



**Public Safety Committee of Council Agenda**  
**October 8, 2024 - 5:30 PM**  
**233 South Main Street, Monroe, Ohio**

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Approval of April 23, 2024, Public Safety Committee Minutes

Discussion pertaining to the purchase of a Pierce 107' Quint to replace an aging vehicle in the Fire Department fleet based on an established Capital Vehicle Replacement Plan.

Discussion, questions, and requests for future meetings.

Adjournment



**Public Safety Committee of Council  
April 23, 2024  
233 South Main Street, Monroe, Ohio**

The Public Safety Committee of Council met at 5:32 p.m. in the Council Library located at 233 South Main Street, Monroe, Ohio.

Present were: Keith Funk, Mayor; John Centers, Council Member; Kelly Clark, Council Member; Larry Lester, City Manager; Bob Buchanan, Chief of Police; and Angela S. Wasson, Clerk of Council and Assistant to the City Manager.

Dr. Clark moved to approve the Public Safety Committee Minutes of July 18, 2023; seconded by Mr. Centers. Voice vote. Motion carried.

Chief Buchanan asked if the Committee if they had any follow-up questions after the presentation before Council on the automated license plate recognition system he is considering purchasing.

Mayor Funk stated he is not a proponent of monitoring the public as it puts residents in a process that they didn't consent to. He did recognize the advantages for investigations, but he struggles with 24 hour surveillance and the direct impact that the residents are going to receive for the price. Mayor Funk struggled with the pros and cons if it is something we need or we want as this is getting close to the cost of another person.

Mr. Centers asked Chief Buchanan to expand on what other municipalities are seeing with cost versus benefit and how it has worked.

Chief Buchanan gave an example of \$16,500 was taken from the outlet mall and we have no suspects or information. This system would be beneficial in this situation. We have experienced scams throughout the City where someone would appear at someone's door and all of a sudden \$15,000 from someone's retirement account is gone. In 2019, we had someone shooting at a house and with the location of the camera system we would have been able to obtain information to catch the suspect. With other municipalities such as, Springboro, Middletown, and Lebanon we can share vehicle descriptions and help track down the vehicle.

As an example, Mr. Centers asked if residents need to be concerned if a camera caught their license plate with expired tags. Chief Buchanan explained that zero enforcement comes from these cameras. The data is only collected for 30 days unless we have a reason to pull it if a case happens. He noted there is no facial recognition with this system either.

Dr. Clark asked where these would be placed in the City. Chief Buchanan replied that we have 23 cameras that we are looking at and would be placed outside subdivisions. Basically, anything coming in and going out of the City.

Chief Buchanan advised this would reduce the investigatory time for certain crimes and they will consistently review the amount of cameras and the locations.



Mayor Funk would like for the Public Safety Committee to meet every six months to see how this is working.

Mr. Centers asked if the videos are subject to public records requests and can dispatch review these real time. Chief Buchanan explained these videos are not subject to public record requests as it is taking snapshots and he will check if dispatch can view this real time.

Mr. Lester reported that he spent time with officers during an investigation and it really speeds up the process to solve crimes.

Mayor Funk asked if any other vendors were reviewed for this type of system. Chief Buchanan replied there are no other vendors that he is aware of that has this type of system. Chief Buchanan anticipates it will take two to three months for the installation and operation of the system.

The Public Safety Committee recommended that Council approve the purchase of the Flock Camera System.

The Public Safety Committee of Council meeting adjourned at 5:58 p.m.

Respectfully submitted,

Angela S. Wasson, MMC  
Clerk of Council

## **SINGLE SOURCE MANUFACTURER**

Pierce Manufacturing, Inc. provides an integrated approach to the design and manufacture of our products that delivers superior apparatus and a dedicated support team. From our facilities, the chassis, cab weldment, cab, pump house (including the sheet metal enclosure, valve controls, piping and operators panel) body and aerial device will be entirely designed, tested, and hand assembled to the customer's exact specifications. The electrical system either hardwired or multiplexed, will be both designed and integrated by Pierce Manufacturing. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) will be provided by Pierce as a single source manufacturer. Pierce's single source solution adds value by providing a fully engineered product that offers durability, reliability, maintainability, performance, and a high level of quality.

Your apparatus will be manufactured in Appleton, Wisconsin.

## **NFPA 2024 STANDARDS**

This unit will comply with the NFPA standards effective January 1, 2024, except for fire department directed exceptions. These exceptions will be set forth in the Statement of Exceptions.

Certification of slip resistance of all stepping, standing and walking surfaces will be supplied with delivery of the apparatus.

All horizontal surfaces designated as a standing or walking surface that are greater than 48.00" above the ground must be defined by a 1.00" wide line along its outside perimeter. Perimeter markings and designated access paths to destination points will be identified on the customer approval print and are shown as approximate. Actual location(s) will be determined based on materials used and actual conditions at final build. Access paths may pass through hose storage areas and opening or removal of covers or restraints may be required. Access paths may require the operation of devices and equipment such as the aerial device or ladder rack.

A plate that is highly visible to the driver while seated will be provided. This plate will show the overall height, length, and gross vehicle weight rating.

The manufacturer will have programs in place for training, proficiency testing and performance for any staff involved with certifications.

An official of the company will designate, in writing, who is qualified to witness and certify test results.

## **NFPA COMPLIANCY**

Apparatus proposed by the bidder will meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications will be indicated in the proposal as "non-NFPA".

## **INSPECTION CERTIFICATE**

A third party inspection certificate for the aerial device will be furnished upon delivery of the aerial device. The certificate will be Underwriters Laboratories Inc. Type 1 and will indicate that the aerial device has been inspected on the production line and after final assembly.

Visual structural inspections will be performed on all welds on both aluminum and steel ladders.

On critical weld areas, or on any suspected defective area, the following tests will be conducted:

- Magnetic particle inspection will be conducted on steel aerials to assure the integrity of the weldments and to detect any flaws or weaknesses. Magnets will be placed on each side of the weld while iron powder is placed on the weld itself. The powder will detect any crack that may exist. This test will conform to ASTM E709 and be performed prior to assembly of the aerial device.
- A liquid penetrant test will be conducted on aluminum aerials to assure the integrity of the weldments and to detect any flaws or weaknesses. This test will conform to ASTM E165 and be performed prior to assembly of the aerial device.
- Ultrasonic inspection will be conducted on all aerials to detect any flaws in pins, bolts and other critical mounting components.

In addition to the tests above, functional tests, load tests, and stability tests will be performed on all aerials. These tests will determine any unusual deflection, noise, vibration, or instability characteristics of the unit.

#### **PUMP TEST**

The pump will be tested, approved and certified by Underwriter's Laboratory at the manufacturer's expense. The test results and the pump manufacturer's certification of hydrostatic test; the engine manufacturer's certified brake horsepower curve; and the manufacturer's record of pump construction details will be forwarded to the Fire Department.

#### **GENERATOR TEST**

If the unit has a generator, the generator will be tested, approved, and certified by Underwriters Laboratories at the manufacturer's expense. The test results will be provided to the Fire Department at the time of delivery.

#### **BREATHING AIR TEST**

If the unit has breathing air, Pierce Manufacturing will draw an air sample from the air system and certify that the air quality meets the requirements of NFPA 1989, *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection*.

#### **VEHICLE INSPECTION PROGRAM CERTIFICATION**

To assure the vehicle is built to current NFPA 1900 standards, the apparatus, in its entirety, will be third-party, independent, audit-certified through Underwriters Laboratory (UL) that it is built and complies to all applicable standards in the current edition. The certification includes: all design, production, operational, and performance testing of not only the apparatus, but those components that are installed on the apparatus.

A placard will be affixed in the driver's side area stating the third party agency, the date, the standard and the certificate number of the whole vehicle audit.

#### **BID BOND NOT REQUESTED**

A bid bond will not be included. If requested, the following will apply:

All bidders will provide a bid bond as security for the bid in the form of a 5 percent bid bond to accompany their bid. This bid bond will be issued by a Surety Company who is listed on the U.S. Treasury Departments list of acceptable sureties as published in Department Circular 570. The bid bond will be issued by an authorized representative of the Surety Company and will be accompanied by a certified power of attorney dated on or before the date of bid. The bid bond will include language, which assures that the bidder/principal will give a bond or bonds as may be specified in the bidding or contract documents, with good and sufficient surety for the faithful performance of the contract, including the Basic One (1) Year Limited Warranty, and for the prompt payment of labor and material furnished in the prosecution of the contract.

Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle will apply only to the Basic One (1) Year Limited Warranty for such vehicle. Any surety bond related to the sale of a vehicle will not apply to any other warranties that are included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision will prevail.

#### **PERFORMANCE BOND NOT REQUESTED**

A performance bond will not be included. If requested at a later date, one will be provided to you for an additional cost and the following will apply:

The successful bidder will furnish a Performance and Payment bond (Bond) equal to 100 percent of the total contract amount within 30 days of the notice of award. Such Bond will be in a form acceptable to the Owner and issued by a surety company included within the Department of Treasury's Listing of Approved Sureties (Department Circular 570) with a minimum A.M. Best Financial Strength Rating of A and Size Category of XV. In the event of a bond issued by a surety of a lesser Size Category, a minimum Financial Strength rating of A+ is required.

Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Bumper to Bumper warranty period included within this proposal. Owner agrees that the penal amount of this bond will be simultaneously amended to 25 percent of the total contract amount upon satisfactory acceptance and delivery of the vehicle(s) included herein. Notwithstanding anything contained within this contract to the contrary, the surety's liability for any warranties of any type will not exceed three (3) years from the date of such satisfactory acceptance and delivery, or the actual Bumper to Bumper warranty period, whichever is shorter.

Due to global supply chain constraints, any delivery date contained herein is a good faith estimate as of the date of this order/contract, and merely an approximation based on current information. Delivery updates will be made available, and a final firm delivery date will be provided as soon as possible.

If the Producer Price Index of Components for Manufacturing [www.bls.gov Series ID: WPUID6112] ("PPI") has increased at a compounded annual growth rate of 5.0% or more between the month Pierce accepts the order ("Order Month") and a month 14 months prior to the then predicted Ready For Pickup date ("Evaluation Month"), then pricing may be updated in an amount equal to the increase in PPI over 5.0% for each year or fractional year between the Order Month and the Evaluation Month.

The seller will document any such updated price for the customer's approval before proceeding and provide an option to cancel the order.

### **APPROVAL DRAWING**

A drawing of the proposed apparatus will be prepared and provided to the purchaser for approval before construction begins. The Pierce sales representative will also be provided with a copy of the same drawing. The finalized and approved drawing will become part of the contract documents. This drawing will indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus will be prepared and submitted by Pierce to the purchaser showing any changes made to the approval drawing.

### **ELECTRICAL WIRING DIAGRAMS**

Two (2) electrical wiring diagrams, prepared for the model of chassis and body, will be provided.

### **ENFORCER CHASSIS**

The Pierce Enforcer™ is the custom chassis developed exclusively for the fire service. Chassis provided will be a new, tilt-type custom fire apparatus. The chassis will be manufactured in the apparatus body builder's facility eliminating any split responsibility. The chassis will be designed and manufactured for heavy-duty service, with adequate strength, capacity for the intended load to be sustained, and the type of service required. The chassis will be the manufacturer's first line tilt cab.

### **WHEELBASE**

The wheelbase of the vehicle will be 249".

### **GVW RATING**

The gross vehicle weight rating will be 66,800 .

### **FRAME**

The chassis frame will be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus. The side rails will have a 13.38" tall web over the front and mid sections of the chassis, with a continuous smooth taper to 10.75" over the rear axle. Each rail will have a section modulus of 25.992 cubic inches and a resisting bending moment (rbm) of 3,119,040 in-lb over the critical regions of the frame assembly, with a section modulus of 18.96 cubic inches with an rbm of 2,275,200 in-lb over the rear axle. The frame rails will be constructed of 120,000 psi yield strength heat-treated 0.38" thick steel with 3.50" wide flanges.

### **FRAME REINFORCEMENT**

In addition, a mainframe internal liner will be provided. The liner will be an internal "C" design that steps to an internal "L" design over the rear axle. It will be heat-treated steel measuring 12.50" x 3.00" x 0.25" through the front portion of the liner, stepping to 9.38" x 3.00" x 0.25" through the rear portion of the liner. Each liner will have a section modulus of 13.58 cubic inches, yield strength of 110,000 psi, and rbm of 1,494,042 in-lb. Total rbm at wheelbase center will be 4,391,869 in-lb.

The frame liner will be mounted inside of the chassis frame rail and extend the full length of the frame.

## **FRONT NON DRIVE AXLE**

The Oshkosh TAK-4® front axle will be of the independent suspension design with a ground rating of 22,800 lb.

Upper and lower control arms will be used on each side of the axle. Upper control arm castings will be made of 100,000-psi yield strength 8630 steel and the lower control arm casting will be made of 55,000-psi yield ductile iron.

The center cross members and side plates will be constructed out of 80,000-psi yield strength steel.

Each control arm will be mounted to the center section using elastomer bushings. These rubber bushings will rotate on low friction plain bearings and be lubricated for life. Each bushing will also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations.

There will be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension.

The upper control arm will be shorter than the lower arm so that wheel end geometry provides positive camber when deflected below rated load and negative camber above rated load.

Camber at load will be zero degrees for optimum tire life.

The ball joint bearing will be of low friction design and be maintenance free.

Toe links that are adjustable for alignment of the wheel to the center of the chassis will be provided.

The wheel ends will have little to no bump steer when the chassis encounters a hole or obstacle.

The steering linkage will provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase.

The axle will have a turning angle of up to 45 degrees.

## **FRONT SUSPENSION**

Front Oshkosh TAK-4™ independent suspension will be provided with a minimum ground rating of 22,800 lb.

The independent suspension system will be designed to provide maximum ride comfort. The design will allow the vehicle to travel at highway speeds over improved road surfaces and at moderate speeds over rough terrain with minimal transfer of road shock and vibration to the vehicle's crew compartment.

Each wheel will have torsion bar type spring. In addition, each front wheel end will also have energy absorbing jounce bumpers to prevent bottoming of the suspension.

The suspension design will be such that there is at least 10.00" of total wheel travel and a minimum of 3.75" before suspension bottoms.

The torsion bar anchor lock system allows for simple lean adjustments, without the use of shims. One can adjust for a lean within 15 minutes per side. Anchor adjustment design is such that it allows for ride height adjustment on each side.

The independent suspension was put through a durability test that simulated 140,000 miles of inner city driving.

### **FRONT SHOCK ABSORBERS**

KONI heavy-duty telescoping shock absorbers will be provided on the front suspension.

### **FRONT OIL SEALS**

Oil seals with viewing window will be provided on the front axle.

### **FRONT TIRES**

Front tires will be Michelin 425/65R22.50 radials, 20 ply XZE wide base tread, rated for 22,800 lb maximum axle load and 75 mph maximum speed.

The tires will be mounted on Alcoa® 22.50" x 12.25" Dura-Black® polished aluminum disc type wheels with a ten (10) stud, 11.25" bolt circle.

### **REAR AXLE**

The rear axle will be a tandem axle assembly, of the Oshkosh TAK-4® T3, Tight Turning Technology, independent suspension design, with the ability to support a mechanical rear axle steering system. Tandem rear axles will have a ground rating of 44,000 lb.

The rear axles will be designed for specific use of the independent suspension.

The rear independent suspension driving axles will be equipped with a carrier reduction of 1.69 to 1.00 with a planetary wheel end reduction of 3.55 to 1.00. Driving torque will be transmitted from the center differential to the planetary wheel drive by means of a half shaft.

Oil fills and level checks will be required at the center differential and the planet wheel end locations.

An inter-axle differential, which divides torque evenly between axles, will be provided with an indicator light mounted on the cab instrument panel.

### **REAR AXLE STEERING**

The tandem rear axle assembly will include a mechanical rear steering system. The mechanical rear steering system will be applied to both rear axles.

The steering geometry will be designed to minimize tire scrub of the rear tandem axle tires while reducing the overall turning diameter of the apparatus.

The mechanical rear steering system will not use electronic controls and will not have a means to be disengaged. Coordinated steering is the only steering mode supported by the mechanical steering system.

Rear steering system is actuated by a mechanical means of connecting the front master/slave steering gear system to a rear axle master/slave steering gear system.

### **TOP SPEED OF VEHICLE**

A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 60 mph/96KPH.

### **REAR SUSPENSION**

The rear suspension will be an Oshkosh TAK-4® independent type with a minimum ground rating of 44,000 lbs.

The independent suspension will be configured with upper and lower control arms with a spring seat for a coil spring mounted to the lower control arm. The spring tower will be integrated into the suspension frame mount. Each control arm has elastomeric bushings at the inner pivot locations with a ball joint bearing at the outer pivot location. All suspension pivot joints will be of a maintenance free design.

The rear independent suspension will be provided with steering toe links providing tow adjustments and maintaining wheel control throughout the range of wheel travel.

The independent suspension will be designed to provide maximum ride quality when traveling at highway speeds over improved roads or a moderate speeds over secondary road surfaces with minimal transfer of shock and vibration to the apparatus.

Each independent suspension will utilize a coil type of spring. The design will allow for removal of the spring without the use of any spring compression.

The rear suspension will provide a minimum wheel travel of 10.00", 6.00" jounce and 4.00" of rebound.

### **REAR OIL SEALS**

Oil seals will be provided on the rear axle(s).

### **REAR TIRES**

Rear tires will be four (4) Michelin super single 445/65R22.5 radials, 20 ply all position XZY3 wide base tread, rated for 52,640 lb maximum axle load and 65 mph maximum speed.

The tires will be mounted on 22.50" x 13.00" steel disc type wheels with a ten (10) stud, 11.25" bolt circle.

### **TIRE BALANCE**

All tires will be balanced with Counteract balancing beads. The beads will be inserted into the tire and eliminate the need for wheel weights.

### **TIRE PRESSURE MANAGEMENT**

There will be a RealWheels LED AirSecure™ tire alert pressure management system provided, that will monitor each tire's pressure. A sensor will be provided on the valve stem of each tire for a total of 10 tires.

The sensor will calibrate to the tire pressure when installed on the valve stem for pressures between 10 and 200 psi. The sensor will activate an integral battery operated LED when the pressure of that tire drops 5 to 8 psi.

Removing the cap from the sensor will indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED will immediately start to flash.

### **BLACK LUG NUT COVERS**

Black lug nut covers will be supplied on front and rear wheels.

### **FRONT HUB COVERS**

Stainless steel hub covers will be provided on the front axle. An oil level viewing window will be provided.

### **FULL WIDTH REAR MUD FLAP**

A full width, black mud flap with a custom logo will be installed behind the rear wheels of the apparatus.

### **WHEEL CHOCKS**

There will be one (1) pair of folding Ziamatic, Model SAC-44-E, aluminum alloy, Quick-Choc wheel blocks, with easy-grip handle provided.

### **Wheel Chock Brackets**

There will be one (1) pair of Zico, Model SQCH-44-H, horizontal mounting wheel chock brackets provided for the Ziamatic, Model SAC-44-E, folding wheel chocks. The brackets will be made of aluminum and consist of a quick release spring loaded rod to hold the wheel chocks in place. The brackets will be mounted forward of the left side rear tire.

### **ANTI-LOCK BRAKE SYSTEM**

The vehicle will be equipped with a Wabco 4S4M, anti-lock braking system. The ABS will provide a four (4) channel anti-lock braking control on both the front and rear wheels (rear axle of tandems). A digitally controlled system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel sensor will be monitored by the system. When any particular wheel begins to lockup, a signal will be sent to the control unit. This control unit then will reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system will eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

### **BRAKES**

The service brake system will be full air type.

The front brakes will be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance.

The brake system will be certified, third party inspected, for improved stopping distance.

The rear brakes will be Bendix®, Model ES1657D, 16.50" x 7.00" cam operated with automatic slack adjusters.

## **AIR COMPRESSOR, BRAKE SYSTEM**

The air compressor will be a Wabco single piston compressor with a 26.8 CI displacement.

## **BRAKE SYSTEM**

The brake system will include:

- Brake treadle valve
- Heated automatic moisture ejector on air dryer
- Total air system capacity of 6,408 cubic inches
- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi
- Spring set parking brake system
- Parking brake operated by a push-pull style control valve
- A parking "brake on" indicator light on instrument panel
- Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, will be provided with an automatic spring brake application at 40 psi
- A pressure protection valve to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa)
- 1/4 turn drain valves on each air tank

The air tank will be primed and painted to meet a minimum 750 hour salt spray test.

The air tanks will be painted black #98.

To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

## **BRAKE SYSTEM AIR DRYER**

The air dryer will be a WABCO System Saver 1200 with spin-on coalescing filter cartridge and 100 watt heater.

## **BRAKE LINES**

Color-coded nylon brake lines will be provided. The lines will be wrapped in a heat protective loom in the chassis areas that are subject to excessive heat.

## **AIR INLET**

One (1) air inlet with 3D series male coupling will be provided. It will allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet will be located forward in the driver side lower step well of cab. A check valve will be provided to prevent reverse flow of air. The inlet will discharge into the "wet" tank of the brake system. A mating female fitting will also be provided with the loose equipment.

## **ALL WHEEL LOCK-UP**

An additional all wheel lock-up system will be installed which applies air to the front brakes only. The standard spring brake control valve system will be used for the rear.

## **ENGINE**

The chassis will be powered by an electronically controlled engine as described below:

Make:	Paccar
Model:	MX
Power:	510 hp at 1600rpm
Torque:	1850 lb-ft at 1000rpm
Governed Speed:	1900 rpm
Emissions Certification:	EPA 2027
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	13.7L
Starter:	DP60
Fuel Filters:	Dual cartridge style with check valve, water separator, and water in fuel sensor

The engine will include On-board diagnostics (OBD), which provides self diagnostic and reporting. The system will give the owner or repair technician access to state of health information for various vehicle sub systems. The system will monitor vehicle systems, engine and after treatment. The system will illuminate a malfunction indicator light on the dash console if a problem is detected.

**HIGH IDLE**

A high idle switch will be provided, inside the cab, on the instrument panel, that will automatically maintain a preset engine rpm. A switch will be installed, at the cab instrument panel, for activation/deactivation.

The high idle will be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light will be provided, adjacent to the switch. The light will illuminate when the above conditions are met. The light will be labeled "OK to Engage High Idle."

**ENGINE BRAKE**

The compression release brake option is a fully integrated MX engine braking system. It utilizes the turbocharger and back pressure valve, but adds in a hydraulically operated compression brake to increase overall retarding power.

To maximize the effectiveness of the compression brake the MX engine brake system works in conjunction with the turbocharger and back pressure valve.

The driver will be able to turn the engine brake system on/off and have a high, medium and low setting.

**CLUTCH FAN**

A fan clutch will be provided. The fan clutch will be automatic when the pump transmission is in "Road" position, and constantly engaged when in "Pump" position.

**ENGINE AIR INTAKE**

The engine air intake will be located above the engine cooling package. It will draw fresh air from the front of the apparatus through the radiator grille.

The ember separator is designed to prevent road dirt and recirculating hot air from entering the engine.

The ember separator will be easily accessible by tilting the cab.

### **EXHAUST SYSTEM**

The exhaust system will be stainless steel from the turbo to the engine's aftertreatment device. The exhaust system will include an aftertreatment device to meet current EPA standards. An insulation wrap will be provided on all exhaust pipe between the turbo and the aftertreatment device to minimize the transfer of heat to the cab.

The exhaust will terminate horizontally ahead of the right side rear wheels and will extend 2.00" past the body rub rail. The exhaust pipes will be aluminized steel.

There will be an aluminized steel exhaust diffuser with a standard straight tip on the end provided to reduce the temperature of the exhaust as it exits. Heat deflector shields will be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

### **RADIATOR**

The radiator and the complete cooling system will meet or exceed the current edition of applicable NFPA and engine manufacturer cooling system standards.

For maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The radiator core will consist of aluminum fins, having a serpentine design, brazed to aluminum tubes.

The radiator core will have a minimum front area of 1060 square inches.

Supply tank will be made of heavy duty glass-reinforced nylon and the return tank will be made of aluminum. Both tanks will be crimped onto the core assembly using header tabs and a compression gasket to complete the radiator core assembly. There will be a full steel frame around the inserts to enhance cooling system durability and reliability.

The radiator will be compatible with commercial antifreeze solutions.

The radiator assembly will be isolated from the chassis frame rails with rubber isolators to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven terrain.

The radiator will include a de-aeration/expansion tank. For visual coolant level inspection, the radiator will have a built-in sight glass. The radiator will be equipped with a 15 psi pressure relief cap.

A drain port will be located at the lowest point of the cooling system and/or the bottom of the radiator to permit complete flushing of the coolant from the system.

Shields or baffles will be provided to prevent recirculation of hot air to the inlet side of the radiator.

### **COOLANT LINES**

Gates, or Goodyear, rubber hose will be used for all engine coolant lines installed by Pierce Manufacturing.

Hose clamps will be stainless steel constant torque type to prevent coolant leakage. They will expand and contract according to coolant system temperature thereby keeping a constant clamping pressure on the hose.

**FUEL TANK**

A 65 gallon fuel tank will be provided and mounted at the rear of the chassis. The tank will be constructed of 12-gauge, hot rolled steel. It will be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank will be mounted with stainless steel straps.

A 0.75" drain plug will be located in a low point of the tank for drainage.

A fill inlet will be located on the left hand side of the body and is covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only."

A 0.50" diameter vent will be installed from tank top to just below fuel fill inlet.

The fuel tank will meet all FHWA 393.67 requirements including a fill capacity of 95 percent of tank volume.

All fuel lines will be provided as recommended by the engine manufacturer.

**DIESEL EXHAUST FLUID TANK**

A 7.3 gallon diesel exhaust fluid (DEF) tank will be provided and mounted under the cab on the driver's side.

A fill inlet will be provided on the driver's side of the cab. The lift up door will be spring loaded and be polished stainless steel.

**TRANSMISSION**

An Allison 6th generation, Model EVS 4000P, electronic, torque converting, automatic transmission will be provided.

The transmission will be equipped with prognostics to monitor oil life, filter life, and transmission health. A wrench icon on the shift selector's digital display will indicate when service is due.

Two (2) PTO openings will be located on left side and top of converter housing (positions 8 o'clock and 1 o'clock).

A transmission temperature gauge with an amber light and buzzer will be installed on the cab instrument panel.

**TRANSMISSION SHIFTER**

A six (6)-speed push button shift module will be mounted to right of driver on console. Shift position indicator will be indirectly lit for after dark operation.

The transmission ratio will be:

1st	3.51 to 1.00
2nd	1.91 to 1.00

3rd	1.43 to 1.00
4th	1.00 to 1.00
5th	0.75 to 1.00
6th	0.64 to 1.00
R	4.80 to 1.00

### **TRANSMISSION COOLER**

A Modine plate and fin transmission oil cooler will be provided using engine coolant to control the transmission oil temperature.

### **DRIVELINE**

Drivelines will be a heavy-duty metal tube and be equipped with Spicer® 1810 universal joints.

The shafts will be dynamically balanced before installation.

A splined slip joint will be provided in each driveshaft where the driveline design requires it. The slip joint will be coated with Glidecoat® or equivalent.

### **STEERING**

Dual Sheppard, Model M110, steering gears, with integral heavy-duty power steering, will be provided. For reduced system temperatures, the power steering will incorporate an air to oil cooler and Paccar hydraulic pump with integral pressure and flow control. All power steering lines will have wire braded lines with crimped fittings.

A tilt and telescopic steering column will be provided to improve fit for a broader range of driver configurations.

### **STEERING WHEEL**

The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a four (4)-spoke design.

There will be a switch pod provided on the left side of the steering wheel between the spokes. The switch pods will be an integral part of the steering wheel. The following switches will be provided:

- Windshield wash
- Wiper intermittent speed increase
- Wiper intermittent speed decrease
- Hi/Lo wiper speed
- Wiper off

### **LOGO AND CUSTOMER DESIGNATION ON DASH**

The dash panel will have an emblem containing the Pierce logo and customer name. The emblem will have three (3) rows of text for the customer's department name. There will be a maximum of eight (8) characters in the first row, 11 characters in the second row and 11 characters in the third row.

The first row of text will be: City

The second row of text will be: of

The third row of text will be: Monroe

### **BUMPER**

A one (1)-piece bumper manufactured from .25" formed steel with a .38" bend radius will be provided. The bumper will be a minimum of 10.00" high with a 1.50" top and bottom flange. The bumper will be 95.28" wide with 45 degree corners. The bumper will be metal finished and painted job color.

The bumper will extend 22.00" from the face of the cab.

The bumper extension frame will be fabricated using .38" gussets welded to 2.00" x 5.00" steel tubing running front to back with .50" front and rear plates mounted to the chassis frame. Fabricated "U" shaped channel supports the weight of the bumper and provides the main strength in frontal crash. .25" steel is formed into "C" shaped backing plates for mounting of the bumper and providing protection to the cab.

The bumper extension's cross section is considered expendable, and a crush zone. The bumper is not intended for pushing other vehicles or objects.

Tow hooks/eyes located under the bumper extension are for straight pull only.

### **TOW HOOKS**

Two (2) painted steel tow hooks will be installed under the bumper and attached to the front frame members. The tow hooks will be painted to match the chassis frame assembly.

The tow hooks will be designed and positioned to allow up to a 6,000 lb straight horizontal pull in line with the centerline of the vehicle. The tow hooks will not be used for lifting of the apparatus.

### **BUMPER TRAY**

A full width bumper tray, constructed of smooth aluminum, will be located in the under slung bumper extension.

The tray will be a bolted modular design 14.00" front to back x 8.00" D. The tray will have capacity for (2) 200' sections of 1.78" .

Black rubber grating will be provided at the bottom of the tray. Drain holes are also provided.

### **GRAVEL PAN**

A gravel pan, constructed of bright aluminum treadplate, will be furnished between the bumper and cab face.

The gravel pan will be properly supported from the underside to prevent flexing and vibration of the aluminum treadplate.

**TRAY COVER**

A bright aluminum treadplate cover will be provided over the full width tray. The cover will be flush with the gravel pan.

The cover will be full width of the tray.

The cover will be attached with a stainless steel hinge.

The cover will be secured with D-ring latch on each side in the closed position and pneumatic stay arm on each side will hold the cover in the open position.

**STRIP LIGHT UNDER BUMPER COVER**

There will be two (2) Fire Research SunStrip, Model LED200-A27 LED light(s) provided in the front bumper cover. Each light will be 27.00" in length.

Opening the cover will automatically turn the compartment lighting on.

**HOSE RESTRAINT**

two (2) hose trays will be provided with hose restraint(s).

Heavy black nylon webbing made of 2.00" nylon strap with a 2.00" box pattern netting will be provided to secure the hose during travel.

The webbed netting will be fastened permanently on one side with stainless steel footman loops and secured on the opposite side with 2.00" cam buckle.

**UL-LX COATING - FRONT BUMPER**

Protective black "UL-LX" coating will be provided on the outside exterior of the top and bottom front bumper flanges. It will not be applied on the inside of the flanges.

The lining will be properly installed by an authorized UL-LX dealer.

**PROTECTIVE COATING ON TRAY COVER(S)**

A protective UL-LX® spray-on polyurethane/polyurea coating will be applied to top surface of the bumper tray cover(s).

The coating will be black in color.

The coating will be properly installed by an authorized UL-LX dealer.

There will be one (1) hose tray cover(s) coated.

**PROTECTIVE COATING ON BUMPER GRAVEL PAN**

A protective UL-LX® spray-on polyurethane/polyurea coating will be applied to top surface of the bumper gravel pan.

The coating will be black in color.

The coating will be properly installed by an authorized UL-LX dealer.

### **CAB**

The Enforcer cab will be designed specifically for the fire service and manufactured by the chassis builder.

The cab will be built by the apparatus manufacturer in a facility located on the manufacturer's premises.

For reasons of structural integrity and enhanced occupant protection, the cab will be a heavy duty design, constructed to the following minimal standards.

The cab will have 12 main vertical structural members located in the A-pillar (front cab corner posts), B-pillar (side center posts), C-pillar (rear corner posts), and rear wall areas. The A-pillar will be constructed of solid A356-T5 aluminum castings. The B-pillar and C-pillar will be constructed from 0.13" wall extrusions. The rear wall will be constructed of two (2) 2.00" x 2.00" outer aluminum extrusions and two (2) 2.00" x 1.00" inner aluminum extrusions. All main vertical structural members will run from the floor to 4.625" x 3.864" x 0.090" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.25" thick corner casting at each of the front corners of the roof assembly.

The front of the cab will be constructed of a 0.13" firewall plate, covered with a 0.090" front skin (for a total thickness of 0.22"), and reinforced with a full width x 0.50" thick cross-cab support located just below the windshield and fully welded to the engine tunnel. The cross-cab support will run the full width of the cab and weld to each A-pillar, the 0.13" firewall plate, and the front skin.

The cab floors will be constructed of 0.125" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.375" of structural material at the front floor area. The front floor area will also be supported with two (2) triangular 0.30" wall extrusions that also provides the mounting point for the cab lift. This tubing will run from the floor wireway of the cab to the engine tunnel side plates, creating the structure to support the forces created when lifting the cab.

The cab will be 96.00" wide (outside door skin to outside door skin) to maintain maximum maneuverability.

The centerline of front axle to the rear of the cab will be 70.00" long.

The forward cab section will have an overall height (from the cab roof to the ground) of approximately 99.00". The crew cab section will have a 10.00" raised roof, with an overall cab height of approximately 109.00". The overall height listed will be calculated based on a truck configuration with the lowest suspension weight rating, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension will increase the overall height listed.

The raised roof section of the crew cab will have a 58.00" wide x 10.00" high square notch in the center section of the roof. This will allow the aerial device to be bedded in the same location as a non-raised roof.

The floor to ceiling height inside the crew cab will be 54.50" in the center position and 64.50" in the outboard positions.

The crew cab floor will measure 46.00" from the rear wall to the back side of the rear facing seat risers.

The medium block engine tunnel, at the rearward highest point (knee level), will measure 61.50" to the rear wall. The big block engine tunnel will measure 51.50" to the rear wall.

The crew cab will be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants.

The cab will be a full tilt cab style.

A 3-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab.

### **CAB ROOF DRIP RAIL**

For enhanced protection from inclement weather, a drip rail will be furnished on the sides of the cab. The drip rail will be painted to match the cab roof, and bonded to the sides of the cab. The drip rail will extend the full length of the cab roof.

### **FENDER LINERS**

Full circular inner fender liners in the wheel wells will be provided.

### **PANORAMIC WINDSHIELD**

A one (1)-piece safety glass windshield will be provided with over 2,775 square inches of clear viewing area. The windshield will be full width and will provide the occupants with a panoramic view. The windshield will consist of three (3) layers: outer light, middle safety laminate, and inner light. The outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage. The inner light will provide yet another chip resistant layer. The cab windshield will be bonded to the aluminum windshield frame using a urethane adhesive. A custom frit pattern will be applied on the outside perimeter of the windshield for a finished automotive appearance.

### **WINDSHIELD WIPERS**

Three (3) electric windshield wipers with washer will be provided that meet FMVSS and SAE requirements.

The washer reservoir will be able to be filled without raising the cab.

### **ENGINE TUNNEL**

Engine hood side walls will be constructed of 0.375" aluminum. The top will be constructed of 0.125" aluminum and will be tapered at the top to allow for more driver and passenger elbow room.

The engine hood will be insulated for protection from heat and sound. The noise insulation keeps the dBA level within the limits stated in the current edition of applicable NFPA standards.

### **INTERIOR CAB INSULATION**

The cab will include 1.00" insulation in the ceiling, 1.50" insulation in the side walls, a minimum of 1.00" insulation in the crew cab floor, and 2.00" insulation in the rear wall to maximize acoustic absorption and thermal insulation.

### **INTERIOR CREW CAB REAR WALL ADJUSTABLE SEATING (PATENT PENDING)**

The interior rear wall of the crew cab will have mounting holes every 2.75" to allow for adjustability of the forward facing crew cab seating along the rear wall. Seats will be adjustable with use of simple hand tools allowing departments flexibility of their seating arrangement should their department needs change.

### **CAB REAR WALL EXTERIOR COVERING**

The exterior surface of the rear wall of the cab will be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered.

### **CAB LIFT**

A hydraulic cab lift system will be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves.

Lift controls will be located on the right side pump panel or front area of the body in a convenient location.

The cab will be capable of tilting 43 degrees to accommodate engine maintenance and removal.

The cab will be locked down by a 2-point normally closed spring loaded hook type latch that fully engages after the cab has been lowered. The system will be hydraulically actuated to release the normally closed locks when the cab lift control is in the raised position and cab lift system is under pressure. When the cab is completely lowered and system pressure has been relieved, the spring loaded latch mechanisms will return to the normally closed and locked position.

The hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally descending when the control is located in the tilt position.

For increased safety, a redundant mechanical stay arm will be provided that must be manually put in place on the left side between the chassis and cab frame when the cab is in the raised position. This device will be manually stowed to its original position before the cab can be lowered.

### **Cab Lift Interlock**

The cab lift system will be interlocked to the parking brake. The cab tilt mechanism will be active only when the parking brake is set and the ignition switch is in the on position. If the parking brake is released, the cab tilt mechanism will be disabled.

### **GRILLE**

A bright finished aluminum mesh grille screen, inserted behind a grille surround, will be provided on the front center of the cab. The grille surround will be painted black #101.

### **DOOR JAMB SCUFFPLATES**

All cab door jambs will be furnished with a 1.00" polished stainless steel scuffplate, mounted on the striker side of the jamb.

### **SCUFFPLATES, REAR CAB CORNER GUARDS**

Both rear cab corners will be furnished with a full height, brushed stainless steel corner guard scuffplate. The guard will extend 2.00" from the corner to protect paint from damage when pulling items (such as booster hose) around the cab.

### **MIRRORS**

A Retrac, Model 613422, dual vision, motorized, west coast style mirror with black finish will be mounted on each side of the front cab door with chrome spring loaded retractable arms. The flat glass and convex glass will be heated and adjustable with remote control within reach of the driver.

### **FRONT CROSS VIEW MIRROR**

An 8.00" diameter convex mirror will be provided over the officer's side front corner of the cab. The mirror will provide the driver with a view of the front bumper and the area several feet in front of the truck.

The mirror housing, tubing, clamps, and hardware will be constructed of corrosion resistant stainless steel.

### **DOORS**

To enhance entry and egress to the cab, the forward cab doors will be a minimum of 37.50" wide x 75.50" high. The crew cab doors will be located on the sides of the cab and will be constructed in the same manner as the forward cab doors. The crew cab door openings will be a minimum of 34.30" wide x 85.50" high.

The forward cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of 0.093". The exterior door skins will be constructed from 0.090" aluminum.

A customized, vertical, pull-down type door handle will be provided on the exterior of each cab door. The finish of the door handle will be chrome/black. The exterior handle will be designed specifically for the fire service to prevent accidental activation, and will provide 4.00" wide x 2.00" deep hand clearance for ease of use with heavy gloved hands.

Each door will also be provided with an interior flush, open style paddle handle that will be readily operable from fore and aft positions, and be designed to prevent accidental activation. The interior handles will provide 4.00" wide x 1.25" deep hand clearance for ease of use with heavy gloved hands.

The cab doors will be provided with both interior (rotary knob) and exterior (keyed) locks exceeding FMVSS standards. The keys will be Model 751. The locks will be capable of activating when the doors are open or closed. The doors will remain locked if locks are activated when the doors are opened, then closed.

A full length, heavy duty, stainless steel, piano-type hinge with a 0.38" pin and 11 gauge leaf will be provided on all cab doors. There will be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.

A chrome grab handle will be provided on the inside of each cab door for ease of entry.

A red webbed grab handle will be installed on the crew cab door stop strap. The grab handles will be securely mounted.

The cab steps at each cab door location will be located inside the cab doors to protect the steps from weather elements.

### **Door Panels**

The inner cab door panels will be constructed out of brushed stainless steel.

### **ELECTRIC OPERATED CAB DOOR WINDOWS**

All four (4) cab doors will be equipped with electric operated windows with one (1) flush mounted automotive style switch on each door. The driver's door will have four (4) switches, one (1) to control each door window.

Each switch will allow intermittent or auto down operation for ease of use. Auto down operation will be actuated by holding the window down switch for approximately 1 second.

### **ELECTRIC CAB DOOR LOCKS**

The front driver and officer doors will have a door lock master switch that will control all front and rear crew cab door locks. Each rear crew cab door will have its own lock control.

There will be one (1) concealed switch located in an easily accessible chassis specific location that will unlock all the doors.

The lock system will include two (2) key FOBs that allow for keyless entry into the vehicle. The key FOB system will use code hopping technology for high security and be FCC part 15 compliant.

### **KEY PAD FOR ELECTRIC DOOR LOCKS**

For improved convenience, the cab door locks will include a Trimark keypad entry system to provide complete keyless entry to the cab. There will be two (2) keypads provided, located one (1) each side of the cab behind the front cab doors. The keypads will include visual and audio feedback to confirm activation and acknowledge correct entry code. For enhanced night time use, the keypads will be lighted. For increased security, the system will allow over 3,000 possible code combinations.

### **CAB STEPS**

The forward cab and crew cab access steps will be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps will be designed with a grip pattern punched into bright aluminum treadplate material to provide support, slip resistance, and drainage. The bottom steps will be a bolt-in design to minimize repair costs should they need to be replaced. The forward cab steps will be a minimum 25.00" wide, and the crew cab steps will be 21.65" wide with a 10.00" minimum depth. The inside cab steps will not exceed 16.50" in height.

The vertical surfaces of the step well will be aluminum treadplate.

### **CAB EXTERIOR HANDRAILS**

A Hansen 1.25" diameter slip-resistant, black anodized knurled aluminum handrail will be provided adjacent to each cab and crew cab door opening to assist during cab ingress and egress. Each handrail will be e-coated and have black powder coated stanchions.

### **STEP LIGHTS**

There will be six (6) white LED step lights with chrome housing installed for cab and crew cab access steps.

- One (1) light for the left access steps.
- Two (2) lights for the left side crew cab access steps.
- Two (2) lights for the right side crew cab access steps.
- One (1) light for the right side access step.

In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light.

The lights will be activated when the battery switch is on and the adjacent door is opened.

### **FENDER CROWNS**

Rubber fender crowns will be provided around the cab wheel openings.

Crowns will be black.

### **STORAGE COMPARTMENT**

Provided on the right side of the cab, to the rear of the crew cab access door, will be a storage compartment.

The compartment will be approximately 12.75" wide x 24.00" high x 15.00" deep.

There will be one (1) double pan door painted to match the cab exterior with a locking, black finish D-ring latch with #751 key. A web strap will be used as a doorstop. The clear door opening will be 10.50" wide x 22.50" high.

The compartment interior will be painted spatter gray.

### **Compartment Light**

There will be one (1) white LED strip light provided on the hinged side of the compartment door opening.

### **SCREEN BELOW GRILLE LETTERING**

There will be lettering provided within the stainless steel screen below the front grille. The lettering will be cut in Helvetica style with a water jet process. The lettering will be centered in the screen. The lettering will read Monroe.

### **CUP HOLDER**

There will be two (2) cup holder(s) provided. Each cup holder will have self-adjusting fingers that automatically grip beverage containers of various sizes. A recess in the cup holder will allow it to hold beverage containers with handles.

The cup holder(s) will be located at customer pick-up.

### **CAB DASH**

The driver side dash, switch panel located to the right of the driver, and center console will be an easily removable high impact resistant polymer cover.

The instrument gauge cluster will be surrounded with a high impact ABS plastic contoured to the same shape of the instrument gauge cluster.

The officer side dash will be a flat top design with an upper beveled edge to provide easy maintenance and will be constructed out of aluminum and painted to match the cab interior.

### **MOUNTING PLATE ON ENGINE TUNNEL**

Equipment installation provisions will be installed on the engine tunnel.

A 0.188" smooth aluminum plate will be bolted to the top surface of the engine tunnel. The plate will follow the contour of the engine tunnel and will run the entire length of the engine tunnel. The plate will be spaced off the engine tunnel .50" to allow for wire routing below the plate.

The mounting surface will be painted black.

### **CAB INTERIOR**

The cab interior will be constructed of primarily metal (painted aluminum) to withstand the severe duty cycles of the fire service.

The engine tunnel will be padded and covered, on the top and sides, with dark silver gray 36 ounce leather grain vinyl resistant to oil, grease, and mildew.

For durability and ease of maintenance, the cab interior side walls will be painted aluminum. The rear wall will be painted aluminum.

The headliner will be installed in both forward and rear cab sections. Headliner material will be vinyl. A sound barrier will be part of its composition. Material will be installed on an aluminum sheet and securely fastened to interior cab ceiling.

The forward portion of the cab headliner will permit easy access for service of electrical wiring or other maintenance needs.

All wiring will be placed in metal raceways.

### **CAB INTERIOR UPHOLSTERY**

The cab interior upholstery will be 36 oz dark silver gray vinyl.

## **CAB INTERIOR PAINT**

The cab interior metal surfaces, excluding the rear heater panels, will be painted fire smoke gray, vinyl texture paint.

The rear heater panels will be painted black, vinyl textured paint.

## **CAB FLOOR**

The cab and crew cab floor areas will be covered with Polydamp™ acoustical floor mat consisting of a black pyramid rubber facing and closed cell foam decoupler.

The top surface of the material has a series of raised pyramid shapes evenly spaced, which offer a superior grip surface. Additionally, the material has a 0.25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.

## **DEFROST/AIR CONDITIONING SYSTEM**

A ceiling mounted combination heater, defroster and air conditioning system will be installed in the cab above the engine tunnel area.

### **Cab Defroster**

A 54,000 BTU heater-defroster unit with 690 SCFM of air flow will be provided inside the cab. The heater-defrost will be installed in the forward portion of the cab ceiling. Air outlets will be strategically located in the cab header extrusion per the following:

- One (1) adjustable will be directed towards the left side cab window
- One (1) adjustable will be directed towards the right side cab window
- Six (6) fixed outlets will be directed at the windshield

The defroster will be capable of clearing 98 percent of the windshield and side glass when tested under conditions where the cab has been cold soaked at 0 degrees Fahrenheit for 10 hours, and a 2 ounce per square inch layer of frost/ice has been able to build up on the exterior windshield. The defroster system will meet or exceed SAE J382 requirements.

### **Cab/Crew Auxiliary Heater**

There will be one (1) 31,000 BTU auxiliary heater with 560 SCFM of air flow provided in each outboard rear facing seat risers with a dual scroll blower. An aluminum plenum incorporated into the cab structure used to transfer heat to the forward positions.

### **Air Conditioning**

A 13.10 cubic inch compressor will be installed on the engine.

A roof-mounted condenser with a 78,000 BTU output at 2,400 SCFM that meets and exceeds the performance specification will be installed on the cab roof. Mounting the condenser below the cab or body would reduce the performance of the system and will not be acceptable. The condenser cover to be painted to match the cab roof.

The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 75 degrees Fahrenheit at 50 percent relative humidity within 30 minutes. The cooling

performance test will be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours.

The evaporator unit will be installed in the rear portion of the cab ceiling over the engine tunnel. The evaporator will include one (1) high performance heating core, one (1) high performance cooling core with (1) plenum directed to the front and one (1) plenum directed to the rear of the cab. The rear plenum will have a formed plastic cover.

The evaporator unit will have a 52,000 BTU at 690 SCFM rating that meets and exceeds the performance specifications.

Adjustable air outlets will be strategically located on the forward plenum cover per the following:

- Four (4) will be directed towards the seating position on the left side of the cab
- Four (4) will be directed towards the seating position on the right side of the cab

Adjustable air outlets will be strategically located on the rear plenum cover per the following:

- Minimum of five (5) will be directed towards crew cab area

A high efficiency particulate air (HEPA) filter will be included for the system. Access to the filter cover will be secured with four (4) screws.

The air conditioner refrigerant will be R-134A and will be installed by a certified technician.

### **Climate Control**

An automotive style controller will be provided to control the heat and air conditioning system within the cab. The controller will have three (3) functional knobs for fan speed, temperature, and air flow distribution (front to rear) control.

The system will control the temperature of the cab and crew cab automatically by pushing the center of the fan speed control knob. Rotate the center temperature control knob to set the cab and crew cab temperature.

The AC system will be manually activated by pushing the center of the temperature control knob. Pushing the center of the air flow distribution knob will engage the AC for max defrost, setting the fan speeds to 100 percent and directing all air flow to the overhead forward position.

The system controller will be located within panel position #12.

### **Gravity Drain Tubes**

Two (2) condensate drain tubes will be provided for the air conditioning evaporator. The drip pan will have two (2) drain tubes plumbed separately to allow for the condensate to exit the drip pan. No pumps will be provided.

### **SUN VISORS**

Two (2) smoked Lexan™ sun visors will be provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab.

There will be no retention bracket provided to help secure each sun visor in the stowed position.

### **GRAB HANDLES**

A black rubber covered grab handle will be mounted on the door post of the driver and officer's side cab door to assist in entering the cab. The grab handles will be securely mounted to the post area between the door and windshield.

### **ENGINE COMPARTMENT LIGHTS**

There will be one (1) Whelen, Model 3SC0CDCR, 12 volt DC, 3.00" white LED light(s) with Whelen, Model 3FLANGEC, chrome flange kit(s) installed under the cab to be used as engine compartment illumination.

These light(s) will be activated automatically when the cab is raised.

### **ACCESS TO ENGINE DIPSTICKS**

For access to the engine oil and transmission fluid dipsticks, there will be a door on the engine tunnel, inside the crew cab. The door will be on the rear wall of the engine tunnel, on the vertical surface.

The engine oil dipstick will allow for checking only. The transmission dipstick will allow for both checking and filling.

The door will have a rubber seal for thermal and acoustic insulation. One (1) flush lift and turn latch will be provided on the access door.

### **CAB SAFETY SYSTEM**

The cab will be provided with a safety system designed to protect occupants in the event of a side roll or frontal impact, and will include the following:

- A supplemental restraint system (SRS) sensor will be installed on a structural cab member behind the instrument panel. The SRS sensor will perform real time diagnostics of all critical subsystems and will record sensory inputs immediately before and during a side roll or frontal impact event.
- A slave SRS sensor will be installed in the cab to provide capacity for eight (8) crew cab seating positions.
- A fault-indicating light will be provided on the vehicle's instrument panel allowing the driver to monitor the operational status of the SRS system.
- A driver side front air bag will be mounted in the steering wheel and will be designed to protect the head and upper torso of the occupant, when used in combination with the 3-point seat belt.
- A passenger side knee bolster air bag will be mounted in the modesty panel below the dash panel and will be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt.
- Air curtains will be provided in the outboard bolster of outboard seat backs to provide a cushion between occupant and the cab wall.
- Suspension seats will be provided with devices to retract them to the lowest travel position during a side roll or frontal impact event.

- Seat belts will be provided with pre-tensioners to remove slack from the seat belt during a side roll or frontal impact event.

### **Frontal Impact Protection**

The SRS system will provide protection during a frontal or oblique impact event. The system will activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The cab and chassis will have been subjected, via third party test facility, to a crash impact during frontal and oblique impact testing. Testing included all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspensions components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing provided configuration specific information used to optimize the timing for firing the safety restraint system. The sensor will activate the pyrotechnic devices when the correct crash algorithm, wave form, is detected.

The SRS system will deploy the following components in the event of a frontal or oblique impact event:

- Driver side front air bag
- Passenger side knee bolster air bag
- Air curtains mounted in the outboard bolster of outboard seat backs
- Suspension seats will be retracted to the lowest travel position
- Seat belts will be pre-tensioned to firmly hold the occupant in place

### **Side Roll Protection**

The SRS system will provide protection during a fast or slow 90 degree roll to the side, in which the vehicle comes to rest on its side. The system will analyze the vehicle's angle and rate of roll to determine the optimal activation of the advanced occupant restraints.

The SRS system will deploy the following components in the event of a side roll:

- Air curtains mounted in the outboard bolster of outboard seat backs
- Suspension seats will be retracted to the lowest travel position
- Seat belts will be pre-tensioned to firmly hold the occupant in place

### **SEATING CAPACITY**

The seating capacity of the vehicle (including tiller cab and belted seat positions in the rescue body) will be four (4).

### **DRIVER SEAT**

A seat will be provided in the cab for the driver. The seat design will be a cam action type, with air suspension. For increased convenience, the seat will include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control will be a towel-bar style located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have an adjustable reclining back. The seat back will be a high back style with side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A suspension seat safety system will be included. When activated in the event of a side roll, this system will pretension the seat belt and retract the seat to its lowest travel position.

The seat will be furnished with a 3-point, shoulder type seat belt.

### **OFFICER SEAT**

A seat will be provided in the cab for the passenger. The seat will be a fixed type, with no suspension. For optimal comfort, the seat will be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat back will be an SCBA back style with 95 degree fixed recline angle. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A seat safety system will be included. When activated, this system will pretension the seat belt.

The seat will be furnished with a 3-point, shoulder type seat belt.

### **RADIO COMPARTMENT**

A radio compartment will be provided under the officer's seat.

The inside compartment dimensions will be 16.00" wide x 7.50" high x 15.00" deep, with the back of the compartment angled up to match the cab structure.

A drop-down door with one (1) lift and turn latch will be provided for access.

The compartment will be constructed of smooth aluminum and painted to match the cab interior.

### **REAR FACING LEFT SIDE CABINET**

A rear facing cabinet will be provided in the crew cab at the left side outboard position.

The cabinet will be 23.00" wide x 28.00" high x 26.75" deep. The interior door will be web netting. The netting is to be made 1.00" wide nylon material with 2.00" openings permanently fastened on the top with 1.00" cam buckle fasteners on the bottom to secure it. The clear door opening will be 16.00" wide x 25.00" high.

The cabinet will also provide access from outside the cab with one (1) double pan door painted to match the cab exterior with a locking, black finish D-ring latch with #751 key. A web strap will be provided as a door stop. The door will be located on the side of the cab over the wheelwell. The clear door opening will be 17.00" wide x 25.50" high.

The cabinet will include two (2) infinitely adjustable shelves with a 0.75" up-turned lip painted to match the cab interior.

The cabinet will include knockouts provided on the right side of the cabinet for ventilation.

The exterior access will be provided with a polished stainless steel scuffplate on the lower door frame.

The cabinet will be constructed of smooth aluminum and painted to match the cab interior.

#### **Cabinet Light**

There will be one (1) white LED strip light installed on the left side of the interior cabinet door opening. The lights will be controlled by an automatic door switch and a rocker switch on the cabinet exterior.

#### **REAR FACING RIGHT SIDE CABINET**

A rear facing cabinet will be provided in the crew cab at the right side outboard position.

The cabinet will be 22.00" wide x 28.00" high x 26.75" deep. The interior door will be web netting. The netting is to be made with 1.00" wide nylon material with 2.00" openings permanently fastened on the top with 1.00" cam buckle fasteners on the bottom to secure it. The interior clear door opening will be 15.00" wide x 25.00" high.

The cabinet will include two (2) infinitely adjustable shelves with a 0.75" up-turned lip painted to match the cab interior.

The cabinet will include louvers provided on the left side of the cabinet for ventilation.

The cabinet will also provide access from outside the cab with one (1) double pan door painted to match the cab exterior with a locking, black finish D-ring latch with #751 key. The door will be located on the side of the cab over the wheelwell. A web strap will be provided as a door stop. The clear door opening will be 17.00" wide x 25.00" high.

The exterior access will be provided with a polished stainless steel scuffplate on the lower door frame.

The cabinet will be constructed of smooth aluminum and painted to match the cab interior.

#### **Cabinet Light**

There will be one (1) white LED strip light installed on the right side of the exterior cabinet door opening. The lighting will be controlled by an automatic door switch and a rocker switch on the front of the cabinet.

#### **FORWARD FACING LEFT SIDE OUTBOARD SEAT**

There will be one (1) forward facing seat provided at the left side outboard position in the crew cab. The seat will be mounted 2.75" inboard from the standard location.

The seat back will be a high back style with 99 degree fixed recline angle. For optimal comfort, the seat will be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat will include the following feature incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position
- A seat safety system will be included. When activated, this system will pretension the seat belt.

The seat will be furnished with a 3-point, shoulder type seat belt.

### **FORWARD FACING RIGHT SIDE OUTBOARD SEAT**

There will be one (1) forward facing seat provided at the right side outboard position in the crew cab. The seat will be mounted 2.75" inboard from the standard location.

The seat back will be a high back style with 99 degree fixed recline angle. For optimal comfort, the seat will be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat will include the following feature incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position
- A seat safety system will be included. When activated, this system will pretension the seat belt.

The seat will be furnished with a 3-point, shoulder type seat belt.

### **SEAT UPHOLSTERY**

All seat upholstery will be leather grain 36 oz black vinyl resistant to oil, grease and mildew. The cab will have four (4) seating positions.

### **AIR BOTTLE HOLDERS**

All SCBA type seats in the cab will have a "Hands-Free" auto clamp style bracket in its backrest. For efficiency and convenience, the bracket will include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp will constrain the SCBA bottle in the seat and will exceed the NFPA standard of 9G.

There will be a quantity of three (3) SCBA brackets.

### **SEAT MOUNT**

All crew cab and officer seats will be mounted as far rearward on the seat riser as possible.

### **SEAT BELTS**

All cab and tiller cab (if applicable) seating positions will have red seat belts. To provide quick, easy use for occupants wearing bunker gear, the female buckle and seat belt webbing length will meet or exceed the current edition of applicable NFPA and CAN/ULC - S515 standards.

The 3-point shoulder type seat belts will include height adjustment. This adjustment will optimize the belts effectiveness and comfort for the seated firefighter. The 3-point shoulder type seat belts will be

furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

The 3-point shoulder type belts will also include the ReadyReach D-loop assembly to the shoulder belt system. The ReadyReach feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.

Any flip up seats will include a 3-point shoulder type belts only.

To ensure safe operation, the seats will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled.

### **HELMET STORAGE PROVIDED BY FIRE DEPARTMENT**

NFPA 1900, 2024 edition, section 11.1.8.4.1 requires a location for helmet storage be provided.

There is no helmet storage on the apparatus as manufactured. The fire department will provide a location for storage of helmets.

### **CAB DOME LIGHTS**

There will be four (4) dual LED dome lights with black bezels provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and two (2) lights will be installed and located, one (1) on each side of the crew cab.

The color of the LED's will be red and white.

The white LED's will be controlled by the door switches and the lens switch.

The color LED's will be controlled by the lens switch.

In order to ensure exceptional illumination, each white LED dome light will provide a minimum of 10.1 foot-candles (fc) covering an entire 20.00" x 20.00" square seating position when mounted 40.00" above the seat.

### **ENHANCED SOFTWARE FOR CAB AND CREW CAB DOME LIGHTS**

The cab and crew cab dome lights will remain on for 10 seconds for improved visibility after the doors are closed.

The dome lights will dim after 10 seconds or immediately if the vehicle's transmission is put into gear.

### **PORTABLE HAND LIGHTS PROVIDED BY FIRE DEPARTMENT**

The hand lights are not on the apparatus as manufactured. The fire department will provide and mount these hand lights.

### **CAB INSTRUMENTATION**

The cab instrument panel include gauges, an LCD display, telltale indicator lamps, control switches, alarms, and a diagnostic panel. The function of the instrument panel controls and switches will be identified by a label adjacent to each item. Actuation of the headlight switch will illuminate the labels in low light conditions. Telltale indicator lamps will not be illuminated unless necessary. The cab instruments and controls will be conveniently located within the forward cab section, forward of the

driver. The gauge assembly and switch panels are designed to be removable for ease of service and low cost of ownership.

### **Gauges**

The gauge panel will include the following ten (10) black faced gauges with black bezels to monitor vehicle performance:

- Voltmeter gauge (volts):
  - Low volts (11.8 VDC)
    - Amber caution indicator on the information center with intermittent alarm
    - Amber caution light on gauge assembly
  - High volts (15.5 VDC)
    - Amber caution indicator on the information center with intermittent alarm
    - Amber caution light on gauge assembly
  - Very low volts (11.3 VDC)
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly
  - Very high volts (16.0 VDC)
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly
- Engine Tachometer (RPM)
- Speedometer MPH (Major Scale), KM/H (Minor Scale)
- Fuel level gauge (Empty - Full in fractions):
  - Low fuel (1/8 full)
    - Amber caution indicator on the information center with intermittent alarm
    - Amber caution light on gauge assembly
  - Very low fuel (1/32 full)
    - Red caution indicator on the information center with steady alarm
    - Amber caution light on gauge assembly
- Engine Oil pressure Gauge (PSI):
  - Low oil pressure to activate engine warning lights and alarms
    - Red caution indicator on the information center with steady alarm
    - Amber caution light on gauge assembly
- Front Air Pressure Gauges (PSI):
  - Low air pressure to activate warning lights and alarm
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly
- Rear Air Pressure Gauges (PSI):
  - Low air pressure to activate warning lights and alarm
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly
- Transmission Oil Temperature Gauge (Fahrenheit):
  - High transmission oil temperature activates warning lights and alarm
    - Amber caution indicator on the information center with intermittent alarm

- Amber caution light on gauge assembly
- Engine Coolant Temperature Gauge (Fahrenheit):
  - High engine temperature activates an engine warning light and alarms
    - Amber caution indicator on the information center with intermittent alarm
    - Amber caution light on gauge assembly
- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions):
  - Low fluid (1/8 full)
    - Amber indicator light in gauge dial

All gauges will perform prove out at initial power-up to ensure proper performance.

### **Indicator Lamps**

To promote safety, the following telltale indicator lamps will be located on the instrument panel in clear view of the driver. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols.

The following amber telltale lamps will be present:

- Low coolant
- Trac cntl (traction control) (where applicable)
- Check engine
- Check trans (check transmission)
- Aux brake overheat (Auxiliary brake overheat)
- Air rest (air restriction)
- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)
- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- Side roll fault (where applicable)
- Front air bag fault (where applicable)

The following red telltale lamps will be present:

- Warning (stop sign symbol)
- Seat belt
- Parking brake
- Stop engine
- Rack down

The following green telltale lamps will be provided:

- Left turn
- Right turn
- Battery on

The following blue telltale lamp will be provided:

- High beam

### **Alarms**

Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.

Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided whenever a caution message is present without a warning message being present.

Alarm silence: Any active audible alarm will be able to be silenced by holding the ignition switch at the top position for three (3) to five (5) seconds. For improved safety, silenced audible alarms will intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp will act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition will enable the steady or pulsing tones respectively.

### **Indicator Lamp and Alarm Prove-Out**

A system will be provided which automatically tests telltale indicator lights and alarms located on the cab instrument panel. Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

### **Control Switches**

For ease of use, the following controls will be provided immediately adjacent to the cab instrument panel within easy reach of the driver. All switches will have backlit labels for low light applications.

Headlight/Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking and headlights. The second switch position will activate the parking lights. The third switch will activate the headlights.

Panel back lighting intensity control switch: A three (3)-position momentary rocker switch will be provided. Pressing the top half of the switch, "Panel Up" increases the panel back lighting intensity and pressing the bottom half of the switch, "Panel Down" decreases the panel back lighting intensity. Pressing the half or bottom half of the switch several times will allow back lighting intensity to be gradually varied from minimum to maximum intensity level for ease of use.

Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will turn off and deactivate vehicle ignition. The second switch position will activate vehicle ignition and will perform prove-out on the telltale indicators and alarms for 3 to 5 seconds after the switch is turned on. A green indicator lamp is activated with vehicle ignition. The third momentary position will temporarily silence all active cab alarms. An alarm "chirp" may continue as long as alarm condition exists. Switching ignition to off position will terminate the alarm silence feature and reset function of cab alarm system.

Engine start switch: A two (2)-position momentary rocker switch will be provided. The first switch position is the default switch position. The second switch position will activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.

Hazard switch will be provided on the instrument panel or on the steering column.

Heater, defroster, and air conditioning control panel.

Turn signal arm: A self-canceling turn signal with high beam headlight controls will be provided.

Windshield wiper control will have high, low and intermittent modes.

Parking brake control: An air actuated push/pull park brake control valve will be provided.

Chassis horn control: Activation of the chassis horn control will be provided through the center of the steering wheel.

High idle engagement switch: A momentary rocker switch with integral indicator lamp will be provided. The switch will activate and deactivate the high idle function. The "OK To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch will indicate when the high idle function is engaged.

"OK To Engage High Idle" indicator lamp: A green indicator light will be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

Emergency switching will be controlled by multiple individual warning light switches for various groups or areas of emergency warning lights. An Emergency Master switch provided on the instrument panel that enables or disables all individual warning light switches is included.

An additional "Emergency Master" button will be provided on the lower left hand corner of the gauge panel to allow convenient control of the "Emergency Master" system from inside the driver's door when standing on the ground.

### **Custom Switch Panels**

The design of cab instrumentation will allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There will be positions for up to four (4) switch panels in the lower instrument console and up to six (6) switch panels in the overhead visor console. All switches have backlit labels for low light conditions.

### **Diagnostic Panel**

A diagnostic panel will be accessible while standing on the ground and located inside the driver's side door left of the steering column. The diagnostic panel will allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches will allow ABS systems to provide blink codes should a problem exist.

The diagnostic panel will include the following:

- Engine diagnostic port

- Transmission diagnostic port
- ABS diagnostic port
- Roll sensor diagnostic port
- Command Zone USB diagnostic port
- ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
- Diesel particulate filter regeneration switch (where applicable)
- Diesel particulate filter regeneration inhibit switch (where applicable)

### **Cab LCD Display**

A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the outside ambient temperature.

The upper right section will display the following, along with other configuration specific information:

- Odometer
- Trip mileage
- PTO hours
- Fuel consumption
- Engine hours

The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.

### **AIR RESTRICTION INDICATOR**

A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm will be provided.

### **"DO NOT MOVE APPARATUS" INDICATOR**

A flashing red indicator light, located in the driving compartment, will be illuminated automatically per the current NFPA requirements. The light will be labeled "Do Not Move Apparatus If Light Is On."

The same circuit that activates the Do Not Move Apparatus indicator will activate a pulsing alarm when the parking brake is released.

### **DO NOT MOVE TRUCK MESSAGES**

Messages will be displayed on the Command Zone™, color display located within sight of the driver whenever the Do Not Move Truck light is active. The messages will designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).

The following messages will be displayed (where applicable):

- Do Not Move Truck
- DS Cab Door Open (Driver Side Cab Door Open)
- PS Cab Door Open (Passenger's Side Cab Door Open)

- DS Crew Cab Door Open (Driver Side Crew Cab Door Open)
- PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- DS Body Door Open (Driver Side Body Door Open)
- PS Body Door Open (Passenger's Side Body Door Open)
- Rear Body Door Open
- DS Ladder Rack Down (Driver Side Ladder Rack Down)
- PS Ladder Rack Down (Passenger Side Ladder Rack Down)
- Deck Gun Not Stowed
- Lt Tower Not Stowed (Light Tower Not Stowed)
- Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
- Aerial Not Stowed (Aerial Device Not Stowed)
- Stabilizer Not Stowed
- Steps Not Stowed
- Handrail Not Stowed

Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved will be displayed as a caution message after the parking brake is disengaged.

### **SWITCH PANELS**

The emergency light switch panel will have a master switch for ease of use plus individual switches for selective control. Each switch panel will contain eight (8) membrane-type switches each rated for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments will include non-functioning black appliques. The built-in switch panels will be located in the lower console or overhead console of the cab.

Additional switch panel(s) will be located in the overhead position(s) above the windshield or in designated locations on the lower instrument panel layout.

The switches will be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch will be illuminated white whenever back lighting is activated and illuminated green whenever the switch is active. An active illuminated switch will flash when interlock requirements are not met or device is actively being load managed. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch will be placed in the center of the switch. The label will allow light to pass through the letters for ease of use in low light conditions.

### **WIPER CONTROL**

Wiper control will consist of a two (2)-speed windshield wiper control with intermittent feature and windshield washer controls. The control will be located in the left hand pod of the steering wheel.

### **HOURMETER - AERIAL DEVICE**

The following aerial hour meter messages will be included in the information centers:

- Aerial Hours, that keeps track of the time the aerial device is in motion.

- Aerial PTO Hours, that keeps track of the time the aerial master switch is on and the aerial PTO is engaged.

### **AERIAL MASTER**

There will be a master switch for the aerial operating electrical system provided.

### **AERIAL PTO SWITCH**

A PTO switch for the aerial with indicator light will be provided.

### **SPARE CIRCUIT**

There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power
- The negative wire will be connected to ground
- Wires will be protected to 15 amps at 12 volts DC
- Power and ground will terminate TBD
- Termination will be with a 10-place bus bar with screws and removable cover
- Wires will be sized to 125 percent of the protection

Battery direct loads cannot be Load Managed

### **INFORMATION CENTER**

An information center employing a 7.00" diagonal touch screen color LCD display will be encased in an ABS plastic housing.

The information center will have the following specifications:

- Operate in temperatures from -40 to 158 degrees Fahrenheit
- LCD optically bonded to hardened AR glass lens
- Five weather resistant user interface switches
- Grey with black accents
- Sunlight Readable
- Linux operating system
- Minimum of 1000nits rated display
- Display can be changed to an available foreign language
- A LCD display integral to the cab gauge panel will be included as outlined in the cab instrumentation area.
- Programmed to read US Customary

### **General Screen Design**

Where possible, background colors will be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background will be used.

If a caution or warning situation arises the following will occur:

- An amber background/text color will indicate a caution condition
- A red background/text color will indicate a warning condition
- The information center will utilize an "Alert Center" to display text messages for audible alarm tones. The text messages will be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages will cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" will change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color will be shown for all alert center messages.
- A label for each button will exist. The label will indicate the function for each active button for each screen. Buttons that are not utilized on specific screens will have a button label with no text or symbol.

### **Home/Transit Screen**

This screen will display the following:

- Vehicle Mitigation (if equipped)
- Water Level (if the water level system includes compatible communications to the information center)
- Foam Level (if the foam level system includes compatible communications to the information center)
- Seat Belt Monitoring Screen
- Tire Pressure Monitoring (if equipped)
- Digital Speedometer
- Active Alarms

### **On Scene Screen**

This screen will display the following and will be auto activated with pump engaged (if equipped):

- Battery Voltage
- Fuel
- Oil Pressure
- Coolant Temperature
- RPM
- Water Level (if equipped)
- Foam Level (if equipped)
- Foam Concentration (if equipped)
- Water Flow Rate (if equipped)
- Water Used (if equipped)
- Active Alarms

### **Virtual Buttons**

There will be four (4) virtual switch panel screens that match the overhead and lower lighting and HVAC switch panels.

## **Page Screen**

The page screen will display the following and allow the user to progress into other screens for further functionality:

- **Diagnostics**
  - **Faults**
    - Listed by order of occurrence
    - Allows to sort by system
  - **Interlock**
    - Throttle Interlocks
    - Pump Interlocks (if equipped)
    - Aerial Interlocks (if equipped)
    - PTO Interlocks (if equipped)
  - **Load Manager**
    - A list of items to be load managed will be provided. The list will provide a description of the load.
    - The lower the priority numbers the earlier the device will be shed should a low voltage condition occur.
    - The screen will indicate if a load has been shed (disabled) or not shed.
    - "At a glance" color features are utilized on this screen.
  - **Systems**
    - **Command Zone**
      - Module type and ID number
      - Module Version
      - Input or output number
      - Circuit number connected to that input or output
      - Status of the input or output
      - Power and Constant Current module diagnostic information
    - Foam (if equipped)
    - Pressure Controller (if equipped)
    - Generator Frequency (if equipped)
  - **Live Data**
    - General Truck Data
- **Maintenance**
  - Engine oil and filter
  - Transmission oil and filter
  - Pump oil (if equipped)
  - Foam (if equipped)
  - Aerial (if equipped)
- **Setup**
  - Clock Setup
  - Date & Time
    - 12 or 24 hour format
    - Set time and date

- Backlight
  - Daytime
  - Night time
  - Sensitivity
- Unit Selection
- Home Screen
- Virtual Button Setup
- On Scene Screen Setup
- Configure Video Mode
  - Set Video Contrast
  - Set Video Color
  - Set Video Tint
- Do Not Move
  - The screen will indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices will be indicated
    - Driver Side Cab Door
    - Passenger's Side Cab Door
    - Driver Side Crew Cab Door
    - Passenger's Side Crew Cab Door
    - Driver Side Body Doors
    - Passenger's Side Body Doors
    - Rear Body Door(s)
    - Ladder Rack (if applicable)
    - Deck Gun (if applicable)
    - Light Tower (if applicable)
    - Hatch Door (if applicable)
    - Stabilizers (if applicable)
    - Steps (if applicable)
- Notifications
  - View Active Alarms
    - Shows a list of all active alarms including date and time of the occurrence is shown with each alarm
    - Silence Alarms - All alarms are silenced
- Timer Screen
- HVAC (if equipped)
- Tire Information (if equipped)
- Ascendant Set Up Confirmation (if equipped)

Button functions and button labels may change with each screen.

### **COLLISION MITIGATION**

There will be a HAAS Alert®, Model HA7 Responder-to-Vehicle (R2V) collision avoidance system provided on the apparatus. The HA7 cellular transponder module will be installed behind the cab windshield, as high and near to the center as practical, to allow clear visibility to the sky. The module

dimensions are 5.40" long x 2.70" wide x 1.30" high, and operating temperature range is -40 degrees Celsius to 85 degrees Celsius.

The transponder will be connected to the vehicle's emergency master circuit and battery direct power and ground.

While responding with emergency lights on, the HA7 transponder sends alert messages via cellular network to motorists in the vicinity of the responding truck that are equipped with the WAZE app.

While on scene with emergency lights on, the HA7 transponder sends road hazard alerts to motorists in the vicinity of the truck that are equipped with the WAZE app.

The HA7 Responder-to-Vehicle (R2V) collision avoidance system will include the transponder and a 5 year cellular plan subscription.

Activation of the HAAS Alert system requires a representative of the customer to accept the End User License Agreement (EULA) via an on-line portal.

### **VEHICLE DATA RECORDER**

There will be a vehicle data recorder (VDR) capable of reading and storing vehicle information provided.

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A USB cable can be used to connect the VDR to a laptop to retrieve required information. The program to download the information from the VDR will be available to download on-line.

The vehicle data recorder will be capable of recording the following data via hardwired and/or CAN inputs:

- Vehicle Speed - MPH
- Acceleration - MPH/sec
- Deceleration - MPH/sec
- Engine Speed - RPM
- Engine Throttle Position - % of Full Throttle
- ABS Event - On/Off
- Seat Occupied Status - Yes/No by Position
- Seat Belt Buckled Status - Yes/No by Position
- Master Optical Warning Device Switch - On/Off
- Internal clock syncs the time and date when a laptop is connected

### **Seat Belt Monitoring System**

A seat belt monitoring system (SBMS) will be provided on the Command Zone™ color display and in the center overhead of the cab instrument panel. The SBMS will be capable of monitoring up to 10 seating positions indicating the status of each seat position per the following:

- Seat Occupied & Buckled = Green LED indicator illuminated

- Seat Occupied & Unbuckled = Red LED indicator with audible alarm
- No Occupant & Buckled = Red LED indicator with audible alarm
- No Occupant & Unbuckled = No indicator and no alarm

The seat belt monitoring screen will become active on the Command Zone color display when:

- The home screen is active:
  - and there is any occupant seated but not buckled or any belt buckled with an occupant.
  - and there are no other Do Not Move Apparatus conditions present. As soon as all Do Not Move Apparatus conditions are cleared, the SBMS will be activated.

The SBMS will include an audible alarm that will warn that an unbuckled occupant condition exists and the parking brake is released, or the transmission is not in park.

### **INTERCOM SYSTEM**

There will be a four (4) position David Clark, Model U3800, intercom system with single radio interface capability at the driver and officer positions and remote radio push to talk buttons located TBD. Two (2) crew cab outboard seats will have intercom only capability.

The following components will be provided:

- One (1) U3805 Radio Cord Junction Module
- Two (2) U3815 Radio interface modules (Driver, Officer)
- Two (2) Remote Push To Talk Button Kits
- One (1) U3800 Master station (1 Crew)
- One (1) U3801 Remote headset intercom station (1 Crew)
- One (1) C3820 Power cord
- All necessary station cables and connectors

### **RADIO / INTERCOM INTERFACE INCLUDED**

All radio interfaced stations will have universal radio interfaces installed. The interface wiring will be routed within the cab to TBD .

### **OVER THE HEAD HEADSET**

There will be four (4) over the head, headset(s) provided Each cab set.

Each David Clark, Model H3432, headset will feature:

- 5' Coiled cord
- Noise cancelling electric microphone
- Flexible microphone boom rotates 200 degrees for left or right dress
- Microphone on/off button
- Comfort Gel Earseals
- 23 dB noise reduction

### **HEADSET HANGERS**

There will be four (4) headset hanger(s) installed driver's seat, officer's seat, driver's side outboard forward facing seat and driver's side outboard rear facing seat. The hanger(s) will meet the current edition of applicable NFPA standards for equipment mounting.

### **RADIO ANTENNA MOUNT**

There will be three (3) standard 1.125", 18 thread antenna-mounting base(s) installed one (1) on the left side and one (1) on the right side on the cab roof with high efficiency, low loss, coaxial cable(s) routed to the instrument panel area. A weatherproof cap will be installed on the mount.

### **VEHICLE CAMERA SYSTEM**

There will be a color vehicle camera system provided with the following:

- One (1) Analog High Definition (AHD) black camera located at the rear of the apparatus, pointing rearward, displayed automatically with the vehicle in reverse.

The camera image will be displayed on a 7.00" High Definition (HD) display located mounted in the driver's side overhead, location to be specified at pick up.. The display will include manual camera activation capability and audio from the active camera.

The following components will be included:

- One (1) HD700136DC, display
- One (1) 1080p AHD rear camera
- All necessary cables

### **Camera Switcher**

A camera switcher is not required.

### **ELECTRICAL POWER CONTROL SYSTEM**

The primary power distribution will be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible.

Distribution centers located throughout the vehicle will contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting). When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

### **Solid-State Control System**

A solid-state electronics based control system will be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network will consist of electronic modules, electronic control modules to include black housings, a power indicator and status indicator located near their point of use to reduce harness lengths and improve reliability. The control system will comply with SAE J1939-11 recommended practices.

The control system will operate as a master-slave system whereas the main control module instructs all other system components. The system will contain patented Mission Critical software that maintains critical vehicle operations in the unlikely event of a main controller error. The system will utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership.

For increased reliability and simplified use the control system modules will include the following attributes:

- Green LED indicator light for module power
- Red LED indicator light for network communication stability status
- Control system self test at activation and continually throughout vehicle operation
- No moving parts due to transistor logic
- Software logic control for NFPA mandated safety interlocks and indicators
- Integrated electrical system load management without additional components
- Integrated electrical load sequencing system without additional components
- Customized control software to the vehicle's configuration
- Factory and field programmable to accommodate changes to the vehicle's operating parameters

To assure long life and operation in a broad range of environmental conditions, the solid-state control system modules will meet the following specifications:

- Module circuit board will meet SAE J771 specifications
- Operating temperature from -40 degrees Celsius to +70 degrees Celsius
- Storage temperature from -40 degrees Celsius to +70 degrees Celsius
- Vibration to 50g
- IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)
- Operating voltage from eight (8) volts to 32 volts DC

The main controller will activate status indicators and audible alarms designed to provide warning of problems before they become critical.

### **Circuit Protection and Control Diagram**

Copies of all job-specific, computer network input and output (I/O) connections will be provided with each chassis. The sheets will indicate the function of each module connection point, circuit protection information (where applicable), wire numbers, wire colors and load management information.

### **On-Board Electrical System Diagnostics**

The on-board information center will include the following diagnostic information:

- Text description of active warning or caution alarms
- Simplified warning indicators
- Amber caution indication with intermittent alarm
- Red warning indication with steady tone alarm

Advanced diagnostic feature will be provided in this control system. From the Command Zone display or connected wireless device, these features allow the user to monitor the real-time status of every input or output on the vehicle. It also allows users logged in as an administrator to force on inputs or outputs to assist the troubleshooting process.

### **TCU Module with WiFi**

An in cab module will provide WiFi wireless interface and data logging capability. The WiFi interface will comply with IEEE 802.11 b/g/n capabilities while communicating at 2.4 Gigahertz. The module will communicate through a black WiFi antenna allowing a line of site communication range of up to 300 feet with a roof mounted antenna.

The module will transmit a password protected web page to a WiFi enabled device (i.e. most smart phones, tablets or laptops) allowing two levels of user interaction. The firefighter level will allow vehicle monitoring of the vehicle and firefighting systems on the apparatus. The technician level will allow diagnostic access to inputs and outputs installed on the Command Zone™, control and information system.

The TCU capability will record faults from the engine, transmission, ABS and Command Zone™, control and information systems as they occur. No other data will be recorded at the time the fault occurs. The data TCU will provide up to 2 Gigabytes of data storage.

The TCU will provide a means to download the TCU information and update software in the device.

### **Indicator Light and Alarm Prove-Out System**

A system will be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.

### **Voltage Monitor System**

A voltage monitoring system will be provided to indicate the status of the battery system connected to the vehicle's electrical load. The system will provide visual and audible warning when the system voltage is below or above optimum levels.

The alarm will activate if the system falls below 11.8 volts DC for more than two (2) minutes.

### **Dedicated Radio Equipment Connection Points**

There will be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment. The studs will consist of the following:

- 12-volt 40-amp battery switched power

- 12-volt 60-amp ignition switched power
- 12-volt 60-amp direct battery power

There will also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.

### **EMI/RFI Protection**

To prevent erroneous signals from crosstalk contamination and interference, the electrical system will meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system will be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.

The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter requirements. Component and partial (incomplete) vehicle testing is not adequate as overall vehicle design can impact test results and thus is not acceptable by itself.

EMI/RFI susceptibility will be controlled by applying appropriate circuit designs and shielding. The electrical system will be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

### **ELECTRICAL SYSTEM PROGNOSTICS**

There will be a software based vehicle tool provided to predict remaining life of the vehicles critical fluid and events.

The system will send automatic indications to the Command Zone™ information center and/or wireless enabled devices to proactively alert of upcoming service intervals.

Prognostics will include the following:

- Engine oil and filter
- Transmission oil and filter

### **ELECTRICAL**

All 12-volt electrical equipment installed by the apparatus manufacturer will conform to modern automotive practices. All wiring will be high temperature crosslink type. Wiring will be run, in loom or conduit, where exposed and have grommets where wire passes through sheet metal. Automatic reset circuit breakers will be provided which conform to SAE Standards. Wiring will be color, function and number coded. Function and number codes will be continuously imprinted on all wiring harness conductors at 2.00" intervals. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

Electrical wiring and equipment will be installed utilizing the following guidelines:

1. All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.
2. Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.
3. Electrical components designed to be removed for maintenance will not be fastened with nuts and bolts. Metal screws will be used in mounting these devices. Also a coil of wire will be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.
4. Corrosion preventative compound will be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation (of the plug).
5. All lights that have their sockets in a weather exposed area will have corrosion preventative compound added to the socket terminal area.
6. All electrical terminals in exposed areas will have silicon applied completely over the metal portion of the terminal.

All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, will be furnished. Rear identification lights will be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads will be protected from damage by installing a false bulkhead inside the rear compartments.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

The results of the tests will be recorded and provided to the purchaser at time of delivery.

### **BATTERY SYSTEM**

There will be four (4) 12 volt Stryten/Exide®, Model 31S950X5W, batteries that include the following features will be provided:

- 950 CCA, cold cranking amps
- 190 amp reserve capacity
- High cycle
- Group 31
- Rating of 3800 CCA at 0 degrees Fahrenheit
- 760 minutes of reserve capacity
- Threaded stainless steel studs

Each battery case will be a black polypropylene material with a vertically ribbed container for increased vibration resistance. The cover will be manifold vented with a central venting location to allow a 45 degree tilt capacity.

The inside of each battery will consist of a "maintenance free" grid construction with poly wrapped separators and a flooded epoxy bottom anchoring for maximum vibration resistance.

### **BATTERY SYSTEM**

There will be a single starting system with an ignition switch and starter button provided and located on the cab instrument panel.

### **MASTER BATTERY SWITCH**

There will be a master battery switch provided within the cab within easy reach of the driver to activate the battery system.

An indicator light will be provided on the instrument panel to notify the driver of the status of the battery system.

### **BATTERY COMPARTMENTS**

Batteries will be placed on non-corrosive mats and be stored in well ventilated compartments located under the cab and bolted directly to the chassis frame. The battery boxes will have reinforced sides. The battery compartments will be constructed of 0.188" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The battery hold-downs will be of a non-corrosive material. All bolts and nuts will be stainless steel.

Heavy-duty, 2/0 gauge, color coded battery cables will be provided. Battery terminal connections will be coated with anti-corrosion compound.

Battery solenoid terminal connections will be encapsulated with semi-permanent rubberized compound.

### **JUMPER STUDS**

One (1) set of battery jumper studs with plastic color-coded covers will be included on the battery compartments.

### **BATTERY CHARGER**

There will be a Kussmaul™, Chief Series Smart Charger 6012, product code 091-266-12-60, 60 amp battery charger with build-in touch screen display provided.

The battery charger will be wired to the AC shoreline inlet through a junction box located near the battery charger.

The battery charger will be located in the cab behind the driver seat.

### **REMOTE CONTROL PANEL - BATTERY CHARGER**

There will be a Kussmaul™, Chief Series Smart Charger remote control panel, product code 091-266-RCP included.

The battery charger indicator will be located on the driver's seat riser.

## INVERTER

There will be a Xantrex Model XPower 450, 12 volt DC to 120 volt AC inverter with an external transfer relay provided. There will be battery switched power, through proper fusing, to 12 volt DC threaded studs installed adjacent to the inverter for the power input connection.

The inverter 120 volt AC output will be connected to an external transfer relay. The transfer relay will be actuated whenever the 120 volt AC shoreline is connected.

When the shoreline is connected to the truck, the external transfer relay will allow AC shoreline power to pass to the VAC loads connected to the inverter. The inverter connected VAC loads will be energized under the following conditions:

- When the battery switch is on.
- When the battery switch is on and the 120V AC shoreline is connected.
- When the battery switch is off and the 120V AC shoreline is connected.

The inverter will be de-energized when the battery switch is off.

This inverter will be rated at 337 watts to meet NFPA requirements.

## INVERTER LOCATION

The Inverter will be located in the left side forward body compartment located on the left wall as high as practical.

## REVIEW REQUIRED, INVERTER

After analyzing historical data, Pierce has concluded that the mission critical loads of orders containing inverters consistently exceeds the capacity of the alternator.

Options for inverters and inverter/chargers must be created to show the current edition of applicable NFPA standards de-rate, quantitative value, and supplier inverter installation requirements for mounting locations determined by distance from batteries.

To best serve our customers and prevent order validation errors, all inverter option requests will now require a **technical review to be performed by Electrical Engineering or an Electrical Product Coordinator**.

After a review has been performed and determined to be within acceptable parameters to ensure the functional integrity of the apparatus electrical system, SP 889570 (Approved, Inverter) will be sent to the requesting proposal that will clear the validation issue relating to the inverter requested.

If after the review it is determined that the inverter request is unacceptable regarding maintaining the functional integrity of the apparatus electrical system, suggestions may be made from the reviewer to the sales representative of the proposal of possible changes that would bring the inverter application into acceptable compliance with the functional integrity of the apparatus electrical system. Otherwise, the request will be denied.

Requests for inverters rated above 1500W by the manufacturer will be labeled Non-NFPA and will be load managed. If the technical review of an order finds that the chassis alternator cannot support 1500W or lower inverter options, a Non-NFPA option will have to be requested.

### **AUTO EJECT FOR SHORELINE**

There will be one (1) Kussmaul™, Model 091-55-20-120, 20 amp 120 volt AC shoreline inlet(s) provided to operate the dedicated 120 volt AC circuits on the apparatus.

The shoreline inlet(s) will include red weatherproof flip up cover(s).

There will be a release solenoid wired to the vehicle's starter to eject the AC connector when the engine is starting.

The shoreline(s) will be connected to the battery charger.

There will be a mating connector body supplied with the loose equipment.

There will be a label installed near the inlet(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency

The shoreline receptacle will be located on the driver side of cab, above wheel.

### **ALTERNATOR**

A Delco Remy®, Model 55SI, alternator will be provided. It will have a rated output current of 430 amps, as measured by SAE method J56. The alternator will feature an integral regulator and rectifier system that has been tested and qualified to an ambient temperature of 257 degrees Fahrenheit (125 degrees Celsius). The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

### **ELECTRONIC LOAD MANAGER**

An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.

For improved reliability and ease of use, the load manager system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components will not be allowed.

The system will include the following features:

- System voltage monitoring.
- A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.

- Sixteen available electronic load shedding levels.
- Priority levels can be set for individual outputs.
- High Idle to activate before any electric loads are shed and deactivate with the service brake.
  - If enabled:
    - "Load Man Hi-Idle On" will display on the information center.
    - Hi-Idle will not activate until 30 seconds after engine start up.
- Individual switch "on" indicator to flash when the particular load has been shed.
- The information center indicates system voltage.

The information center, where applicable, includes a "Load Manager" screen indicating the following:

- Load managed items list, with priority levels and item condition.
- Individual load managed item condition:
  - ON = not shed
  - SHED = shed

### **SEQUENCER**

A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation will allow a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12 volt load to prolong the life of the alternator.

For improved reliability and ease of use, the load sequencing system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components will not be allowed.

Emergency light sequencing will operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights will be activated one by one at half-second intervals. Sequenced emergency light switch indicators will flash while waiting for activation.

When the emergency master switch is deactivated, the sequencer will deactivate the warning light loads in the reverse order.

Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:

- Cab Heater and Air Conditioning
- Crew Cab Heater (if applicable)
- Crew Cab Air Conditioning (if applicable)
- Exhaust Fans (if applicable)
- Third Evaporator (if applicable)

### **HEADLIGHTS**

There will be a HiViz part number FT-4X6-4KIT, that includes four (4) 4.00" high x 6.00" long rectangular LED lights with parking lamp illumination around the outside of the lamps mounted in the front quad style housings on each side of the cab grille:

- the outside lamp on each side will contain a part number FT-4X6-HL with low beam LEDs
- the inside lamp on each side will contain a part number FT-4X6-H with high beam LEDs
- the lights will be controlled through the headlight switch

The headlight housing and headlight trim to be painted black.

### **DIRECTIONAL LIGHTS**

There will be two (2) HiViz FT-TL-GSMJR-TURN, LED combination directional/marker lights with black trim provided. The lights will be located on the outside cab corners, next to the headlights.

The color of the lenses will be amber.

### **INTERMEDIATE LIGHT**

There will be two (2) Weldon, Model 9186-8580-29, amber LED turn signal marker lights furnished, one (1) each side, in the rear fender panel. The light will double as a turn signal and marker light.

### **CAB CLEARANCE/MARKER/ID LIGHTS**

There will be seven (7) amber LED lights provided per the following:

- Three (3) amber LED identification lights will be installed in the center of the cab above the windshield.
- Two (2) amber LED clearance lights will be installed, one (1) on each outboard side of the cab above the windshield as close to the outside of the apparatus as practical.
- Two (2) amber LED clearance lights will be installed, one (1) on each side of the cab as high and far forward as practical.

The lights will be installed without guards.

### **FRONT CAB SIDE DIRECTIONAL/MARKER LIGHTS**

There will be two (2) Truck-Lite®, Model 19036Y, amber LED lights installed to the outside of the chrome wrap around bezel, one (1) on each side of the cab.

The lights will activate as marker lights with the headlight switch and directional lights with the corresponding directional circuit.

### **REAR CLEARANCE/MARKER/ID LIGHTING**

There will be three (3) LED identification lights located at the rear installed per the following:

- As close as practical to the vertical centerline
- Centers spaced not less than 6.00" or more than 12.00" apart
- Red in color
- All at the same height

There will be two (2) LED lights installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

- To indicate the overall width of the vehicle
- One (1) each side of the vertical centerline

- As near the top as practical
- Red in color
- To be visible from the rear
- All at the same height

There will be two (2) LED lights installed on the side of the apparatus used as marker lights as close to the rear as practical per the following:

- To indicate the overall length of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the side
- All at the same height

The lights will be mounted with no guard.

There will be two (2) red reflectors located on the rear of the truck facing to the rear. One (1) each side, as far to the outside as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

There will be two (2) red reflectors located on the side of the truck facing to the side. One (1) each side, as far to the rear as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

Per FMVSS 108 and CMVSS 108 requirements.

### **MARKER LIGHTS**

There will be one (1) pair of amber and red LED marker lights with rubber arm, located at the rear most lower corner of the body. The amber lens will face the front and the red lens will face the rear of the truck.

These lights will be activated with the running lights of the vehicle.

### **REAR FMVSS LIGHTING**

There will be one (1) HiViz FT-TL-GSMJR-TRIPLE-KIT tri-cluster LED modules with black trim provided on the face of the rear body compartments.

Each tri-cluster will include the following:

- One (1) LED stop/tail light
- One (1) LED directional light
- One (1) LED backup light

### **LICENSE PLATE BRACKET**

One (1) license plate bracket constructed of stainless steel will be provided at the rear of the apparatus.

One (1) white LED light with black housing will be provided to illuminate the license plate. A stainless steel light shield will be provided over the light that will direct illumination downward, preventing white light to the rear.

### **BACK-UP ALARM**

A PRECO, Model 1040, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse will be provided. The device will sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.

### **ACCENT LIGHTS**

There will be two (2) Amdor®, Model AY-LB-12HR012, 190 lumen, 12" long, red 12 volt DC LED strip light(s) installed as accent light(s) provided. The accent light(s) will be located behind laser cut screen.

The LED accent light(s) will be activated with the battery switch.

### **CAB PERIMETER SCENE LIGHTS**

There will be four (4) HiViz, Model FT-CU-AQX, 1.24" deep x 4.13" diameter lights with white LEDs on a 45 degree bracket provided per the following:

- one (1) under the driver's side cab access step
- one (1) under the passenger's side cab access step
- one (1) under the passenger's side crew cab access step
- one (1) under the driver's side crew cab access step

The parts of the OEM manufactured light, its bracket and housing are to be black, and the visor bracket to be painted roof job color.

The lights will be activated when the battery switch is on, the respective door is open and by the same control selected for the body perimeter lights.

### **PUMP HOUSE PERIMETER LIGHTS**

There will be one (1) HiViz Model FT-CU-AQX, 1,050 effective lumens 1.24" deep x 4.13" diameter light with white LEDs on a 45 degree bracket provided under the right side pump panel running board.

The lights will be controlled by the same means as the body perimeter lights.

### **BODY PERIMETER SCENE LIGHTS**

There will be one (1) Amdor®, Model AY-LB-12HW020, 20.00" 12 volt DC LED strip light provided under the side turntable access steps.

The perimeter scene lights will be activated when the parking brake is applied.

### **ENHANCED SOFTWARE FOR PERIMETER LIGHTS**

All perimeter lights will be deactivated when the parking brake is released unless alternate control is selected.

The cab and crew cab perimeter lights will remain on for ten (10) seconds for improved visibility after the doors closed.

### **12 VOLT LIGHTING**

There will be a HiViz Model FT-B-X-72-\*-\* , 2.49" high x 72.68" long x 2.45" deep 21,251 effective lumens 12 volt DC light with white LEDs configured with a combination of flood and spot optics provided on the front cab brow of the cab roof. There shall be a visor bracket to hold the top of the light flush with the top of the cab.

The parts of the OEM manufactured light, its bracket and housing are to be black, and the visor bracket to be painted roof job color.

The light will be activated by a switch at the driver's side switch panel and by a switch at the passenger's side switch panel.

The light may be load managed when the parking brake is applied.

### **12 VOLT LIGHTING**

There will be one (1) HiViz Model FT-MB-2.27-\*-\* , 3.46" high x 30.20" long x 3.31" deep, 28,512 raw lumens 12 volt DC light(s) with a combination of flood and spot optics and adjustable mounting brackets installed on the cab Each side of cab centered. . The light(s) to be installed directly to the roof of the cab.

The parts of the OEM manufactured light, its bracket and housing are to be black, and the visor bracket to be painted roof job color.

The light(s) will be activated by a switch at the driver's side switch panel and by a switch at the passenger's side switch panel.

The light(s) may be load managed when the parking brake is applied.

### **12 VOLT LIGHTING**

There will four (4) HiViz Model FT-B-46-\*-\* , 13,306 lumens 2.56" high x 46.00" long x 2.45" deep 12 volt DC light(s) with white LEDs and with a combination of spot, and flood optics installed on the apparatus located, (2) on each side of the body. one forward and one rearward.

The parts of the OEM manufactured light, its bracket and housing are to be black, and the visor bracket to be painted roof job color.

The light(s) will be controlled by a switch at the driver's side switch panel and by a switch at the passenger's side switch panel.

The light(s) may be load managed when the parking brake is applied.

### **HOSE BED LIGHTS**

There will be two (2) sets of 12 volt DC light strips with white LEDs provided to illuminate the hose bed and under the turntable per the following:

- One (1) set of lights installed on the left side of the hose bed.
- One (1) set of lights installed on the right side of the hose bed.

There will be a 16 gauge bright stainless steel overhead cover with 45 degreed ends provided over the lights to protect the lights from the hose and the hose from damaging snags.

The lights will be activated by a cup switch at the rear of the apparatus no more than 72.00" from the ground.

### **REAR SCENE LIGHT(S)**

There will be two (2) surface mounted HiViz, Model FT-GESM, 20,500 equivalent lumens 8.65" high x 10.61" wide x 2.75" deep light(s) with white LEDs installed at the rear of the apparatus, Rear of body high as possible.

The light(s) to include black bezel and black optic holder(s).

The light(s) will be controlled by a switch at the driver's side switch panel, by a switch at the passenger's side switch panel and by a cup switch located at the rear of the truck.

The light(s) may be load managed when the parking brake is applied.

### **WALKING SURFACE LIGHT**

There will be Model FRP, 4" round black 12 volt DC LED floodlight(s) with bolt mount provided to illuminate the entire designated walking surface on top of the body.

The light(s) will be activated when the body step lights are on.

### **WATER TANK**

It will have a capacity of 600 gallons and will be constructed of polypropylene plastic in a rectangular shape. The joints and seams will be nitrogen welded inside and out. The tank will be baffled in accordance with the current edition of applicable NFPA standards. The baffles will have vent openings at both the top and bottom of each baffle to permit movement of air and water between compartments. The longitudinal partitions will be constructed of .38" polypropylene plastic and extend from the bottom of the tank through the top cover to allow positive welding. The transverse partitions extend from 4" off the bottom to the underside of the top cover. All partitions interlock and will be welded to the tank bottom and sides. The tank top will be constructed of .50" polypropylene. It will be recessed .38" and will be welded to the tank sides and the longitudinal partitions. It will be supported to keep it rigid during fast filling conditions. Construction will include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions. Two of the dowels will be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes. A sump will be provided at the bottom of the water tank. The sump will include a drain plug and the tank outlet. Tank will be installed in a fabricated "cradle" assembly constructed of structural steel. Sufficient crossmembers are provided to properly support bottom of tank. Crossmembers are constructed of steel bar channel or rectangular tubing. Tank "floats" in cradle to avoid torsional stress caused by chassis frame flexing. Rubber cushions, .50" thick x 3.00" wide, will be placed on all horizontal surfaces that the tank rests on. Stops are provided to prevent an empty tank from bouncing excessively while moving vehicle. Tank mounting system is approved by the manufacturer.

Fill tower will be constructed of .50" polypropylene and will be a minimum of 8.00" wide x 14.00" long.

Fill tower will be furnished with a .25" thick polypropylene screen and a hinged cover.

An overflow pipe, constructed of 4.00" schedule 40 polypropylene, will be installed approximately halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle.

### **HOSE BED**

The hose body will be fabricated of .125"-5052-H32 aluminum with a tensile strength of 31,000.

The sides of the hose bed will not form any portion of the fender compartments.

The hose bed will be located ahead of the ladder turntable, between the right side sheet and the water tank.

Hose removal will be at the rear of the body via "chute" under the turntable on the right side.

The hose chute will be open at the very top, rear of the chute with no door.

The hose bed flooring will consist of removable aluminum grating with a top surface that is corrugated to aid in hose aeration.

The grating slats will be .50" wide x 4.50" long with spacing between slats for hose ventilation.

The hose bed/cargo area interior will be painted to match the lower body color.

Hose capacity will be a minimum of 1000' of 5.00" large diameter hose.

### **AERIAL HOSE BED HOSE RESTRAINT**

The hose in the hose bed will be restrained by one (1) black nylon Velcro® strap at the top of the hose bed. The strap will be installed to the top of the hose bed side sheets.

### **LETTERING, HOSE BED REAR FLAP**

The lettering designation on the rear flap of the hose bed cover will be TBD.

There will be red non-reflective lettering provided on the rear flap. There will be 12 letters provided. The non-reflective lettering will be approximately 6.00" high with a white outline. The lettering will be centered on the hose bed. The layout of the lettering will be straight.

### **RUNNING BOARDS**

The running boards will be fabricated of 0.125" bright aluminum treadplate and supported by structural steel angle assemblies bolted to the chassis frame rails.

Running boards will be 13.00" deep and are spaced away from the body 0.50".

A splash guard will be provided to keep road dirt or water from splashing up onto the pump panels.

The running boards will have a riser on the body to protect the painted surface from damage by stepping on the running boards.

The entire surface of the running boards will be covered with bright aluminum treadplate.

## **TURNTABLE STEPS**

Steps to access the turntable from the left side will be provided just behind the compartmentation. The bottom step shall be a flip down, stirrup step. The steps will be a swing-down design, with the stepping area made of Morton Tread-Grip® channel. The step height for the bottom step (the distance from the top surface of the step to the ground) will not exceed 24.00" with the step in its extended position. No step height (the distance between the top surfaces of any two (2) adjacent steps) will be greater than 14.00". The stepwell will be lined with bright aluminum treadplate to act as scuffplates. A Hansen illuminated black anodized handrail with e-coated and black powder coated stanchions will be provided on each side of the access steps. The end stanchions will be provided by Hansen. There will be vertical only handrails. The lights will be activated by the same means as the body handrail light controls. The light will be red. A hand hold will be provided in the left and right side of each side of the access steps. The steps will be connected to the "Do Not Move Truck" indicator.

## **STEP LIGHTS**

There will be three (3) white P25 LED step lights provided for the aerial turntable access steps.

In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light.

The step lights will be activated by when the parking brake is applied.

## **SMOOTH ALUMINUM REAR WALL**

The rear wall will be smooth aluminum.

## **TOW EYES**

Two (2) rear painted tow eyes will be located at the rear of the apparatus and will be mounted directly to the torque box. The inner and outer edges of the tow eyes will be radiused. Each tow eye will be rated for 9000lb and painted to match the lower job color.

## **COMPARTMENTATION**

Compartmentation will be fabricated of 0.125" 5052 aluminum. The side compartments are an integral assembly with the rear fenders. Fully enclosed rear wheel housings will be provided to prevent rust pockets and for ease of maintenance. Due to the severe loading requirements of this aerial, a method of compartment body support suitable for the intended load will be provided.

The backbone of the support system will be the chassis frame rail, which is the strongest component of the chassis and is designed for sustaining maximum loads.

A support system will be used which will incorporate a floating substructure by using Neoprene Elastomer isolators to allow the body to remain rigid while the chassis goes through its natural flex. The isolators will have a broad range of proven viability in vehicular applications, be of a fail safe design, and allow for all necessary movement in three (3) transitional and rotational modes. This will result in a 500 lb equipment rating for each lower compartment of the body.

The compartmentation in front of the rear axle will include a 3.00" steel support assemblies which are bolted to the chassis frame rails. A steel framework will be mounted to the body above these support

assemblies connected to the support assemblies with isolators. There will be one (1) support assembly mounted to each chassis frame rail.

The compartmentation behind the rear axle will include 3.00" steel support assemblies which are bolted to the chassis frame rails and extend underneath to the outside edge of the body. The support assembly will be coated to isolate the dissimilar metals before it is bolted to the body. There will be one (1) support assembly mounted to each chassis frame rail.

Compartment flooring will be of the sweep out design with the floor higher than the compartment door lip. The compartment door openings are framed by flanging the edges in 1.75" and bending out again 0.75" to form an angle. Drip protection is provided over all door openings by means of bright aluminum extrusion or formed bright aluminum treadplate. Side compartment tops will be covered with bright aluminum treadplate with a 1.00" rolled over edge on the front, rear and outward side. The covers are fabricated in one (1) piece and have the corners welded. A bright aluminum treadplate cover will be provided on the front wall of each side compartment. All screws and bolts which protrude into a compartment will have acorn nuts at the ends to prevent injury.

The body design has been fully tested. Proven engineering and test techniques such as finite element analysis, model analysis, stress coating and strain gauging have been performed with special attention given to fatigue life and structural integrity of the compartment body and substructure.

#### **AGGRESSIVE WALKING SURFACE**

All exterior surfaces designated as stepping, standing, and walking areas will comply with the required average slip resistance of the current NFPA standards.

#### **LOUVERS**

All body compartments will have a minimum of one (1) set of louvers stamped into a wall to provide the proper airflow inside the compartment and to prevent water from dripping into the compartment. These louvers will be formed into the metal and not added to the compartment as a separate plate.

#### **LEFT SIDE COMPARTMENTATION**

A full height double door compartment ahead of the rear wheels will be approximately 41.75" wide x 64.00" high x 24.25" deep with a door opening of approximately 40.00" wide x 60.50" high.

One (1) lift-up door compartment above the fender compartments and over the rear axles will be provided. The compartment will be approximately 72.13" wide x 33.25" high x 24.25" deep inside with a door opening of approximately 65.00" wide x 29.62" high.

A compartment with a single pan polished stainless steel door will be located above the front stabilizer. The door will be hinged on the rear body side with a D-ring latch. The compartment will be approximately 18.00" wide x 23.00" high x 24.25" deep with a door opening of approximately 12.00" wide x 15.75" high.

A full height double door compartment behind the rear wheels will be approximately 43.75" wide x 49.25" high x 21.25" deep inside with a door opening of approximately 42.00" wide x 45.75" high.

One (1) compartment below the turntable with a lift-up door will be provided. The compartment will be approximately 39.38" wide x 18.38" high x 21.25" deep inside with a door opening of approximately 35.00" wide x 14.88" high.

### **RIGHT SIDE COMPARTMENTATION**

A full height double door compartment ahead of the rear wheels, will be 41.75" wide x 64.00" high x 24.25" deep inside with an clear door opening of 40.00" wide x 60.50" high.

One (1) double door compartment will be provided forward above the rear axle. The compartment will be 36.00" wide x 33.25" high x 24.25" deep inside with a clear door opening of 33.75" wide x 25.50" high.

A compartment with a single pan polished stainless steel door will be located above the front stabilizer. The door will be hinged on the rear body side with a flush lift and turn latch. The compartment will be approximately 18.00" wide x 23.00" high x 24.25" deep with a door opening of approximately 12.00" wide x 15.75" high.

The area to the rear of the full depth compartments will be used for hose storage. The side sheet will be moved to the outer edge of the body. The side sheet support posts will not be visible from the outside of the apparatus. An inner sheet will be added to prevent interference between the support posts and the hose.

A lift-up door for access to the hose chute will be provided rearward above the rear axle.

A double door compartment behind the rear wheels will be 43.75" wide x 29.75" high x 21.25" deep inside with a door opening of 42.00" wide x 26.63" high.

A hose storage area will be provided above the rear compartmentation and the rear stabilizer.

The side sheet will be located at the very outside edge of the body, providing a full-width hose storage area with access at the rear of the unit.

A lift up door will be provided below the turntable for access to the hose chute.

The hose bed will be open at the top for easy packing of hose.

### **RIGHT SIDE PASSENGER SIDE COMPARTMENT IN PLACE OF TURNTABLE STEPS**

A single door compartment in place of turntable stairs approximately 12.00" deep x 20.88" wide x 29.75" high inside with a clear door opening of approximately 16.50" wide x 26.63" high will be provided.

### **SIDE COMPARTMENT DOORS**

All hinged compartment doors will be lap style with double panel construction and fabricated of .09" 5052H32 aluminum. Doors will be a minimum of 1.50" thick. To provide additional door strength, a "C" section reinforcement will be installed between the outer and interior panels.

Doors will be provided with a closed cell rubber gasket around the surface that laps onto the body. A second heavy-duty automotive rubber molding with a hollow core will be installed on the door framing that seals onto the interior panel, to ensure a weather resisting compartment.

All compartment doors will have polished stainless steel continuous hinge with a pin diameter of .25", that is bolted or screwed on with stainless steel fasteners. A dielectric substance will be applied to each hinge fastener.

All door lock mechanisms will be fully enclosed within the door panels to prevent fouling of the lock in the event equipment inside shifts into the lock area.

Doors will be latched with recessed, polished stainless steel "D" ring handles and Eberhard 106 locks.

To prevent corrosion caused by dissimilar metals, compartment door handles will not be attached to outer door panel with screws. A rubber gasket will be provided between the "D" ring handle and the door.

### **BODY MODIFICATION FROM STANDARD**

The compartment above the stabilizers (if applicable) will be decreased due to deeper stabilizer depth. The height of the compartment will decrease 4.00" and the compartment door will move up 4.00" higher. The stabilizer frame opening as well as the stabilizer pan will be increased in height by 6.00".

### **REAR BUMPER**

A 5.00" rear bumper will be furnished. Bumper will be constructed of steel framework and will be covered with polished aluminum treadplate. The bumper will be 4.00" deep x 5.00" high and will be spaced away from the body approximately 1.00". It will extend the full width of the body.

### **COMPARTMENT LIGHTING**

There will be nine (9) compartment(s) with two (2) white 12 volt DC LED compartment light strips. The dual light strips will be centered vertically along each side of the door framing. There will be two (2) light strips per compartment. The dual light strips will be in all body compartment(s).

Any remaining compartments without light strips will have a 6.00" diameter Truck-Lite, Model: 79384 light. Each light will have a number 1076 one filament, two wire bulb.

Opening the compartment door will automatically turn the compartment lighting on.

### **MOUNTING TRACKS**

There will be six (6) sets of tracks for mounting shelf(s) in LS1, LS3, LS4, RS1, RS3 and RS4. These tracks will be installed vertically to support the adjustable shelf(s) and will be full height of the compartment. The tracks will be painted to match the compartment interior.

### **ADJUSTABLE SHELVES**

There will be ten (10) shelves with a capacity of 500 lb provided.

The shelf construction will consist of .188" aluminum painted spatter gray with 2.00" sides.

Each shelf will be infinitely adjustable by means of a threaded fastener, which slides in a track.

The shelves will be held in place by .12" thick stamped plated brackets and bolts.

The location(s) will be determined at a later date.

### **SLIDE-OUT/TILT-DOWN TRAY**

There will be two (2) slide-out trays provided.

The bottom of each tray will be constructed of 0.188" thick aluminum painted spatter gray while special aluminum extrusions will be utilized for the tray sides, ends, and tracks. The corners will be welded to form a rigid unit.

A spring loaded lock will be provided on each side at the front of the tray. Releasing the locks will allow the tray to slide out approximately two-thirds (2/3) of its length from the stowed position and tip 30 degrees down from horizontal. The tray will be equipped with ball bearing rollers for smooth operation.

Rubber padded stops will be provided for the tray in the extended position.

The capacity rating of the tray will be a minimum of 215 lb in the extended position.

The vertical position of the tray within the compartment will be adjustable.

The location(s) will be determined at a later date.

### **SLIDE-OUT FLOOR MOUNTED TRAY**

There will be four (4) floor mounted slide-out tray(s) provided.

Each tray will have 2.00" high sides and a minimum capacity rating of 500 lb in the extended position.

Each tray will be constructed of aluminum painted spatter gray.

There will be two undermount-roller bearing type slides rated at 250 lb each provided. The pair of slides will have a safety factor rating of 2.

To ensure years of dependable service, the slides will be coated with a finish that is tested to withstand a minimum of 1,000 hours of salt spray per ASTM B117.

To ensure years of easy operation, the slides will require no more than a 50 lb force for push-in or pull-out movement when fully loaded after having been subjected to a 40 hour vibration (shaker) test under full load. The vibration drive file will have been generated from accelerometer data collected from a heavy truck chassis driven over rough gravel roads in an unloaded condition. Proof of compliance will be provided upon request.

Automatic locks will be provided for both the "in" and "out" positions. The trip mechanism for the locks will be located at the front of the tray for ease of use with a gloved hand.

The location(s) will be LS1, LS2, LS4 and LS3.

### **SINGLE SWING OUT TOOL GRID SYSTEM**

A Gear Grid single swing out tool grid system will be provided.

The framework will be constructed of heavy gauge steel tubing with high strength .25" diameter wire.

One (1) full width swing out tool grids will be mounted on pivoting devices. The swing out grid will pivot at the front wall. The grid will have positive lock in the stowed and extended position. A stationary grid will be provided on the rear wall.

There will be an amber LED light located on the end of each swing out grid.

There will be Two (2) tool grid system(s) provided, each will be a gray powder coat finish. The system(s) will be installed tbd.

### **RUB RAIL**

Bottom edge of the side compartments will be trimmed with a bright aluminum extruded rub rail.

Trim will be 2.12" high with 1.38" flanges turned outward for rigidity.

The rub rails will not be an integral part of the body construction, which allows replacement in the event of damage.

### **BODY FENDER CROWNS**

Black rubber fender crowns will be provided around the rear wheel openings.

### **BODY FENDER LINER**

A painted black 101 fender liner will be provided. The liners will be removable to aid in the maintenance of rear suspension components.

### **HARD SUCTION HOSE**

Hard suction hose will not be required.

### **HANDRAILS**

The handrails will be 1.25" diameter knurled aluminum to provide a positive gripping surface.

Chrome plated end stanchions will support the handrail. Plastic gaskets will be used between end stanchions and any painted surfaces.

Drain holes will be provided in the bottom of all vertically mounted handrails.

Handrails will be provided to meet current edition of applicable NFPA standards. The handrails will be installed as noted on the sales drawing.

There is to be a step provided below the right side running board.

### **SINGLE AIR BOTTLE STORAGE COMPARTMENT**

A quantity of eight (8) air bottle compartments, 7.75" in diameter x 26.00" deep, will be provided on the left side, two single compartments between the tandem rear wheels, on the right side, two single compartments between the tandem rear wheels, on the left side forward of the rear wheels, on the left side rearward of the rear wheels, on the right side forward of the rear wheels and on the right side rearward of the rear wheels. A polished stainless steel door with a Southco raised trigger C2 chrome

lever latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

Inside the compartment, black rubber matting will be provided.

### **EXTENSION LADDER**

There will be one (1) 35' two (2) section aluminum Duo-Safety Series 1200-A extension ladder(s) provided.

### **AERIAL EXTENSION LADDER**

There will be one (1) 24' two (2) section aluminum Series 900-A extension ladder(s) provided and located in the aerial torque box.

### **ROOF LADDERS**

There will be two (2) 16' aluminum Duo-Safety Series 875-A roof ladders provided.

### **AERIAL ATTIC EXTENSION LADDER**

There will be one (1) 14' Fresno aluminum Duo-Safety Series 701 attic extension ladder(s) provided.

### **AERIAL FOLDING LADDER**

There will be one (1) 10' aluminum Duo-Safety Series 585-A folding ladder(s) provided and located in the aerial torque box.

### **GROUND LADDER STORAGE**

The ground ladders are stored within the torque box and are removable from the rear.

Ladders will be enclosed to prevent road dirt and debris from fouling or damaging the ladders.

The ladders rest in full length stainless steel slides and are arranged in such a manner that any one ladder can be removed without having to move or remove any other ladder.

A Gortite rollup door will be provided at the rear, double faced, aluminum construction, and an anodized satin finish. A polished stainless steel lift bar to be provided for the rear roll-up door. The latching mechanism will consist of a full length lift bar lock with latches on the outer extrusion of the door frame.

A stainless plate with a 2-bend flange and a stainless steel hinge will be provided to secure the aerial ladder complement. The plate assembly will be mounted to the bottom of the entrance of the torque box ladder storage area.

When the plate is vertical, it will secure the ladders and prevent them from migrating to the rear of the apparatus. When the plate is down and not securing the ladders, the rollup door can not close, which will activate the "Open Door Indicator Light" within the cab. The rollup door together with hinge friction will secure the plate in place during driving operations.

A door guard will be provided to prevent tools inside the torque box from damaging the rollup door.

### **LADDER STORAGE LIGHTING**

There will be one (1) Truck Lite Model 40227C, 4.00" white incandescent light with Model 40700, grommet used to illuminate the torque box ladder storage compartment. One (1) light will be provided in the ceiling of the torque box near the ladder storage entry area.

The light will be activated when the ladder storage compartment door is opened.

### **PIKE POLES**

There will be two (2) 12' Duo Safety pike pole(s) with fiberglass handles provided. The pike pole(s) will be stored in tubular holders located in the ground ladder storage compartment.

### **8' PIKE POLE**

There will be two (2) 8' Duo Safety pike pole(s) with fiberglass handle provided. The pike pole(s) will be stored in tubular holders located in the ground ladder storage compartment.

### **6' PIKE POLE**

There will be one (1) 6' Duo Safety pike pole(s) with fiberglass handle provided. The pike pole(s) will be stored in tubular holders located in the ground ladder storage compartment.

### **3' PIKE POLE**

There will be two (2) 3' Duo Safety pike pole(s) with fiberglass shaft and "D" handles shipped loose.

### **PIKE POLE STORAGE IN TORQUE BOX/LADDER STORAGE**

There will be ABS tubing provided in the torque box/ladder storage area for a total of six (6) pike poles.

If the head of a pike pole can come into contact with a painted surface, a stainless steel scuffplate will be provided.

### **PUMP COMPARTMENT**

The pump compartment will be separate from the hose body and compartments so that each may flex independently of the other. The pump compartment will be constructed of the same material as the body compartmentation.

The pump compartment substructure will be a fabricated assembly of steel tubing, angles and channels which supports both the fire pump and the side running boards.

The pump compartment will be mounted on the chassis frame rails with rubber biscuits in a four point pattern to allow for chassis frame twist.

Pump compartment, pump, plumbing and gauge panels will be removable from the chassis in a single assembly.

### **PUMP MOUNTING**

Pump will be mounted to a substructure which will be mounted to the chassis frame rail using rubber isolators. The mounting will allow chassis frame rails to flex independently without damage to the fire pump.

## **LEFT SIDE PUMP CONTROL PANELS**

All pump controls and gauges will be located at the left (driver's) side of the apparatus and properly identified.

Layout of the pump control panel will be ergonomically efficient and systematically organized.

The pump operator's control panel will be removable in two (2) main sections for ease of maintenance:

The upper section will contain sub panels for the mounting of the pump pressure control device, engine monitoring gauges, electrical switches, and foam controls (if applicable). Sub panels will be removable from the face of the pump panel for ease of maintenance. Below the sub panels will be located all valve controls and line pressure gauges.

The lower section of the panel will contain all inlets, outlets, and drains.

All push/pull valve controls will have 1/4 turn locking control rods with polished chrome plated zinc tee handles. Guides for the push/pull control rods will be chrome plated zinc castings securely mounted to the pump panel. Push/pull valve controls will be capable of locking in any position. The control rods will pull straight out of the panel and will be equipped with universal joints to eliminate binding.

## **IDENTIFICATION TAGS**

The identification tag for each valve control will be recessed in the face of the tee handle.

All discharge outlets will have color coded identification tags, with each discharge having its own unique color. Color coding will include the labeling of the outlet and the drain for each corresponding discharge.

All line pressure gauges will be mounted directly above the corresponding discharge control tee handles and recessed within the same chrome plated casting as the rod guide for quick identification. The gauge and rod guide casting will be removable from the face of the pump panel for ease of maintenance. The casting will be color coded to correspond with the discharge identification tag.

All remaining identification tags will be mounted on the pump panel in chrome plated bezels.

The pump panel on the right (passenger's) side will be removable with lift and turn type fasteners.

Trim rings will be installed around all inlets and outlets.

## **MIDSHIP FIRE PUMP**

Midship fire pump will be a Hale QMAX-150, 1500 gpm single (1) stage midship mounted centrifugal type.

Pump will be the class "A" type.

Pump will deliver the percentage of rated discharges at the pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure.
- 100% of rated capacity at 165 psi net pump pressure.

-70% of rated capacity at 200 psi net pump pressure.

-50% of rated capacity at 250 psi net pump pressure.

Entire pump and both suction and discharge passages will be hydrostatically tested to a pressure of 500 psi.

Pump will be fully tested at the pump manufacturer's factory to the performance requirements as outlined by the current edition of applicable NFPA standards and will be free from objectionable pulsation and vibration.

Pump body and related parts will be of fine grain, alloy cast iron with a minimum tensile strength of 30,000 psi (2041.2 bar).

All moving parts in contact with water will be of high quality bronze or stainless steel.

Pump body will be horizontally split, on a single plane in two (2) sections, for easy removal of entire impeller assembly, including wear rings and bearings from beneath the pump, without disturbing pump piping or the mounting of the pump in the chassis.

Pump will have one (1) double suction impeller. The pump body will have two (2) opposed discharge volute cutwaters to eliminate radial unbalance.

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

Impeller clearance rings will be bronze and easily renewable without replacing impeller or pump volute body. They will be of the wrap-around double labyrinth design for maximum efficiency. Pump shaft will be electric furnace heat-treated, corrosion resistant stainless steel. It will be super-finished under packing with galvanic corrosion (zinc separators in packing) protection for longer shaft life. Pump shaft will be sealed with double oil seal to keep road dirt and water out of drive unit.

Pump shaft will be rigidly supported by three (3) bearings for minimum deflection. A high lead bronze sleeve bearing will be located immediately adjacent to the impeller (on the side opposite of the drive unit). The sleeve bearing will be automatically oil lubricated and pressure balanced to exclude foreign material. The remaining bearings will be heavy-duty, deep groove ball bearings in the gearbox and will be splash lubricated.

### **PUMP PACKING**

The pump shaft will have one (1) packing gland located on inlet side of the pump and will be of the split design for ease of repacking.

The packing gland will be a full-circle threaded design to exert uniform pressure on packing and prevent "cocking" and uneven packing load when it is tightened.

The packing gland will be easily adjusted by hand (with a rod or screwdriver, no special tools or wrenches required).

The packing rings will be of a unique, permanently lubricated, long-life graphite composition and have sacrificial zinc foil separators to protect the pump shaft from galvanic corrosion.

### **PUMP TRANSMISSION**

The drive unit will be cast and completely manufactured and tested at the Hale Products, Inc. factory. The pump drive unit will be of sufficient size to withstand up to 16,000 foot/ pounds of torque from the engine in both the road and pump operating conditions. The drive unit is will be designed with ample lubrication reserve to maintain the proper operating temperature.

The gearbox drive shafts will be of heat treated chrome nickel steel and 2.75" in diameter on both the input and output drive shafts. They will be designed to withstand the full torque of the engine in both road and pump operating conditions.

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

Pierce Manufacturing will select the pump ratio to provide the maximum performance with the engine and transmission selected. Three (3) green warning lights will be provided to indicate to the operator(s) when the pump has completed the shift from Road to Pump position. Two (2) lights will be located in the truck driving compartment and one (1) light on pump operator's panel adjacent to the throttle control.

### **PUMPING MODE**

An interlock system will be provided to ensure that the pump drive system components are properly engaged so that the apparatus can be safely operated. The interlock system will be designed to allow stationary pumping only.

### **AIR PUMP SHIFT**

Pump shift engagement will be made by a two (2) position sliding collar, actuated pneumatically (by air pressure), with a three (3) position air control switch located in the cab.

Two (2) indicator lights will be provided adjacent to the pump shift inside the cab. One (1) green light will indicate the pump shift has been completed and be labeled "pump engaged". The second green light will indicate when the pump has been engaged and the chassis transmission is in pump gear. This indicator light will be labeled "OK to pump".

The pump shift will be interlocked to prevent the pump from being shifted out of gear when the chassis transmission is in gear to meet NFPA requirements.

The pump shift control in the cab will be illuminated to meet NFPA requirements.

### **TRANSMISSION LOCK-UP**

The direct gear transmission lock-up for the fire pump operation will engage automatically when the pump shift control in the cab is activated.

### **AUXILIARY COOLING SYSTEM**

A supplementary heat exchange cooling system will be provided to allow the use of water from the discharge side of the pump for cooling the engine water. The heat exchanger will be a separate unit. It will be installed in the pump or engine compartment with the control located on the pump operator's control panel. The exchanger will be plumbed to the master drain valve.

### **INTAKE RELIEF VALVE - PUMP**

There will be One (1) Elkhart Style 40 relief valve(s) installed on the suction side of the pump preset at 125 psig.

The relief valve(s) will have a working range of 75 psi to 250 psi.

The outlet will terminate below the frame rails with a 2.50" National Standard hose thread adapter and will have a "do not cap" warning tag.

The relief valve pressure control will be located behind the right side pump panel with a stainless steel access door.

### **PRESSURE CONTROLLER**

A Pierce Pump Boss Model PBA300 pressure governor will be provided.

A pressure transducer will be installed in the water discharge manifold on the pump.

The display panel will be located at the pump operator's panel.

### **PRIMING PUMP**

The priming pump will be a Trident Emergency Products compressed air powered, high efficiency, multistage venturi based AirPrime System, conforming to standards outlined in the current edition of applicable NFPA standards.

All wetted metallic parts of the priming system are to be of brass and stainless steel construction.

One (1) priming control will open the priming valve and start the pump primer.

### **PUMP MANUALS**

There will be a total of two (2) pump manuals provided by the pump manufacturer and furnished with the apparatus. The manuals will be provided by the pump manufacturer in the form of two (2) electronic copies. Each manual will cover pump operation, maintenance, and parts.

### **PLUMBING, STAINLESS STEEL AND HOSE**

All inlet and outlet lines will be plumbed with either stainless steel pipe, flexible polypropylene tubing or synthetic rubber hose reinforced with hi-tensile polyester braid. All hose's will be equipped with brass or stainless steel couplings. All stainless steel hard plumbing will be a minimum of a schedule 10 wall thickness.

Where vibration or chassis flexing may damage or loosen piping or where a coupling is required for servicing, the piping will be equipped with victaulic or rubber couplings.

Plumbing manifold bodies will be ductile cast iron or stainless steel.

All piping lines are to be drained through a master drain valve or will be equipped with individual drain valves. All drain lines will be extended with a hose to drain below the chassis frame.

All water carrying gauge lines will be of flexible polypropylene tubing.

All piping, hose and fittings will have a minimum of a 500 PSI hydrodynamic pressure rating.

### **MAIN PUMP INLETS**

A 6.00" pump manifold inlet will be provided on each side of the vehicle. The suction inlets will include removable die cast zinc screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump.

### **SHORT SUCTION TUBE(S)**

The suction tube(s) on the water pump will have short suction tube(s) installed to allow for installation of adapters, elbows or intake valves without excessive overhang.

### **MAIN PUMP INLET CAP**

The main pump inlets will have National Standard Threads with a long handle chrome cap.

The cap will be the Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

### **VALVES**

All ball valves will be Akron® Brass. The Akron valves will be the 8000 series heavy-duty style with a stainless steel ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve.

Valves will have a **ten (10) year** warranty.

The location of the valve for the one (1) inlet will be recessed behind the pump panel.

### **INLET CONTROL**

The side auxiliary inlet(s) will incorporate a quarter-turn ball valve with the control located at the inlet valve. The valve operating mechanism will indicate the position of the valve.

### **LEFT SIDE INLET**

There will be one (1) auxiliary inlet with a 2.50" valve at the left side pump panel, terminating with a 2.50" (F) National Standard hose thread adapter.

The auxiliary inlet will be provided with a strainer, chrome swivel and plug.

### **INLET BLEEDER VALVE**

A 0.75" bleeder valve will be provided for each side gated inlet.

The valves will be located behind the panel with a "T" swing style handle control extended to the outside of the panel.

The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage.

The water discharged by the bleeders will be routed below the chassis frame rails.

### **TANK TO PUMP**

The booster tank will be connected to the intake side of the pump with stainless steel piping and a quarter turn 3.00" full flow line valve with the control remotely located at the operator's panel. Tank to pump line will run straight (no elbows) from the pump into the front face of the water tank and angle down into the tank sump. A rubber coupling will be included in this line to prevent damage from vibration or chassis flexing.

A check valve will be provided in the tank to pump supply line to prevent the possibility of "back filling" the water tank.

### **TANK REFILL**

A 1.50" combination tank refill and pump re-circulation line will be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

### **DISCHARGE OUTLET CONTROLS**

The discharge outlets will incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism will indicate the position of the valve.

If a handwheel control valve is used, the control will be a minimum of a 3.9" diameter stainless steel handwheel with a dial position indicator built in to the center of the handwheel.

Any 3.00 inch or larger discharge valve will be a slow-operating valve in accordance with NFPA 1900 2024 Edition 13.7.5.3.

### **LEFT SIDE DISCHARGE OUTLETS**

There will be Two (2) discharge outlets with a 2.50" valve on the left side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter.

### **LEFT SIDE OUTLET ELBOWS**

The 2.50" discharge outlets located on the left side pump panel will be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread, chrome plated, 45 degree elbow.

The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

### **RIGHT SIDE DISCHARGE OUTLETS**

There will be One (1) discharge outlet with a 2.50" valve on the right side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter.

### **RIGHT SIDE OUTLET ELBOWS**

The 2.50" discharge outlets located on the right side pump panel will be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread, chrome plated, 45 degree elbow.

The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

### **LARGE DIAMETER DISCHARGE OUTLET**

There will be an Akron 8800 4.00" flat ball valve with 4.00" plumbing terminating with a 4.00" MNST chrome adapter on the right side pump panel.

The valve will be controlled with a(n) Pierce large handwheel with indicator located at the pump operator's panel.

### **LARGE DIAMETER OUTLET ELBOWS**

The 4.00" outlet(s) will be furnished with one (1) 4.00" (F) National Standard hose thread x 5.00" Storz elbow adapter with Storz cap.

### **FRONT BUMPER CROSSLAYS**

There will be two (2) 1.50" discharge outlets piped to the front of the apparatus and located in the front bumper extension.

The front hose bed will have a hose capacity of 200' of 1.75" double jacket cotton-polyester hose.

The rear hose bed (closest to the cab) will have a hose capacity of 200' of 1.75" double jacket cotton-polyester hose.

The hose beds will run from side to side in the bumper extension. The ends of the bed will be open for hose deployment.

The hose beds will be separated by a full height, fixed vertical divider. The divider will be constructed of smooth aluminum and extend the entire length side to side.

Black rubber grating will be provided at the bottom of the tray. Drain holes will be provided in the bottom of each hose bed.

Plumbing will consist of 2.00" piping and flexible hose with a 2.00" full flow ball valve controlled at the pump operator's panel. A fabricated weldment made of stainless steel pipe will be used in the plumbing where appropriate. The discharges will terminate with a 1.50" NST with 90 degree swivel. A swivel will be located in the bottom of each hose bed and will swing from side to side.

There will be automatic drains provided at all low points in the plumbing.

### **FRONT CROSSLAY COVER**

A bright aluminum treadplate cover will be provided over the full width crosslays. The cover will be attached with a stainless steel hinge at the rear.

The cover will be secured with a D-ring latch on each side in the closed position and a pneumatic stay arm on each side will hold the cover in the open position.

A black 1.00" nylon webbing design with 2.00" box pattern will be installed on each end to retain the hose during travel. The webbing will be permanently attached at the bottom of the crosslay openings. There will be spring clip and hook fasteners located at the opposite end of the permanently attached webbing.

There will be sufficient space in the hose bed for nozzle storage with the cover in the closed position.

### **DISCHARGE CAPS/ INLET PLUGS**

Chrome plated, rocker lug, caps with chain will be furnished for all discharge outlets 1.00" thru 3.00" in size, besides the pre-connected hose outlets.

Chrome plated, rocker lug, plugs with chain will be furnished for all auxiliary inlets 1.00" thru 3.00" in size.

The caps and plugs will incorporate a thread design to automatically relieve stored pressure in the line when disconnected.

### **OUTLET BLEEDER VALVE**

A 0.75" bleeder valve will be provided for each outlet 1.50" or larger. Automatic drain valves are acceptable with some outlets if deemed appropriate with the application.

The valves will be located behind the panel with a T swing style handle control extended to the outside of the side pump panel.

The handles will be chrome plated and provide a visual indication of valve position.

The T swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage.

Bleeders will be located at the bottom of the pump panel. They will be properly labeled identifying the discharge they are plumbed in to.

The water discharged by the bleeders will be routed below the chassis frame rails.

### **AERIAL OUTLET**

The aerial waterway will be plumbed from the pump to the water tower line with 5.00" pipe and a 4.00" Akron valve. The handwheel control for the waterway valve will be located at the pump operator's panel.

An indicator will be provided to show the position of the valve.

### **CROSSLAY HOSE BED, 1.50"**

One (1) crosslay with 1.50" outlets will be provided. The bed to be capable of carrying 200' of 1.78" Key hose and will be plumbed with 2.00" i.d. pipe and gated with a 2.00" quarter turn ball valve.

Outlet to be equipped with a 1.50" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus.

The crosslay control will be at the pump operator's panel.

Vertical scuffplates, constructed of stainless steel, will be provided at the front and rear ends of the bed on each side of vehicle.

Crosslay bed flooring will consist of removable perforated brushed aluminum.

### **2.50" CROSSLAY HOSE BED**

One (1) crosslay with 2.50" outlets will be provided. This bed to be capable of carrying 200' of 2.50" double jacketed hose and will be plumbed with 2.50" i.d. pipe and gated with a 2.50" quarter turn ball valve.

Outlet to be equipped with a 2.50" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus.

The crosslay control will be at the pump operator's panel.

When used in conjunction with other crosslay/speedlay/deadlay configurations, a center crosslay divider, when needed, will be fabricated of .25" aluminum and will provide adjustment from side to side. The divider will be unpainted with a brushed finish. The remainder of the crosslay bed will be painted job color.

Stainless steel vertical scuffplates will be provided at hose bed ends (each side of vehicle). Bottom of hose bed ends (each side) will also be equipped with a stainless steel scuffplate.

Crosslay bed flooring will consist of removable perforated brushed aluminum.

### **CROSSLAY/DEADLAY HOSE RESTRAINT**

Elastic netting will be provided across the top and ends of two (2) crosslay/deadlay opening(s) to secure the hose during travel. The netting will be permanently attached at the top center of the crosslay/deadlay bed and removable on each end.

### **TROUGH STORAGE**

There will be a smooth aluminum enclosure provided and installed forward within the crosslay area.

The enclosure will be able to hold little giant. will get size. .

Dura-Surf will be installed on the bottom surface of the trough.

Velcro straps with footman loops will be used to secure the ladders in place.

### **DEADLAY HOSE BED**

Two (2) deadlay beds without plumbing, will be provided above the pump compartment capable of carrying 250' of 2.5" in one and 200' of 1.75" high rise in the other.

Stainless steel vertical scuffplates will be provided at hose bed ends (each side of vehicle). The bottom of hose bed ends (each side) will also be equipped with a stainless steel scuffplate.

in between the pre connects and the Little giant storage

Deadlay bed flooring will consist of removable perforated brushed aluminum.

### **FOAM SYSTEM**

A foam system will not be required on this apparatus.

### **PUMP PANEL CONFIGURATION**

The pump panel configuration will be arranged and installed in an organized manner that will provide user-friendly operation.

### **PUMP OPERATOR'S PLATFORM**

A pull out, flip down platform will be provided at the pump operator's control panel.

The front edge and the top surface of the platform will be made of DA finished aluminum with a Morton Cass insert.

The platform will be approximately 13.75" deep when in the stowed position and approximately 22.00" deep when extended. The platform stepping surface will be 35.00" wide. The platform will lock in the retracted and the extended position.

The sides, bottom and rear portions of the support assembly will be painted to match lower job color.

The platform will be wired to the "step not stowed" indicator in the cab.

### **PUMP OPERATOR'S PLATFORM PERIMETER LIGHT**

There will be an On Scene Solutions, Model Night Stick Access, 20.00" white 12 volt DC LED strip light provided to illuminate the ground area.

### **PUMP AND GAUGE PANEL**

The pump and gauge panels will be constructed of aluminum with a black vinyl finish. A polished aluminum trim molding will be provided around each panel.

### **PUMP ACCESS**

#### **Right Side Panel**

The right side upper pump panel will be removable.

#### **Panel Fastener**

The removable panels will be secured with black swell latch.

The left side pump panels will be attached with screws.

The right side lower pump panel (drain bank) will be attached with screws.

### **PUMP COMPARTMENT LIGHT**

There will be one (1) Whelen®, Model 3SC0CDCR, 3.00" white 12 volt DC LED light(s) with Whelen, Model 3FLANGEC, flange(s) installed in the pump compartment.

Engine monitoring graduated LED indicators will be incorporated with the pressure controller.

Also provided at the pump panel will be the following:

- Master Pump Drain Control

### **THROTTLE READY GREEN INDICATOR LIGHT**

There will be a green indicator light integrated with the pressure governor and/or engine throttle installed on the pump operators panel that is activated when the pump is in throttle ready mode.

### **OK TO PUMP INDICATOR LIGHT**

There will be a green indicator light installed on the pump operators panel that is activated when the pump is in Ok To Pump mode.

### **VACUUM AND PRESSURE GAUGES**

The pump vacuum and pressure gauges will be liquid filled and manufactured by Class 1 Incorporated ©.

The gauges will be a minimum of 4.00" in diameter and will have white faces with black lettering, with a pressure range of 30.00"-0-600#.

Gauge construction will include a Zytel nylon case with adhesive mounting gasket and threaded retaining nut.

The pump pressure and vacuum gauges will be installed adjacent to each other at the pump operator's control panel.

Test port connections will be provided at the pump operator's panel. One will be connected to the intake side of the pump, and the other to the discharge manifold of the pump. They will have 0.25 in. standard pipe thread connections and non-corrosive polished stainless steel or brass plugs. They will be marked with a label.

This gauge will include a 10 year warranty against leakage, pointer defect, and defective bourdon tube.

### **PRESSURE GAUGES**

The individual "line" pressure gauges for the discharges will be Class 1© interlube filled.

They will be a minimum of 2.00" in diameter and have white faces with black lettering.

Gauge construction will include a Zytel nylon case with adhesive mounting gasket and threaded retaining nut.

Gauges will have a pressure range of 30"-0-400#.

The individual pressure gauge will be installed as close to the outlet control as practical.

This gauge will include a 10 year warranty against leakage, pointer defect, and defective bourdon tube.

### **WATER LEVEL GAUGE**

There will be an electronic water level gauge provided on the operator's panel that registers water level by means of five (5) colored LED lights. The lights will be durable, ultra-bright five (5) LED design viewable through 180 degrees. The water level indicators will be as follows:

- 100 percent = Green
- 75 percent = Yellow
- 50 percent = Yellow
- 25 percent = Yellow
- Refill = Red

The light will flash when the level drops below the given level indicator to provide an eighth of a tank indication. To further alert the pump operator, the lights will flash sequentially when the water tank is empty.

The level measurement will be based on the sensing of head pressure of the fluid in the tank.

The display will be constructed of a solid plastic material with a chrome plated die cast bezel to reduce vibrations that can cause broken wires and loose electronic components. The encapsulated design will provide complete protection from water and environmental elements. An industrial pressure transducer will be mounted to the outside of the tank. The field calibratable display measures head pressure to accurately show the tank level.

The main water level gauge will be powered with battery switch.

There will be a Hale part number 106877, 4-light driver module included with this installation to power additional water level gauges.

The remote level lights will be energized when parking brake is applied.

### **WATER LEVEL GAUGE**

There will be three (3) additional water level indicator(s), Whelen®, Model PSTANK2, LED module with black trim, installed one (1) on the rear body, one (1) on the cab behind the left cab door and one (1) on the cab behind the right cab door.

This light module(s) will include four (4) colored levels, and function similar to the water level indicator located at the operators panel:

- First green module indicates a full water level
- Second blue module indicates a water level above 3/4 full
- Third amber module indicates a water level above 1/2 full
- Last red module indicates a water level above 1/4 full and empty
  - Above 1/4 this light will be steady burning
  - At empty this light will be flashing

The flash rate will be determined by the main water level tank sensor.

This module will be activated when the when either the pump is in gear, or the parking brake is applied.

### **LIGHT SHIELD**

There will be a polished, 16 gauge stainless steel light shield installed over the pump operator's panel.

- There will be 12 volt DC white LED lights installed under the stainless steel light shield to illuminate the controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus. These lights will be activated by the pump panel light switch. Additional lights will be included every 18.00" depending on the size of the pump house.
- One (1) pump panel light will come on when the pump is in ok to pump mode.

There will be a light activated above the pump panel light switch when the parking brake is set. This is to afford the operator some illumination when first approaching the control panel.

### **AIR HORN SYSTEM**

Two (2) Hadley, rectangular bell air horns will be provided below the front bumper. The air horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed to prevent the loss of air in the brake system.

### **Air Horn Location**

The air horns will be located on each side of the bumper, towards the outside.

### **Air Horn Control**

The air horn(s) will be activated by the following:

- Right side lanyard. The lanyard to be a nylon rope.
- Steering wheel horn ring with electric/air horn selector switch
  
- Left side lanyard. The lanyard to be a nylon rope.

### **ELECTRONIC SIREN**

A Whelen®, Model 295SLSA1, electronic siren with noise canceling microphone will be provided.

This siren to be active when the battery switch is on and that emergency master switch is on.

Electronic siren head will be recessed in the driver side center switch panel.

The electronic siren will be controlled on the siren head only. No horn button or foot switches will be provided.

### **SPEAKER**

There will be one (1) Whelen®, Model SA315P, black nylon composite, 100-watt, speaker with through bumper mounting brackets and polished stainless steel grille provided. The speaker will be connected to the siren amplifier.

The speaker(s) will be recessed in the center of the front bumper.

### **AUXILIARY MECHANICAL SIREN**

There will be a Federal Signal Model Q2B mechanical siren furnished and installed in the front of the apparatus.

The Q2B will be chrome finish.

The siren will have a 2-gauge cable connected to a power solenoid that is connected by a 2-gauge cable ran battery direct to the primary chassis batteries and will be labeled Q2B+ at the battery. The power solenoid will only be enabled when the emergency master switch is on.

The siren will have a 2-gauge ground wire connected to the chassis battery stud. The cable will be labeled Q2B- at the battery.

The mechanical siren will be completely recessed behind the front bumper on the left side. The siren will be supported by the bumper framework. The backside of the siren will be protected with a fabricated enclosure. A cutout will be provided in the bumper face, forward of the siren. There will be a Federal EF stainless steel grille provided over the cutout.

### **MECHANICAL SIREN CONTROL**

The mechanical siren will be activated by the following:

- Left side foot switch. The control to be available when the emergency master switch is on.
- Right side foot switch. The control to be available when the emergency master switch is on.
- Left side foot switch.

A momentary chrome push button switch will be included in the right side dash panel to activate the siren brake.

### **LIGHTING SYSTEM CONTROL**

The HiViz®, Control System, will be integrated with the Pierce Command Zone to control the lighting system on the apparatus without the additional component integration .

### **CONTROL HEAD MODULE**

There will be two (2) HiViz Model FT-HVC-ZONEMODULE, 1.22" H x 3.54" W x 3.82" D, connect zone control modules installed in the rear TBD.

The control modules will be controlled utilizing the HiViz Control system.

### **FRONT ZONE UPPER WARNING LIGHTS**

There will be two (2) HiViz Model FT-HVC-OMEN-24 LED 24.30", one (1) module lightbars mounted on the cab roof.

The lightbars will be mounted parallel to the front of the cab.

The lightbar will flash alternating red (top and bottom) with white in the center row.

The Center Row only, may be programmed for different colors (RGBAW).

Includes all mounting hardware and eight (8) user-programmable inputs.

There will be a switch in the cab on the switch panel to control this lightbar.

The white LEDs will be disabled when the parking brake is applied.

These lights will be controlled utilizing the microprocessor based HiViz® Connect™ system.

### **FRONT ZONE LOWER LIGHTS**

There will be four (4) Hiviz®, Model FT-HVC-GSMJR-WN-\*\*, 7.48" long x 5.11" tall x 1.63" deep flashing LED warning lights installed on the cab face above the headlights, in a common bezel matching the bezel for the headlamps.

- One (1) light installed in the left side outside position. The left side outside warning light to include red LEDs.
- One (1) light installed on the left side inside position. The left side inside warning light to include red LEDs.
- One (1) light installed on the right side inside position. The right side inside warning light to include red LEDs.
- One (1) light installed in the right side outside position. The right side outside warning light to include red LEDs.
- These lights will have a clear lens.

There will be two(2) Hiviz®, Model FT-HVC-GSMJR-WN-\*\* LED lights installed on the cab face above the turn signals in a bezel to match the turn signal.

- The color of the left side light will be left side front outside corner light to include red flashing LEDs.
- The color of the right side light will be right side front outside corner light to include red flashing LEDs.
- These lights will have a clear lens.

There will be a switch located in the cab on the switch panel to control the lights.

Each bezel will have a Truck-Lite Model 19036Y LED clearance light in the end position.

White LEDs will be deactivated when the parking brake is applied.

Amber LEDs will be deactivated when the parking brake is released.

Amber, blue, green and red LEDs in the inside positions may be load managed when the parking brake is applied.

These lights will be controlled utilizing the microprocessor based HiViz® Connect™ system.

### **HEADLIGHT FLASHER**

The high beam headlights will flash alternately between the left and right side.

There will be a switch installed in the cab on the switch panel to control the high beam flash. This switch will be live when the battery switch and the emergency master switches are on.

The flashing will automatically cancel when the hi-beam headlight switch is activated or when the parking brake is set.

### **SIDE ZONE LOWER FRONT WARNING**

There will be two (2) Hiviz®, Model FT-HVC-GSMJR-WN-\*\*, 7.48" long x 5.11" tall x 1.63" deep flashing LED warning lights with black trim installed per the following:

- There will be one (1) each side above the front axle centerline.
- The left side front light to include red flashing LEDs.
- The right side front light to include red flashing LEDs.
- The lens color is to be clear.

The lights will be activated with a switch in the cab on the switch panel.

These lights will be controlled utilizing the microprocessor based HiViz® Connect™ system.

### **SIDE ZONE LOWER MIDDLE WARNING**

There will be two (2) Hiviz®, Model FT-HVC-GSMJR-WN-\*\*, 7.48" long x 5.11" tall x 1.63" deep steady burn LED warning lights with black trim installed per the following:

- There will be one (1) each side above the front tandem rear wheels.
- The left side middle light to include red flashing LEDs.
- The right side middle light to include red flashing LEDs.
- The lens color is to be clear.

These lights will be controlled utilizing the microprocessor based HiViz® Connect™ system.

There will be a switch in the cab on the switch panel to control the lights.

### **SIDE ZONE LOWER REAR WARNING**

There will be two (2) HiViz®, Model FT-HVC-GSMJR-WN-\*\*, 5.11" high x 7.48" wide x 1.63" deep flashing LED warning lights with black trim installed per the following:

- There will be one (1) each side above rear wheels.
- The left side rear light to include red flashing LEDs.

- The right side rear light to include red flashing LEDs.
- The lenses are to be clear.

The lights will be activated with a switch in the cab on the switch panel.

These lights will be controlled utilizing the microprocessor based HiViz® Connect™ system.

### **REAR ZONE LOWER LIGHTING**

Two (2) HiViz®, Model FT-HVC-GSM-WN-\*\*, 10.62" long x 8.65" tall x 1.91" deep flashing warning lights with black trim will be located at the rear of the apparatus.

The left side rear warning light to include red LEDs.

The right side rear warning light to include red LEDs.

Both lights will include a lens that is clear.

There will be a switch located in the cab on the switch panel to control the lights.

These lights will be controlled utilizing the microprocessor based HiViz® Connect™ system.

### **REAR UPPER ZONE WARNING LIGHTS**

There will be two (2) HiViz Model FT-HVC-OMEN-12, 12.00" LED beacons, provided at the rear of the truck, one (1) each side.

The beacons will flash alternating red (top and bottom) with white in the center row.

The Center Row only, may be programmed for different colors (RGBAW).

Includes all mounting hardware and eight (8) user-programmable inputs.

There will be a switch in the cab on the switch panel to control the beacons.

The white LEDs will be disabled when the parking brake is applied.

These lights will be controlled utilizing the microprocessor based HiViz® Connect™ system.

### **TRAFFIC DIRECTING LIGHT**

There will be one (1) Whelen®, Model TAL65, 36.00" long x 2.87" high x 2.25" deep, amber LED traffic directing light installed at the rear of the apparatus.

The Whelen, Model TACTL5, control head will be included with this installation.

The controller will be energized when the battery switch is on.

The auxiliary flash not activated.

This traffic directing light will be mounted on top of the body below the turntable with a treadplate box at the rear of the apparatus.

The traffic directing light control head will be located in the driver side overhead switch panel in the right panel position.

### **POWER OUTLET STRIP**

There will be two (2) receptacle strip(s) with six (6) 15 amp 120 volt AC straight blade receptacles provided EMS Cabinets.

The strip(s) selected will be powered from the on board 12 volt DC to 120 volt AC power inverter through a receptacle located adjacent to the strip(s).

There will be a label installed near the strip(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency

### **POWER OUTLET STRIP**

There will be three (3) receptacle strip(s) with six (6) 15 amp 120 volt AC straight blade receptacles provided TBD.

The strip(s) selected will be powered from the on board 12 volt DC to 120 volt AC power inverter through a receptacle located adjacent to the strip(s).

There will be a label installed near the strip(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency

## **FOUR (4)-SECTION 107 FOOT AERIAL LADDER**

### **CONSTRUCTION STANDARDS**

The ladder will be constructed to meet all of the requirements as described in the current edition of applicable NFPA standards.

The aerial device will be a true ladder type device; therefore ladders attached to booms will not be considered.

These capabilities will be established in an unsupported configuration.

All structural load supporting elements of the aerial device that are made of a ductile material will have a design stress of not more than 50 percent of the minimum yield strength of the material based on the combination of the live load and the dead load. This 2:1 structural safety factor meets the current NFPA standard.

All structural load supporting elements of the aerial device that are made of non-ductile material will have a design stress of not more than 20 percent of the minimum ultimate strength of the material, based on the combination of the rated capacity and the dead load. This 5:1 safety factor meets the current NFPA standard.

Wire ropes and attaching systems used to extend and retract the fly sections will have a 5:1 safety factor based on the ultimate strength under all operating conditions. The factor of safety for the wire rope will remain above 2:1 during any extension or retraction stall. The minimum ratio of the diameter of wire rope used to the diameter of the sheave used will be 1:12. Wire ropes will be constructed of seven (7) strands over an inner wire core for increased flexibility. The wire rope will be galvanized to reduce corrosion.

The aerial base pivot bearings will be maintenance free type bearings and require no external lubrication.

The aerial device will be capable of sustaining a static load one and one-half times its rated tip load capacity (live load) in every position in which the aerial device can be placed when the vehicle is on a firm level surface.

The aerial device will be capable of sustaining a static load one and one-third times its rated tip load capacity (live load) in every position the aerial device can be placed when the vehicle is on a slope of five degrees downward in the direction most likely to cause overturning.

With the aerial device out of the cradle and in the fully extended position at zero degrees elevation, a test load will be applied in a horizontal direction normal to the centerline of the ladder. The turntable will not rotate and the ladder will not deflect beyond what the product specification allows.

All welding of aerial components, including the aerial ladder sections, turntable, pedestal, and outriggers, will be in compliance with the American Welding Society standards. All welding personnel will be certified, as qualified under AWS welding codes.

The aerial device will be capable of operating in conditions of wind up to 50 mph and icing conditions of up to a 0.25" coating over the aerial structure.

All of the design criteria must be supported by the following test data:

- Strain gage testing of the complete aerial device
- Analysis of deflection data taken while the aerial device was under test load

The following standards for materials are to be used in the design of the aerial device:

- Materials are to be certified by the mill that manufactured the material
- Material testing that is performed after the mill test will be for verification only and not with the intent of changing the classification
- All welded structural components for the ladder will be traceable to their mill lots.

### **LADDER CONSTRUCTION**

The ladder is comprised of four (4) sections.

The ladder will have the capability to support a minimum of 750 lb at the tip in the unsupported configuration, based upon 360 degree rotation, up to full extension and from -10 degrees to +77 degrees.

The ladder (handrails, baserails, trusses, K-braces and rungs) will be constructed of high strength low alloy steel, minimum 100,000 pounds per square inch yield, with full traceability on all structural members.

Each section will be trussed diagonally, vertically and horizontally using welded steel tubing.

All ladder rungs are round and welded to each section utilizing "K" bracing for lateral and torsional rigidity.

The inside width dimensions of the ladder will be:

Base Section:	41.87"
Lower Mid Section:	34.88"
Upper Mid Section:	27.87"
Fly Section:	21.63"

The height of the handrails above the centerline of the rungs will be:

Base Section:	26.28"
Lower Mid Section:	22.68"
Upper Mid Section:	20.06"
Fly Section:	17.32"

The ladder will be designed to provide continuous egress for firefighters and civilians from an elevated position to the ground.

The egress section will be designed to maintain the rated load of the aerial device. It will be bolted on for easy replacement. There will be a lift eye welded on to each side of the egress.

### **VERTICAL HEIGHT**

The ladder will extend to a minimum height of 107' above the ground at full extension and elevation. The measurement of height will be consistent with NFPA standards.

### **HORIZONTAL REACH**

The rated horizontal reach will be 100'. The measurement of horizontal reach will be consistent with NFPA standards.

### **TURNTABLE**

The upper turntable assembly will connect the aerial ladder to the turntable bearing. The steel structure will have a mounting position for the aerial elevation cylinders, ladder connecting pins, and upper turntable operator's position.

The turntable will be coated with a non-skid, chemical resistant material in the walking areas. The stepping surfaces will meet the skid-resistance requirements of the current NFPA standard.

The turntable handrails will be a minimum 42.00" high and will not increase the overall travel height of the vehicle. The handrails will be constructed from aluminum and have a slip resistant knurled surface. The turntable vertical handrail spacing will be designed with a 44.00" wide x 27.00" high opening to allow for equipment to pass through from the ground to the aerial ladder. The opening will be located at the center, rear of the turntable.

### **ELEVATION SYSTEM**

Dual 5.50" diameter elevating cylinders will be mounted on the underside of the base section of the ladder, one (1) on each side. One (1) 2.25" diameter stainless steel pin will fasten each cylinder to the ladder and one (1) 2.50" diameter stainless steel pin will fasten each cylinder to the turntable. The pins will have 125,000 psi minimum yield strength and will be secured with 0.50" Grade 8 bolts with castle nut and cotter pin. The bolts are to ensure that the pins do not walk out of the mounting brackets on the turntable and base section.

The elevating cylinders will be mounted utilizing maintenance-free spherical bearings on both ends of the cylinders. The aerial base pivot bearings will be maintenance-free type bearings with no external lubrication required. The cylinders will function only to elevate the ladder and not as a structural member to stabilize the ladder side movement. The elevating cylinders will be provided with pilot-operated check valves on the barrel and rod side of the piston to prevent movement of the ladder in case of a loss of hydraulic pressure.

The operation envelope will be 10 degrees below horizontal to 77 degrees above horizontal.

The elevation system will be designed following NFPA standards. The elevation hydraulic cylinders will incorporate cushions on the upper limit of travel.

The lift cylinders will be equipped with integral holding valves located in the cylinder to prevent the unit from descending should the charged lines be severed, at any point within the hydraulic system and to maintain the ladder in the bedded position during road travel. The integral holding valves will NOT be located in the transfer tubes.

The elevation system will be controlled by the microprocessor. Linear transducers will measure the extension of the elevation cylinder. The microprocessor will provide the following features:

- Collision avoidance of the elevation system to prevent accidental body damage
- Automatic deceleration when the aerial device is lowered into the cradle
- Automatic deceleration at the end of stroke, in maximum raise and lower positions
- Deceleration of the aerial device at the limits of travel.

### **EXTENSION/RETRACTION SYSTEM**

A hydraulically powered, extension and retraction system will be provided through dual hydraulic cylinders and wire ropes. Each set will be capable of operating the ladder in the event of a failure, of the other. The extension cylinder rod will be chrome plated to provide smooth operation of the aerial device and reduce seal wear. The extension/retraction cylinders will be equipped, with integral holding

valves, to prevent the unit from retracting should the charged line be severed, at any point within the hydraulic system. The integral holding valves will NOT be located in the transfer tubes.

Wire ropes and attaching systems used to extend and retract the fly sections will have a 5:1 safety factor based on the ultimate strength under all operating conditions. The factor of safety for the wire rope will remain above 2:1 during any extension or retraction stall. The minimum ratio of the diameter of wire rope used to the diameter of the sheave used will be 1:12. Wire ropes will be constructed of seven (7) strands over an inner wire for increased flexibility. The wire rope will be galvanized to reduce corrosion.

The extension/retraction system will be controlled by the microprocessor. Linear transducers will measure the ladder extension. The microprocessor will provide the following features:

- Automatic deceleration at the end of stroke, in maximum extend and retract positions

All sheaves will require lubrication. They will have bronze bushings and grease zerks.

### **MANUAL OVERRIDE CONTROLS**

Manual override controls will be provided for all aerial and stabilizer functions.

### **LADDER SLIDE MECHANISM**

UHMW polyethylene wear pads will be used between the telescoping ladder sections, to provide greater bearing surface area for load transfer. Adjustable slide pads will be used to control side play between the ladder sections.

### **ROTATION SYSTEM**

The aerial will be supplied with a powered rotation system as outlined in NFPA standards. The hydraulic rotation motor will provide continuous rotation under all rated conditions and be supplied with a brake to prevent unintentional rotation. One (1) hydraulically driven, planetary gear box with drive speed reducers will be used to provide infinite and minute rotation control throughout the entire rotational travel. One (1) spring applied, hydraulically released disc type swing brake will be furnished to provide positive braking of the turntable assembly. Provisions will be made for emergency operation of the rotation system should complete loss of normal hydraulic power occur. The hydraulic system will be equipped with pressure relief valves which will limit the rotational torque to a nondestructive power. The gearbox will have a minimum continuous torque rating of 80,000 in. lbs. and a minimum intermittent rating of 160,000 in. lbs. The turntable bearing, ring gear teeth, pinion gear, planetary gearbox, and output shaft will be certified by the manufacturer of the components for the application.

The rotation system will be controlled by the microprocessor. The microprocessor will provide the following features:

- Collision avoidance to prevent accidental body damage
- Prevent the aerial from being rotated into an unstable condition.

### **ROTATION INTERLOCK**

The microprocessor will be used to prevent the rotation of the aerial device to the side in which the stabilizers have not been fully deployed (short-jacked). The microprocessor will allow full and

unrestricted use of the aerial, in the 180 degree area, on the side(s) where the stabilizers have been fully deployed. The system will also have a manual override to comply with the current edition of applicable NFPA standards.

**LADDER CRADLE INTERLOCK SYSTEM**

A ladder cradle interlock system will be provided through the microprocessor to prevent the lifting of the aerial device from the nested position until the operator places all the stabilizers in a load supporting configuration. A switch will be installed at the boom support to prevent operation of the stabilizers once the aerial has been elevated from the nested position..

**AERIAL TORQUE BOX/PEDESTAL**

The pedestal assembly will be a welded assembly made of high strength 0.25" plate. The vertical member will be a 0.375" reinforced wall cylinder with a 28.00" outside diameter and will connect the rotation bearing mounting plate to the lower substructure.

The pedestal assembly will be bolted to the chassis frame with 0.88" diameter Grade 8 bolts, and will be utilized to mount the outrigger jacks and reservoir for the aerial hydraulic system.

There will be a 5/8" gap between the torque box and the frame rails to promote drying of the surfaces and reduce the effect of corrosion.

**LOAD CAPACITIES**

The following load capacities will be established with the stabilizers at full horizontal extension and placed in the down position to level the truck and to relieve the weight from the tires and axles. Capacities will be based upon full extension and 360 degree rotation.

A load chart, visible at the operator's station, will be provided. The load chart will show the recommended safe load at any condition of the aerial device's elevation and extension.

**50 MPH WIND CONDITIONS/WATERWAY DRY**

Degrees of Elevation	-10 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 77
Egress	750	750	750	750	750	750	750	750
Fly	-	-	-	-	-	250	500	750
Upper Mid	-	-	-	-	250	500	1000	1000
Lower Mid	-	-	-	-	500	750	1000	1000
Base	-	-	-	500	500	1000	1000	1000

**50 MPH WIND CONDITIONS/WATERWAY CHARGED**

Degrees of Elevation	-10 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 77
Egress	500	500	500	500	500	500	500	500
Fly	-	-	-	-	-	250	500	500
Upper Mid	-	-	-	-	250	500	750	1000
Lower Mid	-	-	-	250	500	750	1000	1000
Base	-	-	250	500	750	1000	1000	1000

**Reduced loads at the tip can be redistributed in 250 lb increments to the fly, mid, or base sections as needed.**

**The tip capacity will be reduced to zero when flowing water with the nozzle above the waterway centerline.**

**Side to side monitor travel will be reduced with a 50 mph wind rating on the device.**

### **BOOM SUPPORT**

A heavy-duty boom support will be provided for support of the ladder in the travel position. On the base section of the ladder, a stainless steel scuffplate will be provided where the ladder comes into contact with the boom support.

The boom support will be located just to the rear of the chassis cab.

### **AERIAL BOOM SUPPORT LIGHT**

There will be one (1) Peterson, Model 393C, white incandescent light mounted on the boom support cradle. This light will be activated by the aerial master switch.

### **BOOM SUPPORT COMPARTMENT DIRECTLY BEHIND THE CAB**

A compartment will be provided on each side of the apparatus directly behind the cab.

Compartment will be made of aluminum treadplate. The interior dimensions of each compartment will be approximately 8.00" wide x 22.75" deep. The height of the compartment will be determined by the height of the cab (to the raised roof if applicable).

A single pan aluminum treadplate door will be provided for each compartment. Each door will be hinged along the forward edge.

There will be a pair of D-handle latches provided on each door. Latches will be spaced as evenly as possible, yet both latches will remain accessible from the ground.

### **AERIAL BOOM PANEL**

There will be one boom panel provided on each side of the aerial ladder base section. The boom panel will be painted #10 white.

The boom panels will be designed so no mounting bolts are in the face of the panel. This will keep the lettering surface free of holes.

### **FOLDING STEPS**

One (1) set of folding steps will be provided at the tip of the ladder. An additional set of folding steps will be provided at the base of the fly section. The steps will be bright finished with a black tread coating on the stepping surface. Each step will have no integrated light.

### **AERIAL DEVICE RUNG COVERS**

Each rung will be covered with a secure, heavy-duty, fiberglass pultrusion that incorporates an aggressive, no-slip coating.

The rung covers will be glued to each rung and will be easily replaceable should the rung cover become damaged.

The center portion of each rung cover will be black and the outside 2.00" edge at each side will be safety yellow.

Under no circumstances will the rung covers be fastened to the rungs using screws or rivets.

The rung covers will have a 10-year, limited warranty.

### **STOKES STORAGE BRACKETS**

There will be one (1) aluminum bracket(s) provided at the base section of the aerial ladder on the left side of the aerial device while viewed from the turntable. The brackets will be located inboard of the aerial boom panel. The brackets will be painted to match the aerial device and include locking pins to secure the basket.

### **STABILITY TEST**

An aerial stability test will be run on the apparatus using the maximum weight allowance for tip options.

### **TEMPORARY SCABBARD AT END OF AERIAL**

There will be a total of one (1) vent saw scabbard(s) provided. The scabbard(s) will be mounted on the left side of the aerial tip. The scabbard(s) will be DA finished.

### **LIGHTS FOR TURNTABLE WALKWAY**

There will be white LED lights provided at the aerial turntable. The lights will be located to illuminate the entire walking surface of the turntable including the area around the turntable console. These lights will be activated by the aerial master switch.

### **TURNTABLE CONSOLE LIGHTING**

There will be one (1), TecNiq Model T10, white LED light strip mounted in the turntable console cover to illuminate the controls located on both the upper and lower portion of the turntable control station. These lights will be activated by the aerial master switch.

### **ROTATION BEARING COVER**

A cover will be fitted over the aerial rotation bearing and drive pinion gear(s). The cover will be aluminum treadplate and attached to the underside of the turntable deck.

### **SAW STORAGE BOX AT TURNTABLE**

There will be a storage box constructed of aluminum treadplate provided at the aerial turntable. The box will have a hinged cover with a gas shock and rubber draw latch to secure the saw.

The interior dimensions of the saw box will be As large as possible TBD.

### **INFORMATION CENTER**

There will be an information center provided. The information center will operate in temperatures from -40 to 158 degrees Fahrenheit. The information center will employ a Linux operating system and a 7.00" (diagonal measurement) LCD display. The LCD will have a minimum 1000nits rated, color

display. The LCD will be sunlight readable. The LCD display will be encased in an ABS, gray plastic housing with a Pierce decal. There will be five (5), weather-resistant user interface switches provided. The LCD display can be changed to an available foreign language.

### **OPERATION**

The information center will be designed for easy operation in everyday use. There will be a page button to cycle from one screen to the next screen in a rotating fashion. A video button will allow an NTSC signal into the information center to be displayed on the LCD. If any button is pressed while viewing a video feed, the information center will return to the vehicle information screens. There will be a menu button to provide access to maintenance, setup, and diagnostic screens. All other button labels will be specific to the information being viewed.

### **GENERAL SCREEN DESIGN**

Where possible, background colors will be used to provide vehicle information *At A Glance*. If the information provided on a screen is within acceptable limits, a green background color will be used. If the information provided on a screen is not within acceptable limits, an amber background color will indicate a caution condition and a red background color will indicate a warning condition.

Every screen in the information center will include the aerial tip temperature, the time (12- or 24-hour mode) and a text Alert Center. The time will be synchronized between all Command Zone color displays located on the vehicle. The Alert Center will display text messages for audible alarms. The text messages will identify any items causing the audible alarm to sound. If more than one (1) audible alarm is activated, the text message for each alarm will cycle every second until the problems have been resolved. The background for the Alert Center will change to indicate the severity of the warning message. Amber will indicate a caution condition and red will indicate a warning condition. If a warning and a caution condition occur simultaneously, the red background color will be shown for all Alert Center messages.

A label will be provided for each button. The label will indicate the function for each active button for each screen. If the button is not utilized on specific screens, it will have a button label with no text.

Symbols will accurately depict the aerial device type the information pertains to such as rear mount ladder, rear mount platform, mid-mount ladder or mid-mount platform.

### **PAGE SCREENS**

The Information center will include the following pages:

The Aerial Main and Load Chart page will indicate the following information:

- Rungs Aligned and Rungs Not Aligned will be indicated with text and respective green or red colored ladder symbols.
- Ladder Elevation will be indicated via a fire apparatus vehicle with ladder symbol with the degree of elevation indicated between the vehicle and ladder.
- Water Flow (if applicable) will be indicated via a water nozzle symbol and text indicating flow / time.

- Breathing Air Levels will be indicated via an air bottle symbol and text indicating the percent (%) of air remaining. A green bar graphs shown inside the bottle will indicate oxygen levels above 20%. A red bar graph will indicate oxygen levels at or below 20%. When oxygen levels are at or below 10% the red bar graph will flash.

- The Aerial Load Chart will indicate the load limit on each section of the ladder based on actual ladder position and water flow (if applicable).

- *At A Glance* color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

The Aerial Reach and Hydraulic Systems page will indicate the following information:

- Aerial Hydraulic Oil Temperature will be indicated with symbol and text. At a glance features will be utilized.

- Aerial Hydraulic Oil Pressure will be indicated with a symbol and text. At a glance features will be utilized.

- The following calculations will be indicated on a representative vehicle symbol:

- Aerial Device Extension length.

- Aerial Device Height indicating the height of the aerial device tip from the ground.

- Aerial Device Reach indicating the horizontal distance the aerial reaches from the turntable.

- Aerial Device Angle indicating the angle from the vehicle which the device is at.

- *At A Glance* color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

The Level Vehicle page will indicate the following information:

- The grade of the vehicle will be indicated via a fire apparatus vehicle symbol with the degree of grade shown in text format. The symbol will tilt dependent on the vehicle grade.

- The slope of the vehicle will be indicated via a fire apparatus vehicle symbol with the degree of slope shown in text format. The symbol will tilt dependent on the vehicle slope.

- Outriggers status will be indicated via a colored symbol for each outrigger present. Each outrigger status will be defined as one of the following:

- Outrigger stowed indicated with a silver pan located close to the vehicle

- Outrigger fully extended indicated with a fully deployed green outrigger

- Outrigger short-jacked indicated by a yellow outrigger partially deployed

- Outrigger not set indicated by a red outrigger that is not set on the ground
- A text box located on the vehicle symbol will be utilized to identify the overall status of the outrigger leveling system. The following status will be indicated in the text box:
  - Deployed status will indicate all outriggers are properly set on the ground at full extension
  - Shortjacked status will indicate one or more outriggers are set on the ground but not fully extended.
  - Not Set status will indicate one or more outriggers is not properly set on the ground.
  - Stowed status will indicate all outriggers are stowed for vehicle travel.
- A bedding assist alert will indicate that the aerial device is being aligned by the Command Zone system as the operator lowers the aerial device into the cradle with the joystick.
- *At A Glance* color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

## **MENU SCREENS**

The following screens will be available through the Menu button:

The View System Information screen will display aerial device hours, aerial PTO hours, ladder aligned for stowing, aerial rotation angle, total water flow (if applicable), and aerial waterway valve status (if applicable).

The Set Display Brightness screen will allow brightness increase and decrease and include a default setting button.

The Configure Video Mode screen will allow setting of video contrast, video color and video tint.

The Set Startup screen allows setting of the screen that will be active at vehicle power-up.

The Set Date and Time screen has a 12- or 24-hour format, and allows setting of the time and date.

The View Active Alarms screen shows a list of all active alarms including the date and time of each alarm occurrence and shows all alarms that are silenced.

The System Diagnostics screen allows the user to view system status for each module and it's respective inputs and outputs. Viewable data will include the module type and ID number; the module version; and module diagnostics information including input or output number, the circuit number connected to that input or output, the circuit name (item connected to the circuit), status of the input or output, and other module diagnostic information.

Aerial calibrations screen indicates items that may be calibrated by the user and instructions to follow for proper calibration of the aerial device.

Button functions and button labels may change with each screen.

### **LOWER CONTROL STATION**

A lower control station will be located at the rear of the apparatus in an easily accessible area. The controls and indication labels will be illuminated for nighttime operation. The following items will be furnished at the lower control station and will be clearly identified and conveniently located for ease of operation and viewing:

- Level assist switch
- Override switch to override microprocessor
- Emergency power unit switch

### **TURNTABLE CONTROL STATION**

There will be one (1) device control station located on the left side of the turntable so the operator may easily observe the ladder tip while operating the controls. All elevation, extension and rotation controls will operate from this location. The controls will permit the operator to regulate the speed of the aerial functions, within the safe limits, as determined by the manufacturer and NFPA standards. Each control will be equipped, with a positive lock to hold the control in a neutral position, preventing accidental activation. In addition to the neutral lock, a console cover will be provided at the turntable control station. The controls will be so designed to allow the turntable control station to immediately override the tip controls, if equipped, even if the ladder is being operated by the tip controls.

The following items will also be provided at the turntable control station, clearly identified, lighted for nighttime operation and conveniently located for ease of operation and viewing:

- Intercom controls
- Tip tracking light switch
- Emergency stop switch
- Emergency power unit switch
- Operator's load chart
- Two (2) position switch for selecting aerial operational speed

### **HIGH IDLE**

The high idle will be controlled by the microprocessor. The microprocessor will automatically adjust the engine rpm to compensate for the amount of load placed upon the system. The system will include a safety device that allows activation of the high idle, only when the parking brake is set and the transmission is placed in neutral.

### **AERIAL WIRELESS REMOTE CONTROL**

The aerial device will be equipped with a Hetronic J1939 Can Bus wireless remote control. This remote control will operate all functions of the aerial device and one (1) water monitor electrically.

For safety reasons, the wireless remote may only be used in a water tower application, not with personnel on the aerial device.

The system will consist of the follow components:

One (1) wireless transmitter with joysticks and toggle switches mounted in a body compartment inside torque box if possible.

One (1) 12 volt DC battery charger mounted near the transmitter storage cradle.

Two (2) rechargeable batteries.

One (1) SAE J1939 Can Bus controlled receiver to control electric over hydraulic valves and one (1) water monitor mounted on the back side of the aerial turntable console.

One (1) enable maintained toggle switch to activate the wireless system mounted near the transmitter storage cradle.

One (1) wireless control system enabled indicator light mounted next to the enable switch.

**Safety system interlocks:**

Command Zone™ programming will maintain the turntable operator's aerial control priority over the wireless control.

An E-Stop switch on the wireless transmitter or in the rear body stabilizer control compartment will turn off the aerial hydraulic diverter valve, there by stopping all aerial functions.

**STABILIZERS**

The vehicle will come equipped with a stabilization system consisting of four (4) hydraulically operated stabilizers. The front two (2) will be out and down style, the rear two (2) will be down only. This system will meet or exceed all requirements of the NFPA specifications related to stabilization and setup on sloped surfaces.

The stabilizer/leveling jacks will have a maximum spread of 16' measured from the centerline of the jack footpads when the beams are fully extended. The beams will be 6.88" wide x 9.00" high with 3/4" thick top and bottom plates and 1/2" thick sides of 100,000-PSI minimum yield strength steel. The cylinders will have pilot-operated check valves with thermal relief designed to insure that the beams will not drift out of the stowed position during travel. Wear pads will guide the stabilizers.

The horizontal extension cylinders will be totally enclosed within the beams and will incorporate telescoping hydraulic tubing to supply the jack cylinder hydraulic power. Stabilizer hydraulic hoses will remain stationary during operation of the stabilizers to prevent hose wear and potential failure. The cylinders will be equipped with decelerators to reduce the speed of extension and retraction when the beams are near the fully retracted and extended positions. The stabilizer extension hydraulic cylinders will have the following dimensions: 2.25" bore, 1.38" rod, and 39.25" stroke.

The vertical jack cylinders will be capable of 18.00" ground penetration. The cylinders will be supplied with pilot operated check valves on each jack cylinder to hold the cylinder in the stowed or working

position, should a charged line be severed at any point in the hydraulic system. For safety, the integral holding valves will be located in the cylinder base, NOT in the transfer tube. Vertical jack cylinder rods will be fully enclosed by a telescoping inner box to protect the cylinder rods from damage. The stabilizer jack hydraulic cylinders will have the following dimensions: 4.25" bore, 3.00" rod, and 28.88" stroke.

Each stabilizer jack will have a pan that will be a maximum of 14.00" wide so as to allow the extension of the stabilizer between parked cars or other obstacles. This pan will serve as a protective guard and a mounting surface for warning lights. The top, forward, and rear edges will be flanged back 90 degrees for added strength.

### **STABILIZER PADS**

The stabilizer footpad will be 12.00" in diameter. The footpad will be attached to the jack cylinder rod by means of a machined ball at the end of the jack cylinder rod which mates to a socket machined into the footpad. The footpad will have the ability to pivot 20 degrees from horizontal in any direction to allow setup on uneven terrain.

### **AUXILIARY STABILIZER PADS**

An auxiliary ground pad will be supplied for each stabilizer to provide additional load distribution on soft surfaces. The pads will be 31" x 26" and made from lightweight composite material. The ground pressure will not exceed 75 pounds per square inch when the ground pads are used and the apparatus is fully loaded and the aerial device is carrying its rated capacity in any position. The pads will be stored in a double stacked configuration, two (2) behind each rear tandem axle in a single bracket.

### **STABILIZER CONTROLS**

A portable stabilizer control box will be provided. The control box will be weatherproof and oil resistant. Each function and indicator light will be labeled on a metal photo panel. The control box can be taken as far away as 15' from the vehicle with an extension cable.

The stabilizer control box will include the following:

- One (1) green power indicator light for stabilizer control that will be illuminated when the aerial master and "PTO" switches in the cab are activated.
- Four (4) electric toggle switches for stabilizers: each toggle switch will control the extend/retract (front only) and raise/lower of its respective stabilizer to allow vehicle set up in restricted areas and/or on uneven surfaces.
- Auto leveling assist switch: The outrigger control system will incorporate a computerized self leveling system in addition to the standard outrigger controls. The operator will have the option to manually or automatically level the truck. The computerized system will ensure full outrigger extension, proper jack penetration, and will level the vehicle within 1/2 a degree of level for safe operation of the aerial device.
- One (1) electric toggle switch for the engaging the emergency power unit.
- One (1) red "stabilizer not stowed" indicator light: this light will illuminate when the stabilizers are not in the fully stowed position.

- Two (2) fully extended beams green indicator lights: these lights will be illuminated when each of the respective stabilizer beams are fully extended.
- Four (4) firm on ground green indicator lights: each light will be illuminated when its respective stabilizer shoe is in the load supporting condition.

Each toggle switch will activate the engine fast idle automatically.

Manual override will be supplied for each stabilizer control valve.

A stabilizer deployment audible warning alarm will be provided and activated by the stabilizer movement.

A "Stabilizers Not Stowed" indicator will be provided in the driver's compartment. It will illuminate automatically whenever the stabilizers are not fully stowed to prevent damage to the apparatus if moved. The stabilizer system will also be wired to the "Do Not Move Indicator Light", which will flash whenever the apparatus parking brake is not fully engaged and the stabilizers are not fully stowed.

### **CRADLE INTERLOCK SYSTEM**

A cradle interlock system will be provided, to prevent the lifting of the aerial from the nested position, until the operator has positioned all the stabilizers in a load supporting configuration. A switch will be installed at the cradle, to prevent operation of the stabilizers once the aerial has been elevated from the nested position.

### **STABILIZER PAN AND TRIM MATERIAL**

The aerial stabilizer pans will be polished stainless steel and the aerial stabilizer trim will be polished stainless steel.

### **STABILIZER CONTROL BOX DOOR**

A vertically hinged smooth aluminum door will be provided over the stabilizer control box. The door will be hinged along the outboard edge and be provided with a Southco C2 chrome raised trigger lever latch.

### **STABILIZER PLACEMENT**

There will be two (2) cameras provided and installed on the body, one (1) directly above each stabilizer. The cameras will be activated with a switch in the cab and will provide a picture to specify the fully extended stabilizer position allowing the driver the ability to position the vehicle with the proper clearance for stabilizer deployment.

### **HYDRAULIC SYSTEM**

All hose assemblies will be assembled and crimped by the hose manufacturers certified technician.

All manufacturing employees responsible for the installation of hydraulic components will be properly trained. Training will include: proper handling, installation, torque requirements, cleanliness and quality control procedures for hydraulic components.

Hoses used in the aerial hydraulic system will be of a premium quality hose with a high abrasion resistant cover. All pressure hoses will have a working pressure of 4000 psi and a burst pressure rating of 16,000 psi.

All hydraulic fittings and tubing will be plated to minimize corrosion.

The fitting will use an O-ring seal where possible to minimize hydraulic leaks.

An interlock will be provided that prevents activation of the hydraulic pump until the transmission is placed in neutral and the parking brake is set as outlined in the current NFPA 1901 standard.

The system will meet the performance requirement of the current NFPA 1901 standard, which requires adequate cooling less than 2.5 hours of operations.

All hydraulic components that are non-sealing whose failure could result in the movement of the aerial will comply with current NFPA 1901 standards and have burst strength of 4:1.

Dynamic sealing components whose failure could cause aerial movement will have a margin of 2:1 on maximum operating pressure per the current NFPA 1901 standard.

All hydraulic hoses, tubes, and connections will have a minimum burst strength of 4:1 per the current NFPA 1901 standard.

A chassis mounted positive displacement piston pump for consistent pressure and rapid responses will supply hydraulic power for all aerial operations. The positive displacement pump will provide 3,150psi. The hydraulic pump will be solely dedicated to aerial operations.

Each aerial will be evaluated as to the region and climate where it will be used to determine the optimum viscosity and proper oil grade. Oil viscosity will be based on an optimum range of 80 to 1000 SUS during normal aerial use. Before shipment of the unit, an oil sample will be taken and analyzed to confirm the oil is within the allowable ISO grade tolerance.

The aerial hydraulic system will have a minimum oil cleanliness level of ISO 18/15/13 based on the ISO 4406:1999 cleanliness standard. Each customer will receive a certificate of actual cleanliness test results and an explanation of the rating system.

Each aerial will include an oil sample port, identified with a yellow dust cap and a label, for subsequent customer testing.

Ball valves will be provided in the hydraulic suction lines to permit component servicing without draining the oil reservoir.

The aerial will incorporate the use of trombone steel tubes inside the stabilizer beams to eliminate hydraulic hose wear and leaks.

Hydraulic power to the ladder will be transferred from the pedestal by a hydraulic swivel.

The system hydraulic pressure will be displayed on the turntable display.

The hydraulic system will be additionally protected from excessive pressure by a secondary pressure relief valve set at 3,150 psi. In the event the main hydraulic pump compensator malfunctions, the secondary relief will prevent system damage.

### **HYDRAULIC CYLINDERS**

All cylinders used on the aerial device will be produced by a manufacturer that specializes in the manufacture of hydraulic cylinders.

Each cylinder will include integral safety holding cartridges.

Each cylinder will be designed to a minimum safety factor of 4:1 to failure.

All safety holding cartridges will be installed at the cylinder manufacturer, in a controlled clean environment to avoid possible contamination and or failure.

### **POWER TAKEOFF/HYDRAULIC PUMP**

The apparatus will be equipped with a power takeoff driven by the chassis transmission and actuated by an electric shift, located inside the cab. The power takeoff which drives the hydraulic pump will meet all the requirements for the aerial unit operations.

An amber indicator light will be installed on the cab instrument panel to notify the operator that the power takeoff is engaged.

An interlock will be provided that allows operation of aerial power only after the chassis spring brake has been set and the chassis transmission has either been placed in the neutral position or drive position after the driveline has been disengaged from the rear axle.

The hydraulic system will be supplied by a variable displacement load and pressure compensating piston pump. The pump will meet the demands of all three simultaneous aerial functions. The pump will provide proper flow for single aerial function with the engine at idle speed. A switch will be provided on the control console to increase the engine speed for multiple function operation.

### **EMERGENCY PUMP**

The hydraulic system will be designed with an auxiliary power unit meeting the guidelines of the current NFPA 1901 standard.

The aerial will be equipped with an emergency hydraulic pump, electrically driven from the truck batteries. The pump will be capable of running for 30 minutes for limited aerial functions to stow the unit in case of a main pump or truck system failure. A momentary switch will be located at the stabilizer and aerial control locations to activate the emergency pump.

### **AERIAL CONTROL VALVE**

The aerial hydraulic control valve will be designed with special spool flows, limiting the oil flow for the designed function speed. The valve will be electrically controlled and be located in the control console with the handles oriented downward for manual operation. The activation handles will be spaced a minimum of 3.50" for ease of operation. The valve spools will be designed to bleed off downstream pressure, in the neutral position and allow proper sealing of any cylinder holding cartridge.

## **OIL RESERVOIR**

The oil reservoir will have a minimum capacity of 38 gallons. The oil fill location will be easily accessible and be labeled "Hydraulic Oil Only" and also indicate the grade of oil that is installed in the reservoir. The fill will have a desiccant breather filter with a water capacity of 4 fluid ounces and a 5 micron rating. A drain hose will be included and will terminate with a quarter turn ball valve.

Two suction ports will be provided, one for the main hydraulic pump and one for the emergency pump. The main suction will be slightly elevated off the bottom of the reservoir and include a 100 mesh suction strainer. The emergency suction port will be closer to the bottom of the reservoir to provide some reserve oil for emergency operation.

A six (6) disc type magnetic drain will also be provided to collect any ferrous contaminants.

A float type sending unit in the reservoir will provide an indication of oil level on an electronic display. A temperature sending unit in the reservoir will provide indication of the oil temperature on an electronic display.

The hydraulic oil reservoir will be labeled per the current edition of NFPA 1901 standard.

## **RETURN FILTER**

The low pressure oil return filter will be integrated with the hydraulic manifold and designed to prevent oil loss during filter change. A 50 psi bypass will be included to protect the element and hydraulic system during lower than normal operating temperatures. The system will incorporate the following filter to provide dependable service:

- return filter: beta 200 at 6 micron

## **HYDRAULIC SWIVEL**

The aerial ladder will be equipped with a three (3) port, high pressure hydraulic swivel which will connect the hydraulic lines from the hydraulic pump and reservoir through the rotation point to the aerial control bank. The hydraulic swivel will allow for 360 degree continuous rotation of the aerial.

## **ELECTRIC SWIVEL**

The ladder will be equipped with an electric swivel to allow 360 degrees rotation of the aerial while connecting all electrical circuits through the rotation point. A minimum of 28 collector rings will be provided that are capable of supplying 30 amp continuous service. All collector rings will be enclosed and protected with desiccant plugs against condensation and corrosion. No oil or silicone will be used.

## **12-BIT ABSOLUTE ENCODER**

The aerial ladder will be equipped with a 12-Bit Absolute Encoder which provides 4096 counts per shaft turn for position and direction reference.

The 12-Bit Absolute Encoder will provide a unique binary word to reference each position and direction for all 360 degrees of rotation.

If the power is interrupted for any reason, the 12-Bit Absolute Encoder will allow power to be returned to the system without having to re-zero the settings.

The 12-Bit Absolute Encoder will be an integral part of a micro-processor based control system.

### **ELECTRICAL SYSTEM**

The standard 8 conductor cable to the tip contains 10 AWG conductors.

The 107' heavy duty ladder will utilize a microprocessor-based control system. The system will consist of the following components:

A tethered stabilizer control will be provided. The tethered control will be weatherproof and oil resistant. A Super Bright LED indicator light will be labeled on a metal photo panel for each function. The electrical connection at the tethered control will be permanently attached by a strained relieved coil cord that will allow the operator to move 14' away from the electrical connection for operation.

- Remote Stabilizer Controls
- Weatherproof and oil resistant
- One (1) green "power" indicator light
- One (1) red "stabilizer not stowed" indicator light
- One (1) electric toggle switch for auto level assist
- One (1) electric toggle switch for the emergency power unit
- One (1) electric toggle switch for each stabilizer to control:
  - Extend/retract function (front only)
  - Raise/lower function
- One (1) green "stabilizer fully extended" indicator light for each front stabilizer
- One (1) green "firm on ground" indicator light for each stabilizer

### **Control System Modules**

Each of the control system modules will be configured as follows:

- Sealed to a NEMA 4 rating
- Operating range from -40 degrees F to 185 degrees F (-40 degrees C to 85 degrees C)
- Communicate using J1939 data link
- Two (2) diagnostic LED light
  - One (1) green light that illuminates when module has power (B+) and ground
  - One (1) red light that flashes to indicate the module is capable of communicating via the data link
- Ground matrix identification system

The following control system modules will be used:

Control Module

- Main controller for the system
- USB connection allows for computer diagnostics

## Power Module

- Built-in fault sensing
- Eight (8) digital outputs
- Pulse width modulating (PWM) capable
- 10A continuous per output
- Circuit protection based on actual current draw (not affected by heat)

## Constant Current Module

- Built-in fault sensing
- Three (3) analog inputs
- Eight (8) digital outputs
- Pulse width modulating (PWM) capable
- 3A continuous per output
- Circuit protection based on actual current draw (not affected by heat)
- Closed Loop System

## Input Module

- 16 software selectable (digital or analog) inputs

## Output Module

- 16 digital outputs

## Input/Output Module

- Eight (8) software selectable (digital or analog) inputs
- Eight (8) digital outputs

## **TIP LIGHT**

There will be four (2) HiViz Model FT-WL-X-5-\*\*-\*, 4,000 raw lumens 12 volt DC lights with white LEDs and black housing(s) installed at the tip of the aerial device per the following.

- The left side tip light to include a combination of spot and flood optics.
- The right side tip light to include a combination of spot and flood optics.

The lights will be controlled with the tracking lights.

## **TRACKING LIGHTS**

There will be two (2) HiViz FT-WL-X-9-\*, 5,734 effective lumens 12 volt DC lights with white LEDs and adjustable mounts installed on the base section of the aerial device below the hand rails per the following:

- One (1) located on the left side. The left side tracking light to include spot optics.

- One (1) located on the right side. The right side tracking light to include spot optics.
- The painted parts of the tip light housing(s) to be black.

The tracking lights will be controlled by a switch located at the platform/tip, turntable and right side cab switch.

### **LIGHTING ON AERIAL LADDER**

There will be TecNiq, Model D02 LED rung lighting provided on both sides of the aerial ladder base, lower and upper mid, and fly sections. The lighting will be located adjacent to the ladder rungs along the lower rail of the ladder sections and will run the length of the ladder section.

The color of the sections will be:

- The base section of the ladder to be red for the first three (3) rungs and the rest blue.
- The lower mid section of the ladder to be red.
- The upper mid section of the ladder to be red.
- The fly section of the ladder to be blue and the last three (3) rungs to be red.

The LED rung lighting will be activated when a switch at the turntable operator's panel is activated through the aerial master and a switch at the turntable operator's panel is activated through the master battery switch.

The lights may be load managed when the parking brake is applied.

### **STABILIZER WARNING LIGHTS**

There will be our (4) Hiviz®, Model FT-HVC-GSMJR-WN-\*\*, 7.48" long x 5.11" tall x 1.63" deep lights with flashing LEDs, and black trim installed, one (1) on each stabilizer cover panel.

- The left side front stabilizer pan warning light to include red LEDs.
- The left side rear stabilizer pan warning light to include red LEDs.
- The right side rear stabilizer pan warning light to include red LEDs.
- The right side front stabilizer pan warning light to include red LEDs.
- The lens color is to be clear.

The warning LEDs will be activated when the aerial master switch is on or when side warning switch is activated.

These lights will be controlled utilizing the microprocessor based HiViz® Connect™ system.

### **STABILIZER BEAM WARNING LIGHTS**

Two (2) 4.00" diameter red LED flashing lights will be mounted on each stabilizer, one (1) facing forward and one (1) facing rearward. The lights will be Grote Supernova 40 series LED lights. The lights will be recessed in the horizontal beam of the stabilizer. These warning lights will be activated with the aerial master switch.

### **STABILIZER SCENE LIGHTS**

There will be one (1) Truck-Lite, Model 40227C 4.00" incandescent, scene light installed under each stabilizer beam to illuminate the surrounding area. A total of four (4) lights will be installed. These lights will be activated by the aerial master switch.

### **DC POWER CABLE TO TIP**

There will be a cable installed in the aerial device to provide 13.92 amps @ 12 volts DC to the tip of the aerial device.

### **2-WAY AERIAL COMMUNICATION SYSTEM**

There will be a Fire Research, Model ICA910, two-way intercom system provided. The control module with an LED volume display and push-button volume control will be located on the turntable operator console.

A hands free module will be located at the aerial tip or platform and constantly transmit to the other module unless the control module push-to-talk button is pressed.

Each intercom unit will be weatherproof.

### **RAISED AERIAL PEDESTAL**

The aerial pedestal will be raised to accommodate the height of the cab.

### **LIFTING EYE ASSEMBLY - ROPE RESCUE ATTACHMENT**

A lifting eye assembly will be provided that is designed to evenly distribute load at the tip of the aerial. The lift eye assembly is retained by two (2) locking pins, one (1) at each end outboard side of the egress. Leveling is maintained by the lifting eye assembly rotating within the egress mounting. The lifting eye assembly rating will match the capacity rating of the aerial device.

### **AERIAL TURNTABLE MANSAYER™ BARS**

Yellow ManSaver™ bars will be installed at the aerial turntable.

### **WATER SYSTEM**

A waterway system will be provided consisting of the following components and features:

A 5.00" pipe will be connected to the water supply on one end and to a 5.00" internal diameter water swivel at the rotation point of the turntable. The water swivel will permit 360 degree continuous rotation of the aerial device.

The 5.00" waterway swivel is to be routed through the rotation point up to the heel pin swivel. The heel pin swivel will allow the water to flow to the ladder pipe while elevating the aerial ladder from -10 degrees to 77 degrees. The heel pivot pin is not integral with the waterway swivel at any point. The design of the waterway will allow complete servicing of the waterway swivel without disturbing the heel pivot pin.

The integral telescopic water system will consist of a 4.50" diameter tube in the base section, a 4.00" diameter tube in the inner mid-section, a 3.50" diameter tube in the outer mid-section, and a 3.00" diameter tube in the fly section. The telescopic waterway will be constructed of anodized aluminum pipe.

The aerial will be capable of discharging up to 1000 gpm at 100 psi parallel to the ladder and 90 degrees to each side of center while maintaining the rated tip load.

The aerial will be capable of discharging between 1001 and up to 1500 gallons per minute at 100 psi parallel to the ladder and 40 degrees to each side of center while maintaining the rated tip load.

The master stream will be capable of flow up to 30 degrees above horizontal.

An adjustable pressure relief valve will be furnished to protect the aerial waterway from a pressure surge.

A 1.50" drain valve will be located at the lowest point of the waterway system.



### **WATERWAY SEALS**

The waterway seals will be of type-B PolyPak design, composed of nitroxile seal and a nitrile wiper, which together offer maximum stability and extrusion resistance on the waterway. The seal will be capable of withstanding pressures up to 2000 psi, temperatures in excess of 250 degrees Fahrenheit and have resistance to all foam generating solutions. The seals will be internally lubricated.

The waterway seals will have automatic centering guides constructed of synthetic thermalpolymer. The guides will provide positive centering of the extendible sections within each other and the base section to insure longer service life and smoother operation.

### **AERIAL MONITOR**

An Akron Model 3486 monitor with stow and deploy will be provided at the tip with a Akron 1500 gpm Model 5178. This monitor will allow for an additional 30 degrees of travel above horizontal at the aerial tip.

The monitor's functions will be controlled electrically from two (2) separate locations. One (1) control will be located at the control console and the other at the ladder tip.

There will be a courtesy light at the tip of the aerial to illuminate the controls.

If the aerial has a quick-lock waterway, a limit switch will be provided to disable the extended vertical travel when the monitor is locked to the lower ladder section.

### **AERIAL VALVE MANIFOLD UNDER MONITOR**

An Akron Aerial Valve Manifold (AVM) valve and manifold will be provided at the aerial waterway monitor inlet. This configuration provides a valve to control flow through the monitor and an additional valve as a discharge connection for hose.

The AVM monitor flow control valve will be manually operated at the tip of the ladder with a slow close gear valve. The valve will have an integral automatic drain valve.

The Akron S2 left side discharge valve will have a 90 degree, 1/4 turn ball valve with 2.50" NH outlet threads. A 2.50" NH cap with chain will be provided.

A pressure relief valve will be installed to prevent incidental damage to the waterway system when both valves are closed.

### **AERIAL WATERWAY FLOW METER**

Waterway flow, including total water flowed, will be monitored by the microprocessor. An LCD display will be located at the turntable control station.

### **REAR INLET**

A 5.00" NST inlet to the aerial waterway will be provided at the rear of the apparatus. It will be furnished with a 5.00" chrome plated adapter and a 5.00" chrome plated, long handle cap.

### **WATERWAY LOCKING SYSTEM**

The aerial ladder waterway monitor will be capable of being positioned at either the fly section or at the next lower section of the ladder.

The monitor location will be changeable by the use of a single handle, located at the side of the ladder.

The handle, attached to a cam bracket, will simply be moved forward to lock the monitor at the fly section and back to lock it to the previous section.

There will be no pins to remove and reinstall.

The monitor will be operational at all times, regardless of its position, without connecting or disconnecting electrical lines.

### **TOOLS**

The following tools will be provided for retorquing of all specified bolts as recommended by the manufacturer:

- Torque Wrench
- All Required Extensions, Sockets and Adapters
- 4-to-1 Multiplier

### **MANUALS**

Two (2) operator maintenance manuals and two (2) wiring diagrams pertaining to the aerial device will be provided with the apparatus at time of pick-up.

### **INITIAL INSTRUCTION**

On initial delivery of the fire apparatus, the contractor will supply a qualified representative to demonstrate the apparatus and provide initial instruction to the fire department regarding the operation, care, and maintenance of the apparatus for a period of three (3) consecutive days.

### **LOOSE EQUIPMENT**

The following equipment will be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.

## **NFPA LOOSE EQUIPMENT**

### **NFPA Required Loose Equipment Provided by Fire Department**

The following loose equipment as outlined in NFPA 1900, 2024 edition, table 8.1 will be provided by the fire department:

- One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 107, *American National Standard for High-Visibility Safety Apparel and Accessories*, and have a five-point breakaway feature that includes two (2) at the shoulders, two (2) at the sides, and one (1) at the front.
- Five (5) fluorescent orange traffic cones not less than 28.00" (711 mm) in height, each equipped with a 6.00" (152 mm) retro-reflective white band no more than 4.00" (152 mm) from the top of the cone, and an additional 4.00" (102 mm) retro-reflective white band 2.00" (51 mm) below the 6.00" (152 mm) band.
- Five (5) illuminated warning devices such as highway flares, unless the five (5) fluorescent orange traffic cones have illuminating capabilities.
- Four (4) ladder belts meeting the requirements of NFPA 2500.

### **NFPA Loose Equipment That Shall be Considered:**

The following loose equipment as outlined in NFPA 1900, 2024 edition, appendix table A.8.4 (a) should be considered:

- 800 ft (240 m) of 2.50" (65 mm) or larger fire hose
- 400 ft (120 m) of 1.50" (38 mm), 1.75" (45 mm), or 2.00" (52 mm) fire hose
- One (1) handline nozzle, 200 gpm min
- Two (2) handline nozzles, 95 gpm min
- One (1) playpipe with shutoff and 1", 1.125", and 1.25" tips
- Four (4) SCBA apparatus
- Four (4) SCBA spare cylinders
- One (1) first aid kit.
- Four (4) salvage covers, each a minimum size of 12 ft × 18 ft (3.6 m × 5.5 m).
- Four (4) combination spanner wrenches.
- Two (2) hydrant wrenches.
- One (1) double female 2.50" adapter with national hose (NH) thread.
- One (1) double male 2.50" adapter with national hose (NH) thread.
- One (1) rubber mallet, suitable for use on suction hose connections.
- One (1) 150 ft (45 m) light-use life safety rope meeting the requirements of NFPA 2500.
- One (1) 150 ft (45 m) general-use life safety rope meeting the requirements of NFPA 2500.
- One (1) automatic external defibrillator (AED).

### **SOFT SUCTION HOSE**

There will be a 15' length of 6.00" soft suction hose provided with a 6.00" long handle swivel coupling on one (1) end and a 4.50" long handle swivel coupling on the other.

### **DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT**

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

### **WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT**

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

### **FLATHEAD AXE PROVIDED BY FIRE DEPARTMENT**

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

### **PICKHEAD AXE PROVIDED BY FIRE DEPARTMENT**

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

### **PAINT PROCESS**

The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:

1. Manual Surface Preparation - All exposed metal surfaces on the custom cab and body will be thoroughly cleaned and prepared for painting. Imperfections on the exterior surfaces will be removed and sanded to a smooth finish. Exterior seams will be sealed before painting. Exterior surfaces that will not be painted include; chrome plating, polished stainless steel, anodized aluminum and bright aluminum treadplate.
2. Chemical Cleaning and Pretreatment - All surfaces will be chemically cleaned to remove dirt, oil, grease, and metal oxides to ensure the subsequent coatings bond well. The aluminum surfaces will be properly cleaned and treated using a high pressure, high temperature 4 step Acid Etch process. The steel and stainless surfaces will be properly cleaned and treated using a high temperature 3 step process specifically designed for steel or stainless. The chemical treatment converts the metal surface to a passive condition to help prevent corrosion.
3. Surfacer Primer - The Surfacer Primer will be applied to a chemically treated metal surface to provide a strong corrosion protective basecoat. A minimum thickness of 2 mils of Surfacer Primer is applied to surfaces that require a Critical aesthetic finish. The Surfacer Primer is a two-component high solids urethane that has excellent sanding properties and an extra smooth finish when sanded.
4. Finish Sanding - The Surfacer Primer will be sanded with a fine grit abrasive to achieve an ultra-smooth finish. This sanding process is critical to produce the smooth mirror like finish in the topcoat.
5. Sealer Primer - The Sealer Primer is applied prior to the Basecoat in all areas that have not been previously primed with the Surfacer Primer. The Sealer Primer is a two-component high solids urethane that goes on smooth and provides excellent gloss hold out when topcoated.
6. Basecoat Paint - Two coats of a high performance, two component high solids polyurethane basecoat will be applied. The Basecoat will be applied to a thickness that will achieve the proper color match. The Basecoat will be used in conjunction with a urethane clear coat to provide protection from the environment.
7. Clear Coat - Two (2) coats of Clear Coat will be applied over the Basecoat color. The Clear Coat is a two-component high solids urethane that provides superior gloss and durability to the

exterior surfaces. Lap style and roll-up doors will be Clear Coated to match the body. Paint warranty for the roll-up doors will be provided by the roll-up door manufacturer.

After the cab and body are painted, the color will be verified to make sure that it matches the color standard. Electronic color measuring equipment will be used to compare the color sample to the color standard entered into the computer. Color specifications will be used to determine the color match. A Delta E reading will be used to determine a good color match within each family color.

All removable items such as brackets, compartment doors, door hinges, and trim will be removed and painted separately if required, to ensure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly will be finish painted before assembly.

The paint finish quality levels for critical areas of the apparatus (cab front and sides, body sides and doors, and boom lettering panels) are to meet or exceed Cadillac/General Motors GMW15777 global paint requirements. Orange peel levels are to meet or exceed the #6 A.C.T. standard in critical areas. The manufacture's written paint standards will be available upon request.

### **Environmental Impact**

Contractor will meet or exceed all current state regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

- Topcoats and primers will be chrome and lead free.
- Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.
- Particulate emission collection from sanding operations will have a 99.99 percent efficiency factor.
- Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter is used, it will have an efficiency rating of 98 percent. Water wash systems will be 99.97 percent efficient
- Water from water wash booths will be reused. Solids will be removed on a continual basis to keep the water clean.
- Paint wastes are disposed of in an environmentally safe manner.
- Empty metal paint containers will be recycled to recover the metal.
- Solvents used in clean-up operations will be recycled on-site or sent off-site for distillation and returned for reuse.

Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Contractor will, upon demand, present evidence that the manufacturing facility meets the above conditions and that it is in compliance with his state EPA rules and regulations.

### **CAB PAINT**

The cab will be painted #90 red.

### **BODY PAINT**

The body will be painted to match the lower section of the cab.

## **PAINT CHASSIS FRAME ASSEMBLY**

The chassis frame assembly will be finished with a single system black top coat before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

Components that are included with the chassis frame assembly that will be painted are:

- Frame rails
- Frame liners
- Cross members
- Axles
- Suspensions
- Steering gear
- Battery boxes
- Bumper extension weldment
- Frame extensions
- Body mounting angles
- Rear Body support substructure (front and rear)
- Pump house substructure
- Steel fuel tank
- Castings
- Individual piece parts used in chassis and body assembly

Components treated with epoxy E-coat protection prior to paint:

- Two (2) C-channel frame rails
- Two (2) frame liners

The E-coat process will meet the technical properties shown.

## **REAR WHEELS PAINT**

All wheel surfaces, inside and outside, will be provided with paint black #101.

## **AXLE HUB PAINT**

All axle hubs will be painted black #101.

## **COMPARTMENT INTERIOR PAINT**

The interior of all compartments will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

## **AERIAL DEVICE PAINT COLOR**

The aerial device paint procedure will consist of a six (6) step finishing process as follows:

1. Manual Surface Preparation - All exposed metal surfaces on the aerial device structural components above the rotation point will be thoroughly cleaned and mechanically shot-blasted to remove metal impurities and prepare the aerial for painting.

2. Primer/Surfacer Coats - A two (2) component urethane primer/surfacer will be applied to the mechanically shot-blasted metal surfaces to provide a strong corrosion protective base coat and to smooth out the surface. All seams will be caulked with a two (2) component epoxy caulk before painting.
3. Hand Sanding - The primer/surfacer coat of the outer surfaces of the hand rails and base rails will be lightly sanded to a smooth finish.
4. Sealer Primer Coat - A two (2) component sealer primer coat will be applied over the sanded primer.
5. Topcoat Paint - Urethane base coat will be applied to opacity for correct color matching.
6. Clearcoat - Two (2) coats of an automotive grade two (2) component urethane will be applied.

Surfaces that will not be painted include all chrome plated, polished stainless steel, anodized aluminum and bright aluminum treadplate.

All buy out components, such as monitor, nozzle, gauges, etc. will be supplied as received from the vendor.

Removable items such as brackets will be removed and painted separately to ensure paint coverage behind all mounted items.

The stabilizer beams and torque box will be treated with E-coat prior to painting to help provide resistance to corrosion and chemicals. The stabilizers and torque box will be painted black.

The aerial device components will be painted as follows using the aforementioned six (6) step finishing process:

- Aerial device ladder sections and extension cylinders: silver metallic 211
- Aerial egress: #50 red (will be contrasting color to the aerial device ladder)
- Aerial turntable: white 10
- Aerial control console: white 10
- Aerial lift cylinders: white 10
- Aerial boom support: gloss black primer

### **REFLECTIVE BAND**

A 10.00" white reflective band will be provided across the front of the vehicle and along the sides of the body.

The reflective band provided on the cab face will be at the headlight level.

### **REAR CHEVRON STRIPING**

There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. Covered surfaces will include the rear wall and aluminum doors. Rear compartment doors, stainless steel access doors, and the rear bumper will not be covered.

The colors will be red and fluorescent yellow green diamond grade.

Each stripe will be 6.00" in width.

This will meet the requirements of the current edition of NFPA 1901, which states that 50% of the rear surface will be covered with chevron striping.

### **REFLECTIVE STRIPE ON STABILIZERS**

There will be a 4.00" wide fluorescent yellow green diamond grade reflective stripe provided on the forward and rear facing side of all aerial stabilizers.

### **CAB DOOR REFLECTIVE STRIPE**

A 6.00" x 16.00" white reflective stripe will be provided across the interior of each cab door. The stripe will be located approximately 1.00" up from the bottom, on the door panel.

This stripe will meet the NFPA 1901 requirement.

### **LETTERING**

The lettering will be totally encapsulated between two (2) layers of clear vinyl.

### **LETTERING**

Sixty-one (61) to eighty (80) genuine gold leaf lettering, 3.00" high, with outline and double shade will be provided.

### **LETTERING ON MUD FLAP**

The front and rear mud flaps will state the following in reflective lettering: tbd

There will be two (2) different colors of reflective lettering provided.

The following will be in color 1: tbd

The font style of the lettering will be Full Block.

The color of the lettering will be red with white outline.

The following will be in color 2: tbd

The font style of the lettering will be Full Block.

The color of the lettering will be green with blue outline.

### **FIRE APPARATUS PARTS MANUAL**

There will be one (1) custom parts manual(s) in USB flash drive format for the complete fire apparatus provided.

The manual(s) will contain the following:

- Job number
- Part numbers with full descriptions
- Table of contents
- Parts section sorted in functional groups reflecting a major system, component, or assembly

- Parts section sorted in alphabetical order
- Instructions on how to locate parts

Each manual will be specifically written for the chassis and body model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

### **Service Parts Internet Site**

The service parts information included in these manuals are also available on the Pierce website. The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.

### **CHASSIS SERVICE MANUALS**

There will be one (1) chassis service manuals on USB flash drives containing parts and service information on major components provided with the completed unit.

The manual will contain the following sections:

- Job number
- Table of contents
- Troubleshooting
- Front Axle/Suspension
- Brakes
- Engine
- Tires
- Wheels
- Cab
- Electrical, DC
- Air Systems
- Plumbing
- Appendix

The manual will be specifically written for the chassis model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

### **CHASSIS OPERATION MANUAL**

The chassis operation manual will be provided on one (1) USB flash drive.

### **ONE (1) YEAR MATERIAL AND WORKMANSHIP**

A Pierce basic apparatus limited warranty certificate, WA0008, is included with this proposal.

### **ENGINE WARRANTY**

A Paccar five (5) year limited engine warranty will be provided. A limited warranty certificate is included with this proposal.

### **STEERING GEAR WARRANTY**

A Sheppard **three (3) year** limited steering gear warranty will be provided. A copy of the warranty certificate will be submitted with this proposal.

### **FIFTY (50) YEAR STRUCTURAL INTEGRITY**

The Pierce custom chassis frame limited warranty certificate, WA0013, is included with this proposal.

### **FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY**

The Pierce TAK-4 suspension limited warranty certificate, WA0050, is included with this proposal.

### **REAR AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY**

Pierce TAK-4® independent rear suspension will be provided with a three (3) year material and workmanship limited warranty. The manufacturer's warranty will provide that the independent rear suspension be free from any defect related to material and workmanship on the portion of the apparatus built by the manufacturer that would arise under normal use and service.

### **ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY**

A Meritor Wabco™ ABS brake system limited warranty certificate, WA0232, is included with this proposal.

### **TEN (10) YEAR STRUCTURAL INTEGRITY**

The Pierce custom cab limited warranty certificate, WA0012, is included with this proposal.

### **TEN (10) YEAR PRO-RATED PAINT AND CORROSION**

A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included with this proposal.

### **FIVE (5) YEAR MATERIAL AND WORKMANSHIP**

The Pierce Command Zone electronics limited warranty certificate, WA0014, is included with this proposal.

### **CAMERA SYSTEM WARRANTY**

A Pierce fifty four (54) month warranty will be provided for the camera system.

### **COMPARTMENT LIGHT WARRANTY**

The Pierce 12 volt DC LED strip lights limited warranty certificate, WA0203, is included with this proposal.

### **TRANSMISSION WARRANTY**

The transmission will have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission.

Note: The transmission cooler is not covered under any extended warranty you may be getting on your Allison Transmission. Please review your Allison Transmission warranty for coverage limitations.

### **TRANSMISSION COOLER WARRANTY**

The transmission cooler will carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). In addition, a collateral damage warranty will also be in effect for the first three (3) years of the

warranty coverage and will not exceed \$10,000 per occurrence. A copy of the warranty certificate will be included with this proposal.

**WATER TANK WARRANTY**

A UPF poly water tank limited warranty certificate, WA0195, is included with this proposal.

**TEN (10) YEAR STRUCTURAL INTEGRITY**

The Pierce apparatus body limited warranty certificate, WA0009, is included with this proposal.

**ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY**

A Gortite roll-up door limited warranty will be provided. The mechanical components of the roll-up door will be warranted against defects in material and workmanship for the lifetime of the vehicle. A **six (6) year** limited warranty will be provided on painted and satin roll up doors.

The limited warranty certificate, WA0190, is included with this proposal.

**PUMP WARRANTY**

A Hale pump limited warranty certificate, WA0388, is included with this proposal.

**TEN (10) YEAR PUMP PLUMBING WARRANTY**

The Pierce apparatus plumbing limited warranty certificate, WA0035, is included with this proposal.

**TWENTY (20) YEAR AERIAL DEVICE STRUCTURAL INTEGRITY WARRANTY**

The Pierce device limited warranty certificate, WA0052, is included with this proposal.

**AERIAL SWIVEL WARRANTY**

An Amity five (5) year limited swivel warranty will be provided. A copy of the warranty certificate will be included with this proposal.

**HYDRAULIC SYSTEM COMPONENTS WARRANTY**

Aerial hydraulic system components will be provided with a five (5) year material and workmanship limited warranty.

**HYDRAULIC SEAL WARRANTY**

Aerial hydraulic seals will be provided with a three (3) year material and workmanship limited warranty.

A copy of the warranty certificates is included with this proposal.

**AERIAL WATERWAY WARRANTY**

An Amity ten (10) year limited waterway warranty will be provided. A copy of the warranty certificate is included with this proposal.

**FOUR (4) YEAR PRO-RATED PAINT AND CORROSION**

A Pierce aerial device limited pro-rated paint warranty certificate, WA0047, is included with this proposal.

**TEN (10) YEAR PRO-RATED PAINT AND CORROSION**

A Pierce body limited pro-rated paint warranty certificate, WA0057, is included with this proposal.

### **THREE (3) YEAR MATERIAL AND WORKMANSHIP**

The Pierce Goldstar gold leaf lamination limited warranty limited warranty certificate, WA0018, is included with this proposal.

### **VEHICLE STABILITY CERTIFICATION**

The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1900, current edition, section 7.14, Vehicle Stability. The certification is included with this proposal.

### **ENGINE INSTALLATION CERTIFICATION**

The fire apparatus manufacturer will provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification will be provided at the time of delivery.

### **POWER STEERING CERTIFICATION**

The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification is included with this proposal.

### **CAB INTEGRITY CERTIFICATION**

The fire apparatus manufacturer will provide a cab crash test certification with this proposal. The certification will state that a specimen representing the substantial structural configuration of the cab has been tested and certified by an independent third party test facility. Testing events will be documented with photographs, real-time and high-speed video, vehicle accelerometers, cart accelerometers, and a laser speed trap. The fire apparatus manufacturer will provide a state licensed professional engineer to witness and certify all testing events. Testing will meet or exceed the requirements below:

- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.
- European Occupant Protection Standard ECE Regulation No.29.
- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks.

### **Side Impact**

The cab will be subjected to dynamic preload where a 14,320-lb moving barrier is slammed into the side of the cab at 5.50 mph, striking with an impact of 13,000 ft-lb of force. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab will see in a rollover incident.

### **Frontal Impact**

The same cab will withstand a frontal impact of 32,600 ft-lb of force using a moving barrier in accordance with SAE J2420.

### **Additional Frontal Impact**

The same cab will withstand a frontal impact of 65,098 ft-lb of force using a moving barrier. (Twice the force required by SAE J2420)

### **Roof Crush**

The cab will be subjected to a roof crush force of 22,500 lb. This value meets the ECE 29 criteria, and is equivalent to the front axle rating up to a maximum of ten (10) metric tons.

### **Additional Roof Crush**

The same cab will be subjected to a roof crush force of 110,000 lbs. (Four and a half times the load criteria of ECE 29)

The same cab will withstand all tests without any measurable intrusion into the survival space of the occupant area.

There will be no exception to any portion of the cab integrity certification. Nonconformance will lead to immediate rejection of bid.

### **CAB DOOR DURABILITY CERTIFICATION**

Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

### **WINDSHIELD WIPER DURABILITY CERTIFICATION**

Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles*. The bidder will certify that the wiper system design has been tested and that the wiper system has met these criteria.

### **ELECTRIC WINDOW DURABILITY CERTIFICATION**

Cab window roll-up systems can cause maintenance problems if not designed for long service life. The window regulator design will complete 30,000 complete up-down cycles and still function normally when finished. The bidder will certify that sample doors and windows similar to those provided on the apparatus have been tested and have met these criteria without malfunction or significant component wear.

### **SEAT BELT ANCHOR STRENGTH**

Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.

### **SEAT MOUNTING STRENGTH**

Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder will certify, at time of delivery, that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

### **PERFORMANCE CERTIFICATIONS**

#### **Cab Air Conditioning**

Good cab air conditioning temperature and air flow performance keeps occupants comfortable, reduces humidity, and provides a climate for recuperation while at the scene. The cab air conditioning system

will cool the cab from a heat-soaked condition at 100 degrees Fahrenheit to an average of 78 degrees Fahrenheit in 30 minutes. The bidder will certify that a substantially similar cab has been tested and has met these criteria.

### **Cab Defroster**

Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, And Multipurpose Vehicles. The bidder will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

### **Cab Auxiliary Heater**

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. An auxiliary cab heater will warm the cab 77 degrees Fahrenheit from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder will certify, at time of delivery, that a substantially similar cab has been tested and has met these criteria.

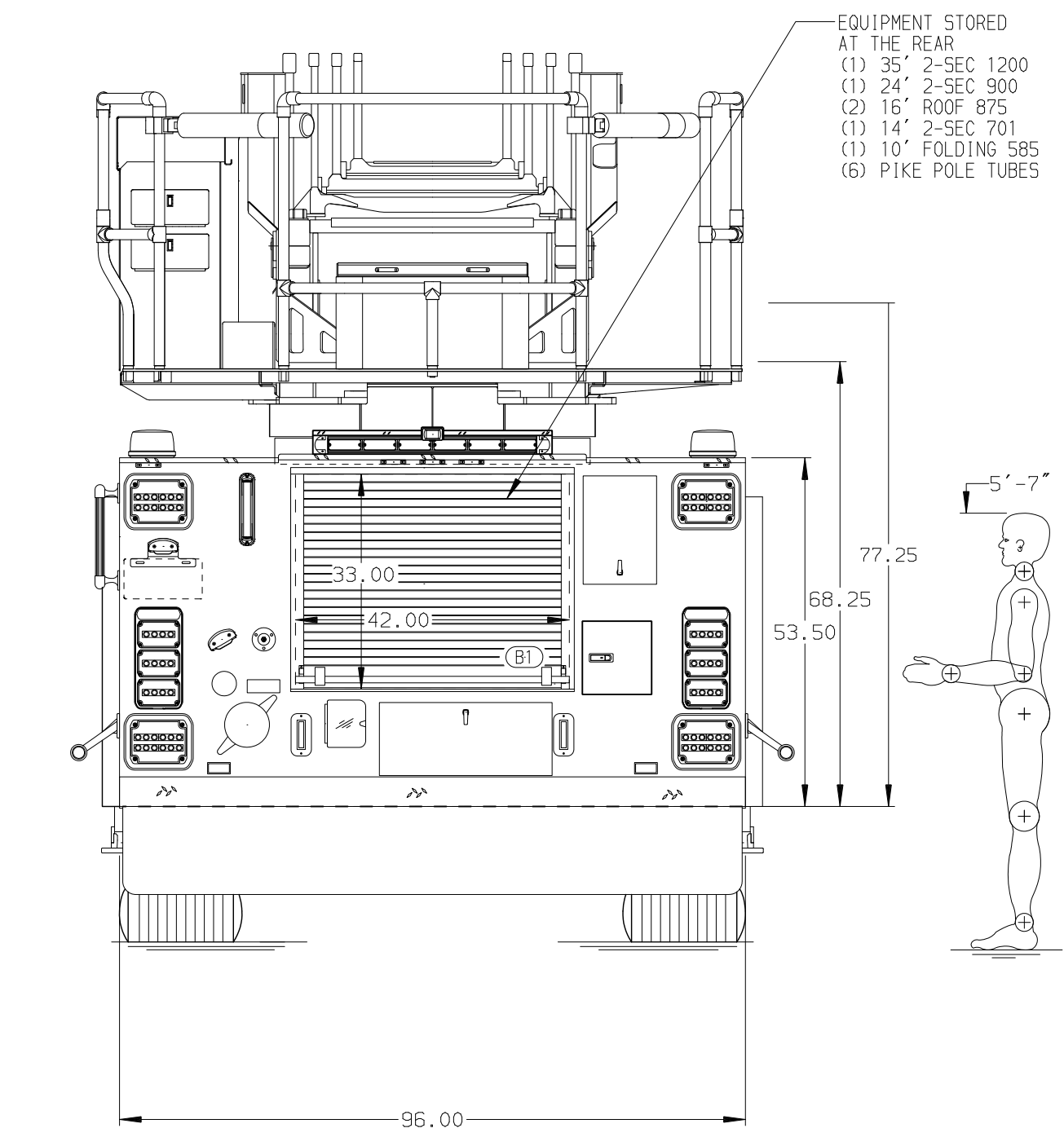
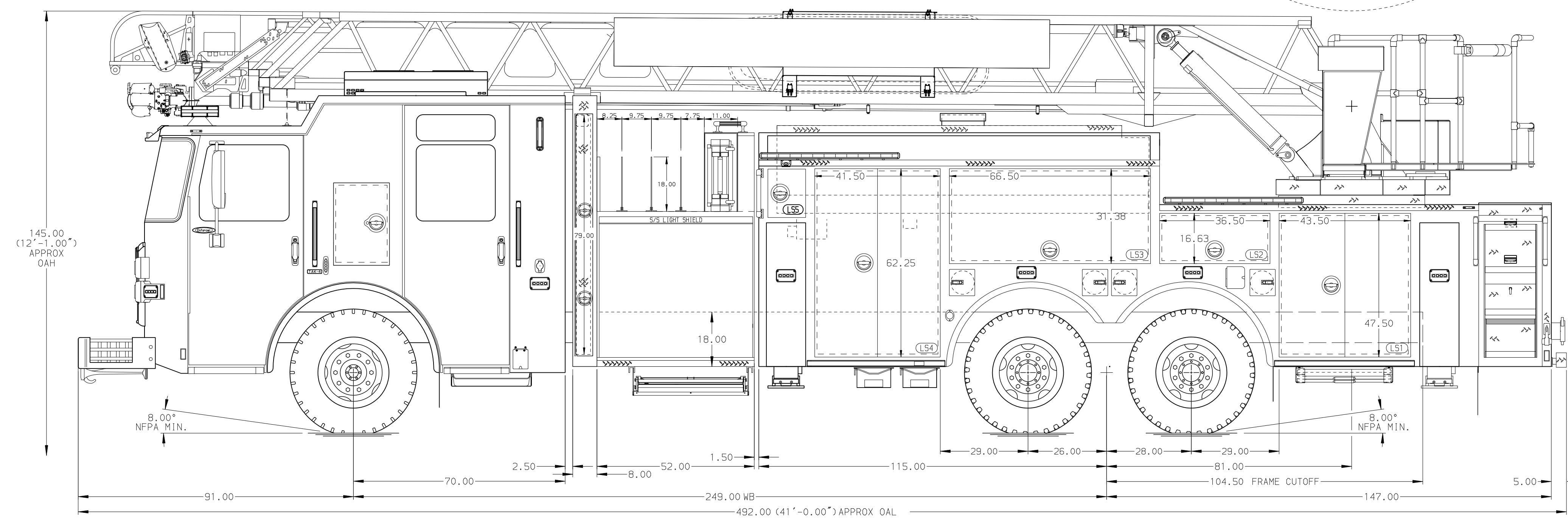
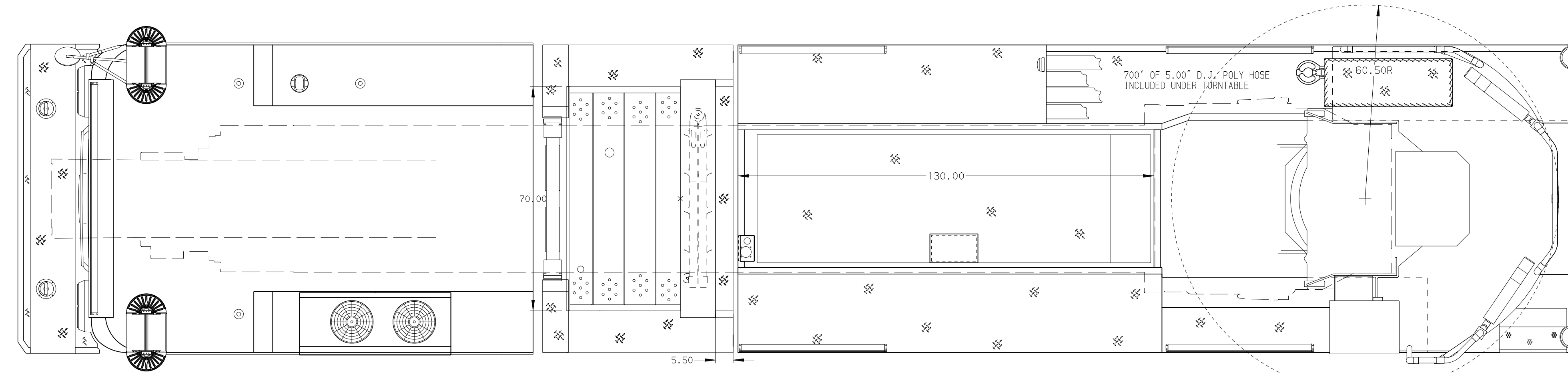
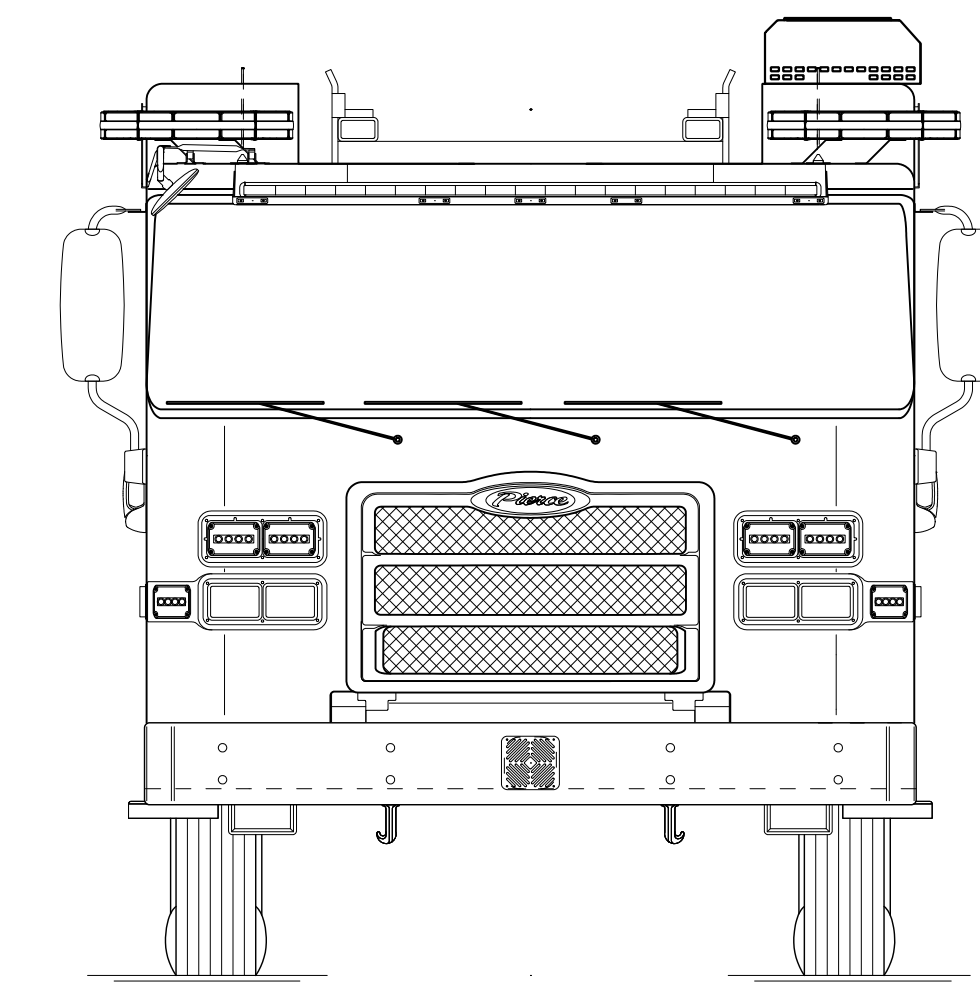
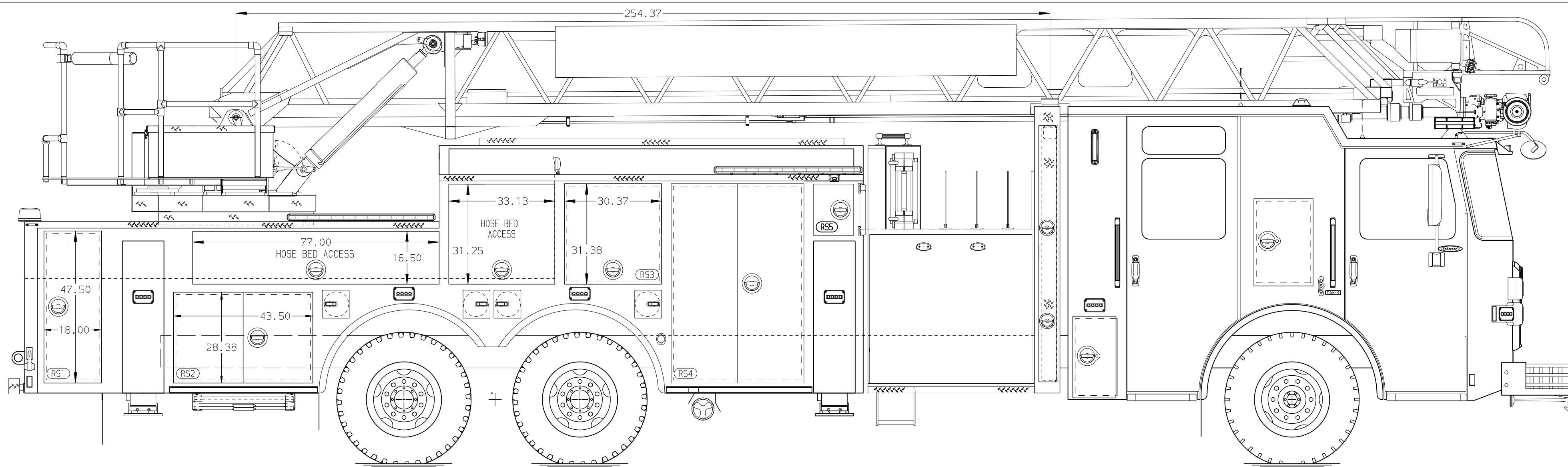
### **AMP DRAW REPORT**

The bidder will provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.

The manufacturer of the apparatus will provide the following:

- Documentation of the electrical system performance tests.
- A written load analysis, which will include the following:
  - The nameplate rating of the alternator.
  - The alternator rating under the conditions specified per:
    - Current edition of applicable NFPA standards.
  - The minimum continuous load of each component that is specified per:
    - Current edition of applicable NFPA standards.
  - Additional loads that, when added to the minimum continuous load, determine the total connected load.
  - Each individual intermittent load.

All of the above listed items will be provided by the bidder per the current edition of applicable NFPA standards.



ALUMINUM BODY SIDE ROLL AND FRONTAL IMPACT PROTECTION

NOTE  
DIMENSIONS SHOWN ARE APPROXIMATE AND ARE SUBJECT TO MINOR DEVIATIONS AS MAY OCCUR OR BE NECESSARY IN CONSTRUCTION. MINOR DETAILS NOT SHOWN.

- 1. NO LIMITED RETRACTION REQUIRED
- 2. 3.00\"/>

REV	DATE	BY	CH	ENFORCER

		JOB NO.	PRELIM
		SCALE	DATE
TITLE	107' ASCENDANT AERIAL LADDER AND BODY ASSEMBLY	DRAWN BY	ANZ
MAKE	550 GALLON WATER TANK	CHECKED BY	-
FOR	MONROE FIRE DEPARTMENT	SHEET SIZE	D
PIERCE	ATLANTIC EMERGENCY SOLUTIONS, INC	SHEET NO.	1 OF 1
MODEL	BID 1376 WOODS, CORY		
DWG NO.	71963		

**Term Proposal**  
September 4, 2024



**FREEDOM**  
— FINANCIAL —

**Jack Jackson**  
144 Freedom Blvd  
Yorktown, VA 23692  
(757) 234-7424  
jjackson@ff.financial

### **City of Monroe, OH**

Freedom Financial is pleased to present the following term sheet. Lease-Purchase terms are for discussion purposes only and subject to acceptance of financial documentation and credit approval. Please note that rates are not locked and are subject to adjustment at time of transaction funding date. Lease-Purchase must qualify for Federal Income Tax Exempt status for the lessee.

---

Equipment: (1) Pierce Enforcer 107' Aerial

Unit Cost: \$1,752,476

Down Payment: \$0

Amount Financed: \$1,752,476

Frequency of Payments: Annual

First Payment Due: February 15, 2025

Term:	10 Years	12 Years	15 Years
Payments:	\$221,390.34	\$192,908.65	\$164,989.63
Rate:	5.17%	5.14%	5.12%

*Quote valid for 10 days from date of issuance with credit submission occurring within this same 10-day period.*

Freedom Financial is providing this information for discussion purposes only in anticipation of engaging in a commercial, arm's length transaction. Freedom Financial is not acting as a municipal advisor, financial advisor or fiduciary to any person or entity. Please consult with your own legal, accounting, tax, financial, and other advisors to the extent you deem appropriate.

**Term Proposal**  
September 4, 2024



**FREEDOM**  
— FINANCIAL —

**Jack Jackson**  
144 Freedom Blvd  
Yorktown, VA 23692  
(757) 234-7424  
jjackson@ff.financial

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---

Equipment: (1) Pierce Enforcer 107' Aerial

Unit Cost: \$1,752,476

Down Payment: \$0

Amount Financed: \$1,752,476

Frequency of Payments: Annual

First Payment Due: February 15, 2026

Term:	10 Years	12 Years	15 Years
Payments:	\$232,827.89	\$202,831.05	\$173,475.99
Rate:	5.17%	5.14%	5.14%

*Quote valid for 10 days from date of issuance with credit submission occurring within this same 10-day period.*

Freedom Financial is providing this information for discussion purposes only in anticipation of engaging in a commercial, arm's length transaction. Freedom Financial is not acting as a municipal advisor, financial advisor or fiduciary to any person or entity. Please consult with your own legal, accounting, tax, financial, and other advisors to the extent you deem appropriate.



# Option List

6/19/2024

<b>Customer:</b>	Monroe Fire Department	<b>Bid Number:</b>	1376
<b>Representative</b>	Woods, Cory	<b>Job Number:</b>	
<b>Organization:</b>	Atlantic Emergency Solutions, Inc	<b>Number of Units:</b>	1
<b>Requirements Manager:</b>		<b>Bid Date:</b>	06/14/2024
<b>Description:</b>	City of Monroe 107' ASL T-3	<b>Stock Number:</b>	
<b>Body:</b>	Aerial, HD Ladder 107' ASL Tandem, Alum Body	<b>Price Level:</b>	49 (Current: 49)
<b>Chassis:</b>	Enforcer Chassis, Aerials, Tandem Axle, Ascendant/LSL	<b>Lane:</b>	

Line	Option	Type	Option Description	Qty
1	0010012		No Boiler Plates requested	1
2	0018180		Single Source Compliance, Aerials	1
3	0584456		Manufacture Location, Appleton, Wisconsin	1
4	0584452		RFP Location: Appleton, Wisconsin	1
5	0588609		Vehicle Destination, US	1
6	0816491		Comply NFPA 1900 Changes Effective Jan 1, 2024, With Exceptions	1
7	0533351		Quint Fire Apparatus	1
8	0588612		Vehicle Certification, Aerial w/Pump	1
9	0681278		Agency, Apparatus Certification, Aerial w/Pump, U.L.	1
10	0816495		Certification, Vehicle Inspection Program, NFPA 1900	1
11	0766110		Consortium, Sourcewell	1
12	0537375		Unit of Measure, US Gallons	1
13	0030006		Bid Bond Not Requested	1
14	0816569		Performance Bond, Not Requested, PPI Terms	1
15	0000007		Approval Drawing	1
16	0002928		Electrical Diagrams	1
17	0786875		Enforcer Chassis, Aerials, Tandem Axle, Ascendant/LSL	1
18	0000110		Wheelbase	1
			Wheelbase - 249"	
19	0000070		GVW Rating	1
			GVW rating - 66,800	
20	0729280		Frame Rails, 13.38 x 3.50 x .375, Enforcer	1
21	0889469		Frame Liner, "C/Inv L" 12.50" x 3.00" x .25", AXT/Vel/Imp/Enf, 56" QVal	1
22	0629940		Axle, Front, Oshkosh TAK-4, Non Drive, 22,800 lb, Enforcer	1
23	0010427		Suspension, Front TAK-4, 22,800 lb, Qtm/AXT/Imp/Vel/Enf/SFR	1
24	0087572		Shock Absorbers, KONI, TAK-4, Qtm/AXT/Imp/Vel/DCF/Enf	1
25	0000322		Oil Seals, Front Axle	1
26	0804562		Tires, Front, Michelin, XZE (wb), 425/65R22.50, 20 ply, Fire Service Speed Rtnq	1
27	0752585		Wheels, Front, Alcoa, 22.50" x 12.25", Aluminum, Dura-Black, Hub Pilot	1
28	0785450		Axle, Rear, Oshkosh TAK-4 T3, 44,000 lb, Rear Steer, 2 Axle, Enforcer	1
29	0544244		Top Speed of Vehicle, 60 MPH/96 KPH	1
30	0639379		Suspen, Rear, Oshkosh TAK-4, Independent, 44,000 lb	1
31	0000485		Oil Seals, Rear Axle	1
32	0636818		Tires, Rear, Michelin, XZY3 (wb), 445/65R22.5, 20 ply,(IRS)Tandem,FS Load Rating	1
33	0693622		Wheels, Rear, 22.50" x 13.00", Steel, Hub Pilot, Tandem, AWS/IRS	1
34	0568081		Tire Balancing, Counteract Beads	1
35	0620569		Tire Pressure Monitoring, RealWheels, AirSecure, Valve Cap, Tandem Axle	1
			Qty, Tire Pressure Ind - 10	
36	0801926		Lug Nut, Covers, Black	1
37	0003245		Axle Hub Covers w/center hole, S/S, Front Axle	1
38	0742343		Mud Flap, Full Width, Rear, Custom Logo	1
39	0601010		Chocks, Wheel, SAC-44-E, Folding, Aerials	1
			Qty, Pair - 01	
40	0601009		Mounting Brackets, Chocks, SAC-44-E, Folding, Horizontal, Aerials	1
			Qty, Pair - 01	
			Location, Wheel Chocks - Left Side Rear Tire, Forward	
41	0821337		ABS Wabco Brake System, Tandem Rear Axle, Tak-4, NFPA 1900/ULC	1
42	0030185		Brakes, Knorr/Bendix 17", Disc, Front, TAK-4	1
43	0581433		Brakes, Bendix, Cam, Rear, 16.50 x 7.00"	1
44	0735527		Air Compressor, Brake, Wabco 26.8 CI, Paccar	1

Line	Option	Type	Option Description	Qty
45	0637583		Brake Reservoirs, 6,408 Cubic Inch Minimum Capacity, Saber FR/Enforcer Paint Color, Air Tanks - Black #98	1
46	0617092		Air Dryer, Wabco System Saver 1200, With Wet Tank, Heated,Saber FR/Enforcer	1
47	0000790		Brake Lines, Nylon	1
48	0000854		Air Inlet, w/Disconnect Coupling Location, Air Coupling(s) - a) DS Step Well, Forward Qty, Air Coupling (s) - 1	1
49	0070810		All Wheel Lockup (Aerial/Tanker Chassis)	1
50	0808515		Engine, Paccar MX, 510HP, 1850 lb-ftW/OBD, EPA 2027, Saber FR/Enforcer	1
51	0810929		Engine Contingency Adjustment	1
52	0001244		High Idle w/Electronic Engine, Custom	1
53	0735687		Engine Brake, Fully Integrated, Paccar MX13 Engine Switch, Engine Brake - MX13	1
54	0644227		Clutch, Fan, Air Actuated, Saber FR/Enforcer	1
55	0644573		Air Intake, Water & Ember Screen, Saber FR/Enforcer	1
56	0814375		Exhaust System, Horizontal, Right Side Exhaust, Diffuser - Aluminized Steel (Standard) Exhaust, Material/Finish - Aluminized Steel (Standard) Location, Diffuser Termination - 2.00" Past Rub Rail (Standard) Tip, Exhaust - Straight Tip (Standard)	1
57	0788765		Radiator, Saber FR/Enforcer	1
58	0001090		Cooling Hoses, Rubber	1
59	0001125		Fuel Tank, 65 Gallon, Left Side Fill	1
60	0001129		Lines, Fuel	1
61	0889521		DEF Tank, 7.3 Gallon, LS Fill, Under Cab, Paccar, Lift Up Fill Dr, Spring, ENF Door, Material & Finish, DEF Tank - Polished Stainless	1
62	0552793		Not Required, Fuel Priming Pump	1
63	0552712		Not Required, Shutoff Valve, Fuel Line	1
64	0699437		Cooler, Chassis Fuel, Not Req'd.	1
65	0690880		No Selection Required From This Category	1
66	0887546		Trans, Allison 6th Gen, 4000 EVS P, w/Prognostics, Imp/Vel/SFR/Enf	1
67	0625331		Transmission, Shifter, 6-Spd, Push Button, 4000 EVS	1
68	0684459		Transmission Oil Cooler, Modine, External	1
69	0001375		Driveline, Spicer 1810	1
70	0734211		Steering, Sheppard M110 w/Tilt, TAK-4, Paccar Pump, w/Cooler, Paccar	1
71	0802950		Steering Wheel, 4 Spoke w/Wiper Control, Saber FR/Enforcer	1
72	0690274		Logo/Emblem, on Dash Text, Row (1) One - City Text, Row (2) Two - of Text, Row (3) Three - Monroe	1
73	0606309		Bumper, 22" Extended, Under Slung, Painted, Recessed Xlays/Trays, SFR/Enf	1
74	0614646		No Lift & Tow Package, Imp/Vel, AXT, SFR/Enf	1
75	0002283		Tow Hooks, Painted	1
76	0644293		Tray, Full Width, 22" Bumper, Under Slung Design, 10"H Bumper, AXT/Enf/Saber FR Capacity, Hose Tray - (2) 200' sections of 1.78" Grating, Bumper extension - Grating, Rubber	1
77	0646611		Cover, Alum Treadplate, Flush, Full Width Tray,Under Slung Bumper Type of fastener - D ring latch on each side Stay arm, Tray Cover - c)Pneumatic Stay Arm, Dual	1
78	0610175		Light, FRC SunStrip, LED Strip Light, 27", Front Bumper Cover Qty, - 02	2
79	0644734		Hose Restraint, 2" Heavy Nylon Webbing w/Fastener Feature, Bumper Hose Tray Qty, - 02 Type of fastener - 2" cam buckle	2
80	0608055		Coating, Protective UL-LX, Bumper Gravel Pan, Black	1
81	0608054		Coating, Protective UL-LX, Hose Tray Cover(s), Black Qty, Hose Tray Covers - 1	1
82	0803221		Coating, Top and Bottom Flange, Front Bumper, UL-LX Coating, Black	1
83	0789736		Cab, Enforcer, 7010 w/Notch	1
84	0891214		Engine Tunnel, X12, MX13, Enforcer w/T3 Rear Axle	1
85	0887601		Cab Insulation, Enforcer/Saber FR	1

Line	Option	Type	Option Description	Qty
86	0633594		Rear Wall, Interior, Adjustable Seating	1
87	0632103		Rear Wall, Exterior, Cab, Saber FR/Enforcer	1
			Material, Exterior Rear Wall - Aluminum Treadplate	
88	0644201		Cab Lift, Elec/Hyd, Saber FR/Enforcer	1
89	0751129		Grille, Painted, Bright Finished Mesh Screen, Front of Cab, Enforcer	1
			Paint Color, Grille Surround - Black #101	
90	0002224		Scuffplates, S/S At Cab Door Jambs, 4-Door Cab	1
			Material Trim/Scuffplate - c) S/S, Polished	
91	0780622		Scuffplates, S/S Corner Guard, Brushed, Rear Cab Corners, 2"	1
92	0647932		Not Required, Trim, S/S Band, Across Cab Face, AXT/Saber/Enforcer	1
93	0015440		No Chrome Molding, On side of cab	1
94	0590424		Mirrors, Retrac, West Coast Style, Htd/Rmt, w/Htd/Rmt Convex, Black	1
95	0072189		Mirror, 8.00" Convex, Cab Front, Front Cross View	1
96	0648172		Door, Full Height, Saber FR/Enforcer 4-Door Cab, Raised Roof	1
			Key Model, Cab Doors - 751	
			Cab, Exterior Door Handle, Finish - 4-Door, Chrome/Black	
97	0655543		Door Panel, Brushed Stainless Steel, Saber/Enforcer 4-Door Cab	1
98	0630636		Controls, Electric Roll-Up Windows, 4dr, 4 Driver Controls, Saber FR/Enforcer	1
99	0528247		Electric Door Locks, Cab Doors, 2 Fob's QXS, AXT, Sab, Enf, Dash CF	1
100	0528263		Key Pad, Electric Door locks, DS & PS, QXS, AXT, Sab, Enf, Dash CF	1
101	0638310		Steps, 4-Door Cab, Saber FR/Enforcer	1
			Step Well Material - Aluminum Treadplate	
102	0770192		Handrail, Exterior, Hansen, Knurled, Alum, Black, 4-Door Cab	1
103	0892638		Lights, Cab & Crw Cab Acs Stps, P25, LED w/Bezel, 6lts	1
			Color, Trim - Chrome Housing	
104	0057836		Crowns, Front Fender, Rubber, TAK-4	1
105	0042105		No Windows, Side of Crew Cab	1
106	0779033		Not Required, Windows Rear of Crew Cab, Saber FR/Enforcer	1
107	0724439		Compt, Storage, 12.75 W x 24 H x 15 D, (1) RS Side C/C, Dbl Pan, 70" Enf	1
			Light, Aux Cab Compartment - Pierce, Hinged Side	
			Finish, Cab Compt/Component - Spatter Gray	
			Door, Cab Exterior Cabinet - Double Pan, Black, Locking #751	
			Door, Exterior Stop - Web Strap	
108	0776419		Lettering, Laser Cut, S/S Screen, Below Grille, SFR/Enf	1
			Fill in Blank - Monroe	
109	0553057		Holder, Cup, Cab/Crewcab, Each	2
			Qty, - 02	
110	0722796		Dash, Poly, Saber FR/Enforcer	1
111	0607217		Mounting Provisions, 3/16" Alum, Full Engine Tunnel, Saber FR/Enforcer	1
			Mounting Provision Spacing - .50"	
			Material Finish, Cab Interior - Black	
112	0750824		Cab Interior, Vinyl Headliner, Saber FR/Enforcer, CARE	1
			Color, Cab Interior Vinyl/Fabric - Endure Vinyl - Silver/Gray	
			Engine Tunnel Cover - Dark Silver Gray Endure Vinyl	
			Cab Interior Rear Wall Material - Painted Aluminum	
113	0753903		Cab Interior, Paint Color, Saber FR/Enforcer	1
			Color, Cab Interior Paint - i) fire smoke gray	
114	0052100		Floor, Rubber Padded, Cab & Crew Cab, Saber/Enforcer	1
115	0817805		HVAC, Heavy-Duty, Enforcer, Paccar, CARE	1
			Paint Color, A/C Condenser - Painted to Match Cab Roof	
			HVAC System, Filter Access - Removable Panel	
			Auxiliary Cab Heater - Both	
			HVAC System, Control Loc. - Panel Position #12	
			Plenum Cover Material - Formed Plastic	
116	0639675		Sun Visor, Smoked Lexan, AXT, Imp/Vel, SFR/Enf	1
			Sun Visor Retention - No Retention	
117	0634328		Grab Handles, Driver and Officer Door Posts, Saber FR/Enforcer	1
118	0583938		Lights, Engine Compt, Custom, Auto Sw, Wln 3SCOCD CR, 3" LED, Trim	1
			Qty, - 01	
119	0631830		Fluid Check Access, Saber FR/Enforcer, Arrow XT	1
			Latch, Door, Storage - Lift and Turn Latch, Flush	
120	0583042		Side Roll and Frontal Impact Protection	1
121	0622619		Seating Capacity, 4 Seats	1

Line	Option	Type	Option Description	Qty
122	0636955		Seat, Driver, Pierce PSV, Air Ride, High Back, Safety, PRIMARY, SFR/Enf	1
123	0636942		Seat, Officer, Pierce PSV, Fixed, SCBA, Safety, PRIMARY, SFR/Enf	1
124	0620420		Radio Compartment, Below Non-Air Ride Seat, Saber FR/Enforcer Latch, Door, Storage - Lift and Turn Latch	1
125	0820059		Cabinet, Rear Facing, LS, 23 W x 28 H x 26.75 D, Web, Ext Acc, SFR/Enf Light, Short Cabinet - Pierce, Interior, Left Side Scuffplate, Material/Finish - S/S, Polished Material Finish, Shelf - Painted - Cab Interior Shelf/Tray, Cabinet - (2) Shelves, Adjustable, 0.75" Up-Turned Lip Door, Cab Exterior Cabinet - Double Pan, Black, Locking #751 Door, Exterior Stop - Web Strap Louvers, Cabinet - Knockouts, Right Side Fastener, Web, Cab Cabinet - 1" Cam Buckle, Bottom	1
126	0102783		Not Required, Seat, Rr Facing C/C, Center	1
127	0822923		Cabinet, Rear Facing, RS, 22 W x 28 H x 26.75 D, Web, Ext Acc, SFR/Enf Light, Short Cabinet - Pierce, Exterior, Right Side Scuffplate, Material/Finish - S/S, Polished Material Finish, Shelf - Painted - Cab Interior Shelf/Tray, Cabinet - (2) Shelves, Adjustable, 0.75" Up-Turned Lip Door, Cab Exterior Cabinet - Double Pan, Black, Locking #751 Door, Exterior Stop - Web Strap Louvers, Cabinet - Louvers, Left Side Fastener, Web, Cab Cabinet - 1" Cam Buckle, Bottom	1
128	0818556		Seat, Fwd Fcng C/C, LS Otbrd, Pierce PSV, Hi-Back, Safety,2.75" Inbrd, PRIMARY, Enf	1
129	0103319		Not Required, Seat, Forward Facing C/C, Center	1
130	0818672		Seat, Fwd Fcng C/C, RS Otbrd, Pierce PSV, Hi-Back, Safety, 2.75" Inbrd, PRIMARY, Enf	1
131	0766467		Upholstery, Seats In Cab, All Vinyl, Seats Inc, CARE Color, Cab Interior Vinyl/Fabric - Endure Vinyl - Black Qty, - 04	4
132	0543991		Bracket, Air Bottle, Hands-Free II, Cab Seats Qty, - 03	3
133	0754657	SP	Seat Mounting, Officer, Crew Cab, As Far Rearward As Possible	1
134	0603866		Seat Belt, Dual Retractor, ReadyReach, Saber FR/Enforcer Seat Belt Color - Red	1
135	0817557		Helmet Storage, Provided by Fire Department, NFPA 2024	1
136	0647647		Lights, Dome, FRP Dual LED 4 Lts Color, Dome Lt - Red & White Color, Dome Lt Bzl - Black Control, Dome Lt White - Door Switches and Lens Switch Control, Dome Lt Color - Lens Switch	1
137	0896451		Enhanced Software for Cab and Crew Cab Dome Lts	1
138	0816997		Portable Hand Light, Provided by Fire Dept, NFPA 2024	1
139	0622803		Cab Instruments, Black Gauges, Black Bezels, Enforcer MUX Emergency Switching - Individual Switches	1
140	0509511		Air Restriction Indicator, Imp/Vel, AXT, Dash CF, Enf MUX	1
141	0543751		Light, Do Not Move Apparatus Alarm, Do Not Move Truck - Pulsing Alarm	1
142	0509042		Messages, Open Dr/DNMT, Color Dsply,	1
143	0611683		Switching, Cab Instrument Lower Console & Overhead, Membrane, Enforcer WiFi MUX	1
144	0802946		Wiper Control, 2-Speed w/Intermittent, Steering Wheel, Left Pod, SFR/Enf	1
145	0731813		Hour Meter, Aerial, Included in Information Centers, ASL, AAT, ASP	1
146	0002615		Switch, Aerial 12V Master	1
147	0002617		PTO switch, w/light - aerial	1
148	0820898		Wiring, Spare, 15 A 12V DC, Batt Dir, 3rd NFPA1900 Location, Wiring - TBD 12vdc power from - Battery direct Wire termination - 10-Place Bus Bar w/Cover	1
149	0814201		Vehicle Information Center, 7" Color Display, Touchscreen, MUX, CL714 System Of Measurement - US Customary	1
150	0816633		Collision Mitigation, HAAS Alert (R2V), HA7 Subscription, HAAS R2V - R2V - 5 Year Data Plan Subscription	1

Line	Option	Type	Option Description	Qty
151	0606249		Vehicle Data Recorder w/CZ and Overhead Display Seat Belt Monitor	1
152	0735006		Intercom, David Clark, 4-Pos, 2-Radio, (D, O, RPTT), 2obC, U3805 Location - TBD	1
153	0637058		David Clark Universal Radio Interfaces Included with Single/Dual System Location, Radio Interface - TBD	1
154	0589947		Headset, David Clark, H3432 Over The Head, Flex Mic, Push On Push Off Qty, - 04 Location - Each cab set	4
155	0819255		Hangers For Headsets, NFPA Each, 1900 Qty, - 04 Location, Headset Hangers - Driver Seat, Officer Seat, DS Outbrd, Fwrđ Fcng Seat and DS Outbrd, Rear Fcng Seat	4
156	0696439		Antenna Mount, Custom Chassis, Cable Routed to Instrument Panel Area Qty, - 03 Location, Antenna Mount - Left And Right Side	3
157	0808099		Camera, Pierce, 7" HD, R, Camera, AHD Color - 1) black Location, Camera Monitor - Mount at Pick Up Driver Overhead FLA	1
158	0814831		Not Required, Camera Switcher	1
159	0890416		Pierce Command Zone, Advanced Electronics & Control System, Enforcer, WiFi CZT Color, Antenna - Black Antenna Module Housings - Black Housing with Power and Status Ind	1
160	0896456		Prognostics, Electrical System	1
161	0624253		Electrical System, Enforcer MUX	1
162	0079166		Batteries, (4) Stryten/Exide Grp 31, 950 CCA ea, Threaded Stud	1
163	0008621		Battery System, Single Start, All Custom Chassis	1
164	0002698		Battery Compartment, Saber/Enforcer	1
165	0812586		Charger, Sngl Sys, Kussmaul, Chief 091-266-12-60, 60 Amp	1
166	0814869		Location, Cab, Charger, Behind Driver Seat	1
167	0811943		Panel, Remote Control, Kussmaul, Chief 091-266-RCP	1
168	0814939		Location, Cab, Ind/Remote, Driver's Seat Riser	1
169	0809558		Inverter, Xantrex XPower 450, Rated @ 337W Batt Sw	1
170	0814953		Location, Body, Inverter, LS Forward Compartment Location, Comp Body - High On Left Wall	1
171	0889666		Review Required, Inverter	1
172	0016857		Shoreline, 20A 120V, Kussmaul Auto Eject, 091-55-20-120, Super Qty, - 01 Color, Kussmaul Cover - b) red Shoreline Connection - Battery Charger	1
173	0026800		Shoreline Location Location, Shoreline(s) - DS Cab Side	1
174	0647728		Alternator, 430 amp, Delco Remy 55SI	1
175	0092582		Load Manager/Sequencer, MUX Enable/Disable Hi-Idle - e)High Idle enable	1
176	0724853		Headlights, Rect LED, HiViz FT-4X6-4KIT, AXT/DCF/Enf/Imp/Sab/Vel, Trim Color, Headlight Housing and Trim - Black Painted Housing and Trim	1
177	0815831	SP	Light, Directional, HiViz FT-TL-GSMJR-TURN, Cab Crn, Wrp Bzl Out HD Lts, Enf/Sab Color, Lens, LED's - c)clear Color, Trim - Black Trim	1
178	0620054		Light, Directional/Marker, Intermediate, Weldon 9186-8580-29 LED 2lts	1
179	0735474		Lights, Clearance/Marker/ID, Front, P25 LED 7 Lts, Saber FR/Enforcer Light Guard - No Guards	1
180	0647929		Lights, Directional/Marker, Cab Front Side, Truck-Lite 19036YLED,AXT/EnfMUX/DCF	1
181	0511569		Lights, Clearance/Marker/ID, Rear, P25 LED 7Lts Light Guard - Without Guard	1
182	0602938		Light, Marker End Outline, Rubber Arm, LED Marker Lamp, Rear Body Qty, Lights, Pair - 1	1
183	0815850	SP	Lights, Tail, Hiviz FT-TL-GSMJR-TRIPLE-KIT, Stop/Tail, Turn & Backup LED, Tri Color, Trim - Black Trim	1
184	0085910		Lights, Backup Included in Signal Cluster	1

Line	Option	Type	Option Description	Qty
185	0889577		Bracket, License Plate & Light, P25 LED, Stainless Brkt Color, Trim - Black Housing	1
186	0589905		Alarm, Back-up Warning, PRECO 1040	1
187	0729676	SP	Light, Accent, Amdor AY-LB-12HR012, Red LED, Each Location - behind laser cut screen. Qty, - 02 Control, Light - e) battery	2
188	0791531		Lights, Perimeter Cab, HiViz FT-CU-AQX LED 4Dr Color, Lt Housing HiViz - Black	1
189	0772744		Lights, Perimeter Pump House, HiViz FT-CU-AQX LED 1lt	1
190	0768498		Lights, Perimeter Body, Amdor AY-LB-12HW020 LED 1lt, Turntable Access Control, Perimeter Lts - Parking Brake Applied	1
191	0896454		Enhanced Software for Perimeter Lts	1
192	0753414		Light, Visor, HiViz, FT-B-X-72-*-* , Cnt Feature, Flush w/Cab Control, Scene Lts - Cab Sw Panel DS and Cab Sw Panel PS Color, Lt Housing HiViz - Black Scene Light Optics - Flood/Spot	1
193	0889717		Lights, HiViz FT-MB-2.27-*-* , 30.2", Brkt Fet 2nd Location - Each side of cab centered. Qty, - 01 Control, Scene Lts - Cab Sw Panel DS and Cab Sw Panel PS Color, Lt Housing HiViz - Black Scene Light Optics - combination	1
194	0773362		Lights, HiViz FT-B-46-*-* LED, 1st Location - (2) on each side of the body. one forward and one rearward Qty, - 04 Control, Scene Lts - Cab Sw Panel DS and Cab Sw Panel PS Color, Lt Housing HiViz - Black Scene Light Optics - combination Brackets, Cab Side Scene Lts - Directly to Cab Roof	4
195	0898617		Lights, Hose Bed, Sides, Dual Strips, 45 Ends Control, Hose Bed Lts - Cup Switch At Rear	1
196	0733247		Lights, Rear Scene, HiViz FT-GESM* , Surface Mt Location, Lights - Rear of body high as possinle Qty, - 02 Control, Rear Scene Lts - Cab Switch Panel DS, Cab Switch Panel PS and Cup Switch at Rear Color, Lt Housing HiViz - Black Bezel & Black Optic Holder	2
197	0709438		Lights, Walk Surf, FRP Flood, LED	1
198	0793399		Aerial, HD Ladder 107' ASL Tandem, Alum Body	1
199	0554269		Body Skirt Height, 18"	1
200	0600469	SP	Tank, Water, 600 Gallon, Poly, PAL, Notched, Hose Bed on Side	1
201	0003405		Overflow, 4.00" Water Tank, Poly	1
202	0028107		Not Required, Foam Cell Modification	1
203	0003429		Not Required, Direct Tank Fill	1
204	0888531	SP	Hose Bed, Aluminum, TCO, RS, Open Top, 2G Aerial	1
205	0723547		Painted Hose Bed/Cargo Area Paint Color, Hose Bed Interior - Match Lower Body	1
206	0003491		Hose Bed Capacity 1000' of 5.00", Ascendant, PAP, PAL	1
207	0591017		Hose Restraint, Hose Bed, Aerial, Front Velcro Strap, Top	1
208	0740280		Lettering, Hose Bed Rear Flap, Non-Reflective, w/Outline Color, Lettering - o) red Qty, Lettering - 12 Lettering, Hosebed - TBD Centering, Lettering, Rear Flap - Centered on Hose Bed Layout, Lettering - Straight Size, Lettering, Rear Flap, Non-Reflective - 6.00" w/ Outline Outline, Lettering, Rear Flap - white	12
209	0003512		Running Boards, Ascendant, PAL	1
210	0767751		Turntable Steps Morton,SwngDn,LS,Knurl Lit Vert Hndrls,AscTA,PAL,PAP,Hndhld Cut Color, Handrail Light - Red Control, Handrail Light - Body Handrail Controls Step, Flip - Flip Step, One Step Assembly Body Handrail Finish - black anodized lit	1

Line	Option	Type	Option Description	Qty
211	0889980		Lights, Step (3), P25 LED, One Side Control, Scene Lts - Park Brake	1
212	0690023		Wall, Rear, Smooth Aluminum	1
213	0029503		Tow Eyes (2), Painted Lower Job Color, Aerial	1
214	0013641		Construction, Compt, Alum, Ascendant Tandem, PAL	1
215	0063686		Compt, LS F/H F/D, Lap Drs, w/o Chute, Ascendant Tandem, 105 HDL, 100 HAL Hinge Location - Rear of Body Door, Material & Finish, Stabilizer - Polished Stainless Steel Latch, Door, Access - D-ring latch	1
216	0063692		Compt, LS Turntable, F/H F/D, Lap Drs, Ascendant Tandem, 105 HDL	1
217	0023672		Compt, IPO Stairs, Not Required, LS	1
218	0746978	SP	Compt,RS F/H F/D Fwd Compt OTW Lap,Lift HB Acc,TCO,AscendTA,105',100 HAL Hinge Location - Rear of Body Door, Material & Finish, Stabilizer - Polished Stainless Steel Latch, Door, Access - lift and turn latch, flush	1
219	0746975	SP	Compt,RS Low Rear Lap,FW Chute,Lift HB Acc,12" Ground Pen,AscendTA,105',100 HAL	1
220	0023679		Compt, IPO Stairs RS, Lap, w/Full Width Chute	1
221	0666824		Doors, Lap w/"D" Handle, Aluminum, Side Compartments	1
222	0540787		Stabilizer Compartment, Modified for 18" Stabilizer Penetration	1
223	0556162		Not Req'd, Compt Blister in Front of Rear Axle	1
224	0018820		Bumper, Rear, 5" w/Treadplate Cover, Ascendant Tandem, PAP, PAL, RMAP	1
225	0603083		Lights, Compt,Pierce LED,Dual Light Strips,Each Side Dr,Ascend TA,75'HAL,PAP,HDL Qty, - 09 Location, Compartment Lights - All Body Compts	9
226	0603420		Shelf Tracks, Painted, Aerial Qty, Shelf Track - 06 Location, Shelf Track - LS1, LS3, LS4, RS1, RS3 and RS4	6
227	0600289		Shelves, Adj, 500 lb Capacity, Full Width/Depth, Predefined Locations, Aerial Qty, Shelf - 10 Material Finish, Shelf - Painted - Spatter Gray Location, Shelves/Trays, Predefined - * Locations To Be Determined At A Later Date	10
228	0709692		Tray, 215 lb, Tilt/Slide-Out, 30 Deg, Adj, Predefined Locations Qty, Tray (slide-out) - 02 Location, Shelves/Trays, Predefined - * Locations To Be Determined At A Later Date	2
229	0603763		Tray, Floor Mounted, Slide-Out, 500lb, 2.00" Sides, 2G Aerial Qty, - 04 Location, Tray Slide-Out, Floor Mounted - LS1, LS2, LS4 and LS3 Material Finish, Tray - Painted - Spatter Gray	4
230	0759090		Tool Grid System, Gear Grid, Single Swing-Out Color - 6) gray location - tbd Qty - 2 Location, Pivot - Front	2
231	0004016		Rub Rail, Aluminum Extruded, Side of Body	1
232	0802981		Fender Crowns, Rear, Rubber, Removable Fender Liner, Aerial, 2G, Two Pair Material Finish, Fender Liner - Painted black 101	1
233	0519849		Not Required, Hose, Hard Suction	1
234	0893756		Handrails, Side Pump Panels, Per Print, Aerial Step, Runningboard - step	1
235	0804426		Compt, Air Bottle, Single, Round, Fender, Bolt-In, Tandem Aerials Qty, Air Bottle Comp - 8 Door Finish, Fender Compt - Polished Location, Fender Compt - Single (2) - LS Tandem, Single (2) - RS Tandem, Single - LS Fwd, Single - LS Rear, Single - RS Fwd and Single - RS Rear Latch, Air Bottle Compt - Southco C2 Chrome Raised Insert, Air Bottle Compt - Rubber Matting	8
236	0004218		Ladder, 35' Duo-Safety 1200A 2-Sect Qty, - 1	1

Line	Option	Type	Option Description	Qty
237	0004222		Ladder, 24' Duo-Safety 900A 2-Section Qty, - 01 Location, Extension Ladder - torque box	1
238	0004232		Ladder, (2) 16' Duo-Safety 875A Roof	1
239	0004233		Ladder, 14' Duo-Safety Fresno 701 Qty, - 1	1
240	0004246		Ladder, 10' Duo-Safety Folding, 585A Qty, - 01 Location, Folding Ladder Aerial - torque box	1
241	0042207		Ladders Stored in Torque Box, Gortite Roll, Ascendant TA, PAL, PAP Color, Roll-up Door, Gortite - Satin finish Latch, Roll-up Door, Gortite - Non-Locking, Rear	1
242	0789440		Lights, Torque Box Ladder Storage, Truck-Lite 40227C 1lt, Incd, Round 4"	1
243	0775907		Pike Pole, 12' DUO Safety, Fiberglass Qty, - 02	2
244	0789564		Pike Pole, 8' DUO Safety, Fiberglass, Aerial Qty, - 02	2
245	0789566		Pike Pole, 6' DUO Safety, Fiberglass, Aerial Qty, - 01	1
246	0789586		Pike Pole, 3' DUO Safety, Fiberglass, w/D Handle Qty, - 02	2
247	0770578		Pike Pole Tubes, in Torque Box/Ladder Storage, ABS Qty, - 06	6
248	0024388		No Steps Required, Front Of Body	1
249	0620530		Pump House, Side Control, 52", Control Zone, Aerial	1
250	0035501		Pump House Structure, Std Height	1
251	0014441		Pump, Hale, QMAX-150, 1500 GPM, Single Stage	1
252	0014481		Seal, Graphite Packing Glands, Hale	1
253	0014477		Trans, Pump, Hale, Gear	1
254	0635600		Pumping Mode, Stationary Only	1
255	0604308		Pump Shift, Air w/o Manual Override, Split Shaft, Interlocked, Hale	1
256	0003148		Transmission Lock-up, EVS	1
257	0004547		Auxiliary Cooling System	1
258	0014486		Not Required, Transfer Valve, Single Stage Pump	1
259	0746501		Valve, Relief Intake, Elkhart Qty - 1 Pressure Setting - 125 psig Intake Relief Valve Control - Behind Right Side Pump Panel	1
260	0794959		Controller, Pressure, Pierce, Pump Boss, PBA300	1
261	0072153		Primer, Trident, Air Prime, Air Operated	1
262	0780364		Manuals, Pump, (2) Total, Electronic Copies	1
263	0602512		Plumbing, Stainless Steel and Hose, Single Stage Pump, Control Zone	1
264	0089437		Plumbing Without Foam System	1
265	0004645		Inlets, 6.00" - 1250 GPM or Larger Pump	1
266	0014650		Pump Suction Tube(s), Short, All	1
267	0004646		Cap, Main Pump Inlet, Long Handle, NST, VLH	1
268	0084610		Valves, Akron 8000 series- All	1
269	0016158		Valve, Inlet(s) Recessed, Side Cntrl, "Control Zone" Qty, Inlets - 1	1
270	0004700		Control, Inlet, at Valve	1
271	0004660		Inlet (1), Left Side, 2.50"	1
272	0029147		Not Required, Inlet, Right Side	1
273	0092569		No Rear Inlet (Large Dia) Requested	1
274	0064116		No Rear Inlet Actuation Required	1
275	0092696		Not Required, Cap, Rear Inlet	1
276	0009648		No Rear Intake Relief Valve Required on Rear Inlet	1
277	0092568		No Rear Auxiliary Inlet Requested	1
278	0723049		Valve, .75" Bleeder, Aux. Side Inlet, "T" Swing Handle	1
279	0029043		Tank to Pump, (1) 3.00" Valve, 3.00" Plumbing	1
280	0004905		Outlet, Tank Fill, 1.50"	1
281	0820189		Control, Outlets, Manual, Pierce HW if applicable	1

Line	Option	Type	Option Description	Qty
282	0004940		Outlet, Left Side, 2.50"	2
			Qty, Discharges - 02	
283	0005091		Elbow, Left Side Outlets, 45 Degree, 2.50" FNST x 2.50" MNST, VLH	1
284	0092570		Not Required, Outlets, Left Side Additional	1
285	0035094		Not Required, Elbow, Left Side Outlets, Additional	1
286	0004945		Outlet, Right Side, 2.50"	1
			Qty, Discharges - 01	
287	0025091		Elbow, Right Side Outlets, 45 Degree, 2.50" FNST x 2.50" MNST, VLH	1
288	0092571		Not Required, Outlets, Right Side Additional	1
289	0089584		Not Required, Elbow, Right Side Outlets, Additional	1
290	0816625		Outlet, Large Diameter, Right Side, Akron Valve	1
			Outlet, Large Diameter, Plumbing - 4.00"	
			Outlet, Large Diameter, NST Adapter - 4.00" MNST	
			Outlet, Large Diameter, Valve Actuation - Pierce large handwheel	
291	0005097		Elbow, Large Dia Outlet, 30 Deg, 4.00" FNST x 5.00" Storz	1
			Qty, - 01	
292	0648503		Outlets, (2) Crosslays, Under Slung Bumper, Open Ends, 1.50" w/2" Plumbing	1
			Capacity, Hose Bed 1 - 200' of 1.75"	
			Capacity, Hose Bed 2 - 200' of 1.75"	
			Drain, Front Outlet - Automatic	
			Grating, Bumper Crosslay - Grating, Black Rubber	
293	0648594		Cover, Aluminum Treadplate, Side Webbing, Under Slung Bumper Crosslays	1
			Type of fastener - spring clip and hook	
			Stay arm, Tray Cover - c)Pneumatic Stay Arm, Dual	
			Nylon Web Color - Black	
			Restraint Location - Bottom (towards the ground)	
			Latch, Bumper Storage - D ring latch each side	
			Location, Side - Rear	
294	0092575		Not Required, Outlet, Rear	1
295	0045099		Not Required, Elbow, Rear Outlets	1
296	0092574		Not Required, Outlet, Rear, Additional	1
297	0085695		Not Required, Elbow, Rear Outlets, Large, Additional	1
298	0092573		Not Required, Outlet, Hose Bed/Running Board Tray	1
299	0752097		Caps/Plugs for 1.00" to 3.00" Discharges/Inlets, Chain	1
300	0723042		Valve, 0.75" Bleeder, Discharges, "T" Swing Handle	1
301	0029106		Not Required, Deluge Outlet	1
302	0029302		No Monitor Requested	1
303	0029304		No Nozzle Req'd	1
304	0029107		No Deluge Mount	1
305	0047583		Waterway Outlet & Control, 4" Akron, Handwheel	1
306	0029216		Crosslay, (1) 1.50", Spl. Cap/Arrangement	1
			Capacity, Special Xlay - 200' of 1.78" Key hose	
307	0090442		Crosslays Sngl Sheet Unpainted, (1) 2.50" Std Cap	1
308	0591145		Hose Restraint, Crosslay/Deadlay, Top/Ends, Elastic Netting	2
			Qty, - 02	
309	0029260		Not Required, Speedlays	1
310	0750536		Hose Restr, Spdly, Not Required, No Spdly	1
311	0802500	SP	Enclosure, Smooth Aluminum, Crosslay Area, Ladder	1
			Size - little giant. will get size.	
312	0092844		Deadlay(s), Special Cap.	2
			Location - in between the pre connects and the Little giant storage	
			Capacity, Special Xlay - 250' of 2.5" in one and 200' of 1.75" high rise in the other	
			Qty, Deadlays - 2	
313	0044333		Not Required, Foam System	1
314	0012126		Not Required, CAF Compressor	1
315	0552517		Not Required, Refill, Foam Tank	1
316	0042573		Not Required, Foam System Demonstration	1
317	0045465		Not Required, Foam Tanks	1
318	0091110		Not Required, Foam Tank Drain	1
319	0091079		Not Required, Foam Tank #2	1
320	0091112		Not Required, Foam Tank #2 Drain	1

Line	Option	Type	Option Description	Qty
321	0738072		Approval Dwg, Pump Panel(s), Not Required	1
322	0032479		Pump Panel Configuration, Control Zone	1
323	0562698		Step, Slide-Out/Fold-Out, Pump Operator Platform, Aerial	1
324	0667186		Light, Slide-Out Pump Operator Step, On Scene Solutions Access LED, Short Step	1
325	0629252		Material, Pump Panels, Side Control Black Vinyl	1
			Material Finish, Pump Panel, Side Control - Black Vinyl	
			Material, Pump Panel, Side Control - Aluminum	
326	0721765		Panel, Pump Access - Right Side Only, Side Control	1
			Latch, Pump Panel Access, Side Mount - Swell Latch, Black	
327	0583824		Light, Pump Compt, WIn 3SC0CDCR LED White	1
			Qty, - 01	
328	0586382		Gauges, Engine, Included With Pressure Controller	1
329	0005601		Throttle, Engine, Incl'd w/Press Controller	1
330	0739224		Indicator Light @ Pump Panel, Throttle Ready, Incl w/Pressure Gov/Throttle, Green	1
331	0549333		Indicators, Engine, Included with Pressure Controller	1
332	0745568		Indicator Light, Pump Panel, Ok To Pump, Green	1
333	0511078		Gauges, 4.00" Master, Class 1, 30"-0-600psi	1
334	0511100		Gauge, 2.00" Pressure, Class 1, 30"-0-400psi	1
335	0757359		Gauge, Water Level, Class 1, Remote Module Driver	1
			Activation, Water Level G - pb) parking brake is applied	
336	0750438		Water Level Gauge, WIn PSTANK2, LED 1-Light, 4-Level	3
			Qty, - 03	
			Activation, Water Level G - Pump in gear or parking brake applied	
			Location, Water Level Gauge, Multi-Select - Rear Body, Cab, Behind Left Cab Door and Cab, Behind Right Cab Door	
			Color, Trim - Black Trim	
337	0006774		Not Required, Foam Level Gauge	1
338	0593161		Light Shield, S/S LED	1
339	0766198		Air Horns, (2) Hadley, Rectangular Bell, Below Bumper	1
340	0606835		Location, Air Horns, Bumper, Each Side, Outside Frame, Outboard (Pos #1 & #7)	1
341	0757092		Control, Air Horn, Multi Select	1
342	0757076		Control, Air Horn, Lanyard, RS	1
			Lanyard - Nylon Rope	
343	0757084		Control, Air Horn, Horn Ring	1
344	0757077		Control, Air Horn, Lanyard, LS	1
			Lanyard - Nylon Rope	
345	0525667		Siren, WIn 295SLSA1, 100 or 200 Watt	1
346	0510206		Location, Elec Siren, Recessed Overhead In Console	1
			Location, Elec Siren - Overhead, DS Center Sw Pnl	
347	0076156		Control, Elec Siren, Head Only	1
348	0601306		Speaker, (1) WIn, SA315P, w/Pierce Polished Stainless Steel Grille, 100 watt	1
			Connection, Speaker - siren head	
349	0601565		Location, Speaker, Frt Bumper, Recessed, Center (Pos 4)	1
350	0895310		Siren, Federal Q2B	1
			Finish, Q2B Siren - Chrome	
351	0796798	SP	Location of Siren, Recessed Behind Under Slung Bumper, w/Enclosure	1
			Location, Siren, Mech - a) Left	
			Siren Grille - Federal EF	
352	0748305		Control, Mech Siren, Multi Select	1
353	0895055		Control Mech Siren, Ft Sw RS, Interlock	1
			Control, Interlocks - E Master On	
354	0748282		Control, Mech Siren, Ft Sw LS	1
355	0895056		Control Mech Siren, Ft Sw LS, Interlock	1
			Control, Interlocks - E Master On	
356	0740391		Sw, Siren Brake, Momentary Chrome Push Button, RS	1
357	0812521	SP	Control System, Supplier Based, Electrical, HiViz Connect, HVC	1
358	0824788		Not Required	1
359	0821625		Modules, Zone Control, Rear, HVC	1
			Location - TBD	
360	0746353		Not Required, Warning Lights Intensity	1
361	0814579	SP	Lightbar, Hiviz, FT-HVC-OMEN-24, 2-24" , HVC	1
			Angle, Front Lightbar - 0 degrees	

Line	Option	Type	Option Description	Qty
362	0016380		No Additional Lights Req'd, Side Zone Upper	1
363	0815227	SP	Lights, Front Zone, Hiviz FT-HVC-GSMJR-WN-**, 4lts Q Bezel, 2lts Above Turn, HVC Color, Lt DS Frnt Outside - Left Red Color, Lt PS Frnt Outside - Right Red Color, Lt DS Front Inside - Left Red Color, Lt PS Front Inside - Right Red Color, Lt DS Frnt Out Corner - Red Flashing Color, Lt PS Frnt Out Corner - Red Flashing	1
364	0653937		Flasher, Headlight Alternating Headlt flash deactivation - a)w/high beam	1
365	0812500		Lights, Side Zone Lower, HiViz, Separated into Front, Middle, Rear, HVC	1
366	0815224	SP	Lights, Side Zone Lower Front, Hiviz FT-HVC-GSMJR-WN-**, HVC Location, Lights Front Side - Each Side Above Front Axle, Centerline Color, Trim - Black Trim Color, Lt Side Frnt RS Cmb - Red Color, Lt Side Frnt LS Cmb - Red	1
367	0815225	SP	Lights, Side Zone Lower Middle, Hiviz FT-HVC-GSMJR-WN-**, HVC Location, Lights Mid Side - Over Front Tandem Rear Wheels Color, Trim - Black Trim Color, Lt Side Mid LS Cmb - Red Color, Lt Side Mid RS Cmb - Red	1
368	0812504	SP	Lights, Side Zone Lower Rear, Hiviz FT-HVC-GSMJR-WN-**, HVC Location, Lights Rear Side - Over Rear Wheels Color, Trim - Black Trim Color, Lt Side Rear RS Cmb - Red Color, Lt Side Rear LS Cmb - Red	1
369	0812497	SP	Lights, Rear Zn Lwr, Hiviz FT-HVC-GSM-WN-**, HVC Color, Lt DS Rear - Left Red Color, Lt PS Rear - Right Red Color, Trim - Black Trim	1
370	0815332	SP	Lights, Rear/Side Up Zone, Hiviz FT-HVC-OMEN-12, 12" Beacon, HVC Color, Lt, Side Rear Upper DS - Red Color, Lt, Side Rear Upper PS - Red Color, Lt, Rear Upper DS - Red Color, Lt, Rear Upper PS - Red Color, Trim - Black Trim	1
371	0006551		Not Required, Lights, Rear Upper Zone Blocking	1
372	0791501		Light, Traffic Directing, WIn TAL65, 36" Long LED, Aerials Activation, Traffic Dir L - Not Connected	1
373	0530074		Location, TDL, On Top of Body Below Turntable w/Treadplate Box	1
374	0530282		Location, Traf Dir Lt Controller, Overhead Switch Panel DS Right End	1
375	0780350		Receptacle Strip, 15A 120V 6-Place, Interior Cab Qty, - 02 Location 1 - EMS Cabinets AC Power Source - Inverter	2
376	0779698		Receptacle Strip, 15A 120V 6-Place, Interior Body Qty, - 03 Location 1 - TBD AC Power Source - Inverter	3
377	0519934		Not Required, Brand, Hydraulic Tool System	1
378	0649753		Not Required, PTO Driven Hydraulic Tool System	1
379	0755095		Aerial, 107' ASL Tandem, 750/500 Tip, 50 MPH	1
380	0000042		Boom Support, Rear of the Chassis Cab	1
381	0601990		Light, Boom Support, Peterson 393C, Incandescent	1
382	0799569		Boom Support Compartment, Rear of Cab, Cab Height, Full Depth Latch, Door, Storage - "D" Handle Latch, Pair Hinge Location - Forward	1
383	0680821		Boom Panel, Pair Paint Color, Predefined - #10 white	1
384	0526890		Not Required, Indicator, Extension	1
385	0723719		Steps, Folding, Four, Aerial Device, Trident Coating, Step - black Light, Aerial Device Folding Step - no integrated light	1

Line	Option	Type	Option Description	Qty
385			Finish, Aerial Device Folding Step - bright finish	
386	0688232		Rung Covers, Aerial Device	1
			Rung Cover Color - Safety Yellow	
387	0678711		Brackets, Stokes Storage, Base Section, Inboard of Boom Panel	1
			Qty, - 01	
			Finish - Painted, Aerial Device Color	
			Location, Aerial Device - left side	
388	0674963		Scabbard, Temporary Vent Saw Storage, No Depth Gauge, Aerial Ladder	1
			Qty, - 01	
			Location, Aerial Device - left side of tip	
389	0623645		Aerial Stability Test, Maximum Tip Options	1
390	0601972		Lights, Turntable Walkway, P25, LED	1
391	0601949		Light, Turntable Console, TecNiq T-10, LED Strip Light	1
392	0675062		Box, Saw Storage, Turntable	1
			Size - As large as possible TBD	
			Latch, Door, Storage - Rubber Draw Latch	
393	0682164		Cover, Around Aerial Rotation Bearing	1
			Material - treadplate	
394	0814217		Control Stations, ASL Tandem Axle, MUX, Color Display, CL714	1
395	0709594		Remote Aerial Control, Wireless, D-Series MUX Aerials, Hetronic	1
			location - inside torque box if possible	
			Location, Wireless Receiver - Back of Turntable Console	
396	0792976		Stabilizers, Ascendant Tandem, Rear Mount Steel, 16' Spread, 18" Pen, MUX	1
			Material, Stabilizer Pad - Composite	
397	0729051		Stabilizer Pan and Trim Material	1
			Stabilizer Panels - polished stainless steel	
			Stabilizer Trim - polished stainless steel	
398	0809974		Door, Stabilizer Control Box, MUX Aerials	1
			Latch, Door, Storage - Southco C2 Chrome Raised	
			Hinge Location - Outboard	
			Door, Material & Finish, Stabilizer - Smooth aluminum	
399	0615058		Stabilizer Placement, Cameras w/Command Zone Color Display, 1 Set	1
400	0793039		Hydraulic System, Ascendant Tandem Axle	1
401	0793037		Swivels, D-Series w/Encoder, ASL-Tandem/Tiller, MUX (28 Collector Rings)	1
402	0805186		Electrical System, ASL Tandem Axle, MUX, 10/8 Cable	1
403	0804781		Aerial Scene Lts Separated into Aerial Tip Category and Aerial Tracking Category	1
404	0807388		Lights, Tip, HiViz FT-WL-X-5-**-*, 2lts	1
			Color, Lt Housing HiViz - Black Housing	
			Scene Lt Optics LH Fly - Combination Left	
			Scene Lt Optics RH Fly - Combination Right	
405	0764346		Lights, Tracking, HiViz FT-WL-X-9-* LED, 2lts	1
			Location, Sw, Arl DC Lts - Pltfm/Tip, TrnTbl & RS Cab	
			Color, Lt Housing HiViz - Tip Lts Black	
			Scene Lt Optics LH Base - Left Spot	
			Scene Lt Optics RH Base - Right Spot	
406	0653677		Lighting, Rung, LED, TecNiq, 4 Section, Base, Lower/Upper Mid, Fly	1
			Control, Aerial Rung Lighting - Turntable Sw w/Aerial Mstr and Turntable Sw w/Master Batt Sw	
			Color, Lt Aerial Fly Sect - Blue & (3) Red	
			Color, Lt Aerial Base Sect - 3 Red, Blue	
			Color, Lt Aerial Lower Mid Sect - Red	
			Color, Lt Aerial Upper Mid Sect - Red	
407	0815584	SP	Lights, Stabilizer Warn (2) Sets, Hiviz FT-HVC-GSMJR-WN-**, HVC	1
			Color, Trim - Black Trim	
			Color, Lt Stabilzr Pan, LS Front - Red	
			Color, Lt Stabilzr Pan, LS Rear - Red	
			Color, Lt Stabilzr Pan, RS Front - Red	
			Color, Lt Stabilzr Pan, RS Rear - Red	
408	0068703		Lights, Grote Supernova LED, Stabilizer Beam, (1) Set	1
409	0601977		Lights, Stabilizer Scene, (2) sets, Truck-Lite 40227C, Incandescent	1
410	0783034		DC Power To Aerial Tip, 13.92 Amps @ 12 Volt DC, ASL	1
411	0737181		Intercom, 2-Way Fire Research ICA910 Hands Free	1
412	0540895		Not Required, Breathing Air to Tip, Aerial Ladder	1

Line	Option	Type	Option Description	Qty
413	0024742		Not Required, Mask, Breathing Air To Tip	1
414	0126600		Raised Pedestal, 3.00", Rear Mount Aerials, AXT, Velocity, Impel, Enf	1
415	0604457		Lifting Eye Assembly, Rope Rescue Attachment, ASL, LSL	1
416	0530826		Turntable Access, ManSaver Bars, Yellow	1
417	0624672		Waterway, High Flow, 1500 GPM, ASL	1
418	0729475		Monitor,Akron 3486 StreamMaster II Electric,Extended Vertical Travel,w/ManualAVM Nozzle, Monitor 1 PAL - Akron 5178 Electric 1500 gpm Location, Valve - Akron S2 left side discharge	1
419	0010758		Flow Meter, Waterway, PAL, 110' Ascendant, MUX	1
420	0004836		Inlet, 5.00" at Rear w/ Pump, Ascendant Tandem, PAP, PAL	1
421	0673128		Quick-Lock Waterway Locking System, 100' HDL, 105' HDL, ASL	1
422	0047897		Tools, Aerial	1
423	0559494		Manuals and Training, 3 Consecutive Days, Ascendant Ladder, PAL	1
424	0007150		Bag of Nuts and Bolts Qty, Bag Nuts and Bolts - 1	1
425	0816502		NFPA Required Loose Equipment, Quint, NFPA 2024, Provided by Fire Department	1
426	0067022		Hose, 6.00" Soft Suction - 15 Ft. Long	1
427	0027023		No Strainer Required	1
428	0816939		Extinguisher, Dry Chemical, NFPA 2024, Provided by Fire Department	1
429	0816937		Extinguisher, 2.5 Gal. Pressurized Water, NFPA 2024, Provided by Fire Department	1
430	0007482		Not Required, Crowbars	1
431	0007484		Not Required, Claw Tools	1
432	0816998		Axe, Flathead, Provided by Fire Department	1
433	0817000		Axe, Pickhead, Provided by Fire Department	1
434	0007494		Not Required, Sledgehammers	1
435	0741569		Paint Process / Environmental Requirements, Appleton	1
436	0709567		Paint, Single Color, Enforcer Paint Color, Cab - #90 Red	1
437	0709845		Paint, Single Color, Body Paint, Body - Match Lower Cab	1
438	0646901		Paint Chassis Frame Assy, With Liner, E-Coat, Standard Paint Color, Frame Assembly, Predefined - Standard Black	1
439	0693797		No Paint Required, Aluminum Front Wheels	1
440	0806169		Paint, Rear Wheels, Tandem Axle, TAK-4 T3 Paint, Wheels - Black #101	1
441	0733739		Paint, Axle Hubs Paint, Axle Hub - Black #101	1
442	0007230		Compartment, Painted, Spatter Gray	1
443	0782203		Aerial Ladder Paint, ASL-Tandem, LSL, E-Coat Paint Color, Aerial Device - Silver metallic 211 Paint Color, Egress - #50 Red Paint Color, Turntable - White 10 Paint Color, Boom Support - gloss black primer Paint Color, Cylinders - white 10 Paint Color, Aerial Control Console - white 10	1
444	0544111		Reflective Band, 10" Color, Reflect Band - A - a) white	1
445	0007356		Reflective across Cab Face	1
446	0583454		Stripe, Chevron, Rear, Diamond Grade, Aerial Color, Rear Chevron DG - fluorescent yellow green	1
447	0598754		Stripe, Reflective/Diamond Grade, 4.00" on Stabilizers Color, Reflect Band - A - p) fluorescent yellow green diamond grade	1
448	0065687		Stripe, Reflective, Cab Doors Interior Color, Reflective - a) white	1
449	0027372		Lettering Specifications, (GOLD STAR Process)	1
450	0686426		Lettering, Gold Leaf, 3.00", (61-80) Outline, Lettering - Outline and Double Shade	1
451	0741670		Lettering, Reflective, Front and Rear Mud Flaps, 2 Colors Fill in Blank - tbd Configuration - tbd Fill in Blank 2 - tbd Font, Lettering, Mud Flap - Full Block	1

Line	Option	Type	Option Description	Qty
451			Outline, Lettering, Mud Flap - White Outline Color, Lettering, Mud Flap - Red Color, Lettering, Mud Flap, 2nd - Green Outline, Lettering, Mud Flap, 2nd - Blue Outline Font, Lettering, Mud Flap, 2nd - Full Block	
452	0772003		Manual, Fire Apparatus Parts, USB Flash Drive, Custom Qty, - 01	1
453	0772037		Manual, Chassis Service, USB Flash Drive, Custom Qty, - 01	1
454	0773381		Manual, Chassis Operation, (1) USB Flash Drive, Custom	1
455	0030008		Warranty, Basic, 1 Year, Apparatus, WA0008	1
456	0735523		Warranty, Engine, Paccar MX13, 5 Year, WA0386	1
457	0684953		Warranty, Steering Gear, Sheppard M110, 3 Year WA0201	1
458	0596017		Warranty, Frame, 50 Year, Custom Chassis, WA0013	1
459	0595698		Warranty, Axle, 3 Year, TAK-4, WA0050	1
460	0644874		Warranty, Axle, 3 Year, TAK-4, IRS, WA0249	1
461	0652758		Warranty, ABS Brake System, 3 Year, Meritor Wabco, WA0232	1
462	0019914		Warranty, Structure, 10 Year, Custom Cab, WA0012	1
463	0744240		Warranty, Paint, 10 Year, Cab, Pro-Rate, WA0055	1
464	0524627		Warranty, Electronics, 5 Year, MUX, WA0014	1
465	0695416		Warranty, Pierce Camera System, WA0188	1
466	0647720		Warranty, Pierce LED Strip Lights, WA0203	1
467	0046369		Warranty, 5-year EVS Transmission, Standard Custom, WA0187	1
468	0685945		Warranty, Transmission Cooler, WA0216	1
469	0688798		Warranty, Water Tank, Lifetime, UPF, Poly Tank, WA0195	1
470	0596025		Warranty, Structure, 10 Year, Body, WA0009	1
471	0693127		Warranty, Gortite, Roll-up Door, 6 Year, WA0190	1
472	0892410		Warranty, Pump, Hale, 5 Year Parts, 2 Year Labor, WA0388	1
473	0648675		Warranty, 10 Year S/S Pumbing, WA0035	1
474	0641372		Warranty, Foam System, Not Available	1
475	0006999		Warranty, Structure, 20 Year, Aerial Device, WA0052	1
476	0687388		Warranty, Swivels, 5 Year, Aerial Device, WA0197	1
477	0685727		Warranty, Hydraulic System and Components, 3 Year/5 Year, WA0200	1
478	0687327		Warranty, Waterway, 10 Year, Aerial Device, WA0198	1
479	0595860		Warranty, Paint, 4 Year, Aerial Device, Pro-Rated, WA0047	1
480	0595820		Warranty, Paint, 10 Year, Body, Pro-Rate, WA0057	1
481	0595421		Warranty, Goldstar, 3 Year, Apparatus, WA0018	1
482	0819254		Certification, Vehicle Stability, CD0196	1
483	0808565		Certification, Engine Installation, Enf, Paccar MX, 2027	1
484	0686786		Certification, Power Steering, CD0098	1
485	0892691		Certification, Cab Integrity, Saber FR/Enforcer, CD0189	1
486	0631973		Certification, Cab Door Durability, Saber FR/Enforcer, CD0137	1
487	0631978		Certification, Windshield Wiper Durability, Saber FR/Enforcer, CD0132	1
488	0631974		Certification, Electric Window Durability, Saber FR/Enforcer, CD0133	1
489	0631977		Certification, Seat Belt Anchors and Mounting, Saber FR/Enforcer, CD0134	1
490	0735949		Certification, Cab HVAC System Performance, SFR/Enf, CD0165/CD0167/CD0174/CD0175	1
491	0545073		Amp Draw Report, NFPA Current Edition	1
492	0002758		Amp Draw, NFPA/ULC Radio Allowance	1
493	0799248		Appleton/Florida BTO	1
494	0000049		Ascendant BODY	1
495	0000012		PIERCE CHASSIS	1
496	0735525		PACCAR MX13 ENGINE	1
497	0046396		EVS 4000 Series TRANSMISSION	1
498	0020012		HALE PUMP	1
499	0020009		POLY TANK	1
500	0028047		NO FOAM SYSTEM	1
501	0020006		SIDE CONTROL	1
502	0020007		AKRON VALVES	1
503	0020015		ABS SYSTEM	1
504	0755453		AERIAL BASE	1



**Monroe Fire Department  
Capital Improvement Replacement Plan**

2023			
Unit	Vendor	Expected Cost	Notes
Medic Unit	Horton	\$345,000.00	Delivery expected in 2025. This will replace unit purchased in 2015.
Power Load System & Electric Cot	Stryker	\$82,000.00	Install with new Medic Unit for delivery in 2025
2024			
Unit	Vendor	Expected Cost	Notes
Station Bay Floors	TBD	\$140,000.00	This is to resurface the bay floors at both stations in order to maintain a safe surface and prolong the life of this part of the station. Has not been done since station was built.
2025			
Unit	Vendor	Expected Cost	Notes
Engine / Quint	Pierce	\$1,600,000.00 - \$1,900,000.00	This is to replace the Quint that was purchased in 2007. Determination still needs to be made on whether to replace with a Quint or another vehicle that would better suit the department, thus a range of pricing. Delivery expected in 2028.
2026			
Unit	Vendor	Expected Cost	Notes
Medic Unit	Horton	\$371,500.00	Delivery expected in 2028. This will replace unit purchased in 2018.
Power Load System & Electric Cot	Stryker	\$88,300.00	Install with new Medic Unit for delivery in 2028
LifePak 35	Stryker	\$120,600.00	Replace 2 units that were purchased in 2014.
2027			
Unit	Vendor	Expected Cost	Notes
Lucas CPR Units	Stryker	\$44,300.00	Replace the two units purchased in 2017
2028			
Unit	Vendor	Expected Cost	Notes
Medic Unit	Horton	\$390,300.00	Delivery expected in 2030. This will replace unit purchased in 2020.
Power Load System & Electric Cot	Stryker	\$92,800.00	Install with new Medic Unit for delivery in 2030
2030			
Unit	Vendor	Expected Cost	Notes
LifePak 35	Stryker	\$133,200.00	Replace 2 units that were purchased in 2018.
2031			
Unit	Vendor	Expected Cost	Notes
Extrication Equipment	Genesis	\$50,000.00	Replace equipment purchased in 2016.
2032			
Unit	Vendor	Expected Cost	Notes
Engine 61	Rosenbauer	\$811,000.00	Delivery expected in 2035. Replace unit that was purchased in 2015
Engine 62	Rosenbauer	\$811,000.00	Delivery expected in 2035. Replace unit that was purchased in 2015
2033			
Unit	Vendor	Expected Cost	Notes
Medic Unit	Horton	\$441,600.00	Delivery expected in 2035. This will replace unit purchased in 2025.
Power Load System & Electric Cot	Stryker	\$105,000.00	Installed with new Medic Unit for delivery in 2035
2034			
Unit	Vendor	Expected Cost	Notes
Tower 61	Rosenbauer	\$2,200,000	Delivery expected in 2037. Replace unit purchased in 2010.
2035			
Unit	Vendor	Expected Cost	Notes
LifePak 35	Stryker	\$150,600.00	Replace 2 units that were purchased in 2023.
2036			
Unit	Vendor	Expected Cost	Notes
Medic Unit	Horton	\$475,600.00	Delivery expected in 2038. This will replace unit purchased in 2028.
Power Load System & Electric Cot	Stryker	\$113,000.00	Installed with new Medic Unit for delivery in 2038

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2037								
Unit	Vendor	Expected Cost	Notes					
Lucas CPR Units	Stryker	\$56,700.00	Replace the two units purchased in 2027					
2038								
Unit	Vendor	Expected Cost	Notes					
Medic Unit	Horton	\$499,700.00	Delivery expected in 2040. This will replace unit purchased in 2030.					
Power Load System & Electric Cot	Stryker	\$118,800.00	Installed with new Medic Unit for delivery in 2040					
LifePak 35	Stryker	\$162,200.00	Replace 2 units that were purchased in 2026.					

**Cost estimates based on 2.5% annual increases**

	Medic Units	Engines	Lucas Device (2)	Power Load System and Electric Cot	LifePak 15 (2)
2023	\$345,000.00	\$650,000.00	\$40,000.00	\$82,000.00	\$40,000.00
2024	\$353,625.00	\$666,250.00	\$41,071.04	\$84,050.00	\$114,804.80
2025	\$362,465.63	\$682,906.25	\$42,097.82	\$86,151.25	\$117,674.92
2026	\$371,527.27	\$699,978.91	\$43,150.26	\$88,305.03	\$120,616.79
2027	\$380,815.45	\$717,478.38	\$44,229.02	\$90,512.66	\$123,632.21
2028	\$390,335.83	\$735,415.34	\$45,334.74	\$92,775.47	\$126,723.02
2029	\$400,094.23	\$753,800.72	\$46,468.11	\$95,094.86	\$129,891.09
2030	\$410,096.59	\$772,645.74	\$47,629.81	\$97,472.23	\$133,138.37
2031	\$420,349.00	\$791,961.88	\$48,820.56	\$99,909.04	\$136,466.83
2032	\$430,857.72	\$811,760.93	\$50,041.07	\$102,406.76	\$139,878.50
2033	\$441,629.17	\$832,054.95	\$51,292.10	\$104,966.93	\$143,375.46
2034	\$452,669.90	\$852,856.33	\$52,574.40	\$107,591.11	\$146,959.85
2035	\$463,986.64	\$874,177.74	\$53,888.76	\$110,280.88	\$150,633.85
2036	\$475,586.31	\$896,032.18	\$55,235.98	\$113,037.91	\$154,399.69
2037	\$487,475.97	\$918,432.98	\$56,616.88	\$115,863.85	\$158,259.68
2038	\$499,662.87	\$941,393.81	\$58,032.30	\$118,760.45	\$162,216.18
2039	\$512,154.44	\$964,928.65	\$59,483.11	\$121,729.46	\$166,271.58
2040	\$524,958.30	\$989,051.87	\$60,970.19	\$124,772.70	\$170,428.37