Proposal Details Report

11/3/2018

Customer: Coppell Fire Department
Bid Number: 751
Representative Ownby, Travis
Job Number:
Requirements Manager:
Organization: Siddons-Martin Emergency Group
Description: Velocity single axle quint
Chassis: Velocity Chassis, Aerials, Single Axle, Ascendant (Big Block)
Body: Aerial, HD Ladder 107' ASL Single, Quint, Alum Body

OptionCode	Type	Option	ProposalText
0010012		No Boiler Plates requested	
0018180		Single Source Compliance, Aerials	**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.
0584456		Manufacture Location, Appleton, Wisconsin	Your apparatus will be manufactured in Appleton, Wisconsin.
0584452		RFP Location: Appleton, Wisconsin	
0588609		Vehicle Destination, US	
0610784		Comply NFPA 1901 Changes Effective Jan 1, 2016, With Exceptions	**NFPA 2016 STANDARDS** This unit will comply with the NFPA standards effective January 1, 2016, 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.
0533351		Quint Fire Apparatus	
0588612		Vehicle Certification, Aerial w/Pump	

0681278	Agency, Apparatus Certification, Aerial w/Pump, U.L.	**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". **VEHICLE INSPECTION PROGRAM CERTIFICATION** To assure the vehicle is built to current NFPA standards, the apparatus, in its entirety, will be third-party, audit-certified through Underwriters Laboratory (UL) that it is built and complies to all applicable standards in the current edition of NFPA 1901. The certification will include: 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. **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 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.*

0536644	Customer Service Website	**AFTERMARKET SUPPORT WEBSITE** Pierceparts.com will provide Pierce authorized dealer access to comprehensive information pertaining to the maintenance and service of their customer's apparatus. This tool will provide the Pierce authorized dealer the ability to service and support their customers to the best of their ability with factory support at their fingertips. Pierceparts.com is also accessible to the end user through the guest login. Limited access is available and vehicle specific parts information accessible by entering a specific VIN number. All end users should see their local authorized Pierce dealer for additional support and service. The website will consist of the following screens at the dealer level: **My Fleet Screen** The My Fleet screen will provide access to truck detail information on the major components of the vehicle, warranty information, available vehicle photographs, vehicle drawings, sales options, applicable vehicle software downloads, etc. **Parts Screens** The Parts screens will provide parts look-up capability of Pierce Manufacturing sourced items, with the aid of digital photographs, part drawings and assembly drawings. The parts search application will permit the searching of parts by item description or function group (major system category). The parts application will provide the ability to submit electronically a parts order, parts quote, or parts return request directly to Pierce Manufacturing for processing. **Warranty Screen** The Warranty screens will provide dealers the ability to submit electronically warranty claims directly to Pierce Manufacturing for reimbursement. **My Reports Screens** The My Reports screens will provide access to multiple dealer reports to allow the dealership to maintain communication with the customer on the status of orders, claims, and phone contacts. **Technical Support Screens** The Technical Support screens will provide access to all currently published Operation and Maintenance and Service Publications. Access to Pierce Manufacturing Service Bulletins and Work Instructions, containing information on current service topics and recommendations will be provided. **Training** The Training screens will provide access to upcoming training classes offered by Pierce Manufacturing along with interactive electronic learning modules (Operators Guides) covering the operation of major vehicle components will be provided. Access to training manuals used in Pierce Manufacturing training classes will be provided. **About Pierce** Access to customer service articles, corporate news, quarterly newsletters, and key contacts within the Customer Service Department will be provided. The current Customer Service Policy and Procedure Manual, detailing the operation of the Customer Service group will also be accessible.
0537375	Unit of Measure, US Gallons	
0529326	Bid Bond, 10%, Pierce Built Chassis	**BID BOND** A bid bond as security for the bid in the form of a 10% bid bond will be provided with the proposal. 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.
0582697	Performance Bond, 100 Percent w/Warranty Bond, 1 Yr, and Payment Bond	**PERFORMANCE BOND, 1 YEAR** 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 Basic One (1) Year Limited Warranty period included within this proposal. Owner agrees that the penal amount of this bond will be simultaneously amended to 100 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 one (1) year from the date of such satisfactory acceptance and delivery, or the actual Basic One (1) Year Limited Warranty period, whichever is shorter.

0000007	Approval Drawing	**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.
0002928	Electrical Diagrams	**ELECTRICAL WIRING DIAGRAMS** Two (2) electrical wiring diagrams, prepared for the model of chassis and body, will be provided.
0614994	Velocity Chassis, Aerials, Single Axle, Ascendant (Big Block)	**VELOCITY CHASSIS** The Pierce Velocity® 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 and 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.
0000110	Wheelbase	**WHEELBASE** The wheelbase of the vehicle will be 233.50.
0000070	GVW Rating	**GVW RATING** The gross vehicle weight rating will be 57,500.
0000203	Frame Rails, 13.38 x 3.50 x .375, Qtm/AXT/Imp/Vel/DCF	**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.
0604483	Frame Liner, Inv "L" 12.68" x 3.00" x .25", AXT/Vel/Imp, 107' ASL, 56" Qval	**FRAME REINFORCEMENT** In addition, a mainframe inverted "L" liner will be provided. It will be heat-treated steel measuring 12.00" x 3.00" x 0.25". Each liner will have a section modulus of 7.795 cubic inches, yield strength of 110,000 psi, and rbm of 857,462 in-lb. Total rbm at wheelbase center will be 3,976,502 in-lb. The frame liner will be mounted inside of the chassis frame rail.
0508846	Axle, Front, Oshkosh TAK-4, Non Drive, 24,000 lb, Velocity	**FRONT NON DRIVE AXLE** The Oshkosh TAK-4® front axle will be of the independent suspension design with a ground rating of 24,000 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 0 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 must 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 third party certified turning angle of 40 degrees. Front discharge, front suction, or aluminum wheels will not infringe on this cramp angle.

0090914	Suspension, Front TAK-4, 24,000 lb, DLX/Qtm/AXT/Vel/Enf	**FRONT SUSPENSION** Front Oshkosh TAK-4™ independent suspension will be provided with a minimum ground rating of 24,000 lb. The independent suspension system has been 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 a 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.
0087572	Shock Absorbers, KONI, TAK-4, Qtm/AXT/Imp/Vel/DCF/Enf	**FRONT SHOCK ABSORBERS** KONI heavy-duty telescoping shock absorbers will be provided on the front suspension.
0000322	Oil Seals, Front Axle	**FRONT OIL SEALS** Oil seals with viewing window will be provided on the front axle.
0582746	Tires, Front, Goodyear, G296 MSA, 445/65R22.50, 20 ply	**FRONT TIRES** Front tires will be Goodyear radials 445/65R22.50, 20 ply all-position G296 MSA tread, rated for 24,600 lb maximum axle load and 68 mph maximum speed.
0019618	Wheels, Front, Alcoa, 22.50" x 13.00", Aluminum, Hub Pilot	The tires will be mounted on Alcoa 22.50" x 13.00" polished aluminum disc type wheels with a ten (10)stud, 11.25" bolt circle.
0598516	Axle, Rear, Meritor RS30-185, 33,500 lb, Imp/Vel/DCF	**REAR AXLE** The rear axle will be a Meritor™, Model RS-30-185, with a capacity of 33,500 lb.
0544253	Top Speed of Vehicle, 68 MPH	**TOP SPEED OF VEHICLE** A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 68 mph.
0122073	Suspen, Rear, Standens, Spring, 33,500 lb, Imp/Vel/Dash CF/Enf	**REAR SUSPENSION** The rear suspension will be Standens, semi-elliptical, 3.00" wide x 53.00" long, with a ground rating of 33,500 lb. The spring hangers will be castings. The two (2) top leaves will wrap the forward spring hanger pin, and the rear of the spring will be a slipper style end that will ride in a rear slipper hanger. To reduce bending stress due to acceleration and braking, the front eye will be a berlin eye that will place the front spring pin in the horizontal plane within the main leaf. A steel encased rubber bushing will be used in the spring eye. The steel encased rubber bushing will be maintenance free and require no lubrication.
0000485	Oil Seals, Rear Axle	**REAR OIL SEALS** Oil seals will be provided on the rear axle(s).
0585004	Tires, Rear, Goodyear, G289 WHA, 315/80R22.50, 20 ply, Single	**REAR TIRES** Rear tires will be four (4) Goodyear 315/80R22.50 radials with 20 ply G289 WHA tread, rated for 36,360 lb maximum axle load and 68 mph maximum speed.
0019675	Wheels, Rear, Alcoa, 22.50" x 9.00", Aluminum-Steel, Hub Pilot, Single	The outside tires will be mounted on Alcoa© 22.50" x 9.00" polished aluminum disc wheels with a ten (10)stud 11.25" bolt circle. The inside tires will be mounted on 22.50" x 9.00" steel disc wheels with a ten (10) stud 11.25" bolt circle.
0568081	Tire Balancing, Counteract Beads	**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.

0620570	Tire Pressure Monitoring, RealWheels, AirSecure, Valve Cap, Single Axle	**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 six (6) 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.
0003245	Axle Hub Covers w/center hole, S/S, Front Axle	**FRONT HUB COVERS** Stainless steel hub covers will be provided on the front axle. An oil level viewing window will be provided.
0003240	Axle Hub Covers, Rear, S/S Baby Moon (Pair)	**HUB COVERS (rear)** Stainless steel baby moon covers will be provided over the rear axle hubs.
0057936	Covers, Lug Nut, Chrome	**CHROME LUG NUT COVERS** Chrome lug nut covers will be supplied on front and rear wheels.
0002045	Mud Flaps, w/logo front & rear	**MUD FLAPS** Mud flaps with a Pierce logo will be installed behind the front and rear wheels.
0544802	Chocks, Wheel, SAC-44-E, Folding	**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.
0544806	Mounting Brackets, Chocks, SAC-44-E, Folding, Horizontal	**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 below the left side rear compartment.
0010670	ABS Wabco Brake System, Single rear axle	**ANTI-LOCK BRAKE SYSTEM** The vehicle will be equipped with a Meritor WABCO 4S4M, anti-lock braking system. The ABS will provide a 4-channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel 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.
0030185	Brakes, Knorr/Bendix 17", Disc, Front, TAK-4	**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.
0000740	Brakes, Meritor, Cam, Rear, 16.50 x 8.63"	The rear brakes will be Meritor™ 16.50" x 8.63" cam operated with automatic slack adjusters. Dust shields cannot be provided.
0020784	Air Compressor, Brake, Cummins/Wabco 18.7 CFM	**BRAKE SYSTEM AIR COMPRESSOR** The air compressor will be a Cummins/WABCO with 18.7 cubic feet per minute output.

0000786	Brake Reservoirs, Four	**BRAKE SYSTEM** The brake system will include: Bendix® dual brake treadle valve Heated automatic moisture ejector on air dryer Total air system capacity of 5,198 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, 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 valve on each air tank The air tank will be primed and painted to meet a minimum 750 hour salt spray test. To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.
0568012	Air Dryer, Wabco System Saver 1200, Heater, 2010	**BRAKE SYSTEM AIR DRYER** The air dryer will be WABCO System Saver 1200 with spin-on coalescing filter cartridge and 100 watt heater.
0000790	Brake Lines, Nylon	**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.
0000854	Air Inlet, w/Disconnect Coupling	**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.
0690889	All Wheel Lockup (Aerial/Tanker Chassis), Aerial Master Activation	**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. The all wheel lock-up system will be activated automatically when the aerial master switch is activated.
0615609	Fittings, Compression Type, Entire Apparatus, Single Rear Axle	**COMPRESSION FITTINGS ONLY** Any nylon tube on the apparatus that is pneumatic will be plumbed with compression type fittings where applicable.
0764546	Engine, Cummins X12, 500 hp, 1695 lb-ft, W/OBD, EPA 2018, Velocity	**ENGINE** The chassis shall be powered by an electronically controlled engine as described below: Make: Cummins Model: X12 Power: 500 hp at 1900 rpm Torque: 1695 lb-ft at 1000 rpm Governed Speed: 2000 rpm Emissions Level: EPA 2018 Fuel: Diesel Cylinders: Six (6) Displacement: 720 cubic inches (11.8L) Starter: Delco 39MT™ Fuel Filters: Spin-on style primary filter with water separator and water-in-fuel sensor. Secondary spin-on style filter. The engine shall include On-board diagnostics (OBD), which provides self diagnostic and reporting. The system shall give the owner or repair technician access to state of health information for various vehicle sub systems. The system shall monitor vehicle systems, engine and after treatment. The system shall illuminate a malfunction indicator light on the dash console if a problem is detected.

0001244	High Idle w/Electronic Engine, Custom	**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."
0687994	Engine Brake, Jacobs Compression Brake, Cummins Engine	**ENGINE BRAKE** A Jacobs® engine brake is to be installed with the controls located on the instrument panel within easy reach of the driver. The driver will be able to turn the engine brake system on/off and have a high, medium and low setting. The engine brake will activate when the system is on and the throttle is released. The high setting of the brake application will activate and work simultaneously with the variable geometry turbo (VGT) provided on the engine. The engine brake will be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated. The ABS system will automatically disengage the auxiliary braking device, when required.
0552334	Clutch, Fan, Air Actuated, Horton Drive Master	**CLUTCH FAN** A Horton® fan clutch will be provided. The fan clutch will be automatic when the pump transmission is in "Road" position, and fully engaged in "Pump" position.
0123135	Air Intake, w/Ember separator, Imp/Vel	**ENGINE AIR INTAKE** An air intake with an ember separator (to prevent road dirt, burning embers, and recirculating hot air from entering the engine) will be mounted at the front of the apparatus, on the passenger side of the engine. The ember separator will be mounted in the air intake with flame retardant, roto-molded polyethylene housing. It will be easily accessible by the hinged access panel at the front of the vehicle.
0794743	Exhaust System, 5", X12/X15 Engine, Horizontal, Right Side	**EXHAUST SYSTEM** The exhaust system will include a Single Module™ aftertreatment device to meet current EPA standards. The exhaust system will be stainless steel from the turbo to the inlet of the aftertreatment device, and will be 5.00" in diameter. An insulation wrap will be provided on all exhaust pipes between the turbo and aftertreatment device to minimize the heat loss to the aftertreatment device. The exhaust will terminate horizontally ahead of the right side rear wheels. A tailpipe diffuser will be 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.
0787999	Radiator, Impel/Velocity	**RADIATOR** The radiator and the complete cooling system will meet or exceed 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 core will be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes will be brazed to aluminum headers. The radiator core will have a minimum frontal area of 1434 square inches. Supply tank made of glass-reinforced nylon and a return tank of cast aluminum alloy shall be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator will be compatible with commercial antifreeze solutions. There will be a full steel frame around the entire radiator core assembly. The radiator core assembly will be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. The radiator will be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly will be isolated from the chassis frame rails with rubber isolators. The radiator assembly will include an integral deaeration tank permanently mounted to the top of the radiator framework, with a readily accessible remote-mounted overflow 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. A heavy-duty fan will draw in fresh, cool air through the radiator. Shields or baffles will be provided to prevent recirculation of hot air to the inlet side of the radiator.
0616439	Cooling Hoses, Gates Silicone	**COOLANT LINES** Gates® silicone hoses will be used for all engine/heater coolant lines installed by the chassis manufacturer. The chassis manufacturer will also use Gates brand hose on other heater, defroster and auxiliary coolant circuits. There will be some areas in which an appropriate Gates product is not available. In those instances, a comparable silicone hose from another manufacturer will be used. Hose clamps will be stainless steel "constant torque type" to prevent coolant leakage. They will react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose.

0001125	Fuel Tank, 65 Gallon, Left Side Fill	**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.
0001129	Lines, Fuel	All fuel lines will be provided as recommended by the engine manufacturer.
0644984	DEF Tank, 4.5 Gallon, DS Fill, Rearward of Rear Axle, Double Dr	**DIESEL EXHAUST FLUID TANK** A 4.5 gallon diesel exhaust fluid (DEF) tank will be provided and mounted in the driver's side body rearward of the rear axle. A 0.50" drain plug will be provided in a low point of the tank for drainage. A fill inlet will be located on the driver's side of the body and be covered with a hinged stainless steel door that is marked "Diesel Exhaust Fluid Only". The door will cover both the diesel fuel inlet as well as the DEF fill inlet. The hinged door will flip between the two, preventing accidental filling of the incorrect fluid. The tank will meet the engine manufacturers requirement for 10 percent expansion space in the event of tank freezing. The tank will include an integrated heater unit that utilizes engine coolant to thaw the DEF in the event of freezing.
0552793	Not Required, Fuel Priming Pump	
0582243	Shutoff Valves, Fuel Line @ Primary Filter, Cummins	**FUEL SHUTOFF** A fuel line shutoff valve will be installed on both the inlet and outlet of the primary fuel filter.
0553019	Cooler, Engine Fuel, Imp/Vel, AXT/Qtm/Sab/DCF/SFR/Enf	**FUEL COOLER** An air to fuel cooler will be installed in the engine fuel return line.
0578959	Fuel/Water Separator, Racor Inline	**FUEL SEPARATOR** The engine will be equipped with a Racor in-line spin-on fuel and water separator in addition to the engine fuel filters.
0642533	Trans, Allison 5th Gen, 4500 EVS P, w/Prognostics, Imp/Vel/DCF/Enf	**TRANSMISSION** An Allison 5th generation, Model EVS 4500P, 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 red light and buzzer will be installed on the cab instrument panel.
0512762	Transmission, Shifter, 6-Spd, Push Button, 4500, Imp/Vel/Qtm/DCF/Enf	**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 - 4.70 to 1.00, 2nd - 2.21 to 1.00, 3rd - 1.53 to 1.00, 4th - 1.00 to 1.00, 5th - 0.76 to 1.00, 6th - 0.67 to 1.00, R - 5.55 to 1.00.
0684459	Transmission Oil Cooler, Modine, External	**TRANSMISSION COOLER** A Modine plate and fin transmission oil cooler will be provided using engine coolant to control the transmission oil temperature.
0535530	Mode, Downshift, Aggressive downshift to 2nd, w/engine brake, 6 speed	**DOWNSHIFT MODE (w/engine brake)** The transmission will be provided with an aggressive downshift mode. This will provide earlier transmission downshifts to 2nd gear from 6th gear, resulting in improved engine braking performance.
0001375	Driveline, Spicer 1810	**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.

0669988	Steering, Sheppard M110 w/Tilt, TAK-4, Eaton Pump, w/Cooler	**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 an Eaton, Model VN20, 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.
0001544	Not Required, Steering Assist Cylinder on Front Axle	
0509230	Steering Wheel, 4 Spoke without Controls	**STEERING WHEEL** The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a 4-spoke design.
0690274	Logo/Emblem, on Dash	**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: Coppell The second row of text will be: Fire The third row of text will be: Department
0524744	Bumper, 22" Extended, Steel, Painted, Imp/Vel	**BUMPER** A one (1) piece bumper manufactured from 0.25" formed steel with a 0.38" bend radius will be provided. The bumper will be a minimum of 10.00" high with a 1.50" top and bottom flange, and will extend 22.00" from the face of the cab. The bumper will be 102.00" wide with 45 degree corners and side plates. The bumper will be metal finished and painted job color. To provide adequate support strength, the bumper will be mounted directly to the front of the C channel frame. The frame will be a bolted modular extension frame constructed of 50,000 psi tensile steel. **GRAVEL PAN** A gravel pan, constructed of bright aluminum treadplate, will be furnished between the bumper and the cab face. The pan will be properly supported from the underside to prevent flexing and vibration. Documentation will be provided, upon request, to show that the options selected have been engineered for fit-up and approval for this modular bumper extension. A chart will be provided to indicate the option locations and will include, but not be limited to, the following options: air horns, mechanical sirens, speakers, hose trays (with hose capacities), winches, lights, discharge and suction connections.
0616482	Tray, Hose, Center, 22" Bumper, Outside Air Horns, Imp/Vel	**CENTER HOSE TRAY** A hose tray, constructed of aluminum, will be placed in the center of the bumper extension. The tray will have a capacity of 150' of 1.75" double jacket cotton-polyester hose. Black rubber grating will be provided at the bottom of the tray. Drain holes are also provided.
0630809	Cover, Aluminum Treadplate, One (1) D-Ring Latch, Hose Tray, Notched	**CENTER HOSE TRAY COVER** A bright aluminum treadplate cover will be provided over the center hose tray. The cover will be "notched" allowing the hose to be pre connected to hose connection. The cover will be attached with a stainless steel hinge. A D-ring latch will secure the cover in the closed position and a mechanical stay arm will hold the cover in the open position.
0510226	Lift & Tow Package, Imp/Vel, AXT, Dash CF	**LIFT AND TOW MOUNTS** Mounted to the frame extension will be lift and tow mounts. The lift and tow mounts will be designed and positioned to adapt to certain tow truck lift systems. The lift and tow mounts with eyes will be painted the same color as the frame.
0032932	Tow Eyes, Painted, Extended Out Front of Bumper	**TOW EYES** Two (2) tow eyes will be mounted through the front face of the bumper. The inner and outer edges of the tow eyes will have a .25" radius. The tow eyes will be mounted directly to the bumper frame. Cutouts will be provided in the front face of the stainless steel bumper to allow the tow eyes to extend out the front. The tow eyes will be designed and positioned to allow up to a 9,000 lb straight horizontal pull in line with the centerline of the vehicle. The tow eyes will not be used for lifting of the apparatus. The tow eyes will be painted job color.

0668314	Cab, Velocity FR, 7010 Raised Roof w/Notch	**CAB** The Velocity cab will be designed specifically for the fire service and will be manufactured by Pierce Manufacturing. To provide quality at the source and single source customer support, 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 of 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 0.25" heavy wall extrusions joined by a solid A356-T6 aluminum joint casting. The B-pillar and C-pillar will also be constructed from 0.25" heavy wall extrusions. The rear wall will be constructed of two (2) 4.00" x 2.00" outer aluminum extrusions and two (2) 3.00" x 2.00" inner aluminum extrusions. All main vertical structural members will run from the floor to 7.50" x 3.50" x 0.125" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.75" thick corner casting at each of the front corners of the roof assembly. The front of the cab will be constructed of a 0.25" thick firewall, covered with a 0.125" front skin (for a total thickness of 0.38"), and reinforced with 24.50" wide x 10.00" deep x 0.50" thick supports on each side of the engine tunnel. The cross-cab support will be welded to the A-pillar, 0.25" firewall, and engine tunnel, on the left and right sides. The cab floors will be constructed of 0.1875" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.44" of structural material at the front floor area. The front floor area will also be supported with three (3) 0.50" plates bolted together that also provides the mounting point for the cab lift. This tubing will run from the front of the cab to the 0.1875" thick engine tunnel, creating the structure to support the forces created when lifting the cab. The cab will be a full-tilt style. A 3-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab. 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 forward cab section will have an overall height (from the cab roof to the ground) of approximately 102.00". The crew cab section will have a 10.00" raised roof, with an overall cab height of approximately 112.00". The raised portion will start at the most forward point of the B-pillar and continue rearward to the back of the cab. The overall height listed will be calculated based on a truck configuration with the lowest suspension weight ratings, 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 cab will have an interior width of not less than 93.50". The driver and passenger seating positions will have a minimum 24.00" clear width at knee level. To reduce injuries to occupants in the seated positions, proper head clearance will be provided. The floor-to-ceiling height inside the forward cab will be no less than 60.25". The floor-to-ceiling height inside the crew cab will be no less than 52.95" in the center position and 68.75" in the outboard positions. The crew cab will measure a minimum of 57.50" from the rear wall to the backside of the engine tunnel (knee level) for optimal occupant legroom. **INTERIOR CAB INSULATION** The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling. **FENDER LINERS** Full-circular, aluminum inner fender liners in the wheel wells will be provided. **PANORAMIC WINDSHIELD** A one (1)-piece, safety glass windshield with more than 2,802 square inches of clear viewing area will be provided. The windshield will be full width and will provide the occupants with a panoramic view. The windshield will consist of three (3) layers: the outer light, the middle safety laminate, and the inner light. The 0.114" thick 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 a washer, in conformance with FMVSS and SAE requirements, will be provided. The wiper blades will be 21.65" long and together will clear a minimum of 1,783 square inches of the windshield for maximum visibility in inclement weather. The windshield washer fluid reservoir will be located at the front of the vehicle and be accessible through the access hood for simple maintenance. **FAST SERVICE ACCESS FRONT TILT HOOD** A full-width access hood will be provided for convenient access to engine coolant, steering fluid, wiper fluid, cab lift controls, headlight power modules, and ember separator. The hood will also provide complete access to the windshield wiper motor and components. The hood will be contoured to provide a sleek, automotive appearance. The hood will be constructed of two (2) fiberglass panels bonded together and will include reinforcing ribs for structural integrity. The hood will include air cylinders to hold the hood in open and closed positions, and a heavy duty latch system that will meet FMVSS 113 (Hood Latch System). The spring-loaded hood latch will be located at the center of the hood with a double-action release lever located behind the Pierce logo. The two (2)-step release requires the lever first be pulled to the driver side until the hood releases from the first latch (primary latch) then to the passenger side to fully release the hood (secondary latch).

0667982	Engine Tunnel, ISX, Impel/Velocity FR	**ENGINE TUNNEL** To provide structural strength, the engine tunnel sidewalls will be constructed of .50" aluminum plate that is welded to both the .25" firewall and .38" heavy wall extrusion under the crew cab floor. To maximize occupant space, the top edges will be tapered. The engine tunnel will be insulated on both sides for thermal and acoustic absorption. The underside of the tunnel will be covered with 1.00" thick polyether foam that is reinforced with an aluminized face. Thermal rating for this insulation will be -40 degrees Fahrenheit to 300 degrees Fahrenheit. The insulation will keep noise (dBA) levels at or lower than the specifications in the current edition of the NFPA 1901 standards.
0677478	Rear Wall, Exterior, Cab, Aluminum Treadplate	**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.
0122466	Cab Lift, Elec/Hyd, w/Manual Override, Imp/Vel	**CAB LIFT** A hydraulic cab lift system will be provided, consisting of an electric-powered hydraulic pump, fluid reservoir, dual lift cylinders, remote cab lift controls and all necessary hoses and valves. The hydraulic pump will have a backup manual override, for use in the event of an electrical failure. The cab lift controls will be located at the driver side front of the cab, easily accessible under the full width front access hood. The controls will include a permanently mounted raise/lower switch. For enhanced visibility during cab tilt operations, a remote control tether with on/off switch will be supplied on a coiled cord that will extend from 2.00' (coiled) to 6.00' (extended). The cab will be capable of tilting 42 degrees and 80 degrees with crane assist to accommodate engine maintenance and removal. The cab pivots will be located 46.00" apart to provide stability while tilting the cab. The rear of the cab will be locked down by a two (2)-point, automatic, hydraulic, double hook mechanism that fully engages after the cab has been lowered (self-locking). The dual 2.25" diameter hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position. For increased safety, a redundant mechanical stay arm will be provided that must be manually put in place on the driver side between the chassis and cab frame when 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 safety 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.
0123176	Grille, Bright Finished, Front of Cab, Impel/Velocity	**GRILLE** A bright finished aluminum mesh grille screen, inserted behind a formed bright finished grille surround, will be provided on the front center of the cab, and will serve as an air intake to the radiator.
0002224	Scuffplates, S/S At Cab Door Jambs, 4-Door Cab	**DOOR JAMB SCUFFPLATES** All cab door jambs will be furnished with a polished stainless steel scuffplate, mounted on the striker side of the jamb.
0646179	Trim, S/S, Rect Headlights, VEL/IMP	**FRONT CAB TRIM** There will be polished stainless steel rectangular garnish plates installed behind the two (2) headlight bezels for an enhanced appearance. There will be no covers provided over the painted cab corner where the cab turn signals are located.
0015440	No Chrome Molding, On side of cab	
0521669	Mirrors, Retrac, West Coast Style, Htd/Rmt, w/Htd/Rmt Convex	**MIRRORS** A Retrac, Model 613423, dual vision, motorized, west coast style mirror, with chrome finish, will be mounted on each side of the front cab door with spring loaded retractable arms. The flat glass and convex glass will be heated and adjustable with remote control within reach of the driver.

0667937	Door, Full Height, Velocity FR 4-Door Cab, Raised Roof	**CAB DOORS** To enhance entry and egress to the cab, the forward cab doors will be a minimum of 43.59" wide x 76.46" 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 doors will measure a minimum of 37.87" wide x 85.50" high. The forward cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of 0.125". The exterior door skins will be constructed from 0.090" aluminum. The forward cab door windows will include a 7.50" high x 10.00" wide drop area at the front to enhance visibility. A customized, vertical, pull-down type door handle will be provided on the exterior of each cab door. 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 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 and crew cab door. The cab steps at each cab door location will be located inside the cab doors to protect the steps from weather elements.
0655511	Door Panel, Brushed Stainless Steel, Impel/Velocity 4-Door Cab	**CAB DOOR PANELS** The inner cab door panels will be constructed out of brushed stainless steel. The cab door panels will be removable.
0667905	Storage Pockets w/ Elastic Cover, Recessed, Impel/Velocity FR	**RECESSED POCKET WITH ELASTIC COVER** To provide organized storage (clutter control) in the cab for miscellaneous equipment, the cab interior will be provided with recessed storage pockets. The pockets will be 5.63" wide x 2.00" high x 4.00" deep. The pockets will be provided with a perforated elastic material cover to secure the equipment in the pocket. The pockets will be installed in all available mounting locations of the overhead console.
0667902	Controls, Electric Windows, All Cab Doors, Impel/Velocity FR	**ELECTRIC WINDOW CONTROLS** Each cab entry door will be equipped with an electrically operated tempered glass window. A window control panel will be located on the door panel within easy reach of the respective occupant. 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. The driver control panel will contain a control switch for each cab door's window. All other door control panels will contain a single switch to operate the window within that door. The window switches will be connected directly to the battery power. This allows the windows to be raised and lowered when the battery switch is in the off position.
0662776	Electric Door Locks, Cab Doors, Conceal Switch Feature, Imp/Vel	**ELECTRIC CAB DOOR LOCKS** The front driver and passenger doors will have a door lock master switch (custom designed rotary lock knob) built into the interior door latch that will control all front and rear side exit door locks. Each rear cab door will have its own lock control. Each door will have a keyed exterior lock mechanism built into the door handle assembly. There will be one (1) concealed switch located front bumper. 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.
0512420	Key Pad, Electric Door locks, DS & PS, Imp/Vel	**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 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 3000 possible code combinations.
0555485	Steps, 4-Door Full Tilt Cab, Imp/Vel	**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 31.00" wide, and the crew cab steps will be 24.25" wide with an 8.00" minimum depth. The inside cab steps will not exceed 18.00" in height and be limited to two (2) steps.

0770200		Handrail, Exterior, Hansen, Knurled, Alum, LED Backlit, 4-Door Cab	**CAB EXTERIOR HANDRAILS** A Hansen 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 provided with white LED lights. The lights will be activated when the parking brake is applied. The LED lights may be load managed.
0566180		Steps, Stirrup, Cab Doors, Imp/Vel	**STIRRUP STEPS** A stirrup step will be provided below each front cab door. The steps will be designed with a grip pattern punched into bright aluminum treadplate material providing support, slip resistance, and drainage. The steps will be a bolt-on design and provide a 18.50" wide x 5.00" deep stepping surface. Each step will provide a step height of 8.25" from the top of the stirrup step to the first step of the cab. The stirrup step will be lit by a white 12 volt DC LED light provided on the step. The step light will be activated automatically when the battery switch is on and the exit doors are opened or by the same means as the body step lights.
0509649		Lights, Cab and Crew Cab Access Steps, P25, LED w/Bezel, 1Lt Per Step	**STEP LIGHTS** For reduced overall maintenance costs compared to incandescent lighting, there will be four (4) white LED step lights provided. The lights will be installed at each cab and crew cab door, one (1) per step. The lights will be located in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep. In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light. The lights will be activated when the adjacent door is opened.
0002140		Fenders, S/S on Cab	**FENDER CROWNS** Stainless steel fender crowns will be installed at the cab wheel openings.
0592071		No Windows, Side of Crew Cab, Vel/Imp	
0568605		Not Required, Interior Trim, No Cab Side Windows	
0012090		Not Required, Windows, Front/Side of raised roof	
0509286		Not Required, Windows Rear of Crew Cab, Imp/Vel	
0558334		Not Required, Trim, Cab Rear Windows, No Rear Windows	
0651515		Window Protector Bars, Knurled, Crew Doors, 2" Above Window Sill Plate	**WINDOW PROTECTOR BARS, CREW CAB DOORS** A knurled window protector bar will be installed on each crew cab door, 2.00" above the bottom of the window opening. The bar will extend from the front of the crew cab door to the rear of the crew cab door, mounted as close to the door frame as possible.
0782446	SP	Compt, Storage, 10.71 W x 30 H x 14 D, (1) Ea Side C/C, Rev Hng, D-Ring, Imp/Vel	**STORAGE COMPARTMENTS** Provided on each side of the cab, to the rear of the crew cab access doors, will be a storage compartment. The compartments will be approximately 10.71" wide x 30.00" high x 14.00" deep with a clear door opening of 9.50" wide x 28.00" high. The doors will be a reverse hinged, painted single pan construction with one (1) D-ring latch. A cable will be used as a door stop. The compartment interior will be painted to match the cab interior. **Compartment Light** There will be no lights required in the compartments.

0667945	Cab Interior, Vinyl, Velocity FR, CARE	**CAB INTERIOR** With safety as the primary objective, the wrap-around style cab instrument panel will be designed with unobstructed visibility to instrumentation. The dash layout will provide the driver with a quick reference to gauges that allows more time to focus on the road. The center console will be a high impact ABS polymer and will be easily removable for access to the defroster. The center console will include louvers strategically located for optimal air flow and defrost capability to the windshield. The passenger side dashboard will be constructed of painted aluminum for durability and low maintenance. For enhanced versatility, the passenger side dash will include a flat working surface. To provide optional (service friendly) control panels, switches and storage modules, a painted aluminum overhead console will also be provided. To complete the cab front interior design, painted aluminum modesty panels will be provided under the dash on both sides of the cab. The driver side modesty panel will provide mounting for the battery switch and diagnostic connectors, while the passenger side modesty panel provides a glove box, and ground access to the main electrical distribution panel via quick quarter turn fasteners. To provide a deluxe automotive interior, the engine tunnel, side walls and rear wall will be covered by a leather grain vinyl that is resistant to oil, grease, and mildew. The headliner will be installed in both forward and rear cab sections. The headliner panel will be a composition of an aluminum panel covered with a sound barrier and upholstery. The cab structure will include designated raceways for electrical harness routing from the front of the cab to the rear upper portion of the cab. Raceways will be extruded in the forward door frame, floor, walls and overhead in the area where the walls meet the ceiling. The raceways located in the floor will be covered by aluminum extrusion, while the vertical and overhead raceways will be covered by painted aluminum covers. The raceways will improve harness integrity by providing a continuous harness path that eliminates wire chafing and abrasion associated with exposed wiring or routing through drilled metal holes. Harnesses will be laid in place. **CAB INTERIOR UPHOLSTERY** The cab interior upholstery will be dark silver gray. All cab interior materials will meet FMVSS 302 (flammability of interior materials).
0667943	Cab Interior, Paint Color, Impel/Velocity FR	**CAB INTERIOR PAINT** A rich looking interior will be provided by painting all the metal surfaces inside the cab red, vinyl texture paint.
0509532	Floor, Rubber Padded Cab & Crew Cab, Imp/Vel, Dash CF	**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.
0667936	Heater/defroster, Dual Zone Control, Impel/Velocity FR	**CAB DEFROSTER** To provide maximum defrost and heating performance, a 54,961 BTU heater-defroster unit with 558 SCFM of air flow will be provided inside the cab. The defroster unit will be strategically located under the center forward portion of the instrument panel. For easy access, a removable metal cover will be installed over the defroster unit. The defroster will include an integral aluminum frame air filter, high performance dual scroll blowers, and ducts designed to provide maximum defrosting capabilities for the 1-piece windshield. The defroster ventilation will be built into the design of the cab dash instrument panel and will be easily removable for maintenance. 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 CAB HEATER** Two (2) 36,702 BTU auxiliary heaters with 276 SCFM (each unit) of air flow will be provided inside the crew cab, one (1) in each outboard rear facing seat riser. The heaters will include high performance dual scroll blowers, one (1) for each unit. Outlets for the heaters will be located below each rear facing seat riser and below the fronts of the driver and passenger seats, for efficient airflow. An extruded aluminum plenum will be incorporated in the cab structure that will transfer heat to the forward cab seating positions. The heater/defroster and crew cab heaters will be controlled by an integral electronic control panel. The heater control panel will allow the driver to control heat flow to the front and rear independently. The control panel will include variable adjustment for temperature and fan control, and be conveniently located on the dash in clear view of the driver. The control panel will include highly visible, progressive LED indicators for both fan speed and temperature.

0603346	Air Conditioning, Dual Zone Control, Hinge Acc Panel, Impel/Velocity FR	**AIR CONDITIONING** Due to the large space inside the cab, a high-performance, customized air conditioning system will be furnished. A 19.10 cubic inch compressor will be installed on the engine. The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 64 degrees Fahrenheit in the forward section of the cab, and 69 degrees Fahrenheit in the rear section of the cab, 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. A roof-mounted condenser with a 63,000 BTU output that meets and exceeds the performance specification will be installed on the cab roof. The condenser cover and mounting legs to be painted white as provided by the A/C manufacturer. The evaporator unit will be installed in the rear portion of the cab ceiling over the engine tunnel. The evaporator will include two (2) high performance cores and plenums with multiple outlets, one (1) plenum directed to the front and one (1) plenum directed to the rear of the cab. There will be a hinge on the forward edge of the filter cover and two (2) quarter turn fasteners with a knob on the rear edge to allow easy access. The evaporator unit will have a 49,000 BTU (4.08 tons) rating that meets and exceeds the performance specifications. Adjustable air outlets will be strategically located on the evaporator cover per the following: Four (4) will be directed towards the drivers location Four (4) will be directed towards the officers location Eight (8) will be directed towards crew cab area The air conditioner refrigerant will be R-134A and will be installed by a certified technician. The air conditioner will be controlled by dual zone integral electronic control panels for the heater, defroster and air conditioner. The cab control panel will be located in the center console. For ease of operation, the control panels will include variable adjustment for temperature and fan control. **INTERIOR CAB INSULATION** The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling. Headliners will be constructed from a 0.20" high density polyethylene corrugated material. Each headliner will be wrapped with a 0.25" thick foil faced poly damp low emissivity foam insulation barrier for acoustic and thermal control. Designed for maximum sound absorption and thermal insulation, the rear cab wall will be insulated with a 1.50" thick open cell acoustical foam. The thermal protection of the foam will provide and R-value of 4 per 1.00" thickness.
0545846	Air Conditioning, Dometic, Split System	**AIR CONDITIONER** A Dometic, Model ECEQ14-CEB, auxiliary remote split air conditioning system will be provided for additional cooling of the cab interior. The evaporator unit, consisting of the evaporator, blower and compressor, will be located tbd. The condenser will be mounted on the cab roof. The air conditioner will have a cooling capacity of 14,000 BTU. The unit will be 120 volt AC. The full load amperage draw will be 14.5 amps in the cooling mode. The unit will be powered from the shoreline inlet. A thermostat will control the cooling unit, located within the crew cab, rear face of the center console.
0640814	Dual Condensate Drain Tubes for A/C Drip Pan, Imp/Vel FR	**SPECIAL 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.
0639675	Sun Visor, Smoked Lexan, AXT, Dash CF, Imp/Vel, Saber FR/Enforcer	**SUN VISORS** Two (2) smoked Lexan™ sun visors 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.
0543257	Grab Handles, Driver Door Post & Passenger Dash Panel, Imp/Vel	**GRAB HANDLE** A black rubber covered grab handle will be mounted on the door post of the driver side cab door to assist in entering the cab. The grab handle will be securely mounted to the post area between the door and windshield. A long rubber grab handle will be mounted on the dash board in front of the officer.
0583938	Lights, Engine Compt, Custom, Auto Sw, Wln 3SC0CDCR, 3" LED, Trim	**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.

0122516		Fluid Check Access, Imp/Vel	**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 door will be 17.75" wide x 12.75" high and be flush with the wall of the engine tunnel. The engine oil dipstick will allow for checking only. The transmission dipstick will allow for both checking and filling. An additional port will be provided for filling the engine oil. The door will have a rubber seal for thermal and acoustic insulation. One (1) flush latch will be provided on the access door.
0000000	STF	Center Cab Console with Cup Holders-SEMG Furnished	**CENTER CAB CONSOLE WITH CUP HOLDERS-DEALER FURNISHED** There shall be a custom console installed on the apparatus engine tunnel. This console shall be constructed of high density poly propylene. The design and layout shall be approved by the fire department.
0583042		Side Roll and Frontal Impact Protection	**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
0622618		Seating Capacity, 5 Seats	**SEATING CAPACITY** The seating capacity in the cab will be five (5).

0697005	Seat, Driver, Pierce PS6, Premium, Air Ride, High Back, Safety	**DRIVER SEAT** A Pierce PS6® 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 electric controls to adjust the rake (15 degrees), height (1.75" travel) and horizontal (7.00" travel) position. Electric controls will be located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have a reclining back, adjustable from 20 degrees back to 45 degrees forward. Providing for maximum comfort, the seat back will be a high back style with manual lumbar adjustment lever, for lower back support, and will include minimum 7.50" deep side bolster pads for maximum support. The lumbar adjustment lever will be easily located at the lower outboard position of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density 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. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.
0696994	Seat, Officer, Pierce PS6, Premium, Air Ride, SCBA, Safety	**OFFICER SEAT** A Pierce PS6® seat will be provided in the cab for the passenger. The seat 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. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat 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 belted. The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. 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 suspension seat safety system will be included. When activated, this system will pretension the seat belt and then retract the seat to its lowest travel position. The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.
0002517	Not Required, Radio Compartment	
0771848	Cabinet, Rear Facing, LS, 24 W x 28 H x 30.5 D, Web, Ext Acc, Imp/Vel	**REAR FACING LEFT SIDE CABINET** A rear facing cabinet will be provided in the crew cab at the left side outboard position with interior and exterior access. The cabinet will be 24.00" wide x 28.00" high x 30.50" deep. The interior door will be web netting. The netting is to be made with 1.00" wide nylon material with 2.00" openings. The interior clear door opening will be 19.50" wide x 24.50" high. The nylon webbing will be fastened with spring clip and hook fasteners on all sides to secure it. The cabinet will include one (1) infinitely adjustable shelf with a 0.75" up-turned lippainted to match the cab interior. The cabinet will include no louvers. The cabinet will also provide exterior access with one (1) double pan door painted to match the cab exterior with a locking D-ring latch with #751 key. A pneumatic stay arm will be provided as a door stop. The clear door opening will 20.00" wide x 25.75" 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 interior cabinet door opening. The lights will be controlled by an automatic door switch and a rocker switch on the cabinet exterior.
0102783	Not Required, Seat, Rr Facing C/C, Center	

0767512	Cabinet, Rear Facing, RS, 22 W x 28 H x 26.5 D, Web, Ext Acc, Imp/Vel	**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 26.50" deep. The interior door will be web netting. The netting is to be made with 1.00" wide nylon material with 2.00" openings. The nylon webbing will be permanently fastened at the bottom side of the cabinet and have spring clip and hook fasteners on the opposite side to secure it. The clear door opening will be 17.50" wide x 24.50" high. The cabinet will include one (1) infinitely adjustable shelf with a 0.75" up-turned lippainted to match the cab interior. The cabinet will include no louvers. 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 D-ring latch with #751 key. A pneumatic stay arm will be provided as a door stop. The exterior clear door opening will be 20.00" wide x 25.75" high. The door will be located on the side of the cab over the wheelwell. 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 rocker switch on the exterior of the cabinet.
0645433	Seat, Forward Facing C/C, DS Outbrd, Pierce PS6, Base, SCBA, Safety, Inboard 3"	**FORWARD FACING DRIVER SIDE OUTBOARD SEAT** There will be one (1) forward facing Pierce PS6® seat provided at the driver side outboard position in the crew cab. To provide improved ride comfort, and maximize accessibility to the crew cab, the seat will be provided with 15.00" deep foam cushions, and the seat back will be provided with 0 degree fixed recline angle. To ensure safe operation, the seat 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. The seat back will be an SCBA back style. 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 around the occupant to firmly hold them in place in the event of a side roll. The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position. The seat will be moved approximately 3.00" inboard from the standard location.
0637508	Seat, Forward Facing C/C, Center, (1) Pierce PS6, Base, SCBA, 17" Btm, Safety	**FORWARD FACING CENTER SEAT** There will be one (1) forward facing, Pierce PS6® seat provided at the center position in the crew cab. To provide improved ride comfort, and maximize accessibility to the crew cab, the seat will be provided with 17.00" deep foam cushions, and the seat back will be provided with 0 degree fixed recline angle. To ensure safe operation, the seat 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. The seat back will be an SCBA back style. 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 feature incorporated into the side roll protection system: A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll. The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.
0645431	Seat, Forward Facing C/C, PS Outboard, Pierce PS6, Base, SCBA, Safety, Inbrd 3"	**FORWARD FACING PASSENGER SIDE OUTBOARD SEAT** There will be one (1) forward facing Pierce PS6® seat provided at the passenger side outboard position in the crew cab. To provide improved ride comfort, and maximize accessibility to the crew cab, the seat will be provided with 15.00" deep foam cushions, and the seat back will be provided with 0 degree fixed recline angle. To ensure safe operation, the seat 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. The seat back will be an SCBA back style. 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 around the occupant to firmly hold them in place in the event of a side roll. The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position. The seat will be moved approximately 3.00" inboard from the standard location.
0042359	Upholstery, Seats In Cab, All Vinyl, CARE	**SEAT UPHOLSTERY** All seat upholstery will be 46 ounce leather grain dark silver gray vinyl resistant to oil, grease and mildew. The cab will have five (5) seating positions.

0543991	Bracket, Air Bottle, Hands-Free II, Cab Seats	**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 four (4) SCBA brackets.
0603867	Seat Belt, ReadyReach	**SEAT BELTS** All seating positions in the cab, crew cab and tiller cab (if applicable) 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 NFPA 1901 and CAN/ULC - S515 standards. The 3-point shoulder type seat 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.
0604864	Seat Belt Height Adjustment, 5 Seats, Imp/Vel, Dash CF	**SHOULDER HARNESS HEIGHT ADJUSTMENT** All seating positions furnished with 3-point shoulder type seat belts will include a height adjustment. This adjustment will optimize the belts effectiveness and comfort for the seated firefighter. A total of five (5) seating positions will have the adjustable shoulder harness.
0602464	Helmet Storage, Provided by Fire Department, NFPA 2016	**HELMET STORAGE PROVIDED BY FIRE DEPARTMENT** NFPA 1901, 2016 edition, section 14.1.7.4.1 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.
0647647	Lights, Dome, FRP Dual LED 4 Lts	**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.
0631776	Not Required, Overhead Map Lights	
0602622	Portable Hand Light, Provided by Fire Department, Quint NFPA 2016 Classification	**PORTABLE HAND LIGHTS, PROVIDED BY FIRE DEPARTMENT** NFPA 1901, 2016 edition, section 9.9.4 requires two portable hand lights mounted in brackets fastened to the apparatus. The hand lights are not on the apparatus as manufactured. The fire department will provide and mount these hand lights.
0568369	Cab Instruments, Ivory Gauges, Chrome Bezels, Impel/Velocity 2010, Dash CF	**CAB INSTRUMENTATION** The cab instrument panel will consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel. The function of 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 directly forward of the driver. Gauge and switch panels will be designed to be removable for ease of service and low cost of ownership. **GAUGES** The gauge panel will include the following ten (10) ivory gauges with chrome bezels to monitor vehicle performance: **- Voltmeter gauge (Volts)** **Low volts (11.8 VDC)** **Amber indicator on gauge assembly with alarm** **High volts (15 VDC)** **Amber indicator on gauge assembly with alarm** **Very low volts (11.3 VDC)** **Amber indicator on gauge assembly with alarm** **Very high volts (16 VDC)** **Amber indicator on gauge assembly with alarm** **- Tachometer (RPM)** **- Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)** **- Fuel level gauge (Empty - Full in fractions)** **Low fuel (1/8 full)** **Amber indicator on gauge assembly with alarm** **Very low fuel (1/32) fuel** **Amber indicator on gauge assembly with alarm** **- Engine oil pressure gauge (PSI)** **Low oil pressure to activate engine warning lights and alarms** **Red indicator on gauge assembly with alarm**

- Front air pressure gauge (PSI)
Low air pressure to activate warning lights and alarm
Red indicator on gauge assembly with alarm
- Rear air pressure gauge (PSI)
Low air pressure to activate warning lights and alarm
Red indicator on gauge assembly with alarm
- Transmission oil temperature gauge (Fahrenheit)
High transmission oil temperature activates warning lights and alarm
Amber indicator on gauge assembly with alarm
- Engine coolant temperature gauge (Fahrenheit)
High engine temperature activates an engine warning light and alarm
Red indicator on gauge assembly with alarm
- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions)
Low fluid (1/8 full)
Amber indicator on gauge assembly with alarm
All gauges and gauge indicators will perform prove out at initial power-up to ensure proper performance.

INDICATOR LAMPS

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located above and below the center gauges. 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)
- SRS (supplemental restraint system) fault (where applicable)
- DEF (low diesel exhaust fluid level)
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

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.
Emergency master switch: A molded plastic push button switch with integral indicator lamp will be provided. Pressing the switch will activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.
Headlight / Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking lights and the headlights. The second switch position will activate the parking lights. The third switch position will activate the headlights.
Panel backlighting intensity control switch: A three (3)-position momentary rocker switch will be provided. The first switch position decreases the panel backlighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect the backlighting intensity. The third switch position increases the panel backlighting intensity to a maximum level as the switch is held.
The following standard controls will be integral to the gauge assembly and are located below the right hand gauges. All switches have backlit labels for low light applications.
High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp will be provided. The first switch position is the default switch position. The second switch position will activate and deactivate the high idle function when pressed and released. 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.
The following standard controls will be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches will have backlit labels for low light applications.
Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will deactivate vehicle ignition. The second switch position will activate vehicle ignition. The third momentary position will disable the Command Zone audible alarm if held for three (3) to five (5) seconds. A green indicator lamp will be activated with vehicle ignition.
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.
4-way hazard switch: A two (2)-position maintained rocker switch will be provided. The first switch position will deactivate the 4-way hazard switch function. The second switch position will activate the 4-way hazard function. The switch actuator will be red and includes the international 4-way hazard symbol.
Heater, defroster, and optional air conditioning control panel: A control panel with membrane switches will be provided to control heater/defroster temperature and heater, defroster, and air conditioning fan speeds. A green LED status bar will indicate the relative temperature and fan speed settings.
Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls will be provided. The 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.
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 overhead console on the driver's side, up to four (4) switch panels in the engine tunnel console facing the driver, up to four (4) switch panels in the overhead console on the officer's side and up to two (2) switch panels in the engine tunnel console facing the officer. All switches will have backlit labels for low light applications.
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
- SRS diagnostic port (where applicable)
- 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, 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.

0509511	Air Restriction Indicator, Imp/Vel, AXT, Dash CF, Enf MUX	**AIR RESTRICTION INDICATOR** A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm shall be provided.
0543751	Light, Do Not Move Apparatus	**"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.

0509042	Messages, Open Door/Do Not Move Truck, MUX w/Color Display	**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.
0611681	Switching, Cab, Membrane, Impel/Velocity/Quantum, Dash CF, AXT WiFi MUX	**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 appliqués. Documentation will be provided by the manufacturer indicating the rated cycle life of the switches. The switch panel(s) will be located in the overhead position above the windshield on the driver side overhead to allow for easy access. 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.
0555915	Wiper Control, 2-Speed with Intermittent, MUX, Impel/Velocity	**WIPER CONTROL** For simple operation and easy reach, the windshield wiper control will be an integral part of the directional light lever located on the steering column. The wiper control will include high and low wiper speed settings, a one (1)-speed intermittent wiper control and windshield washer switch. The control will have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use.
0669028	Hourmeter, Aerial Inside Cab, Deadman Switch	**HOURMETER - AERIAL DEVICE** An hour meter for the aerial device will be provided and located within the cab display or instrument panel. The hour meter will be activated only while the dead man switch is applied.
0002615	Switch, Aerial 12V Master	**AERIAL MASTER** There will be a master switch for the aerial operating electrical system provided.
0002617	PTO switch, w/light - aerial	**AERIAL PTO SWITCH** A PTO switch for the aerial with indicator light will be provided.
0548004	Wiring, Spare, 15 A 12V DC 1st	**SPARE CIRCUIT** There will be four (4) 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 behind officer seat, in EMS compartment(s) and in the center console Termination will be with heat shrinkable butt splicing Wires will be sized to 125 percent of the protection The circuit(s) may be load managed when the parking brake is set.
0615386	Vehicle Information Center, 7" Color Display, Touchscreen, MUX	**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 185 degrees Fahrenheit

An Optical Gel will be placed between the LCD and protective 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 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 indicate
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.

0606247 Vehicle Data Recorder w/CZ Display Seat Belt Monitor

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
Time - 24 Hour Time
Date - Year/Month/Day
Seat Belt Monitoring System
A seat belt monitoring system (SBMS) will be provided on the Command Zone™ color display. 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.

0791824		Intercom, Firecom 5100D Single Radio, 1 Wireless Base Station, (D,O,3C,Wired)	**INTERCOM SYSTEM** There will be digital, single radio interface, intercom located in reach of the officer to match job 28686 in the cab. The front panel will have master volume, and squelch controls with illuminated indicators, allowing for independent level setting of radio and auxiliary audio devices. There will be one (1) radio listen only / transmit control with select, monitor, receive, and transmit indicators. There will be one (1) auxiliary audio input with select, and receive indicators. There will be one (1) wireless base station for up to five (1-5) headset users provided. Wired headset jacks will be provided for the driver, officer, and three (3) crew positions located at three (3) forward facing seats. The wireless base station will have a 100' to 1100' range, line of sight. Objects between the transmitter and receiver affect range. The following Firecom components will be provided: One (1) 5100D Intercom One (1) WB505R wireless base station (1-5 wireless positions) Five (5) HM-10 Interior headset jacks All necessary power and station cabling
0006240		Cable, Radio to Intercom Interface, Firecom, 1 Radio	**RADIO / INTERCOM INTERFACE CABLE** The apparatus manufacturer will supply and install one (1) radio interface cable before delivery of the vehicle. The radio equipment to be used by the customer will be: Motorola High Power , Model number Motorola, Model APX 7500, high power.
0602376		Headset, Firecom, Wireless, UHW-505 Under Helmet, Radio Transmit	**WIRELESS UNDER HELMET, RADIO TRANSMIT ONLY HEADSET** There will be one (1) Firecom™, Model UHW-505, wireless under the helmet, radio transmit headset(s) provided. A heavy duty, coiled 12 volt charging pigtail with plug will be provided driver side EMS compartment. Each headset will feature: Noise cancelling electric microphone Flexible microphone boom Ear seals with 20 dB noise reduction Stereo Listen-Through Ear dome microphones Radio Push To Transmit button (Left or Right Side) Rechargeable battery operates for 24 hours on a full charge IP-66 when worn
0681384		Headset, Firecom, UH-52 Under Helmet, Intercom Only	**UNDER THE HELMET HEADSET, INTERCOM ONLY** There will be three (3) Firecom™, Model UH-52, under helmet, intercom only headset(s) provided driver's side inboard forward facing seat, passenger's side inboard forward facing seat and passenger's side outboard forward facing seat. Each headset will feature: Coiled cord with rugged angled plug Noise cancelling electric microphone Flex boom for left or right dress Adjustable volume control ComLeather ear seals with 24 dB noise reduction Intercom Push To Talk button
0681389		Headset, Firecom, UH-51 Under Helmet, Radio Transmit	**UNDER THE HELMET HEADSET, RADIO TRANSMIT** There will be two (2) Firecom™, Model UH-51, under helmet, radio transmit headset(s) provided driver's seat and officer seat. Each headset will feature: Coiled cord with rugged angled plug Noise cancelling electric microphone Flex boom rotates for left or right dress Adjustable volume control ComLeather ear seals with 24 dB noise reduction Radio Push To Transmit button. Mic is always live for intercom communication
0000000	STF	Install Customer Provided Two-Way Radio(s)	**TWO WAY RADIO INSTALLATION** There will be one (1) customer supplied two way radio(s) sent to the apparatus manufacturers preferred radio installer to be installed determined at service center per the shipping document. No antenna mount or whip will be included in this option. Specific radio shipping requirements will be followed.
0696439		Antenna Mount, Custom Chassis, Cable Routed to Instrument Panel Area	**RADIO ANTENNA MOUNT** There will be one (1) standard 1.125", 18 thread antenna-mounting base(s) installed 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.

0589496	Camera, Zone Defense, Driver Mux, Rear Camera Only	**REAR CAMERA VIDEO** A color rear view video camera will be located at the rear of the vehicle as close to center as possible. Zone Defense, Model CAM-313C, camera features include: Waterproof and weather resistant, IP69 Built in microphone 18 infrared emitters for 0 lux operation 120 degree lens 1/3 CCD The camera will be activated with the reverse signal. Images will be displayed in the cab on the driver's vehicle information center display. Audio from the active camera will be via an amplified speaker with volume control located behind the driver seat.
0511071	Guard, 4-Way, Rear Vision Camera	**VEHICLE CAMERA GUARD** There will be one (1) aluminum treadplate guard(s) fastened over the vehicle camera(s) located over camera centered .
0796440	Pierce Command Zone, Advanced Electronics & Control System, Velocity, Black WiFi	**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 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 re programmable to accommodate changes to the vehicle's operating parameters Complete operating and troubleshooting manuals USB connection to the main control module for advanced troubleshooting 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 -40C to +70C Storage temperature from -40C to +70C 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 16 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** Advanced on-board diagnostic messages will be provided to support rapid troubleshooting of the electrical power and control system. The diagnostic messages will be displayed on the information center located at the driver's position. 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 **TECH 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 provide a black external antenna connection 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 data logging 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 logger will provide up to 2 Gigabytes of data storage.
A USB connection will be provided on the Tech Module. It will provide a means to download data logger information and update software in the device.

PROGNOSTICS

A software based vehicle tool will be provided to predict remaining life of the vehicles critical fluid and events.
The system will send automatic indications to the Command Zone, color display and/or wireless enabled device to proactively alert of upcoming service intervals.
Prognostics will include:
Engine oil and filter
Transmission oil and filter
Pump oil (if equipped)
Foam oil (if equipped)
Aerial oil and filter (if equipped)

ADVANCED DIAGNOSTICS

An advanced, Windows-based, diagnostic software program will be provided for this control system. The software will provide troubleshooting tools to service technicians equipped with a Windows-based computer or wireless enabled device.
The service and maintenance software will be easy to understand and use and have the ability to view system input/output (I/O) information.

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.

ENHANCED SOFTWARE

The solid-state control system will include the following software enhancements:
All perimeter lights and scene lights (where applicable) will be deactivated when the parking brake is released.
Cab and crew cab dome lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.
Cab and crew cab perimeter lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

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.
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.

0624254	Electrical System, Velocity	**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: 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. 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. 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. 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). All lights that have their sockets in a weather exposed area will have corrosion preventative compound added to the socket terminal area. All electrical terminals in exposed areas will have silicon (1890) 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.
0079211	Batteries, (6) Exide Grp 31, 950 CCA each, Threaded Stud	**BATTERY SYSTEM** There will be six (6) 12 volt Exide®, Model 31S950X3W, batteries that include the following features will be provided: 950 CCA, cold cranking amps 190 amp reserve capacity High cycle Group 31 Rating of 5700 CCA at 0 degrees Fahrenheit -140 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.
0008621	Battery System, Single Start, All Custom Chassis	**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.
0123174	Battery Compartment, Imp/Vel	**BATTERY COMPARTMENTS** The batteries will be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments will be constructed of 3/16" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The compartments will include formed fit heavy-duty roto-molded polyethylene battery tray inserts with drains on each side of the frame rails. The batteries will be mounted inside of the roto-molded trays. **JUMPER STUDS** One (1) set of battery jumper studs with plastic color-coded covers will be installed on the battery box on the driver's side. This will allow enough room for easy jumper cable access.

0531338	Charger, Sngl Sys, Kussmaul, Pump Plus 1200, 52-21-1100	**BATTERY CHARGER/ AIR COMPRESSOR** There will be a Kussmaul™ Pump Plus 1200, Model # 52-21-1100, single output battery charger/air compressor system will be provided. A display bar graph indicating the state of charge will be included. The automatic charger will maintain one (1) set of batteries with a maximum output current of 40 amps. The 12-volt air compressor will be installed to maintain the air system pressure when the vehicle is not in use. There will be an auto pump timer installed between the pressure switch and the pump that will allow the pump to run for one hour than shut down for one hour. The battery charger will be wired to the AC shoreline inlet through an AC receptacle adjacent to this battery charger.
0598091	Location, Charger/Compr, Behind Driver's Seat, Vel/Imp/DCF	Battery charger/compressor will be located behind the driver's seat.
0531403	Location, Bat Chrg Ind, Driver's Seat with Bracket	The battery charger indicator will be located near the driver's seat riser with special bracketry.
0016857	Shoreline, 20A 120V, Kussmaul Auto Eject, 091-55-20-120, Super	**AUTO EJECT FOR SHORELINE** There will be two (2) 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 battery and other for dometic AC and cab receptacles. 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 Ratting (amps) Phase Frequency
0026800	Shoreline Location	The shoreline receptacle will be located on the driver side of cab, to the front of cab door.
0783395	Transfer Switch, Generator to Shoreline 30 Amp and Under	**GENERATOR TO SHORELINE TRANSFER SWITCH** There will be an automatic transfer switch between the onboard generator and the shoreline inlet. The loads connected to the transfer switch will be power from the onboard generator when the generator is running.
0647728	Alternator, 430 amp, Delco Remy 55SI	**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.

0092582	Load Manager/Sequencer, MUX	**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)
0783153	Headlights, Rect LED, JW Spkr Evo 2, AXT/DCF/Enf/Imp/Sab/Vel	**HEADLIGHTS** There will be four (4) JW Speaker®, rectangular LED lights mounted in the front quad style, chrome housing on each side of the cab grille: the outside light on each side will contain a part number 055***1 low beam module the inside light on each side will contain a part number 055***1 high beam module the headlight to include chrome bezels The low beam lights will be activated when the headlight switch is on. The high beam and low beam lights will be activated when the headlight switch and the high beam switch is activated.
0648425	Light, Directional, Wln 600 Cmb, Cab Crn, Imp/Vel/AXT/Qtm/DCF	**DIRECTIONAL LIGHTS** There will be two (2) Whelen 600® series, LED combination directional/marker lights provided. The lights will be located on the outside cab corners, next to the headlights. The color of the lenses will be the same color as the LED's.
0620054	Light, Directional/Marker, Intermediate, Weldon 9186-8580-29 LED 2lts	**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.
0648074	Lights, Clearance/Marker/ID, Front, P25 LED 7 Lts	**CAB CLEARANCE/MARKER/ID LIGHTS** There will be seven (7) amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations: 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. Two (2) amber LED marker lights will be installed, one (1) on each side above the cab doors.

0511569	Lights, Clearance/Marker/ID, Rear, P25 LED 7Lts	**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.
0602938	Light, Marker End Outline, Rubber Arm, LED Marker Lamp, Rear Body	**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.
0564683	Lights, Tail, Wln M6BTT* Red LED Stop/Tail & M6T* Amber LED Dir Arw For Hsg	**REAR FMVSS LIGHTING** The rear stop/tail and directional LED lighting will consist of the following: Two (2) Whelen®, Model M6BTT, red LED stop/tail lights Two (2) Whelen, Model M6T, amber LED arrow turn lights The lights shall be provided with color lenses. The lights will be mounted in a polished combination housing.
0561471	Lights, Backup, Wln M6BUW, LED, For Tail Lt Housing	There will be two (2) Whelen Model M6BUW, LED backup lights provided in the tail light housing.
0664481	Bracket, License Plate & Light, P25 LED	**LICENSE PLATE BRACKET** There will be one (1) license plate bracket mounted on the rear of the body. A white LED light will illuminate the license plate. A polished stainless steel light shield will be provided over the light that will direct illumination downward, preventing white light to the rear.
0556842	Bezels, Wln, (2) M6 Chrome Pierce, For mtg (4) Wln M6 lights	**LIGHTING BEZEL** There will be two (2) Whelen, Model M6FCV4P, four (4) place chromed ABS housings with Pierce logos provided for the rear M6 series stop/tail, directional, back up, scene lights or warning lights.
0589905	Alarm, Back-up Warning, PRECO 1040	**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.
0769569	Lights, Perimeter Cab, Amdor AY-LB-12HW012 LED 4Dr	**CAB PERIMETER SCENE LIGHTS** There will be four (4) Amdor, Model AY-LB-12HW012, 190 lumens each, 12.00" white LED strip lights provided. 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 lights will be activated when the battery switch is on and the respective door is open and whenever control has been selected for the body perimeter lights.

0769553	Lights, Perimeter Pump House, Amdor AY-LB-12HW012 LED 1lt	**PUMP HOUSE PERIMETER LIGHTS** There will be one (1) Amdor, Model AY-LB-12HW012, 190 lumens each, 12.00" LED weatherproof strip lights with brackets provided under the passenger's side pump panel running boards. The light shall be activated when the battery switch is on, and controlled by the same means as the body perimeter lights.
0768498	Lights, Perimeter Body, Amdor AY-LB-12HW020 LED 1lt, Turntable Access	**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.
0554198	Lights, Step, P25 LED, Aerial With Pump 2Lts, Pump Pnl Sw	**STEP LIGHTS** Two (2) white LED step lights will be provided, one (1) on each side of the front body. In order to ensure exceptional illumination, each light shall 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 actuated with the pump panel light switch. All other steps on the apparatus will be illuminated per the current edition of NFPA 1901.
0629191	Light, FRC, 12V SPA260-Q20* LED MAX, Surface Mount 2nd	**12 VOLT LIGHTING** There will be one (1) Fire Research Spectra Max, Model SPA260-Q20, 12 volt LED surface mounted scene light(s) with white bezel(s) provided PS crew cab. The light(s) will be controlled in the following way: a switch at the driver's side switch panel a switch at the passenger's side switch panel no additional switch location no additional switch location The light(s) may be load managed when the parking brake is applied.
0629192	Light, FRC, 12V SPA260-Q20* LED MAX, Surface Mount 1st	**12 VOLT LIGHTING** There will be one (1) Fire Research Spectra Max, Model SPA260-Q20, 12 volt LED surface mounted scene light(s) with white bezel(s) provided DS crew cab . The light(s) will be controlled in the following way: a switch at the driver's side switch panel a switch at the passenger's side switch panel no additional switch location no additional switch location The light(s) may be load managed when the parking brake is applied.
0629418	Light, FRC, 12V SPA570-Q28* LED MAX, Fixed Top Mount 2nd	**12 VOLT LIGHTING** There will be one (1) Fire Research Spectra Max, Model SPA570-Q28, 12 volt DC LED floodlight (s) with a fixed top mount pedestals provided and located, at the transition from body to turntable compartments DS. The painted parts of this light assembly to be white with a white bezel. The light(s) will be controlled in the following way: from the driver's side cab scene light option control no additional switch location no additional switch location no additional switch location These lights may be load managed when the parking brake is applied.
0629421	Light, FRC, 12V SPA570-Q28* LED MAX, Fixed Top Mount 1st	**12 VOLT LIGHTING** There will be one (1) Fire Research Spectra Max, Model SPA570-Q28, 12 volt DC LED floodlight (s) with a fixed top mount pedestals provided and located, at the transition from body to turntable compartments PS. The painted parts of this light assembly to be white with a white bezel. The light(s) will be controlled in the following way: from the passenger's side cab scene light option control no additional switch location no additional switch location no additional switch location These lights may be load managed when the parking brake is applied.
0618301	Light, Visor, FRC, 12V SPA851-Q15-*, LED 1st	**12 VOLT LIGHTING** There will be two (2) Fire Research, Model SPA851-Q15-*, 12 volt LED floodlight(s) provided on the front visor, one (1) on the driver's side and one (1) on the passenger's side with 15 degree outward bracket. The painted parts of this light assembly to be black with a chrome bezel. The light(s) will be controlled in the following way: a switch at the driver's side switch panel a switch at the passenger's side switch panel no additional switch location These lights may be load managed when the parking brake is applied.

0657535	Lights, Work, (2) Wln PELCC LED, w/Alternative Hose Bed Lights	**REAR WORK LIGHTS** There will be one (1) pair of Whelen, Model PELCC, white 12 volt DC LED scene lights installed at the rear of the body to the outside of the rear compartment. The lights will be directed down ward by a 40 degree angle and mounted with a chrome flange. The lights will be controlled by a control from a switch at the rear of the truck and a switch located at the driver side switch panel.
0645877	Lights, Hose Bed, Sides, Dual LED Light Strips	**HOSE BED LIGHTS** There will be white 12 volt DC LED light strips with stainless steel protective cover, provided to light the hose bed area. Hose Bed lights will meet the photometric levels listed in NFPA 1901 for Hose Bed lighting requirements. Light strip(s) will be installed along the upper edge of the left side of the hose bed. Light strip(s) will be installed along the upper edge of the right side of the hose bed. The lights will be activated by a cup switch at the rear of the apparatus no more than 62.00" from the ground.
0645677	Lights, Not Required, Rear Work, Alt. 12 Volt Lights At Rear Body	
0709438	Light, Walking Surf, FRP Flood, LED	**WALKING SURFACE LIGHT** There will be Model FRP, 4" round black 12 volt DC LED floodlight with bolt mount provided to illuminate the entire designated walking surface on top of the body. The light will be activated when the body step lights are on.
0624713	Aerial, HD Ladder 107' ASL Single, Quint, Alum Body	
0554271	Body Skirt Height, 20"	
0601008	Tank, Water, 500 Gallon, Poly, Ascendant Single Axle	**WATER TANK** The water tank will have a capacity of 500 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 current NFPA 1901 requirements. 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 0.38" polypropylene plastic and extend from the bottom of the tank through the top cover to allow positive welding. The transverse partitions extend from 4.00" 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 0.50" polypropylene. It will be recessed 0.38" 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 (0.50" 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, 0.50" 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.
0003405	Overflow, 4.00" Water Tank, Poly	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.
0028104	Foam Cell Required	
0003429	Not Required, Direct Tank Fill	

0624711	Hose Bed, Alum, LS/RS, Ascendant Single Axle	**HOSE BED** The hose bed will be fabricated of 0.125" 5052-H32 aluminum with a tensile strength range of 31,000 to 38,000 psi. The sides of the hose bed will not form any portion of the fender compartments. The upper and rear edges of the hose bed side panels will have a double break for rigidity. The hose bed will be located ahead of the ladder turntable. There will be a hose chute to the side and rear of the hose bed on both the left and right side to allow for payout/removal of the hose. The hose bed flooring will consist of removable aluminum grating with a top surface that is perforated to aid in hose aeration.
0003492	Hose Bed Capacity, Special Amount, Ascendant, PAP, PAL	Hose capacity will be a minimum of 600' of 5" PS and 400' of 2.5" on DS.
0578797	Divider, Fixed, In Hose Bed, Left Side, 75' HAL, Ascendant Single Axle	**FIXED DIVIDER IN HOSE BED** A fixed divider will be provided in the hose bed. The divider will run from the front of the water tank grating to the rear on the left side of the water tank. This divider will be gusseted to the tank grating at the front and rear for strength.
0604069	Hose Restraint, Two (2) Hose Beds, Aerial, Front Strap, 1" Heavy Nylon Web Rear	**AERIAL HOSE BED HOSE RESTRAINT** The hose in the hose beds will be restrained by black nylon Velcro® straps at the top of the hose bed and 1.00" black nylon web design with a 2.00" box pattern at the rear of the hose beds. The Velcro strap will be installed to the top of the hose bed side sheets. The rear webbing will have 1.00" web straps that loop through footman loops and fasten with spring clip and hook fasteners.
0003512	Running Boards, Ascendant, PAL	**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.
0601894	Turntable Steps-Morton Cass, Swing-Down, LS Only, Non-TCO, Ascendant SA	**TURNTABLE STEPS** Access to the turntable will be provided by a set of swing-down steps on the left side of the truck. The access steps will be located rearward of the compartmentation. All steps will have a height no greater than 14.00" from top surface to top surface. The swing down step mechanism will be constructed of brushed aluminum with bright aluminum steps with Morton Cass inserts. The stepwell will be lined with bright aluminum treadplate to act as scuffplates. A handrail will be provided on each side of the access steps. Holes will be provided in each side step plate for hand holds. The bottom step will have a step height not exceeding 24.00" from the ground to the top surface of the step at any time. The steps will be connected to the "Do Not Move Truck" indicator in the cab.
0554001	Lights, Step (3), P25 LED, Swing Down Access Steps, One Side	**STEP LIGHTS** There will be three (3) white LED step lights provided for the aerial turntable access steps. In order to ensure exceptional illumination, each light shall 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 actuated by the aerial master switch in the cab.
0690023	Wall, Rear, Smooth Aluminum	**SMOOTH ALUMINUM REAR WALL** The rear wall will be smooth aluminum.
0074515	Tow Eyes (2), Ascendant 100' Aerial Tower, Ascendant Single Axle, 75' HAL	**TOW EYES** Two (2) rear painted tow eyes will be located at the rear of the apparatus and will be mounted directly to the frame rails. The inner and outer edges of the tow eyes will be radiused.

0624701	Construction, Compt, Alum, 3rd Gen, Ascendant Single Axle	**COMPARTMENTATION** Compartmentation will be fabricated of 0.125" 5052 aluminum. Side compartments will be an integral assembly with the rear fenders. Circular fender liners will be provided. For prevention of rust pockets and ease of maintenance, the fender liners will be formed from aluminum and removable for maintenance. Compartment flooring will be of the sweep out design with the floor higher than the compartment door lip. Drip protection will be provided above the doors by means of bright aluminum extrusion, formed bright aluminum treadplate or polished stainless steel. The top of the compartment will be covered with bright aluminum treadplate rolled over the edges on the front, rear and outward side. These covers will have the corners welded. Side compartment covers will be separate from the compartment tops. All screws and bolts, which are not Grade 8, will be stainless steel and where they protrude into a compartment will have acorn nuts on the ends to prevent injury. **UNDERBODY SUPPORT SYSTEM** The backbone of the body support system will begin with the aerial torque box which is the strongest component of the apparatus and is designed for sustaining maximum loads. An aluminum body structure will be mounted to the aerial torque box at three (3) points to create a floating substructure which will result in an 800 lb equipment support rating per lower compartment and provide up to 0.31" accumulative floor thickness. The three (3) point body mounting system will consist of two (2) points in the front and one (1) in the rear. The front mounts will attach to the top of the stabilizer H-box, and the rear mount will attach to the rear of the torque box at the chassis centerline. The body structure will be mounted with neoprene elastomer isolators. These isolators will have a broad load range, proven viability in vehicular applications, be of a fail-safe design and allow for all necessary movement in three (3) transitional and rotational modes. The combination of the three (3) point mounting system and elastomer isolators allow the chassis and torque box to flex without driving loads into the body. **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 be vented to provide one (1) way airflow out of the compartment that prevents water and dirt from gaining access to the compartment. **TESTING OF BODY DESIGN** Body structural analysis will be fully tested. Proven engineering and test techniques such as finite element analysis, model analysis, and strain gauging have been performed with special attention given to fatigue, life and structural integrity of the body and substructure. The body will be tested while loaded to its greatest in-service weight. The criteria used during the testing procedure will include: - Raising opposite corners of the vehicle tires 9.00" to simulate the twisting a truck may experience when driving over a curb. - Making a 90 degree turn, while driving at 20 mph to simulate aggressive driving conditions. - Driving the vehicle on at 35 mph on a washboard road. - Driving the vehicle at 55 mph on a smooth road. - Accelerating the vehicle fully, until reaching the approximate speed of 45 mph on rough pavement. Evidence of the actual testing techniques will be made available upon request.
0610141	Compt, LS F/H, Lap Drs, Ascendant Single Axle	**LEFT SIDE COMPARTMENTATION** The full height double lap door compartment ahead of the rear wheels will be 39.19" wide x 63.00" high x 26.00" deep inside the lower 25.50" and 12.00" deep inside the upper portion with a clear door opening of 36.44" wide x 56.00" high. There will be one (1) lift-up door compartment above the wheelwell and stabilizer. The compartment will be 83.88" wide x 25.25" high x 12.00" deep inside with a clear door opening of 81.12" wide x 22.25" high.
0614991	Compt, LS Turntable, F/H, Lap Dr, Ascendant Single Axle	The full height double door compartment behind the rear wheel will be 45.12" wide x 57.00" high x 26.00" deep inside the lower 25.50" and 12.00" deep in the upper portion with a clear door opening of 43.38" wide x 50.00" high.
0023672	Compt, IPO Stairs, Not Required, LS	
0610140	Compt, RS F/H, Lap Drs, Ascendant Single Axle	**RIGHT SIDE COMPARTMENTATION** The full height double lap door compartment ahead of the rear wheels will be 39.19" wide x 63.00" high x 26.00" deep inside the lower 25.50" and 12.00" deep inside the upper portion with a clear door opening of 36.44" wide x 56.00" high. There will be one (1) lift-up door compartment above the wheelwell and stabilizer. The compartment will be 83.88" wide x 25.25" high x 12.00" deep inside with a clear door opening of 81.12" wide x 22.25" high.
0614988	Compt, RS Turntable, F/H, Lap Dr, Ascendant Single Axle	The full height double door compartment behind the rear wheel will be 45.12" wide x 57.00" high x 26.00" deep inside the lower 25.50" and 12.00" deep in the upper portion with a clear door opening of 43.38" wide x 50.00" high.

0607982	Compt, IPO Stairs RS, Lap Door, Ascendant Single Axle	**RIGHT SIDE COMPARTMENT IN PLACE OF TURNTABLE STEPS** There will be a single door compartment in place of turntable stairs that is 20.88" wide x 57.00" high x 13.50" deep inside with a clear door opening of 19.12" wide x 50.00" high.
0615264	Compt, Rear, Gortite Rollup Door, Narrow, Ascendant Single Axle	**REAR COMPARTMENT** A compartment will be provided at the rear of the unit. Compartment will be 27.75" wide x 35.00" high x 26.25" deep with a clear door opening of 25.00" wide x 29.50" high. The compartment will be furnished with a satin finish roll-up door.
0666824	Doors, Lap w/"D" Handle, Aluminum, Side Compartments	**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.
0624690	Bumper, Rear, Aluminum Rub Rail, Ascendant Single Axle	**REAR BUMPER** An aluminum rub rail will be provided at the rear of the unit. It will extend the full width of the body.
0603083	Lights, Compt,Pierce LED,Dual Light Strips,Each Side Dr,Ascend TA,75'HAL,PAP,HDL	**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.
0687145	Shelf Tracks, Recessed, PUC/3rd Generation	**MOUNTING TRACKS** There will be recessed tracks installed vertically to support the adjustable shelf(s). Tracks will not protrude into any compartment in order to provide the greatest compartment space and widest shelves possible. The tracks will be provided in each compartment except for the one that contains the pump operator's panel.
0600289	Shelves, Adj, 500 lb Capacity, Full Width/Depth, Predefined Locations, Aerial	**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.
0603179	Tray, Floor Mounted, Slide-Out, 500lb, 2.00" Sides, 3G, Ascendant Single Axle	**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 250lb 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 50lb 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 RS1, RS3, LS1 and LS3.

0650435	Toolboard, Swing-Out, Alum, .188", No Holes, 3G	**SWING OUT TOOLBOARD** A swing out aluminum toolboard will be provided. It will be a minimum of .188" thick with a 1.00" x 1.00" aluminum tube frame welded around the edge. The board will be mounted on a pivoting device at the front of the compartment on the top and bottom to allow easy movement in and out of the compartment. The maximum tool load will be 400 pounds. The board will have positive lock in the stowed and extended position. The board will be mounted on adjustable tracks from front to back within the compartment. There will be One (1) toolboard(s) provided. The toolboard(s) will be spatter gray painted and installed LS2 over wheel.
0061917	Rub Rail, Aluminum Extruded, 3.12", Side of Body	**RUB RAIL** Bottom edge of the side compartments will be trimmed with a bright aluminum extruded rub rail. Trim will be 3.12" high with 1.50" 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.
0565606	Fender Crowns, Rear, S/S, w/Removable Fender Liner, Aerial, 3rd Gen	**BODY FENDER CROWNS** Polished stainless steel fender crowns will be provided around the rear wheel openings. An unpainted fender liner will be provided to avoid paint chipping. The liners will be removable to aid in the maintenance of rear suspension components. A dielectric barrier will be provided between the fender crown fasteners (screws) and the fender sheet metal to prevent corrosion. The fender crowns will be held in place with stainless steel screws that thread directly into a composite nut and not directly into the parent body sheet metal to eliminate dissimilar metals contact and greatly reduce the chance for corrosion.
0519849	Not Required, Hose, Hard Suction	**HARD SUCTION HOSE** Hard suction hose will not be required.
0626229	Handrails, Side Pump Panels, Per Print	**HANDRAILS** The handrails will be 1.25" diameter anodized aluminum extrusion, with a ribbed design, 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 NFPA 1901 section 15.8 requirements. The handrails will be installed as noted on the sales drawing.
0074030	Compt, Air Bottle, Dbl, in Fender Panel, Alum, 3rd Gen.	**AIR BOTTLE STORAGE** A total of three (3) air bottle compartments will be provided and located on the left side ahead of the rear wheel, on the right side ahead of the rear wheel and on the right side behind the rear wheel. The air bottle compartment will be a minimum of 15.00" wide x 7.50" tall x 26.00" deep. A polished stainless steel door with a chrome plated flush lift & turn 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.
0004225	Ladder, 24' Duo-Safety 900A 2-Section	**EXTENSION LADDER** There will be a 24' two-section aluminum Duo-Safety Series 900-A extension ladder provided.
0084222	Extension Ladder, Not Required	
0595251	Ladder, 16' Duo-Safety 875-DR Roof, Hooks Both Ends	**ROOF LADDER** There will be one (1) 16' aluminum, Duo-Safety, Series 875-DR roof ladder(s) provided. The ladder(s) will have hooks on both ends.
0542436	Ladder, 16' Duo-Safety 875-DR Roof	**ADDED ROOF LADDER** There will be one (1) 16' roof, aluminum, Series 875-A-DR provided.
0024233	Not Required, Attic Extension Ladder	
0600819	Ladder, 10' Duo-Safety Folding, 585A, Ascendant Single Axle, 75' HAL	**AERIAL FOLDING LADDER** There will be one (1) 10' aluminum Duo-Safety Series 585-A folding ladder(s) provided and located in the ladder storage compartment.

0624687		Ladders Stored at Rear, Ascendant Single Axle, Smooth Aluminum Doors	**GROUND LADDER STORAGE** Ladder tunnels will be provided at the rear of the apparatus on either side of the turntable. Tunnels will be capable of holding up to two (2) two-section pumper style ladders on each side not in excess of 22.00" wide or 5-13/16" in thickness. The ladders will be held captive top and bottom by stainless steel tracks. A polyethylene wear plate will be provided to prevent ladders from being scuffed by contacting metal parts. The plate will be mounted to the bottom of the entrance area of the ladder tunnels. All ladders will be removable individually without having to remove any other ladder. A Velcro® strap will be provided to help contain the ladders. A smooth aluminum door will be provided on each ladder tunnel.
0600674		Lights, Torque Box Ladder Storage, Not Required, Ascendant Single, 75' HAL	
0653539		Ladder, Little Giant, Revolution XE - Model 22, 12022	**ADDITIONAL FOLDING LADDER** One (1) Revolution XE Model 12022 Little Giant folding ladder will be provided. The stored dimensions will be 67.00" high x 26.50" wide x 9.25" deep. The weight will be 38lb. The ladder will be located in the ladder storage area where fits best.
0640426	SP	Tray, Poly, Additional Hose Storage In Torque Box	**HOSE STORAGE** Provisions will be made for a poly tray inside the torque box. The tray will be sized to hold 100' of 1.75" hose no more than 7' 6" long in total length for the bundle as a high rise pack hose. Three (3) hand holds will be provided on each side. There will be 0.75" drain holes provided in the bottom of the tray. The forward end of the tray will be closed off with a poly end cap. The rearward end of the tray will remain open. Structure will be provided in the torque box to support the tray and to allow it to be slide in or out similar to a speedlay.
0008911		Pike Pole, 12' Fire Hooks Unlimited, Fiberglass, APH-12, Gas Shut Off	**PIKE POLES** There will be one (1) Fire Hooks Unlimited, Model APH-12, 12' pike pole(s) with fiberglass handles provided. The pike pole(s) will be located ladder storage area.
0009048		Pike Pole, 8' Fire Hooks Unlimited, Fiberglass, APH-8', Gas Shut Off	**8' PIKE POLE** There will be one (1) Fire Hooks Unlimited APH-8, 8' pike pole(s) with fiberglass handles and gas shut off end provided ladder storage area.
0552649		Pike Pole, 6' Fire Hooks Unlimited, New York Roof Hook, Steel, Pry End, RH-6	**6 FT PIKE POLE** There will be two (2) Fire Hooks Unlimited NY roof hook RH-6, 6 foot pike pole(s) with steel handles and pry end provided one each side rear of cab.
0638907		Pike Pole, 3', Quint, Provided by Fire Department, NFPA	**PIKE POLE PROVIDED BY FIRE DEPARTMENT** There will be one (1) 3' pike pole(s) provided by the fire department. The pike pole(s) will be a Duo-Safety 3' Pike Pole.
0770578		Pike Pole Tubes, in Torque Box/Ladder Storage, ABS	**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 three (3) pike poles. If the head of a pike pole can come into contact with a painted surface, a stainless steel scuffplate will be provided.
0024388		No Steps Required, Front Of Body	

0014456	Pump, Hale, QMAX-200, 2000 GPM, Single Stage	**MIDSHIP FIRE PUMP** Midship fire pump will be a Hale QMAX-200, 2000 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 NFPA 1901 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.
0014482	Seal, Mechanical, Hale	**MECHANICAL SEAL ON PUMP** Only one (1) mechanical seal will be used on the suction (inboard) side of the pump. The mechanical seal will be 2.00" in diameter and will be spring loaded, maintenance-free, and self-adjusting. The mechanical seal construction will be a carbon sealing ring, stainless steel coil spring, Viton® rubber boot, and a tungsten carbide seat with a Teflon backup seal.
0014477	Trans, Pump, Hale, Gear	**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.
0635600	Pumping Mode, Stationary Only	**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.

0604324	Pump Shift, Air w/Manual Override, Split Shaft, Interlocked, Hale	**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. A manual back-up shift control will also be located on the left side pump panel. 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". Another green indicator light will be installed adjacent to the hand throttle on the pump panel and indicate either the pump is engaged and the road transmission is in pump gear, or the road transmission is in neutral and the pump is not engaged. This light will be labeled "Warning: Do not open throttle unless light is on". 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.
0003148	Transmission Lock-up, EVS	**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.
0004547	Auxiliary Cooling System	**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 cylindrical type and will be a separate unit. The heat exchanger will be installed in the pump or engine compartment with the control located on the pump operator's control panel. Exchanger will be plumbed to the master drain valve.
0014486	Not Required, Transfer Valve, Stage Pump	
0783096	Valve, Relief Intake, Trident Air Max, Control at Operator Panel	**INTAKE RELIEF VALVE** A Trident Air Max intake relief valve will be installed on the suction side of the pump preset at 125 PSI. The relief valve will have a working range of 50 PSI to 350 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. An adjustable air regulator and pressure indicating gauge will be located at the pump operator's panel on a common bezel.
0794959	Controller, Pressure, Pierce, Pump Boss, PBA300	**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.
0072153	Primer, Trident, Air Prime, Air Operated	**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 NFPA 1901. 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.
0780364	Manuals, Pump, (2) Total, Electronic Copies	**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.
0602512	Plumbing, Stainless Steel and Hose, Single Stage Pump, Control Zone	**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.
0795135	Plumbing, Stainless Steel, w/Foam System	**PLUMBING, FOAM SYSTEM** All piping that is in contact with the foam concentrate or foam/water solution will be stainless steel. The fittings will be stainless steel or brass. Cast iron pump manifolds will be allowed.

0004645	Inlets, 6.00" - 1250 GPM or Larger Pump	**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.
0004646	Cap, Main Pump Inlet, Long Handle, NST, VLH	**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.
0084610	Valves, Akron 8000 series- All	**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.
0004660	Inlet, Left Side, 2.50"	**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.
0029147	Not Required, Inlet, Right Side	
0016158	Valve, Inlet(s) Recessed, Side Cntrl, "Control Zone"	The location of the valve for the one (1) inlet will be recessed behind the pump panel.
0004700	Control, Inlet, at Valve	**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.
0092569	No Rear Inlet (Large Dia) Requested	
0092696	Not Required, Cap, Rear Inlet	
0064116	No Rear Inlet Actuation Required	
0009648	No Rear Intake Relief Valve Required on Rear Inlet	
0092568	No Rear Auxiliary Inlet Requested	
0563738	Valve, .75" Bleeder, Aux. Side Inlet, Swing Handle	**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 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.
0029043	Tank to Pump, (1) 3.00" Valve, 3.00" Plumbing	**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.
0004905	Outlet, Tank Fill, 1.50"	**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.
0004940	Outlet, Left Side, 2.50"	**LEFT SIDE DISCHARGE OUTLETS** There will be one (1) discharge outlet with a 2.50" valve on the left side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter.

0092570	Not Required, Outlets, Left Side Additional	
0004945	Outlet, Right Side, 2.50"	**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.
0092571	Not Required, Outlets, Right Side Additional	
0005047	Outlet, 4" w/4" Right, Handwheel	**LARGE DIAMETER DISCHARGE OUTLET** There will be a 4.00" discharge outlet with a 4.00" Akron valve installed on the right side of the apparatus, terminating with a 4.00" (M) National Standard hose thread adapter. This discharge outlet will be actuated with a handwheel control at the pump operator's control panel. An indicator will be provided to show when the valve is in the closed position.
0648906	Outlet, Front, 2.50" w/2.50" Plumbing	**FRONT DISCHARGE OUTLET** There will be one (1) 2.50" discharge outlet piped to the front of the apparatus and located on the top of the right side of the front bumper. Plumbing will consist of 2.50" piping and flexible hose with a 2.50" full flow valve with control at the pump operator's panel. A fabricated weldment made of stainless steel pipe will be used in the plumbing where appropriate. The piping will terminate with a 2.50" NST with 90 degree stainless steel swivel. There will be automatic drains provided at all low points of the piping.
0092575	Not Required, Outlet, Rear	
0092574	Not Required, Outlet, Rear, Additional	
0092573	Not Required, Outlet, Hose Bed/Running Board Tray	
0085076	Caps for 1.50" to 3.00" Discharge, VLH	**DISCHARGE CAPS** Chrome plated, rocker lug, caps with chains will be furnished for all side discharge outlets. The caps will be the Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.
0563739	Valve, 0.75" Bleeder, Discharges, Swing Handle	**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 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 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.
0005091	Elbow, Left Side Outlets, 45 Degree, 2.50" FNST x 2.50" MNST, VLH	**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.
0035094	Not Required, Elbow, Left Side Outlets, Additional	
0025091	Elbow, Right Side Outlets, 45 Degree, 2.50" FNST x 2.50" MNST, VLH	**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.
0089584	Not Required, Elbow, Right Side Outlets, Additional	

0045099	Not Required, Elbow, Rear Outlets	
0085695	Not Required, Elbow, Rear Outlets, Large, Additional	
0005097	Elbow, Large Dia Outlet, 30 Deg, 4.00" FNST x 5.00" Storz	**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.
0062133	Control, Outlets, Manual, Pierce HW if applicable	**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.
0029106	Not Required, Deluge Outlet	
0029302	No Monitor Requested	
0029304	No Nozzle Req'd	
0029107	No Deluge Mount	
0047583	Waterway Outlet & Control, 4" Akron, Handwheel	**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.
0029167	Crosslays Sngl Sheet Unpainted, (2+) 1.50", Std. Cap	**CROSSLAY HOSE BEDS** Two (2) crosslays with 1.50" outlets will be provided. Each bed to be capable of carrying 200' of 1.75" double jacketed hose and will be plumbed with 2.00" i.d. pipe and gated with a 2.00" quarter turn ball valve. Outlets 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 controls will be at the pump operator's panel. The center crosslay dividers will be fabricated of 0.25" aluminum and will provide adjustment from side to side. The divider will be unpainted with a brushed finish. 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.
0090442	Crosslays Sngl Sheet Unpainted, (1) 2.50" Std Cap	**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. The center crosslay dividers will be fabricated of 0.25" 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.
0029260	Not Required, Speedlays	
0590942	Hose Restraint, Crosslay/Deadlay, 1" Heavy Nylon Web, Strap Fasteners, Each Side	**CROSSLAY/DEADLAY HOSE RESTRAINT** A black 1.00" nylon webbing design with 2.00" box pattern will be provided across each end of three (3) crosslay/deadlay(s) to secure the hose during travel. The webbing will be permanently attached at the front of the crosslay/deadlay opening(s). 1.00" web straps will loop through footman loops located at the opposite end of the permanently attached webbing. The straps will attach with a pair of spring clip and hook fasteners.

0075206	Cover, Crosslay, Bi-fold 3\16" Alum Treadplate	**CROSSLAY COVER** A bi-fold .19" aluminum treadplate cover will be installed over the crosslay hose beds. It will include a latch at each end of the cover to hold it securely in place, a chrome grab handle at each end for opening and closing the cover and a foam rubber gasket where the cover comes into contact to a painted surface.
0019853	Crosslays, 8.00" Lower Than Standard - Control Zone w/9.00" Raised PH	**CROSSLAY 8.00" LOWER THAN STANDARD** The crosslays will be lowered 8.00" from standard.
0025299	Crosslays, Unpainted, D/A Finish	**CROSSLAYS UNPAINTED** The walls of the crosslays and the crosslay divider will be unpainted with a DA finish.
0007827	Foam Sys, FoamPro 2002 (Single Agent)	**FOAM CONCENTRATE PROPORTIONING SYSTEM** A Hypro FoamPro®, Model 2002, foam system will be provided as the means for the proportioning of foam concentrate into the water stream. The FoamPro is an electronic, fully automatic, variable speed, direct injection, discharge side foam proportioning system. This system will be a single agent system capable of handling Class A foam concentrates, as well as most Class B foam concentrates. The foam system will be plumbed to five (5) discharges. The discharges capable of dispensing foam will be four preconnects and the DS 2.5". The foam proportioning system operation will be based on a direct measurement of water flows, and remain consistent within the specified flow and pressure. The system will be equipped with a digital electronic control display on the pump panel. Incorporated within the control display will be a microprocessor, which receives input from the system flow meter while also monitoring the foam concentrate pump output. The microprocessor will compare the values of the water flow versus the foam flow, to ensure the proportion rate is accurate. One (1) paddle wheel will be installed to monitor all foam discharges. Push button control for the form proportioning rate will allow a ratio from .1 percent to 3 percent in .1 percent increments. The rated capacity of this system will be 166 gpm at 3 percent and 1000 gpm at .5 percent. A 5 gpm positive displacement foam pump will be powered by a 12 vdc electric motor. One (1) check valve will be installed in the plumbing to prevent foam from contaminating the water pump. The check valve will be approved by the foam system manufacturer.
0012126	Not Required, CAF Compressor	
0552663	Foam Refill, Pump, Foam Pro, Power-Fill	**FOAM REFILL PUMP** A 12v pump will be permanently mounted in the pump compartment. A male quick disconnect fitting will be provided on the pump panel and a pick-up wand with a 6' tube and mating female fitting will be provided loose. The control switch for the pump will be located on the pump panel adjacent to the quick disconnect fitting. The pump will be plumbed to the foam tank allowing the user to refill the foam tank from the ground.
0031896	Demonstration, Foam System, Dealer Provided	
0022539	Foam Cell, 20 Gallon, Reduce Water	**FOAM TANK** The foam tank will be an integral portion of the polypropylene water tank. The cell will have a capacity of 20 gallons of foam with the intended use of Class A foam. The foam cell will reduce the capacity of the water tank. The foam cell will have a screen in the fill dome and a breather in the lid.
0091036	Drain, 1.00" Foam Tank #1	**FOAM TANK DRAIN** The foam tank drain will be a 1.00" drain valve located inside the pump compartment accessible through a door on the right side pump panel.
0091079	Not Required, Foam Tank #2	
0091112	Not Required, Foam Tank #2 Drain	

0620530	Pump House, Side Control, 52", Control Zone, Aerial	**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.
0032479	Pump Panel Configuration, Control Zone	**PUMP PANEL CONFIGURATION** The pump panel configuration will be arranged and installed in an organized manner that will provide user-friendly operation.
0562698	Step, Slide-Out/Fold-Out, Pump Operator Platform, Aerial	**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 will be 35.00" wide. The platform will lock in the retracted and the extended position. The platform will be wired to the "step not stowed" indicator in the cab.
0667186	Light, Slide-Out Pump Operator Step, On Scene Solutions Access LED, Short Step	**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.
0635355	Material, Pump Panels, Side Control Painted FormCoat Black	**PUMP AND GAUGE PANEL** The pump and gauge panels will be constructed of aluminum with a painted FormCoat black finish. A polished aluminum trim molding will be provided around each panel.
0005578	Panel, Pump Access - Right Side Only	The right side pump panel will be removable and fastened with swell type fasteners.
0035501	Pump House Structure, Std Height	
0583824	Light, Pump Compt, Wln 3SC0CDCR LED White	**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. There will be a switch accessible through a door on the pump panel included with this installation.

0586382	Gauges, Engine, Included With Pressure Controller	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
0005601	Throttle Included w/ Pressure Controller	
0549333	Indicators, Engine, Included with Pressure Controller	
0511078	Gauges, 4.00" Master, Class 1, 30"-0 -600psi	**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.
0511100	Gauge, 2.00" Pressure, Class 1, 30"-0-400psi	**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.
0062586	Gauge, Water Level, Class 1, Pierce Std	**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.
0062992	Gauge, Foam Level, (1) Tank, Class 1, 5lt	**FOAM LEVEL GAUGE** An electronic foam level gauge will be provided on the operator's panel that registers foam 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 foam 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 foam 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 foam and environmental elements. An industrial pressure transducer will be mounted to the outside of the tank. The display will be able to be calibrated in the field and will measure head pressure to accurately show the tank level.

0682503	Light Shield/Step 8" LED, P25 LED Step Light	**STEP/LIGHT SHIELD** There will be an aluminum treadplate stepping surface no less than 8.00" deep and properly reinforced to support a man's weight, installed over the pump operators panel. There will be 12 volt DC white LED lights installed under the step 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. There will be a green pump engaged indicator light activated on at the operator's panel when the pump is shifted into gear from inside the cab. There will be one (1) white LED, step light provided above this step. In order to ensure exceptional illumination, each step light will provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light. The step light will be activated by the pump panel light switch.
0606697	Air Horns, (2) Grover, In Bumper	**AIR HORN SYSTEM** There will be two (2) Grover air horns recessed in the front bumper. The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent loss of air in the air brake system.
0606835	Location, Air Horns, Bumper, Each Side, Outside Frame, Outboard (Pos #1 & #7)	**Air Horn Location** The air horns will be located on each side of the bumper, towards the outside.
0016065	Control, Air Horn, Horn Ring, PS Chrome Push Button	**AIR HORN CONTROL** The air horns will be actuated by a chrome push button located on the officer's side of the engine tunnel and by the horn button in the steering wheel. The driver will have the option to control the air horns or the chassis horns from the horn button by means of a selector switch located on the instrument panel.
0534828	Siren, Wln 295SL101, 100 or 200W Removable Mic	**ELECTRONIC SIREN** There shall be a Whelen, Model 295SL 101, 100 or 200 watt electronic siren with noise canceling plug-in microphone will be provided. This siren to be active when the battery switch is on and that emergency master switch is on.
0510206	Location, Elect Siren, Recessed Overhead In Console	Electronic siren head will be recessed in the driver side inside switch panel.
0076156	Control, Elec Siren, Head Only	The electronic siren will be controlled on the siren head only. No horn button or foot switches will be provided.
0601306	Speaker, (1) Wln, SA315P, w/Pierce Polished Stainless Steel Grille, 100 watt	**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.
0601565	Location, Speaker, Frt Bumper, Recessed, Center (Pos 4)	The speaker(s) will be recessed in the center of the front bumper.
0545191	Siren, Auxiliary, Wln HOWLER Speaker System	**SIREN AMPLIFIER** One (1) amplifier will be provided installed with the Whelen Howler system to be used in conjunction with the vehicle's primary electronic siren. **AUXILIARY SPEAKERS** Two (2) auxiliary speakers will be provided with the Whelen Howler system. These speakers will be installed behind the front bumper or cab, under front bumper .
0016080	Siren, Federal Q2B	**AUXILIARY MECHANICAL SIREN** A Federal Q2B® siren will be furnished. A siren brake button will be installed on the switch panel. The control solenoid will be powered up after the emergency master switch is activated.
0006095	Siren, Mechanical, Mounted Above Deckplate	The mechanical siren will be mounted on the bumper deck plate. It will be mounted on the left side. A reinforcement plate will be furnished to support the siren.
0026163	Control, Mech Siren, DS & PS Foot Sw	The mechanical siren will be actuated by two (2) foot switches, one (1) located on the officer's side and one (1) on the driver's side.

0606715	Lightbar, Wln, Freedom IV-Q, 2-21.5", RRRRR RRRRR	**FRONT ZONE UPPER WARNING LIGHTS** There will be two (2) 21.50" Whelen Freedom IV LED lightbars mounted on the cab roof, one (1) on each side, above the driver's and passenger's door, facing forward. The driver's side lightbar will include the following: One (1) red flashing LED module in the outside end position. One (1) red flashing LED module in the outside front corner position. One (1) red flashing LED module in the outside front position. One (1) red flashing LED module in the inside front position. One (1) red flashing LED module in the inside front corner position. The passenger's side lightbar will include the following: One (1) red flashing LED module in the inside front corner position. One (1) red flashing LED module in the inside front position. One (1) red flashing LED module in the outside front position. One (1) red flashing LED module in the outside front corner position. One (1) red flashing LED module in the outside end position. There will be clear lenses included on the lightbar. There will be a switch in the cab on the switch panel to control the lightbars.
0691544	Light, GTT, 794* LED Opticom Emitter, Remote Mounted on Cab Roof	**TRAFFIC LIGHT CONTROLLER** There will be a GTT, Model 794* LED Opticom traffic light controller with national standard high priority remote mounted on the front edge of the cab DS of roof. The Opticom traffic light controller will be activated by a cab switch with emergency master control. The Opticom traffic light controller will have no momentary activation switch. The Opticom traffic light controller will be disabled when the parking brake is applied.
0540460	Light, Front Zone, Wln M6*C LED, Clear Lens, 4lts Q Bezel	**CAB FACE WARNING LIGHTS** There will be four (4) Whelen®, Model M6*C, LED flashing warning lights installed on the cab face, above the headlights, mounted in a common bezel. The driver's side front outside warning light to be red The driver's side front inside warning light to be red The passenger's side front inside warning light to be red The passenger's side front outside warning light to be red All four (4) lights will include a clear lens. There will be a switch located in the cab, on the switch panel, to control the four (4) lights. The inside lights may be load managed if colored or disabled if white, when the parking brake is set.
0653937	Flasher, Headlight Alternating	**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.
0540692	Lights, Side Zone Lower, Wln M6*C LED, Clear Lens, 3pr, Ovr 25	**SIDE ZONE LOWER LIGHTING** There will be six (6) Whelen®, Model M6*C, flashing LED warning lights with chrome trim installed per the following: Two (2) lights, one (1) each side on the bumper extension. The side front lights to be red. Two (2) lights, one (1) each side of cab rearward of crew cab doors. The side middle lights to be red. Two (2) lights, one (1) each side above rear wheels. The side rear lights to be red. The lights will include clear lenses. There will be a switch in the cab on the switch panel to control the lights.
0564655	Lights, Rear Zone Lower, Wln M6*C LED, Clear Lens, For Tail Lt Housing	**REAR ZONE LOWER LIGHTING** There shall be two (2) Whelen®, Model M6*C, LED flashing warning lights located at the rear of the apparatus. The driver's side rear light to be red The passenger's side rear light to be red 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.
0088745	Light, Rear Zone Upper, Wln L31HRFN LED Beacon, Red LED	**REAR/SIDE ZONE UPPER WARNING LIGHTS** There will be two (2) Whelen®, Model L31H*FN, LED warning beacons provided at the rear of the truck, located one (1) each side. There will be a switch located in the cab on the switch panel to control the beacons. The color of the lights will be red LEDs with both domes clear.
0006551	Not Required, Lights, Rear Upper Zone Blocking	
0006646	Electrical System, 120/240VAC, General Design	**ELECTRICAL SYSTEM GENERAL DESIGN for ALTERNATING CURRENT** The following guidelines will apply to the 120/240 VAC system installation: **General**

Any fixed line voltage power source producing alternating current (ac) line voltage will produce electric power at 60 cycles plus or minus 3 cycles.
Except where superseded by the requirements of NFPA 1901, all components, equipment and installation procedures will conform to NFPA 70, National Electrical Code (herein referred to as the NEC).
Line voltage electrical system equipment and materials included on the apparatus will be listed and installed in accordance with the manufacturer's instructions. All products will be used only in the manner for which they have been listed.

Grounding

Grounding will be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems will not be used. Only stranded or braided copper conductors will be used for grounding and bonding.
An equipment grounding means will be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC.
The grounded current carrying conductor (neutral) will be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor will be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of the NEC.
In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure will be bonded to the vehicle frame by a copper conductor. This conductor will have a minimum amperage rating of 115 percent of the nameplate current rating of the power source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor properly sized to meet the low voltage and line voltage requirements will be permitted to be used.
All power source system mechanical and electrical components will be sized to support the continuous duty nameplate rating of the power source.

Operation

Instructions that provide the operator with the essential power source operating instructions, including the power-up and power-down sequence, will be permanently attached to the apparatus at any point where such operations can take place.
Provisions will be made for quickly and easily placing the power source into operation. The control will be marked to indicate when it is correctly positioned for power source operation. Any control device used in the drive train will be equipped with a means to prevent the unintentional movement of the control device from its set position.
A power source specification label will be permanently attached to the apparatus near the operator's control station. The label will provide the operator with the following information:
Rated voltage(s) and type (ac or dc)
Phase
Rated frequency
Rated amperage
Continuous rated watts
Power source engine speed
Direct drive (PTO) and portable generator installations will comply with Article 445 (Generators) of the NEC.

Overcurrent protection

The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device will not exceed 144.00" (3658 mm) in length.
For fixed power supplies, all conductors in the power supply assembly will be type THHW, THW, or use stranded conductors enclosed in nonmetallic liquid tight flexible conduit rated for a minimum of 194 degree Fahrenheit (90 degrees Celsius).
For portable power supplies, conductors located between the power source and the line side of the main overcurrent protection device will be type SO or type SEO with suffix WA flexible cord rated for 600-volts at 194 degrees Fahrenheit (90 degrees Celsius).

Wiring Methods

Fixed wiring systems will be limited to the following:
Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit (90 degrees Celsius)
or
Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit (90 degrees Celsius)
Electrical cord or conduit will not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring. In addition the wiring will be run as follows.
Separated by a minimum of 12.00" (305 mm), or properly shielded, from exhaust piping
Separated from fuel lines by a minimum of 6.00" (152 mm) distance
Electrical cord or conduit will be supported within 6.00" (152 mm) of any junction box and at a minimum of every 24.00" (610 mm) of continuous run. Supports will be made of nonmetallic materials or corrosion protected metal. All supports will be of a design that does not cut or abrade the conduit or cable and will be mechanically fastened to the vehicle.

Wiring Identification

All line voltage conductors located in the main panel board will be individually and permanently identified. The identification will reference the wiring schematic or indicate the final termination point. When prewiring for future power sources or devices, the unterminated ends will be labeled showing function and wire size.

Wet Locations

All wet location receptacle outlets and inlet devices, including those on hardwired remote power distribution boxes, will be of the grounding type provided with a wet location cover and installed in accordance with Section 210-7 "Receptacles and Cord Connections" of the NEC.
All receptacles located in a wet location will be not less than 24.00" (610 mm) from the ground. Receptacles on off-road vehicles will be a minimum of 30.00" (762 mm) from the ground.
The face of any wet location receptacle will be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle will be installed in a face up position.

Dry Locations

All receptacles located in a dry location will be of the grounding type. Receptacles will be not less than 30.00" (762 mm) above the interior floor height.
All receptacles will be marked with the type of line voltage (120-volts or 240-volts) and the current rating in amps. If the receptacles are direct current, or other than single phase, they will be so

			marked. **Listing** All receptacles and electrical inlet devices will be listed to UL 498, Standard for Safety Attachment Plugs and Receptacles, or other appropriate performance standards. Receptacles used for direct current voltages will be rated for the appropriate service. **Electrical System Testing** The wiring and associated equipment will be tested by the apparatus manufacturer or the installer of the line voltage system. The wiring and permanently connected devices and equipment will be subjected to a dielectric voltage withstand test of 900-volts for one (1) minute. The test will be conducted between live parts and the neutral conductor, and between live parts and the vehicle frame with any switches in the circuit(s) closed. This test will be conducted after all body work has been completed. Electrical polarity verification will be made of all permanently wired equipment and receptacles to determine that connections have been properly made. **Operational Test per Current NFPA 1901 Standard** The apparatus manufacturer will perform the following operation test and ensure that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order. The test will be witnessed and the results certified by an independent third-party certification organization. The prime mover will be started from a cold start condition and the line voltage electrical system loaded to 100 percent of the nameplate rating. The power source will be operated at 100 percent of its nameplate voltage for a minimum of two (2) hours unless the system meets category certification as defined in the current NFPA 1901 standard. Where the line voltage power is derived from the vehicle's low voltage system, the minimum continuous electrical load as defined in the current NFPA 1901 standard will be applied to the low voltage electrical system during the operational test.
0563275		Generator, Harrison 6kW MSV, Hydraulic, Hotshift PTO, Volt Meter Only	**GENERATOR** The apparatus will be equipped with a complete AC (alternating current) electrical power system. The generator will be a Harrison, Model MSV, 6,000 watt hydraulic driven unit with vertical exhaust. The generator will be driven by a transmission power take off unit, through a hydraulic pump and motor. The hydraulic engagement supply will be operational at any time (no interlocks). An electric/hydraulic valve will supply hydraulic fluid to the clutch engagement unit provided on the chassis PTO drive. **Generator Instruments and Controls** To properly monitor the generator performance, a voltmeter will be furnished near the breaker box.
0637440	SP	Location, Hydraulic Generator, Front Of Turntable, Reinforced Floor, Aerial	**GENERATOR LOCATION** The generator will be mounted in the area in front of and below the turntable. The flooring in this area will be either reinforced or constructed, in such a manner, that it will handle the additional weight of the generator.
0016752		Starting Sw, Truck Engine Powered Gen, Cab Sw Pnl	**GENERATOR START** There will be a switch provided on the cab instrument panel to engage the generator.
0651902		Remote Start, Hydraulic Generator, 1 Location	**GENERATOR REMOTE START** There will be a generator remote start/stop switch with indicator light located pump panel.
0016740		Not Required, Fuel System	
0016767		Not Required, Oil Drain Extension, Generator	
0016771		Not Required, Routing Exhaust, Generator	
0036738		Circuit Breaker Panel, Included With PTO Generator	**CIRCUIT BREAKER PANEL** The circuit breaker panel will be located high on the back wall of compartment LS4.

0006825	Reel, Elect Cable, Hannay, 1600, (3) Wire	**ELECTRIC CORD REEL** Furnished with the 120 volt AC electrical system will be a Hannay, Series 1600, cord reel. The reel will be provided with a 12-volt electric rewind switch, that is guarded to prevent accidental operation and labeled for its intended use. The switch will be protected with a fuse and installed at a height not to exceed 72.00" above the operators standing position. The exterior finish of the reel(s) will be painted #269 gray from the reel manufacturer. A Nylatron guide to be provided to aid in the payout and loading of the reel. A ball stop will be provided to prevent the cord from being wound on the reel. A label will be provided in a readily visible location adjacent to the reel. The label will indicate current rating, current type, phase, voltage and total cable length. A total of one (1) cord reel will be provided one (1) above the pump area, opposite side of the generator. The cord reel will be configured with three (3) conductors.
0006828	Cord, Electric, 10/3 Yellow, 3 Wire	**CORD** Provided for electric distribution will be one (1) length installed on the reel of 150 feet of yellow 10/3 electrical cord, weather resistant 105 degree Celsius to -50 degree Celsius, 600 volt jacketed SOOW cord. A Hubbell L5-20, 20 amp, 120 volt, twist lock connector body will be installed on the end of the cord.
0781579	Receptacle, 15/20A 120V 3-Pr 3-Wr, NEMA 5-20R SB Dup, 1st, Interior Cab	**120 VOLT RECEPTACLE** There will be two (2), 15/20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with interior stainless steel wall plate(s), installed one in each EMS cabinet in the back and low. The NEMA configuration for the receptacle(s) will be 5-20R. The receptacle(s) will be powered from the shoreline inlet. There will be a label installed near the receptacle(s) that state the following: Line Voltage Current Ratting (amps) Phase Frequency Power Source
0519934	Not Required, Brand, Hydraulic Tool System	
0649753	Not Required, PTO Driven Hydraulic Tool System	
0649750	Not Required, Hydraulic Reels	
0786787	Aerial, 107' ASL Single Axle, Active Damping System, 750/500 Tip, 35 MPH Wind	**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 NFPA 1901 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% 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 1901 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% 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 1901 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 with the maximum rated tip load in either of the two (2) following conditions: - Conditions of high wind up to 35 mph - Conditions of icing, up to a coating of 0.25" over the entire 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 will be comprised of four sections.

The ladder will have the capability to support a minimum of 750 pounds 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 vertically and horizontally using welded steel tubing.

All ladder rungs will be welded to each section utilizing "K" bracing for torsional rigidity.

The inside width dimensions of the ladder will be:
- Base Section 41.87"
- Inner-Mid Section 34.88"
- Outer-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"
- Inner-Mid Section 22.68"
- Outer-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 end of the fly section will be constructed in a manner that aids personnel in climbing off the ladder.

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 tow eye welded on to each side of the egress.

ACTIVE DAMPING SYSTEM (ADS)

The aerial device will be equipped with an Active Damping System (ADS). This active damping system will understand the accelerations or forces that are acting on the aerial device and counteract these forces to reduce the vertical displacement of the device, resulting in a more rigid or stiff aerial device.

The active damping system will perform as follows: during aerial operation with a full extended device at zero degrees elevation, a load of 250lb will be applied to the tip of the device. Upon removal of this 250lb tip load, the vertical displacement of the aerial device will be reduced by 80% within 10 seconds.

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 a minimum of 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 a 0.375" thick aluminum plate, 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 1901 standard.

The turntable will be modified at the passenger side to allow for easier access to the hose bed for hose loading. The portion of the turntable outboard of the rotational motor will be omitted, and the handrails will be modified as required.

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.

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 NFPA 1901. SYSTEMS THAT PERMIT THE AERIAL TO ROTATE TO THE "SHORT JACK" SIDE, WITHOUT AUTOMATICALLY STOPPING THE ROTATION AND/OR WITHOUT ACTUATION OF THE "MANUAL OVERRIDE", will NOT BE ACCEPTED. SYSTEMS THAT ONLY INCLUDE AN ALARM ARE NOT CONSIDERED AN INTERLOCK AND will NOT BE ACCEPTED.

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.

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 360 degree rotation with ladder extended to operational limits at 0 degrees elevation.

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.

35 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
250
500
750
Upper Mid
-
-
-
-
250
500
1000
1000
Lower Mid
-
-
-
500
500
750
1000
1000
Base
-
-
500
500
500
1000
1000
1000
35 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
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.*** ***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.***
0000042	Boom Support, Rear of the Chassis Cab	The boom support will be located just to the rear of the chassis cab.
0762413	Light, Boom Support, Amdor AY-LB-12HW012, 12" LED	**AERIAL BOOM SUPPORT LIGHT** There will be one (1) Amdor®, Model AY-LB-12HW012, 190 lumen, 12" long, white LED strip light mounted on the boom support cradle. This light will be activated when the aerial master switch is activated.
0799560	Boom Support Compartment, Not Required	
0680820	Boom Panel, One, Sized to Match Opposite Side Box	**AERIAL BOOM PANEL** There will be one boom panel provided on the base section on the left side of the aerial device while viewed from the turntable. This boom panel will be sized to match the storage box on the opposite side. The boom panel will be painted #10 white. The boom panel will be designed so no mounting bolts are in the face of the panel. This will keep the lettering surface free of holes.
0526890	Not Required, Indicator, Extension	
0591645	Steps, Folding, Four, Aerial Device, Trident	**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, non-skid with a black coating.
0688232	Rung Covers, Aerial Device	**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.
0678896	Box, Stokes/Backboard Storage, w/Cover, Base Section, In Place of Boom Panel	**STOKES AND BACKBOARD STORAGE BOX** There will be one (1) aluminum storage box(es) provided at the base section of the aerial ladder on the right side of the aerial device while viewed from the turntable. The box will be painted to match the aerial device with the face of the box painted to match the boom sign color. The box (es) will be located in place of the aerial boom panel and have a hinged cover with butterfly latch to secure the equipment. The cover will have the same finish as the box. A divider will be provided to separate the stokes basket and the backboard. The box(es) will have no louvers. The size of the stokes basket and backboard will be determined at precon. The maximum capacity of each box will be 75 lb.
0784202	Brackets Only, Roof Ladder, Base Section, Inboard of Boom Panel, Ascendant	**LADDER STORAGE MOUNTING BRACKETS** Mounting brackets for a single roof ladder will be provided on the left side of the aerial device while viewed from the turntable. A total of one (1) roof ladder(s) will be stored on the aerial base section. The bracket(s) will be located inboard of the boom panel at the base section and include straps to secure the ladder(s). The mounting brackets will accommodate a 16' Duo-Safety 875-A-DR roof ladder(s) to be stored individually as determined by the type of aerial device and the available space.

0601972	Lights, Turntable Walkway, P25, LED	**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.
0601949	Light, Turntable Console, TecNiq T-10, LED Strip Light	**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.
0624684	Control Stations, ASL Single Axle, MUX, Color Display	**INFORMATION CENTER** There will be an information center provided. The information center will operate in temperatures from -40 to 185 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, true digital operation, and will have improved resolution. The LCD display will be encased in an ABS, grey plastic housing with a gray 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 black 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 time (12- or 24-hour mode) and a fault alert triangle symbol. The time will be synchronized between all Command Zone color displays located on the vehicle. Once the fault alert triangle is selected, a text message 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 or symbol will be provided for each button. The label or symbol will indicate the function for each active button for each screen. If the button is not utilized on specific screens, it will remain black. 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 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. - If applicable, breathing air levels will be indicated via an air bottle symbol and text indicating the percent (%) of air remaining. A green bar graph 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. - *At A Glance* color features will be utilized on this screen. A fault alert triangle symbol in the lower right portion of the screen will indicate any caution faults with 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: - If applicable, aerial hydraulic oil temperature will be indicated with symbol and text. - Aerial Hydraulic Oil Pressure will be indicated with a symbol and text. - 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 Angle indicating the angle from the vehicle which the device is at. - *At A Glance* color features will be utilized on this screen. A fault alert triangle symbol in the lower right portion of the screen will indicate any caution faults with 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 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. A fault alert triangle symbol in the lower right portion of the screen will indicate any caution faults with 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 operation envelope page will indicate the following:
- A top view of the aerial operating envelope
- A side view of the aerial operating envelope

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 its 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 STABILIZER CONTROL STATIONS

A lower control station will be located on each side of the rear wall 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 interlocks
- Emergency stop
- Emergency hydraulic power unit switch

The stabilizer controls will include the following:
- Leveling assist toggle switch
- Left and right side stabilizer beam in/out switches
- Left and right side stabilizer beam up/down switches
- Rear stabilizer up/down 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 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 and illuminated 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
- Ladder illumination switch (if equipped)
- Aerial monitor switches (if equipped)

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.

0624682	Stabilizers, One Set, Ascendant Single Axle	**STABILIZERS** The vehicle will come equipped with an out and down stabilization system. The system will consist of two (2) hydraulically operated out and down style stabilizers mounted above the frame and a rear stabilizer jack that is attached directly to the center rear of the torque box. The stabilizers will have a maximum spread of 18' from the centerline of the footpads when fully extended. The internal tubes will be 8.00" x 10.00" with 1/2" thick top and bottom plates and 3/8" thick sides of 130,000 psi minimum yield strength steel and will be extended out by hydraulic cylinders. The cylinders will have pilot-operated check valves with thermal relief. This will insure that the beams will be in the stowed during travel. The external tubes will be 9-3/4" x 11-3/4" with 3/8" wall thickness. The internal jack tubes will slide on permanently attached wear pads. The extension cylinders will be totally enclosed within the extension beams. The horizontal extension cylinders will be of the trombone type to eliminate wear and potential failure of hydraulic hoses. The stabilizers will have a tip over safety margin of 1 1/2 times its rated load in any position the aerial device can be placed as outlined in the current edition of NFPA 1901. The aerial will be able to sustain a 1 1/3 to 1 rated load on a 5 degree slope downward in the position most likely to cause overturning. The maximum ground slope the apparatus can be set up on is 12 percent. On the 12 percent slope, the apparatus can be leveled within a 6 percent operating range with the apparatus cab facing uphill. The cylinders will be supplied with dual pilot operated check valves on each stabilizer cylinder to hold the cylinder in the stowed or working position should a charged line be severed at any point in the hydraulic system. Stabilizers will contain safety lock valves and will require no mechanical pins to assure there will be no "leak down" of stabilizer legs. Each stabilizer leg will have attached to the end of the leg a 16 gauge polished stainless steel shield. The stainless steel shield will be a maximum 13.00" wide to allow the extension of the stabilizer between parked cars. This plate will serve as a protective guard and a mounting surface for warning lights. The top, forward, and rear edges will be flanged back for added strength. The stabilizer cylinders will be sized to maximize ground penetration. The lift cylinders will be mounted on the end of the stabilizer tube and will have the following dimensions: 4.00" bore 3.50" rod 23.38" stroke The stabilizer extension cylinders will have the following dimensions 1.75" bore 1.25" rod 64.00" stroke The rear stabilizer will have the following dimensions: 4.50" bore 4.00" rod 29.00" stroke Each stabilizer that can be extended from the body will be supplied with a red warning light as outlined in the current edition of NFPA. The stabilizers will be connected to a warning light in the cab to warn the operator if the stabilizers are deployed. The ground contact area for each stabilizer will be a 12.00" diameter circular stainless steel disc without the auxiliary pads and 24.00" x 24.00" with lightweight composite material pads deployed. The ground pressure will not exceed 75 psi when the apparatus is fully loaded and the aerial device is carrying its rated capacity in every position. This will be accomplished with the stabilizer pads deployed, as outlined in the current edition of NFPA 1901. There will be one (1) pad located on each side of the apparatus in front of the stabilizers. The auxiliary jack pad for the rear stabilizer will be integral to the stabilizer foot pad. **STABILIZER CONTROLS** One (1) electric solenoid valve will control the stabilizers. The control switches will be located one (1) each side at the rear of the apparatus so the operator may observe the stabilizers during deployment. The stabilizer controls will include the following: - Leveling assist toggle 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. - Two (2) fully extended beams green indicator lights: these lights will be illuminated when each of the respective stabilizer beams are fully extended. - Three (3) 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 "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.
0782113	Door, Stabilizer Control Box, Ascendant Single Axle MUX, Smooth Aluminum	**STABILIZER CONTROL BOX ALUMINUM DOOR** A vertically hinged smooth aluminum door will be provided over each stabilizer control box. The door will be hinged outboard.
0615058	Stabilizer Placement, Cameras w/Command Zone Color Display, 1 Set	**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.

0624678	Hydraulic System, Ascendant Single Axle	**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 hydraulic oil sight gauge will be supplied at the rear of the unit for easy fluid level verification. 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. A green 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 the aerial power takeoff shift 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 20 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. 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. The emergency suction port will be closer to the bottom of the reservoir to provide some reserve oil for emergency operation.

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 filter will be integrated with the hydraulic manifold and designed to prevent oil loss during filter change. The system will incorporate the following filter to provide dependable service:
return filter: beta 200 at 6 micron

0615180 Swivels, w/Encoder, ASL Single Axle, (28 Collector Rings)

HYDRAULIC SWIVEL
The aerial ladder will be equipped with a six (6) 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 20 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.
WATER SWIVEL
Water will be transferred to the aerial waterway by means of a 5.00" internal diameter waterway through the swivel, permitting 360 degree continuous rotation.
13-BIT ABSOLUTE ENCODER
The aerial ladder will be equipped with a 13-Bit Absolute Encoder, CAN-based, which provides 8192 counts per shaft turn for position and direction reference.
The 13-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 13-Bit Absolute Encoder will allow power to be returned to the system without having to re-zero the settings.
The 13-Bit Absolute Encoder will be an integral part of a micro-processor based control system.

0624676 Electrical System, ASL Single Axle, MUX

ELECTRICAL SYSTEM
The aerial device will utilize a microprocessor-based control system. The system will consist of the following components:
Control System Modules
Each of the control system modules will be configured as follows:
Sealed to a NEMA 4X rating
Operating range from -40 degrees F to 156 degrees F (-40 degrees C to 70 degrees C)
Communicate using J1939 data link
Two (2) diagnostic LED lights
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
Up to 16 diagnostic LEDs on each module
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)
Current Control Module
Built-in fault sensing
Three (3) analog inputs
Eight (8) digital outputs
Pulse width modulating (PWM) capable
3A continuous per output
Closed Loop System
Circuit protection based on actual current draw (not affected by heat)
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

0607850	Lights, FRC SRA110-07A* LED Spot, Trk & Tip, 6lts (PAL/HAL)	**SPOTLIGHTS** There will be six (6) Fire Research Model SRA110-07A*, 7,000 lumens 12 volt DC LED lights with polished fixed mounts furnished per the following: One (1) will be mounted on the driver's side of the base section of the ladder One (1) will be mounted on the passenger's side of the base section of the ladder One (1) will be mounted high on the driver's side tip of aerial One (1) will be mounted high on the passenger's side tip of aerial One (1) will be mounted low on the driver's side tip of the aerial One (1) will be mounted low on the passenger's side tip of the aerial The painted parts of this light assembly to be white. Power to the "tracking lights" will be controlled by an on/off switch at the turntable control operator's position. The lights at the tip will be controlled by platform/tip and turntable.
0653677	Lighting, Rung, LED, TecNiq, 4 Section, Base, Lower/Upper Mid, Fly	**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 blue. The lower mid section of the ladder to be blue. The upper mid section of the ladder to be blue. 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 master battery switch. The lights may be load managed when the parking brake is applied.
0540737	Lights, Stabilizer Warn (1) Set, Wln M6*C LED, Clear Lens	**STABILIZER WARNING LIGHTS** There will be two (2) Whelen®, Model M6*, LED flashing warning lights with clear lenses and Whelen, Model M6FC, chrome flanges installed on the stabilizer cover panels, one (1) each side. The LED lights will be red. These warning lights will be activated by the same switch as the side warning lights.
0617469	Lights, Wln T0R00FRR LED 2", Stabilizer Beam (1) Set, Ascendant	**STABILIZER BEAM WARNING LIGHTS** There will be two (2) Whelen®, Model T0R00FRR, 2.00" round red LED flashing lights mounted on each out and down stabilizer, one (1) facing forward and one (1) facing rearward. The lights will be recessed in the horizontal beam of the stabilizer. These warning lights will be activated with the aerial master switch.
0768550	Lights, Stabilizer Scene, Amdor AY-LB-12HW012, 12", 3lts LED, Ascendant Single	**STABILIZER SCENE LIGHTS** There will be three (3) Amdor, Model AY-LB-12HW012, 190 lumens, 12.00" long, white LED strip lights installed to illuminate the area around the aerial stabilizers, one (1) light per stabilizer. The lights will be activated by the aerial master switch.
0783034	DC Power To Aerial Tip, 14.0 Amps @ 12 Volt DC, ASL	**DC POWER CABLE to TIP** There will be a cable installed in the aerial device to provide 14.00 amps @ 12 volts DC to the tip of the aerial device.
0594648	Intercom, 2-Way Fire Research ICA900 Hands Free	**2-WAY AERIAL COMMUNICATION SYSTEM** There will be a Fire Research model ICA900-112 two-way intercom system provided. The control module will be located on the turntable operator console, provided there is room, and have an LED volume display and push-button volume control. 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.
0540895	Not Required, Breathing Air to Tip, Aerial Ladder	
0024742	Not Required, Mask, Breathing Air To Tip	
0610887	Aerial Pedestal, Ascendant Single Axle	**AERIAL PEDESTAL** The aerial pedestal will accommodate the height of the cab.
0604457	Lifting Eye Assembly, Rope Rescue Attachment, ASL	**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.

0530828	Turntable Access, Chains	**AERIAL TURNTABLE CHAIN** A chain will be installed at the aerial turntable.
0624672	Waterway, High Flow, 1500 GPM, ASL	**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 mid-section and a 3.50" 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 500lb 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 500lb tip load. When the aerial device is positioned at -10 to 0 degrees of elevation, 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.
0632855	Monitor, Akron 3480 StreamMaster II Electric w/Extended Vertical Travel	**AERIAL MONITOR** An Akron Model 3480 monitor with stow and deploy will be provided at the tip with a Akron 1250 gpm Model 1578. 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.
0010758	Flow Meter, Waterway, PAL, 110' Ascendant, MUX	**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.
0624671	Inlet, 5.00" w/5.00" Aluminum, Plumbing at Rear, Ascendant Single Axle	**REAR INLET** A 5.00" NST inlet to the aerial waterway will be provided at the rear of the apparatus. The inlet will have 5.00" aluminum plumbing. It will be furnished with a 5.00" chrome plated adapter and a 5.00" chrome plated, long handle cap.
0673128	Quick-Lock Waterway Locking System, 100' HDL/MDL, 105' HDL, ASL	**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.
0047897	Tools, Aerial	**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

0559494	Manuals and Training, 3 Consecutive Days, Ascendant Ladder, PAL	**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.
0007150	Bag of Nuts and Bolts	**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.
0602497	NFPA Required Loose Equipment, Quint, NFPA 2016, Provided by Fire Department	**NFPA REQUIRED LOOSE EQUIPMENT PROVIDED BY FIRE DEPARTMENT** The following loose equipment as outlined in NFPA 1901, 2016 edition, section 9.9.3 and 9.9.4 will be provided by the fire department. 800 ft (240 m) of 2.50" (65 mm) or larger fire hose, in any combination. 400 ft (120 m) of 1.50" (38 mm), 1.75" (45 mm), or 2.00" (52 mm) fire hose, in any combination. One (1) handline nozzle, 200 gpm (750 L/min) minimum. Two (2) handline nozzles, 95 gpm (360 L/min) minimum. One (1) playpipe with shutoff and 1.00" (25 mm), 1.125" (29 mm), and 1.25" (32 mm) tips. One (1) SCBA complying with NFPA 1981 for each assigned seating position, but not fewer than four (4), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer. One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s). One (1) first aid kit. Four (4) salvage covers, each a minimum size of 12 ft × 14 ft (3.6 m × 5.5 m). Four (4) combination spanner wrenches. Two (2) hydrant wrenches. One (1) double female 2.50" (65 mm) adapter with National Hose threads. One (1) double male 2.50" (65 mm) adapter with National Hose threads. One (1) rubber mallet, for use on suction hose connections. Four (4) ladder belts meeting the requirements of NFPA 1983. One (1) 150 ft (45 m) light-use life safety rope meeting the requirements of NFPA 1983. One (1) 150 ft (45 m) general-use life safety rope meeting the requirements of NFPA 1983. One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, *Standard for High Visibility Public Safety Vests*, 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. One (1) automatic external defibrillator (AED). If the supply hose carried does not use sexless couplings, an additional double female adapter and double male adapter, sized to fit the supply hose carried, will be carried mounted in brackets fastened to the apparatus. If none of the pump intakes are valved, a hose appliance that is equipped with one or more gated intakes with female swivel connection(s) compatible with the supply hose used on one side and a swivel connection with pump intake threads on the other side will be carried. Any intake connection larger than 3.00" (75 mm) will include a pressure relief device that meets the requirements of 16.6.6. If the apparatus does not have a 2.50" National Hose (NH) intake, an adapter from 2.50" NH female to a pump intake will be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake. If the supply hose carried has other than 2.50" National Hose (NH) threads, adapters will be carried to allow feeding the supply hose from a 2.50" NH thread male discharge and to allow the hose to connect to a 2.50" NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake.
0602397	Soft Suction Hose, Provided by Fire Department, Quint NFPA 2016 Classification	**SOFT SUCTION HOSE PROVIDED BY FIRE DEPARTMENT** NFPA 1901, 2016 edition, section 9.8.2.1 requires a minimum of 20' of suction hose or 15' of supply hose will be carried. Hose is not on the apparatus as manufactured. The fire department will provide suction or supply hose.
0027023	No Strainer Required	
0602534	Extinguisher, Dry Chemical, Quint NFPA 2016, Provided by Fire Department	**DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT** NFPA 1901, 2016 edition, section 9.9.4 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus. The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

0602352	Extinguisher, 2.5 Gal. Pressurized Water, Quint, NFPA 2016,Provided by Fire Dept	**WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT** NFPA 1901, 2016 edition, section 9.9.4 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus. The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.
0007482	Not Required, Crowbars	
0007484	Not Required, Claw Tools	
0602883	Axe, Flathead, Quint NFPA 2016, Provided by Fire Department	**FLATHEAD AXE PROVIDED BY FIRE DEPARTMENT** NFPA 1901, 2016 edition, Section 9.9.4 requires one (1) flathead axe mounted in a bracket fastened to the apparatus. The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.
0602670	Axe, Pickhead, Quint NFPA 2016, Provided by Fire Department	**PICKHEAD AXE PROVIDED BY FIRE DEPARTMENT** NFPA 1901, 2016 edition, Section 9.9.4 requires one (1) pickhead axe mounted in a bracket fastened to the apparatus. The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.
0007494	Not Required, Sledgehammers	

0559573 Paint, Single Color, Custom

PAINT - BODY PAINTED TO MATCH CAB

The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:

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.

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. A final pure water rinse will be applied to all metal surfaces.

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.

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.

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.

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.

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 manufacture.

Each batch of basecoat color is checked for a proper match before painting of the cab and the body. After the cab and body are painted, the color is verified again to make sure that it matches the color standard. Electronic color measuring equipment is used to compare the color sample to the color standard entered into the computer. Color specifications are used to determine the color match. A Delta E reading is 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 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.

Pierce Manufacturing paint finish quality levels for critical areas of the apparatus (cab front and sides, body sides and doors, and boom lettering panels) meet or exceed the Cadillac/General Motors GMW15777 global paint requirements. Orange peel levels meet or exceed the #6 A.C.T.standard in critical areas. These requirements are met in order for the exterior paint finish to be considered acceptable. The Pierce Manufacturing written paint standards will be available upon request.

The cab and the body will be painted #90 red.

PAINT - 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% 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 98.00%. Water wash systems will be 99.97% 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 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.

0646901	Paint Chassis Frame Assy, With Liner, E-Coat, Standard	**PAINT CHASSIS FRAME ASSEMBLY** The chassis frame assembly will be finished with primer and gloss paint to match the lower job color 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 Air tanks 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.
0693797	No Paint Required, Aluminum Front Wheels	
0687653	Paint, Rear Wheels, Single Axle, Alum-Stl	**PAINT, REAR WHEELS** All wheel surfaces, inside and outside of inboard steel wheels only, will be provided with powder coat paint #101 black.
0594533	Paint, Grille, Mesh Only, AXT/Vel/Imp/DCF/SFR/Enf	**PAINT GRILLE MESH** The mesh on the front grille will be painted BLACK.
0007230	Compartment, Painted, Spatter Gray	**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.
0792617	Aerial Ladder Paint, ASL-Single Axle, E-Coat	**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, pedestal and torque box (including water tank cradle) will be treated with epoxy 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 124 Aerial turntable: bright silver metallic 124 Aerial control console: silver metallic 124 Aerial lift cylinders: silver metallic 124 Aerial egress: #90 red (will be a contrasting color to the aerial device) Aerial boom support: gloss black primer
0544111	Reflective Band, 10"	**REFLECTIVE BAND** A 10.00" black reflective band will be provided across the front of the vehicle and along the sides of the body.

0568574		Stripe, Reflective, Chevron, Front Bumper	**CHEVRON STRIPING ON THE FRONT BUMPER** There will be alternating chevron striping located on the front bumper. The colors will be black and ruby red reflective. The size of the striping will be 6.00".
0624670		Stripe, Chevron, Rear, Diamond Grade, Aerial, Ascendant Single Axle	**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. Roll up doors and stainless steel access doors will not be covered in chevron. 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.
0598754		Stripe, Reflective/Diamond Grade, 4.00" on Stabilizers	**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.
0087342		Jog, "Z"-Shaped, In Reflective Stripe	**"Z" JOG IN REFLECTIVE STRIPE** There will be one (1) "Z"-shaped jog(s) provided in the reflective stripe design.
0679883		Stripe, Printed Effect Gold Leaf Outline Above & Below Reflective Band	**PRINTED EFFECT GOLD LEAF STRIPE** There will be a printed effect gold leaf stripe applied above and below the reflective band. The printed effect gold leaf stripes will be .50" wide with an outline.
0567374		Stripe, Black Outline each Chevron Stripe @ Rear (Not Warranted)	**REFLECTIVE STRIPE OUTLINE** A black vinyl outline will be provided for each chevron stripe at the rear of the truck.
0667294		Stripe, Reflective, Chevron, Body Compt Door Edge, Diamond Grade	**DIAMOND GRADE CHEVRON STRIPE ON COMPARTMENT DOOR EDGE** A fluorescent yellow green diamond grade and red diamond grade reflective stripe will be provided on the door edge of six (6) compartment doors. all doors.
0671595		Stripe, Diamond Grade Chevron, Swing Down Turntable Access Steps, Front and Rear	**DIAMOND GRADE CHEVRON STRIPE ON TURNTABLE ACCESS STEPS** A fluorescent yellow green diamond grade and red diamond grade stripe will be provided on the front and rear sides of the swing down turn table access steps. one (1) step(s) will be striped.
0687353	SP	Stripe, Black Outline each Chevron Stripe, Stabilizers, Four	**OUTLINE, REFLECTIVE STRIPE** A black vinyl outline will be provided for each chevron stripe on the aerial stabilizers.
0512024		Stripe, Reflective, Chevron/Inverted "V", On Front Bumper	**CHEVRON/INVERTED "V" STRIPING ON THE FRONT BUMPER** There will be alternating chevron striping located on the front bumper. The striping will consist of the following colors: The first color will be black The second color will be ruby red The size of the striping will be 6.00".
0552453		Stripe, Reflective, Chevron, Cab and Crew Cab Doors Interior, Diamond Grade	**INVERTED "V" CHEVRON STRIPING ON CAB AND CREW CAB DOORS** There will be alternating chevron striping located on the inside of each cab and crew cab door. The striping will consist of the following colors: The first color will be red diamond grade The second color will be fluorescent yellow green diamond grade The size of the striping will be 4.00".
0679900		Stripe, Printed Effect Gold Leaf, Box, Boom Sign without Scrolls, Aerial	**BOOM SIGN STRIPING** There will be printed effect gold leaf stripes along all edges of the aerial boom sign.
0027372		Lettering Specifications, (GOLD STAR Process)	**LETTERING** The lettering will be totally encapsulated between two (2) layers of clear vinyl.
0685693		Lettering, Printed Effect Gold Leaf, 3.00", Each	**LETTERING** There will be printed effect gold leaf lettering, 3.00" high, with outline and shade provided. There will be 17 letters provided.

0685525		Lettering, Printed Effect Gold Leaf, 12.00", Each	**LETTERING** There will be printed effect gold leaf lettering, 12.00" high, with outline and shade provided. There will be nine (9) letters provided.
0685536		Lettering, Printed Effect Gold Leaf, 10.00", Each	**LETTERING** There will be printed effect gold leaf lettering, 10.00" high, with outline and shade provided. There will be ten (10) letters provided.
0685544		Lettering, Printed Effect Gold Leaf, 8.00", Each	**LETTERING** There will be printed effect gold leaf lettering, 8.00" high, with outline and shade provided. There will be eight (8) letters provided.
0685589		Lettering, Printed Effect Gold Leaf, 4.00", (21-40)	**LETTERING** Twenty-one (21) to forty (40) printed effect gold leaf lettering, 4.00" high, with outline and shade will be provided.
0684055		Lettering, Vinyl, 3.00", Each	**LETTERING** There will be non-reflective vinyl lettering, 3.00" high, with outline and shade provided. There will be 18 letters provided.
0614821	SP	Emblem, Seal, Printed Effect Gold Leaf, 15"-17", Pair	**EMBLEM INSTALLATION** There will be one (1) pair of department seals, comprised of printed effect gold leaf material, provided and installed on cab doors.
0772003		Manual, Fire Apparatus Parts, USB Flash Drive, Custom	**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.
0772037		Manual, Chassis Service, USB Flash Drive, Custom	**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 EngineTires 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.
0773381		Manual, Chassis Operation, One (1) USB Flash Drive, Custom	**CHASSIS OPERATION MANUAL** The chassis operation manual will be provided on one (1) USB flash drive.
0030008		Warranty, Basic, 1 Year, Apparatus, WA0008	**ONE (1) YEAR MATERIAL AND WORKMANSHIP** A Pierce basic apparatus limited warranty certificate, WA0008, is included with this proposal.
0611136		Warranty, Chassis, 3 Year, Velocity/Impel, WA0284	**THREE (3) YEAR MATERIAL AND WORKMANSHIP** The Pierce custom chassis limited warranty certificate, WA0284, is included with this proposal.

0696698	Warranty, Engine, Cummins, 5 Year, WA0181	**ENGINE WARRANTY** A Cummins **five (5) year** limited engine warranty will be provided. A limited warranty certificate, WA0181, is included with this proposal.
0684953	Warranty, Steering Gear, Sheppard M110, 3 Year WA0201	**STEERING GEAR WARRANTY** A Sheppard **three (3) year** limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.
0595767	Warranty, Frame, 50 Year, Velocity/Impel, Dash CF, WA0038	**FIFTY (50) YEAR STRUCTURAL INTEGRITY** The Pierce custom chassis frame and crossmembers limited warranty certificate, WA0038, is included with this proposal.
0595698	Warranty, Axle, 3 Year, TAK-4, WA0050	**FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY** The Pierce TAK-4 suspension limited warranty certificate, WA0050, is included with this proposal.
0777368	Warranty, Axle, 2 Year, Meritor, General Service, WA0328	**REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY** A Meritor axle limited warranty certificate, WA0046, is included with this proposal.
0652758	Warranty, ABS Brake System, 3 Year, Meritor Wabco, WA0232	**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.
0019914	Warranty, Structure, 10 Year, Custom Cab, WA0012	**TEN (10) YEAR STRUCTURAL INTEGRITY** The Pierce custom cab limited warranty certificate, WA0012, is included with this proposal.
0595813	Warranty, Paint, 10 Year, Cab, Pro-Rate, WA0055	**TEN (10) YEAR PRO-RATED PAINT AND CORROSION** A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included with this proposal.
0524627	Warranty, Electronics, 5 Year, MUX, WA0014	**FIVE (5) YEAR MATERIAL AND WORKMANSHIP** The Pierce Command Zone electronics limited warranty certificate, WA0014, is included with this proposal.
0647720	Warranty, Pierce LED Strip Lights, WA0203	**COMPARTMENT LIGHT WARRANTY** The Pierce 12 volt DC LED strip lights limited warranty certificate, WA0203, is included with this proposal.
0046369	Warranty, 5-year EVS Transmission, Standard Custom, WA0187	**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.
0685945	Warranty, Transmission Cooler, WA0216	**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 submitted with the bid package.
0688798	Warranty, Water Tank, Lifetime, UPF, Poly Tank, WA0195	**WATER TANK WARRANTY** A UPF poly water tank limited warranty certificate, WA0195, is included with this proposal.
0596025	Warranty, Structure, 10 Year, Body, WA0009	**TEN (10) YEAR STRUCTURAL INTEGRITY** The Pierce apparatus body limited warranty certificate, WA0009, is included with this proposal.
0693127	Warranty, Gortite, Roll-up Door, 6 Year, WA0190	**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.

0639211	Warranty, Pump, Hale, 5 Year Parts, 2 Year Labor, WA0248	**PUMP WARRANTY** A Hale pump limited warranty certificate, WA0248, is included with this proposal. .
0648675	Warranty, 10 Year S/S Pumbing, WA0035	**TEN (10) YEAR PUMP PLUMBING WARRANTY** The Pierce apparatus plumbing limited warranty certificate, WA0035, is included with this proposal.
0641372	Warranty, Foam System, Not Available	
0006999	Warranty, Structure, 20 Year, Aerial Device, WA0052	**TWENTY (20) YEAR AERIAL DEVICE STRUCTURAL INTEGRITY WARRANTY** The Pierce device limited warranty certificate, WA0052, is included with this proposal.
0687388	Warranty, Swivels, 5 Year, Aerial Device, WA0197	**AERIAL SWIVEL WARRANTY** An Amity five (5) year limited swivel warranty will be provided. A copy of the warranty certificate will be submitted with the bid package.
0685727	Warranty, Hydraulic System and Components, 3 Year/5 Year, WA0200	**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 will be submitted with the bid package.
0687327	Warranty, Waterway, 10 Year, Aerial Device, WA0198	**AERIAL WATERWAY WARRANTY** An Amity ten (10) year limited waterway warranty will be provided. A copy of the warranty certificate will be submitted with the bid package.
0595860	Warranty, Paint, 4 Year, Aerial Device, Pro-Rated, WA0047	**FOUR (4) YEAR PRO-RATED PAINT AND CORROSION** A Pierce aerial device limited pro-rated paint warranty certificate, WA0047, is included with this proposal.
0609981	Warranty, Harrison Generator, 6 Year, WA0285	**SIX (6) YEAR GENERATOR MATERIAL AND WORKMANSHIP WARRANTY** A Harrison Hydra-Gen limited warranty certificate, WA0285, is included with this proposal.
0595820	Warranty, Paint, 10 Year, Body, Pro-Rate, WA0057	**TEN (10) YEAR PRO-RATED PAINT AND CORROSION** A Pierce body limited pro-rated paint warranty certificate, WA0057, is included with this proposal.
0595421	Warranty, Goldstar, 3 Year, Apparatus, WA0018	**THREE (3) YEAR MATERIAL AND WORKMANSHIP** The Pierce Goldstar gold leaf lamination limited warranty limited warranty certificate, WA0018, is included with this proposal.
0683627	Certification, Vehicle Stability, CD0156	**VEHICLE STABILITY CERTIFICATION** The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification will be provided at the time of bid.
0764540	Certification, Engine Installation, Velocity, Cummins X12, 2018	**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.
0686786	Certification, Power Steering, CD0098	**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 will be provided at the time of bid.

0667417	Certification, Cab Integrity, Velocity FR, CD0009	**CAB INTEGRITY CERTIFICATION** The fire apparatus manufacturer will provide a cab integrity certification with this proposal. The certification will state that 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: European Occupant Protection Standard ECE Regulation No.29. SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks. SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks. **Roof Crush** The cab will be subjected to a roof crush force of 22,050 lb. This value meets the ECE 29 criteria and is equivalent to the front axle rating up to a maximum of 10 metric tons. **Additional Roof Crush** The same cab will be subjected to a roof crush force of 100,000 lbs. This value exceeds the ECE 29 criteria by nearly 4.5 times. **Side Impact** The same cab will be subjected to dynamic preload where a 13,275 lb moving barrier slams into the side of the cab at 5.5 mph at a force of 13,000 ft-lbs. 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-lbs of force using a moving barrier in accordance with SAE J2420. **Additional Frontal Impact** The same cab will withstand a frontal impact of 65,200 ft-lbs of force using a moving barrier, (twice the force required by SAE J2420). The same cab will withstand all tests without any measurable intrusion into the survival space of the occupant area.
0548950	Certification, Cab Door Durability, Velocity/Impel, CD0001	**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.
0548967	Certification, Windshield Wiper Durability, Impel/Velocity, CD0005	**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.
0667411	Certification, Electric Window Durability, Velocity/Impel FR, CD0004	**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.
0549273	Certification, Seat Belt Anchors and Mounting, Imp/Vel/Vel SLT, CD0018	**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 that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.
0667416	Certification, Cab Heater and Defroster, Velocity/Impel FR, CD0015	**CAB DEFROSTER CERTIFICATION** 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 HEATER CERTIFICATION*** *Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. The cab heaters will warm the cab 75 F from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder will certify that a substantially similar cab has been tested and has met these criteria.*

0667415	Certification, Cab Air Conditioning Performance, Velocity/Impel FR, CD0016	**CAB AIR CONDITIONING PERFORMANCE CERTIFICATION** 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 67 degrees Fahrenheit in 30 minutes. The bidder will certify that a substantially similar air conditioning system has been tested and has met these criteria. The certification will be available at the time of delivery.
0545073	Amp Draw Report, NFPA Current Edition	**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: Applicable NFPA 1901 or 1906 (Current Edition). The minimum continuous load of each component that is specified per: Applicable NFPA 1901 or 1906 (Current Edition). 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 applicable NFPA 1901 or 1906 (Current Edition).
0002758	Amp Draw, NFPA/ULC Radio Allowance	
0799248	Appleton/Florida BTO	
0000049	Ascendant BODY	
0000012	PIERCE CHASSIS	
0004713	ENGINE, OTHER	
0046396	EVS 4000 Series TRANSMISSION	
0020012	HALE PUMP	
0020009	POLY TANK	
0028048	FOAM SYSTEM	
0020006	SIDE CONTROL	
0020007	AKRON VALVES	
0020015	ABS SYSTEM	
0658751	Manufacturing Attribute	