4. Minimum of ten (10) body structural warranty
5. Minimum of ten (10) year cab structural warranty
6. Minimum of two (2) year aerial mechanical warranty
7. Minimum of twenty (20) year aerial structural warranty
8. Manufacturers Warranties for all major components.

Detailed warranty documents shall be included for complete coverage on each of these warranties.

## **MANUFACTURING & LOCATIONS**

The apparatus will be manufactured in facilities wholly owned and operated by the company. A complete stock of service parts, and service shall be provided on a 24 hour around the clock basis. **The company shall maintain parts and service for a minimum period of twenty (20) years on each apparatus model manufactured.**

## **ATTACHED NFPA 1901 STANDARDS FOR AUTOMOTIVE FIRE APPARATUS**

Sections of Chapter 19 which pertain to Aerial Devices

- Sections 19.2 through 19.6
- Sections 19.17 through 19.25